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Editorial

Justice as Fairness

Prof. Baidyanath Misra

I had read almost all the novels of Charles Dickens at my graduate level. I was surprised to find how he could write such outstanding books without much education. The books were not only interesting but also educative and exciting. Once you start reading his novel, you cannot stop without finishing it. I also did not know the author was rated so high in English World. Once I had gone to Bombay to attend a seminar. I guess it was about 20 years back. Herbert Morrison, a socialist leader of great repute was the main speaker. I was tempted to ask him what action should be taken in India to reduce the social and economic injustice since he was mostly concerned about Indian economy. His reply was, have you read Charles Dickens' novels? What you see in India today, the same thing was happening in Great Britain about 150 or 200 years back. Children were not only exploited, some of them were sold in the market like other commodities. And not only children, politicians, were bought and sold to secure power in the country. Such things cannot happen today in Britain because people are now enlightened and vigilant to safeguard the country's liberty. They know what liberty is and how can it be protected. I got my answer and did not pursue further.

When I started reading "The Idea of Justice" by Amartya Sen, I was surprised to find that he started his book with a quotation from Charles Dickens' 'Great Expectations' where he said, 'In the little world in which children have their existence, says Pip, 'there is nothing so finely perceived and finely felt, as injustice'. Amartya Sen adds, 'I expect Pip is right; he vividly recalls after his humiliating encounter with Estella, the capricious and violent coercion, he suffered as a child at the hands of his own sister. But Sen adds further, the strong perception of manifest injustice applies to adult human beings as well. What moves us, reasonably enough, is not realization that the world falls short of being completely just – which few of us expect – but there are clearly remediable injustices around us which we want to eliminate'. I have given such a long introduction to show that there are many injustices in the society which can be controlled, though not eliminated.

There are examples to show how attempts have been made in different countries to fight injustice. French revolution is one such example where Parisians stormed the Bastille and succeeded to eliminate the misrule of the crown. In India, Gandhiji challenged G.B and

succeeded to secure independence for India. Now in the Arab world, great risings have been started to remove the exorbitant power of oligarchs. Not that all these risings have removed injustice, but at least they have shown remedial methods to control injustices. We are not going to discuss the theory of justice. All we are interested to discuss how to enhance justice and remove injustice. It is difficult to decide the nature of perfect justice. Adam Smith in his 'The Theory of Moral Sentiments' has pointed out that justice can be defined in many different ways since justice has several meanings. Amartya Sen has given a beautiful illustration by giving an example of 'Three Children and a Flute'. The three children are Anne, Bob and Carla and they are quarrelling for a flute. Anne claims the flute on the ground that she knows how to play. Bob on the other hand argues that he is the only one among the three who is so poor that he has no toys of his own. The flute would give something to play with. Carla argues that she has been working diligently for many months to make the flute with her own labour. Bob, the poorest would get support from the economic egalitarians. Carla, the maker of the flute, would receive immediate sympathy from the libertarians. Utilitarian hedonist would support Anne, because Anne's pleasure is likely to be stronger because she is the only one who can play the flute (there is also the general dictum of 'waste not, want not').

The general point here is that it is not easy to brush aside as foundationless any of the claims based respectively on the pursuit of human fulfilment, or removal of poverty or entitlement to enjoy the products of one's own labour. It follows from this that the meaning of justice will be defined differently by theorists of different persuasions, such as utilitarians, or economic egalitarians or labour right theorists. Students of economics may side with economic egalitarians, but cannot bypass other views. By and large, they are social scientists.

There are wide range of views on the pattern of development which can increase the pace of growth and at the same time provide adequate social benefit to the poor and downturn. One view is market economy. This is the right wing view, which was propounded by Milton Friedman (1962). According to him, free market position is such that, in the long run, market forces, individual initiative, and productive growth are the sole determinants of the distribution of income and standard of living, in particular of the least well off members of society. Hence government efforts to redistribute wealth should be limited and should rely on instrument that interfere as little as possible with virtuous mechanisms of the market.

In this connection we can refer to 'Economic Growth and Economic Inequality' by Simon Kuznets (1955) in which he points out that inequality everywhere be described by an inverted U curve. In the first phase of development, inequality would increase as traditional agricultural societies industrialized and urbanized. This would be followed by a second phase of stabilization, and then a third phase in which inequality would substantially decrease. As a matter of fact in seventies and eighties of the 20th Century, there was substantial decrease in

income inequality both in UK and the USA. But such a phenomena did not last long. Piketty in his study of 'Capital in the Twenty-first century and 'The Economic of Inequality' has shown that the idea of an inverted U shaped curve linking development inexorably to increasing and then decreasing inequality was found to be false when inequality started increasing towards the end of the 20th Century and beginning of 21st century. Piketty therefore, points out 'This inversion of Kuznets curve spelled an end to the notion that there was a grand historical law governing the evolution of inequality, at least for a time.

In respect of India, we find that Jagadish Bhagwati and Arvind Panagaria in their excellent book, 'India's "Tryst with Destiny"' argues that sustained rapid growth offers the only inescapable route to lifting the millions out of poverty, illiteracy and ill health. They argue that only growth can provide sufficient revenue for the provision of education and good health for the masses. Ofcourse they have made a number of good suggestions for reforms, which will further help to accelerate growth and make it more inclusive and permit more effective and efficient redistribution from the rich to the poor. Unlike Friedman, they have made some suggestions for reforms. But by and large they are found to recommend market system for economic growth and depend upon redistribution for social change.

Without going to theory of justice, we would try to continue our attention to some of the measures which can accelerate economic development making societies less unjust. Both Jean Dreze and Amartya Sen in their illuminating book, 'An Uncertain Glory – India and its Contradictions' have tried to show how economic development while accelerating growth should pay sufficient attention to the essential needs of the people, especially of the poor and women. According to them, there have been major failures in India's development pattern both to foster participatory growth and to make good use of the public resources generated by economic growth to enhance people's living conditions. There is also a continued inadequacy of social services such as schooling and medical care as well as physical services such as safe water, electricity, drainage, transport and sanitation. In the long run, even the feasibility of high economic growth is threatened by the underdevelopment of social and physical infrastructure and the neglect of human capabilities, in contrast with the Asian approach of simultaneous pursuit of economic growth and human development. Dreze and Amartya Sen have pursued a combined approach which includes economic growth and human development. Their analysis does not neglect redistribution but it is different from that of Bhagabati and Panagaria.

Pending a detailed discussion of the books, we can consider the method of redistribution which can serve as a remedial measure. The right wing feels that the price system be allowed freely with redistribution of means of taxes and transfers. This is what is being done now in India. On the other hand progressive thinkers propose to alter the market forces that generate

inequality. According to Thomas Piketty, this contrast corresponds to Pure Distribution and Efficient Distribution (The Economic of Inequality). Pure Distribution occurs when the market equilibrium is “Pareto efficient”, meaning that it is impossible to alter the allocation of resources and output in such a way that every one gains, yet social justice nevertheless calls for redistribution from the better off to the worse off. Efficient Distribution occurs when the existence of market imperfections allows for direct intervention in the production process to achieve Pareto efficient improvements in the allocation and equitable distribution of resources. The same type of contrast we find both in ‘India’s Tryst with Destiny’ and ‘An Uncertain Glory’.

We can certainly have more improvement in the social system of Indian economy provided we resort to Efficient Distribution. The fact that liberalization has been less successful in India than China reminds us, as suggested by Picketty, however of the crucial importance of the egalitarian element, without which liberalization cannot lead to lasting growth (Dreze and Sen, 1995), Egalitarian educational policies are probably the most basic example of Efficient Distribution. A detailed analysis of the contributions of India’s ‘Tryst With Destiny’ and ‘An Uncertain Glory’ will throw much light on differences between Pure Distribution and Efficient Distribution.

Tourism as a Means of Mass Employment- Leading to Economic Growth of Odisha¹

Satya Prakash Panda²

The greatest challenge that Govt. of Odisha faces today, and it shall be more in the coming days, is the problem of unemployment. Establishment of more industries addresses only a part of the problem.

One of the greatest providers of employment over the world is tourism industry. If we deeply analyze the cause of prosperity of Kerala and Rajasthan, we will find that every person willing to work has a job, because of tourism sector.

Nobel laureate, Prof. Amartya Sen suggests that the best model for economic development of India, where overpopulation is a reality, is providing jobs to the common man. He has cited the Kerala example. While agriculture, horticulture, and industry are able to provide jobs to a particular section of the society, lakhs of matriculates, +2 and +3 pass outs with general qualifications are not able to find employment and have contributed greatly to various maladies of the society as well as extremism. For them tourism can provide bulk employment. As observed by me, Kerala, Rajasthan, Australia, USA, Europe, Dubai, Thailand, and other 30 nation's, tourism provides mass employment to the following categories of people.

- a) Highly paid managers by tourism oriented business companies.
- b) Middle managers, junior managers, executives and supervisors.
- c) Unskilled and semiskilled workers at all levels.
- d) The support services operators and their workers.

The potential area of tourism in Odisha can be divided into the following categories.

- a. Historical tourism
- b. Religious tourism – Hindu/ Budha/ Jaina circuits.
- c. Aquatic tourism – Sea and lakes like Chillika, Ansupa, Tampara (Chatrapur), Sonapur (Ganjam), Bhitarkanika, Hirakud Dam, Satakosia Ganda, Waterfalls and other numerous water bodies.
- d. Cultural/ Tribal tourism – Bhubaneswar and tribal districts, where micro project are there.
- e. Adventure tourism – Ballooning, Sky diving, river tracking.
- f. Hill station tourism – Panchapatamali – Pottangi, Daringibadi, Belghar.
- g. Ayurvedic tourism – Ayurvedic, Naturopathy treatment in tourist locations.
- h. Light and Sound shows + Dancing foundations in tourist locations.
- i. Comprehensive tourism circuits – consisting of varied attraction like water world, fun world, Ethic village like Choki Dhani (Jaypore, Rajasthan) etc.

¹ Welcome Address delivered on the occasion of 48th Annual Conference of Orissa Economics Association.

² Chairman, Gandhi Group, Odisha

- j. Agro/ Horticulture tourism (Kerala)
- k. Sea cruises from the ports of Odisha.
- l. Wild life tourism.

What role Govt. should play

1. An Institute of Tourism and Leisure Activities has to be established at Bhubaneswar. We should offer the following courses.
 - a. Tourism certificate course – for matriculates of one year duration.
 - b. Tourism degree course – 3 years degree course for +2 pass outs.
 - c. MBA in Tourism – 2 years course for +3 pass outs.

The pass outs will find job with the tourist companies or can be entrepreneurs.

2. A new cadre like OAS can be created, to be titled as “Odisha Tourism Services”, with good salary and promotion prospects.
3. Three study groups can be constituted, each consisting of one IAS officer, one OAS officer, one MLA, one tourism department officer, one hotel industry representative, one business analyst, who should be deputed to different states and nation to study how big money is earned through tourism by Govt. as taxes, by the industry and by the persons, who are employed in the industry. Besides, they will also find out what is best for Odisha. After their report Govt. can lay down its policies on tourism afresh.
4. Excellent road communication is to be laid down to tourism sites. The most important road shall be the east coast road of Odisha along the sea line as is being done by Andhra Govt. This will lead to establishment of seaside resorts in hundreds by national and international hospitality industry.
5. Comfortable bus communication to un-served tourist destinations.
6. Lying of rope ways by PPP mode.
7. Developing a special berth for passenger ships at Paradip and other ports, for sea cruise tour.
8. Infrastructure development for aquatic games at important points.
9. Development of new tourism circuits like Sambalpur, Keonjhar – Mayurbhanj, Korapur – Rayagada, Bhadrak – Balasore.
10. Development of hill station at Deomali – Potangi, Daringbadi and Belghar.
11. More showcasing of Odisha, by inviting world famous tourism TV channels to Odisha. Hiring the services of Indian and internationally famous tour organizers and showing them all the sites and taking practical advices from them for improvement of the sites and correction of our present policies.
12. Preparation of attractive documentary films for screening in popular tourism and general TV channels, cinema halls and hosting it on the websites with latest information on happenings. The websites should be interactive and ready to answer the queries of the visitors.

13. Organisation of shows
 - a. Sand art competition
 - b. Flower show competition at all tourist points and Bhubaneswr
 - c. Aquatic game competitions, row boats competition like Kerala
 - d. Flora fauna study by college students in chillika, Jungles etc.
 - e. Dog show competition
 - f. Dance competition
 - g. Air gliding
 - h. Sea surfing
 - i. Elephant shows, Elephant training centre can be developed like Kerala and Thailand, where tourists can ride. This way the elephants can be meaningfully employed and will be properly fed and cared, while providing employment to hundreds of people.
 - j. Horse shows and horse training centre
 - k. Tiger safari shows
 - l. Lion safari shows
 - m. Crocodile safari shows
 - n. Dolphin shows
 - o. Olive ridley shows
 - p. Aquarium can be developed at important tourist sites.
 - q. Govt. land can be provided on a concessional premium to organisations who can develop Water world, Fun world, Ethnic and art and craft village.

We have many of the above but they have not been able to attract adequate number of tourists, because of the people who handle it. Hence professionally trained hands are necessary to take these projects ahead, for which an Institute of Tourism and Leisure Activities should be established at, Bhubaneswar to play a major role.

For all these ambitious programmes huge initial investments have to be done by the State Govt. As yet fund allocation for tourism has a last priority in our state budget. It has to be remembered that it is the right time, where we should jump into tourism as a mass employment provider. We shall have to address the needs of

- a) International tourist, which shall increase with our new international airport.
- b) Tourist from Odisha and other Indian states.
- c) Pleasure activities to be organised locally through establishment of more parks and utilizing innumerable number of water bodies like dams, lakes, rivers, sanctuaries, forests, waterfalls, festivals, folk dances etc., where facilities are to be created by Govt. and private organisations.

Tourism is a vast area where sky is the limit for imaginations and has got huge potential for employment generation leading to eradication of poverty and will pump in huge income to the pockets of the common man and shall bring an end to naxalism etc.

Sustainability Goals and Constraints for Development of Odisha¹

Nirmal Chandra Sahu

Prologue

I feel myself fortunate and greatly honoured to address you today as the President of the Orissa Economics Association in its 48th Annual Conference at the GIET, Gunupur. I thank all of you from the core of my heart for accepting me in this position during 2015. I am grateful to revered Professor Baidyanath Misra for nominating me to lead one of the oldest academic associations of Odisha. I am also thankful to all my respected mentors and senior teachers of economics for remembering me at the appropriate time of selection of President.

I am exceptionally obliged to express my gratefulness to Dr. Satya Prakash Panda, Chairman and Dr. Chandra Dhvaj Panda, Secretary of the esteemed Gandhi group of institutions for shouldering the burden of organizing this conference. I will never forget the way Dr. Satya Prakash Panda responded, when I proposed this conference to him in a social function right in February 2015. He just uttered – ‘Done’. Dr. NVJ Rao and his colleagues have put in whole-hearted efforts to make this a memorable conference. I remain indebted to the team GIET.

The delegates are intended to deliberate here on two themes: *Regional disparities in India*, and *Trends in Food Consumption and Nutrition Security in Odisha*. These concerns from ‘economics of justice and security’ are the unsolved mysteries of our lives. I hope sensible solutions would occur to us through this conference. However, I have chosen to release the steam of my mind on a topic of my curiosity over the last four decades, i.e. ‘sustainability of development in Odisha’. I propose to make a sandwich of two slices: first, the theory of sustainability followed by the development riddle of Odisha.

Part I

Sustainability: Perspectives and Paradigms

Sustainability: Features and implications

The issues concerning the challenge of sustainability of development have been evolving since 1972. There is now consensus on two things regarding sustainable development (SD). First, no other strategy of development has hauled as much passion as it did for such a long time. Second, it is a normative contestable concept, and so open to several interpretations. However, like all great ideas, such as honesty, sustainability is a simple idea. The multiple views notwithstanding, identification of

¹ Presidential Address delivered on the occasion of the 48th Annual Conference of Orissa Economics Association at GIET, Gunupur

unsustainability can motivate us to take necessary policy correction. This may help us recognize sustainability as essentially an organizing principle to facilitate a dynamic process so as to achieve equity, efficiency and resilience through generations.

The social science perspectives were missing when the idea of SD was first espoused in 1980 in the World Conservation Strategy. This defect was remedied in 1987 in the highly influential Brundtland Report, *Our Common Future*, prepared by the World Commission on Environment and Development (WCED) which was chaired by Mrs. Gro Harlem Brundtland, the Prime Minister of Norway. Although it offered a very comprehensive and most popular definition, there is no general agreement on its precise meaning. Even the report itself is not consistent throughout its text. The search for a meaningful definition and suitable indicators continued in the international literature that swelled in the late 1980s through the 1990s, which produced a gallery of definitions (Pearce *et al.*, 1989).

The Brundtland report defines SD as a process that “meets the needs of the present without compromising the ability of the future generations to meet their own needs.” It is a process of change in which the exploitation of resources, the direction of investments, the orientation of technology and institutional change are all mutually compatible. The fundamental message of the concept is that the developmental achievements of human economy should last well into the future. The scope of the concept has been further broadened to imply ‘*sustainable human development*’ (SHD) by the United Nations Development Programme (UNDP) in the Human Development Report, 1994. SHD envisages that the countries should have non-declining human development index, which includes along with the indicators of economic development, elements like educational attainment, health standard, nutritional status, state of environment and human rights profile. In the extensive discussion and use of the concept since 1987, there has generally been recognition of the following three interconnected dimensions of sustainability:

Economic: An economically sustainable system must be able to produce goods and services on a continuing basis, and avoid sectoral imbalances that damage agricultural or industrial production.

Ecological: An ecologically sustainable system must maintain a stable resource base, avoiding over-exploitation of renewable resources or environmental sink functions, and depleting non-renewable resources only to the extent that investment is made in adequate substitutes.

Socio-cultural: A socially sustainable system must achieve distributive justice, adequate provision of social services including health and education, gender equity, people’s participation, cultural diversity and political accountability.

These three dimensions of sustainability introduce many complications, while harmonizing the interconnected elements. For example, what to do, if provisions of adequate food and water supplies require changes in land use, which will decrease biodiversity? In the real world, we can rarely avoid such trade-offs. Any attempt to optimize several objectives simultaneously is a daunting task. However, sustainability emulates a phenomenon of nature, which always remains in steady state. In 1857, John

Stuart Mill extended the Classical postulate that the imbalance between population growth and output growth cannot continue indefinitely. The process would lead an economy to stationary state. Herman E. Daly resurrected this idea in 1973 in his steady state configuration of constant population, constant wealth, moral growth and equitable distribution. Economics of sustainability is a renewal of this thinking. Daly (1992) has articulated SD as “development without throughput growth, but with population control and wealth redistribution.” It has been conceived as the ideal interface between development and environment. Environmental quality is a part of the wider development objective of achieving an improved quality of life. One of its strategic imperatives is that we must change the quality of economic growth by changing the composition and distribution of output, not just by increasing the quantity of output.

The heart of the sustainability idea lies in its futurity. It involves a compulsion that the time horizon of socioeconomic calculations has to be extended to a very long period. It is concerned not only with the short to medium-term time horizons, over which a political party may plan and implement its manifesto, but also with the longer-run future to be inherited by our grand children and perhaps beyond. The question of discounting the future and heeding to the voice of the grand children are delicate moral issues. In a trans-generational framework, Parikh (1995) formulates a possible operational strategy to “maximise the present discounted value of utility (or social welfare) over a time period of one generation (say 20 years), subject to a sustainability constraint that requires that at the end of this generation, the production possibility set would include all the production possibility sets.” It implies non-declining utility, non-declining resource stock and non-increasing pollution. Another implication of sustainability relates to the optimum scale of resource use. The institutions of market and state try to achieve allocative and distributive efficiency through price mechanism, and fiscal and monetary policies. But there is hardly an institution to determine the optimum scale of production and consumption compatible with sustainability. All other species have only instrumental value in an anthropocentric optimum. But there is an ecocentric optimum, which recognizes both instrumental and intrinsic value of other species. Based on these implications, the concept of sustainability is consistent with justice to socially disadvantaged (*intra-generational equity*), justice to the future generations (*intergenerational equity*), justice to nature, economic efficiency, and resilience to external shocks and uncertainty.

Sustainability paradigms

There are two main paradigms of sustainability, which are derived from the capital theory in economics. Given the widely accepted formulation that it implies non-declining per capita human wellbeing, the fundamental condition is the maintenance of capital stock, which yields a flow of goods and services into the future. The overall capital stock at any point of time comprises of two main components, such as **natural capital** (K_N) and **human-made capital** (K_M). K_N refers to the Nature’s dowry to an economy, which ensures flow of renewable and non-renewable resources, amenities and sink functions of the environment. K_M includes the human produced means of production, which are generated via economic activity through human ingenuity and technological change. An overlapping category of *cultivated natural capital* (K_{MN}) includes the practices like agriculture, aquaculture, plantation forestry

and so on. However, one can decompose K_{MN} into its components of K_N and K_M proper. For example, a plantation forest has K_N component of sunlight, rainfall and soil nutrients; and K_M component of management services of planting, spacing and control of diseases. Yet another form of capital relates to *socio-cultural capital* (K_{SC}), which provides means and adaptations to deal with nature. It includes traditional ecological knowledge (TEK), and socio-political ethics and institutions. Even though K_{SC} is the most important component, it is difficult to make it analytical within the economics of sustainability.

There are two ways to maintain total capital stock constant over time. The sum of K_M and K_N can be maintained constant in some aggregate sense or *each* component can be maintained constant separately. The first way is reasonable if K_M and K_N are believed as substitutes. According to this view it is acceptable to divest K_N as long as one creates K_M of equivalent value by investment. The second way is reasonable if one believes that K_M and K_N are complements. The complements must each be maintained constant, separately or jointly in fixed proportion because the productivity of one depends on the availability of the other. The first is a hypothesis of **weak sustainability** (WS) and the second is the theory of **strong sustainability** (SS). In a large part of mainstream economics K_M and K_N are considered as substitutes. But ecological economists believe that the two are fundamentally complements and only marginally substitutes. Had they been substitutes, why did we bother to accumulate K_M in the first place as we were already rich by nature with a perfect substitute? Further, K_M is a physical transformation of K_N , and production of the former requires the latter as an input. K_N is the material cause of production and K_M is the efficient cause of production. The material cause and efficient cause are complements, not substitutes. What good is a saw mill without a forest, or a fishing boat in a natural lake without a fish population? The WS paradigm states that the total wealth of an economy should not decrease over time, as long as adequate compensation is made in the form saving and investment. The SS paradigm, on the other hand, emphasizes on conservation of natural assets through prudent capital portfolio management. The choice between the approaches depends on the facts about the world we live, which are uncertain.

Operationalization of sustainability

It is worthwhile here to classify the major interpretations, so as to develop operational approaches to sustainability. Perman *et al.* (1999) have distinguished at least six alternative ways of thinking about sustainability, which are listed in Box 1.

Box 1. Concepts of sustainability (with main author(s) in parentheses)

1. A sustainable state is one in which utility or consumption is non-declining over time (John M. Hartwick, Robert M. Solow).
2. A sustainable state is one in which resources are managed so as to maintain production opportunities for the future (John M. Hartwick, Robert M. Solow).
3. A sustainable state is one in which the natural capital stock is non-declining through time (David Pearce, Edward Barbier, Anil Markandya, G. Atkinson).

4. A sustainable state is one in which resources are managed so as to maintain a sustainable yield of resource services (Several biologists, and Kenneth E. Boulding, Herman E. Daly).
5. A sustainable state is one which satisfies minimum conditions of ecosystem stability and resilience through time (S. V. Ciriacy-Wantrup, Charles A. Perrings, Michael Common, Robert Costanza).
6. A sustainable state is one in which there is a continuous process of capacity and consensus building (H. J. de Graaf, C.J.M. Musters, Elinor Ostrom).

These concepts are not necessarily mutually exclusive. They do not explicitly specify the duration of time. Obviously, they imply a long unlimited time span. Further, all of them are not pure economic conceptualizations. For example, the third, fourth and fifth concepts do not pursue an economic objective *per se*. Nevertheless, they involve a necessary condition for achieving sustainability in standard economic terms. However, all the approaches, except the sixth, view sustainability in terms of constraints on economic behaviour. They do not specifically imply what an economy should do in achieving an ultimate objective. But whatever that objective is, sustainability is seen as a constraint on the process of achieving it. This is what we need to search for SD of Odisha. Before that, let us carry the operational rules and indicators available in the economics of sustainability.

The Solow-Hartwick approach (1974 and 1977) states that every future generation must have the option of being as well-off as its predecessor. In order to maintain a constant potential for wealth creation, the economy must maintain its overall productive capacity, which includes human-made capital, human capital (the level of learning), natural resources and technology. What is necessary to know and monitor at each moment in time is how much of this productive base an economy can use up. This is given by environmentally adjusted net national product (ENNP) or 'green NNP', which is the total income earned by an economy in any year, less allowance for depreciation of K_M and K_N . This is the annual *pay-off* from the total capital ($K_N + K_M$) stock. If ENNP is falling, then society's sustainable level of income is also falling. It can rise through time if this total capital stock rises, and/or technology improves. The total stock of capital can be maintained by following the Hartwick rule, which states that the Hotelling rents (price minus marginal cost) from an optimal non-renewable resource extraction plan must be reinvested each year in natural or human-made capital.

In the traditional System of National Accounts (SNA), many aspects of natural resource depletion are being ignored. While any loss in welfare due to environmental pollution is being ignored, the expenditure on pollution clean-up is actually added to NNP. A country can deplete its biodiversity, fell its forests, erase its wildlife, erode its soils, exhaust its minerals, pollute its air and degrade its aquifers without adversely affecting its measured income. By failing to recognize the asset value of natural resources, the traditional SNA misrepresents the policy options which nations face. In recognition of such flaws, the United Nations has developed a System of Integrated Environmental and Economic Accounting (SEEA) as a satellite account of SNA. The SEEA and its alternative variants have been implemented in a number of countries. In India, besides the comprehensive study at the state and national levels, some researchers like K. Chopra, G. Kadekodi, M. N. Murty, G. S. Haripriya, K.

S. Parikh and J. Parikh have demonstrated how to account for natural resources and environment in the national accounts (Haripriya, 2003). The search for a better proxy of welfare and sustainability has roots in the MEW (Measure of Economic Welfare) index developed by William D. Nordhaus and James Tobin in 1972. In 1989 Herman E. Daly and John B. Cobb proposed the Index of Sustainable Economic Welfare (ISEW), which adjusts consumer expenditure by such factors as income distribution and costs associated with pollution and other unsustainable activities. In an extension of ISEW, the Genuine Progress Indicator (GPI) tries to monitor welfare and the ecological sustainability of an economy as index of real progress of a society.

In 1993, D. W. Pearce and G. Atkinson have proposed an indicator of weak sustainability (WS) based on the neoclassical assumption of substitutability between KM and KN. The Pearce-Atkinson measure (PAM) is a measure of genuine or 'green savings', which is simply the savings (average propensity to save) minus the sum of depreciation of KM and KN. Pearce and Atkinson argued that this is a useful rule, in the sense that if countries fail even this weak test of sustainability, they are unlikely to pass any stronger test. Further, there are natural capital stock approaches of the London School of Environmental Economics (1990s), which suggest for monitoring sustainability from the measured levels of KN (in physical or value terms) in each class in comparison to the constraint or existing levels. In another closely related approach under environmental uncertainty, the sustainability rule of S. Ciriacy-Wantrup (1952) and R. C. Bishop (1978) is to prevent reductions in the KN stock below the safe minimum standard (SMS) identified for each component of the stock unless the social opportunity costs are unacceptably large.

Being a founder member of the ecological economics school, Herman E. Daly (2005) has incorporated the core of the SS paradigm, while suggesting a set of *operational principles* for SD. The *first* principle is to limit the scale of a human economy to a level which, if not optimal, is at least within the carrying capacity of the ecosystem. The scale measured by the product of the number of people and the average standard of living (level of per capita resource consumption) should not exceed the carrying capacity. The technological progress should be efficiency-increasing rather than throughput-increasing. *Secondly*, the harvesting rates of renewable resources should not exceed regeneration rates. *Thirdly*, the nonrenewable resources should be exploited at a rate equal to the creation of renewable substitutes. Nonrenewable projects should be paired with renewable projects and their joint rate of return should be calculated on the basis of their income component. The receipts from non-renewable extraction should be divided into an *investment stream* and an *income stream*. The former should be invested in renewable substitutes (for example, human-made forest for coal) such that, by the time the non-renewable resource is exhausted, an equivalent level of consumption is available from the renewable substitute. Only the income stream should be available for current consumption. For degradable pollutants, the *fourth* rule is to establish assimilative capacities for the receiving ecosystems and to maintain the waste discharges below these levels. Daly has not proposed a rule for cumulative pollutants, but the implication is that their discharge should be set close to zero.

Yet another ecological economics approach relates to the model of Michael Common and Charles Perrings (1992). They have integrated ecological sustainability represented by ecosystem *resilience*

and economic sustainability represented by the Hartwick rule. Resilience is the capacity of the overall ecosystem to withstand external shocks without losing its 'self-organization'. Ecological sustainability is defined using the concept of C. S. Holling, in which resilience is an increasing function of diversity of a system. The ecological constraint requires that the economic process does not have a destabilizing effect on the resilience of the ecosystem. It implies that rate of change in the natural parameters with respect to time is strictly zero, so that they do not threaten the stability either of the system as a whole or of its key components (Hanley *et al.*, 1997).

Combining the concerns and elements of the different approaches, the United Nations Commission on Sustainable Development (UNCSD) had approved a list of approximately 130 indicators of SD in 1995. These are organized in a framework of *Driving Force*, *State* and *Response* indicators with reference to the chapters of the Agenda 21 of the Rio (Earth Summit) declaration. The driving force indicators represent human activities, processes and patterns that impact on SD. The state indicators reflect the shape and status of development. The response indicators are the policy choices available to change the state. The indicators are classified under socioeconomic, environmental and institutional categories, which can be monitored with reference to the various dimensions of development such as poverty, education, health, demography, land, water, forest, biodiversity and people's participation (UNO, 1996). For example, under socioeconomic category (Chapter 36, Agenda 21), for promotion of education, the driving force indicators include rate of change of school age population, gross and net primary and secondary school enrolment ratio, adult literacy rate, etc. The state indicators are the number of children reaching Grade 5, difference between male and female school enrolment ratios and the labour force participation rate of women in comparison to men. The response indicator to be watched include the national and regional spending on education.

Sustainability goals and constraints

After a series of inter-governmental negotiations, evolving since 1972, more than 190 countries of the UN General Assembly adopted a set of seventeen Sustainable Development Goals (SDGs) on 25 September 2015 in place of eight Millennium Development Goals (MDGs) being pursued since 2000. The SDGs, officially known as *Transforming our world: the 2030 Agenda for Sustainable Development*, are the following aspiration goals (UNO, 2015), which have 169 targets and 304 indicators:

1. **End poverty** in all its forms everywhere.
2. **End hunger**, achieve food and nutrition security, and promote sustainable agriculture.
3. Ensure **good health and well-being** for all at all ages.
4. Ensure inclusive **quality education** and promote lifelong opportunities for all.
5. Achieve **gender equality** and empower all women and girls.
6. Ensure availability and sustainable management of **clean water and sanitation** for all.
7. Ensure access to **affordable energy** for all, which is reliable, sustainable and modern.
8. Promote inclusive and sustainable economic growth, with full and **decent work for all**.
9. Build **resilient infrastructure**, promote sustainable industrialization and innovation.

10. **Reduce inequality** within and among countries.
11. Make inclusive, safe, resilient and **sustainable cities and human settlements**.
12. Ensure **sustainable and responsible consumption and production patterns**.
13. Take **urgent action to combat climate change** and its impacts.
14. Conserve **life below water** and sustainably use the oceans, seas and marine resources.
15. Protect **life on land**, sustainably manage forests and halt biodiversity loss.
16. Promote **peace, justice and strong institutions** and build inclusive societies.
17. Strengthen **partnerships for the goals** and the means of implementation.

Part II

Sustainability of Development in Odisha

The state of development

Odisha is now considered as a good performer in terms of better economic growth rates. Since 1997 the Plan-wise average annual growth rates are quite good (Table 1). As per advance estimates, the performance during 2014-15 has been further impressive, with anticipated growth rates of GSDP at 8.78 percent and per capita NSDP at 7.31 percent in real terms at 2004-05 base (GoO, 2015). The standard of living in Odisha has improved over the years with the rise in real per capita income, though its continuing gap from the national average remains a matter of concern. Further, the State's economy is diversifying at a faster rate. The structural shifts from primary to tertiary sectors have been visible over a period of time. In 2014-15, the broad agriculture, industry and service sectors (as per CSO classification) contributed about 15.4 percent, 33.4 percent and 51.2 percent of GSDP. These are signs of a march towards prosperity. Agriculture experienced a decelerating trend, but continues to remain a priority sector because of its high potential for employment generation and inclusiveness. The State has recently addressed the challenging issues of fiscal deficits and debt burden with strengthening of institutional measures, fiscal correction, consolidation and efficient management. This led to remarkable turnaround in State finances in recent years (GoO, 2015). Further, as per the NSS (National Sample Survey) data, the rate of rural and urban unemployment has fallen from the 61st round (July 2004-June 2005) to the 68th round (July 2009-June 2010). But the State's unemployment rate in rural area is marginally higher than the national rate of unemployment, while it is lower than all India average in case of urban areas. It is heartening to note that the share of women employees in the organized sector has been steadily increasing (GoO, 2015).

Most large-scale industries in Odisha are mineral-based. Presently in steel production, Odisha has 10 percent of the total capacity of the nation, while it has 25 percent of total iron ore reserves in the country. Therefore, there is substantial scope for expansion in steel production in the State. Odisha occupies the first place in the country in aluminum, both in terms of production capacity and actual output. Out of the four big plants producing aluminium in the country, two are in Odisha. These are NALCO and Vedanta Aluminum Limited (VAL). As on March 2013, total aluminum production in

Odisha was 54 percent of total production by all the four big plants, i.e., NALCO, VAL, BALCO and HINDALCO. The number of micro, small and medium enterprises (MSME) in the State has been increasing over time. Among manufacturing units, the highest position belongs to repairing and services followed by food and allied sector. Industrial sickness continues to be a problem among MSME. The handicraft and cottage industry in Odisha exhibits a declining trend in terms of the number of units as well as employment generation.

The economy of Odisha is deficient in infrastructure and there is a felt need for substantially improving the magnitude and quality. The State has been a pioneer in power sector reforms. But the transmission and distribution (T&D) losses continue to be a matter of concern. The demand for power in Odisha has been rising at a faster rate due to increased emphasis on industrialization and expansion in household electrification. Over 80 percent of villages in Odisha are now electrified. Road density is better than the all-India average. But the State lags in surface-road density. Several initiatives have been taken to extend the spread of good quality roads throughout the State. An ambitious programme for increasing the number of bridges and cross drainage works has been undertaken to ensure all weather connectivity to remote habitations. Railway density in the State is 16 km per thousand square km. of area, which is below the national average of 20 km. Tele-density has grown rapidly. However, it is yet to catch up with the national average. The overall tele-density of the State by the end of March 2014 was 60.90 percent as against the all India average of 75.23 percent.

Odisha has historically witnessed higher incidence of poverty. But now it is one among very few leading States with faster reduction of poverty ratio from 57.20 percent in 2004-05 to 32.59 percent in 2011-12. As per estimates made by the Planning Commission based on the Tendulkar Committee methodology, decline in poverty by 24.61 percentage points in Odisha was the highest reduction by any major State in the country (Table 2). Poverty declined in all NSS regions (i.e., coastal, northern and southern regions) and among all social classes (i.e., ST, SC, OBC and others) of Odisha. This implies inclusive growth in Odisha. But the poverty ratio in Odisha is still very high among the States of India (Table 2). The incidence of poverty in southern and northern regions as well as among ST and SC communities still remains high and a matter of concern.

With increased emphasis on human development and Millennium Development Goals (MDG), attainments in social sector have been significant in recent years. In 2011, the overall literacy rate (72.9 percent) in Odisha was at par with the national average (73 percent). Enrollment ratio in elementary (primary and upper primary) schools has substantially increased. The dropout rates have come down sharply from 41.8 percent in 2000-01 to 1.97 percent in 2013-14 at primary level and from about 57 percent in 2000-01 to 2.40 percent in 2013-14 at upper primary level. The school infrastructure has also been substantially improved. A large number of vocational and technical institutions have come up during the last few years.

In the healthcare sector, the basic demographic variables present a mixed picture. The crude birth rate in the State is 19.6 against the national average of 21.4 in 2013, but the crude death rate stood at 8.4 compared to 7.0 for the country. Life expectancy at birth in the State for male and female are

projected at 64.3 years and 67.3 years respectively which are lower than the national average of 67.3 years and 69.6 years respectively. Infant mortality rate (IMR) has come down to 51 during 2013, which is higher than the all India level of 40. Maternal mortality ratio (MMR) during 2012-13 in Odisha was 235 per 1,00,000 live births in Odisha, compared to 178 in India. Since the disease burden is quite high, the *Panchvyadhi Chikitsa* scheme, under which free treatment and medicines are provided since 2001, covers five most prevalent diseases like malaria, leprosy, diarrhoea, acute respiratory infections and scabies that contribute about 70 percent of patient load. Further, a number of new health initiatives, including NRHM, ASHA and other health development programmes including Odisha Emergency Medical Ambulance Service have been launched. There has been an improvement in women's health in recent times. Leprosy has declined to less than 1 per 10,000 population and filaria has been controlled. Malaria is endemic in some parts, but the incidence has come down. HIV positive cases have declined remarkably from 3255 by March 2013 to 2091 by August 2014. The coverage of households having access to safe drinking water (taps, hand pumps and tube wells) was 75.3 percent as per the 2011 census. But about 78% of all households do not have sanitation facility in their premises.

Integrated Child Development Scheme (ICDS), rehabilitation of cured leprosy patients, emergency feeding programme and heavily subsidized rice at the rate of Rs. 1 per kg., pension schemes like the National Old Age Pension (NOAP), Madhu Babu Pension and National Family Benefit schemes are in operation to provide social security to the poor, old and destitute. There exist gender disparities in several human development indicators. Only sixty-four percent of the female population is literate in comparison to about eighty two percent of the male population. About 5.63 lakh women Self- Help Groups (SHGs) with 67.61 lakh members have been organized with support from the Mission *Shakti* programme. The development of ST and SC communities has received focused attention by the Central as well as the State governments. The Tribal Sub-Plan has been operating with greater focus on tribal dominated 118 blocks of the State. Special Central Assistance (SCA) is provided for accelerated development of tribal communities including Particularly Vulnerable Tribal Groups (PVTG).

Natural capital endowment

Beauty of the land of Odisha is enhanced by the diversity of its natural regions, like the coastal plains, middle mountainous country, rolling uplands, river valleys and the subdued plateaus. The coastal plains are the gift of six major rivers, Subarnarekha, Budha Balanga, Baitarani, Brahmani, Mahanadi and Rushikulya. The mountainous region, covering about three-fourth of the area of the State, is fertile, well-drained and thickly populated. The rolling uplands are lower in elevation than the plateaus. Being the products of continued river action, they are rich in soil nutrients. The major river valleys are associated with Brahmani, Mahanadi and Vansadhara rivers. They are fertile, but at times present an undulating topography. The subdued plateaus (305–610m.) occur in Panposh-Keonjhar-Pallahara and Nawrangpur-Jeypore areas. In the uplands of upper Baitarani (Keonjhar District) and Saberi basin (Malkangiri and Koraput Districts) sheet erosion is most common (GoO 2014).

Odisha mainly depends (to the tune of about 78 percent) upon monsoon rains for its water resources. The long-term annual average rainfall is 1452 mm, but there occurs wide spatial variation ranging

from about 1200 mm in southern region to about 1700 mm in northern plateau, which causes droughts in some parts and floods in other. The state is endowed with an extensive network of rivers and streams. As per an assessment of 2001, the average annual availability of surface water from the State's own drainage boundary and outside is estimated as 120397 Million Cubic Metre (MCum). Considering topography and geological limitations 95540 MCum of surface water can be utilized. In the projected scenario for 2051, inflow from neighbouring states will be reduced, and only 85891 MCum can be utilized (Table 3). However, the storage capacity of reservoirs, including those under construction is only 20000 MCum. As per the latest assessment of 2008-09, Odisha has net dynamic ground water resources of 16.69 lakh hect-metre (HM). Out of this, exploration to the extent of only 4.73 lakh HM has been made for various uses.

For fisheries development, fresh water resources of the State are estimated to be 6.76 lakh hectares comprising of 1.24 lakh hectares of tanks/ponds, 2.0 lakh hectares of reservoirs, 1.80 lakh hectares of lakes, swamps and *jheels*, and 1.71 lakh hectares of rivers and canals. Besides this, Odisha is endowed with rich marine and brackish water reserves, which have good potential for brackish water and marine fisheries. The State has a long coastline of about 480 km with continental shelf area of 24,000 sq kms along the Bay of Bengal. The State's brackish water resources are of the order of 4.18 lakh hectares including the Chilika Lake, estuaries and tanks (GoO, 2015).

Odisha has a recorded forest land of 58,136 sq km, which constitutes 37.34 percent of the total geographical area of the State. This includes 26,329 sq km (45.29%) of reserve forests, 15,525 sq km (26.70%) of protected forests and 16,282 sq km (28.01%) of un-classed forests. About 12 sq. km. of forests are under private ownership. The peculiarity with our government recorded forests relates to the ownership. Only about 45% of the total forest area, that is 26350 sq. km. (all reserve forests and about 21 Sq. Km. of unclassified forests), is under the control of the Forest Department. The rest of the area is at the disposal of the Revenue Department (GoO, 2015a). Here the Forest Department only tends the crop on a land that belongs to the Revenue Department (Sahu and Bali, 2008). The actual forest cover (remote sensing assessment) of Odisha in terms of different canopy density classes was 50,347sq km in 2013, which constitutes 32.33 percent of the State's land area. The corresponding figure for 2009 was 48,903 sq km. The increase in forest cover is due to conservation measures and improvement in scrub area including afforestation activities, and, involvement of *Vanasanrakhyan Samitees*.

Excepting semi-evergreen patches in Puri, Koraput and Kalahandi districts and the tidal forests of Bhitarkanika area, most of the forests (97.75 percent) come under the tropical (dry and moist) deciduous types. Such forests contain a diverse mix of species, which may not be yielding commercially valuable timber but are an important source of NTFP (non-timber forest products). A three-storied composite flora characterize such forests with the ground cover of herbs and shrubs, middle canopy of bamboo and small sized trees and the top canopy containing dominant tree species like Sal, Asan, Bija, Haldu, and so on. Among bamboos, *Salia* and *Daba* varieties are prominent. In most places, Sal and Bamboo predominate other species. As the management practice favours only a few commercially important tree species, forests are known under popular economic classes: Sal, bamboo and mixed.

Of the numerous herbs occurring in the forests of the state, 130 medicinal plant species have been identified as important. In Koraput, Kalahandi and Bolangir districts the forest vegetation has the unique ecological distinction in India of being the natural meeting place of the two giant species namely (northern) Sal and (Southern) Teak (Sahu, 1986).

The forests of the State are rich in biodiversity. There are two National parks, 18 Sanctuaries and one Biosphere Reserve in the State. There are two notified Tiger Reserves, namely Similipal, and Satkosia. The Sunabeda sanctuary is a proposed tiger reserve. There are three elephant reserves in the State namely Mayurbhanj, Sambalpur and Mahanadi. The protected area for wildlife management constitutes 4.25% of the total geographical area of the State. The wetlands of Odisha have received international accreditation. Chilika Ramsar site is the Asia's largest brackish water lagoon having rich estuarine and marine fauna including 152 Irrawady dolphins (as per 2013 census). About nine lakh migratory birds visit the lake every year. Bhitarkanika mangroves were designated a Ramsar wetland in 2002. It is famous for its salt water crocodiles and Olive Ridley sea turtles. Gahirmatha Sanctuary attracts more than five lakh sea turtles every year for nesting during February - March.

Odisha is richly endowed with a variety of metallic and nonmetallic minerals and occupies a prominent place in the country. Mineral resources and metallurgical industry are treated as the real wealth of the State (GoO 2015). It is ascertained from surveys in 2010 that about 93 percent of Chromite, 52 percent of Bauxite, 44 percent of Manganese, 33 percent of Iron ore and 24 percent of Coal deposits of India are located in the State (Table 4). The abundance and quality grades of the minerals support the State to achieve higher industrial growth. The mining and quarrying sub-sector is more pronounced not only for its quantity of production and contribution to GSDP (in the range of 6.31 to 8.24 percent during 2005-06 to 2014-15), but also for its huge potential in generation of both direct and indirect employment. Among the districts, almost one-third of the minerals are confined to Keonjhar district alone, whereas this district together with Sundargarh constitutes more than 50 percent of the State's mineral resources. Coal deposits occupy a very impressive position, constituting a lion's share of about 86 percent among all the mineral deposits in the State, followed by iron ore (6.61%) and bauxite (2.16%). Based on availability of minerals, power and water, Odisha has 12 industrially active zones such as Rourkela-Rajgangpur, Ib valley, Hiraikud, Angul-Talcher, Choudwar, Balasore, Duburi, Chandikhol, Paradeep, Khurda-Tapang, Joda-Barbil and Rayagada.

Observations: Contextualizing lessons from theory

The concept and theory of SD discussed in Part I indicate that sustainability of development of an economy hinges on several conditions, which are normative in nature. There is, however, consensus on the following vector of necessary conditions, which would render development pleasing and sustainable.

- Poverty and inequality should be reduced;
- Sources of people's livelihood should be maintained as large and as diverse as possible;
- The three forms of capital – natural, socio-cultural and human-made – should be appreciated as complementary;

- Stock of critical natural capital should not decline;
- Ecosystem of keystone species should not deteriorate;
- Investment in human capital through education and health should receive focus for promoting quality of population;
- Resilience to shocks and stress should be promoted;
- Pollution load should be within assimilative capacity;
- Depletion of non-renewable resources should be compensated by renewable resource augmentation;
- Non-renewable resource rents should be appropriated for building at least human-made capital

While assessing development of Odisha in the context of the stated conditions, certain facts are prominently visible. The State is rich in natural capital and socio-cultural heritage. So far as human-made capital is concerned, there is deficiency with regard to infrastructure. However, the process and pace of development in Odisha seem to be on track. Economic growth of the State has been fast and inclusive. There are positive activities in all fronts of the SDGs. Large reduction in poverty indicates that growth has been inclusive. But the poverty ratio of Odisha is still the second highest in India. The scope for mineral-processing activities is high. The engagement of the corporate sector for industrial growth in Odisha has increased.

There are a few peculiarities with regard to our natural capital endowment. The mineral and forest resources occur mostly in the tribal concentrated mountains of Odisha. Mineral extraction and processing, forest protection and tribal welfare have led to socio-economic and environmental conflicts and movements. Resource availability in specific areas has not supported balanced regional development in the State. Further, the industrially active zones have the problems of environmental degradation and pollution. For example, Angul-Talcher and Jharsuguda-Rajgangpur industrial growth poles are some of the worst pollution hot spots of India. Water storage potential is roughly 20 percent of the State's surface water dowry. There are constraints to development of large reservoir projects. More than half of the forest lands are owned by the Revenue Department. Most of the revenue forests are not worth the name. Degradation of forests and rural common property resources have affected the entitlements of the poor. It appears that there exists environment-linked vicious circle of poverty in Odisha.

The physiographic natural divisions and wide spatial variation in rainfall in Odisha cause droughts and floods in different parts every year. About 480 km. long coastline exposes the State to flood, cyclones and storm surges. Heavy rainfall during monsoon causes floods in the rivers, such as the Mahanadi, Subarnarekha, Brahmani, Baitarani, Rushikulya, and Vansadhara, and their many tributaries and branches. Flow of water from neighbouring States of Jharkhand and Chhattisgarh also contributes to flooding. The flat coastal belts with poor drainage, high degree of siltation of the rivers, soil erosion, breaching of the embankments and spilling of floodwaters over them cause severe floods in the river basins and delta areas. The tracks of the various cyclonic storms in the notorious Bay of Bengal since

1891 reveals that most of them are crossing the east coast through coastal Odisha and East Godavari district of Andhra Pradesh. Odisha along with West Bengal and Andhra Pradesh has the locational disadvantage of being on the path of severe depressions and cyclonic storms, which mostly occur when the south-west monsoon recedes. People of Odisha have culturally accepted the natural disasters as their fate. Climate change is likely to worsen the situation with higher frequency and intensity of extreme events.

A society invests in its people only through education and health. These are the foundation sectors for sustainable human development. No amount of economic development can be sustained without concomitant development in the social sector. With mainstreaming of the concept of human development and Millennium Development Goals (MDGs, which have been replaced by SDGs), the State has made far higher commitment to the social sector in the recent years. The sector also includes a wide range of welfare schemes and social security measures. In Odisha the social sector includes education, medical and public health, family welfare, food security, nutrition, safe drinking water supply, sanitation, sports, art and culture, housing, urban development, relief and natural calamity, and welfare of disadvantaged and marginalized groups such as scheduled castes, scheduled tribes and OBCs. In Table 5 it is worked out that during 2010-11 to 2015-16, the share of total revenue and capital expenditure on all the social sectors in Odisha roughly vary in the range of 7 to 13 percent of total State expenditure and 6 to 9 percent of GSDP at Current Prices. This is too low to help us achieve the SDGs. In education alone, the desired level is 6 percent of GDP/GSDP. Long ago, the education commission (1964-66) chaired by D. S. Kothari had recommended that we should allocate 6 percent of national income to education (Tilak, 2006). Further, there are compromises in our definitions and targets. For example, hand pumps and tube wells are now considered as sources of safe drinking water. If the target is elevated to piped water supply, we need a lot more funds for this component alone.

Conclusions: Towards a policy for SD in Odisha

The economy of Odisha appears to be now on a track of development that is faster and inclusive. To make the process sustainable over a long-run, win-win opportunities available in environment, forest, land management, soil conservation and social sectors should be more vigorously taken up. Poverty reduction is now a targeted activity. Through rigorous 'poverty reduction audit', the process needs to be monitored.

Being based on non-renewable resources, Odisha should integrate its development policy with more sustainable initiatives. Apart from augmenting renewable resources, steps may be taken to tap the mineral resource rents for human-made capital formation. Further, mineral royalty should increase every year at some social discount rate. Through periodic assessment of *Green NSDP*, the extent of divestment of natural capital for economic development can be appreciated.

Ecological systems of Chilika, Bhitarkanika, Similipal, Satkosia, Sunabeda, Mahendragiri, Gandhamardan, etc. constitute the critical natural capital of Odisha. Some of these systems, like Mahendragiri are out of focus. Similarly, elephant, tiger, Olive Ridley turtle, Irrawady dolphins and

migratory birds in wetlands are symbols of heritage and healthy environment. These are our keystone species. The state of the systems and species can be maintained only with people's confidence and participation in the conservation measures.

Sustainable tourism has a huge growth potential in Odisha. It can create decent jobs on a large scale, and generate business opportunities. The state has scope for cultural heritage tourism and natural heritage tourism. Sustainability of ecotourism is often suspected. However, with relevant capacity building it is possible to promote environmental awareness, conserve and protect the environment, respect wildlife, biodiversity and cultural diversity, and improve the welfare and livelihoods of local communities.

Reduction of risk from natural disasters and building of resilience to shocks have to be addressed with a renewed sense of urgency in the context of poverty eradication, climate change and sustainable development. Desirable coping mechanisms have to be designed and propagated among people.

Epilogue

In an epilogue, while I profoundly thank you again, I offer my vision how OEA can play a more proactive role in our lives and in sustainability development of Odisha. I propose a couple of things for your consideration. Ours is now an 'once-remembered-in-a-year' association. The conference thus becomes an academic ritual. But it can make us active through intra-year activities. The association will have its golden jubilee in 2018. Attempts can be made right from now to build a Golden Jubilee Corpus Fund to encourage good researchers by rewarding them, sponsor focused seminars within a year, and in the longer-run support desired research works on economic policy in Odisha for the benefit of the state. Moreover, all of us have already done lot of good research on the economy of Odisha, which is neither well-coordinated nor well-archived for the benefit of the government and others. A database of the research output on economic problems of Odisha will be extremely useful. In the process of teaching – learning of economics in Odisha now, a hiatus between 'economics of current international journals' and 'economics of our class rooms and research desks' is visible to all. It is time for the OEA to engage itself on this issue.

Table 1. Plan-wise average annual growth rate of GSDP, NSDP and Per Capita NSDP of Odisha (Percent)

Five-Year Plan Period	GSDP		NSDP		Per capita NSDP	
	Current Prices	2004-05 Prices	Current Prices	2004-05 Prices	Current Prices	2004-05 Prices
Eighth (1992-97)	12.57	2.00	12.28	1.67	10.51	0.07
Ninth (1997-02)	10.53	5.58	12.27	7.09	10.53	5.63
Tenth (2002-07)	14.67	8.82	14.03	8.07	12.57	6.69
Eleventh (2007-12)	16.89	7.05	16.07	5.39	14.55	4.01
Twelfth (3 yrs: 2012-15)	12.14	4.55	12.38	4.04	10.91	2.68

Source: GoO (2015)

**Table 2. Incidence of Poverty in Odisha vis-à-vis other Major States, 2004-05 to 2011-12
(Head Count Ratio in %)***

Sl. No.	States	2004-05	2009-10	2011-12
1.	Andhra Pradesh	29.90	21.10	9.20
2.	Bihar	54.40	53.50	33.34
3.	Gujarat	31.80	23.00	16.63
4.	Haryana	24.10	20.10	11.16
5.	Karnataka	33.40	23.60	20.91
6.	Kerala	19.70	12.00	7.05
7.	Madhya Pradesh	48.60	36.70	31.65
8.	Maharashtra	38.10	24.50	17.35
9.	Odisha	57.20	37.00	32.59
10.	Punjab	20.90	15.90	8.26
11.	Rajasthan	34.40	24.80	14.71
12.	Tamil Nadu	28.90	17.10	11.28
13.	Uttar Pradesh	40.90	37.70	11.26
14.	West Bengal	34.30	26.70	19.98
	All India	37.20	29.80	21.92

Note: * Based on Tendulkar Committee methodology of MRP (Mixed Recall Period) consumption

Source: GoO (2015).

Table 3. Basin-wise availability of surface water in Odisha under scenarios of 2001 and 2051

Name of River Basin	Catchment area (Sq. Km.)		Water resources (MCum)			
	Total	Within Odisha	2001 Scenario		2051 Scenario	
			Average	75% Depend-able	Aver-age	75% Depend-able
Mahanadi	141134	65628 (42.15)	59155	48732	50939	42210
Brahmani	39116	22516 (14.46)	18577	14011	14509	10884
Baitarani	14218	13482 (8.66)	7568	5434	7568	5434
Kolab	20427	10300 (6.61)	11089	8885	11089	8885
Rushikulya	8963	8963 (5.76)	3949	2782	3949	2782
Vansadhara	11377	8960 (5.75)	5083	3881	5083	3881

Indravati	41700	7400 (4.75)	6265	4451	6265	4451
Budhabalanga	6691	6354 (4.08)	3111	2521	3111	2521
Nagavali	9275	4500 (2.89)	2853	2322	2853	2322
Subarnarekha	19277	2983 (1.92)	2308	2308	2308	2308
Bahuda	1118	890 (0.57)	438	213	438	213
Draining to Sea	—	3731 (2.4)	—	—	—	—
Total	—	155707 (100)	120397	95540	108113	85891

Note: Figures in parentheses are percentages from total geographical area of the State

Source: www.dowrorissa.gov.in

Table 4. Reserves and extraction selected minerals in Odisha, 2013-14 (Million Tons)

Mineral	Major districts of occurrence	Total reserve*	Average annual extraction, 2010-14	Average as extraction % of reserve
1. Coal	Angul, Jharsuguda, Sundargarh, Sambalpur	75073 (24)	108.52	0.14
2. Iron ore	Keonjhar, Sundargarh, Jajpur, Mayurbhanj	5737 (33)	75.75	1.32
3. Bauxite	Koraput, Rayagada, Kalahandi, Bolangir	1879 (52)	5.75	0.31
4. Dolomite	Sudargarh, Koraput	676 (9)	1.08	0.16
5. Manganese	Sundargarh, Keonjhar, Rayagada	190 (44)	0.59	0.31
6. Chromite	Keonjhar, Jajpur	176 (93)	3.46	1.96
7. Fire clay	Cuttack, Sambalpur, Jharsuguda	170 (24)	0.03	0.01

Note: * Figures in parentheses relate to the % share of deposits in Odisha in reserves of India

Source: GoO (2015) and GoI (2008)

Table 5. Share of Social Sector in Total State Expenditure (TSE) and GSDP at Current Prices (CuP) of Odisha (Rs. in thousand crores)

Year	Expenditure on Social Sector ^a			TSE	GSDP at CuP	TSSE ^b as % of TSE	TSSE as % of GSDP at CuP
	Revenue	Capital	Total				
2010-11	11.92	0.78	12.71	172.71	197.53	7.36	6.43
2011-12 ^c	14.34	0.66	14.99	159.11	220.59	9.42	6.80
2012-13 ^d	14.98	1.20	16.18	177.01	251.22	9.14	6.44
2013-14 ^e	18.72	1.72	20.45	193.74	272.98	10.55	7.49
2014-15 ^f	24.15	2.81	26.96	207.91	310.81	12.97	8.68
2015-16 ^g	26.05	3.04	29.09	239.75	—	12.13	—

Notes: a. Social sector includes education, medical and public health, family welfare, food security, nutrition, safe drinking water supply, sanitation, sports, art and culture, housing, urban development, relief and natural calamity and welfare of disadvantaged and marginalized groups such as scheduled castes, scheduled tribes and OBCs.

b. TSSE: Total Social Sector Expenditure.

c. Third Revised Estimate of GSDP.

d. Second Revised Estimate of GSDP

e. First Revised Estimate of GSDP

f. Advanced Estimate of GSDP and Revised Estimate of Expenditure

g. Budget Estimate of Expenditure

Sources: GoO (2015 and 2015b)

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Fourteenth Finance Commission Recommendations and Fiscal Autonomy of Sub-National Governments in India¹

R Sudarsana Rao²

This Article is based on an Endowment Lecture presented in honour of Prof Baidhyanath Misra ‘the heart and soul’ of Orissa Economics Association. I really deem it an honour as Prof Misra is an eminent economist, an academician of national repute and an able administrator. Having a long and illustrious career as a student as well as a Faculty Member, he was a role model not only to his students but also to the academic fraternity. He excelled himself in the fields of Public Finance and Agricultural Economics by producing more than a score of Ph.Ds and by publishing a number of books and journals. His long and rich experience, visionary outlook and administrative capabilities brought him very coveted positions which were held by with dignity and decorum. He played a pivotal role in shaping the Nabakrushna Choudhury Centre for Development Studies, Bhubaneswar as its Founder-Director and the Orissa Economics Association as its Founder-Secretary. He made significant contributions as Vice-Chancellor, University of Agriculture and Technology and also as the Deputy Chairman of Orissa Planning Board to mention a few.

I am thankful to the Orissa Economic Association for giving an opportunity to deliver the Endowment Lecture in honour of this great academic luminary.

Introduction

In most of the federations the division of powers and functions based on economic and scientific principles between the center and the states, has a centripetal bias. This leads to the existence of vertical and horizontal fiscal imbalances which has become a common feature in almost all the federations. Hence, the subject of fiscal federalism always generates a perennial source of interest among academics, administrators and policy makers.

Equalization is necessitated in most of the federations due to the existence of differences among the member States with regard to geographical area, natural resources, population, its density, occupational structure, income and other economic aspects. These differences are captured to a large extent by the per capita incomes resulting in differences in the ability of the States to raise revenue and provide the required public services. These regional inequalities could be resolved through the central financing of the state governments. Equalization transfers were advocated from

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the Centre to the States mainly to enable them to provide certain national minimum essential social and administrative services and other basic amenities. This equalization objective of federal transfers was supported by many economists like J M Buchanan and R.N. Bhargava.

Though the Constitution of India has demarcated the jurisdiction and the authority of the Union and the States into exhaustive Lists, it is not devoid of the above mentioned twin fiscal imbalances. Having realized the built-in vertical imbalances, the framers of the Constitution made a few statutory provisions for the devolution of resources from the Center to the States. Provision has been made under Article 280 of the Constitution for setting up of a Finance Commission for every five years or earlier if the President of India feels it necessary. Under Article 280 clause (3), the Finance Commission recommends fiscal transfers to meet the non-plan current budgetary needs of the states, besides a huge amount of fiscal transfers made through a non-statutory body like the Planning Commission (wound up by the Union Government in 2014). Plan transfers are made on the basis of Gadgil Formula or Modified version of it, while the Finance Commission transfers are based on a set of criteria which are often changed. The Finance Commission transfers include (a) Shared Tax Revenue and (b) Grants-in-Aid. With the 80th Amendment of the Constitution Act 2000, Government of India, consequent upon the recommendations of the Tenth Finance Commission, all the net revenue from central taxes except the proceeds from cess and surcharges are pooled and shared between the Centre and the States. The Finance Commissions, after vertical sharing of shared tax revenue, distribute these resources across the States on the basis of a criterion, to minimize the horizontal fiscal imbalances. However, the set of criteria not only varied from Commission to Commission but also varied in between taxes for several decades. The letter and spirit of the Indian Constitution is such that the Finance Commission plays a major role in the fiscal transfer mechanism with the prime objective of equalization. . For instance, they have increased from Rs. 476 crs. during the First Finance Commission period to Rs.44.85 lakh crs. during the Fourteenth Finance Commission period. This shows a phenomenal growth of fiscal transfers recommended by the successive Finance Commissions. So is the importance of Finance Commission transfers in the Indian federation. Of the total revenue transfers from the Centre as much as 67.02 per cent are transferred by the Finance Commission (Thirteenth) which were increased further to 72.16 in 2012-13.

Besides large amount of fiscal transfers made by the Finance Commission, the Planning Commission made fiscal transfers (until it was abolished in 2014) to States for plan purposes in the form of loans and grants. But in the process, the States had to lose their fiscal autonomy because of the conditions attached to the non-statutory transfers. Moreover, the undue expansion of Central Sector and Centrally Sponsored Schemes (CSS) eroded the autonomy of the States. These schemes which were only handful in 1980s and 1990s have increased to more than two hundred by the year 2000 encroaching upon several subjects of the State's domain which have attracted the main focus of the Fourteenth Finance Commission in its scheme of fiscal transfers.

So far fourteen Finance Commissions have submitted their recommendations. All the Finance Commissions tried their best to reduce vertical and horizontal fiscal imbalances by recommending both shared tax revenue and grants-in-aid as may be seen from Table-1.

Table - 1: Fiscal Transfers Recommended by Successive Finance Commissions

(Rs. Crores)

Finance Commission	Shared Taxes	Grants			Total Transfers
		Non-plan Revenue Deficit	Other Grants	Total Grants	
I	370 (77.33)	34 (7.14)	72 (15.13)	106 (22.27)	476 (100.00)
II	823 (78.08)	185 (17.55)	46 (4.36)	321 (21.92)	1054 (100.00)
III	1068 (78.82)	252 (18.60)	35 (2.58)	287 (21.81)	1355 (100.00)
IV	1330 (74.64)	423 (23.74)	29 (1.63)	452 (25.36)	1782 (100.00)
V	4642 (85.63)	713 (13.15)	66 (1.22)	779 (14.37)	5421 (100.00)
VI	8355 (75.62)	2683 (24.28)	10 (0.09)	2693 (24.38)	11048 (100.00)
VII	21171 (92.93)	1173 (5.15)	437 (1.92)	1610 (7.07)	22781 (100.00)
VIII	35683 (90.45)	2200 (5.58)	1569 (3.98)	3769 (9.55)	39452 (100.00)
IX	11785 (86.26)	984 (7.20)	893 (6.54)	1877 (13.74)	13662 (100.00)
IX	87882 (85.41)	6016 (5.85)	9001 (8.75)	15017 (14.59)	102899 (100.00)
X	206343 (91.04)	7583 (3.35)	12717 (5.61)	20300 (8.96)	226643 (100.00)
XI	376318 (86.53)	35359 (8.13)	23228 (5.34)	58587 (13.47)	434905 (100.00)
XII	613112 (84.85)	56856 (5.39)	85784 (9.76)	142640 (15.15)	755752 (100.00)
XIV	3948187 (88.02)	194821 (4.34)	342533 (7.64)	537354 (11.98)	4485541 (100.00)

Source: Reports of Finance Commission, GOI

Also several Commissions made specific recommendations to attain equalization of important public services especially in recent times. While there is substantial reduction in the vertical fiscal imbalance due to the Finance Commissions' fiscal transfers, the horizontal fiscal balance is yet to be achieved. Similarly, still there exist wide variations in the service levels of various essential administrative and social services across the States. With this brief theoretical background, a modest attempt has been made to examine the important recommendations of the Fourteenth Finance Commission (hereafter FFC). To be specific, the present Paper mainly attempts to analyze the issues like vertical and horizontal fiscal imbalances, fiscal autonomy at sub-national governments, the role of grants-in-aid, assistance to local governments and promoting cooperative federalism etc. with regard to the recommendations of FFC.

Fourteenth Finance Commission

The FFC which was constituted on 2 January 2013 under the Chairmanship of Y V Reddy submitted its Final Report on 31-12-2014. As usual, it has been given the traditional Terms of Reference (ToR) with

regard to sharing of union tax revenue and award of different types of grants-in-aid to states. The FFC has been asked to have consideration, while making its recommendations, to issues like resources and expenditure commitments of both the Centre and states, generating surpluses on revenue account for capital investment, additional resource mobilisation, level of subsidies, non-salary maintenance expenditure, pricing of public utilities, public sector performance, sustainable economic development and the impact of the proposed Goods and Services Tax on the Centre and State finances etc. In addition, it has been given an additional ToR to make recommendations for the successor or reorganized states, on the matters under reference in the Presidential Order (published under S.O.NO. 142 E. Dated 2 June 2014) that arose due to the reorganization of the State of Andhra Pradesh. While making its recommendations, it shall take into account the resources available to the successor or reorganized states.

A critical perusal of the ToR reveals that the FFC has not been asked to treat the gross budgetary support to the plan as a committed liability of the union government. Similarly, FFC has not been confined to only the non-plan revenue expenditure of the States contrary to its predecessors. Another important aspect that needs mention is that the FFC has been asked to take into account the demographic changes that have taken place since 1971 while mandating to take 1971 population figures as the base for all purposes where population was a factor.

As far as the macroeconomic conditions are concerned, adverse economic conditions were prevailing at the beginning of FFC, mostly influenced by global economic conditions though there was an improvement over their working period. It may be noted that the FFC has taken enough care in taking several fundamental changes that have taken place in the Indian economy along with the global economic parameters which are likely to have an impact on the federal-fiscal relations in future, especially during their award period. After a thorough examination of the union and state finances in a uniform way without making a distinction between plan and non-plan expenditure, FFC had the opportunity to take a comprehensive view of both revenue and capital expenditure of the Centre and States. In addition, while taking a comprehensive view of the fiscal transfers from the Centre to States in their totality, it has addressed several fundamental issues like Plan transfers, Centrally Sponsored Schemes (CSS), the conditions attached to statutory grants, categorization of States as Special category States, empowerment of Local governments and issues relating to cooperative federalism etc.,

With this backdrop, the FFC made a reassessment of the forecasts of revenue and expenditure of the union and state governments following largely the procedures adopted by its predecessors with occasional and purposeful departures. The notable departure is doing away with the distinction of the plan and non-plan expenditure on the revenue account. The importance of the reassessment may be noted from the fact that the own revenue-GDP ratio of states was 8.58 per cent for the award period compared to 7.36 per cent projected by the States. Similarly, the projected expenditure needs of the states for the award period would be 13.57 of GDP while it was scaled down to 11.12 per cent in the FFC reassessment. FFC made its fiscal devolution after carrying out the reassessment exercise mainly with the twin objectives of reducing (i) Vertical and (ii) Horizontal fiscal imbalances.

Vertical Fiscal Balance

Though successive finance commissions have made attempts to achieve the objective of vertical fiscal balance, the attempt made by FFC is very vigorous. Thus, it has chosen the formula-based tax devolution as the prime fiscal instrument to reduce vertical fiscal imbalance. It has the considered view that such a transfer mechanism would promote sound fiscal federalism wherein states enjoy more fiscal autonomy because of large additional fiscal space and the untied nature of fiscal transfers. Further, it assigned a supplementary role to grants-in-aid to the post-devolution needy states. Taking cognizance of the fact that the cess and surcharges have been kept out of the divisible pool, the fiscal space available to the union government to discharge its constitutionally given responsibilities and for other reasons mentioned above, FFC has recommended the share of tax devolution to 42 per cent, a quantum jump from the existing 32 per cent as recommended by its predecessor. The estimated shared tax revenue and the total amount including grants-in-aid transferred to states are Rs. 3948187 and Rs. 4485541 crores respectively for the award period as may be seen in Table-1. This total amount is two and a half times more than that of its predecessor. As has been stated above, FFC has used shared tax revenue as the prime fiscal instrument as it constitutes almost 88 per cent in the total devolution.

In fact, the previous finance commissions hitherto recommended an increase of 1 or 2 percentage points only in the states' share of tax devolution as may be seen in Table-2.

Table-2 : Global Sharing for Vertical Balance

Finance Commission	Percentage Share Recommended
X F.C.	29
XI F.C.	29.5
XII F.C.	30.5
XIII F.C.	32.0
XIV F.C.	42.0

Source: Reports of the Finance Commission, GOI

The large amount of fiscal space provided by the big jump of states' share will definitely help the states in envisaging developmental programmes as per their priorities. This will enhance their fiscal autonomy and freedom of action.

Economic Survey 2014-15, Government of India makes an analysis of revenue implications in terms of additionality provided by FFC recommendations in 2015-16 compared to 2014-15. It explains that the amount of increase in revenue receipts of all the States is estimated to be about 2 lakh crores and all the States are gained in absolute terms. Of course, the biggest gainers in absolute terms under the major states are Uttar Pradesh, West Bengal and Madhya Pradesh. In per capita terms the major gainers are Kerala, Chhattisgarh and Madhya Pradesh. While the absolute gain to Odisha is Rs. 6752 and in per capita is Rs. 1609 in 2015-16 over 2014-15. The tax devolution including grants-in-aid is expected to enhance the spending capacity of the States. The additional capacity is measured in terms of NSDP at current market prices and /or by States' own tax revenue. In terms of increase in NSDP, the highest beneficiaries are Chattisgarh, Bihar and Jharkhand and in terms of states' own tax revenues

the largest beneficiaries are Bihar, Jharkhand and Chhattisgarh. With regard to Odisha, the benefits as per cent of NSDP is 3.2 per cent while the benefits as per cent of Own Tax Revenue is 50.2 per cent in 2015-16 over 2014-15 implying a substantial impact of FFC recommendations.

But subsequently the fiscal space provided by FFC has been limited by two factors. Firstly, the difference between the FFC projections of tax revenue of the Union for the award period and that of the Government of India raises doubts about the size of fiscal space of States as expected by the FFC. For instance, the estimated difference is about Rs. 1.17 lakh and 2.21 lakh crore in 2015-16 and 2019-20 respectively. Second is the policy change with regard to CSSs by the Union government in 2015-16. The Union government has restructured its grants given to States in the Union Budget 2015-16 which has resulted in neutralizing the benefit of an increase in tax devolution. Thus, the contention of the Prime Minister that in the post – FFC period, States are “flush with resources” (Prime minister’s Letter) is not true due to the changes that have been brought about in the 2015-16 with regard to union transfers to States. For instance, the Union government has grouped the existing Centrally Sponsored and Central Sector Schemes (CSSs) into three categories. These are (i) Schemes which are fully supported by the Union (ii) Schemes which are to be continued with a revised (higher) share of States’ contribution and (iii) schemes which are delinked from Union support. To elaborate, 34 schemes such as Pradhan Mantri Gram Sadak Yojana, MPLADS, MGNREGS, National Social Assistance Programme, Externally Aided Projects etc., come under the first category for which there is no change in the outlay proposed in 2015-16 compared to the previous year budget estimate. A higher matching contribution by states has been proposed for 20 Schemes such as Rashtriya Krishi Vikas Yojana, National Rural Drinking Water Programme, Mid-day Meal Programme and Accelerated Irrigation Benefit Programme etc., by which Central government’s fiscal commitment has been reduced. For instance, the Union government’s budget support has come down from Rs. 138524 crore in 2014-15 (B.E) to Rs. 78230 crore in 2015-16 (Reddy, G R. 2015). This policy change has resulted in the expenditure savings to the Union while causing an additional fiscal burden to the states.

This reduction in central assistance not only impacted the social welfare and social sector expenditure of the States but also affected badly their own priorities

of social and developmental programmes. Schemes such as Backward Regions Grant Fund, Model Schools, Jawaharlal Nehru National Urban Renewal Mission etc., have been delinked saving an amount of Rs. 73702 crore (2014-15 B.E). It is pertinent to note in this context the observations made by Abhijit Sen, the Part- Time Member of FFC who suggested the vertical tax percentage share of 38 instead of 42. He cautioned that there would be transitional problems to States in view of the structural changes in CSSs proposed by the FFC. He rightly observed (Note of Dissent, FFC Report, GOI) that there would be serious socio-economic implications because of the total withdrawal of schemes like BRGF and Model Schools etc, in the Backward States. So because of these policy changes, States could not gain substantial fiscal space due to the enhanced tax devolution as expected immediately after the acceptance of FFC recommendations. For instance, it is estimated that the net benefit of FFC fiscal transfers to Odisha is only Rs 1516.56 crores during 2015-16 even though the estimated increase in tax share (over and above Odisha’s estimate) was Rs. 7391 crore. This is mainly due to the restructuring of CSSs resulting a loss of Rs. 4910.72 crore. (OBAC, 2015). Similarly, all the

General Category States including Andhra Pradesh has incurred huge loss of central Plan transfers since 2015-16 onwards due to an increase in the State's contribution to CSSs, de-linking of 8 Schemes and the discontinuance of Normal Plan Assistance. This has resulted in the reduction of the enhanced fiscal space due to FFC devolution.

But it may be noted that in spite of the restructuring of CSSs and discontinuance of the Normal Plan Assistance to the states resulting in reduced fiscal transfers, still every state's untied resources have increased notably. The compositional shift in the fiscal transfers and transfer of almost 70 per cent of total transfers to states through the finance Commission enhances the operational freedom and fiscal autonomy of the States. Of course, in view of the enhanced fiscal space especially of untied nature, states may resort to spend more resources on unproductive programmes due to the much prevalent phenomenon of competitive populism among the States, ultimately leading to adverse impact on developmental efforts. With regard to fiscal autonomy, enhanced by more fiscal space provided by FFC, it appears like moving two steps forward and one step backward due to the subsequent policy changes initiated by the union government.

Horizontal Fiscal Balance

As stated above, reduction of horizontal fiscal imbalance is one of the important objectives of a finance Commission. Achievement of this objective much depends on the criteria, a finance commission adopts. Knowing fully well that no finance commission can ever satisfy all the states, every finance commission evolves its own criteria for inter se distribution of the pooled resources among the states. Table-3 shows the criteria and weight ages adopted by recent finance commissions.

Table-3 : Criteria and Weights Adopted by Finance Commissions

Finance Commission					
Criteria/weights	X	XI	XII	XIII	XIV
Population	20	10	25	25	17.5
Income Distance	60	62.5	50		50
Area	5	7.5	10	10	15
Tax Effort	10	5.0	7.5		
Fiscal Discipline		7.5	7.5	17.5	
Fiscal Capacity Distance				47.5	
Index of infrastructure	5	7.5			
Demographic Change					10
Forest Cover					7.5
Total	100	100	100	100	100

Source: Reports of the Finance Commission, GOI

After careful consideration of the ToR and taking the views of the states, FFC has increased the weightage given to income and area factors reduced the weightage given to population factor while

introducing two new factors- demographic change and forest area as may be seen in the above Table. The criterion for horizontal distribution has generated as much debate as for its vertical sharing of tax revenue. Regarding increasing the weightage given to income factor from the existing 47.5 per cent to 50 per cent for equity consideration needs appreciation. The second important factor is population which was used by almost all the Finance Commissions in the criteria for inter se distribution of the tax devolution. The seventh Finance Commission has been mandated to use the population figures of 1971 in all cases where population was regarded as a factor for determination of inter se distribution of tax devolution and grants-in-aid. As population factor has both implicit and explicit implications, the base of population as well as the weights adopted gains significance. The Twelfth and Thirteenth Finance Commissions assigned a weightage of 25 per cent while using the 1971 population. With regard to population factor, States expressed their difference of opinion not only about adopting the base year but also about its weightage. For instance, a majority of States (13) favoured the use of 1971 population; nine States requested the commission to use 2011 population and the remaining states were neutral. It was clearly illustrated by Government of Andhra Pradesh in its Memorandum to the FFC that States like Andhra Pradesh, Tamil Nadu, Karnataka, Kerala, Orissa and West Bengal would have sustained significant losses in the tax devolution share, had the Thirteenth Finance Commission had used either 2001 or 2011 population (Memorandum, GoAP, 2014). Regarding the weightage suggested by states, it ranges from 10 per cent (Assam, Jammu & Kashmir and Jharkhand) to 30 per cent (Andhra Pradesh and West Bengal). A state like Haryana suggested as much as 40 per cent of 2011 Census (FFC Report- II). FFC has ultimately reduced the existing weightage of 25 per cent to 17.5 per cent. But this is not the end of the story as it has given a 10 per cent weightage to Demographic Change. This is because the FFC has been mandated to take “the base of population figures as of 1971 in all cases where population is a factor for determination of devolution of taxes and duties and grants-in-aid; however, the commission may also take into account the demographic changes that have taken place subsequent to 1971” (Report of the Finance Commission, 2014). So in order to capture the demographic changes since 1971 (migration and age structure), the Commission adopted 2011 population as a proxy indicator and assigned a weightage of 10 per cent. Notwithstanding the criticism against taking 2011 population as an indicator of demographic Change (Bhaskar, V 2015 and M A Oommen, 2015), the weightage given to population though appears to be reduced from 25 to 17.5 per cent, in fact in effect, has been enhanced to 27.5 per cent when the weightage given to demographic factor is added. States like Andhra Pradesh, Karnataka, Kerala, Odisha, Punjab, Tamil Nadu and West Bengal sustained a loss in terms of reduction in percentage share due to the use of population 2011 and obtained less devolution to that extent. Population factor, per se, is neutral to level of economic development measured in terms of GSDP or Per Capita Income and an increase in its weightage treats both the rich and poor states alike. Hence, it is difficult to achieve the objective of equity.

Area of a state is often used as a factor in the criteria in the devolution process since the Tenth finance Commission which has given 5 per cent weightage. Area is used as a factor in order to help the states having wide spread population or with low population densities. Such States will have cost disadvantages in providing the basic services and hence the weightage is justified. However, area

factor is also, just like population, neutral to Per capita Income and acts adversely to progressivity. While the Eleventh and Twelfth Finance commissions increased the weightage given to area to 7.5 and 10 per cent respectively, the Thirteenth Finance commission retained the weightage given by its predecessor. While Andhra Pradesh has requested the FFC to give 30 per cent weightage Odisha government requested to maintain status quo. However, FFC has not only increased the weightage to 15 per cent but also introduced Forest area as a new factor for the first time giving a weightage of 7.5 per cent. Besides the hilly states, Chattisgarh, Karnataka, Madhya Pradesh, Maharashtra and Odisha have been benefitted by this factor. The commission justified this factor on the grounds of encouraging states protecting forests, especially dense forests for maintaining environment and ecological balance, but it attracted criticism from the academia. In effect the area factor has been given unduly more weightage- 22.5 per cent – including the forest area factor. This is likely to cause adverse impact on the progressivity of the inter se distribution as a whole. Moreover, the commission has not included any factors like tax effort (Tenth, Eleventh and Twelfth Commissions) and fiscal discipline (Eleventh, Twelfth and Thirteenth Finance Commissions). In fact, the Thirteenth Finance Commission gave as much as 17.5 per cent weight to fiscal discipline factor. But the commission felt that there need to be symmetrical treatment between the Centre and the states as far as fiscal discipline is concerned. Accordingly, it has suggested suitable changes in the FRBM targets that are to be achieved.

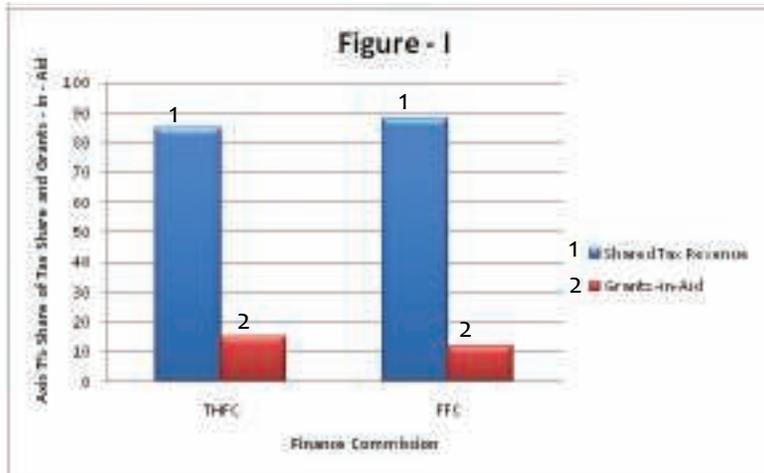
Horizontal Equity of Tax Devolution

A comparison of percentage shares of tax devolution of States between the FFC and its predecessor (THFC) reveals that while the High Income States gained, the Medium and Low Income States' share declined indicating less progressivity of the FFC inter se distribution compared to that of THFC. A similar inference can be made from an analysis of correlation between the Per capita Net Domestic Product of States and the Per Capita Transfers of THFC and FFC. The empirical analysis in terms of coefficients reveals that the transfers under both the commissions are progressive, but the progressivity is more with the THFC transfers than with the FFC as the coefficients estimated are -0.84 and -0.72 respectively (Economic Survey 2014-15, GoI).

Grants-in – Aid

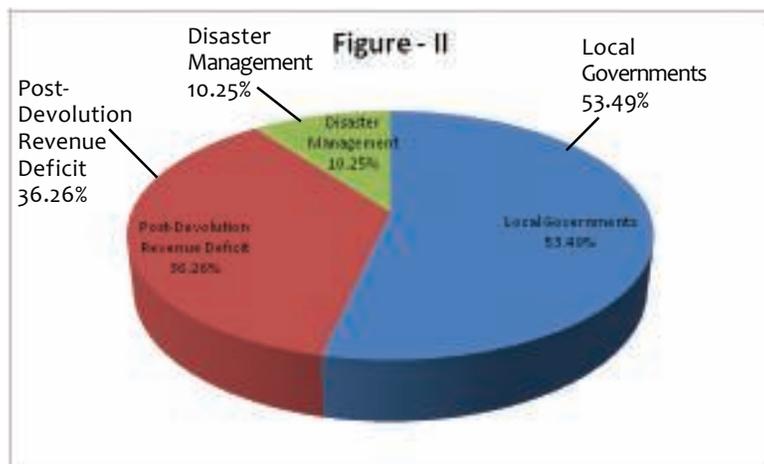
Finance Commissions have been awarding different types of grants-in-aid like revenue deficit grants, calamity relief grants, grants for local governments and upgradation grants. The importance of grants-in-aid in relation to shared tax revenue in the total devolution has varied from Finance Commission to Finance Commission. In recent times the percentage of grants in relation to shared tax revenue has been on the increase from 8.96 per cent (Tenth) to 13.47 per cent (Eleventh) and as much as 18.87 per cent (Twelfth). Following its mandate, the FFC has awarded Revenue Deficit Grants (RDG) instead of Non-Plan Revenue Deficit Grants (NPRDG) because it has taken into account both plan and non-plan expenditure while making assessment of state finances. FFC has recommended a total amount of Rs.537354 grants which constitutes 11.98 per cent. Compared to the THFC, FFC has preferred to transfer the resources more in the form of shared tax revenue than grants-in-aid. The relative importance of shared tax revenue and grants-in-aid in the total devolution under the FFC

and THFC are presented in Figure -1. It may be seen from the figure that the relative importance to grants-in-aid given by the FFC is less than that of the THFC.



THFC recommended relatively a higher percentage share (15.15) of grants-in-aid in the total devolution. This also implies that FFC wants to promote States' fiscal autonomy by providing more fiscal space through a higher share of tax devolution compared to grants-in-aid. The composition of different types of grants recommended by the FFC is presented in Figure-2. Successive Finance Commissions awarded more grants for filling the revenue deficit of the States compared to the other types of grants-in-aid. For the first time, THFC gave the largest amount of the total grant-in-aid to Local Governments. Of the total amount of grants, FFC has awarded the largest share (53.49 per cent) to Local Governments followed by Revenue Deficit Grants (36.26 per cent) and Disaster Management (10.25 per cent) as may be seen from the Figure-2.

Figure-2
Composition of Grants-in- Aid Recommended by Fourteenth Finance Commission.



After reassessment of revenue and expenditure on the entire Revenue Account, FFC recommended Revenue Deficit Grants to eleven States for the five year period 2015-20, as may be seen in the following Table.

Table-4 : Revenue Deficit Grants - in-Aid Recommended by FFC

State	2015-16	2016-17	2017-18	2018-19	2019-20	2015-20
Andhra Pradesh	6609	4930	4430	3644	2499	22113
Assam	2191	1188	Nil	Nil	Nil	3379
Himachal Pradesh	8009	8232	8311	8206	7866	40625
Jammu & Kashmir	9892	10831	11849	12952	14142	59666
Kerala	4640	3350	1529	Nil	Nil	9519
Manipur	2066	2096	2091	2042	1932	10227
Meghalaya	618	535	404	213	Nil	1770
Mizoram	2139	2294	2446	2588	2716	12183
Nagaland	3203	3451	3700	3945	4177	18475
Tripura	1089	1089	1059	992	875	5103
West Bengal	8449	3311	Nil	Nil	Nil	11760
Total States	48906	41308	35820	34581	34206	194821

Source: Report of the Fourteenth Finance Commission, GOI

While the Thirteenth Finance Commission recommended Non-Plan Revenue Deficit(NPRD) grants to eight States, FFC has included three more States - The successor State of Andhra Pradesh, Kerala and West Bengal. As states are rarely satisfied with the projections made by Union Finance Commissions, FFC cannot be an exception to this general feature. Several States, those who were awarded grants as well as those who didn't qualify for RDGs, expressed their dissatisfaction over the parameters it has chosen for making projections in view of the large amount of difference in their own projections of pre-devolution revenue deficit compared to that of FFC projection. For instance, Andhra Pradesh and Odisha assessed an amount of Rs. 396210 and Rs.338498 crores respectively as Pre-Devolution deficit while the FFC reassessed it as Rs. 192798 and Rs.126511 crores for the two states respectively. Barring the small, hilly and the Border States, the other States which have been awarded RDGs, especially Andhra Pradesh and Kerala have a feeling that FFC has under projected their revenue deficit.

Disaster management

With regard to financing of relief expenditure of the States that arise due to natural calamities, FFC has followed the methodology adopted by the THFC and arrived at an aggregate corpus of Rs.61219

crores of which centre's contribution is Rs.55097 crores as grants for the five year period. FFC has met a long time demand of the States to change the hitherto existing share of 75 percent to the Calamity Relief Fund of the States. AS it is recommended by FFC that the Centre has to contribute 90 per cent instead of 75 per cent, States have to contribute the rest of 10 per cent only. Besides this important recommendation, FFC has made several State-friendly recommendations with a view to make the financing of National Disaster Responsive Fund (NDRF) more sustainable and for better disaster management. With regard to financing of National Disaster Response Fund(NDRF) it has recommended that the Centre should make a sustainable source of financing so that there would be adequate funds for timely release to the states at times of need. The commission also suggested that Income Tax exemption to contributions made by people or institutions to NDRF need to be expedited. Expressing its concern over the possible adverse impact on the operational efficiency of the defence forces when they divert their resources for relief expenditure that arise due to natural disasters, it recommended that the present arrangements for reimbursement of such expenditure be reviewed. Another flexibility mechanism it has suggested which enhances the freedom of action of the states rather an element of fiscal autonomy is that the States can spend 10 per cent of the State Disaster Responsive Fund (SDRF) for local natural disasters even though such disasters are not in the approved list. In view of the wide variations of States to proneness to different disasters, FFC recommended that the Union government should expedite the development and scientific validation of the Hazard Vulnerability Risk Profiles of States which would be helpful in future planning of disaster management. As a whole, FFC has made several State - friendly recommendations without changing the pattern of assistance in the case of a national calamity.

Grants to Local Governments

The FFC has been mandated to recommend "the measures needed to augment the Consolidated Fund of States to supplement the resources of the Panchayats and Municipalities in the State, on the basis of the recommendations made by the Finance Commission of the State". Though it has not been much benefitted by the recommendations of the State Finance Commissions(SFCs) for various reasons, following its predecessors, the Commission has generously recommended a large amount of Rs. 2,87,436 crs to Local governments for the five year period 2015-20, which is almost thrice the amount recommended by the THFC. In fact in the case of Urban Local Bodies (ULBs), it is as much as five times compared to the THFC grants. The Commission arrived at the total amount of grant taking Rs.488 Per Capita Per annum. Surprisingly, FFC considered a uniform per capita while working out the total grant deviating from its predecessors which had taken differential per capita for RLBs and ULBs in view of the cost differences of provision of public services. Of the total amount of grant, Rs.2,00,292crs. have been awarded to the Gram Panchayats directly. This is a remarkable departure from its predecessors. The Commission felt that since the gram panchayats are responsible for providing basic services, it has recommended grants directly to the gram panchayats ignoring the upper layers of the PRIs- Block Panchayats and District Panchayats for the first time.

Basic and Performance grants

The Commission adopted a very easy and simple criteria of population of 2011 and area for inter se distribution across States by giving a weightage of 90 per cent and 10 per cent respectively. FFC has recommended that the amount given to a State will be divided between Gram Panchayats and Municipal bodies in the ratio of rural and urban population of 2011 Census. It may be observed that no Finance Commission has ever given such undue weightage to population factor as far as distribution of grants for local governments are concerned. Further, FFC has recommended the grants like its predecessor, in two parts- (i) Basic Grants and (ii) Performance Grants.

FFC has also distributed the total grant in between the Rural and Urban local bodies. With regard to Rural Local Bodies the ratio of these two types of grants is 90:10 while it is 80:20 with regard to Urban Local Bodies. FFC prescribed two conditions for availing the performance grants by Gram Panchayats- (i) making available reliable data on receipts and expenditure through audited accounts of revenue and (ii) improvement in own revenues. In addition to these two conditions, the FFC prescribed that the ULBs should measure and publish service level bench marks for basic services. The 'Trust-based Approach' followed by the FFC in directly channelling the funds to Gram Panchayats and Municipal governments is really appreciable. It shows that FFC not only made an attempt to give more financial autonomy to the States but also to the sub-State Governments in India for the first time.

Another important aspect of freedom given to States in this regard is to develop an 'operational Criteria' including the quantum of incentive with regard to release of the performance grant. FFC made a flexibility mechanism with regard to undisbursed performance grant that it should be distributed on an equal basis among all the eligible gram panchayats. A similar framework has been suggested for ULB performance grants. Such a flexible arrangement will help in the full utilisation by the local bodies and encourages better accounting and fiscal performance of the local governments at the grass root level. This has resulted in severe resource crunch at the District and Block Panchayats for maintaining certain common facilities like drinking water supply, roads and buildings. For instance, there are about 483 Community Protected Water Supply (CPWS) and about 2 lakh bore well hand pumps being maintained by the Zilla Parishads and Mandal Parishads respectively supplying drinking water to the villages in Andhra Pradesh. Under the new arrangement, these PRI bodies do not find enough resources to maintain the water supply systems and other common assets like link roads, panchayat and block panchayat buildings. Though these public services are meant for the people in the Gram Panchayats (GPs), GPs are not willing to share the FFC funds to finance these services in the domain of District panchayats and Block Panchayats. The same situation is being experienced by, more or less, all the States including Odisha. It is the responsibility of the State Finance Commissions or the State government to make an adjustment to see that the provision of essential services are not badly affected due to this arrangement made by FFC.

Conditionalities

FFC has not stipulated any conditions for the Basic Grants while it put relatively less number of conditions to operationalize the Performance Grants compared to the THFC. This may be due to

more than one reason. Firstly, it advocated a trust-based approach wherein the local governments- Gram Panchayats and Urban Local Governments- will be given more fiscal autonomy. Secondly, several States could not avail and utilise the grants allocated by the THFC due to non-compliance of large number of conditions stipulated by the THFC and/ or by the Union government. The THFC has imposed six conditions to be fulfilled by Rural Local Bodies and nine conditions for Urban Local Bodies to be eligible to utilise the Performance Grant. Due to the severity of the conditions several local governments could not comply with the conditions and has not utilised the earmarked grant amount. The following Table reveals how several states could not utilise the grant amount awarded by the THFC due to the conditions imposed by it. For instance, overall 6 per cent of the basic grant and 25 per cent of Performance grant of both RLBs and ULBs was not allocated to the States during 2010-15 as may be seen in Table-5. The shortfall is more in the case of ULBs with regard to both the types of grants mostly due to the stringent nature of conditions

Table-5 : Shortfall in the Allocation of Grants to States during 2010-15

Type	Rural Per cent	Urban Percent	Total Percent
Basic grants	4.9	8.8	6.00
Performance Grants	20.70	37.97	25.33

Source: Presentation made by Indira Rajaraman at National Workshop organised by MOPR,GOI, 18-19 Jan, 2016, NewDelhi

As per the Ministry of Panchayati Raj, Government of India only 10 states obtained full allocation of the rural basic grant every year and out of the 18 States which got less than full allocation, 8 States got zero allocation at least in one year. With regard to urban basic grant, 20 States out of 28 States didn't get full allocation and out of 20 States 12 States got zero allocation in one year or more. It implies that the very purpose of grants to local governments is lost because of imposing too many conditions either with reference to the eligibility or for their utilisation. May be that is the reason why the FFC has not insisted any conditions for the Basic Grant. FFC has not only liberalised the conditionalities but also recommended that the undisbursed Performance Grant be distributed among those local governments which perform well. It has given more operational flexibility to the States in fixing the quantum of incentive to the States. For instance, FFC states that "The operational criteria, including the quantum of incentive to be given, is left to the discretion of the State Governments" (FFC Report, P.123). Also, it recommended for the first time, that either the Centre or the States should not put any additional conditions for the release or the utilisation of the grant amount. FFC categorically stated, may be in view of past experience, that 'no further conditions or directions other than those indicated by us should be imposed either by the Union or the State governments for the release of funds' (FFC Report, P.115). All these recommendations along with fixing the schedule for the release of the grant in two instalments a year really empower the local governments as such a stipulation reduces the discretion of the state governments in the release of funds. It is upto the GPs and ULBs to utilise the funds properly upholding the trust reposed in them by the FFC and the State government to put in place the necessary administrative and accounting systems to absorb the funds productively.

Augmenting of Revenues

Another important recommendation is, like its predecessor, that the State Finance Commissions need to be further strengthened so that the letter and spirit of the 73rd and 74th CAA will be achieved. It strongly advocated to strengthen the State Finance Commissions in all the states, by ' timely constitution, proper administrative support and adequate resources for smooth functioning and timely placement of SFC report before State legislatures with Action Taken Report(ATR)'. Regarding augmenting of fiscal resources, it is of the opinion that States need to take fiscal and administrative measures to further augment the resources at the State and local bodies' level so that their fiscal dependency will be reduced resulting in more fiscal autonomy. Rightly recognising that there exists lot of revenue potential at the local governments, it has suggested measures relating to Property Tax, land based instruments like Vacant Land Tax(VLT), Land Conversion Charges, Betterment Tax ,Entertainment Tax, Taxes on Professions, Trades, Callings and Employments. Besides these taxes, it also suggested that the non-tax revenue base of local governments need to be improved relating to tolls, fees and user charges of local productive assets and services respectively, Royalty on minor minerals, service Charges on government properties etc. The FFC has given wide-ranging suggestions covering (i) bringing in reforms and increasing the tax rates in the existing taxes, (ii) imposing new taxes and (iii) to provide enabling rules and framework by the States to augment the resources at the State and Local Governments level. For instance, it has suggested to bring reforms in the domain of Property Tax which is one of the most important taxes of the local bodies in almost all the states. States which are not imposing important taxes are suggested to impose them and where the taxes are imposed have been advised to increase the tax rates and/or tax bases. For example, surprisingly, odisha is not imposing a elastic tax like Profession Tax and several States are not exploiting their full potential of both taxes and non-tax sources which were appropriately illustrated by the FFC. Importantly, its recommendation that the profession tax be increased from the existing maximum level of Rs.2500 to Rs.12000 will bring lot of resources to the States/Local governments if implemented through a Constitutional amendment.

Sector Specific Grants

Sector specific grants are those grants which are given to a state to induce the expenditure on those services which fall below the national average either due to lack of resources or due to lack of priority by a state. Similarly, States may have specific needs and they need to be fiscally supported in the national interest however small the amount may be for the same reasons mentioned above. Grants for up gradation have been awarded for essential social and administrative services. Right from the Sixth Commission to THFC, except the Ninth commission, some amount of grants-in-aid have been given to the States for up gradation of essential social and administrative services. ThFC, the immediate predecessor of FFC has awarded as much as Rs. 91,389 crs for a variety of services and purposes. For Instance, it has awarded Rs.24068 crs. Rs.15000crs, Rs.19930 Rs.27945 cr. for the up gradation of Elementary Education ,Environment and for maintenance of Roads and Buildings and for State Specific needs respectively during the period 2010-2015. FFC has not recommended any such grants with the contention that States can meet such requirements with additional fiscal space provided by them.

Almost all the States criticised FFC for not recommending upgradation grants and it is likely that these services will be suffered due to lack of funds.

Other Important Recommendations

FFC has made several non-financial recommendations which are equally important and which have an important bearing to promote cooperative federalism in India. What follows is a brief discussion about such recommendations made by the FFC.

Cooperative Federalism

After thoroughly examining the existing federal fiscal system and the pattern of fiscal transfers, the Commission felt that the existing transfer mechanism need to be examined in order to minimise the discretionary element and avoid the duplication to promote cooperative federalism. Accordingly, FFC suggested for a new institutional arrangement besides suggesting to expand the role of Inter-State Council. Further, FFC is of the opinion that the “Union Government will utilise its fiscal space to continue to address the needs and expectations of the States and ensure the prevailing level of transfers to States of about 49 per cent of the gross revenue receipts during the award period” has an important bearing on the fiscal resources and thus on the fiscal autonomy of the States.

Goods and Services tax

Regarding Goods and Services Tax(GST) also the FFC made state-friendly recommendations like revenue compensation for five years and establishment of an autonomous and independent mandatory GST Compensation Fund though it has not estimated the quantum of revenue loss. The commission was silent on the rate, structure, base and the possible impact on the Union and State finances during the award period if GST is imposed. However, it has generously recommended 100 per cent compensation for the first three years,75 per cent in the fourth year and 50 per cent compensation in the fifth and final year which was favoured by most of the States.(Of course the Union Government recently agreed to give 100 per cent compensation for the entire five ears).It was expected that the FFC would make suggestions to implement GST which would be taken as a road map both by the Union as well as by the States in implementing GST. But such a thing has not happened may be due to lack of several details relating to GST as claimed by the Commission.

Fiscal Consolidation

With regard to creating a conducive fiscal environment for equitable growth through fiscal consolidation and fiscal roadmap, FFC made several suggestions. While retaining the 3 per cent target for fiscal deficit for the Union Government like its predecessors, it has not fixed any target for revenue deficit hoping that the Union Government would achieve revenue surplus by the end of the award period, if not earlier, given the fiscal environment. Regarding States, it has suggested several flexibility provisions in fixing the fiscal targets and fiscal rules. For instance, it recommended a conditional and differential target of 3.5 per cent fiscal deficit to States linking their performance with reference to Debt-GSDP ratio and revenue receipts-interest payments. States like Andhra Pradesh were benefited by this flexibility provision during the budget 2016-17. The Commission recommended

that the existing FRBM Acts be amended incorporating the new fiscal rules and targets or a Debt Ceiling and Fiscal responsibility Legislation be made to replace the present FRBM both by the Centre and the States. Its recommendation, for the first time, to establish an independent Fiscal council to undertake an ex-ante assessment of the fiscal policy implications of the budget proposals and their consistency with the adopted fiscal policy and rules would be proved to be very useful in future.

The Commission examined thoroughly issues relating to pricing of public utilities, Public Sector Enterprises and management of public expenditure. In this context, it has been criticised that though FFC has discussed various issues on these items referred by the TOR elaborately, they 'are largely academic and theoretical and more in the nature of do's and don'ts suggested by the stakeholders'(Archana R.Dholakia,2015). It is true that the FFC has not given specific estimates with regard to disinvestment proceeds, categorised the PSUs as per priority and not provided the utility-wise cost recovery rates or percentages. But its recommendations to bring systemic changes in the service delivery, regulation of tariff and minimisation of wastage of resources are note worthy. It made a very important recommendation in favour of the States that the Union government can give a share of proceeds from disinvestment of PSUs. Besides several suggestions to streamline and improvise the accounting and budgeting procedures, it has suggested that the expenditure on subsidies should be pegged at 1 per cent of GDP and enhance the capital expenditure above 2.5 per cent of GDP is in tune with the overall fiscal road map suggested by FFC

Conclusion

The Fourteenth Finance Commission deserves appreciation for several departures it has made, the most important being the big jump in the vertical share in the tax revenue. Its intention to provide large fiscal space at the States by transferring more than 70 per cent of the total fiscal transfers with a view to giving more fiscal autonomy to enable them to plan for their own developmental programmes according to their own priorities is really laudable. However, the expected fiscal autonomy has been limited by the subsequent policy changes of the Union government. Though the inter se distribution of the fiscal transfers is progressive, but the progressivity of FFC is less than that of the THFC. The Commission gave relatively more importance to shared tax revenue compared to grants-in-aid and totally discarded the sector specific and state specific grants which were used by its predecessors. Its decision to give grants directly to gram panchayats and municipal bodies is historical in the Indian fiscal federalism. Doing away with the conditions for release and utilisation of the segrants to local governments following a 'trust-based approach' is noteworthy. However, it is upto these local governments to use the funds productively and the respective States to put in place the required administrative, technical and accounting systems to absorb the large amount of funds provided by FFC. The FFC has recommended several non-financial recommendations which are equally important for implementation which will hopefully pave the way for achieving cooperative federalism in India. It is necessary that the Union should move forward with the same 'trust-based approach' to operationalize the non-financial recommendations to see that cooperative federalism is sustained in India.

Notes:

1. Vertical Federal Fiscal Imbalance refers to non-correspondence between revenue resources and functional responsibilities of the Central government vis-à-vis the non-correspondence between revenue resources and functional responsibilities of the States put together in a federal context.
2. Horizontal Federal Fiscal Imbalance refers to non-correspondence between revenue resources and functional responsibilities across States due to differences in fiscal capacities that arise due to differences in endowment of resources in a federal context.
3. 80th Constitution Amendment Act 2000, consequent upon the recommendations of the Tenth Finance Commission, changed the pattern of sharing of Union Taxes in a fundamental way. As per this amendment, Article 272 was abolished and Article 270 was changed substantially. The amended Article 270 provides for sharing of all the taxes and duties referred to in the Union List except surcharges and duties.

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- For more details and an elaborate discussion on equalization, see Buchanan, J.M. (1949), "The Pure Theory of Government Finance: A Suggested Approach", *The Journal of Political Economy*, December, Vol. XLVII, pp.496-505., "Federalism and Fiscal Equity", *American Economic Review*, September 1950, p.591., Bhargava, R.N., (1954), "The Theory of Federal Finance", *The Economic Journal*, June, Vol.64, pp. 407-408. , *The Theory and Working of Union Finance in India*, George Allen and Unwin, London, 1967, Govinda Rao M. and Tapas K.Sen (1996), "Fiscal Federalism in India, Theory and Practice", National Institute of Public Finance and Policy (NIPFP), New Delhi and Sudarsana Rao, R (1996), *Federal Fiscal Transfers in India*, APH Publishers, New Delhi.
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New Monetary Policy Framework in India: Challenges and Opportunities¹

B K Bhoi²

Historical Perspective

The framework of monetary policy in India has evolved over time. Immediately after India's independence, there was a need for financing economic development by borrowing from banks. As revenues available to the Government were limited, commercial banks were asked to hold a certain percentage of their net demand and time liabilities in the form of government securities under a statutory arrangement known as Statutory Liquidity Ratio (SLR). Due to pre-emption of resources from commercial banks through SLR, the balance amount of resources available with banks was rationed among the non-government users. In the post-independence period up to mid-1980s, the framework of monetary policy followed by RBI was best known as **credit planning approach**. Both deposit and lending rates were regulated and available resources were directed towards productive sectors, including agriculture, small scale industries, etc. Directed credit and directed investment led to financial repression warranting a review of the monetary policy framework with a view to breaking the low level saving-investment equilibrium trap which could deliver only about 3.5 per cent growth in real GDP for a long period - the so called Hindu rate of growth for nearly three decades after independence.

The first systematic review of the monetary policy framework in India was done by a high powered committee headed by Prof. Sukhamoy Chakravarty (RBI 1985). On the basis of the Chakravarty Committee's recommendations, the RBI adopted **monetary targeting** framework in 1985 which continued up to 1998. Under the monetary targeting regime, the RBI used broad money (M₁) target as a nominal anchor so as to achieve price stability under the assumptions that both demand for money and its velocity are stable. The intermediate target of M₁ was modified during the course of the year based on feedback received from the economy, particularly on growth and inflation. Out of the 13 years of broad money targeting, M₁ growth was close to the target only in 4 years. Targeting M₁ could not achieve price stability as the relationship between intermediate target (M₁) and the ultimate objective *i.e.*, price stability had been weakened. The demand for money was found to be unstable since the early 1980s (Bhoi, 1995 and Working Group on Money Supply, 1998). The proximate cause of money demand instability was financial innovations. There was predictive failure as well as parameter instability which interfered with targeting broad money designed to achieve price stability.

¹ Professor Khetra Mohan Pattnaik Memorial Lecture delivered on the occasion of 48th Annual Conference of Orissa Economics Association at GIET, Gunupur

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By the early 1990s, the Indian economy was overheated. Persistent fiscal deficit spilled over to the external sector. Foreign exchange reserves depleted at a faster pace. By 1990-91, India's forex reserves were hardly one billion US dollars, barely sufficient for a few weeks of imports. In order to tide over the situation, the Reserve Bank, in consultation with the Government had to pledge gold for meeting external obligations. In order to overcome the balance of payments crisis, India opted for the IMF loan under stand-by and extended fund facilities. Together with the Fund-supported stabilisation-cum-structural adjustment programme, a systematic reform process was put in place with the initiatives of the RBI and the Government of India. Wide ranging reforms in the money market, credit market, Government securities market and foreign exchange market were initiated as per recommendations of several high level committees such as the Narashimham Committees on Financial System (1991) and Banking Sector Reforms (1998), Rangarajan Committee on Balance of Payments (1993) and Tarapore Committee on Capital Account Convertibility (1997).

In April 1998, the RBI adopted a **Multiple Indicator Approach (MIA)** as its monetary policy framework. Under the MIA, the use of broad money target was deemphasised and a host of quantitative indicators from financial and real sectors such as credit, fiscal deficit, rainfall, IIP, services sector activities, export-import, external balance of payments and capital flows together with rate variables such as money market rates, deposit and lending rates, yield on G-sec, asset prices and exchange rates, etc. were considered. By that time, both deposit and lending rates were largely deregulated. Government securities market was reasonably developed. Under the MIA, the RBI started giving policy signals increasingly through interest rate. The RBI was actively engaged in the day-to-day liquidity management in order to implement the stance of the monetary policy under the Liquidity Adjustment Facility (LAF) introduced in 1999. The corridor was introduced around the policy repo rate with a spread of 100 basis points on either side so that the Weighted Average Call Money Rate (WACMR) shall remain within the corridor. The repo rate emerged as the single policy rate since 2011 together with the WACMR as the operating target of monetary policy. The operating procedure has been refined from time to time so as to keep the overnight call money rate as close to the policy rate as possible.

Under the MIA, forward looking information generated by several surveys such as the industrial outlook survey, order book, inventories and capacity utilisation survey, professional forecasters' survey, credit condition survey, inflation expectations survey, consumer confidence survey, etc. were gradually incorporated into the information set. Moreover, formulation of monetary policy has increasingly become a consultative process engaging all stakeholders rather than a closed door affair of the RBI. The RBI has been receiving inputs from banks, non-bank financial institutions, trade bodies, and depositors' associations through structured pre-policy consultation meetings. The pre-policy consultation meeting with the Technical Advisory Committee on Monetary Policy has become an important ingredient of the monetary policy formulation in India since July 2005.

Despite considerable improvement in the operating procedure under the MIA, there has been a lack of clarity as regards the nominal anchor which is very much needed to implement monetary policy. Moreover, original mandates available in the preamble to the RBI Act have been somewhat ambiguous

as regards the objective(s) of monetary policy. Over a period of time, both growth and inflation objectives have been pursued striking a delicate balance between the two. Of late, financial stability has been added as the third objective of monetary policy. According to Prof. Tinbergen (1952), central banks should have multiple instruments to achieve multiple objectives. As a matter of fact, central banks have only one weapon *i.e.* money, either the quantity or its price *i.e.*, interest rate which could be suitably deployed to achieve monetary policy objective(s). Strictly speaking, financial stability is not a monetary policy objective although it is unequivocally needed for pursuing growth/inflation objective(s). Prudential regulations, both micro-prudential and macro-prudential, are the ideal instruments used to achieve financial stability. Monetary policy at the most can lean against asset price boom and thereby, contribute to financial stability as a supplementary objective. Moreover, financial stability cannot be achieved without coordination among multiple regulators of the financial system and also with the Government.

Basis for the Regime Shift: Patel Committee Recommendations

Keeping in view the above problems, a high level Expert Committee to Revise and Strengthen the Money Policy Framework in India was set up under the Chairmanship of Dr. Urjit R Patel in 2013. The Patel Committee submitted its recommendations to the Governor in January 2014 for a regime shift from the MIA to **flexible inflation targeting (FIT)**. Major recommendations of the Patel Committee are: a) inflation should be nominal anchor for monetary policy; b) the RBI should adopt CPI inflation as the nominal anchor; c) the target for inflation should be set at 4 per cent with a band of ± 2 per cent around it; d) the RBI should reach 4 per cent headline CPI inflation in a time-bound manner for which a glide path was indicated; e) operating procedure needs to be modified suitably; f) impediments to monetary policy transmission be removed; and g) monetary policy decision making should be vested in a monetary policy committee with equal voting power. Each of these recommendations was deliberated in depth in the committee. For details, one should read the report, available on the RBI's website.

When the Patel Committee's Report was submitted, the CPI inflation was close to 10 per cent. According to the proposed glide path for disinflation, the headline CPI inflation to be brought down to below 8 per cent by January 15 and below 6 per cent by January 2016. At the time of submission of the report, the projected disinflation path looked little too ambitious. However, the RBI has so far been able to achieve the milestones and hopes to bring down the CPI inflation to around 5 per cent by March 2017, consistent with the inflation target proposed by the above committee.

A major path-breaking development in terms of institutional reform in the sphere of monetary policy has been signing of a historic agreement between the central government and the RBI on February 20, 2015. The flexible inflation targeting has been formally adopted as the new monetary policy framework. Now, there is a clear mandate for the RBI to pursue low rate of inflation while keeping in mind the growth objective. The recommendation of the Patel Committee to bring inflation below 6 per cent by January 2016 has been included in the agreement. Inflation target from 2016-17 shall be within a band of ± 2 per cent around the central path of 4 per cent. The RBI shall be accountable if inflation is outside the prescribed band for three successive quarters from 2016-17. If the RBI fails to

meet the inflation target for three consecutive quarters, it shall provide reasons for its failure, propose remedial measures to be taken by the RBI to bring inflation back to the target and indicate the estimated time period required within which inflation target is expected to be achieved. In-house research, including modelling and forecasting capability, has been strengthened so as to provide reliable input to the Governor on a regular basis for the formulation of monetary policy. The projections on growth and inflation are regularly being given in the policy statements based on in-house research. Monetary Policy Reports (MPR) are being published on a half-yearly basis since September 2014. The sector-specific refinance facility against rupee export credit has been removed.

Challenges and Opportunities

There are several challenges before the monetary authority to implement flexible inflation targeting in India. One of the pre-conditions for the inflation targeting to be successful is that there should be absence of fiscal dominance. The commitment of the central government to adhere to the fiscal consolidation path is, therefore, critical going forward. As of now, there are upside risks to inflation emanating from deviation from the path of fiscal consolidation. The Government is under obligation to implement Seventh Pay Commission recommendations from 2016-17 which involves an additional expenditure of about rupees one lakh crore. One-rank-one-pension award for retired defence employees is also overdue for implementation. The state governments shall be under pressure to implement Seventh Pay Commission award with a lag. To remain on the fiscal consolidation path, the central government has to mobilise additional resources and also prioritise expenditure in a manner that gross fiscal deficit does not exceed 3.5 per cent of GDP in 2016-17. This should not derail government's recent initiatives of augmenting capital expenditure which are very much necessary to strengthen the process of recovery. Stimulating growth through accommodative fiscal policy has not been very successful in India in the past. The experience of fiscal deficit coexisting with external current account deficit, the so called twin deficits, is fresh in our memory. This was experienced in the aftermath of the global financial crisis and also on earlier occasions when fiscal deficit was high. Inflation targeting countries around the world unequivocally advocate for fiscal rectitude. Dr. Raghuram G Rajan, Governor, RBI in his C. D. Deshmukh memorial lecture (2016) has lucidly explained the need for fiscal consolidation in India at this juncture.

Until recently, it was argued that inflation targeting is neither desirable nor feasible in India. In view of this, the mind set of quite a sizeable chunk of serious researchers and analysts is yet to change. They still believe that sacrifice ratio is too high in terms of loss of growth if the central bank is solely focussed on inflation control. Inflation-growth relationship is positive going by the conventional Phillips Curve analysis. According to the conventional wisdom, curbing inflation is as good as sacrificing growth and therefore, inflation targeting as an objective of monetary policy is not desirable.

The text-book knowledge alone may not be adequate to conduct monetary policy in an emerging economy like India. Inflation-growth dynamics in the emerging economy is complex. In the aftermath of the global financial crisis, growth collapsed in most of the developed countries. Simultaneously, inflation also decelerated much below the long-term average. The emerging economies could not escape the onslaught on growth, but inflation remained at an elevated level. It would not, therefore,

be appropriate to believe that growth-inflation relationship is necessarily positive in developing countries.

High rate of inflation harms growth in a variety of ways. First, it erodes the value of savings, particularly financial savings. Therefore, not only the rate of households' savings as proportion to GDP decelerates, but also the composition of savings undergoes a shift in favour of physical savings like real estate, gold, etc. Growth is adversely affected due to low savings and low level of investment. Second, high inflation creates uncertainty and therefore, distorts allocation of resources by market forces. Third, inflation rate differential between India and its major trading partners leads to appreciation of the Real Effective Exchange Rate (REER). Loss of competitiveness due to appreciation of REER worsens the external sector balance. Fourth, the elasticity of government expenditure with respect to change in inflation is much higher than the revenue buoyancy. Therefore, it would be difficult for the government to achieve fiscal consolidation if inflation remains high.

The next question, therefore, arises at what level of inflation it harms growth (Vasudevan *et al.* 1999). In other words, what is the threshold level of inflation beyond which inflation is harmful to growth? In India, various studies have shown that the threshold level of inflation is around 6 per cent beyond which it harms growth. The Patel Committee has acknowledged this empirical finding and designed its recommendations accordingly. The upper limit of inflation tolerance has been set at 6 per cent. As inflation above 6 per cent is harmful to growth, it is desirable to focus solely on inflation control above this threshold. If inflation falls below 6 per cent, it opens up space for monetary authority to support growth. The recent cumulative cut in the policy rate by 125 basis points needs to be seen as consistent with the flexible inflation targeting. Low rate of inflation provides a congenial environment for sustaining high rate of growth on a medium term basis. Targeting inflation below 6 per cent on a continuous basis is, therefore, a desirable option.

Many economists still believe that it is not feasible on the part of RBI to achieve low rate of CPI inflation as 'food and beverage' and 'fuel and light' which have a combined weight of nearly 53 per cent, are beyond the control of monetary policy. Diesel and petrol prices that are accounted under transport and communication services (combined weight of 2.3 per cent) are also outside the ambit of monetary policy. Supply shocks are transitory and therefore, one would expect this to last for a season, say 6 months or at the most 12 months in case of annual crops like sugarcane. If it is limited to a few commodities like onion and tomato, the impact of relative price changes may not be pervasive on the CPI-combined. If it is a severe drought leading to a decline in farm production, food inflation may last for a year or so. Food inflation remained in double digits for more than two years since 2012. During 2013-14, India witnessed a record level of agricultural production. Food inflation was also at a record level during the year.

Is this a supply shock or a generalised inflation? Supply shock is often converted into generalised inflation if supported by easy monetary policy. In the aftermath of the global financial crisis, India's monetary policy was accommodative. The fiscal policy also came out of the FRBM discipline. Rural wage growth was above 15 per cent for more than six years since 2007-08. It was too much money in the hands of the people chasing too few goods. 'Inflation is, therefore, always and every where a

monetary phenomenon' *a la* Milton Friedman. During last two years, there was drought like situation; foodgrain production declined marginally. However, food inflation has moderated from double digit in 2013-14 to 6.3 per cent in 2015-16 so far. Besides supply management and low minimum support prices (MSP) by the government, tight monetary policy contributed significantly in reducing aggregate demand and thereby contained CPI inflation, including food prices. A reasonable inference in this regard shall be that supply shocks can constrain monetary authority in achieving inflation target in the short-run. However, the endeavour of the monetary authority has been to prevent a supply shock from converting into a generalised inflation.

One of the major challenges under the FIT is to anchor inflation expectations. According to the households' inflation expectation survey, the three-month ahead median inflation expected by urban households, which was around 15 per cent in September 2014, came down to a single digit in December 2014, before rising to above 10 per cent by December 2015. Notwithstanding some moderation, inflation expectations remain at an elevated level. Indian households are not convinced that the RBI can sustain low rate of CPI inflation on an enduring basis. As inflation rate was high for a long period and food inflation was much above the headline inflation, including sporadic increase in the prices of pulses, onion, and tomato, it is natural for the households to be sceptic about the success of inflation targeting in India. Given the adaptive nature of their behaviour, inflation expectations are expected to move downward if credibility of FIT is established on an enduring basis. However, inflation expectations provided by professional forecasters have converged to the in-house projection of about 5 per cent for CPI inflation, both in the short-run and in the long-run.

India has adopted FIT at an opportune time. International commodity prices, particularly crude oil prices, have continued to remain benign during the recent years. As of now, there is no external threat to inflation. The central government has not completely passed on the benefit of large fall in the crude oil prices to the consumers. Although most of the retail prices of petroleum products, including diesel and petrol, have been deregulated, government has imposed indirect taxes restraining consumers to go overboard in the consumption of such products due to large fall in international prices. In case there will be a sudden reversal of crude oil prices, the government has the option to adjust taxes and thereby prevent the domestic prices to rise abruptly. This is perceived as an appropriate supply management strategy of the government. Given the headroom available to the government, this would not only provide an opportunity for consumption smoothing but also help achieve inflation target by the RBI.

Low inflation is critical to protect a country's competitiveness. When the global growth is tepid and growth of global trade volume is sluggish, export growth would depend on low inflation and competitive exchange rate. Developing countries have limited option to pursue competitive exchange rate as a policy to boost export. The exchange rates are otherwise susceptible to depreciation pressure from flight to safety, mostly arising out of adverse global developments. Sound macroeconomic fundamentals of the economy can prevent large capital outflows under such situations. As India is gradually being integrated to the global economy, its inflation rate should not be significantly misaligned from its major trading partners so as to remain globally competitive.

The Indian economy is currently on a recovery phase of the real business cycle. This is considered as the best time to initiate inflation targeting. Supply side shock is generally less in the recovery phase of the real business cycle. In fact, India is growing below its potential level of output. The capacity utilisation of the industrial sector at around 70 per cent is one of the lowest in the recent history. The available slack in the economy may prevent the inflation rate to accelerate even if growth picks up. The central government has initiated several measures during the recent period to attract both foreign and domestic investments. As developing countries are investment-driven economies, growth is likely to pick up going forward. There is also a possibility for the potential growth to rise to a higher level. In India, as supply side looks promising in the medium term in an otherwise gloomy global scenario, there is a need for coordination between fiscal policy and monetary policy to complement each other for the best outcome going forward.

Price stability as an objective of monetary policy has a social dimension too. Low inflation is considered as the best anti-poverty programme. In case of high inflation, most vulnerable section of society is the downtrodden. They have limited means to earn their livelihood. Their wages are not indexed. Social safety net is currently not adequate to protect this segment of the population. They can live with dignity despite low income if the RBI succeeds in its endeavour to achieve low and stable rate of inflation.

Concluding Observations

India's monetary policy framework as well as the operating procedure has evolved over time. Flexible inflation targeting is a desirable option in India as inflation harms growth, if it remains above a threshold level. Low CPI inflation is feasible on an enduring basis through an effective demand and supply management policy for which coordination between monetary policy and fiscal policy is necessary. The RBI's endeavour has so far been successful in ensuring disinflationary glide path (envisaged in the Patel Committee and included in the agreement with the Government) and mitigating the initial challenges of adopting flexible inflation targeting framework in India.

Thank you once again for giving me an opportunity to share my thoughts on a topic of contemporary relevance.

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Development Management in Income Growth and Regional Balance¹

Akshya K Panda²

Government is a political arrangement and the philosophy is ordered society. A democratic government works towards social, political and economic justice. Indian constitution in article 38(2) encourages the government(s) to strive to achieve these objectives. These objectives are interlinked. Inadequacy in one thwart advancement in other(s). 66 years have passed-by, but we are still in different stages. Bullock kart, as mode of transportation exists simultaneously with the country contracting to place other countries' satellite in the orbit. While the country promotes medical tourism, IMR³ is one of the highest in the world. There must be some thing wrong in creating and selling policy⁴ and / or delivery vehicle⁵.

As economists, we are concerned with income and wealth, its creation, growth and its distribution. There are issues of trade-off between the two but there are also line of arguments of both being complements. Contemporary thinking is the complementary character of the two (growth and decent distribution) are mutually beneficials. When we think of distribution, it encompasses both spatial and individual. Spatial distribution we, call regional distribution.

As citizens, we are also as much vigilant to the manner in which our Government approach the directions contained in the "Directive principles of state policy". Article 38(2) states, "The state shall, in particular, strive to minimise the inequalities in income, and endeavour to eliminate inequalities in status, facilities and opportunities, not only among individuals but also among groups of people residing in different areas or engaged in different vocations." All democratic governments follow the maxim of largest welfare of the largest numbers⁶. Where do we stand?

¹ This paper is based on statistical work carried out by Shri Sukhdeep Singh, IES, Shri Md. Feroz Khan, DD (DE&S), and Ms. Sujata Priambada, AD(DE&S), GoO.

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³ A simple measure of Human Development.

⁴ Government is the only institution in the business of creating policy and effecting its implementation for desired outcome.

⁵ Government effectiveness. It is one of the elements in the Kaufman governance index (world bank). All the countries are placed/ compared with other on a standardised(z score) scale. India is in the negative range while most developed countries are around (+) 2.0 and above.

⁶ Except that different approaches are followed to achieve the same based on values the society attaches to it. Variation in degree is with regard to importance it places on incentive to private enterprise/initiative.

As student of economics, we are familiar in different degrees, the theoretical underpinning of the approach to mitigate regional imbalance and inequality at individual level. A theory provides a logical basis for action, and evaluation of a post facto situation provides the evidence of success or failure. Many economists have their work at global level and many have tested the propositions at local level. As the context varies, so also the approach varies. The earliest approach to growth and distribution is that of Kuznet, inverted U curve. Equity-blind-growth policies remained the consensus for a half a century. The net result of Kaldor-Kuznets-Solow consensus was a policy of mind-set: that inequality induces growth, growth reduces inequality, and by pursuing growth all nations would converge to the same growth path. Some of the prepositions in classical writings are: upper income class are savers (Kuznets, 1955), savings are a function of real income, profits outweigh the workers' savings (Kaldor, 1958), productivity growth in OECD countries in 1950s and 1960s is a function of investment behaviour (Kaldor, 1967). The simplistic logic essentially is that, Capitalists and high income earners had greater MPS- investment is important to growth. Thus follows inequality promotes growth. The income gap between the rich and the poor has also been theorised as encouragement to greater risk taking, hard work, entrepreneurial spirit (Mirrlees, 1971). Solow believed that technological change would make both capital and labour more productive. With low base productivity in poorer countries, capital investment would drive productivity growth in these countries (relative to rich nations affected by diminishing returns) and attract more investment. The process ultimately leading to convergence. The convergence is based on the proposition that there is no artificial barriers to trade and investment across countries. The logic has also its implications for regional balance. Thus the consensus is that while national income growth policy would bring greater national income, equity (implied in Kuznets), it would have its application on an international scale implied through Solow.

Myrdal, however, had a different view though Solow and Myrdal were writing at the same time but from different context. Myrdal's theory of cumulative causation shows a different direction, while Solow leads to convergence. Rather than global capital investments seeking out to poorer and poorer nations (regions), along the continuum of decreasing returns, cumulative causation holds that investment begets more investment. For example, US economy attracts more capital and knowledge worker to their knowledge economy, especially when global system is more fragile and in turmoil.

There are several other views, on this subject, from economists of different group. Some of these are summarised for illustration: Manufacturing and service economies experience increasing returns if right policies are in place while agrarian economies are thought to be following decreasing returns to investment (Skott and Aurbach, 1995). Adam Smith also recognised this possibility, and the consequences of increasing returns (Romer, 1986). Marx argued that increasing returns would lead to what he called uneven development. Young viewed increasing returns as macro phenomena, and a function of continual division of labour (Skott and Aurbach, 1986). Myrdal maintained, 'in the normal case a change doesn't call forth countervailing changes but, instead, supporting changes, which moved the system in the same direction as the first change, but much further, because of such

circular causation a social process tends to become cumulative and often to gather speed at an accelerating rate.

Other recent concepts on similar lines are path dependency models of institutional economists, positive feedback to system builders, learning by doing (Kenneth Arrow, 1962), and technology lock-ins (Brian Arthur, 1999). Similar is the idea of low-level equilibrium trap (Nelson, 1956). Lewis (1954) paper also hinted at the cumulative effect, while international trade might lead to continued growth for the importer and exploitation for the exporter (Ranis, 2004).

The question is which path the countries follow both within their borders and in relation to other countries. Useful in this context are some of the empirical findings: Bourguignon and Morrison (2002) conclude that income divergence across nations, at the best decelerated over the past 50 years. They also found that over the past two centuries, the global Gini coefficient has increased 30%, driven mainly by disparities across rather than within the nations. As Barrow states the idea that poorer countries have greater growth rates is inconsistent with evidence, and a rare exception is due to human capital endowment. Easterly and Levine's regression analysis motivated, by Africa's slow growth, finds that low income countries have associated inhibiting characteristics such as low level of schooling, political instability, and insufficient infrastructure, all of which have a negative effect on growth. Both Galor and Quah developed models known as club convergence in which there are two steady states corresponding to high and low growth paths. Romer's increasing returns model matched data suggesting that growth rates were a function of attained level of development.

More such work are found in the endogenous growth theory. Li et al (1998) find that Kuznets curve works better for a cross section of countries at a particular point of time rather than for evolution of inequality over time within countries. In the endogenous growth theory, the question is how income distribution affects growth. Influential work on this issue are by Alesina and Perotti (1993), Bertola (1991), Perotti (1993, 1994) Persson and Tabellini (1994). In the Indian context, Das et al investigated the issue and concluded that growth-inequality relationship is unambiguously inverted U shape. A strong case for reduction of inequality is a vibrant democratic process for redistributive measures (Acemoglu and Robinson (2002).

In an ICRIER study, it is revealed that the share of labour in gross value added has fallen from 28.6% in the financial year 2001 to 17.4% in fy2012. The share of interest income fell from 29% to 19% and that of profit rose from 19.9% to 46.2% during this period. Within the total wage bill, the share of the supervisory and managerial staff rose from 26.1% to 35.8% while that of the production workers fell from 56.6% to 48.8%. The share of contractual workers in manufacturing has risen from 15.7% to 26.5%. In manufacturing, while only a 4% workers have technical education, 27% are trained in some vacation, the remaining are informally trained. This is symptomatic of India, the stage of development of a broad cross section of productive sectors and inequality inherent in this pattern.

The global trend in the factor share in value added is a higher share accounted for by salaries, followed by capital gains and business income. There is erosion in the share of Capital income. (Atkinson, Piketty, and Saez: *Top Incomes in the Long Run of History*, *Journal of Economic Literature*, Vol. XLIX (March 2011) P.8).

India started big on the planned development strategy, and so also the States in the Indian Union towards sustained growth with regional balance. Direct Public investment remained the key focus, as also deficit financing as a source of funding, and as part of deliberate strategy. In the initial years, PSEs were entrusted with the key role to develop industries⁷. But in subsequent years, especially since late 1980s, the strategy shifted to private sector led industrialisation. In between, state sponsored FIs supported the financing needs of the private sector⁸. This is the period also during which most of the Governments (centre and states) were severely constrained in financing the business of Government as effective governments⁹. With buoyancy in central revenue and state revenue, after process reengineering in tax administration, a number of productive welfare enhancing programmes were launched in the early years of this century. These programmes were Flagship schemes. The State Governments not only partnered with the Centre in most of these programmes, but also had their own programmes¹⁰. Outcome indicators of the various development initiatives, though, vary significantly among the states. Some of these indicators are IMR¹¹, MMR, literacy, quality of learning, power, all weather road, small culverts, transport, houses, jobs. In terms of satisfaction quotient, the list is still¹² endless even in respect of basic human needs to live a life of dignity.

Inequality and regional development are still challenges in India despite its recognition. The experience varies across regions and states in mitigating these challenges depending upon government effectiveness. But, it cannot ever be ignored that growth is paramount¹³.

Profiling Odisha

The focus in this essay is Odisha. A state that can replicate the country. It has a vast coast line, large tracts of alluvial soil, vast forest cover, unparalleled mineral reserves, a very good river system, a variety of temperature, rainfall pattern and a population known outside Odisha for its dexterity. Odisha's districts would be placed in the subnational context of study of regional underdevelopment, and Odisha would be reckoned in terms of its distance from the national context.

Odisha remains lower both in level and growth of income. This happened since a time when for the first time stable regimes were a constant feature. Stable regime was accompanied by very little competition at the political level. The growth rate GSDP of Odisha had always been fluctuating

⁷ As it was felt that private sector neither had the resources nor managerial competence to carry forward faster industrialisation.

⁸ It is debatable how far it helped, but certainly it promoted rent-seeking in a big way and allowed playing favourites at the cost of quality of assets with the FIs.

⁹ Most Governments failed to pay salaries to their employees on regular basis and over draft account of the Governments with RBI was mostly on red. Situation improved after FRBM law and generous 12th Finance commission devolution.

¹⁰ Odisha government currently have 5 region focussed programmes running in 20 out of 30 districts. Biju KBK as additional to KBK line from the GOI.

¹¹ IMR is symptomatic of performance of the state in health indicator of an population.

¹² After several years of pump priming and putting the country in the rudder of Global Rating Agencies.

¹³ Overall GDP growth provide the sustenance for distribution.

with a year of positive growth alternated by negative growth. This type of growth in income is never helpful for any long term plan by any economic agent, whether it is household, farm entrepreneur, business investment etc., As a result, the distance in per capita income of the state from that of all-India average has been widening (Myrdal's cumulative causation). Odisha's growth is mostly led by transport, storage, communication, banking and insurance. There is break in the growth of manufacturing, trade, hotel and restaurant and agriculture since 2002-3 (structural break year : Quant-Andrews). The sector without any momentum and sector very vital (human capital development) is electricity, gas and water supply (minimum amenities of life yet productive enhancing).

In a situation of this type (uncertain growth), most of the growth is experienced by well endowed regions with good **financial sector development and larger presence of the government** and sections of the population with skilled jobs. The backward regions with lower per capita income experience very little growth (discussion in paragraphs on district experience) as private investment shy away either from material wealth creation or in to human capital development. The rentier class find efficient investment of their savings in to real estate and gold. There are not many poles of attraction also. A proxy for a central Area (growth pole) is level of urbanisation. Odisha's urban population (sans any urban amenities) is 16.7% in 2011 (a level lower than the all-India average, in 1951) compared to around 14% in 2001.

Odisha Government also recognised the need for direct public investment intervention to remove regional imbalance in the state. Kalahandi drew the national attention in early 1990s. Regional alienation was also a hot topic in the political discourse (western Odisha). The state launched its own programmes for undivided KBK districts (now Eight), Kandhamal and Boudh districts, a Western Odisha Development Plan. Separate funding and seemingly autonomous administrative structures, were put in place. Each of the 20 of the 30 districts had specific programmes of at least 4-5 each, including such flagship programmes as RLATP, IAP, BRGF. Programmes have already run for sufficiently long period. *Spending on these programmes and efficacy of the spending need a thorough study though.*

Districts' Experience

Considering the very negligible presence of attractive growth poles, Odisha's districts are in different stages of development. Theoretically, initial differences in the districts (region) are attributed to endowment differences and movement in any direction is explained by the behaviour of economic agents. Government can change course either by policy or by a shock wave investment. Some of the initial conditions are functioning government, rule of law, competitive political market, policy, agricultural (natural) endowments (especially for resource use activities), properly functioning market, credit, risk proofing, nearness to a growth centre, transportation network, access to education, health and hygiene. Further developments are higher education, growing middle class, advocacy groups. In a backward area functioning in a low level equilibrium trap in the subsistence mode of production, an initial shock further exacerbate the movement on the path of divergence.

The return to convergence is delayed as long as there is no growth fatigue in the Central region, Capital still on innovation, lacks for technology adoption and there is no skilled labour tightening and in-migration continue to pour in to the Centre. The periphery remains in the backyard.

The districts vary in their experiences and districts had their structural breaks at different points in time. It is expected that with political focus on KBK and larger outlay for these districts, development outcome would differ significantly from other than would otherwise would not have been the case. IT appears business as usual. The test case is Malkangiri. The district per capita income not only remained a far distant (33 of 100) from the top performer (Jharsuguda (2010-11= 100), but also it holds the same queue number in fy12 as was in fy94. Is the growth in income any different? No. The question is: can Malkangiri grow and catch-up? It seems doubtful, when most of the productive labour, though unskilled, migrate to safer areas. Is it not a typical case of adverse selection confronted in VRS Scheme? As regards, the top performer, Jharsuguda, it is crest fallen from the pedestal, with difficulties in the metal market as there is no other sector to anchor it. There is no breakthrough long period of growth might have created depth. Can it be a pole? Only district showing some depth and breadth is Khorda, the seat of political and administrative power.

Future research may unravel the relationship between share of public administration and the growth rate of the district to unravel any relationship.

I would conclude with some of the findings on inequality, another dimension and a vital dimension of the discourse on income. Both Lorenz curve, and Gini coefficients indicate that inequality in Odisha is lower than that of India. Further, inequality in KBK region is lower than that of Odisha. A great solace is that there is movement towards more equality in the KBK region compared to Odisha between the 61st round (2004-5), and 66th round (2009-10). This trend does not appear to be maintained in the 68th round (2011- 2012). Is this more equal society something to do with deprivation in equal measure? Is there any scope for unequal growth when the driving sectors could be trade (sometimes exploitative) and usury. Take a look at the government effectiveness and make a judgement whether it would be business as usual (**Kemiti Achha- Semiti**).

Per Capita Income Convergence (or Divergence) across the states of India: Post Reform Experience

Jagannath Lenka¹

The estimation of 'sigma' and 'beta' convergence on the basis of real per capita income for the period 1993-94 to 2013-14 reveals that there is divergence of per capita income across the states of India. There is not only an increase in the dispersion of per capita income in absolute terms but also the speed of divergence is increasing over the years. This reflects the fact that poorer states have lagged behind in their catching up efforts after economic reforms. Regional policies need to be revamped to support the poorer states for more efficient use of their resources so as to ensure the balanced growth of the country.

Keywords: Per Capita Income, Convergence, Divergence, Catching up Effort.

Introduction

Studies on regional pattern of growth have assumed wide currency in the development literature to answer the question, why some regions grow at a faster rate and others lag behind, that accentuate the problem of regional disparity. All countries whether developed or developing share the same experience of having both economically advanced as well as backward regions. But the problem is worse and more confounded in the developing countries with glaring and visible disparities in the level of economic development across the regions and in the rate of their growth. The co-existence of developed and depressed regions has not only led to inefficiency and underutilization of resources but also has threatened the national goals of growth, stability and social justice. It is therefore rightly said that the reduction in regional disparities is of utmost importance in the context of social justice, economic growth and maintaining national integration and unity (United Nations, 1953).

Convergence (or Divergence) Theories

In the economic literature devoted to the integration theory, there is no unanimity of opinions regarding the process of regional growth and the catching up hypothesis. According to one group, economic activities spread out across regions and hence are favorable to the tendency of convergence. The 'accordion effect' hypothesis developed by Hanna (1957) and empirically verified by Perloff et. al. (1960) set out to support this view.

The other group holds the view that economic activities concentrate in certain regions causing greater disparities and divergence across regions. The 'self perpetuations hypothesis' developed by

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Hughes (1961) and empirically verified by Booth (1964) favours this divergent trend.

However, the 'Concentration cycle' hypothesis of Myrdal (1958), empirically verified by Hirschman (1961), Williamson (1965), Alonso (1968), Kerpeckyz (1972) maintains that regional disparities diverge initially only to converge later in the growth process.

Research Question

Whether the real per capita income across all the states of India has converged or has diverged after economic reforms?

Data and Methodology

The per capita income data for the purpose of analysis have been drawn from the hand book of statistics on Indian economy 2014-15 published by the Reserve Bank of India. The technique of base shifting has been used where necessary to convert the per capita income of all states for the period from 1993-94 to 2013-14 at constant prices (1993-94 base year). It may be noted here that per capita income has its limitation in any study of inter-state comparisons (Bhattacharya and Saktivel, 2004)

There are two main approaches to quantify the extent to which the growth process is leading to over time. The traditional approach that is used for the purpose is known as '**sigma**' convergence while the neo-classical approach is known as the '**beta**' convergence. Both these approaches have been used for eliciting the results.

Results and Discussion

A. Sigma Convergence

The 'sigma' convergence measures the dispersion of real per capita income among regions (states) based on the standard deviation of the cross section. If the standard deviation tends to fall over time, it indicates that the differences of the per capita income among regions in absolute terms decrease with the passage of time, which is an evidence of convergence. On the other hand divergence implies that the standard deviation of the cross section in terms of per capita income increases over time. In the case where the standard deviation does not show any clear tendency, but instead increases or decreases alternatively, a mixed process of convergence and divergence is found to have taken place over time.

An alternative method of measuring 'sigma' convergence is the use of coefficient of variation (CV) that is obtained by dividing the standard deviation by the mean of the sample. A decreasing value of the CV over time reflects regional convergence while an increasing value of CV reflects divergence, and a no stable tendency is taken as evidence of both convergence and divergence during the study period.

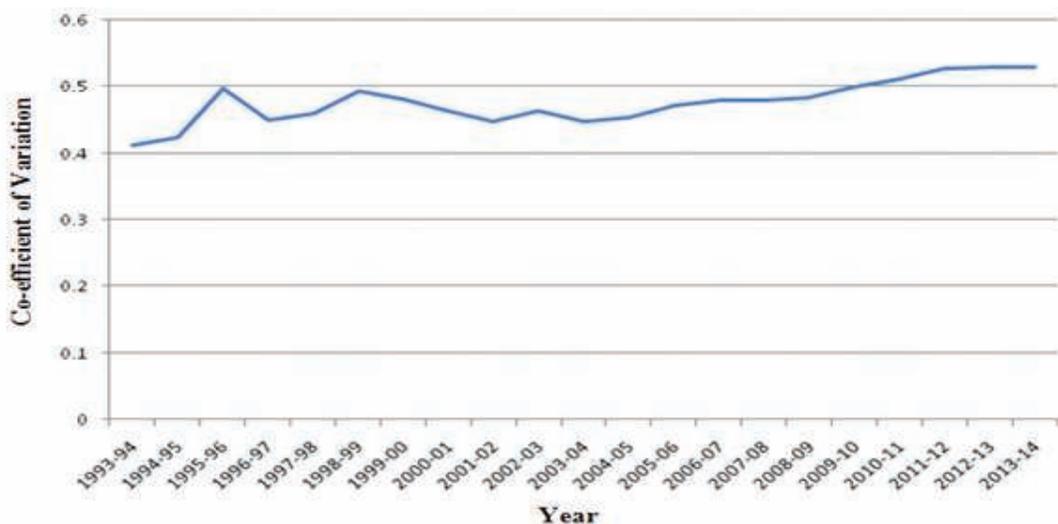
Inter-state comparison of per capita income is hampered by the quality of statistics provided by different states as well as other state specific factors. Therefore the coefficient of variation is calculated for the natural logarithm of the per capita income of the states. The sigma convergence of per capita income across the states of India is shown in Table-1.

Table-1: Sigma Convergence of Per Capita Income across the States of India

Year	Coefficient of Variation	Year	Coefficient of Variation
1993-94	0.4127	2003-04	0.4490
1994-95	0.4236	2004-05	0.4544
1995-96	0.4987	2005-06	0.4713
1996-97	0.4499	2006-07	0.4803
1997-98	0.4594	2007-08	0.4804
1998-99	0.4931	2008-09	0.4846
1999-00	0.4821	2009-10	0.4992
2000-01	0.4644	2010-11	0.5124
2001-02	0.4480	2011-12	0.5283
2002-03	0.4635	2012-13	0.5292
		2013-14	0.5296

It is evident from the table that there was 'sigma' convergence during 1998-99 to 2001-02 based on coefficient of variation, though the rate of convergence was very slow. From 1993-94 to 1997-98, there was a mixed experience of convergence and divergence. On the other hand, there is a clear cut sigma divergence from 2003-04 to 2013-14 reflected by the continuous increase in the value of the coefficient of variation from 0.4490 in the year 203-04 to 0.5296 in the year 2013-14. However, the co-efficient of variation for the entire study period shows a tendency of divergence pointing to the fact that the dispersion of per capita income across the states in absolute terms has increased.

Fig-1 presents a clear view of the sigma convergence and divergence where the co-efficient of variation of per capita income of states is plotted over the study period.

Fig-1: Sigma convergence and divergence of per capita income across the states of India

The regression of CV on time confirms that there is sigma divergence of per capita income in absolute terms across the states of India. The regression result is given below.

$$CV = 4.717 + 0.045 t$$

$$SE = (0.032) (0.005)$$

$$t = 146.83 (9.020)$$

$$R^2 = 0.81$$

B. Beta Convergence

The 'beta' convergence of the neo-classical approach is obtained through regression analysis by estimating the growth of per capita income of a certain period of time on the initial level of per capita income. The regression coefficient 'beta' with a negative sign indicates that regions with a lower initial level of per capita income grow more rapidly compared to regions with higher initial level of per capita income and this is known as beta convergence. On the other hand beta with a positive sign points to the fact that regions with high initial level of income grow more rapidly compared to their low initial income counterparts.

The neo-classical theory distinguishes two types of convergence, unconditional and conditional convergence. When it is assumed that all regions (states) converge to the same terminal point, the convergence is said to be unconditional, on the contrary when the regions converge to different terminal points, the convergence is said to be conditional. In the neo-classical model diminishing returns to capital is the explanation why poor regions grow faster relative to the rich regions in terms of their per capita income showing 'beta' convergence.

There are several studies testing the hypothesis of 'beta' convergence (Barro and Sala-i-Martin-1992); Dew Hurst, J.H. and Muties-Gaitan-1995; Armstrong-1995, Marques A and E Soukiazas-1998) across regions using per capita income A common finding of these studies is that there is significant negative relation between the growth of per capita income and the initial level of per capita income which confirms the neo-classical hypothesis of convergence.

In India, inter-state inequality has been one of the major concerns before policy makers and planners. There was huge gap between active and vibrant regions and the hinterlands in the pre-independence period in terms of availability of resources and facilities. After independence, reduction in inter-state disparities has been emphasised during the successive Five Year Plans. The issue has been examined, in depth, by the scholars like Chattopadhaya, R N and M N Pal (1972), Rao, S K (1973), Nair, K G (1973,1982), Sampat, R K (1977), Mathur, A (1983,1987,1992), Datta and Ravallion (1993,1998,2002), Dreeze and Sen (1995), Dreeze and Srinivasan (1996), Rao, M G, Ricschand and K.P. Kalirajan (1999), Ahluwalia, M (2002), Dholakia, R H (2003), Majumdar, R (2004), Kurien, N J (2007) and many others. According to these studies, there are enormous variations in regional experiences and achievements that have resulted in remarkable diversities in India. An approach to the 11th Five Year Plan (Planning Commission, Government of India, 2006) has also acknowledged regional backwardness as an issue of concern. The World Bank (2008) in its report ' Strategies for Sustained Growth and Inclusive

Development' has mentioned that disparity in income distribution in India has risen during 1993-2005. Much water has flown down the river during the period. The present exercise is a step forward in the sense that it takes into account all the states except Mizoram for which comparable data is not available.

The following model (known as Barro Regression) is estimated to find out the 'beta' convergence in per capita income across the states of India.

$$1/T \ln(Y_{it}/Y_{io}) = \alpha + \beta \ln(Y_{io}) + U_{it}$$

where, Y is the per capita income at constant prices, i is the individual state, o is the base year, t is the final year, T is the length of time where the growth of per capita income is calculated; α is the constant term and β measures the speed of convergence. The equation is estimated for the whole period 1993-94 to 2013-14 and for two sub-periods, one from 1993-94 to 2001-02 (accelerating growth period) and the other from 2002-2013-14 (further accelerating growth period). The estimated results are presented below.

Table-2: Regression Results for beta Convergence

Period	α	β	SE	t	R**2
1993-93 to 2013-14	-0.038	0.009	0.006	1.416	0.072
1993-94 to 2001-02	-0.061	0.007	0.006	1.454	0.075
2002-03 to 2013-14	-0.036	0.010	0.064	1.425	0.072

The regression results confirm the view that there is beta divergence in the per capita income across the states in India during the study period. It is evident from the positive 'beta' coefficients though they are not statistically significant. In the second sub-period the speed of divergence is found to be more compared to that of the first sub period.

Concluding Remarks

The present study tested empirically two approaches for measuring convergence (or divergence) based on 'sigma' and 'beta' convergence. The results show that there is divergence of per capita income across the states in India during the period from 1993-94 to 2013-14. There is not only an increase in the dispersion of per capita income in absolute terms but also the speed of divergence is increasing over the years though at a slow rate. This reflects the fact that richer states are performing better compared to poorer states and the latter ones lag behind to keep pace with the former ones. In a federal structure, it questions the efficiency of the regional policies adopted by the government to promote balanced growth. A clear cut policy with adequate financial support shall have to be declared so as to facilitate the catching up efforts of the poorer states. At the same time attention shall have to be given to the difficulties faced by the poorer states in implementing the policies for their faster growth such that the real per capita income across states converge over time leading to balanced development of the country.

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**PER CAPITA NET STATE DOMESTIC PRODUCT AT FACTOR COST-STATE-WISE
(1993-94 PRICES)**

	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00
Andhra Pradesh	7416	7711	8071	8514	8191	9144	9445
Arunachal pradesh	8733	8342	9352	8590	8643	8712	8890
asam	5715	5737	5760	5793	5796	5684	5785
Bihar	3037	3306	2728	3338	3100	3210	3282
Jharkhanda	5897	6050	6105	5647	7259	7754	7238
Goa	16558	16977	17929	20686	20595	25364	25371
Gujrat	9796	11535	11649	13206	13018	13735	13298
Haryana	11079	11598	11545	12591	12389	12728	13308
Himachal Pradesh	7870	8498	8801	9140	9625	10131	11051
Jammu & Kashmir	6543	6619	6732	6978	7128	7296	7348
Karnataka	7838	8097	8368	8990	9416	10549	10912
Kerala	7983	8598	8868	9145	9265	9818	10430
Madhya Pradesh	6584	6550	6790	7089	7301	7621	8248
Chattishgarh	6539	6445	6474	6654	6810	6873	6692
Maharashtra	12183	12158	23221	13464	13925	14199	15257
Manipur	5846	5558	5616	6022	6434	6401	7097
Meghalaya	6893	6940	7535	7602	7881	8507	8996
Nagaland	9129	9410	9646	9880	10287	9118	9826
Orissa	4896	5054	5204	5773	5382	5471	5742
Punjab	12710	12784	13008	13705	13812	14334	14809
Rajasthan	6182	7134	7216	7862	8601	8754	8555
Sikkim	8402	8277	8822	9146	9539	9914	9874
Tamil Nadu	8955	9932	10147	10451	11260	11592	12167
Tripura	5534	5364	5707	6239	6828	7396	7968
Uttar Pradesh	5066	5209	5256	5706	5518	5432	5675
Uttarakhand	6896	7369	7163	7476	7429	7385	7256
West Bengal	6756	7094	7492	7880	8408	8814	9320
Delhi	18166	19575	19162	20983	23482	23762	24003

**PER CAPITA NET STATE DOMESTIC PRODUCT AT FACTOR COST-STATE-WISE
(1993-94 PRICES)**

	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07
Andhra Pradesh	10147	10538	10616	11522	12222	12797	14029
Arunachal pradesh	9358	10671	10061	11019	12289	12358	12728
asam	5863	5901	6157	6441	6569	6674	6881
Bihar	3718	3400	3777	3470	3841	3683	4251
Jharkhanda	6255	6550	6620	7002	8065	7584	7593
Goa	23387	23597	24355	25317	27229	28601	30516
Gujrat	12144	12830	13753	15782	16458	18555	19822
Haryana	13996	14693	15329	16507	17588	18817	20576
Himachal Pradesh	11592	11974	12341	12948	13939	14967	15965
Jammu & Kashmir	7371	7331	7627	7897	8198	8451	8817
Karnataka	10818	10850	11294	11370	12370	13481	14710
Kerala	10617	11072	11761	12412	13464	14771	15862
Madhya Pradesh	7426	7802	7246	7906	8014	8265	8860
Chattishgarh	6220	7022	6742	7861	8097	8084	9415
Maharashtra	14515	14758	15546	16482	17639	19885	22286
Manipur	6507	6766	6593	7166	7672	8000	7963
Meghalaya	9344	9725	9953	10439	11026	11599	12169
Nagaland	10935	11588	12126	12063	12028	13068	13859
Orissa	5518	5783	5676	6433	7196	7417	8233
Punjab	15014	15018	14996	15643	16123	16607	18063
Rajasthan	8066	8752	7572	9786	9365	9809	10766
Sikkim	10149	10579	11316	12042	12820	13933	14550
Tamil Nadu	12722	12365	12311	12965	14385	16330	18742
Tripura	8427	9564	10018	10471	11188	11782	12639
Uttar Pradesh	5659	5630	5708	5891	6066	6298	6671
Uttarakhand	8016	8248	8874	9417	10481	11776	12990
West Bengal	9529	10104	10305	10778	11361	11942	12741
Delhi	24041	24073	25247	25864	27855	30144	33247

**PER CAPITA NET STATE DOMESTIC PRODUCT AT FACTOR COST-STATE-WISE
(1993-94 PRICES)**

	2007-08	2008-09	2009-10	2010-11	2011-12	20012-13	2013-14
Andhra Pradesh	15639	15882	16798	17754	18153	18666	19855
Arunachal pradesh	13929	14730	15587	15889	16339	15547	16565
asam	7080	7406	7987	8277	8510	8718	9156
Bihar	4402	4998	5162	5868	6382	6968	7526
Jharkhanda	9148	8657	9383	10601	11009	11769	12585
Goa	30808	31984	33722	39023	45777	46776	48609
Gujrat	21842	22452	25270	27658	29108	30404	32466
Haryana	21791	23057	25495	26770	28585	29667	31153
Himachal Pradesh	16780	17416	18180	19513	20567	21623	22778
Jammu & Kashmir	9230	9672	10002	10435	10859	11329	11862
Karnataka	16370	17342	17162	18728	19093	19910	21173
Kerala	17195	18164	19710	20870	21978	23158	24539
Madhya Pradesh	9119	10100	10877	11264	12077	12905	13935
Chattishgarh	10003	10438	10553	11339	11850	12253	12378
Maharashtra	24513	24535	26522	29133	29959	31826	33783
Manipur	8218	8629	9022	8567	9170	9568	9945
Meghalaya	12247	13484	14002	15011	16355	16581	17751
Nagaland	14745	15427	16039	17383	18311	19011	19742
Orissa	8822	9362	9314	9771	10005	10259	10163
Punjab	19271	19971	20861	21805	22563	23307	24123
Rajasthan	11058	11781	12260	13822	14937	15556	16059
Sikkim	15237	17000	29191	31766	35401	37670	40119
Tamil Nadu	19770	20669	22679	25604	27320	27927	29841
Tripura	13311	14544	15843	16840	18166	19985	21676
Uttar Pradesh	6968	7360	7678	8145	8438	8729	9009
Uttarakhand	15025	16371	18888	20570	22300	23473	25078
West Bengal	13590	14002	14947	15707	16134	17143	18205
Delhi	36299	40050	42527	45185	46518	49032	51635

Dynamics of Inter-state Uneven Growth of Rural Infrastructure in India

Sasmita Sethy and Bhagabata Patro¹

The regional disparity in India is now a matter of serious concern. It is well known that in a large economy, different regions with different resource bases and endowments would have a dissimilar growth path over time. One of the reasons why centralized planning was advocated earlier was that it could restrict the regional disparity. In spite of planning, however, the regional disparity remained a serious problem in India. A new controversy in this respect is whether growth rates and standard of living in different regions would eventually converge or not. The convergence theorem (Barro, 1991) postulates that when the growth rate of an economy accelerates, initially some regions with better resources would grow faster than others. But after sometime, when the law of diminishing marginal returns set in, first growth rates would converge, due to differential marginal productivity of capital (higher in poorer regions and lower in richer regions), and this in turn would bridge the gaps in the levels of income across regions. The empirical evidence on this is, however, very controversial. It has also been observed that when an economy is liberated, especially after controls on investment are lifted, then regions with better infrastructure would attract more investment, especially foreign capital, through market mechanism, and this in turn would lead to regional inequity.

Economic activities in rural areas depend on the availability of rural infrastructure. The items of rural infrastructure are irrigation facility, availability of electricity, rural connectivity, safe drinking water, education and health etc. Over the years, the central government has been launching many flagship schemes to improve the rural infrastructure in the economy. The objective of all these programmes is to provide employment and income to the people in the rural areas by creating capabilities and opportunities. Generating more and better jobs are fundamental to provide self and wage employment to the people in the rural areas. Critical components for generating more jobs are; support for agro-industrial investment, enabling environment for rural agri-business, market-oriented infrastructure and development of capacity of the labour force (FAO, 2009). Development of rural infrastructure facilitates all this and improves employability of the surplus labour available in the rural sector. This paper is interested to study the problem of development of states in India and links it to the rural infrastructure availability. Few items of rural infrastructure are selected for examination. By using statistical tools there is an attempt to show the glaring inequality in the availability of rural infrastructure.

Key words: Regional Disparities, Rural Infrastructure, Physical Infrastructure, India

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Introduction

India is a large federal nation and it is well known that there exists widespread disparities in the levels of economic and social development between different regions. It is generally recognised that inter-regional economic disparities increase, at least in the initial stages of national economic development due to the free play of market forces. India has now become a highly liberalised and globalised economy with great faith in the efficacy of the market mechanism. It is hence a matter of considerable research interest to know the manner in which the existing inter-regional disparities in the levels of economic and social development have changed over time in the past two decades. A comparison of India's regional development experience over the past two decades would therefore give at least a broad idea of the impact, if any, of these changes on the regional aspect of India's development.

A detailed study examining the nature, extent, possible causes and manner of change of inter-state economic and social disparities in rural India and drawing broad inferences regarding regional policy in India would hence be of considerable relevance to policy-makers and planners in India. This is more important if one compares the situation before and after adoption of liberalized economic policies in the country. In the present scenario, there is probably no such study focusing on the status of rural infrastructure across the states in India. There were several study groups and committees which have examined the inter-regional disparity in the development process in India. These are;

- Committee on Dispersal of Industries, 1960;
- Patel Committee, 1964;
- Planning Commission Study Group, 1966-1971;
- Pande Committee, 1968;
- Wanchoo Committee, 1968;
- Sukhamoy Chakravarty Committee on Backward Areas, 1972;
- National Committee on Development of Backward Areas, 1978;
- Hyderabad Karnataka Development Committee, 1981;
- Fact Finding Committee on Regional Imbalances, 1983;
- Committee for the Development of Backward Area, 1983 and
- Sarma Committee on 100 Backward Districts, 1996.

Barring a few exceptions like the study by Nair (1982) dealing with the pre-80 period, the studies did not link regional development experience to government policies. The situation has remained more or less the same since the 90's. There have of course been a number of meaningful studies about indicators of regional wellbeing like the ones by Cassen (2002), Malhotra (1998) and the Planning Commission (2002). There have also been some attempts to find out the relationship between economic growth and poverty at the regional level like the one by Datt and Ravillion (2002). There were also some efforts at linking regional development experience to regional policy. One of these by Nair (1993) was a mere exploratory note and that too concerned with just one state – Odisha. The other was a much more detailed one by Kurian (2000) and dealt with the major Indian states, but it

focused mostly on the period since the 80's. In the recent years , two studies tried to identify the backward districts in the country by taking certain infrastructure related parameters. (Debroy and Bhandari, 2003) and (Barooha and Dubey, 2007)

This paper studies the problem of development of states in India and link it to the rural infrastructure availability. Few items of rural infrastructure are selected for examination. By using statistical tools there is an attempt to show the existence of glaring inequality in the availability of rural infrastructure.

Types of Regional Disparities

Regional disparities can be classified from two related perspectives:

1. Vertical perspective- It is based on knowledge that disparities are changing in accordance with geographical dimension. If we assess disparities in the context of different geographically based frameworks or different territorial dimensions (country, region, and municipality), a resultant view on such disparities rate will differ a lot.
2. Horizontal perspective-It is associated with subject sphere of their occurrence. Horizontal perspective includes tangible or intangible disparities.

Social disparities relate to population in wider context of life quality, level of living, social inequality and social pathology. But they do not relate to manpower as an economic category that is included among economic disparities. Economic disparities relate to regional output in wider context of economic performance, structure, development and manpower. Territorial disparities are associated with locational conditions in wider context with geographical, natural and technical conditions.

The regional disparity in India is now a matter of serious concern. It is well known that in a large economy, different regions with different resource bases and endowments would have a dissimilar growth path over time. In spite of planning, however, the regional disparity remained a serious problem in India. A new controversy in this respect is whether growth rates and standard of living in different regions would eventually converge or not. The convergence theorem (Barro, 1991) postulates that when the growth rate of an economy accelerates, initially some regions with better resources would grow faster than others. But after sometime, when the law of diminishing marginal returns set in, first growth rates would converge, due to differential marginal productivity of capital (higher in poorer regions and lower in richer regions), and this in turn would bridge the gaps in the levels of income across regions. The empirical evidence on this is however very controversial. It has also been observed that when an economy is liberated, especially after controls on investment are lifted, then regions with better infrastructure would attract more investment, especially foreign capital, through market mechanism, and this in turn would lead to regional inequity, at least in the early phase of reforms. The regional disparity in China after economic reform is a classic example of this.

Regional economic disparities are a global phenomenon. These economic disparities among different regions or nations of the world have been an object of considerable concern to many, particularly to those who are in power and to the scholars interested in regional economics. A lot of attention had

been focused in the past few decades on the problem of development of regions intra and international. Many studies have been conducted to measure or decipher the pattern of regional development in the process of growth of national economies. It is pointed out that, in the absence of deliberate policy measures or government interventions, regional disparities would increase, at least, in the initial stages of economic development. Government intervention to remove regional disparities is hence, perforce accepted as an essential concomitant of public policy in both developed and developing countries. In this context, the problem of regional imbalances is increasingly becoming a matter of greater concern to policy makers in most of the countries especially in developing countries like India. Some states are outgrowing in their capacities while some others are remaining poor and backward. More than four-fifths of India's population, 80.7 percent now live in states with per capita income below the national average. The problem of regional disparities in economic development is, for India, up to a great extent, an inheritance from the colonial past. For example, in India, the historical factors have guided the development of the port towns of Bombay, Madras, Calcutta and these three cities have in turn worked as nuclei for the development of Maharashtra and Tamil Nadu and West Bengal respectively which are at present the most industrially advanced states in India. On the other hand, the areas having natural advantages in the form of mineral resources, such as Bihar, Madhya Pradesh, Odisha and Rajasthan have lagged far behind in the process of economic development. Examining regional disparities in India with relevant theoretical background, the previous studies have obtained the following results. One of the major reasons for regional disparities that may arise in the course of economic development is due to the uneven distribution of natural resources, employment and concentration of industrial activities in a few developed centres. Consequently, the regional disparities can be thought of as a problem of industrial location. Since location theories are largely based on the assumption of perfect competition and free market economy, these are not active in a developing country like India. Moreover, these theories, especially the least cost theory, considered to be working in accordance with scale economy arising out of agglomeration advantages. Besides, as these theories are developed in the West, they are not fully aimed at serving our social needs of dispersal of industries and, thereby regionally balanced economic development.

Status of Rural Infrastructure in States

Adequate infrastructure raises productivity and lowers production costs, but it has to expand fast enough to accommodate growth. While the precise linkages between infrastructure and development are yet to be firmly established, it is estimated that infrastructure capacity grows step by step with economic output. It is observed that 1 percent increase in the stock of infrastructure is associated with a 1 percent increase in GDP across all countries (Summers and Heston, 1991). As countries develop infrastructure must adapt to support changing patterns of demand as the use of power, roads, and telecommunications are likely rise in a faster manner as compared with other basic services. (Ingram and Fay, 1993)

The role of infrastructure in economic development is complex and indirect. The benefit of infrastructure is realized in the long run and sometimes it is difficult to measure in numerical terms. Because of this in democratic countries it is difficult to get votes by developing infrastructure.

Hirschman argued for enlarged availability of electric power and transportation facilities as essential preconditions for economic development (Hirschman, 1958). In his 'Stages theories of Growth', Rostow held similar views and considered social overhead capital, especially in transport and communication as one of the main pre-conditions for takeoff (Rostow, 1960). The role of social overhead capital in accelerating economic growth and in enhancing public welfare is more pronounced in developing economies as the indivisibility in the social overhead capital has been identified as one of the main obstacles of the development of under-developed countries (Rosenstein-Rodan, 1943).

Rural infrastructure plays a key role in reaching the large mass of rural poor. When rural infrastructure has deteriorated or is nonexistent, the cost of marketing farm produce can be prohibitive for poor farmers. Poor rural infrastructure also limits the ability of traders to travel and communicate with remote farming areas, limiting market access from these areas and eliminating competition for their produce. Construction of rural roads almost inevitably leads to increases in agricultural production and productivity by bringing in new land into cultivation or by intensifying existing land use to take advantage of expanded market opportunities. In addition to facilitating agricultural commercialization and diversification, rural infrastructure, particularly roads, consolidates the links between agricultural and nonagricultural activities within rural areas and between rural and urban areas (IFAD, 1995).

Provision of adequate and quality infrastructure in rural areas is necessary for increasing the productivity and efficiency of agriculture in the form of improving the credit absorbing capacity, enhancing the productivity of crops and livestock, generating employment and increasing farmers' income etc. It makes a direct attack on minimizing the incidence of rural poverty. Integration of Indian economy with the global economy has put forth enormous opportunities as well as challenges to agricultural sector to become resilient, cost effective, and competitive and quality conscious in the international market. This challenge can be met only with a well-conceived perspective plan on rural infrastructure development. Improved infrastructure also leads to expansion of markets, economies of scale and improvement in factor market operations. The development of rural infrastructure helps to enlarge markets with greater access to factors of production. The female labour participation rate increases as traditional taboos against it are overcome (Rahman, 1993). Easier access to market allows an expansion of perishable and transport-cost intensive products. It can also lead to a conversion of latent demand into effective commercial demand. These effects of infrastructure accentuate the process of commercialisation in agriculture and rural sector (Jaffee, Morton, 1995). There is increased scale of trade too and it helps in reduction of trading costs per unit owing to the economies of scale.

The 1994 World Development Report had exclusively examined the status of infrastructure and divided it into two types. One is social infrastructure and the other is economic infrastructure. Social infrastructure includes education, health, water supply and sanitation. Similarly economic infrastructure includes road, electricity, irrigation, communication and financial services. The inter-state status of some items of rural infrastructure is discussed in the following paragraphs.

Irrigation

Irrigation is a very important input for agriculture. It protects the crop from uncertainties of rainfall in the Kharif season and facilitates crop production in Rabi and Summer season. Better irrigation

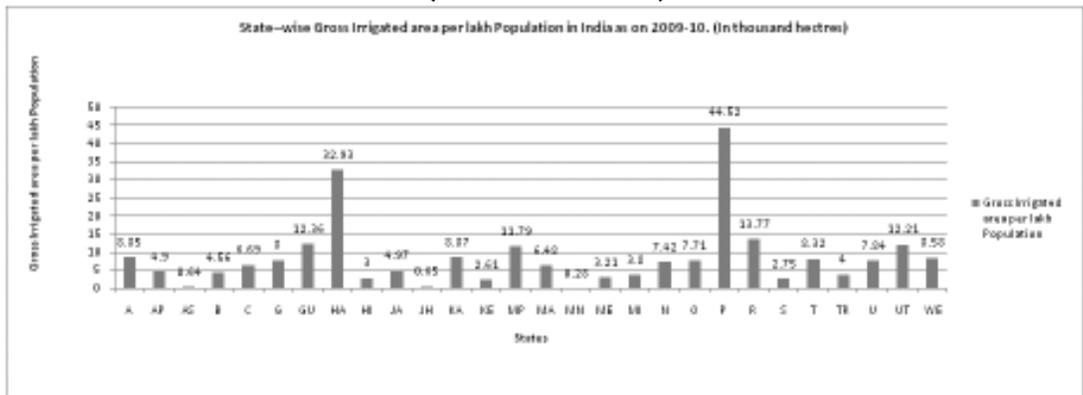
increases cropping intensity and makes the economy self-reliant and promotes agro-industries. In the Indian context, this is more important as two-thirds of our population depend on agriculture sector. Increase in productivity of agriculture is the most important benefit of irrigation. The Planning Commission has estimated that the productivity in the irrigated land is almost double that of un-irrigated land (Dagied, 1978).

**Table-1: State-wise Gross Irrigated area per lakh Population in India as on 2009-10
(In thousand hectares)**

State	Gross Irrigated area per lakh Population	State	Gross Irrigated area per lakh Population
Andhra Pradesh	8.85	Maharashtra	6.48
Arunachal Pradesh	4.9	Manipur	0.28
Assam	0.64	Meghalaya	3.21
Bihar	4.56	Mizoram	3.8
Chhattisgarh	6.69	Nagaland	7.42
Goa	8.00	Odisha	7.71
Gujarat	12.36	Punjab	44.52
Haryana	32.93	Rajasthan	13.77
Himachal Pradesh	3.00	Sikkim	2.75
Jammu and Kashmir	4.97	Tamilnadu	8.32
Jharkhand	0.65	Tripura	4.00
Karnataka	8.87	Uttaranchal	7.84
Kerala	2.61	Uttar Pradesh	12.21
Madhya Pradesh	11.79	West Bengal	8.58

Source. State Wise Irrigated Area- 2001-02 TO 2010-11

**Figure-1: State-wise Gross Irrigated area per lakh Population in India as on 2009-10.
(In thousand hectares)**



The table reveals that Punjab topped the list in having irrigated land per lakh population in 2009-10 followed by Haryana. Almost all other states are way behind these two states. It is lowest for Manipur and then comes Assam. The situation of Odisha is not very much encouraging.

Rural Education

Education in every sense is one of the fundamental requirement for development. No country can achieve sustainable economic development without substantial investment in human capital. Education enriches peoples' understanding about the economic activities available to them and influences their behaviour to earn a decent livelihood. Education raises people's productivity and creativity and promotes entrepreneurship and technological advance. In addition it plays a very crucial role in securing economic and social progress and improving income distribution.

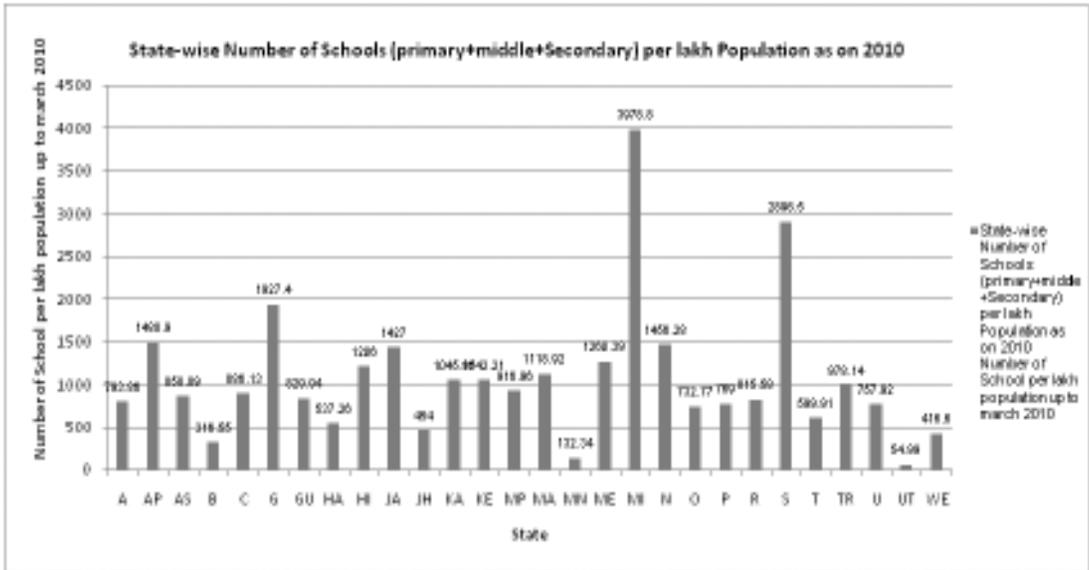
Informal education is given to a child in the family. Thereafter the role of formal education begins. Economic Progress is basically the result of human effort and human resource development which is possible by an educated person. The purpose of education from a development point of view is to rationalize the attitudes and to impart knowledge and skill (Myrdal, 1968). The slow growth in knowledge is one of the deterrents of economic progress, The quality of population remains substandard when there is little knowledge about availability of production techniques and to optimally utilize them. Rural areas in India have mostly government run education which is highly substandard and is provided in a very casual manner. Table-2 gives the extent of school infrastructure among states in the country.

Table-2:- State-wise Number of Schools (primary+middle+Secondary) per lakh Population as on 2010.

State	Number of Schools per lakh population up to march 2010	State	Number of Schools per lakh population
Andhra Pradesh	793.86	Maharashtra	1118.92
Arunachal Pradesh	1488.9	Manipur	132.34
Assam	858.89	Meghalaya	1260.39
Bihar	316.55	Mizoram	3978.8
Chhattisgarh	886.13	Nagaland	1456.28
Goa	1927.4	Odisha	732.77
Gujarat	829.94	Punjab	769
Haryana	537.26	Rajasthan	815.58
Himachal Pradesh	1206	Sikkim	2896.5
Jammu and Kashmir	1427	Tamilnadu	599.91
Jharkhand	454	Tripura	978.14
Karnataka	1045.95	Uttaranchal	757.92
Kerala	1042.21	Uttar Pradesh	54.99
Madhya Pradesh	916.96	West Bengal	416.60

Source: Annual Status of Education Report 2010.

Figure-2:- State-wise Number of Schools (primary+middle+Secondary) per lakh Population as on 2010.



The table reveals that most of the special category states have higher number of schools per lakh population as compared with non-special category states. Uttaranchal tops the list and UP is at the bottom. Wide variation is visible in the provision of elementary and secondary education among the states in India.

Rural Health:

The provision of health should occupy a central position in development policy as healthy citizens of today will mean better human capital tomorrow. Poor health conditions are intimately linked with almost every aspect of life. Improved health has an independent value for individuals to engage in any productive activity with a smiling face. The availability of almost every other item of consumption like food stuffs, house, cloth, sanitation, and educational facilities is relevant to maintain good health condition of a family (Mydal, 1968).

Primary Health Centres constitute the grass root healthcare delivery centre in India. It is mostly located in the rural areas. The number of PHCs has wide variation across the states. Number of PHCs available per lakh population gives the healthcare status of a state. Table-3 gives the situation in the states for the year 2010.

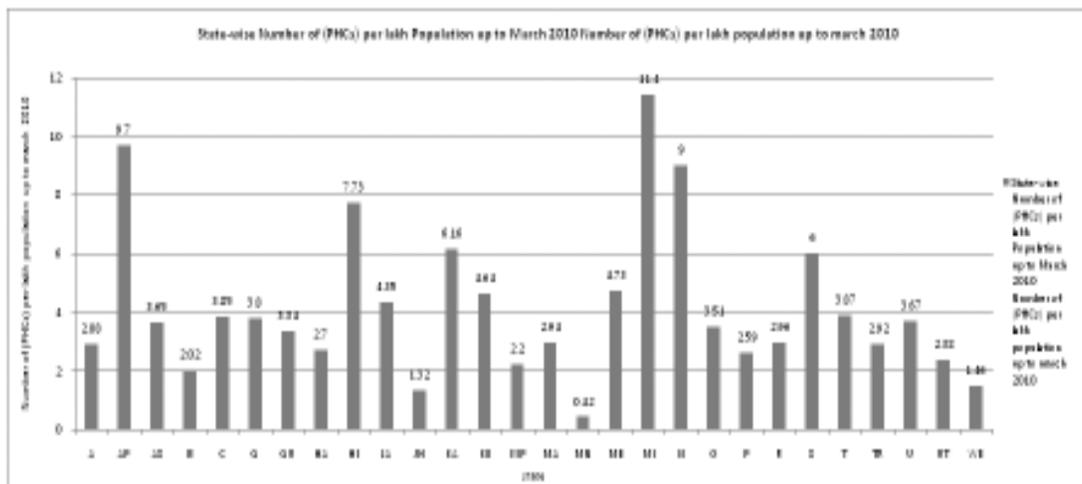
Table-3:- State-wise Number of (PHCs) per lakh Population up to March 2010.

State	Number of (PHCs) per lakh population up to march 2010	State	Number of (PHCs) per lakh population up to march 2010
Andhra Pradesh	2.88	Maharashtra	2.94
Arunachal Pradesh	9.7	Manipur	0.42
Assam	3.65	Meghalaya	4.73
Bihar	2.02	Mizoram	11.4
Chhattisgarh	3.85	Nagaland	9.00
Goa	3.8	Odisha	3.51
Gujarat	3.34	Punjab	2.59
Haryana	2.70	Rajasthan	2.96
Himachal Pradesh	7.73	Sikkim	6.00
Jammu and Kashmir	4.35	Tamilnadu	3.87
Jharkhand	1.32	Tripura	2.92
Karnataka	6.16	Uttaranchal	3.67
Kerala	4.64	Uttar Pradesh	2.38
Madhya Pradesh	2.20	West Bengal	1.46

Source: Rural Health Statistics in India 2012 and Statistics Division; Ministry of Health and Family Welfare; Government of India.

Note: #data for 2011 repeated

Figure-3:- State-wise Number of (PHCs) per lakh Population up to March 2010.



Like rural education, there exists wide variation in the rural healthcare facilities in the states. Karnataka and Kerala top the list in giving the highest per lakh PHCs with 6.16 and 4.35 respectively among non-special category states. The situation in West Bengal and Bihar is probably the worst among NSCs with 1.46 and 2.02 respectively.

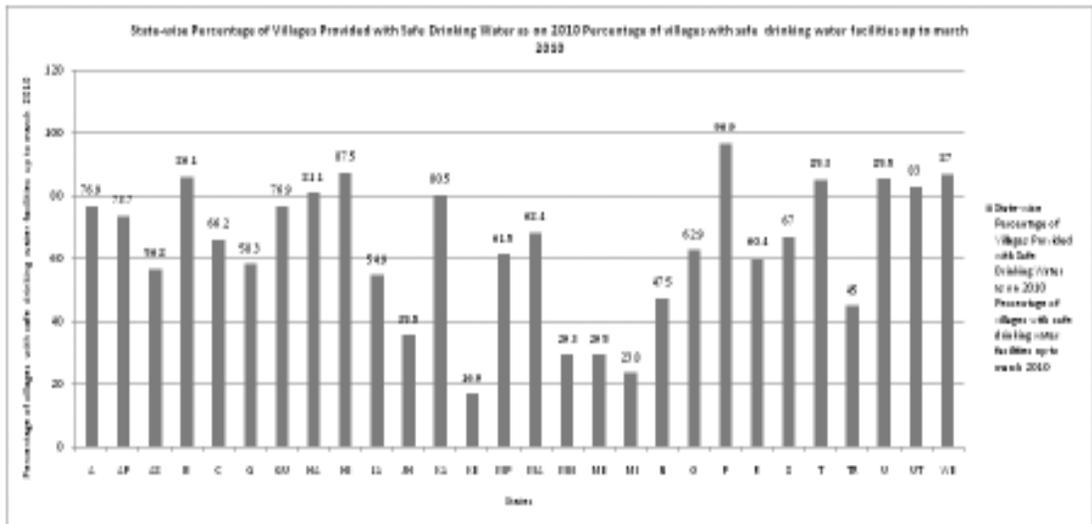
Rural Water Supply:

Water is an essential requirement of life. Rural poor suffer most in the absence of safe and clean drinking water. Unsafe drinking water and deteriorated environmental condition cause major health hazards. Water-borne diseases are most significant cause of ill health in rural India. To provide safe drinking water to the people both in rural and urban areas, the centre and the states governments have initiated a number of schemes. The situation in the states is given in Table-4. Initially the target in the rural areas is to provide safe drinking water through tube wells but now there is an attempt to provide piped drinking water through 'swajaladhara' scheme.

Table-4:: State-wise Percentage of Villages Provided with Safe Drinking Water as on 2010

State	Percentage of villages with safe drinking water facilities up to march 2010	State	Percentage of villages with safe drinking water facilities up to march 2010
Andhra Pradesh	76.90	Maharashtra	68.40
Arunachal Pradesh	73.70	Manipur	29.30
Assam	56.80	Meghalaya	29.50
Bihar	86.10	Mizoram	23.80
Chhattisgarh	66.20	Nagaland	47.50
Goa	58.30	Odisha	62.90
Gujarat	76.90	Punjab	96.90
Haryana	81.10	Rajasthan	60.40
Himachal Pradesh	87.50	Sikkim	67
Jammu and Kashmir	54.90	Tamilnadu	85.30
Jharkhand	35.50	Tripura	45
Karnataka	80.50	Uttaranchal	85.50
Kerala	16.90	Uttar Pradesh	83
Madhya Pradesh	61.50	West Bengal	87

Source: Statistical Abstract India 2008-09, and India Statistics 2012; Ministry and Programme implementation, Government of India, New Delhi.

Figure-4:- State-wise Percentage of Villages Provided with Safe Drinking Water as on 2010.

Provision of safe drinking water gives a very different picture as compared to other items. Bihar which is lagging behind other states in many other variables could manage to give 86 percent villages with safe drinking water. Similarly, Kerala a very high human development index state have only 16 percent villages covered with safe drinking water supply. Punjab tops the list with 97 percent villages covered with the same facility.

Rural Transport

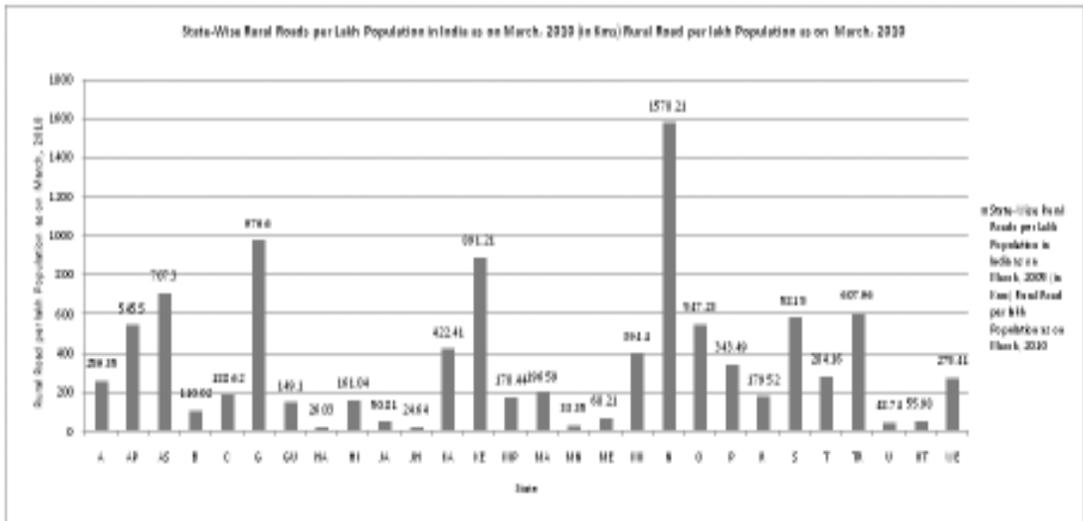
Transport has always been the core infrastructure in the evolution of mankind. Kipling, the novelist stated that “transport is civilization”. Transport and communication networks are the arteries of an economy without which the development of industry (bone) sector and agricultural (body) sector is possible. It is one of the most important infrastructure services needed for the rapid growth of an economy. Transport brings people of different areas into one place and migration of people from one place to another. Goods and services produced in one place can be sold in other places with the help of transport. (Siva prakash, 1997). Transport can be divided into few categories like roads, railways, seaways and airways.

Among the various modes of transport, road transports occupies a dominant place and play a vital role in integrating production, marketing, and consumption functions of the economy (Raman and Kumar, 1998). This sector is highly labor intensive and employment oriented. There are different types of roads basing on the ownership of the government. National highways are with centre, state highways are with the state and other roads are with the local governments. Table-6 gives the state-wise position of roads in India.

Table-5: State-Wise Rural Roads per Lakh Population in India as on March, 2010 (in Kms)

State	Percentage of villages	State	Percentage of villages
Andhra Pradesh	259.35	Maharashtra	196.59
Arunachal Pradesh	545.5	Manipur	33.35
Assam	707.30	Meghalaya	68.21
Bihar	110.02	Mizoram	394.4
Chhattisgarh	188.62	Nagaland	1578.21
Goa	976.60	Odisha	547.23
Gujarat	149.10	Punjab	343.49
Haryana	26.03	Rajasthan	179.52
Himachal Pradesh	161.04	Sikkim	581.5
Jammu and Kashmir	50.81	Tamilnadu	284.16
Jharkhand	24.64	Tripura	607.96
Karnataka	422.41	Uttaranchal	48.74
Kerala	891.21	Uttar Pradesh	55.98
Madhya Pradesh	178.44	West Bengal	275.41

Source: Basic Road Statistics of India 2008-09, 2009-10 and 2010-11.

Figure-5: State-Wise Rural Roads per Lakh Population in India as on March, 2010 (in Kms)

Rural road connectivity appears to be very high in Goa followed by Kerala. It is the least in the states of Jharkhand and Haryana. Greater variation is visible in the rural road network among the states in India.

Communication

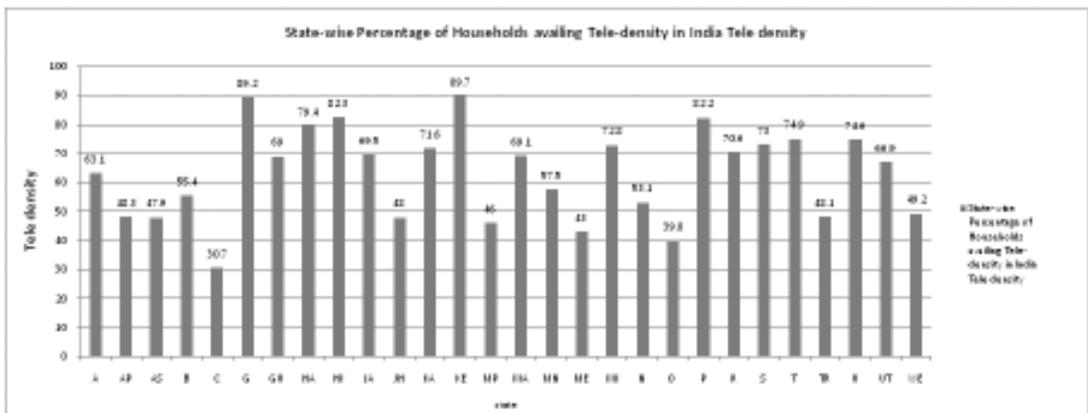
The expansion of communication facility in India is quite significant. There is high growth in the mobile phone penetration. Even the rural population has availed of this facility as the means of their communication.

Table-6: State-wise Percentage of Households availing Tele-density in India

State	Tele density	State	Tele density
Andhra Pradesh	63.1	Maharashtra	69.1
Arunachal Pradesh	48.3	Manipur	57.5
Assam	47.9	Meghalaya	43
Bihar	55.4	Mizoram	72.8
Chhattisgarh	30.7	Nagaland	53.1
Goa	89.2	Odisha	39.8
Gujarat	69	Punjab	82.2
Haryana	79.4	Rajasthan	70.6
Himachal Pradesh	82.3	Sikkim	73
Jammu and Kashmir	69.5	Tamilnadu	74.9
Jharkhand	48	Tripura	48.1
Karnataka	71.6	Uttaranchal	74.6
Kerala	89.7	Uttar Pradesh	66.9
Madhya Pradesh	46	West Bengal	49.2

Source: State wise teledensity reports of India, 2011

Figure-6: State-wise Percentage of Households availing Tele-density in India



The table reveals that Kerala and Goa topped the list with regard to percentage of household with telephone facilities. Chhattisgarh and Odisha are at the bottom of the list.

Banking

Evolution of banking dates back to 15th century played a major role in the rise of the Italian city-states as world economic powers. Ever since, the health of an economy and the health of its banks have

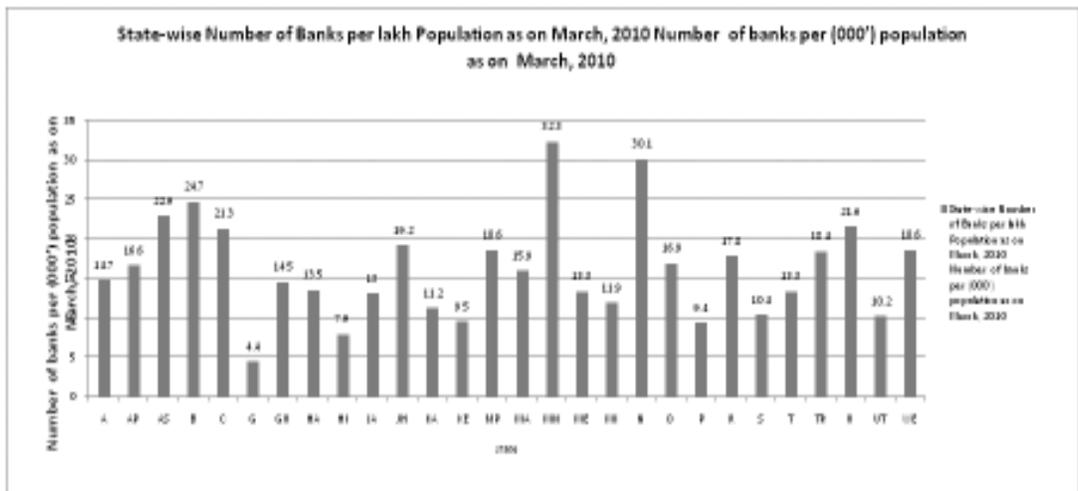
been interrelated. The global credit crisis arising out of the banking sector failure in US is only the most recent example. As financial intermediaries, banks stand between depositors who supply capital and borrowers who demand capital. Banks also provide security and convenience to their customers in many other ways.

Table-7:- State-wise Number of Banks per lakh Population as on March, 2010

State	Number of bank branches per (000') population as on March, 2010	State	Number of bank branches per (000') population as on March, 2010
Andhra Pradesh	14.7	Maharashtra	15.9
Arunachal Pradesh	16.6	Manipur	32.3
Assam	22.9	Meghalaya	13.3
Bihar	24.7	Mizoram	11.9
Chhattisgarh	21.3	Nagaland	30.1
Goa	4.4	Odisha	16.9
Gujarat	14.5	Punjab	9.4
Haryana	13.5	Rajasthan	17.8
Himachal Pradesh	7.9	Sikkim	10.4
Jammu and Kashmir	13	Tamilnadu	13.3
Jharkhand	19.2	Tripura	18.4
Karnataka	11.2	Uttaranchal	21.6
Kerala	9.5	Uttar Pradesh	10.2
Madhya Pradesh	18.6	West Bengal	18.6

Source: Banking and Statistics quarterly hand book, March 2010.

Figure-7:- State-wise Number of Banks per lakh Population as on March, 20010.



Rural Electrification

Among the infrastructure facilities, energy plays an important role to achieve economic development. Energy is the basic element of human activities and indispensable for growth of an economy. Modern civilization and economic pursuits cannot be conceived without energy. The life style, in the name of higher and still higher standards of living is becoming more and more complex and human activities have become extremely energy intensive.(Mishra,1997).Electricity plays a vital role in the development process, as it is the most critical and important input for agricultural production.

Table-8:- State-wise Percentage of Villages Electrified up to March, 2010

State	Percentage of villages electrified up to march 2010	State	Percentage of villages electrified up to march 2010
Andhra Pradesh	100.0	Maharashtra	88.3
Arunachal Pradesh	56.8	Manipur	84.9
Assam	78.6	Meghalaya	59.3
Bihar	52.9	Mizoram	80.6
Chhattisgarh	95.6	Nagaland	64.4
Goa	100.0	Odisha	55.8
Gujarat	99.6	Punjab	100.0
Haryana	100.0	Rajasthan	68.3
Himachal Pradesh	98.2	Sikkim	94.4
Jammu and Kashmir	98.2	Tamilnadu	100.0
Jharkhand	31.1	Tripura	57.2
Karnataka	98.7	Uttaranchal	96.5
Kerala	100.0	Uttar Pradesh	88.1
Madhya Pradesh	96.3	West Bengal	95.9

Source: Statistical Abstract of India, 2008, and India Statistics 2012

Figure-8:- State-wise Percentage of Villages Electrified up to March, 2010.

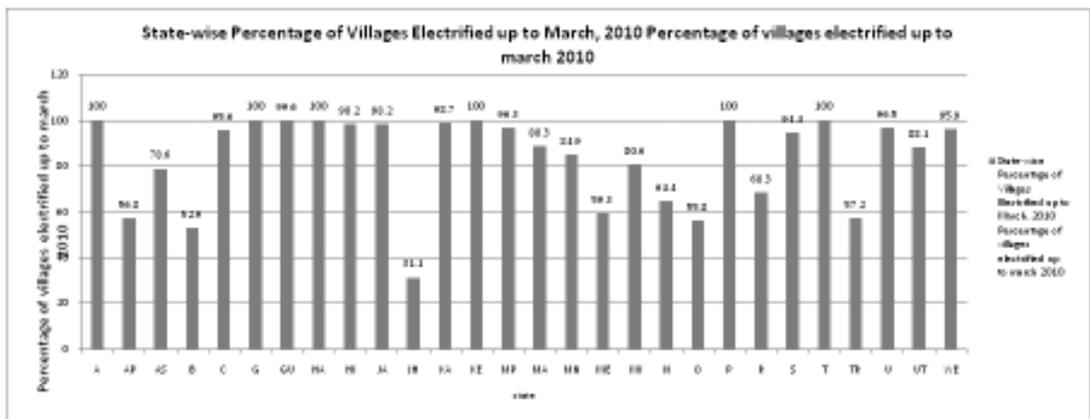


Table-9 reveals that, in some states rural electrification is a grand success. These are Punjab, Tamilnadu, Kerala and Haryana where cent percent of villages were electrified. It is the lowest in Jharkhand followed by Bihar.

Conclusions

Examination of inter-state inequality in the rural infrastructure reveals significant difference. In some items it is more pronounced whereas in some other items it is not so. Rural infrastructure inequality may influence the level of living of the people in rural areas if it is more related to agriculture. . Social infrastructure inequality in the sphere of education and health greatly influences the economic activities to be pursued by the people of the region. The governments of the different state governments are required to recognise these inequalities and take corrective action.

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(Non-) Convergence of Indian states – Behaviour of measures of inequality and Evidence on neo-Classical Conditional convergence

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Balanced regional growth is an important development objective in India. An inclusive growth process is vital to promoting social harmony and political stability. While initially inter-regional disparity may increase with development, it is expected that as growth gathers momentum and with specific policy initiatives and interventions, this divergence would attenuate. This paper attempts to capture the trend of disparity between Indian states over the last three decades using various measures of inequality. Thereafter, changes in regional inequality in India in the period 1999-2000 to 2012-13 are examined using state data. The methodology deployed is that of cross-section growth regression to explain longer run growth rates in terms of initial development indicators. The role played by factors like physical infrastructure, financial development and human capital in influencing regional growth patterns is explored. The conditional or unconditional convergence of Indian states is investigated. The paper concludes with implications for government policy.

Key words: Convergence, Financial development, GSDP, Human capital, Infrastructure, Regional disparity
JEL Classifications: C20, R11

Introduction

With the advent of planned development, balanced regional growth has been one of the prime development objectives. The over-riding factor responsible for this is the glaring regional disparities that existed during the initiation of planning process. In this context, the Second Plan stated that “*In any comprehensive plan of development, it is axiomatic that the special needs of the less developed areas should receive due attention. The pattern of investment must be devised as to lead to balanced regional development.*” The Third Plan devoted a separate chapter (Chapter IX) to “Balanced Regional Development”. It reiterated that “*balanced development of different parts of the country, extension of benefits of economic progress to the less developed regions and wide spread diffusion of industry are among the major aims of planned development.*” Several policies were adopted in this plan as well as the subsequent plans towards this end, which used the resource-based or the problem-based development approach, the target-group approach, the incentive approach and the comprehensive

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area approach, as and where considered appropriate. The Sixth plan introduced the mechanism of area planning and the sub-plan approach so as to integrate the area plans with the national development plan. The Seventh Plan diagnosed that the two critical determinants of a region's economic status were agricultural productivity and human resource potential and reduction in inter-regional disparities in these two elements would help greatly in the task of reducing regional imbalances. However it is often opined that the Eighth Plan lacked regional perspective as it replaced the regulatory planning system by market friendly indicative planning. The approach of the Ninth Plan towards this issue is also regarded as lackadaisical, though it admitted that *"it will be necessary to deliberately bias public investment in infrastructure in favour of the less well off states."* But the Tenth Plan once again expressed concern over increasing regional inequalities. Emphasising the importance of ensuring a balanced development for all states, it included a state-wise break-up of the broad development targets, including targets for growth rate and social development, consistent with national targets. The Eleventh Plan has carried forward the initiatives of the Tenth Plan while emphasising *"a faster and more inclusive growth."* The Twelfth Plan too has the subtitle of *"Faster, Sustainable and More Inclusive Growth"*. According to the planners, while there is a need to broad base the improvement in the economic and social conditions of the people, a rapid growth of GDP is essential for attaining this inclusiveness. The Plan also emphasises a balanced regional development as an important dimension of inclusiveness.

This over-riding objective of the development agenda is also regarded as being vital to promote societal harmony besides being crucial for political stability. But in a vast country like India, with wide disparity in natural resource endowments and in availability of human resource, it is but natural that growth rates and income levels will vary across regions. But it is believed that during the early phase of growth, inter-regional disparity will accentuate, but subsequently as the process becomes mature, and with specific policy interventions, these differences will decline. The basic Solow model also predicts a convergence of the per capita income (PCI) of the economic units (such as states). This convergence will become effective through diminishing returns to capital, that is, states with higher capital-labour ratio and consequently higher PCI will experience lower PCI growth rates and vice versa. This process of convergence will be aided by redistribution of incomes in favour of the poorer states through mechanisms such as the Finance Commission and grants from the centre to the states (Cashin and Sahay, 1996). Studies to examine this convergence or otherwise are aplenty in the economic literature and this paper too makes an attempt to examine changes in regional inequality for the period 1999-2000 to 2012-13.

Literature Review

Generally convergence theorists distinguish between two types of convergence: sigma convergence and beta convergence. When the dispersion of real per capita income across a group of economies falls over time, there is sigma convergence and when the correlation between growth in income over time and its initial level is negative, there is beta convergence (Young, 2007). Two distinct types of beta convergence are further differentiated. *"Absolute beta convergence"* is said to be achieved if states with low initial incomes experience higher growth rates while those with high initial incomes

experience some slowing down. “Conditional beta convergence” on the other hand examines how the same process is influenced by heterogeneity of variables such as savings/investments (Aiyer, 2001), infrastructure (Nagaraj, 1998), Income distribution (Cashin and Sahay, 1996), and financial/physical/human capital (Singh et al, 2014).

Beta convergence, both absolute and conditional, has been found by quite a number of studies in the period prior to 1990s. But in the post 1990 period, many studies have pointed at an income divergence, which may be indicative of a structural change around the 1990s. Cashin and Sahay (1996) have documented absolute and conditional convergence for the period 1961 to 1991. Absolute convergence has been observed by Bajpai and Sachs (1996) in 19 states during 1960s. Ghosh (1998) has observed an absolute divergence during the period 1960-61 to 1994-95. He has rejected the need for conditional convergence stating that *“it is enough to look at the regression as the state within a geopolitical boundary which do share common characteristics. Interesting point is how ‘divergence’ appears in such homogenous environment.”* Ahluwalia (2000) has used Gini coefficient to measure dispersion and calculated it to be stable up to 1986-87. But it started showing an increasing trend indicating an increase in inter-state income inequalities in the 1990s. Nagaraj et al (2000), Aiyer (2001), Kochar et al (2006) and Mishra (2007) have found absolute convergence as well as conditional convergence using control variables such as share of agricultural sector, price shocks, infrastructure, literacy rate and private investment. Sachs, Bajpai and Ramaiah (2002) have observed overall income divergence across 14 Indian states during the period 1980-1998, where the divergence is more prominent for the relatively poorer states. Purfield (2006) has documented absolute convergence for the period 1973-2003, though the pace of convergence was found to be slower in the post-1991 period that over the entire sample period. The study also documented conditional convergence subject to difference in policies and economic structure. Another study by Bandopadhyay (2006) finds two clubs of income convergence among Indian states over the period 1965-97. The study also reports a significant association between infrastructural indicators, such as roads and power consumption in industrial sector and economic growth, especially for the lower income states.

A similar lack of consensus can be observed for the recent periods too. Ahluwalia (2011) has found that the growth rates of poorer states, especially the BIMARU² states have accelerated after 2000-01, indicating a ‘catch up’. ‘Catching up’ usually refers to the process where lower income states grow faster than before so that the gap between their growth rate and those of the richer states is narrowing down. The ‘convergence’ implies that the lower income states have already caught up so that their per capita income is moving towards the national average per capita income. Bhalla (2011) has found that during the two periods 1993-2002 and 2003-09, the poorer states have experienced a growth rate relatively faster than that of the richer states. And according to him this is synonymous with conditional convergence. The mid-term appraisal of 11th Five Year Plan too states that *“Although growth rates continue to differ across states the variation has tended to decline.”* But Subramanian (2012) has observed divergence during the two periods, 1993-2001 and 2001-2009. Rangarajan et al (2014) have explored three periods, 1980-81 to 1993-94, 1993-94 to 2004-05 and 2004-05 to 2012-13

² Acronym for Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh

and they have not found any convergence whatsoever. But they note that ‘in the recent period, there is a strong evidence of “catching up” by the loser income states.’ All the 15 states under consideration showed higher growth rates in recent periods. Though states with lower per capita income initially, like Assam, Madhya Pradesh, Uttar Pradesh and Bihar have made significant gains in growth rates, yet convergence did not happen because states with high initial per capita income, like Maharashtra, Gujarat, Kerala, Tamil Nadu and Haryana, also exhibited high growth rates (in the range of 7 per cent and above). The silver lining is that the tendency to diverge appears to be coming down over time.

Thus, one finds that rich literature on convergence often does not come to the same conclusion. This can be explained by the fact that the studies vary in terms of one or more of the following factors: data sources, estimation methodology used, the period under study, states covered, deflators and control variables used etc.

Methodology And Data

The basic theoretical framework for the empirical analysis comes from neoclassical economic growth theory, which takes factor accumulation as the single most significant determinant of growth. In the absence of continuing technical progress, diminishing returns to factor accumulation imply that there is a long-run steady state with constant per capita output, that is, asymptotically; there is no growth in per capita output.

Thus, economies starting with different factor endowments will converge to the same steady state, as long as there are no differences in technologies or other productive opportunities. In the presence of exogenous technological progress, economies will grow at the rate determined by this technological advancement.

The neoclassical growth models yield a log-linearisation around the steady state of the form:

$$\ln y(t) - \ln y(0) = (1 - e^{-\beta t}) \ln y(0) + (1 - e^{-\beta t}) \ln y^* \quad (1)$$

Here y is the measure of income or output per capita, and the parameter β is the rate of convergence to the common steady state of the system, y^* .

In the presence of lingering distinction in technologies or other factors of production, long-run convergence to a steady state still takes place, but not to a single one, rather to a multiple steady states - their characteristics being conditional on the differences in productive potential. When growth is also affected by other variables besides initial income levels, the convergence is called as conditional – in other words, a country or region with worse initial conditions (for example, infrastructure) may converge to a steady state that is different from that of a country or region with better initial conditions. Thus, one can identify three plausible scenarios – absolute convergence [where different entities are moving towards the same steady state]; conditional convergence [where they are converging to (possibly very) different steady states] and divergence [where there is no evidence of convergence].

Conditional convergence is consistent with increasing differences across entities. Variables such as literacy, health, physical infrastructure, measures of the economic policies followed can be used as

conditioning variables. The conditioning variables themselves may be endogenous, but if one uses their initial values, that are values assumed by them in beginning of the period under study, they become predetermined over the period and a causal relationship can be examined. The empirical form of such a convergence regression, allowing for the impact of different initial conditions, then takes the following form:

$$\ln(y_{i,t}) - \ln(y_{i,t^0}) = \tilde{\alpha} \ln(y_{i,t^0}) + \sum \delta_i x_{i,t^0} + \hat{\alpha}_{it} \quad (2)$$

Here, i denotes the cross-sectional units (countries, states, regions), δ the initial time period, t the final time period, the

x are the various conditioning factors. The parameter $\tilde{\alpha}$ is approximately equal to the theoretical parameter λ (of the previous equation), and therefore measures the rate of convergence [if negative] or divergence [if positive]. The final term is an error component, reflecting unobservable or excluded factors. Our empirical estimations are along this form, using per capita GSDP as the measure of output.

To examine conditional convergence, three categories of conditioning variables have been used to study their impact on impact on growth. They are chosen so as to capture the differences in physical infrastructure, financial infrastructure and human capital. First, we include state road kilometres (an aggregate of highways, project roads and urban roads – as defined in the data set alluded to) as a measure of physical infrastructure. This variable potentially measures access to markets. Second, we include literacy rates as a measure of human capital, which can be thought of as measuring access to jobs. Third, we include the state credit-deposit ratio, in attempting to measure state-level availability of financial capital or financial development and the financial variables capture access to credit. We would expect all the conditioning variables to have positive impacts on the level of economic growth.

In the paper, GSDP data has been sourced from the Central Statistical Organisation (CSO). Sigma convergence has been examined by using growth rates and dispersion indicators like max-min ratios, coefficient of variation and population adjusted Gini coefficient. Test for absolute convergence has been done by using initial income of the states and their growth rates.

Data on road kilometres was obtained from Motor Transport Statistics of India, Ministry of Road Transport and Highways, Government of India, data on literacy rates were used from Census 2001 and on credit-deposit ratio from State Statistical Abstract of Himachal Pradesh 1999, Department of Economics and Statistics, Government of Himachal Pradesh. All states and Union Territories are covered under the study; however states created in 2000 viz. Jharkhand, Uttarakhand and Chhattisgarh drop out in some regression specifications due to non-availability of data required. The data used are for 1999-2000 and 2002-13, allowing a 13-year snapshot of growth across states and UTs in our study.

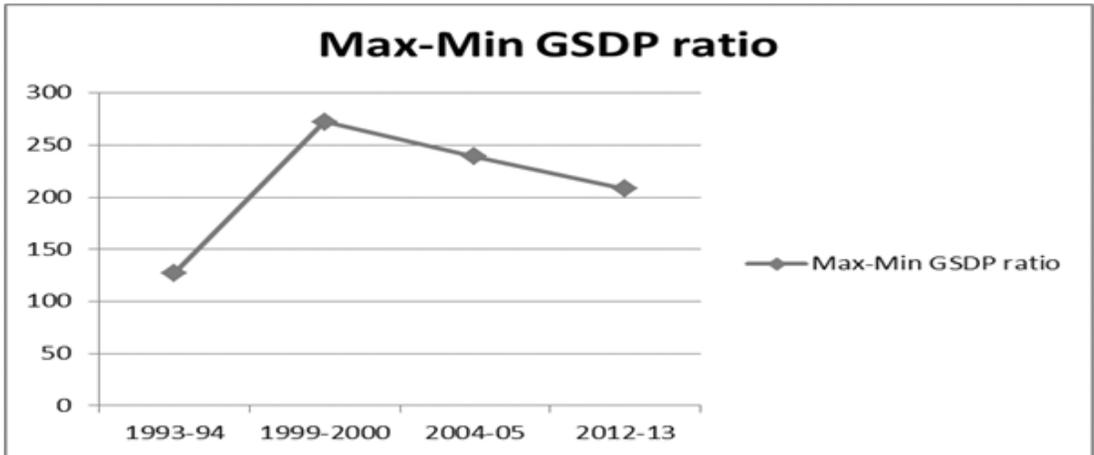
(A) Results (On Sigma Convergence)

Sigma convergence is examined by taking into consideration three indicators, namely, the ratio of maximum to minimum per capita GSDP of states, the coefficient of variation of per capita GSDP of states and the population weighted Gini coefficient of the states. The trend of all these indicators is

observed over the period under consideration. These measures do not take into account the intra-state inequalities and assume that all individuals within a state have an income equal to the state per capita income.

$$\text{Max-min ratio} = \frac{\text{Maximum GSDP in time period } t}{\text{Minimum GSDP in time period } t} \quad (3)$$

Figure 1

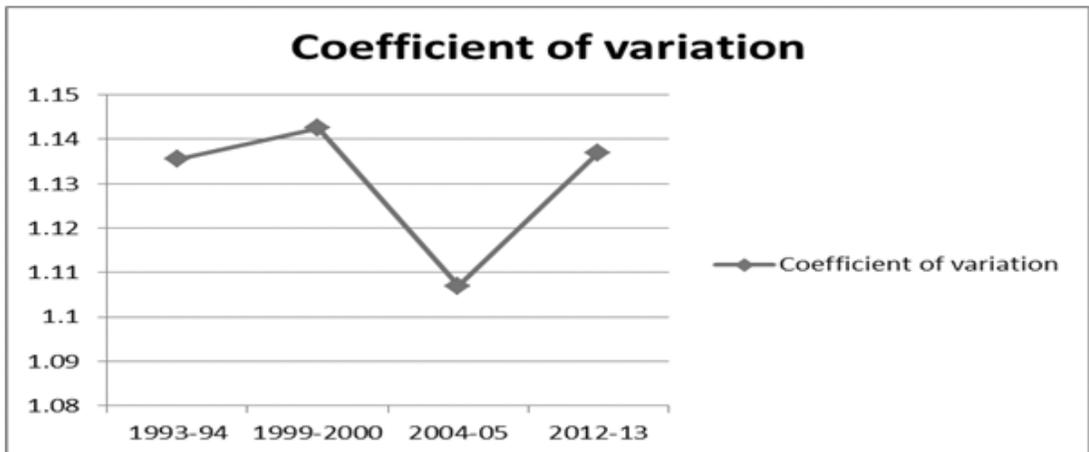


Source: Author's own calculation

The max-min ratio records an increase from 1993-94 till 1999-2000 and thereafter declines continuously up to 2012-13, indicating a fall in disparity across Indian states.

$$\text{Coefficient of variation} = \frac{\text{Variance in per capita GSDP series at time } t}{\text{Mean of the series}} \quad (4)$$

Figure 2



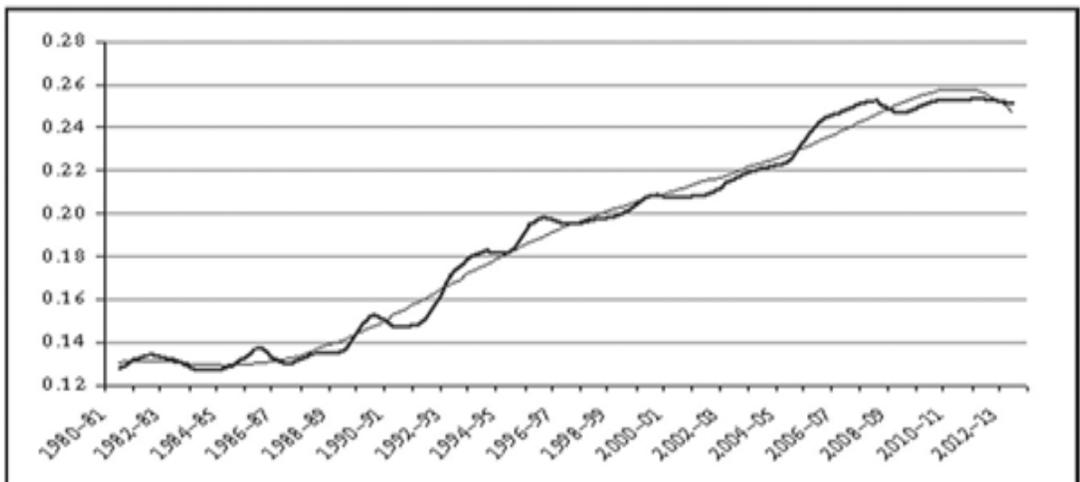
The coefficient of variation shows a mild increase from 1993-94 till 1999-2000 and then declines up to 2004-05, after which it has increased steadily. Thus, this indicator points at a decrease in disparity across Indian states followed by an increase till 2012-13.

The simple population weighted Gini coefficient is given by

$$G = \frac{\frac{1}{n^2} \sum_{i=1}^n \sum_{j=1}^n |y_i - y_j|}{2\mu} \quad (5)$$

where y refers to state level per capita GDP measure, n refers to total number of states and μ gives the mean per capital GDP for India.

Figure 3: Population weighted GINI



Source: Adapted from Rangarajan et al (2014)

This indicator shows a secular rise from 1980 onwards, implying an increase in disparity among the Indian states.

Thus the three indicators provide contradictory results regarding the trend of inequalities.

(B) Results (on beta convergence)

We begin with basic absolute convergence regressions, presented in columns 1 and 2 of Table 1. Column 1 features estimates

using normal standard errors, while column 2 uses clustered, robust errors, which corrects for heteroscedasticity, if any. There is statistically significant indication of absolute

convergence, since the regression coefficient is negative. The coefficients across the two estimation methods are not qualitatively different in sign or magnitude, implying absence of heteroscedasticity and are statistically significant – both of them being significant at 5%. Furthermore, the explanatory power of the absolute convergence regressions is good enough taking account of the fact that it is a cross section regression.

Table 1

LHS = Growth	Standard errors (1)	Robust errors (2)
Log of GDP in 1999-2000	-0.0482186*	-0.0482186*
Constant	1.489584	1.489584
Observations	32	32
R squared	0.1536	0.1536
* 5% level of significance		

Next, we examine possibilities of conditional convergence, returning in this case to the assumption of identical parameters across the states in the sample, but allowing for the growth impact of different initial conditions. We use three categories of conditioning variables, as already discussed, namely state road kilometres as a measure of physical infrastructure, literacy rates as a measure of human capital and state credit-deposit ratio, in attempting to measure state-level availability of financial capital or financial development.

Table 2 presents the basic conditional convergence regressions. We allow for normal error terms and allow for robust standard errors as well. The measures of access to jobs and access to credit have coefficients with the expected positive signs, while that of the measure of access to markets has a sign opposite to a priori expectation – but we ignore the same since the estimate is statistically insignificant. In the case of the financial variables, financial development per se, as proxied by credit-deposit ratio matters as expected in our specification. The coefficient on initial per capita GSDP is not very different from that in Table 1.

Table 2

LHS = Growth	Standard Errors	Robust Errors
Log of GDP in 1999-2000	-.0371395	-.0371395*
Road km in 1999	-8.77e-09	-8.77e-09
Literacy rate ln 2001	.0030378	.0030378**
C-D ratio in 1998	5.72e-06	5.72e-06**
Constant	1.187774	1.187774
Observations	29	29
R squared	0.2110	0.2110

*: 5% level of significance, **: 10% level of significance

The convergence coefficients all indicate fairly rapid convergence, though the sample excludes Chhattisgarh, Jharkhand and Uttarakhand for reasons mentioned earlier. Allowing convergence rates to be different across the states in the sample did not qualitatively affect the estimated impacts of the three conditioning variables. Our inference is that clearly, there is tendency for conditional convergence. The roles of initial literacy rates and initial credit-deposit ratio cannot be undermined in this consideration. Although the level of significance has had to be compromised, the results obtained are along expected lines.

Discussion

Thus, there is conflicting results so far as sigma convergence is concerned. But the evidence regarding beta convergence is overwhelming – that, Indian states and UTs over the time period considered (1999-2013) have shown immutable tendency to converge absolutely, since the coefficient on initial per capita GSDP is negative (Table 1). Additionally, investigation for conditional convergence shows that while initial infrastructure does not play a crucial role (coefficient on Road km in 1999 is insignificant in Table 2) in determining rates of growth over the period, indices for human capital (Literacy rate in 2001) and financial development (C-D ratio in 1998) have a vital role to play in deciding the transition rate of growth. Thus, while erstwhile poor states may have grown faster than richer counterparts, greater human capital and financial development unequivocally hastens this pace of growth.

Conclusion

Thus, gauged by max-min GSDP ratio, state-level disparity has fallen in recent times, but the level remains higher than the initial period considered – because of the substantial rise witnessed in the earlier part of the period under scrutiny. Coefficient of variation, on the other hand, has fluctuating trends with regard to state-level disparity in India and suggests that inequality may have been exacerbated in recent past. Gini coefficient, in line with the coefficient of variation, has shown climbing trend-line in inequality among states – but has displayed a secular rise from the earliest period for which data is available. Beta convergence among Indian states has been a reality – both in terms of absolute as well as conditional convergence. For the period under review, infrastructure variable has not been vital in dictating convergence, while human capital variable and credit availability variable have. Policy may, therefore, be structured to provide greater public thrust on the latter without compromising on the former. The current dispensation's resolve to heighten the pace of construction of national highways is a welcome step in reducing inequalities at the state level. Similarly, credit supply programs such as Start-Up India and MUDRA (Micro Units Development Refinance Agency) schemes will augment the process of reduction of state level inequality in India.

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Interstate level wise disparity in higher education

Ananya Mitra¹ and Shradhanjali Panda²

Indian higher education system is going through a transformation phase. Over the last decade the higher education system has undergone tremendous structural changes like change in funding system, management, privatisation, promoting professional courses, involving women segment, raising FDI limit etc. Various economic, social and demographic factors have increased the importance of higher education in this 'Knowledge Economy'. With increase in number of middle class population there is a rise in many first generation learners into the market. With very few enrolments in research activities, India does not stand chance against other technologically advanced nations. Lack of encouragement in innovation and market for budding scholars has reduced the interest in the students. In terms of equitability Indian higher education has improved, but in other aspects like inter level diversity, gender gap, number of college per lakh population, public expenditure towards education it has not yet developed. Despite all the measures the gap between demand and supply could not be bridged. The purpose of the paper is to provide statistical description of the pattern in which Indian states have dealt with higher education from 2006 till 2015. The objectives shall be to study: (1) market for higher education, (2) level wise gender gap, (3) relation between GSDP, enrolment. If India wants to reap the fruits of a "young country" by 2020 then it has to focus on higher education. Central government has to synchronise its priorities with state governments towards education sector as whole and tertiary education in particular.

JEL Classifications: I240, I210. Key Words: Higher Education, Interstate, Level wise.

Introduction

Indian higher education system is going through a transformation phase. Over the last decade the higher education system has undergone tremendous structural changes like change in funding system, management, privatisation, promoting professional courses, involving women segment, raising FDI limit etc. Various economic, social and demographic factors have increased the importance of higher education in this 'Knowledge Economy'. With increase in number of middle class population there is a rise in many first generation learners into the market. Yashpal committee spoke about 'renovation and rejuvenation of higher education' in 2006. With very few enrolments in research activities, India does not stand a chance against other technologically advanced nations. Lack of encouragement in innovation and market for budding scholars has reduced the interest in the students. In terms of

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equitability Indian higher education has improved, but in other aspects like inter level diversity it has not yet developed. Despite all the measures the gap between demand and supply could not be bridged. Currently supply is higher than demand in many streams, leading to mass vacant seats and unwillingness in the part of authorities to allow permission for opening more colleges. The purpose of the paper is to provide analytical description of the pattern in which Indian states have dealt with higher education since 2006.

Objective

Out of three sides of higher education- expansion, equity and excellence, the current paper focuses on equity. So the objective of the paper is,

1. To study interstate level wise demand and supply for higher education.
2. To study interstate gender gap in higher education.
3. To study relation between GSDP, enrollment and Public Expenditure in education.

Research Methodology

All data used in the study are secondary in nature. Various government databases like website of MHRD (All India Survey on Higher Education Report), RBI has been used to collect data on GDP, GSDP, percentage of money spent as public expenditure on higher education, and state-wise level wise enrolment ratio. To nullify the impact of fluctuating inflation rate during the time frame, ranging from 6.53% (2006) to 14.97% (2009), the monetary variables are taken in their constant price. Levels used under higher education are Diploma, PG Diploma, Undergraduate, Post Graduate and M.Phil and above. Trend in state-wise enrolment at various levels of higher education from 2006 to 2015 and GSDP from 2006 to 2014 is analysed. Interstate level wise disparity in enrolment ratio is calculated using standard deviation technique. Correlation is established between variables to check the linearity. t-test is used to check the significance level of these correlation coefficients.

Economic background

Keeping in mind National Knowledge Commission Report (2006) strong recommendation for public investment towards higher education and simultaneous stability in economic front during 2006, GOI allocated towards education increased by 31.5% compared to 2005. With Indian growth rate touching 9.8% in 2007 budget levied an additional 1% tax to fund secondary and higher education. Allocation towards education has been increased by more than 34%. With growth rate of 10.6% (2010) Finance Minister Mr. Mukherjee allocated 16% more than the previous plan for education. By 2011 US began to get over the crises. In spite of a fall in FDI, FM allocated 24% more towards education to equip young Indians with basic knowledge and cope up with the slowing economy. Mukherjee proposed National Knowledge Network for connecting research centers nationwide. In 2012 budget allocated Rs 1000 crore for National Skill Development Fund. In 2013 education was termed “high priority” and received Rs.65,869 crore. One million students would be given Rs.10,000 per head on completion of skill training. Higher education ultimately got the deserved importance. In the 2015 budget Rs 26,855 crore was sanctioned for higher education under the human resource development, an increase of over 13% over last year.

Male and female sections of the society do not enjoy the same amount of liberty while accessing education. UNESCO (2012) pointed that the preference to males over females in education has been a marked feature since ancient societies in virtually all countries. Papadóulos and Radakovich (2005) noted that higher education was precisely the 'best environment for reproducing such gender disparities in education', since this level was not considered a space properly 'feminine'. World Atlas of Gender Equality in Education published by UNESCO (2012) gives proof that women have reached parity with men in earning Bachelor's degrees. In Master's degrees, they have an edge over men, accounting 56%. However, at Ph.D. level they only account for 44%. Friesen et al in 2012 collected data across 14 Asian countries from 1900 to 1960 and detected the Potential social, cultural and economic factors that might influence educational gender equality in Asia to be female voting rights, predominant religious belief, school enrolment rates, GDP per capita and the colonialists in South and Southeast Asia. It was found that the situation of women in East Asia resembled the conditions in South Asia at the beginning of the nineteenth century, but underwent radical transformations under European and Japanese influence. Karuna Chanana (1993) found as against 14 women per 100 men in 1950-51, there were 46 women in 1988-89 women students in higher education. Thus, the proportion of women rose from one-tenth to nearly one-third of total enrollment. The undergraduate level enrolment increased from 10.8% to 31.6 %; from 12.1% to 33% at the graduate level and from 14.1% to 34.6 % in the doctoral programmes. The proportion of women has become almost uniform at all levels constituting one-third of enrolment. This uniformity indicates that proportionately the incidence of discontinuance is equal among men and women in higher education. Yet the enrolment of women continues to be much lower than that of men. In India women enrolment in arts faculties ranges from 67.9% in 1950-51 to 54.9% in 1988-89 (Chanana, 1993). Next to arts and sciences, women are more likely to enrol in medical and teacher training courses. In science the proportion of women decreased from 33.3 % in 1950-51 to 28.8 % 1980-81 (Chanana, 2004) and the proportion of men was around 80-90 % till 1980-81, has come down to 59.8 % in 2002-03. She went on to say that "jobs involving public relations, personnel management, marketing, and advertising in the corporate sector, such as the banks, IT firms, BPO companies are becoming feminine jobs and specializations" in India. On the other hand, their participation in professional courses such as engineering and technology, agriculture and veterinary science continue to be very low. Commerce has become popular while law is gaining popularity gradually among girls since the seventies. This trend is significant and noteworthy since it reflects a shift from arts subjects and may be an indicator of the changed options as well as perceptions of women and about women. Medicine and education, traditionally female-dominated subjects in India, show an understandably upward trend.

Enrolment in higher education

Because tuition fees in the public sector are generally low students' flock to programs that offer the greatest payoff in terms of employment, thus resulting in over-enrolment in some programs and under-enrolment in others. There has been the problem of clustering of women and students from the deprived sections in general education, namely, humanities and social sciences - subjects which either lead to low end jobs or unemployment. When all the states/UTs of India are ranked based on their absolute total enrolment in higher education from 2006 to 2015, there is a wide fluctuation in

the interstate total enrolment values in the last eight years. A Comparative analysis of the ranks shows the existence of wide disparity among the states. Even within the states some levels have high demand while other levels are facing scarcity. There is wide gap between preference of UG and Diploma courses in almost all states. Madhya Pradesh, Tamil Nadu, Uttar Pradesh, and Maharashtra are the only three states that are able to retain their rank in top ten in all level of higher education demand. The difference in rank of a particular state at UG and PG and Ph.D level is definitely discouraging for any country. The interstate variation in enrolment figure depends on various social and demographic reasons. These reasons are diluted with concentration of the area of study. Thus within a particular state the disparity should be lower in magnitude. But compared to national average ($S.D_{India}=3.07$) some states have wider standard deviation. Chhattisgarh has highest amount of deviation followed by Odisha. There is a wide fluctuation in the interstate total enrolment values in the last eight years. The total value is mostly affected by the UG enrolment. Performance of Odisha and Kerala is the worst as these two states score the lowest rank (10) in one category each. Delhi is slightly better comparatively as it gets to remain in two levels at top 10 rank. Total enrolment is mostly affected by the UG enrolment ($r_s=0.97$), because the number of UG students outnumber enrolment in any other level. PG Diploma has least impact on total enrolment ($r_s=0.22$).

In the supply side in 2015 there were 757 universities in India, out of this only 256 are private and remaining 501 are government. There are 29506 colleges all over India. Out of which 61% are private un-aided enrolling 42.7% students, 15% private aided enrolling 22.6% and 23% government owned enrolling 34.6%. Private sector is dominating up to PG level but government covers majority of university level. There has been a rise in the number of universities in India, but the rate of increase is very low. Apart from absolute number of institutions, number of colleges per lakh population belonging to 18 to 23 age group serves a better tool to measure the supply side. The study shows that there is hardly any change in national average (ranges between 23 to 27) number of college per lakh population in India. Interstate comparison has three exceptions to national result: Andhra Pradesh showing a decline in number of colleges, Maharashtra moving back and forth thus nullifying the outcome and Kerala having a huge rise in number of colleges. Telangana has maximum density of colleges (57).

Disparity in Enrolment

The northern states of India are slacking behind in absolute quantitative terms at all levels of higher education but this may be because their population is low. When population is taken into consideration the result is different. The northern states like Manipur, Sikkim and Himachal Pradesh appear in top ten as maximum enrolment occurs in these states with respect to their population. Thus Uttar Pradesh which ranks one and Maharashtra two in absolute enrolment actually does not appear in top ten with respect to population. Chandigarh, Delhi and Puducherry do not have any rank in absolute terms, but rank top three states having highest percentage of youth population in higher education. Chandigarh and Puducherry are the only states that come in top ten on all categories. Diploma and PG diploma are preferred over UG and PG in Madhya Pradesh, Delhi, and Chandigarh. When consistency in performance is measured using standard deviation Puducherry tops followed by Odisha. But

consistency of Puducherry is in a better sense than Odisha. Odisha has been performing poorly in all level of education consistently. Arunachal Pradesh and Chandigarh have been doing moderately consistent in at least two levels. Sikkim shows highest amount of fluctuation out of all. UG students of Sikkim go for PG, but Diploma students do not opt for PG Diploma. Similarly PG students do not prefer higher education. PG is the most favourable course in Sikkim.

Gender Disparity

Gender Parity Index of India was stagnant from 2006 till 2009 in higher education sector. But there was a jump in 2009. This might be because of loan subsidy worth of 2,600 crore to 9 lakh student who borrowed before March 31, 2009 but could not repay by the end of December. And under Central Scheme for Interest Subsidy (CSIS) “government took over the burden of interest for the duration of the period of study and a little beyond”. After the leap the index has been stable and increasing at slow pace till 2015. There exists low national (7.6%) and high state wise gender disparity in various levels of higher educations. With rise in level of education the gender gap seems to melt down both at national and state level. Males dominate all levels of high education except M.Phil where females exceed by 3%. Women enrolment exceeds men in 13 states out of 36 states and UTs leading to GDI of 0.83 in 2014-15. The widest gap is in Diploma (44%), where male population dominates the demand.

Relation between GSDP and enrolment

There exists significant amount of negative correlation between interstate $GSDP_{(t)}$ and $Enrol_{(t)}$. Even in previous years state wise enrolment, $Enrol_{(t-1)}$, did not have any positive effect on $GSDP_{(t)}$. All correlation coefficients between GSDP and enrolment turn out to be not significant at 5% level except $GSDP_{(2011-12)}$, $Enrol_{(2009-10)}$. The low amount of positive correlation between these years might have been due to post financial crisis time zone and loan subsidy. Surprisingly correlation between $[GSDP_{(t)}, Enrol_{(t)}] > [GSDP_{(t)}, Enrol_{(t-2)}] > [GSDP_{(t)}, Enrol_{(t-1)}]$. This means last year enrolment had lower linear relation with this year GSDP compared to two years back enrolment. This might be because PG courses are generally of two years. And two years back PG students are most likely currently in job market. This line of thinking also supports positive and significant correlation between $GSDP_{(t)}$ and $[PGEnrol_{(t)} - UGEnrol_{(t-3)}]$ for 2012-14 except for Odisha and Tamil Nadu. $[PGEnrol_{(t)} - UGEnrol_{(t-3)}]$ represents the students who enrolled in UG courses but due to some reason did not go for higher courses. Assuming they entered the labour market, there must be a rise in the GSDP. Correlation between $GSDP_{(t)}$ and $[PGEnrol_{(t)} - UGEnrol_{(t-3)}]$ is negative for 11 states including Odisha from 2010-13. This reverse situation is because of financial crises of 2008-10.

Disparity in public expenditure

The basic problem while allocating fund for education is the difference of priorities between the states and centre. The national average spending on education is 15.3% of GDP from 2006 to 2014. Fourteen states spend more than national average including Odisha. Arunachal Pradesh (10.4%) and Andhra Pradesh (11.2%) spend least amount of GSDP. Uttarakhand (19.8%) and Assam (19.6%) spend highest amount of GSDP in education. Correlation coefficient is extremely low between total public expenditure in education and GSDP. Without time lag the values are mostly positive excluding 2006-07 and 2008-09. With lag/lead of 1, 2, and 3 years correlation coefficient between $GSDP(t)$ and $Ed.Exp(t-$

1) is positive from 2010-11 onwards, and between $GSDP(t)$ and $Ed.Exp(t+1)$ all coefficients are extremely low but positive. Interstate correlation between $GSDP_{(t)}$ and $PubExp_{(t)}$ in education is not significant except for Tamil Nadu, Odisha and J&K. Correlation between $GSDP_{(t)}$ and $PubExp_{(t-1)}$ in education is positively significant for 4 states (Jharkhand, Punjab, Nagaland, Tripura). Correlation between $GSDP_{(t)}$ and $PubExp_{(t-2)}$ in education is positively significant for 6 states (Jharkhand, Punjab, Mizoram, Tripura, Uttar Pradesh and Tamil Nadu). Correlation between $GSDP_{(t)}$ and $PubExp_{(t-3)}$ in education is positively significant for 14 states. Thus as the time gap is increased more and more states show significant linear relation between variables. All states except Tamil Nadu, Odisha and J&K have correlation above 0.9. When these correlations are tested for significance, using t-test, all the correlation except the three states is found not significant.

Vocational Education and Training

National Skill Development Mission was launched during 11th plan under *National Council on Skill Development* to upgrade and develop the skill of Indian youths. The objectives of the national policy on skill development are to:

1. Create opportunities for all (especially for youth, women and disadvantaged groups) to acquire skills throughout life
2. Promote commitment by all stakeholders to own skill development initiatives.
3. Develop a high-quality skilled workforce and entrepreneur relevant to emerging market needs.
4. Enable the establishment of flexible delivery mechanisms that respond to the characteristics of a wide range of needs of stakeholders.
5. Enable effective coordination between different ministries, the centre and the states and public and private providers.

‘The challenges facing skill development in India: An issue paper’ in 2010 reported that “Unit costs of vocational education are roughly 60 percent higher than that of general secondary education”. No wonder demand for general education is higher than diploma. From 2011-12 onwards 2035 schools have been approved under VET. 916 schools received approval in 2014-15 themselves, with majority of them concentrated in Maharashtra (315). The demand for diploma courses in India is still at its lowest compared to other higher education courses. Students prefer to go for undergraduate courses rather than diploma. With slow rise in aggregate demand for VET over the time, there is also the problem of a very high amount of interstate dispersion ($\bar{\alpha}^2=2351149$). Only a selected few states in India have high enrolment in diploma courses whereas other states do not. Maharashtra has the highest demand for diploma courses, followed by TN and Karnataka. MP tops in case of PG Diploma. Post Graduate Diploma level data show a rather fluctuating picture. In 2013-14 number of girls outnumbered (by 20%) the boys in Odisha. At the national level the gap is widening. Certificate courses are very short term courses dealing with hardcore specialization study module. It may range from a few weeks to a few months. The area may cover management, technical, general, liberal art and many more. The demand for management courses is extremely low. Majority of states have demand less than 1.5%. But from gender perspective these courses have a different view. Female

dominates over the male in terms of enrolment. The correlation between the PGD+D and G(S)DP turns out to be very high ($r=0.85$). Diploma holders share a stronger correlation ($r=0.89$) with G(S)DP compared to PG Diploma holders ($r=0.25$). States with higher income are also the states with higher enrolment in VET. With rise in enrolment in certificate courses the G(S)DP seem to rise, but the existence of impact of time on trend cannot be denied. The biggest problem for VET is fund - amount and mobilization. A model must be devised to incorporate the income generated by interns as service provided or goods manufactured as a 'by-product' of VET under PPP.

Conclusion

India ranks one in the world with respect to higher education system. Given the fact that GER was single digit in 2003-04 and currently 33.3 million students are enrolled in various colleges, is a great achievement. GDI has also been increased since 2006. With population going to touch 1.5 billion in 2020, even world's largest higher education system has to double itself in short period of time. With economic stability and growth, the demand for higher education has increased multiple times. If India wants to reap the fruits of a "young country" in 2020 then it has to support top ranking good institutes with state of the art research facility. Inter disciplinary research activities need to be popularized. R&D budget allocation should be based on the outcomes. Rising interstate disparity in enrolment needs immediate solution. To sum up higher education in India has grown in many aspects, but the growth is skewed in nature. Few states at the peak and many at the bottom. The funding and management situation in India is slightly different from that of other developed countries, because of involvement of two tier government system. Central government has to synchronise their priorities with state governments towards education.

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Empirical Evidence on Regional Disparities Across Indian States

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There is a consensus in economics literature that balanced regional development is essential for national integration, political stability, and economic viability. It has been observed by economists over last few decades that Indian states have been experiencing different paces of growth, with some states showing fast progress and others lagging behind. There had been a huge gap between active and vibrant regions and hinterland during pre-independence period in terms of availability of facilities and this has resulted in the form of unequal levels of development both in terms of economic and human factors. Although the reduction in inter-state disparities has been emphasized in five year plans, the menace continued unabated. Thus, regional disparities in the level of economic growth experienced in India is a key challenge for policy makers and planners, as it has been observed to produce serious threat to the socio-economic and political harmony of the country. It is with this backdrop, the present study intends to examine the patterns of the regional disparities in the level of economic growth in India. Specifically, the present paper analyses the trends and patterns of economic inequality across Indian states. The objective further is to find out if Indian states are on a convergence path. The study provides evidence of increase in economic inequality, and a lack of convergence, except for decline in disparities in 1980s and during 2010-15. This can lead to the conclusion that the growth experience in Indian states has certainly been imbalanced which if continues for next few decades would undermine the sustainable development of the nation. In terms of policy content, basic infrastructure, such as health, education, transport, and political governance require the most attention in the poor performing states, while for higher income states, macroeconomic stability and political governance seen to be the more important.

Key Words: Regional Disparity, Growth, Convergence, Sustainable Development, India

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Introduction

Regional disparities are an ever-present development challenge in countries having large geographic areas under their jurisdictions (Shankar and Saha, 2003). This is also applicable to India which accounts for 2.4 per cent of the world surface area, and sustains about 124 crores people residing in 29 states and 7 union territories. The variation across these geographical regions with regard to socio-economic, political and cultural conditions is enormous. Despite the fact that the government of India has given priority to balanced regional development in all its five year plans, some states have achieved rapid economic growth over years, while other have languished (Dholakia, 1985; Sachs et al., 2002; Somasekharan et al, 2011). Such regional disparities in the level of economic growth experienced in India is a major challenge for policy makers and planners, as it produces serious threat to the socio-political harmony of the country (Agarwalla and Pangotra, 2011). This widespread perception of increased disparity level across Indian states is shared by a number of studies and firmly supported by the available statistical indicators (Cashin and Sahay, 1996; Ahluwalia, 2002; Nagaraj et al. 1998; Bhattacharya and Sakthivel, 2004; Kar and Sakthivel, 2007; Nayyar, 2008; Ghosh, 2008, 2010, 2012; Kalra and Sodsriwiboon, 2010).

Over the last decades, India's population has risen by almost 3 fold, and its GDP has increased almost 30 fold. This growth experience has not been evenly distributed - some of the richest states in India, like Gujarat and Maharashtra, are similar to middle-income countries such as Brazil and Poland in their levels of development while the poorest states of Bihar and Orissa are more akin to that of some of the poorest Sub-Saharan African countries (Bandyopadhyay, 2011). Thus, the following questions strike our mind: has growth benefited only the leading regions/states of the country resulting in widening inequality in income? Has the trend in regional disparity been uniform across all periods? Whether differential growth rates and standards of living in different regions/states would eventually converge?

It is with this backdrop, the present study intends to examine the patterns of the regional disparities in the level of economic growth in India, specifically, the trends and patterns of economic inequality across Indian states. This study also seeks to find out if Indian states are on a convergence path or not. The rest of the paper is organised as follows: Section 2 makes a note of the data and methodology used in the study; Section 3 carries out the empirical analysis; Section 4 discusses the reasons for regional disparities in India; and Section 5 highlights the policy suggestions for bringing regional balance in the long-run and Section 6 concludes.

Data and Methodology

The primary objective of this study is to examine the trends and patterns of economic inequality across Indian states. Another objective is to find out if Indian states are on a convergence path. For this purpose, this paper evaluates economic performance of 15 states, namely, Assam, Bihar, Gujarat, Haryana, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Uttar Pradesh and West Bengal in India for the period spanning from 1960-61 to 2014-15, and examines whether divergence in per capita income across the states has increased

or decreased over last decades. The choice of the states is based on the availability of continuous and comparable data for the period. For studies that undertake econometric analysis, rather than simply summarizing data, the most common sample sizes vary between 14 and 16 states (Stewart and Moslares, 2014).

The differential economic performance of the states is examined by comparing the levels and growth rates of per capita income among the states. The per capita income has been measured in terms of real per capita Net State Domestic Product (NSDP) at 2004-05 prices. The data for the 15 select states have been collected from the CMIE database on States of India and Economic Surveys of respective states for the period under study.

The study uses the metrics such as coefficient of variation (CV), Maximum to Minimum Ratio (MMR), and Ranking of States to investigate the trends and patterns of economic disparity across selected states of India over the observation period. Further, we have used absolute $\hat{\alpha}$ -convergence and $\hat{\sigma}$ -convergence tests as suggested by Barro and Sala-i-Martin (1992) to judge whether Indian states are in a convergence path. The $\hat{\alpha}$ -convergence test involves regressing the average growth rate of income per capita over time on the initial level of income. States are said to be converging when a negative relationship is observed between the growth rate of per capita income and its initial level of income. In other words, absolute $\hat{\alpha}$ -convergence is concluded, if the coefficient $\hat{\alpha}$ is found less than zero. Another measure of convergence is that of $\hat{\sigma}$ -convergence which is estimated together with the $\hat{\alpha}$ -convergence. The $\hat{\sigma}$ -convergence takes place if the standard deviation of the natural logarithm of per capita real income across states declines over time.

Empirical Analysis

Although India has been enjoying elevated growth rates since the beginning of the 1980s, a clear departure from the *Hindu* growth rate prevailing since independence through the 1970s, and witnessing a substantial growth due to the implementation of major economic reforms since 1991, a widespread perception has been shared by a number of studies that growth experience across states is quite uneven, i.e., the disparities among states have been increasing steadily and the benefits of the rapid growth have not reached all parts of the country in an equitable manner. Hence, for growth to be 'more inclusive' regionally, it is necessary that the benefits of economic growth be shared equally by all the regions/states of the country. Against this background, it is pertinent to examine the trends and patterns of economic inequality across Indian states which will help in finding out the reasons for regional disparities, and appropriate policy suggestions for convergence or inclusive growth can be made.

At the outset, we analyse the growth rates of per capita net state domestic product at constant prices for all the fifteen states which are presented in Table-1. It may be seen that the regional disparities in standard of living, as measured by per capita NSDP at constant prices, have accentuated over years. In the 1960s, Bihar recorded lowest per capita NSDP growth at -0.29 per cent per annum, and Haryana the highest at 8.44 per cent. In the 1970s, the disparity range has widened from -1.85 for Madhya Pradesh to 2.95 for Gujarat.

Table-1: Growth Rate of Real Per Capita NSDP (% per annum)

States of India	Growth Rate of Real Per Capita NSDP (% per annum)					
	1960s	1970s	1980s	1990s	2000s	2010s*
Assam	-	-1.05	2.76	0.56	3.29	3.27
Bihar	-0.29	0.97	2.53	0.42	5.00	9.59
Gujarat	1.02	2.95	3.98	4.80	6.83	6.48
Haryana	8.44	1.42	4.50	2.65	6.73	5.37
Himachal Pradesh	2.55	0.49	3.89	3.79	5.11	5.80
Jammu & Kashmir	1.08	1.83	0.32	1.96	3.14	2.95
Karnataka	2.09	1.79	2.56	5.09	4.72	5.60
Kerala	1.35	0.66	1.47	4.92	6.76	5.63
Madhya Pradesh	-	-1.85	4.38	3.88	3.01	6.88
Maharashtra	0.46	2.63	3.16	4.46	5.82	5.91
Odisha	2.19	0.99	4.06	1.03	5.10	3.06
Punjab	5.87	2.47	3.33	2.33	3.50	3.71
Rajasthan	0.23	1.58	4.48	4.04	4.20	6.48
Uttar Pradesh	-	-1.04	4.29	1.40	3.09	4.13
West Bengal	0.11	-0.05	2.58	4.82	4.80	5.33
Mean	2.100	0.919	3.219	3.077	4.740	5.346
Standard Deviation	2.581	1.422	1.209	1.687	1.366	1.753
Coefficient of Variation	1.229	1.547	0.376	0.548	0.288	0.328

* Period from 2010-11 to 2014-15 is considered

Source: Authors' Own Calculation from CMIE Data and Economic Survey Data

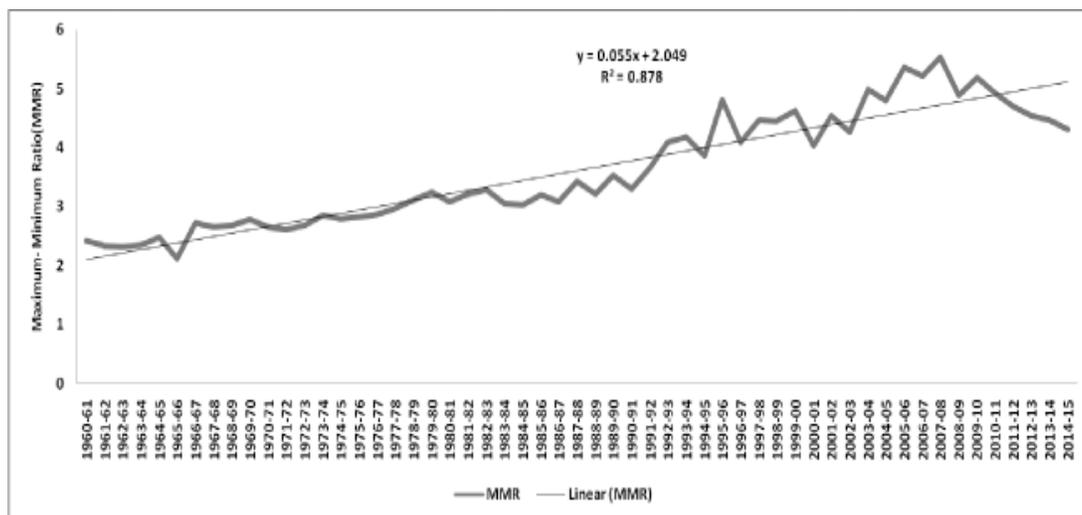
However, in 1980s, the growth performance has become positive, and the disparity level has been narrowed down. Jammu and Kashmir witnessed a meagre performance at 0.32 per cent per annum and Haryana recorded the highest at 4.5 per cent per annum per capita NSDP growth rate. Substantial changes have been noticed in 1990s, especially due to the implementation of economic reforms. Bihar recorded the lowest per capita growth rate of NSDP at 0.42 per cent per annum and Karnataka witnessed this growth at 5.09 per cent. This indicates an increase in the regional disparity level since the poor state like Bihar witnessed a low growth rate. The 2000s register further a reduced disparity rate with the lowest per capita growth rate of NSDP by Madhya Pradesh at 3.01 per cent per annum and the highest by Gujarat at 6.83 per cent per annum. In last five years during 2010-15, J&K registered the lowest growth rate of real per capita NSDP at 2.95 per cent per annum and Bihar the highest at 9.59 per cent per annum! Can it be called 'Growth Miracle'? It may be said that Assam, Himachal Pradesh, J&K, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, UP and West Bengal have managed

to push up their income growth to a satisfactory level over decades. Particularly, the growth performance of Gujarat and Kerala is noteworthy as they witnessed greater than 6 per cent growth rate of per capita NSDP during 2000s at 2004-05 prices in comparison to their earlier performances. The performance of Punjab is quite surprising. It was one of the richest states in India in the 1960s, and later performed relatively worse in terms of per capita income growth and as a result, it is no longer the richest one. The performance of Odisha was quite discouraging during 1990s, but shows a revival in 2000s. Although encouraging improvement in growth rates for the poorest states has been observed for the most recent decade, persistently high levels of poverty, lower literacy rates all distributed across staggering populations may prove to be significant roadblocks for the potential to begin on the path towards convergence.

Table 1 indicates certain pattern of regional disparity in terms of coefficient of variation of real per capita NSDP growth rates among states. The coefficient shows a jump from 1960s to 1970s indicating thereby a widened regional disparity level. However it shows an interesting pattern afterwards: declining trend during 1980s, increasing trend in 1990s, declining trend in 2000s, and an increasing trend during 2010-15. Is it indicating a cyclical kind of movements in the regional disparity levels across Indian states? Is it meaning that the levels of regional disparity across Indian states depend upon political stability, economic reforms, cross-border capital flows, international competition, or any other factors?

Fig.1 below introduces an illustrative example of the cross-state inequalities in real per capita NSDP levels throughout our study window. The Maximum-Minimum Ratio (MMR) captures the maximum level of real per capita NSDP compared to the minimum for the 15 states considered in this study, for each given a year throughout the 55-year period. If MMR is close to 1, then it would mean that the different regions have relatively equal income.

Fig.1: Maximum to Minimum Real Per Capita NSDP Ratio



States of India	Average of Per Capita NSDP (Rs.)						Ranking of States of India					
	1960s	1970s	1980s	1990s	2000s	2010s*	1960s	1970s	1980s	1990s	2000s	2010s*
Assam	-	11681.79	13298.44	14596.06	17106.92	22504.00	-	7	8	11	12	13
Bihar	5090.83	5408.39	6391.45	6570.72	8385.63	14380.40	11	15	15	15	15	15
Gujarat	10104.99	11244.42	14564.70	22031.13	34809.61	58193.00	7	8	6	4	5	3
Haryana	11234.28	14080.37	18611.74	25534.14	40556.52	64463.56	6	3	2	3	1	2
Himachal Pradesh	12201.60	13250.61	14870.99	21043.03	34953.05	50527.25	3	5	5	5	4	5
Jammu & Kashmir	12451.88	14857.03	16355.80	17832.35	22427.81	29710.20	1	2	3	8	9	10
Karnataka	8857.16	10382.97	12294.64	18594.45	29503.69	44075.36	9	9	9	7	7	7
Kerala	11523.45	13140.61	13570.12	20182.91	34683.45	54389.50	4	6	7	6	6	4
Madhya Pradesh	-	9005.44	10189.52	13177.73	16497.75	25183.20	-	12	12	12	13	11
Maharashtra	11235.07	13336.61	16141.59	25702.54	40227.07	65451.04	5	4	4	2	2	1
Odisha	-	9893.62	10961.11	12374.61	18090.90	25026.60	-	10	10	13	11	12
Punjab	12404.58	15528.90	20514.31	26983.41	35225.46	47976.02	2	1	1	1	3	6
Rajasthan	8110.87	8951.08	9836.97	14679.74	19668.77	30595.08	10	13	13	10	10	9
Uttar Pradesh	-	7646.51	9313.39	11337.49	13647.37	18665.40	-	14	14	14	14	14
West Bengal	9151.31	9260.89	10587.97	14851.57	23783.76	34514.40	8	11	11	9	8	8
Standard Deviation	-	2773.094	3657.622	5706.932	9991.285	16426.4						
Mean	-	11177.95	13166.85	17699.46	25971.18	39043.67						
CV	-	24.81	27.78	32.24	38.47	42.07						

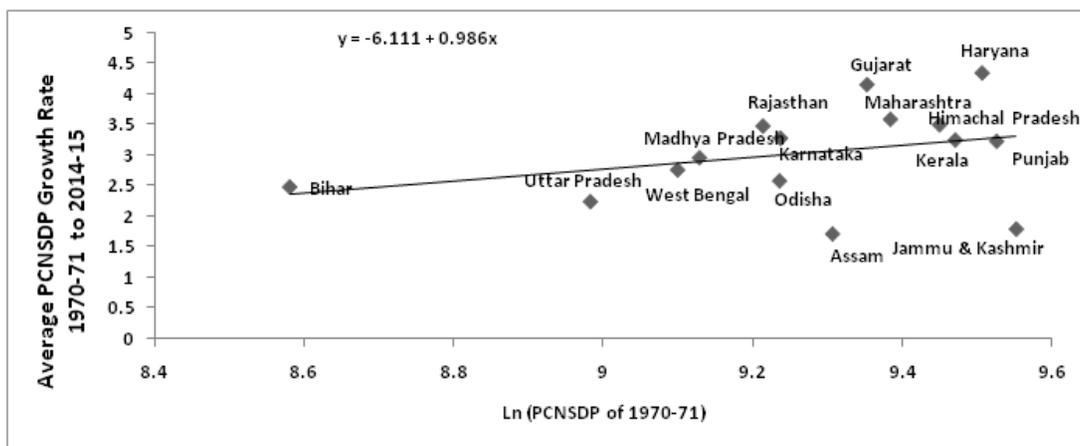
Source: Authors' Own Calculation from CMIE Data and Economic Survey Data

Table-2 provides a more complete depiction of the evolution of real per capita NSDP levels throughout our sample period. Averages were calculated for each state's decade specific per capita NSDP level to assist with a period ranking. We prefer decadal averages to point specific measurement as it captures a more stable, representative indication of a state's wealth. A mixed evidence is provided by this ranking metrics. There are states which started with a low ranking per capita NSDP and remain at the lower end of the ranking spectrum. These states include Bihar, Madhya Pradesh, Odisha, Rajasthan, and Uttar Pradesh. There are states which started at a relatively high ranking and remain relatively high throughout. These states include Haryana, Himachal Pradesh, Kerala, and Punjab. The ranking pattern for states including Assam and Jammu and Kashmir has deteriorated

over decades. However, there are states such as Gujarat, Karnataka, Maharashtra, and West Bengal, the ranking pattern has shown an improvement. All this clearly indicates the persistence of regional disparities across Indian states.

Another finding from Table-2 is that the coefficient of variation of per capita NSDP is increasing over the years. But this is not evident from the trend pattern of the coefficient of variation of growth of per capita NSDP (see table-1). Table-2, thus, shows that the 'catch up effect' is not operating in India, i.e., the poorer states are not growing at a faster pace in comparison to rich states. In other words, convergence is a lacking feature in India.

Fig.2(a): Absolute β -Convergence, 1970-71 to 2014-15

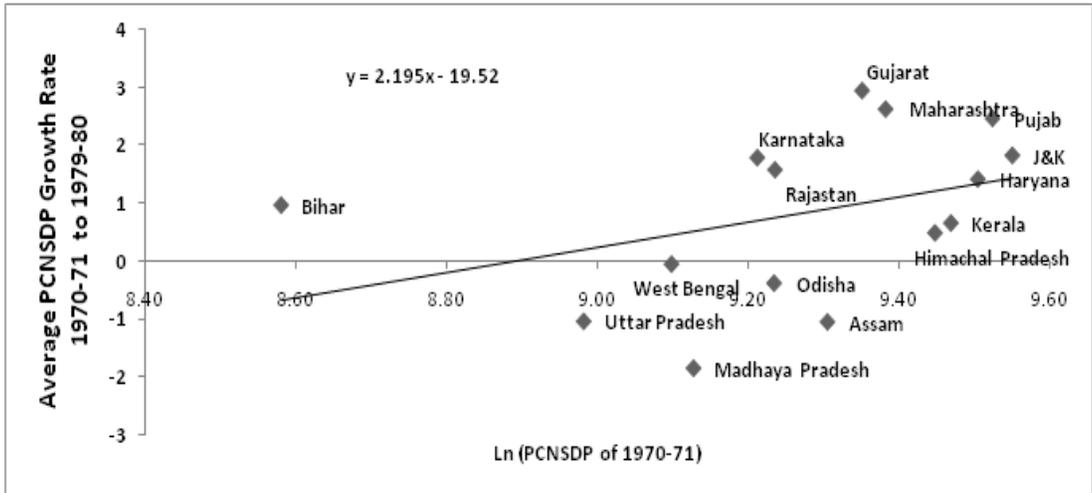


Source: Authors' Own Plot

Having discussed the trend pattern of regional disparities across Indian states, now the obvious question arises whether such differential growth rates and standards of living in different regions/states of India would eventually converge. Thus, we move to the convergence tests. For this purpose, we have used Barro and Sala-i-Martin (1992) absolute β -convergence test. The states' natural logarithms of initial real per capita NSDP for the observation year 1970-71 have been graphed alongside their respective average growth rates for the observation period, 1970-71 through 2014-15. If absolute β -convergence were to be observed, an inverse relationship ought to be observed between initial income level and the subsequent average period growth rate. The test results can be followed from the fig.2(a). It is clear that the trend line is positively sloped ($\beta = 0.986 > 0$) which indicates divergence of regional per capita incomes. In other words, initially poorer states did not tend to grow at a faster pace than the initially richer states. Indeed, the opposite is true: the initially richest states tended to grow comparatively faster than the initially poorest states.

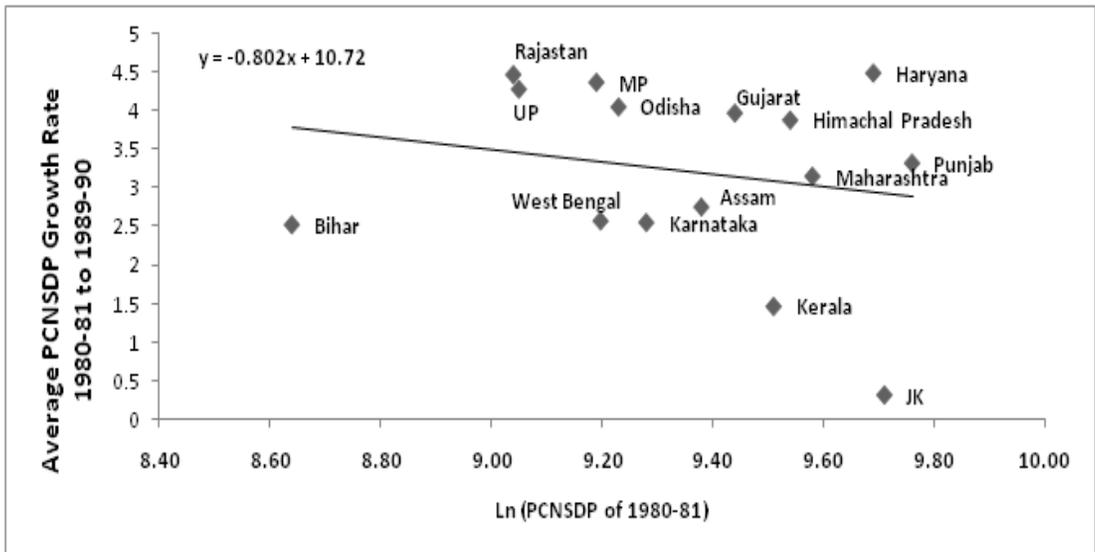
¹The realization of inclusive growth is contingent upon the reduction in regional disparities in terms of per capita NSDP, i.e., the 'catch up effect' must operate in the economy.

Fig.2(b): Absolute β -Convergence, 1970-71 to 1979-80



Source: Authors' Own Plot

Fig.2(c): Absolute β -Convergence, 1980-81 to 1989-90



Source: Authors' Own Plot

Then we divided the observation period into five sub-periods of a decade each starting from 1970-71 through 2009-10 and the last one is from 2010-11 to 2014-15. The purpose is to observe the absolute convergence hypothesis in each decade. The results are presented in Table-3 and also plotted in following figures.

Fig.2(d): Absolute β -Convergence, 1990-91 to 1999-00

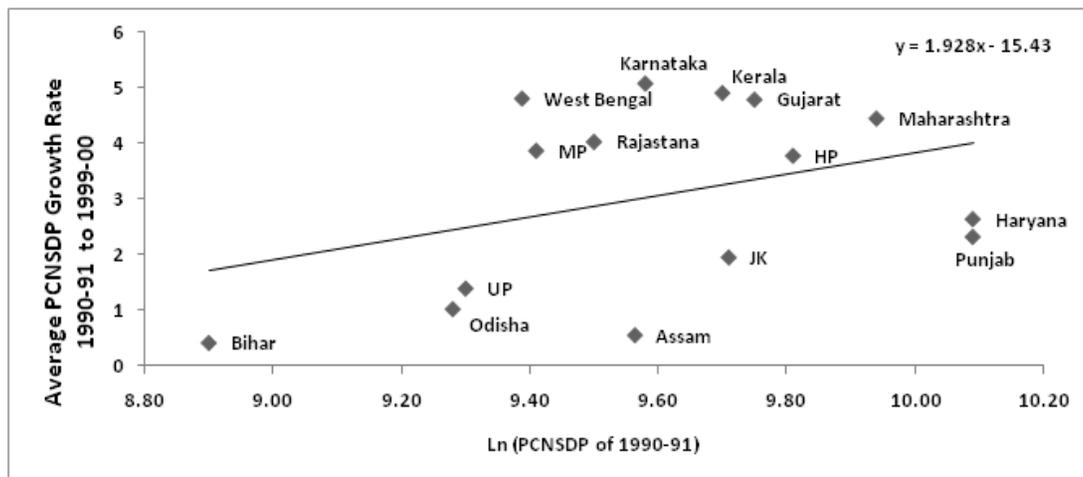
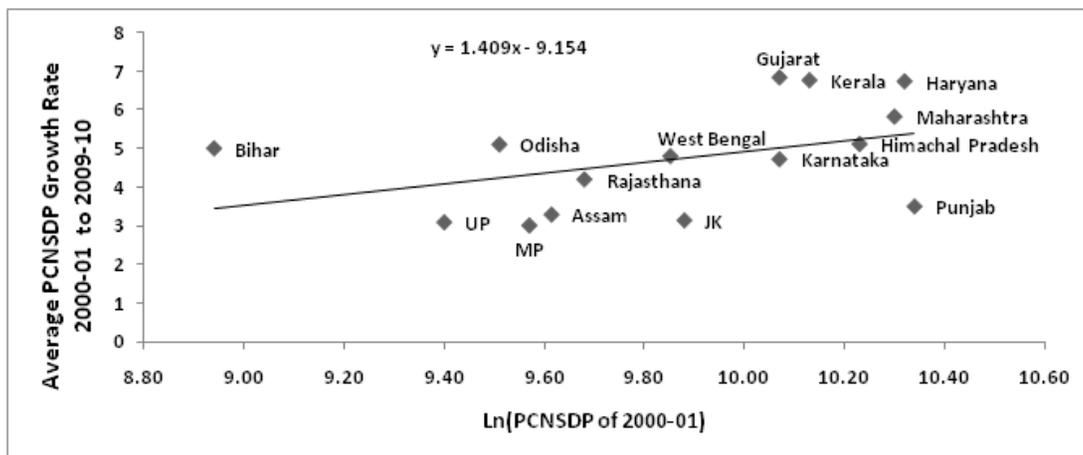


Fig.2(e): Absolute β -Convergence, 2000-01 to 2009-10



Source: Authors' Own Plot

The Table-3 and figure 2(b) to 2(f) shows an interesting result which indicates either convergence or divergence in sub-periods. The decade 1970s indicate divergence of regional per capita incomes; the decade 1980s indicate absolute convergence of regional per capita incomes; the decade 1990s indicate divergence of regional per capita incomes; the decade 2000s indicate divergence and the last half-decade indicate a convergent path of regional per capita incomes. But it is further interesting to note that the rate of divergence in 1990s is relatively more than the speed of divergence observed in 2000s. This finding corroborates to earlier findings that the reforms are responsible for widening income disparities among states in India (Bhattacharya and Sakhivel, 2004; Das and Barua, 1996; Ghosh, 2008; Kar and Sakhivel, 2007). Thus, improved growth performance of the economy during the post-reform period has been associated with widening regional disparity in income. Some

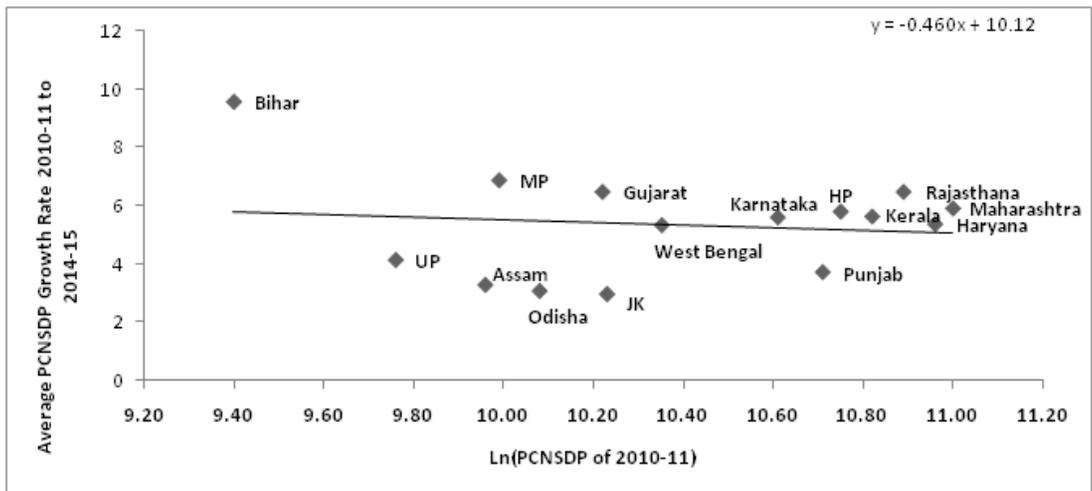
researchers assign large disparities in education, health and infrastructure across states as the main reasons behind the economic inequality noticed in the post-reform period (Das, Barua and Ghosh, 1993; Das and Barua, 1996; Bhattacharya and Sakhivel, 2004; Kumar, 2004; Ghosh, 2010).

Table-3: β -Coefficient for Sub-Periods

Period	β -Coefficient	Result
1970-71 to 1979-80	2.195	Divergence
1980-81 to 1989-90	-0.802	Convergence
1990-91 to 1999-00	1.928	Divergence
2000-01 to 2009-10	1.409	Divergence
2010-11 to 2014-15	-0.460	Convergence
1970-71 to 2014-15	0.986	Divergence

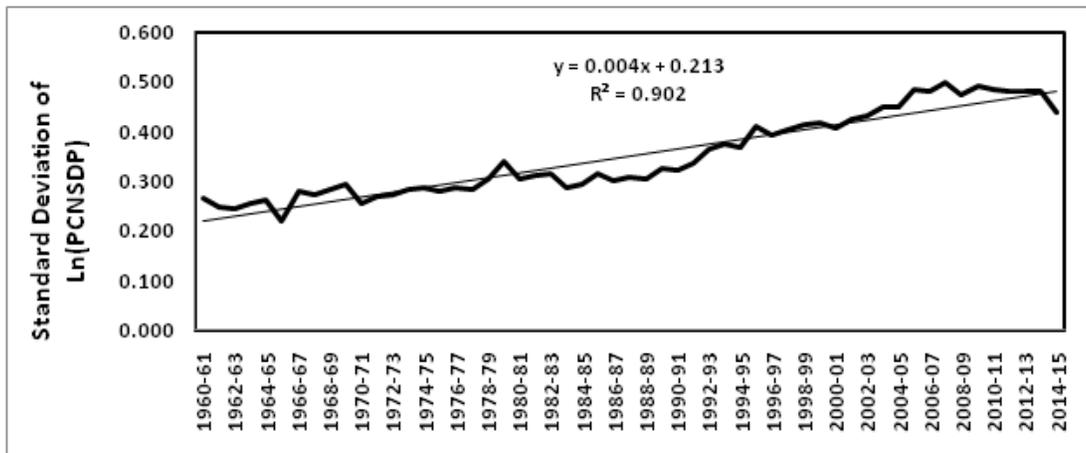
Source: Author's Own Calculation

Fig.2(f): Absolute β -Convergence, 2010-11 to 2014-15



Source: Authors' Own Plot

The finding of absolute convergence in 1980s may be attributed to the implementation of the socialistic pattern of first generation economic reforms by the then government. But such a converging trend did not last long. It may be due to the implementation of capitalistic pattern of second generation reforms by the government. However, looking at the convergence evidence of recent years, we can assert that the strategies of inclusive growth that the Gol has been following since last decade or so, seems to be beneficial in the long-run, if economic and other policies remain complementary and supplementary.

Fig.3: δ -Convergence, 1960-61 to 2014-15

Source: Authros' Own Plot

Finally, we evaluate the existence of δ -convergence across Indian states over the observation period. The δ -convergence takes place if the measure of dispersion of the real income across states falls over time. In other words, if the standard deviation of the logarithm of per capita NSDP across 15 states declines over time, then δ -convergence is said to exist. The result of the δ -convergence is depicted in fig.3 below. In our case, we do not observe δ -convergence, given that our results reveal that in fact real per capita NSDP dispersion across states has increased substantially. It is clearly understood that cross-state income levels have diverged over time in India. This simply prompts us to say that the well-known case of India's miracle growth over the last three decades conceals the overlooked truth that the gains from this economic expansion have not been distributed in an equitable fashion across states.

Explaining Regional Divergence

The empirical evidence that we presented in section 3 above, clearly infers divergence in real per capital income across Indian states over the period of observation which within itself carries a very crude form of convergence path in the current decade. However, we cannot conclude about it unless it replaces the persistent disparities over a long period of time. Thus, it is appealing to wind up with the divergent finding. A cursory look at the extant literature on regional disparities reveal that such divergence in per capita income across Indian states may be due to: *first*, better performance of states with low share of agriculture and high share of service sector (Nagaraj et al., 1998; Kalra and Sodsriwiboon, 2010); *second*, relative price shocks measured by the rate of change in the relative price of manufactured to agricultural goods, weighted by the share of the manufacturing sector in total SDP (Nagaraj et al., 1998); *third*, public and private investment in both domestic and foreign fronts, and different variables representing physical, social and economic infrastructure (Nagaraj et al. 1998; Ghosh and De, 1998, 2004; Sachs et al, 2002; Trivedi, 2002; Nayyar, 2008; Bandyopadhyay, 2003; Baddeley et al, 2006; Kalra and Sodsriwiboon, 2010); *fourth*, educational and non-educational human

capital represented by different variables (Nagaraj et al, 1998; Sachs et al, 2002; Trivedi, 2002; Nayyar, 2008; Bandyopadhyay, 2003; Kalra and Sodsriwiboon, 2010); *fifth*, state-level investment in economic and social sectors (Baddeley, 2006), and efficiency in the use of development spending (Kalra and Sodsriwiboon, 2010). For the entire period 1980-81 to 2009-10, the primary sector demonstrates the highest variability in growth rates across states, followed by the secondary and tertiary sectors respectively (Chowdhury, 2014). Besides, the 12th Five Year plan notes that the reasons for the persistence of wide disparity in per capita income across Indian states is not only that low per capita states such as Uttar Pradesh, Bihar and Rajasthan, Odisha and Madhya Pradesh have low growth rates, but also high growth rates of population (Mohanty, 2015).

To sum up, the important reasons for regional disparities in India may be the uneven distribution of natural resources, employment and concentration of industrial activities in a few developed locations. The geographic location and inadequate overheads like transport, labour, power, technology, banking and insurance, etc., also explain the disparity across states. Some people also blame the five years plans for widening the disparity level across states by favouring relatively developed states in terms of allocating plan outlays. From 1st plan to the 7th plan, Punjab and Haryana have received the highest per capita plan outlay, all along. The other three states like Gujarat, Maharashtra and Madhya Pradesh have also received larger allocation of plan outlays in almost all the five year plans. On the other hand, the backward states like Bihar, Assam, Odisha and Uttar Pradesh and Rajasthan have been receiving the smallest allocation of per capita plan outlay in almost all the plans. Illiteracy, corruption, and lack of political vision also intensified backwardness and disparity. Growing regional imbalances in India has also been resulted from lack of motivation on the part of the backward states for industrial development. Another important factor responsible for growing regional disparity is the political instability in the form of unstable government, extremist violence, law and order problems, etc. in backward regions of the country. The state-level factors, such as political uncertainty, caste-based politics and religious and social unrest, are preventing Uttar Pradesh and Assam from reaping the benefits of the overall economic success of India (Mishra and Mishra, 2015).

Policy Suggestions

It is learnt from the existing literature that the observed patterns and dynamics in the economic performance of the states over last decades can better be explained in terms of inter-state variations in physical and/or social infrastructures, state-level policy reforms, cross-border capital flows, economic structure and relative performance of the states at the sectoral level. The most important factors driving growth come from the health, education, transport, agriculture, and energy sectors (Chotia and Rao, 2015). Improvement in educational opportunities, especially focused on high poverty and low literacy areas, would be one of many potential policy recommendations. Health and education are instrumental in improving human development and accelerating economic development. Health facilities comprise medical care, nutrition, and water supply; education pertains to quality of educational institutes, literacy rate etc. In transport, roads and railways need to be developed first of all. Agriculture is one of the sectors on which the Indian economy depends and remains a major source of income for many, and so requires special attention. Finally, energy is a sector that needs consistent development and progress.

Regional disparities in India are accounted for by differences, first, in the structure of production, second, in infrastructure endowments, and, third, in State-specific fixed effects in the growth regression. Consequently, economic policy measures aiming at improving the availability of physical, economic, and social infrastructure can have a significant impact in promoting long-run growth, as well as convergence across Indian States (Nagaraj et al, 1998). Our results support the view that there is a strong case for proactive public policy to induce more investment in backward states either through public investment or through fiscal incentives. Simultaneously, efforts should be made to restrain population growth, especially in backward states. Finally, the quality of governance and in particular the efficiency of investment should be given more attention at the state level (Bhattacharya and Sakthivel, 2004).

Conclusion

In India, the disparities created by man on account of socio-economic, political, religious and cultural aspects have been hindering the balanced growth of the country since a long time. In economics, disparity relates to per capita real income, employment opportunities, infrastructure facilities, amenities and services which help interpreting the material well-being of the populace. And, the primary goal of economic planning is to bring uniform regional development that improves quality of life. However, the case of India is an exception. Since the days of British Regime, India has been witnessing regional imbalances which have been amplified in the post-independence period, and further accentuated in the post-reform period. The growing regional disparity in the post-reform period is a matter of serious concern. In this era, with deregulation of private investment, faster growth induced more investment, and this in turn accentuated regional disparity. This has certainly impaired the regional harmony across states and posed a serious threat to the growth and development of the Indian economy. Thus, we have undertaken this piece of research to provide empirical evidences to support the theoretical perceptions of widening regional disparity in India. Applying various metrics from simple Maximum to Minimum Ratio to β -convergence tests on fifteen selected states over the observation period spanning from 1960-61 to 2014-15, we found the evidence for the persistence of regional disparities in terms of real per capita income in India. However, the disaggregated study of each decade provides the mixed results. Our study found divergence in terms of real national income for 1970s, 1990s, and 2000s, but convergence for 1980s and for 2010-15. Such a finding of convergence in the last five years is although outweighed by dominating diverging trends of the past, express a little hope for success of the inclusive growth in India. The most worrisome divergence trends are due to several factors which need the attention of the policy circle, if we wish to have the sweet fruits of inclusive sustainable development. In terms of policy content, basic infrastructure, such as health, education, transport, and political governance require the most attention in the lower income states, while for higher income states, macroeconomic stability and political governance seem to be the more important (Bandyopadhyay, 2002).

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Regional Disparity in Development of Odisha Economy: Assessment of Schemes, Issues and Challenges

Pradeep Kumar Panda¹

Odisha is one the fastest growing state economies in India. According to 2015-16 Economic Survey, Odisha's gross state domestic product (GSDP) was expected to grow at 7-8% in the 2014-15. Odisha has an agriculture-based economy which is in transition towards an industry and service-based economy. According to Dun and Bradstreet report, the GSDP is expected to grow at a rate of 8.1% during 2015-2020. Odisha is also one of the top FDI destinations in India. However, the state faces several developmental issues in terms of regional disparity. Removal of regional disparities has been one of the important development strategies of the State Government. However, due to several economic, social and institutional obstacles, all regions in Odisha have not shared the gains of development in an equitable manner. Some regions continue to remain backward. The undivided districts of Koraput, Bolangir and Kalahandi (KBK districts) form one such region where the incidence of poverty is very high. Several other pockets of southern and western Odisha are also socially and economically depressed. These regions are also frequently visited by natural calamities including severe droughts and floods. Persistence of heavy incidence of poverty in these regions is a cause of concern. Nine key initiatives, which have been taken to address problems of underdevelopment and regional disparities, are: Special Plan for KBK districts, Biju KBK Plan for KBK districts, Biju Kandhamal 'O' Gajapati Yojana, Backward Regions Grant Fund, ACA for Leftwing Extremism Affected Districts, Gopabandhu Gramin Yojana, Western Odisha Development Council for backward western districts, Grants-in-aid received to bridge critical infrastructure gaps in identified sectors in the Tribal Sub Plan (TSP) areas, and implementation of development programmes in TSP areas funded out of Special Central Assistance. The State needs to conceptualize a well articulated development strategy with special emphasis on poverty and human development with emphasis on building rural and urban productive infrastructure, strengthen the momentum already gained in mobilizing rural poor with emphasis on, women and vulnerable groups, Strengthening social security system to reduce IMR, MMR, provide food security, and increase female literacy etc, Focused efforts for reducing poverty and achieving Sustainable Development Goals, Improving governance and service delivery mechanisms, Promoting broad-based growth, encouraging private investment, public private partnership and public private community partnership, Emphasis on creation of adequate self-employment / employment opportunities, Enhancing and promoting convergence at district level across large number of Government programmes through strengthening Integrated District Planning to achieve

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the SDGs, Focus on household based Micro-Planning to provide support for livelihoods of most vulnerable groups in different parts of the State with special emphasis to KBK region.

Key Words: Odisha Economy, Growth, Inclusion, Regional Disparity, Development, Issues, Challenges, Poverty, Inequality

Introduction

Odisha is accredited as a good performer of economy in terms of better economic growth rates. The continuing economic slowdown at global as well as national level did not deter Odisha State to achieve higher anticipated economic growth rate of 7 to 8% in real terms at Market prices 2014-15. Odisha's economy has grown at a real annual average rate of 8.23% at 2004-05 prices during the 11th Plan period. Significantly, the real annual growth rate of the agriculture and allied sectors in the State has been 3.4% during the 11th Plan. It is worthwhile to mention here that human development indicators have also improved across all regions and all classes in Odisha. The overall literacy rate for Odisha is 73.45% against the national average of 74.04% in 2011, male literacy being 82.40% and female literacy 64.36%. The gender gap in literacy has come down from 24.84 percentage points in 2001 to 18.04 in 2011. The rural-urban gap in literacy levels has reduced from about 21 percentage points in 2001 to about 16 percentage points in 2011. Infant mortality rate and maternal mortality ratio have declined from 73 and 303 respectively in 2006 to 61 and 258 respectively in 2011.

Ten districts namely Jharsuguda, Kandhamal, Angul, Khorda, Sambalpur Sundergarh, Cuttack, Kendujhar, Koraput and Jagatsinghpur have per capita income higher than Odisha with Jharsuguda reporting the highest per capita income, followed by Angul. The per capita income of Kandhamal district was higher probably due to bumper crop production, particularly of ginger and turmeric production during 2010-11 and lowest population density in the State. In term of percentage share of GDDP to State GSDP, Sundargarh contributed maximum to the State's GSDP with 8.54% share followed by Khorda (7.52%) and Cuttack and Ganjam (7.09% each) in 2010-11. Deogarh district contributed lowest to GSDP of Odisha with 0.53 GDDP share in 2010-11.

Present section gave an overview of Odisha Economy. Section II outlines Objective, Data Source and Methodology of the present study. Section III outlines current scenario of Regional Disparity along with issues and challenges. Section IV outlines assessment of various Central Government and State Government Scheme for addressing Regional Disparity. Summary with strategies to overcome these issues and bottlenecks are outlined in Section IV.

Objective, Data Source and Methodology of the Study

The objective of the present study is to:

- i. Assessment of current scenario of Regional Disparity along with issues and challenges.
- ii. Assessment of various Central Government and State Government Scheme for addressing Regional Disparity
- iii. Strategies to overcome these issues and bottlenecks.

Data were collected from Odisha Economic Survey published by Planning and Coordination Department, Government of Odisha. General measures of central tendency and dispersion are applied for data analysis.

Current Scenario of Regional Disparity

Per capita income is an important indicator of standard of living of the people. The rising trends of per capita real Net State Domestic Product (NSDP) for Odisha from 2004-05 to 2014-15 at 2004-05 prices are observed. The per capita income (real NSDP) of Odisha during 2014-15 is estimated at Rs. 28,384 as per the advance estimates, which accounted for a growth rate of 7.31% over 2013-14. Before the beginning of the 11th Plan, i.e., during 2006-07, the per capita income of Odisha was Rs. 21,585. It increased to Rs. 25,847 in 2011-12, i.e., at the end of 11th Plan, registering a growth of 19.74% during the 11th plan period. Odisha has been continuously striving to bridge the gap in the real per capita income with the national average. Though the gap in real per capita income between Odisha and the national average has been reducing over the recent years, this gap has remained as area of concern. Odisha still lags far behind in comparison to several faster growing states and national averages. As per the advance estimate of State-wise GSDP for 2013-14, the real per capita NSDP of Odisha in 2013-14 at factor cost at 2004-05 prices was Rs. 25,891, which was higher than that of Bihar, Uttar Pradesh, Assam.

Employment: In the 2011 Census, the population of Odisha was reported to be 4.20 crore – about 3.47% of the population of the country. As per 2011 population census, the total number of workers was 175.42 lakh, of which 151.04 lakh (86.1%) were in rural Odisha and 24.38 lakh (13.9%) in urban Odisha. The male workers were 119.03 lakh, which constituted 67.9% of the total workers and female workers were 56.39 lakhs being 32.1% of total workers. The main workers numbered 107.08 lakh constituting 61% of the total workers, while the cultivators were reported as 41.04 lakh (23.4% of total workers) and agricultural labourers 67.40 lakh (38.4% of the total workers). In rural areas, the percentage of main workers to total workers accounted for 57.1% and in urban areas it was 85.5%. Further, it was also reported that total number of marginal workers was 68.34 lakh constituting 39% to the total workers, out of which 81.9% were engaged for 3-6 months and the balance 18.1% were engaged for less than three months during the reference period. Census data for 2011 reveal that there was an increase of 22.9% of total workers in 2011 census over 2001 census. The proportion of male workers to male population and female workers to female population in the State stood at 56.1% and 27.2% respectively.

Poverty: Odisha has historically witnessed higher incidence of poverty. In recent years Odisha has been able to reduce poverty at faster rates. As per estimates made by the Planning Commission based on the Tendulkar Committee methodology, poverty in Odisha declined by 24.6 percentage points from 57.2 per cent in 2004-05 to 32.6 per cent in 2011-12. This was the highest poverty reduction by any major State in the country. Poverty declined in all National Sample Survey regions (i.e., coastal, northern and southern regions) and among all social classes (i.e., ST, SC, OBC and others) of Odisha. This implies inclusive growth in Odisha. Though there has been significant poverty reduction among ST and SC communities and in northern and southern regions, the incidence of poverty in

southern and northern regions as well as among ST and SC communities still continues to be high and remains a matter of concern. The State witnesses wide regional, social and general disparities in development. All regions have not shared the gains of development in an equitable manner.

Issues and Challenges:

A daunting challenge is to transform rural economies and achieve higher sustainable growth in agriculture and allied sectors. This would significantly contribute to the objective of more inclusive growth and require appropriate measures to raise productivity of the agriculture and allied sectors so that the income and employment opportunities in these sectors are enhanced in a sustained manner. Sustainable growth in agriculture will depend upon large scale public investment in expanding irrigation facilities. Increasing irrigation potential and drought proofing are critical pre-requisites to enhance agricultural productivity. A renewed thrust is needed to expand irrigation, promote watershed development at a massive scale in rain-fed areas, diversify crops, strengthen rural marketing, encourage agricultural extension and technology transfer, expand crop insurance and improve rural infrastructure. Higher growth targets for agriculture and allied sectors can be achieved if public and private investments in these sectors are substantially augmented and appropriate institutional reforms are undertaken in an expeditious manner. There is an urgent need to ensure that Long Term Farm Credit is available and made affordable to farmers with a view to encouraging capital formation in the farm sector. More specifically, long term credit for agriculture and allied sectors should be made available by the banks at a rate not exceeding 7 per cent. There is a need to substantially enhance the scope of, and central funding for, Integrated Watershed Management Programme in rain-fed areas and to extend AIBP or other central funding to support Mega Lift Projects. The state has rightly put emphasis on sustainability of economic development which underscores the need for sustainable management of natural resources including biodiversity, environment, forests, land and water. The need of the hour is to substantially augment human resource development capacities at both national and state levels. More and more institutions of higher technical and managerial learning and massive networks of ITI, tool rooms, centres of excellence and other training facilities are required to be established throughout the state with a view to enhancing employable technical and soft skills of unemployed youth. Odisha should put employment generation on a mission mode by way of convergence of resources and activities under different programmes and aims at generating at least one million self employment and employment opportunities for unemployed people. The state should also focus on substantially improving human development indicators and stepping up investments in social sectors, particularly health, education, poverty eradication and other social safety nets. We suggest that subsidized LPG connections should be provided for implementation of Mid-Day-Meal programme and supplementary nutrition programme so that cooking is undertaken in an eco-friendly environment. There is also need to make adequate provisions for gender equality and child and women welfare. Special efforts are needed to arrest fast declining sex ratio among children in 0-6 year age group and to improve the welfare of girl children. Greater attention is needed to substantially improve human development indicators and welfare of disadvantaged sections, particularly Scheduled Castes and Scheduled Tribes. A conditional cash transfer

scheme for promoting girls' education in the educationally backward blocks would be really worthwhile. The physical infrastructure and Human Development Index of the tribal areas calls for massive public investment. State has embarked upon an ambitious plan to provide hostel facilities to 5 lakh girl children belonging to Schedules Tribes and Scheduled Castes. The growth strategy should focus on raising the productivity of the economy and creating an environment which enables private and public sectors to realize their full potential. The Plan document also highlights various dimensions of inclusiveness and accords very high priority to develop human capabilities, particularly those of marginalized and disadvantaged sections so that they are enabled to take advantage of emerging opportunities. These are challenging tasks and would require greater attention and immediate actions on several fronts including enabling policies and programmes. It is also necessary that the objective of high growth is complemented by appropriate and adequate social protection measures. A major challenge currently is to enhance the economy's capacity for growth, to deal with the issues of regional disparities, particularly those of widening gap between more developed and less developed areas, and to mobilize adequate resources from various sources. The state should give reasonable tax breaks for attracting private investment in labour intensive manufacturing, agro-processing, tourism and other employment generating sectors. The removal of intra-state imbalances has been receiving special attention in the plan strategy of the State. The Koraput-Bolangir-Kalahandi (i.e., KBK) region of Odisha still considerably lags behind in terms of most development indicators.

Assessment of Schemes

Removal of regional disparities has been one of the important development strategies of the State Government. However, due to several economic, social and institutional obstacles, all regions in Odisha have not shared the gains of development in an equitable manner. Some regions continue to remain backward. The undivided districts of Koraput, Bolangir and Kalahandi (popularly known as KBK districts) form one such region where the incidence of poverty is very high. Several other pockets of southern and western Odisha are also socially and economically depressed. These regions are also frequently visited by natural calamities including severe droughts and floods. Persistence of heavy incidence of poverty in these regions is a cause of concern. Nine key initiatives, which have been taken to address problems of underdevelopment and regional disparities, are:

Special Plan for KBK Districts: The State Government, in consultation with the Government of India, has formulated a Long Term Action Plan (LTAP) / Revised Long Term Action Plan (RLTAP) for speedy development of the KBK districts. The special plan has focused on improving productive infrastructure, strengthening livelihoods of the marginalized communities, improving literacy levels and accelerating the pace of development in this region. Special Central Assistance to the extent of Rs. 2,593.95 crore has been received from 1998-99 to 2013-14 and an amount of Rs. 2,570.18 crore has been utilised by the end of March, 2014.

Biju KBK Plan: In order to fill up critical gaps in development of the KBK region, a scheme "Biju KBK Plan" was launched during the year 2006-07 in the KBK districts out of the State's own funds. The focused areas of the scheme are Bijli, Sadak and Pani, i.e., Village electrification including street lighting, construction of concrete roads within the village or any other form of connectivity and

creation of irrigation / drinking water source. An outlay of Rs.120.00 crore has been proposed for this scheme in the annual plan 2014-15. Out of that Rs. 80.00 crore has been provided towards State sector and Rs. 40.00 crore for district sector.

Biju Kandhamal O Gajapati Yojana (BKGY): The State Government launched a new special development initiative, called BKGY during 2009-10 under the State plan in order to accelerate the development process and expedite poverty reduction in tribal dominated Kandhamal and Gajapati districts. The focused areas of the scheme are: Biji,, Sadak, Pani and livelihood initiatives. An annual outlay of Rs. 28.50 crore has been envisaged for the scheme and accordingly a sum of Rs. 28.50 crore have been proposed in the Annual Plan, 2014-15.

Western Odisha Development Council (WODC): The State Government has constituted a WODC comprising of ten districts spread over about 57,384 sq. km which is 36.85% of the total geographical area of the state. A total sum of Rs. 893.38 crore has been provided to WODC since inception. A grant-in-aid of Rs. 100.00 crore and a special grant of Rs. 50 crore has been provided to the Council annually since 2008-09 to undertake developmental programmes in the area. The council has approved 21,327 projects out of which 15,740 projects have been completed. During the year 2013-14, the council has approved 2842 completed projects out of 3895 new projects with estimated cost of Rs. 143.37 crore.

Backward Regions Grant Fund (BRGF): This is a central scheme launched during the year 2006-07 in 20 districts. Since inception till date, the total receipts under BRGF was Rs. 1937.78 crore and expenditure was Rs.1775.55 crore and completed 57,739 number of projects out of 89,734 taken up. The total annual provision for 2013-14 under BRGF scheme made by the Govt. of India is Rs. 437.01 crore. Out of this provision, Rs. 417.01 Crore is earmarked for Development “Grant and Rs. 20.00 crore for capacity building.

Integrated Action Plan (IAP): A special scheme, called “Integrated Action Plan (IAP)”, has been introduced by the Government of India from the year 2010-11 for selected tribal and backward districts. The scheme has been renamed as “Additional Central Assistance (ACA) for LWE Affected Districts” from the year 2013-14. Initially a block grant of Rs. 25.00 crore per district was allocated, which increased to Rs. 30.00 crore from 2011-12. The objectives of the scheme are to bring about quick perceptible improvement and visible impact in public infrastructure and services through implementation of short gestation prioritized tangible projects reflecting the felt critical needs of, and immediate benefits to the local people. Under this scheme, various types of 34,071 projects including school buildings, ST / SC hostels, Anganwadi centres, Primary Health Centres, roads, culverts, bridges, tubewells, pipe water supply works, check dams and other projects have been approved and 22,224 projects have been completed by March 2014. Skill development programmes have also been funded under this programme with a view to enhancing employability of youth. Odisha emerged as the best performing state in all 9 states by way of utilizing 91.70% of available funds against the national average of 87.88%.

Special Central Assistance for TSP Area: Special Central Assistance (SCA) is being received from the Ministry of Tribal Affairs (MOTA) for implementation of programmes under ITDA, MADA, and DTDP

and MPC for development of Scheduled Tribes. During 2013-14, an amount of Rs.133.21 crore has been spent on different schemes and 1348 works have been completed covering 0.94 lakh beneficiaries. Similarly, MOTAs provide grant-in-aid as SCA to the State under 1st proviso of Article 275 (i) of the Constitution for creation of infrastructure in TSP areas and for setting of Model Schools. Besides, Integrated Livestock Development has been included under this programme, which aims at providing services of artificial insemination and veterinary First Aid to cows and buffaloes by setting up 770 Integrated Livestock Development Centres in tribal areas of 13 districts at a total project cost of Rs.108.06 crore.

Gopabandhu Gramin Yojana (GGY): The scheme has been launched by the State Government during 2006-07 with a view to providing additional developmental assistance to the targeted 11 districts which are not covered under the BRGF. The principal objective of the scheme is to provide rural infrastructure, primarily Bijli, Sadak, and Pani, to every revenue village in the identified districts. During 2013-2014, a sum of Rs. 225 crore has been provided for implementation of GGY project. During the year, emphasis has been given on construction of cement concrete road within the village and connecting a village with nearest PMGSY or ODR road. Another sector on which emphasis has been given during this financial year is funding support for Higher Capacity Distribution Transformers and re-conducting of 33KV line under GGY. It has been decided in the high level meeting that funds not exceeding Rs. 3 crore per district per year under GGY will be utilised for replacement of burned transformers and providing High-Power transformer to provide un-interrupted power supply in rural areas.

Conclusion and Strategies for Balanced Growth

Removal of regional disparities has been one of the important development strategies of the State Government. However, due to several economic, social and institutional obstacles, all regions in Odisha have not shared the gains of development in an equitable manner. One of the criticisms of economic reforms and globalization is that they do not have 'human face'. Although economic growth increased in Odisha, inclusive and balanced growth has to be improved. We suggest following measures for enhancing growth and to overcome the issues in Odisha.

If we define equity in terms of empowerment and increase in the participation of the poor, there is no trade-off between inclusive and balanced growth and economic growth.

Second, agriculture development should be given priority for more balanced growth. Agriculture has been an area of strength for Odisha but has not received adequate priority in the last two decades. Stepping up agricultural growth is essential for raising the growth rate in GSDP and for reducing poverty.

Third, investment in infrastructure is important for inclusive and balanced growth. For this, sequencing of reforms or phasing of public policy is important. Priority should, therefore, be given to the policies that improve quality and quantity of employment growth. Priority to public investment in physical (irrigation, roads, communications, transport, electricity etc.) and human infrastructure (health, education etc.) is considered one of the important factors responsible for inclusive growth.

Fourth one which is related to second one is that structural change in economy which should follow agriculture-industry-service sequence. For example, in GDP shares, like other states in India, Odisha jumped from agriculture to services without concentrating on manufacturing. Therefore, there is a need to develop industry in order to improve employment.

Fifth, equality of opportunities is important. Even if we do not follow equitable distribution of assets, everyone should get equal opportunity for better education and health. A sustained emphasis on education and health and improvement in delivery of public services are needed in the next decade in many states for inclusive growth.

Sixth, the regional disparities can be reduced by speedy completion of ongoing irrigation projects, investments in remaining irrigation projects and rehabilitation of tanks etc. in drought prone regions of KBK region. Public expenditure on health and education needs to be stepped up substantially focusing on less developed areas.

Seventh, South East Asian and East Asian experience shows that globalization with better initial conditions have increased employment and incomes for workers and lead to equitable development. Therefore, Odisha should also learn from these experiences.

Eighth, development of technology is important for inclusive and balanced growth. For example, the spread of green revolution in Odisha showed that small farmers benefited from technology. This is because gains from technology are widely distributed. Therefore, stepping up agricultural growth through the use of biotechnology holds considerable prospects for reducing regional and interpersonal disparities.

Ninth, it has been recognized that better governance is very important for inclusive and balanced development. This is important for better implementation of sectoral policies and poverty alleviation programmes. Social mobilization, community participation and decentralized approach are needed.

Tenth, all over the world it is recognized that decentralization in terms of transferring power to local councils is important for rural development. Odisha needs to make a significant progress towards financially and administratively strengthening these institutions making them self-sustaining.

Eleventh suggestion is the need to have economic reforms in relation to socio-economic environment. However, these 'economic' phenomena are present largely a superstructure, which is profoundly influenced by the underlying socio-political factors. The economic reforms may not be sustainable if the burden falls disproportionately on the poorer sections of the population. Therefore, there may be a need for meaningful economic reforms that is in line with socio-political factors. Some political space is needed in implementing policies.

To conclude, there is a need to operationalize a plan for achieving inclusive and balanced growth during the Plan period and beyond in Odisha. The action plan should cover the priority areas like agriculture, employment and social sectors. It should have a plan for removing economic and social deprivation across all regions and for socially disadvantaged sections.

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An Inter-temporal Analysis of Regional Disparities in Agriculture in India

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India is known worldwide for its diversity, be it in language, culture, religion, climate and topography or resource endowments. This diversity in socio-economic factors and differences in the agricultural policies of states account for diversity in agricultural development in the country. In addition to this the adoption of New Agricultural Technology that emphasised the use of improved seeds and chemical fertilisers in the regions having assured irrigation facilities widened the gap in agricultural production and productivity among states in India during 1960s. The strategies of Green Revolution, as the name goes, was having a built-in bias towards the promotion of both intra and inter regional inequalities. This is akin to differences in the size of land holdings and inequality in availability of irrigational facilities as corroborated by numerous empirical studies. Another equally important factor in the process of inter regional divergence is the crop specificity of Green Revolution. Only in respect of wheat, the yields have significantly increased. (Krishnaji, 1975). Since agriculture is the main source of income of the rural population in India, imbalances in its growth among different regions have led to inequalities in income and standard of living. (Rao, H. 1977)

The present paper attempts to study the disparities in production and productivity of five major crops among 13 Indian states using secondary data and measuring the coefficient of variation. It is found that the inter-state disparities in agricultural production and productivity has declined as a whole so also for cereals and sugarcane. The inter-state divergence is seen in the production of pulses and fibres while convergence is there in their productivity. Inter-state divergence has aggravated in the production and productivity of oilseeds. The states like Punjab, Maharashtra, Haryana, Gujarat, Andhra Pradesh and West Bengal are better performers agriculturally as compared to other states. Creation of awareness regarding the use of inputs, soil-water management and marketing facilities in those states is necessary for balanced agricultural development.

Key Words: Agriculture, Regional Disparity, Convergence, Divergence

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Introduction

India is known worldwide for its diversity, be it in language, culture, religion, climate and topography or resource endowments. This diversity in socio-economic factors and state agricultural policies account for diversity in agricultural development in the country. In addition to this the adoption of New Agricultural Technology that emphasised the use of improved seeds and chemical fertilisers in the regions having assured irrigation facilities aggravated the gap in agricultural production and productivity among states in India during 1960s. The strategy of Green Revolution, as the name goes, was having a built in bias towards the promotion of both intra and inter regional inequalities. This is akin to differences in the size of land holdings and inequality in availability of irrigational facilities as corroborated by numerous empirical studies. Another equally important factor in the process of inter regional divergence is the crop specificity of the Green Revolution. Only in respect of wheat, the yields have significantly increased. (Krishnaji, 1975). Since agriculture is the main source of income of the rural population in India, imbalances in its growth among different regions have led to inequalities in income and standard of living. (Rao, H. 1977) G.S.Bhalla and G.Singh (1997) analysed the agricultural development in India during 1962-95 and found that there is significant variation in agricultural production and absorption of agricultural inputs in different states.

Thus the first decade following the Green Revolution is believed to have witnessed increasing interstate disparities with respect to agricultural production and productivity. Even though attempts have been made during 1980s and 1990s to increase the productivity in less advantageous states the average yield of various crops varies significantly among Indian States.

In this backdrop an attempt has been made in the present paper to study the disparities in agricultural production among Indian states. It is organised in the following manner. Section II presents the objectives of the study. The methodology is discussed in section III. Section IV deals in the result discussion followed by the concluding section.

Objectives

1. To study the variation in agricultural production and productivity among states of India.
2. To analyse the inter-state disparities in production and productivity of different crops.

Methodology

For the study the production and productivity of 5 major crops in 13 major states are considered. The data have been collected for 2 points of time 2007-08 and 2013-14 from Economy survey, Agricultural statistics in India, Directorate of Economics and Statistics, Department of Agriculture and Cooperation and Statistical Handbook of RBI The existence and trend of disparities are obtained by measuring the coefficient of variation over these time periods.

Result Discussion

The variation in agricultural production (in million tonnes) and productivity (in kg/ha) among 13 major states of India at selected points of time (2007-08, 2013-14) is presented in Table-1. A cursory glance at the table reveals that Maharashtra tops the list with highest agricultural production

producing 130.74 MT followed by Andhra Pradesh (66.28MT) and Punjab (62.75 MT) during 2007-08. Assam, Odisha and Bihar are there in the bottom of the list having a total agricultural production of 8.74, 17.85, 27.18 million tonnes respectively. The agricultural production is high in four states in the year 2013-14, that is Maharashtra 118.75 MT followed by 67.66 MT in Punjab, 65.35 MT in Karnataka and 63.64 MT in Andhra Pradesh. It is seen that the total agricultural production has declined in states like Maharashtra, Andhra Pradesh and Tamilnadu, it has increased in all other states. There is an increase in the total agricultural production on an average from 47.7185 MT in 2007-08 to 52.0915 MT in 2013-14. But the coefficient of variation decreases from 62.55 percent in 2007-08 to 49.82 percent in 2013-14 showing the convergence of Indian states in terms total agricultural production.

In terms of the total agricultural productivity coefficient of variation decreases from 87.31 percent in 2007-08 to 70.67 percent in 2013-14 implying that there is a reduction in the inter-state disparity. It is disheartening to see that on an average the total agricultural productivity is declining from 748.07 in 2007-08 to 595.71 in 2013-14 despite all the attempts made to increase it. The convergence observed is due to the decline in productivity in states like Andhra Pradesh, Madhya Pradesh, Gujarat, Bihar and Maharashtra accompanied by an increase in productivity in other states.

Table -1: Total Agricultural Production and Yield in Major States of India

Production-(Million Tonnes)

Yield-(Kg/Hectare)

SI No.	States	2007-08		2013-14	
		Production	Yield	Production	Yield
1.	Andhra Pradesh	66.28	488.53	63.64	438.53
2.	Assam	8.74	227.66	12.20	293.26
3.	Bihar	27.18	344.83	40.58	53.07
4.	Gujarat	44.60	2371.07	47.92	344.74
5.	Haryana	42.00	99.05	44.64	702.88
6.	Karnataka	52.94	410.61	65.35	634.77
7.	Madhya Pradesh	34.53	721.78	57.49	135.46
8.	Maharashtra	130.74	579.59	118.75	513.71
9.	Odisha	17.85	196.78	18.20	201.01
10.	Punjab	62.75	797.33	67.66	856.23
11.	Rajasthan	37.77	1701.35	43.48	1489.55
12.	Tamil Nadu	52.58	1178.92	51.39	999.80
13.	West Bengal	42.38	607.42	45.89	1081.29
	Mean	47.71	748.07	52.09	595.71
	S.D.	29.84	653.17	25.95	420.99
	CV	62.55	87.31	49.82	70.67

Source: Directorate of Economics and Statistics, Department of Agriculture and Cooperation

Table-2 shows the inter-states disparities in production (MT) and productivity (kg/per hectare) of cereals in two time periods. During the period 2007-08, Punjab has been at the top of the list with 26.21 followed by West Bengal, Haryana and Andhra Pradesh with 15.64, 13.85 and 13.4 respectively. States like Assam and Karnataka are in the bottom of the ladder. As the table shows, on an average the production of Cereals has increased from 9.77 million tonnes in 2007-08 to 11.75 million tonnes in 2013-14. A decline in the coefficient of variation from 64.68 percent in 2007-08 to 62.97 percent in 2013-14 shows a reduction in inter-state inequalities in Cereals production in India. The productivity of Cereals in India is high in Punjab 4296 (kg/hect.) followed by 3912 in Haryana and 3260 in Andhra Pradesh during 2007-08. Again Punjab is having the highest productivity of Cereals in 2013-14 that is 4451 (kg/hect.). The second and third position in yield of Cereals is occupied by Haryana 4235 (kg/hect.) and Rajasthan 2820 (kg/hect.). A reduction in coefficient of variation from 62.97 percent to 35.48 percent reflects a decline in interstate disparities in Cereals production. It is due to the success of green revolution in the states.

Table-2: Inter-State Disparities in Production and Productivity of Cereals

Production-(Million Tonnes)
Yield-(Kg/Hectare)

SI No.	States	2007-08		2013-14	
		Production	Yield	Production	Yield
1.	Andhra Pradesh	13.4	3260	20.03	2478
2.	Assam	3.39	1424	4.81	2082
3.	Bihar	8.87	1547	10.59	1972
4.	Gujarat	5.31	2615	5.27	2462
5.	Haryana	13.85	3912	15.8	4235
6.	Karnataka	3.98	2341	3.99	2590
7.	Madhya Pradesh	5.08	1801	4.55	1710
8.	Maharashtra	7.49	707	16.71	2086
9.	Odisha	7.75	1692	7.81	1807
10.	Punjab	26.21	4296	28.31	4451
11.	Rajasthan	10.62	2452	12.75	2820
12.	Tamil Nadu	5.42	2913	5.97	1503
13.	West Bengal	15.64	2578	16.26	2784
	Mean	9.77	2426.00	11.75	2536.46
	S.D.	6.32	1015.11	7.40	900.03
	CV	64.68	41.84	62.97	35.48

Source: Directorate of Economics and Statistics, Department of Agriculture and Cooperation

Table-3 reveals the inter-states disparities in production and productivity of Pulses in India. During the period 2007-08 to 2013-14 the mean production of pluses has increased from 0.9985 to 1.3631MT and coefficient of variation also increases that is 94.00 percent in 2007-08 to 105.81 percent in 2013-14. Similarly, the mean yield of pulses increases from 589.08 in 2007-08 to 726.15 in 2013-14 and the coefficient of variation decreases i.e. 34.97 percent to 30.68 percent from 2007-08 to 2013-14. Results show that there is increase in inequality in production of pulses while inequality is coming down in its yield.

Table-3: Inter-State Disparities in Production and Productivity of Pulses

Production-(Million Tonnes)
Yield-(Kg/Hectare)

SI No.	States	2007-08		2013-14	
		Production	Yield	Production	Yield
1.	Andhra Pradesh	1.70	803	1.55	928
2.	Assam	0.64	544	1.20	576
3.	Bihar	0.50	818	0.52	984
4.	Gujarat	0.74	843	0.74	910
5.	Haryana	0.10	602	0.13	850
6.	Karnataka	1.27	531	1.47	597
7.	Madhya Pradesh	2.45	609	5.09	938
8.	Maharashtra	3.02	746	3.12	796
9.	Odisha	0.38	446	0.42	529
10.	Punjab	0.29	219	0.32	290
11.	Rajasthan	1.55	401	2.47	589
12.	Tamil Nadu	0.19	303	0.44	500
13.	West Bengal	0.15	793	0.25	953
	Mean	.9985	589.08	1.36	726.15
	S.D.	.93864	206.04	1.44	222.83
	CV	94.00	34.97	105.81	30.68

Source: Directorate of Economics and Statistics, Department of Agriculture and Cooperation

Disparities in production (MT) and productivity (kg/per hectare) of Nine Oilseeds in 13 major states in India are shown in Table-4. It is observed that the mean production of this crop is almost same i.e. 2.1654 and 2.4069 in both these periods .The coefficient of variation also increases from 102.67

percent in 2007-08 to 112.44 percent in 2013-14 reflecting existing interstate disparities. The productivity figure depicts that there is an increase in it from 1097.15 in 2007-08 to 1243.69 in 2013-14 and the coefficient of variation also increases from 32.98 percent to 43.88 percent in 2007-08 to 2013-14. It depicts widening of inequality in the productivity of nine oilseeds among the states.

Table-4: Inter-State Disparities in Production of Nine Oilseeds

Production-(Million Tonnes)
Yield-(Kg/Hectare)

SI No.	States	2007-08		2013-14	
		Production	Yield	Production	Yield
1.	Andhra Pradesh	3.39	1276	1.84	934
2.	Assam	0.14	523	0.16	571
3.	Bihar	0.14	979	0.14	1114
4.	Gujarat	4.73	1618	6.84	2222
5.	Haryana	0.64	1214	0.90	1630
6.	Karnataka	1.55	681	1.28	853
7.	Madhya Pradesh	6.35	1015	6.66	850
8.	Maharashtra	4.87	1274	5.24	1177
9.	Odisha	0.20	608	0.16	727
10.	Punjab	0.08	1288	0.07	1372
11.	Rajasthan	4.20	1051	6.07	1150
12.	Tamil Nadu	1.15	1739	1.00	2382
13.	West Bengal	0.71	997	0.93	1186
	Mean	2.16	1097.15	2.40	1243.69
	S.D.	2.22	361.88	2.70	545.81
	CV	102.67	32.98	112.44	43.88

Source: Directorate of Economics and Statistics, Department of Agriculture and Cooperation

Table-5 shows the production and productivity of Fibres in India from the period 2007-08 to 2013-14. Gujarat was the highest producer in 2007-08 producing 8.35 MT followed by West Bengal and Maharashtra that is 8.37 and 7.05 MT. The mean value of Fibres production increases from 3.47 in 2007-08 to 4.21 in 2013-14. The coefficient of variation also increases as 86.45 percent in 2007-08 and 87.41 percent in 2013-14. So far as yield is concerned West Bengal tops the list. An increase in the

coefficient of variation 69 percent in 2007-08 to 127.23 in 2013-14 shows the widening gap even though yield of Fibres has increased in almost all the states.

Table-5: Inter-State Disparities in Production of Fibres

Production-(Million Tonnes)
Yield-(Kg/Hectare)

Sl No.	States	2007-08		2013-14	
		Production	Yield	Production	Yield
1.	Andhra Pradesh	3.99	3352	7.22	3166
2.	Assam	0.73	5214	0.75	3750
3.	Bihar	1.47	9187	1.98	12375
4.	Gujarat	8.35	3422	11.2	41328
5.	Haryana	3.99	7528	2.56	4063
6.	Karnataka	5.48	6447	1.42	1670
7.	Madhya Pradesh	7.05	2189	8.56	2200
8.	Maharashtra	2.07	3234	3.03	4734
9.	Odisha	0.15	1363	4.08	22666
10.	Punjab	2.41	3651	2.46	3075
11.	Rajasthan	0.91	1978	1.14	3454
12.	Tamil Nadu	0.21	15	0.55	2619
13.	West Bengal	8.37	11957	9.79	11383
	Mean	3.47	4694.00	4.21	8960.23
	S.D.	3.00	3239.09	3.68	11400.39
	CV	86.45	69.00	87.41	127.23

Source: Directorate of Economics and Statistics, Department of Agriculture and Cooperation

Table-6 presents the disparities in production and yield of sugarcane from 2007-08 to 2013-14 among thirteen major states in India. The production of sugarcane is highest in Maharashtra in both periods producing 88.40 and 76.55 respectively. But both production and productivity have declined in the state. The second highest producer is Karnataka with an increase in production but decline in productivity. As a consequence there is a decline in the total production on an average from 16.55 to 15.95 MT whereas the mean productivity has increased from 61495 to 66021. However, as there is a decline in the coefficient of variation in both production and productivity it can be construed that there is interstate convergence with respect to cultivation of sugarcane.

Table-6: Inter-State Disparities in Production of Sugarcane

Production-(Million Tonnes)

Yield-(Kg/Hectare)

SI No.	States	2007-08		2013-14	
		Production	Yield	Production	Yield
1.	Andhra Pradesh	20.30	82170	15.36	80000
2.	Assam	0.98	37692	0.97	33414
3.	Bihar	3.85	35496	13.48	50740
4.	Gujarat	15.19	71991	12.55	72126
5.	Haryana	8.86	63286	7.45	73000
6.	Karnataka	26.24	85752	35.91	85500
7.	Madhya Pradesh	3.18	42287	3.31	81702
8.	Maharashtra	88.44	80912	76.55	46621
9.	Odisha	1.10	55364	0.94	65951
10.	Punjab	6.69	60818	6.31	70918
11.	Rajasthan	1.06	927	1.14	1002
12.	Tamil Nadu	38.07	107484	31.76	97007
13.	West Bengal	1.27	75266	1.71	100294
	Mean	16.55	61495.77	15.95	66021.15
	S.D.	24.48	27581.52	21.47	27334.39
	CV	147.86	44.85	134.59	41.40

Source: Directorate of Economics and Statistics, Department of Agriculture and Cooperation

Conclusion

Looking back to the analysis of interstate variation in total agricultural production and productivity and also the same with respect to five major crops among thirteen major states, it can be recalled that there is a decline in the disparities in agricultural production and productivity as a whole. The same is the case with crops like cereals and sugarcane whereas interstate divergence is seen in the production of fibres and pulses but convergence in the productivity of these two crops. The interstate divergence has aggravated in production and productivity of nine oilseeds. However, as the study reveals states like Punjab, Maharashtra, Andhra Pradesh, Gujarat, Haryana and West Bengal are performing better agriculturally than the remaining states. Differences in rainfall, irrigation facilities, and resource endowments, nature of soil, climatic condition, storing and marketing facilities, and

implementation of extension activities, awareness and attraction towards farming are some of the reasons behind existence and widening of disparities among states in India. Thus it now can be construed that if at all a balanced agricultural development is to be achieved proper attention need be given to the farming sector in less advantageous states. In the alarming situation of climate change, the farmers should be provided with adequate information relating to preparation and use of bio-fertilisers and pesticides, water and soil management, crop diversification, water and soil management. Apart from this, steps need to be taken to make the farming a lucrative, profit making occupation through establishment of agro- based industries and provision of adequate storage and marketing facilities. To achieve the goal the sincere involvement of all the stakeholders starting from policy makers, executers, NGOs, administrators and above all the farming community is highly imperative.

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Infrastructure Disparities in India and Initiatives for Regional Cohesion

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Provision of adequate physical and social infrastructure in the form of transport, communication, energy, banking, irrigation, science and technology, education, health etc. are the supportive key inputs to ensure the avowed objectives of balanced regional development in India. They can be demand-driven when followed by investment in directly productive activities and supply-driven when preceded by investment in directly productive activities. Economic development has to be preceded, accompanied and followed by progress in infrastructure. The paper is an attempt to explore the causes, indicators and magnitude of infrastructure disparities in India across the States and regions, affecting agricultural and industrial development, percapita NSDP, growth rates and human development. The reforms process in India which strengthen market forces coupled with globalisation favoured forward States and neglected the backward States. Infrastructure development in India has been lopsided and urban-biased to the relative neglect of the rural areas. The Infrastructure Development Index developed by the CMIE has clearly revealed the existing situation of polarization and glaring disparities across the States. The initiatives taken during the Plan Periods of India in the form of RSVY, Backward Regions Grants Fund, development of North-Eastern Regions etc. have not been adequate to reduce regional imbalance. On this backdrop, policy imperatives suggested in the paper are pro-active public policy, consideration of PPP as the preferred mode, sector-specific reforms, larger resource assistance from the centre to the identified backward regions, more investment by the capital market institutions, energising the PSUs and to improve the quality of governance as to ensure greater convergence and regional cohesion.

Key Words: Economic and Social Infrastructure, Infrastructure Development Index, Polarisation, Regional cohesion, Convergence.

Introduction

Removal of regional disparities and ensuring balanced regional and harmonious development has always been one of the avowed objectives of Planning in India. Balanced development of different parts of the country, extension of benefits of economic progress to the less development regions, an integrated, target-group and incentive approach and area approach to development

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are some major dimensions of planning and development strategy in India to rule out social exclusion and ensure inclusive growth. Paradoxically regional disparities in the growth process not only exists in India but goes on expanding across the states. It has been admitted in the Eleventh Five Year Plan document that regional disparities have continued to grow and the gaps have accentuated as the benefits of economic growth have been largely confined to the better developed areas. Ironically, it is the natural-resource rich areas which continue to lag behind. Infrastructural facilities and their development is a basic pre-requisite to reduce regional imbalances in India. Infrastructure facilities often referred to as economic and social overheads consisting of irrigation, energy, transport, communication, banking, health and hygiene and education. Infrastructure development can be demand-driven when it is followed by investment in directly productive activities and it is supply-driven when it is preceded by investment in directly productive activities. Demand-driven extension of infrastructure leads to its better utilisation with very little time lag but supply-driven enlargement of capacities does lead to its utilization with a time lag. However, there can be justification for both approaches which generate linkage effects or spread effects. Despite this, glaring infrastructural disparities are visible in India.

Infrastructure Indicators and Magnitude of Regional Imbalances

Differences in percapita income are often highlighted to bring out disparities in different States. But State Domestic Product is not a sufficient indicator of economic development. Differences in agricultural growth, disparities in industrial growth, level of literacy, infant mortality, disparities in physical qualities of life, road length,

percentage of workers in manufacturing sector etc. are considered indicators for studying regional imbalances. Inter-State disparities in percapita income, converging growth rate but increasing income inequalities, incidence of poverty, disparities in physical qualities of life, percapita electricity consumption etc. reveal the inter-state regional disparities.

Taking in to account various components of infrastructure the scenario of levels of infrastructure and inter-state variation among major States is presented in Table-I.

Glaring infrastructure disparities in India are visible from Table-I, taking percapita power consumption, road length per 1000 sq.kms of area, Tele-density and percentage of irrigated area to gross cropped area. Looking at the percapita power consumption as an indicator of energy consumption, it is evident from the Table-1 that but for Kerala and West Bengal all other forward States are above the national average of 509 kwh in 2007-08. Bihar and Assam are way behind at 49 kwh and 124 kwh respectively. So also in Tele-density Bihar (46.1) and Odisha (60.9) have not only below the national average 75.23 but also below the forward States. It is the highest in Tamil Nadu 111.14 followed by 107.22 in Punjab. While considering irrigation infrastructure, it may be noted that whereas Punjab had 97.7 percent of irrigation area as a proportion of gross cropped area with the highest productivity per hectare, in backward States like Madhya Pradesh, Assam, Bihar and Odisha it is below the national average of 44.6%. This indicates wide regional variation in the development of irrigation facilities. Whereas Punjab

and Haryana were able to harness the high infrastructure facility Uttar Pradesh did not succeed adequately in this regard as regards productivity per hectare is concerned. So also the widening infrastructure disparities are visible in other indicators affecting agricultural and industrial development. The reform process has not adequately attended to or sidelined these issues evident from the anomalies and inadequacies of infrastructure.

Table – I : Levels of Infrastructure Development in Major States

States	Percapita Power Consumption Kwh (2007-08)	Percentage of villages Electrified (2014)	Road Length per 1000km of area of States (2008)	Tele-density 2013-15	Percentage of Irrigated area in gross cropped area 2007-08	Social and Economic Infrastructure Index 2009
Forward States						
Punjab	1155	100	897	107.22	97.7	187.6
Maharastra	680	99.9	726	91.29	19.6	112.8
Haryana	309	100	672	81.44	86.6	137.5
Gujarat	1116	100	743	90.59	41.7	124.3
West Bengal	321	99.9	2336	69.72	56.9	111.3
Karnataka	661	97.5	1331	92.45	29.4	104.9
Kerala	352	100	5269	96.19	16.5	178.7
Tamil Nadu	896	100	1393	111.14	55.9	149.1
Andhra Pradesh	651	100	1524	79.52	46.3	103.3
Backward States						
Madhya Pradesh	395	97.1	538	56.04	32.2	76.8
Assam	124	96.8	2937	48.74	2.4	77.7
Uttar Pradesh	241	98.7	1182	57.27	75.5	101.2
Odisha	520	93.4	1383	60.9	36.7	81.0
Bihar	49	95.5	1276	46.1	60.6	81.3
All India	509	95.7	1288.7	75.23	44.6	100.0

Source: Planning Commission Ninth Five Year Plan (1997-2002), CMIE, Profiles of States, March, 1997, Statistical Outline of India, 1999-2000, Eleventh Finance Commission 2000, CSO Infrastructure Statistics, Directorate of Economics and Statistics, 2010, Department of Agriculture and Cooperation, Odisha Economic Survey, 2015-16.

While creation of infrastructure is important but the intensity of its use would depend upon the State of development of the NSDP as well. Nevertheless, development of infrastructure is an essential though not a sufficient condition for development. This can be realised from a close perusal of the Infrastructure Development, Index developed by the Centre for Monitoring Indian Economy (CMIE) with weights assigned to Transport facilities (26 percent), Energy Consumption (24 percent), Irrigation facilities (20 percent), Banking facilities (12 percent), Communication (6 percent), Education facilities (6 percent) and Health facilities (6 percent).

Treating the value of Index for all India as 100, the relative values of Infrastructure Development Index (IDI), in Column (7) of Table-I shows that Punjab had the highest value of IDI 187.6 followed by Kerala and Tamilnadu as 78.7 and 149.1 respectively. Lowest value of IDI was for Madhya Pradesh (76.8) followed by Assam (77.7) and Bihar (81.1). Variations in IDI have been reflected in agricultural and industrial productivity and standard of living across the States. Taking energy which is a key component of infrastructure, the latest Global Energy Architecture Performance Index Report explored the energy architecture of 126 countries based on their ability to provide or deliver energy access across three dimensions of the energy trainable – affordability, environmental sustainability, security and access, where India has been ranked 90th as compiled by the World Economic Forum (WEF).

Table-2 presents inter-State variation of Social Infrastructure in 15 major States those are used as human development indicators.

Table – 2 : Inter-State Disparities of Social Infrastructure and Selected Indicators of Human Development

States	Life expectancy at birth in years (2007-11)	Literacy Rate (2011)	Female Literacy (2011)	Infant mortality (2013)
Forward States				
Punjab	69.8	76.7	71.3	26
Maharashtra	70.3	82.9	75.5	24
Haryana	67.3	76.6	66.8	41
Gujarat	67.3	79.3	70.7	36
West Bengal	69.4	77.1	71.2	31
Karnataka	67.5	75.6	68.1	31
Kerala	74.4	93.9	92.0	12
Tamil Nadu	69.4	80.3	73.9	21
Andhra Pradesh	66.3	67.6	59.7	39

Backward States				
Madhya Pradesh	62.8	70.6	60.0	54
Assam	62.2	73.2	67.3	54
Uttar Pradesh	63.0	69.2	59.3	50
Rajasthan	66.8	67.1	52.7	47
Odisha	63.7	73.4	64.4	51
Bihar	69	63.8	53.3	42
All India	66.5	74.0	65.5	40

Source: Government of India, Economic Survey 2009-2010, Census of India, Series I, Paper I, 2011, SRS Bulletins 2013, Odisha Economic Survey 2014-15.

To achieve higher level of human development it is necessary that investment in education and health infrastructure be stepped up. Table-2 reflects that among the backward States Bihar, Rajasthan and Uttar Pradesh have very poor record in terms of literacy, especially female literacy. They have also failed to make adequate investment in health infrastructure and consequently have lower life expectancy, higher infant mortality and higher birth rate. The backward States are unable to attract private investment because of unfavourable investment climate including poor infrastructure. They are unable to improve the investment climate by improving the existing poor infrastructural facilities due to lack of resources. The backward States lag behind the forward States not only in terms of roads, telecom, agriculture, extension services and irrigation etc. but also in all types of indicators of human development marked by low life expectancy, low literacy high birth rate and high death rate. The reforms process which strengthen market forces coupled with globalization favour forward States and neglected the backward States.

Variations in infrastructure is reflected in the percapita NSDP, growth rates and poverty ratios across different States as presented in Table-3.

A look at Table-3 clearly reveals that in the backward States not only the percapita NSDP is low, the rate of economic growth has also been very slow and is identified by high poverty ratio. At an aggregated level the rate of growth of the backward States was only 1.7 percent per annum.

However, what is a matter of concern is the fact that although the SDP growth rates of relatively poor States have increased at a faster rate percapita income disparities are increasing. The Twelfth Five Year Plan 2007-12 shows that the variation in percapita income across the States has been worsening in last two decades with increase in coefficient of variation from 34 percent in 1993-94 to 41 percent in 2011-12. As presented in the Twelfth Five Year Plan Volume I, the average Gini Coefficient during 1981-90 was 0.15 which increased to 0.19 during 1991-2000 and further to 0.224 for the period 2000-2010 and remained stagnant at 0.224 for 2010-11 as well. Higher value of Gini Coefficient shows the glaring extent of inequality. This indicates the growing income disparities in India.

**Table - 3 : State-wise Percapita Net State Domestic Product (NSDP)
(at 2004-2005 Prices) Growth Rates and Poverty Ratio.**

States	Percapita NSDP (in Rs.)		Average Growth Rate 2004-2005 to 2012-13	Poverty Ratio 2011-12 based on MRP** Consumption
	2004-05	2012-13		
Forward States				
Haryana	37972	65500	7.0	11.2
Punjab	33103	48409	4.8	8.3
Maharashtra	33915	66066	7.9	17.4
Kerala	31871	53877*	7.8	7.1
Gujarat	32021	57508*	8.7	16.6
Tamil Nadu	30062	59113	8.8	11.3
Andhra Pradesh	25321	44089	7.1	9.2
Karnataka	26882	44183	6.4	20.6
Backward States				
Assam	16782	24198	4.7	32.0
Rajasthan	18565	28851*	6.5	8.3
Odisha	17650	25584	4.8	32.6
Madhya Pradesh	15442	26514	7.0	31.7
Uttar Pradesh	12950	18891	4.8	29.4
Bihar	7914	14994	8.3	33.7

Source: RBI, Hand Book Statistics for Indian Economy (2010-11), National Accounts Statistics, 2013-14, Reserve Bank of India, Hand Book of Statistics on the Indian Economy 2013-14, Mumbai.* for 2011-12, ** Mixed Recall period.

State Human Development Indices are largely governed by social infrastructure. In terms of State Human Development Indices there are considerable variation across the States in the Published Report of 18 States in India. Kerala is the best performer with State HDI 0.773 followed by Tamil Nadu 0.657. Madhya Pradesh has the lowest value of 0.394 and Odisha 0.404 as poor States shown in the State Human Development Reports (SHDRs) in the Eleventh Plan 2007-12. Inter-district disparities within a State as indicated by Coefficient of variation is the highest 36.55% in Maharashtra compared to the lowest 2.3% in Kerala. Maharashtra, Arunachal Pradesh, Assam, Chhatisgarh and Nagaland have

high inter-district variation. Only seven States in India are in the range of medium HDI value 0.5 to 0.8 and the rest having low HDI values less than 0.5. Hence, the backward States with weak infrastructure lagging behind need to be developed to catch up relatively advanced HDI States by reducing inter-State and intra-State variations by strengthening infrastructure facilities in maintaining the economic and social fabric.

N.J.Kurian's extensive study of the "Widening Regional Disparities in India" indicated that more than two-thirds of investment proposals (69.2%) in the post-reforms period are concentrated in the forward States. Similar situation prevailed in terms of financial assistance distributed by All India Financial Institutions, IDBI, ICICI, IFCI, UTI, LIC, GIC, IRBI, SIDBI those disbursed 67.3% of total financial assistance to forward States by March 1997.

Hence, the reform process has favoured the forward States in terms of approval of investment proposals as well as financial assistance. Consequently, the already better off States can further accelerate growth process while the backward States being unfavourably treated face a retardation in growth. There has been a tendency of polarisation across the States.

Policy measures for Regional cohesion and strategy of Convergence

Besides the above initiatives following key initiatives and policies imperatives are needed as the ways forward to augment infrastructure development, reduce polarisation, regional disparities and ensure regional cohesion from the point of view of improving living standards in backward regions and faster economic development of the country at large.

1. There is a strong case for pro-active public policy to induce more investment in backward States and lagging regions either through public investment or through fiscal policy to provide infrastructural facilities like transport, communication, irrigation etc. and utilise the potentials for agricultural and industrial development.
2. Public-Private Partnerships (PPPs) have become the preferred mode for construction and operation of infrastructure services with promising outlook and prospects such as highways, airports, ports, energy etc. There is a greater need for Rail-Road Co-ordination in the transport system. They offer significant advantages in attracting private capital in construction of public infrastructure as well as in improving provision of services to users. PPPs offer a number of advantages in terms of introducing private sector expertise and cost reducing technologies as well as bringing in efficiencies in operation and maintenance. PPPs can also encourage better risk sharing, accountability, cost recovery and management of infrastructure. They are tools to fulfil the basic obligations of the Government to provide better infrastructure services with large externalities by increasing accountability of the private sector as a service provider. However, it should be ensured that the terms of agreement are transparent and protective of public interest and there is robust competition in bidding for the project, so that least cost options are chosen. The frame work for promotion of synergistic firmness of PPP in infrastructure is required. The PPP model as the key driver reduces the financial burden and risk of public sector investments as the private counterparts are cheaper and more efficient. The investment from private players

and expertise of the private players from all the sectors facilitate the rapid development of all infrastructure projects that have large gestation periods.

3. Sector-specific reforms like telecom, banking, energy, etc. are needed and fiscal concessions like tax holiday and project import duty ought to be provided to attract more investment in these areas.
4. There is need to introduce appropriate reforms in public provident funds, pension funds and insurance companies so that private sector can have access to these funds for infrastructure development.
5. Public-sector reforms would be necessary to broad base their management, upgrade their technology, improve their performance and quality of services by energising them and to generate adequate investible resources through rationalisation of service charges and better recovery of costs.
6. There is the need for deliberate promotion of growth centres generating both forward and backward linkage on effects and having more spread effects than backward effect.
7. Growth centres and growth poles are to be linked in an integrated manner. Recognition of backwardness as a factor to be taken into account in the transfer of financial resources from the Centre to the State in the Indian fiscal federal system to reduce horizontal and vertical fiscal imbalance and ensure fiscal consolidation and cooperative federalism. They should be in the form of plan grants, non-plan grants and discretionary grants.
8. Priority to be accorded to Special Area Development programmes for development of backward and less developed regions for developing rural infrastructure, reducing rural-urban imbalance development of priority sector, agriculture and no industry districts. Tax concessions, tax holidays, subsidies and concessions in infrastructure utilisation need to be given to private investors in backward geographical areas. Additional assistance to backward regions can surely amplify their speed of catch up.

Conclusion

In the light of the aforesaid analysis it is logical and legitimate to conclude that in the budgetary provisions, there is a need for providing a 'big bang' for the infrastructure with a priority on the rural sector by a kick-start investment development in rural areas. Indeed it is by increasing public spending, creating new infrastructure funds, fiscal incentives for investment and laying out the foundation for a stronger and transparent PPP process the committed goals of addressing the key challenges and reducing regional disparities can be realised and regional cohesion be met in a convergent and harmonious manner in the spatial and decentralised approach to reduce inter-State and inter-District disparities in economic and social development.

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Disparity Among State Public Sector Undertakings and Growth of States in India

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Introduction

A vital role was assigned to the public sector in the process of economic development of India. Public Sector was envisaged not only to control the commanding heights of the economy but also to serve as a vehicle to promote balanced and equitable growth. This led to a phenomenal growth of the public sector enterprises at both the Centre and the States during the earlier plans.

Public Sector reforms occupy a vital place in the process of second-generation reforms. Public Sector reforms are generally considered synonymous with reforms in the central public enterprises. The fact that State PSUs are as important as the central public enterprises in terms of investment, manpower and efficiency are sometimes lost sight of. The financial performance of these enterprises has a direct bearing on the health of State finances that are not in a good shape at present. There has been no comprehensive study on the state PSUs during the recent times. Obviously, the lack of adequate data and audited figures, and the difficulties in having an effective access to the nodal agencies controlling the state PSUs in the various states have acted as major impediments in undertaking such a study.

The central purpose of this study is to build a database on certain crucial parameters of State PSUs, assess the trends in their financial health. The study explores the scope for divesting public ownership of non-strategic State PSUs which may release financial resources for bridging the fiscal gap or enhancing public spending on social sector. This paper will make an attempt to establish a link between regional disparities and the growth of state public sector undertakings in India.

The paper aims to:

1. To examine the interstate disparities in the growth of state PSUs.
2. To establish the link between the growth of PSUs and the growth of the state economy in general.

In order to make the analysis smooth and simple all the states in the country have been divided into two categories via: Special category states and General Category States. Moreover all the Public Sector Enterprises pertaining to all the 28 states are divided in to two groups such as Government Companies and Statutory Corporations.

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Government Company – Public enterprises incorporated as joint stock companies, and registered under the Indian Companies Act of 1956, and where the entire capital is owned by Government are classified as Government Companies.

Statutory Corporations – Enterprises created by an Act of the State Legislative are managed according to the legal provision in the Act and are included under the classification of statutory corporation.

The following table reveals the financial and Non-financial Public Sector Enterprises in Special Category States and in General Category States of India. It is also divided into the two types of PSEs.

Table-1: Number Financial and Non Financial Public Sector Enterprises in the States of India.

Sl. No.	State	Companies			Corporations		
		Working	Non-working	Total	Working	Non-working	Total
Special Category States A							
1.	A. Pradesh	3	2	5	-	-	-
2.	Assam	35	10	45	4	-	4
3.	H. Pradesh	16	2	18	3	-	3
4.	J & K	17	3	20	3	-	3
5.	Manipur	8	7	15	-	-	-
6.	Meghalaya	10	-	10	3	-	3
7.	Mizoram,	5	-	5	-	-	-
8.	Nagaland	5	1	6	-	-	-
9.	Sikkim	9	3	12	3	-	3
10.	Tripura	9	1	10	1	-	1
11.	Uttrakhand	16	4	20	2	-	2
	Total A	133	33	166	19	-	19
General Category States B							
1.	A. Pradesh	35	18	53	3	-	3
2.	Bihar	17	34	51	4	-	4
3.	Chhattisgarh	8	-	8	2	-	2
4.	Goa	15	-	15	1	-	1
5.	Haryana	19	7	26	2	-	2
6.	Jharkhand	5	-	5	1	-	1
7.	Gujarat	41	12	53	4	-	4
8.	Karnataka	59	17	76	6	-	6

9.	Kerala	84	25	109	5	-	5
10.	M. Pradesh	31	9	40	4	-	4
11.	Maharashtra	51	22	73	4	-	4
12.	Odisha	29	32	61	3	-	3
13.	Punjab	22	19	41	5	-	5
14.	Rajasthan	22	4	26	3	-	3
15.	Tamil Nadu	53	14	67	2	-	2
16.	U. Pradesh	48	40	88	7	-	7
17.	W.Bengal	56	19	75	10	1	11
	Total B	595	272	867	66	1	67
	Grand Total (A+B)	728	305	1033	85	1	86

Source: CAG report of the states

Total number of PSEs existing as on 31st March 2007 was 1119 out of which around 92 percent are government companies and 8 percent are statutory corporations. Of these companies whose number is 1033 almost 30 percent are non-working and the rest are working companies. On the other hand the statutory corporations whose number is 86 (around 99 percent) are working as statutory companies and the number of non-working companies are nil except West Bengal which has only one non-working statutory corporation. Odisha has 64 Public Sector Enterprises of which 61 are the Government Companies and 3 are Statutory Corporations. Out of 61 Government Companies 29 are working companies and 32 are non-working companies and all the statutory corporations are working corporations. Moreover the above table reveals that the average number of Public Sector Enterprises existing in a state is nearly 40. For general category states the figure is 55 and for special category state the same is only 16. Even among the general category states, Kerala has the highest number of PSEs at 114 whereas states like UP has only 95. In states like Chhattisgarh and Jharkhand, which are newly created states the number of PSEs are only 10 and 6 respectively. Other states which have highest number of PSEs are Karnataka (82), West Bengal (86), and Maharashtra (77). Thus the disparities on the ground of existence of number of state public sector units are quite obvious.

Capital Investment

The state public sector units have been playing an important role in the regional economies for economic development of the state. Like the State government the PSUs are also investing a considerable amount in different heads and this is included in the plan investment of the state. But there exists wide variation in the investment of State PSUs over the years. Quantum of investment will reflect the health of these units in the states. Table below gives the investment of the different states on working and non-working enterprises..

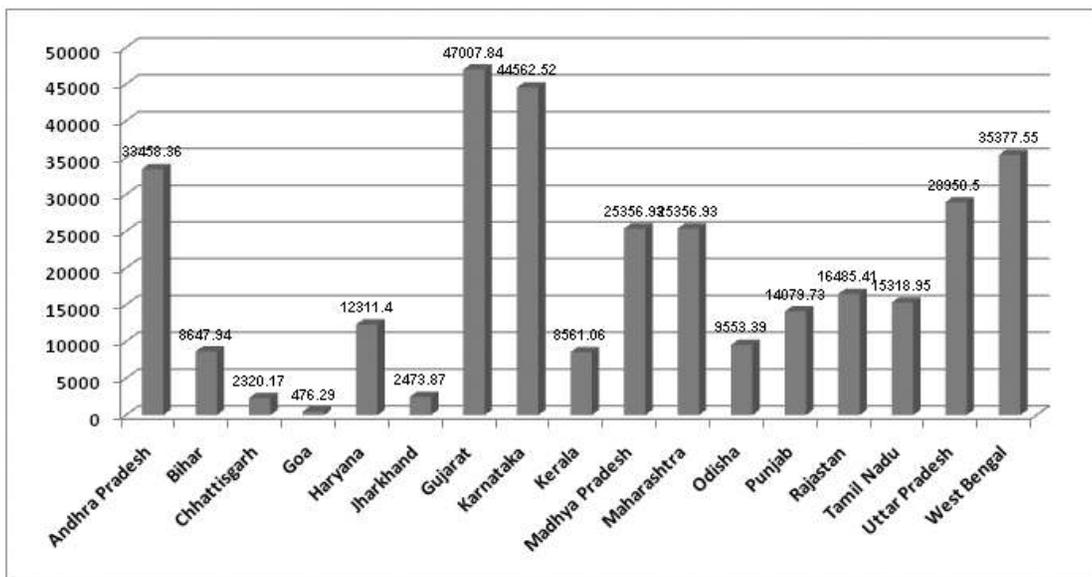
Table 2.1: State-wise Capital Investment in the Public Sector Enterprises in India as on 2007.**(Rs in crore)**

Sl. No.	State	Working	Non-Working	Total
Special Category States A				
1.	Arunachal Pradesh	16.18	3.15	19.33
2.	Assam	2622.86	83.01	2705.87
3.	Himachal Pradesh	3886.32	4.79	3891.11
4.	Jammu & Kashmir	4420.88	3.40	4424.28
5.	Manipur	39.37	72.74	112.11
6.	Meghalaya	1290.34	-	1290.34
7.	Mizoram,	89.23	-	89.23
8.	Nagaland	59.74	4.96	64.70
9.	Sikkim	158.96	3.43	162.39
10.	Tripura	345.59	0.04	345.63
11.	Uttrakhand	2724.78	0.39	2725.17
	Total A	15654.25	175.91	15830.16
General Category States B				
1.	Andhra Pradesh	33195.02	263.34	33458.36
2.	Bihar	7929.91	718.03	8647.94
3.	Chhattisgarh	2320.17	-	2320.17
4.	Goa	476.29	-	476.29
5.	Haryana	12172	139.32	12311.40
6.	Jharkhand	2473.87	-	2473.87
7.	Gujarat	46169.13	838.71	47007.84
8.	Karnataka	43968.73	593.79	44562.52
9.	Kerala	8396.34	164.72	8561.06
10.	Madhya Pradesh	20308.69	794.24	21102.93
11.	Maharashtra	24562.69	794.24	25356.93
12.	Odisha	9398.67	154.72	9553.39
13.	Punjab	13915.01	164.72	14079.73
14.	Rajasthan	16471.83	13.58	16485.41
15.	Tamil Nadu	15232.06	86.89	15318.95
16.	Uttar Pradesh	28071.54	878.96	28950.50
17.	West Bengal	34976.45	401.10	35377.55
	Total B	320038.16	5441.10	325479.26
Grand Total (A+B)		335692.41	5617.01	341309.42

Source: CAG Report of the states

Total investment made in the Public Sector Enterprises was to the tune of Rs.3, 41,309.42 crore by the end of year 2006-07. Out of this around 98.35 percentage was in working companies and the rest i.e. 1.65 percentage only was in non-working companies. The special category states made an investment of Rs. 15830.16 crore in aggregate out of which around 99 percentages is in working PSEs and the rest are on non working PSEs. Moreover there were disparities among the states in investment also. The state which invests most is Jammu and Kashmir and followed by Himanchal Pradesh, Uttrakhand, Assam. The state wise investment of different general category states is discussed in the following figure.

Figure 1: Capital Investment in PSEs of the General Category States (Rs. In crore)



(Source: CAG Report of the states)

The uneven investment scenario is clearly reflected in the bar chart figure given above. Gujarat had the highest level of investment of around Rs. 47000 crore followed by Karnataka at Rs. 44562.52, West Bengal at Rs.35377.55, Andhra Pradesh at Rs.33458.36 and Uttar Pradesh at Rs. 28950. The investment figure of states like Chhattisgarh, Jharkhand, Kerala, Goa and Odisha was very low. Public Sector Enterprises of Odisha had made an investment of Rs. 9398.67 crore in working enterprises and Rs. 154.72 crore in non-working enterprises i.e. a total of Rs. 9553.39 crore. Kerala which has the highest number of Public Sector Units is placed much lower in terms of total investment in PSEs which has only Rs 8561 crore as investment in the Public Sector Enterprises.

Sector-wise Investment in the PSEs

Capital investment of PSEs are in different types of enterprises. Mostly in economic services many of these units were established in the early years of planning to facilitate provision of essential public services. Power and transport are the two sectors in which there is lot of investment. . The investment pattern in different sectors is given in the following table.

Table 2.2: Sector wise and State-wise Capital investment of State PSEs in India as on 2007.

(Rs In Crore)

Sl. No.	States	Total Investment	Power	Transport	Welfare
Special Category States A					
1.	Arunachal Pradesh	16.18	-	-	-
2.	Assam	2622.86	1635.52	332.70	48.41
3.	Himachal Pradesh	3886.32	2400.95	437.07	-
4.	Jammu & Kashmir	4420.88	2162.25	438.03	52.90
5.	Manipur	39.38	-	-	0.88
6.	Meghalaya	1290.34	1065.96	66.03	-
7.	Mizoram,	89.23	-	-	-
8.	Nagaland	59.74	-	-	-
9.	Sikkim	158.90	53.41	-	25.38
10.	Tripura	345.59	9.55	131.15	4.58
11.	Uttrakhand	2724.78	2386.35	96.92	16.69
	Total A	15654.20	9713.35	1501.90	148.84
General Category States B					
1.	Andhra Pradesh	33195.02	21541.91	-	-
2.	Bihar	7929.91	7007.23	-	71.28
3.	Chhattisgarh	2320.17	2263.16	-	4.00
4.	Goa	476.29	-	70.58	8.63
5.	Haryana	12172.58	10947.17	-	-
6.	Jharkhand	2473.87	2460.82	-	-
7.	Gujarat	46168.83	41624.33	1386.33	155.21
8.	Karnataka	43968.73	10178.72	1485.10	494.22
9.	Kerala	8396.34	4051.52	697.60	340.75
10.	Madhya Pradesh	20308.37	18273.04	601.96	92.46
11.	Maharashtra	24562.69	18322.48	1266.15	570.26
12.	Odisha	9398.67	7604.40	-	-
13.	Punjab	13915.01	11855.53	293.89	-
14.	Rajastan	16471.83	14780.55	383.73	-
15.	Tamil Nadu	15232.06	11271.07	1430.79	152.03
16.	Uttar Pradesh	28071.54	22685.65	-	-
17.	West Bengal	34976.45	20481.91	820.96	-
	Total B	320038.36	225349.49	8437.09	1888.84
Grand Total (A+B)		335692.56	235063.48	9938.99	2037.68

(Source: CAG report of the states)

The above table reveals that the investment on power sector has more disparities among the states. Out of the total investment of Rs. 335692 crore, only power sector investment accounts for Rs. 235063.48 crore which is 70 percent of the total.. In power sector states like Gujarat , Karnataka, West Bengal have invested more while the investment of the states like Goa, Chhattisgarh, Jharkhand are negligible. In transport sector, the investment is around Rs. 9939 crore. Higher amount is invested in the states like Karnataka, Gujarat and Tamil Nadu while state like Goa has invested very little. In other welfare sectors the investment is nearly 2037 crore by all the states. The investment of Gujarat alone in power sector was to the tune of Rs 41624 crore. It is followed by Andhra Pradesh, Uttar Pradesh and West Bengal. Similarly the investment in transport sector is highest in the state Karnataka and Gujarat. In Odisha the investment in power sector is Rs. 7604 crore and nil in transport sector. This shows wide variation in the investment pattern in different sectors. .

Return on Capital Invested

The rate of return on capital employed indicates the earnings on capital invested. In general, capital employed is represented by total assets less current liabilities or net fixed assets plus working capital. 'Capital employed' as defined by CAG, represents net fixed assets (including capital work in progress) and working capital except in finance companies and corporations where it represents a mean of aggregate of opening and closing balances of paid up capital, free reserves, bonds, deposits and borrowings (including refinance). For calculating total return on capital employed, interest on borrowed funds is added to the net profit/subtracted from the loss as disclosed in the profit and loss account.

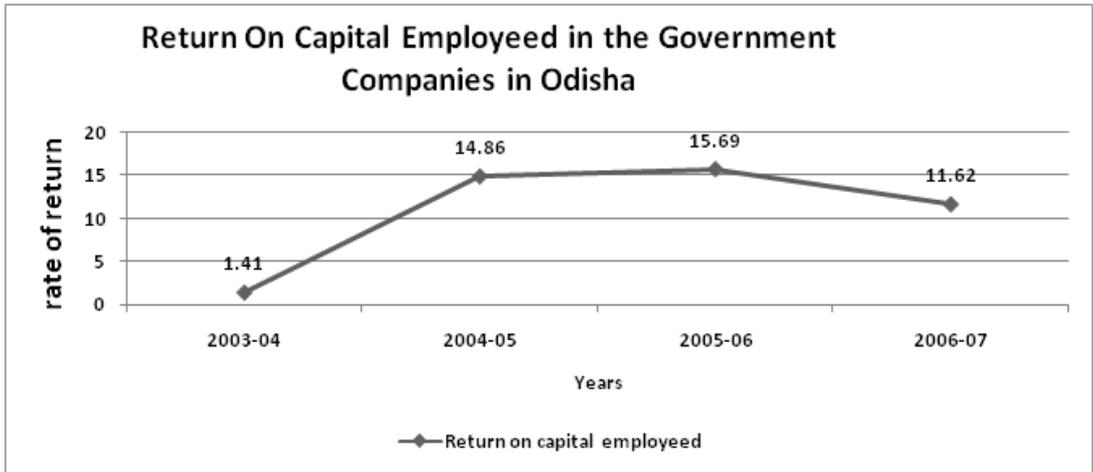
Table 3: Return on Capital Invested of the State PSEs in India

Sl. No	State	Working Government Companies				Statutory Corporations			
		2003-04	2004-05	2005-06	2006-07	2003-04	2004-05	2005-06	2006-07
Special Category States A									
1.	A.I Pradesh	-9.02	-11.31	-8.16	-7.80	-	-	-	-
2.	Assam	3.19	7.02	5.57	5.36	-45.30	-51.59	-119.88	-119.20
3.	H.I Pradesh	2.37	0.56	2.40	-0.73	1.40	2.31	3.72	3.89
4.	J & K	9.64	6.41	14.25	7.21	-25.48	-43.77	-54.38	-6.98
5.	Manipur	7.72	8.84	9.04	7.03	-	-	-	-
6.	Meghalaya	0.76	-0.16	-2.69	-2.37	1.95	5.81	-2.74	-8.98
7.	Mizoram	-4.87	-5.74	-7.28	-9.10	-	-	-	-
8.	Nagaland	-	-11.08	-4.78	4.80	-	-	-	-
9.	Sikkim	2.50	0.53	1.71	1.53	0.13	0.82	1.02	0.68
10.	Tripura	-8.63	-11.62	-10.69	-5.36	-	-	-	-
11.	Uttrakhand	-0.82	1.31	6.42	11.40	-	-	-	-
Average A		0.28	-1.39	0.53	1.09	-13.46	-17.28	-34.45	-26.12

General Category States B									
1.	Andhra Pradesh	11.19	9.21	5.86	5.20	10.70	10.52	0.02	6.56
2.	Bihar	2.17	-1.10	-1.06	0.62	-	-41.47	12.25	27.95
3.	Chhattisgarh	-	-	-	-	-	-	-	-
4.	Goa	5.78	1.76	4.13	9.32	-4.68	-4.68	-4.91	-4.91
5.	Haryana	10.39	9.76	0.68	2.25	7.78	7.04	13.20	11.32
6.	Jharkhand	-	-	-	-	-	-	-	-
7.	Gujarat	2.30	3.11	3.48	6.35	1.95	-9.86	1.94	2.86
8.	Karnataka	4.20	3.05	3.38	4.32	12.71	10.50	8.44	14.23
9.	Kerala	8.90	9.25	8.89	9.48	7.40	7.40	7.25	10.16
10.	M. Pradesh	-21.99	1047	7.16	-2.36	4.78	29.73	13.55	11.97
11.	Maharashtra	-2.06	-0.64	0.73	3.29	4.61	3.72	11.40	12.21
12.	Odisha	1.41	14.86	15.69	11.62	1.24	3.47	4.24	4.10
13.	Punjab	4.11	8.84	10.11	9.30	4.86	9.53	-22.26	7.62
14.	Rajasthan	7.40	7.19	6.35	6.13	6.87	6.96	12.38	8.86
15.	Tamil Nadu	10.26	9.87	3.47	5.18	8.00	-3.06	-3.22	-4.44
16.	Uttar Pradesh	-1.14	-3.90	-3.21	2.31	2.06	1.26	4.23	2.56
17.	West Bengal	8.32	7.61	6.97	8.92	2.71	3.87	0.65	0.54
	Average B	3.42	5.36	4.84	5.46	5.07	2.33	3.94	7.44
	Average (A+B)	2.16	2.50	3.02	3.61	0.19	-2.57	-5.65	-0.95

Source: CAG report of the states

The average return for all states has been low for all the years for both companies and corporations. In fact, the corporations have turned negative for the years of 2004-05, 2005-06 and 2006-07. The performance of the general category states, as a whole, has been much better than that of the special category states. For special category states, it is negative for most of the years for both category of enterprises. For general category states, the annual return is positive for all the years with variation between 2 to 7 percent. Coming to an individual state like Odisha, we find that it has done well in all the years. Wide variation exists in the performance with individual states. Within the general category states only, a few (viz. Kerala, Karnataka, Rajasthan,) have been giving a consistently high rate or return. But other states such as Andhra Pradesh, Gujarat, Haryana and Punjab though make small positive and negative return for some years. Andhra Pradesh has been showing a steadily declining performance over the years. States like Goa and Tamil Nadu show negative returns for corporations. The situation in Odisha for government companies is shown in the figure below.



Number of Profit and Loss Making Units

Earning profit is important for any business concern. But the creation of PSEs is not to have much profit. The borrowed capital invested in the organisations need to be repaid and for this you need some profit to service such loans. Number of profit making PSEs has improved in the period of examination marginally. At present profit making and loss making enterprises are in the ratio of fifty-fifty. Now-a-days though the states are investing a considerable amount of capital in the Public Sector Enterprises, the result is not quite satisfactory in most of the states. Although the State PSEs were started with the sole aim of accelerating economic growth, the present scenario is that most of them continue to be a burden on the state economy.

Table 4: Number of Loss and Profit making State PSEs in India

Sl. no	States	Profit making				Loss making			
		2003-04	2004-05	2005-06	2006-07	2003-04	2004-05	2005-06	2006-07
Special Category States A									
1.	A.I Pradesh	-	-	-	-	3	3	3	3
2.	Assam	6	7	7	6	25	24	24	29
3.	H. Pradesh	6	6	8	7	11	11	9	11
4.	J & Kashmir	4	5	5	8	11	10	12	10
5.	Manipur	4	3	3	3	3	3	3	3
6.	Meghalaya	3	4	3	3	10	9	10	10
7.	Mizoram	0	0	0	0	4	5	5	5
8.	Nagaland	-	-	-	-	3	3	3	3
9.	Sikkim	4	5	3	3	7	6	8	8

10.	Tripura	0	3	2	2	9	6	7	7
11.	Uttrakhand	-	1	6	4	9	11	8	12
12.	Total A	27	34	37	36	95	91	92	101
General Category States B									
1.	An. Pradesh	18	20	21	22	12	11	19	10
2.	Bihar	6	6	7	7	13	13	12	12
3.	Chhattisgarh	4	2	3	6	1	3	4	3
4.	Goa	5	4	4	5	9	10	12	10
5.	Haryana	14	12	12	13	5	7	7	7
6.	Jharkhand	3	3	2	-	0	1	2	-
7.	Gujarat	23	24	25	32	13	11	9	8
8.	Karnataka	39	37	37	45	17	21	20	12
9.	Kerala	36	38	37	37	53	51	48	48
10.	M Pradesh	12	15	17	19	12	9	8	12
11.	Maharashtra	11	18	22	26	44	36	27	25
12.	Odisha	14	16	17	17	17	14	13	13
13.	Punjab	8	11	11	10	6	11	13	15
14.	Rajasthan	8	10	8	11	15	5	7	5
15.	Tamil Nadu	31	36	29	36	23	18	23	17
16.	U. Pradesh	2	22	24	31	28	27	30	23
17.	W. Bengal	17	19	23	26	56	53	46	38
	Total B	251	293	299	343	324	301	300	258
	Total (A+B)	278	327	336	379	419	392	392	359

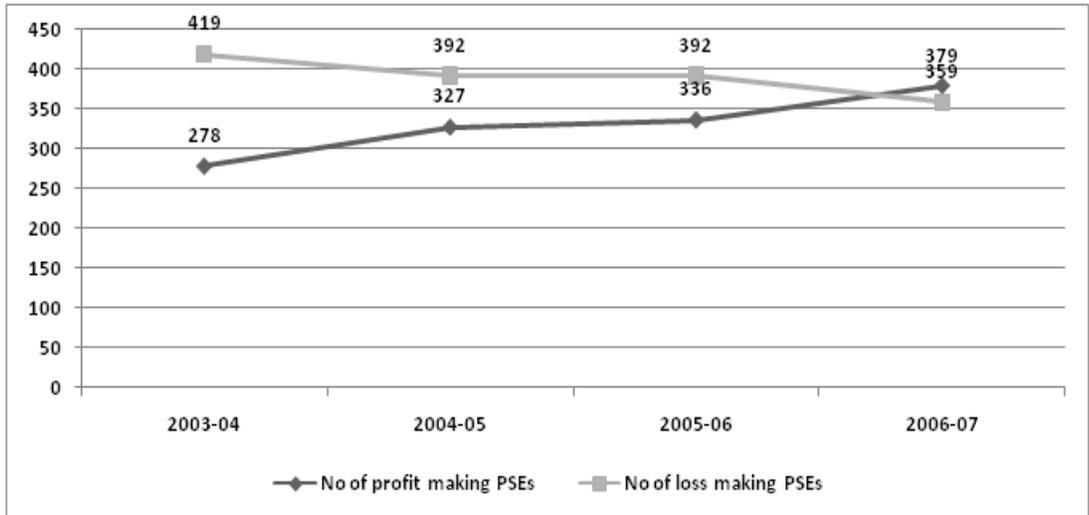
Source: CAG report of the states

State-wise variation in the number of profit making PSEs is also visible from the table given above. Karnataka, Kerala, Gujarat and Tamil Nadu have consistently larger number of profit making units while in states like Maharashtra and West Bengal the loss making units are more. Many other states show stagnation in the number of profit making units. Thus even if the states which made a huge amount of investment in different state PSEs, they suffered loss consistently. And the states which made only an average amount of investment made considerable profits during the explained years. Odisha shows a mixed picture in case of profit and loss making units of the PSEs. In Odisha the profit

making units are 14 in the year 2003-04 which has increased to 17 in 2006-07. Thus the profit making units have been increasing over the years in Odisha. On the other hand the number of loss making units are also 17 in the year 2002-03 and which got reduced to 13 in the year 2006-07.

The overall number of profit and loss making trends in all the state PSEs in India is given below in the graph.

Figure 2: Number of Profit and Loss making State PSEs in india



The rising situation of profit making units and the falling situation of loss making units are clearly visible for the above graph.

2. Amount of Profit and Loss

There has been a slow but steady decline in the aggregate losses of the PSEs during the period 2003-04 to 2005-06. However, in 2006-07 there appears to be a drastic improvement. This is because of two major factors –

- 1) There was a write off of losses to the tune of Rs.3242 crore for Punjab State Electricity Board in the year 2004- 05 which is reflected in the sharp decline in overall losses for Punjab in the year 2006 -07; and
- 2) Delay in finalization of accounts by the PSEs (which is proportionately more for states where the PSEs have been incurring aggregate losses i.e. Uttar Pradesh, West Bengal, Maharashtra and most of the Special Category states. However, in spite of these aberrations it can be concluded that there has been a marginal improvement in the overall profitability of the PSEs.

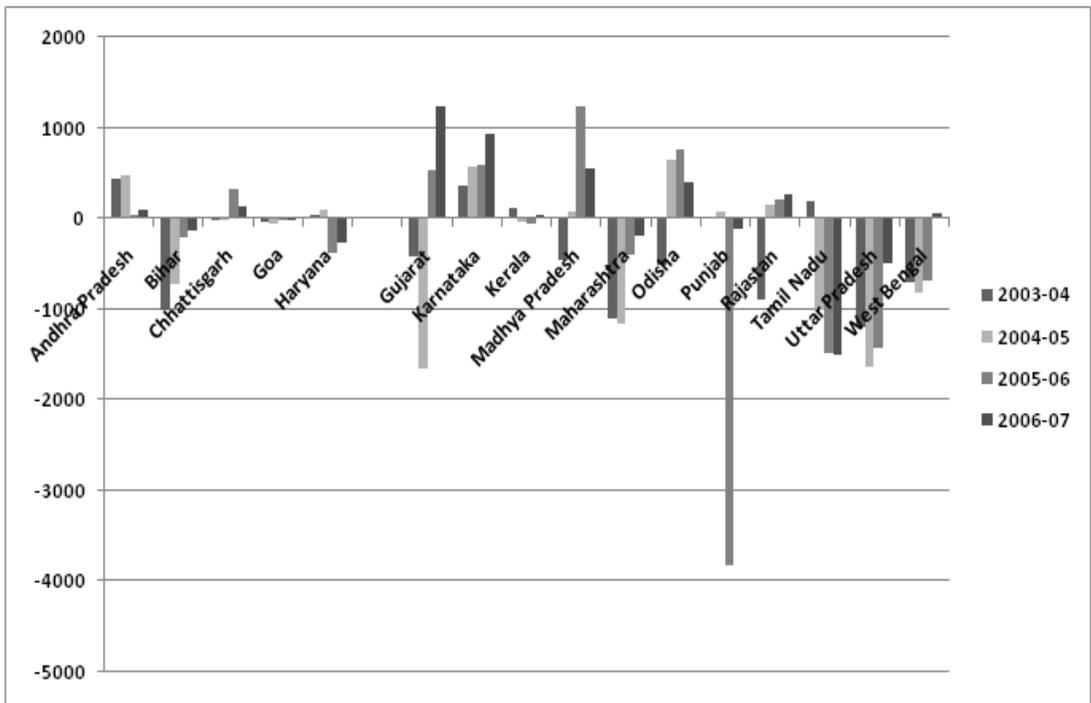
Table 5: Quantum of Profit and Loss of State PSEs in India .

Sl. No.	States	Aggregate Profit (+)/Loss(-)			
		2003-04	2004-05	2005-06	2006-07
Special Category States A					
1.	Arunachal Pradesh	-3.00	-3.00	-3.00	-3.00
2.	Assam	-711.27	-6565.19	-1030.28	-1032.12
3.	Himachal Pradesh	-76.93	-80.42	-9.98	-59.68
4.	Jammu & Kashmir	306.27	3.40	70.25	151.69
5.	Manipur	-0.42	0.74	0.76	0.45
6.	Meghalaya	-27.48	4.92	-7075	-99.35
7.	Mizoram	-3.74	-4.21	-5.03	-5.19
8.	Nagaland	-2.06	-2.06	-1.63	-1.63
9.	Sikkim	-22.30	-2.85	-4.05	-2.86
10.	Tripura	-20.59	-18.99	-19.10	-16.33
11.	Uttrakhand	-19.44	-38.47	-65.33	-75.86
	Total A	-580.96	-812.93	-1138.14	-1143.88
General Category States B					
1.	Andhra Pradesh	435.09	483.78	36.29	95.31
2.	Bihar	-1008.37	-725.19	-210.05	-121.66
3.	Chhattisgarh	3.81	5.13	328.90	137.48
4.	Goa	-33.07	-46.97	-25.65	1.36
5.	Haryana	40.21	91.74	-385.25	-260.95
6.	Jharkhand	3.15	-46.30	-47.65	-
7.	Gujarat	-413.88	-1653.38	532.68	1243.46
8.	Karnataka	369.03	566.05	590.17	934.72
9.	Kerala	125.32	-40.33	-58.28	40.35
10.	Madhya Pradesh	-450.33	74.48	1242.13	555.7
11.	Maharashtra	-1103.88	-1158.93	-388.96	-182.81
12.	Odisha	-508.19	656.92	761.34	397.79
13.	Punjab	12.45	75.26	-3827.99	-111.29
14.	Rajasthan	-895.79	148.01	215.38	268.77
15.	Tamil Nadu	199.44	-1008.96	-1487.67	-1497.57
16.	Uttar Pradesh	-1201.74	-1640.38	-1428.27	-500.09
17.	West Bengal	-709.01	-811.00	-678.55	65.03
	Total B	-5466.40	-5030.07	-4507.43	1075.77
Total (A+B)		-6047.36	-5843.00	-5645.57	-68.11

Source: CAG report of the states

Considering state wise data it is clear that all the special category states have incurred losses in all the above mentioned years except Jammu and Kashmir and Manipur (last 3 years). For general categories states it is clear that for the years 03-04, 04-05 and 05-06 all the states are making losses. In 2006-07, there was a turn around in the situation and there was a small amount of profit .This shows considerable improvement in the administration of these units. Bihar, Haryana, Maharashtra, Punjab, Tamil Nadu and UP were still in the red zone in 06-07. Moreover it is very much important to note here that out of 17 general categories states only 7 states are making profits during 2003-04, 8 states during 2004-05, 7 states during 2005-06 and 10 states during 2006-07. In 2003-04, among the general category states Andhra Pradesh is the most profit making state with Rs. 435 crore followed by Karnataka (369), Tamil Nadu (119), and Haryana (40). The major loss making states during the same year are; UP (1201), Maharashtra (1103), Bihar (1008), WB (709), Rajasthan (805), Odisha (508). Though Gujarat is a major investing states in Public Sector Enterprises but it was also in the loss making table in the year 2004-05 with Rs. 1653 crore followed by UP (1640), Maharashtra (1159), Tamil Nadu (1008). The profit making States in this year are headed by Odisha (657), Karnataka (506), and Andhra Pradesh (483). All the other profit making states only maintain double digit figures. Similarly for the year 2005-06 the profit making states comprise of MP (1242), Odisha (761) and Gujarat (532). The loss making states are; Punjab (3827), Tamil Nadu (1487) and UP (1428). In 2006-07 the profit making states are headed by Gujarat while the loss making states are headed by Tamil Nadu. The situation of profit and loss of the General category states is explained in the figure given below.

Figure 3: Amount of Profit and Loss of State PSEs in India



From the above analysis, it is clear that the states like Bihar, Maharashtra, Tamil Nadu, Uttar Pradesh, West Bengal have suffered continuous loss during the period. The states doing well or making profit considerably in the successive years are; Andhra Pradesh, Karnataka, Madhya Pradesh, Odisha and Rajasthan. Therefore we may conclude that the performance of the states with regard to profit and loss of each and every state is not identical, rather it varies from state to state.

Conclusions

The analysis of the status of the state public sector undertakings reveals that these organisations were established in the early sixties with the sole aim of accelerating the economic growth of the nation but they could not accomplish that objective. In other words though economic development is achieved with the help some public sector undertakings in different parts of the nation, but their performance is highly uneven and there exists serious regional disparities even after fifty years. There exists high disparities in investment and net profit earned by the PSEs. Some states like Kerala which has the highest number of PSEs invest less amount in different sectors. On the other hand states like West Bengal, Andhra Pradesh, Kerala, Tamil Nadu which invest quite a large amount in the PSEs, have incurred loss in the successive years as outlined above. The analysis shows fluctuating figures in all the heads such as investment, profit and loss, and return on capital employed and also in VRS reform programme. Therefore it could be mentioned here that with a view to achieve balanced growth and achieve regional balance, the central government should come forward and regulate the financial as well as administration of the state public sector enterprises so that the economic growth of the nation as a whole can be accelerated and regional disparities among the different states and different sectors of the economy can be minimized.

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Regional Disparity and Issues of Convergence in Human Development in India

Sudhakar Patra¹

The objectives of the paper is to consider regional disparity in Human Development and lack of convergence over time. The study is based on secondary data on human development index(HDI) of 15 major states of India in 1981, 1991, 2001 and 2007-08. Rank of Andhra Pradesh remained at 9 in all years but rank of Tamil Nadu improved from 7 in 1981 to 3 in 1991 and 2001. Kerala continues to get first position in all the years. The rank of Odisha was 11 in 1981, 12 in 1991, 10 in 2001. The low HDI states growing faster than the high HDI states. However at the same time dispersion of their cross-sectional HDI is not decreasing over time. Standard deviation is more for developed states like Haryana, Punjab, Tamil Nadu and less for Odisha, Bihar, Madhya Pradesh. It indicates income divergence among Indian states. HDI value registered highest increase in Kerala. Between 1981 to 1991, Tamil Nadu achieved highest increase in HDI.

JEL Classification Code: O15, O47, C87

Key Words:- Convergence, Disparity, Economic Growth, Human development, Rank

Introduction

Regional disparities in Human development along with economic growth experienced in India are a major challenge for policy makers and planners, as these produce serious threat to the socio-political harmony of the country. States have experienced different paces of economic growth and human development, with some states showing fast progress and others languishing behind, although increase in the national growth has been remarkable for the past two decades. Important policy questions that whether the national growth leads to further widening disparities, with rich states getting richer and poor states languishing behind even more? Similarly, whether differences in human development index of states are narrowing or rising over time? The economic policy of India must consider both disparity income and disparity in Human Development.

Regional equality has been a significant objective of the national plans. Regional backwardness is a main criterion while determining the funds devolution to state governments by the Finance Commission and the Planning Commission. If it is established that national growth will lead to

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convergence in regional incomes and human development, then growth in richer states will trickle down to poorer states in due course of time leading to improvement in human development.. In that case, emphasis should be on economic growth and human development rather than regional backwardness while distributing resources to the state governments. However, if the alternative hypothesis of divergence in regional incomes has stronger ground then, some growth may have to be sacrificed in order to achieve balanced regional growth. In this context, the objectives of the paper are to analyse the inter- state disparity in Human development in 1981,1991,2001 and 2007-08 with linkage to economic growth.

Data and Methodology on Convergence

The study has used human development index data from reports of Planning Commission, HDI reports of different states, state domestic product data provided by Central Statistical Organization (CSO) for the purpose of the analysis. This idea of convergence is nothing new as it was buried in the conventional treatment of growth model by Robert Solow. But the issues, those that have been made transparent through recent findings, seem to be quite interesting and have opened up avenues for further research in this area. Two main concepts of convergence appear in the classical literature. They are β convergence and σ convergence. If low HDI states (GDP is replaced by HDI) tend to grow faster than high ones we say there is absolute β convergence. There are two approaches for testing convergence, namely, (i) the σ convergence measure, which captures the trend in regional disparities, through changes in cross sectional dispersion of per capita product over time; and (ii) the β convergence, an approach based on neo-classical growth model. This approach is based on the measuring the empirical relationship between the initial income level in a region and the subsequent growth rate. A positive association between the two shows high growth in richer states, and therefore divergence in regional incomes.

(i) The σ measure

This measure captures the trend in dispersion in the human development index and regional incomes overtime. The study used standard deviation as a measure of dispersion. The standard deviations of human development index of different states over the four time periods are plotted.

(ii) β convergence Measure

Neoclassical growth theory framework is used to discern the pattern of regional state products in India. Neo classical growth model predicts that regional incomes will overtime converge, to their respective study states. Neo classical growth predicts convergence in regional income based on the assumption of diminishing factor returns. Therefore, the rich states with high factor stocks and high incomes will experience lower marginal factor returns, as compared to the poorer states. Hence, a negative relationship between the initial level of income and subsequent income growth rate become a criterion for testing convergence.

Inter State Disparity in HDI

There is high degree of inequality and regional disparity in human development across Indian States. It is observed from table-1 and Fig-1 and Fig-2 that minimum, maximum and mean values of HDI are

increasing over time but standard deviation of HDI is also increasing over time indicating increasing disparity over time.

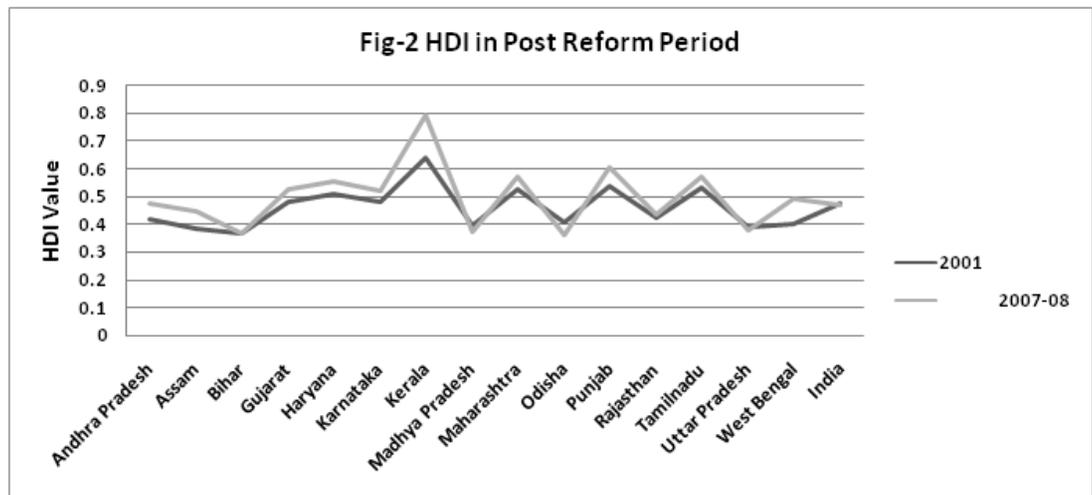
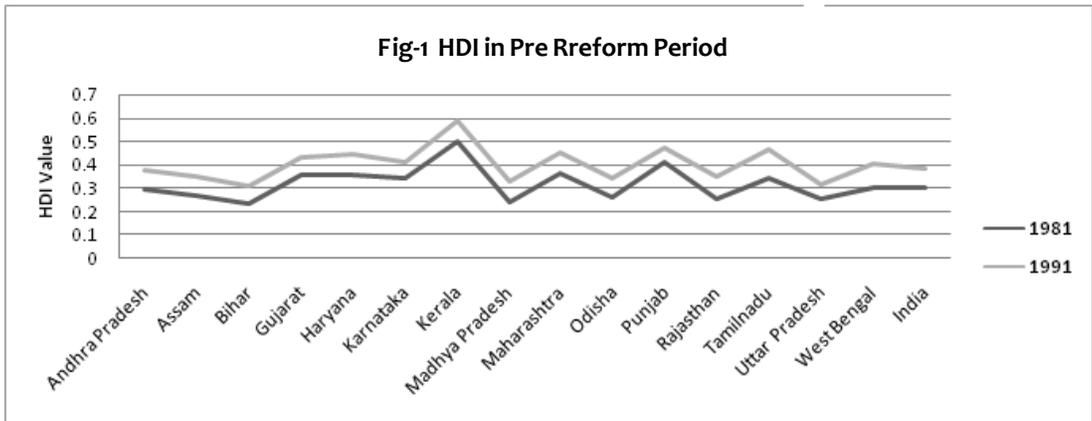
Table- 1: Human Development Index in India (1981, 1991, 2001 and 2007-08)

State	HDI 1981	HDI Rank	HDI 1991	HDI Rank	HDI 2001	HDI Rank	HDI 2007-08	HDI Rank
Andhra Pradesh	0.298	9	0.377	9	0.416	10	0.473	9
Assam	0.272	10	0.348	10	0.386	14	0.444	10
Bihar	0.237	15	0.308	15	0.367	15	0.367	14
Gujarat	0.360	4.5	0.431	6	0.479	6	0.527	6
Haryana	0.360	4.5	0.443	5	0.509	5	0.552	5
Karnataka	0.346	6	0.412	7	0.478	7	0.519	7
Kerala	0.500	1	0.591	1	0.638	1	0.79	1
Madhya Pradesh	0.245	14	0.328	13	0.394	12	0.375	13
Maharashtra	0.363	3	0.452	4	0.523	4	0.572	3
Odisha	0.267	11	0.345	12	0.404	11	0.362	15
Punjab	0.411	2	0.475	2	0.537	2	0.605	2
Rajasthan	0.256	12	0.347	11	0.424	9	0.434	11
Tamilnadu	0.343	7	0.466	3	0.531	3	0.57	4
Uttar Pradesh	0.255	13	0.314	14	0.388	13	0.38	12
West Bengal	0.305	8	0.404	8	0.472	8	0.492	8

Source- Planning Commission, Government of India, * indicate consumption adjusted HDI

It is evident from table -1 that rank of Andhra Pradesh remained at 9 in all years but rank of Tamilnadu improved from 7 in 1981 to 3 in 1991 and 2001. Kerala continues to get first position in all the years. The rank of Odisha was 11 in 1981, 12 in 1991, 10 in 2001. The low HDI states growing faster than the high HDI states. However at the same time dispersion of their cross-sectional HDI is not decreasing over time. Hence convergence in HDI may not be achieved over time among the Indian states rather divergence is observed more in pre and post reform period. In absence of convergence, it is difficult to achieve social equality in view of welfare implications and redistributive policies of the policy makers in India. The low human development index (HDI) states will remain lower for many generations and those states are having high HDI will be higher for ever unless serious policy intervention into social sector is done by the Government of India. Odisha is included among low HDI states of India where HDI increased from 0.267 in 1981 to 0.345 in 1991 and to 0.404 in 2001 with 22 rank among 23 states in India and 15th rank among 15 major states in 2007-08.

Fig-1 and Fig-2 shows HDI in pre and post reform periods.



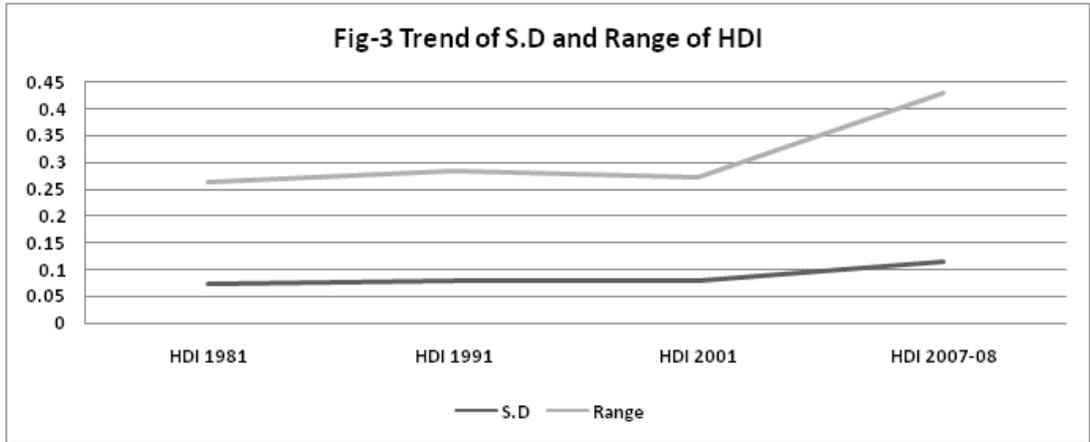
The summary statistics of HDI values are given in table-2.

Table- 2 Summary Statistics of HDI values

Measure	HDI 1981	HDI 1991	HDI 2001	HDI 2007-08
Mean	0.321	0.403	0.458	0.497
S.D	0.072	0.077	0.077	0.115
Kurtosis	1.131	1.060	0.268	1.700
Skewness	1.029	0.917	0.876	1.022
Range	0.263	0.283	0.271	0.428
Minimum	0.237	0.308	0.367	0.362
Maximum	0.500	0.591	0.638	0.790
N	15.000	15.000	15.000	15.000

Source- Computed using EXCEL data Analysis

The range in HDI is 0.428 in 2007-08 but it is 0.263 in 1981, 0.283 in 1991 and 0.271 in 2001. This indicates rising disparity in HDI among Indian states.



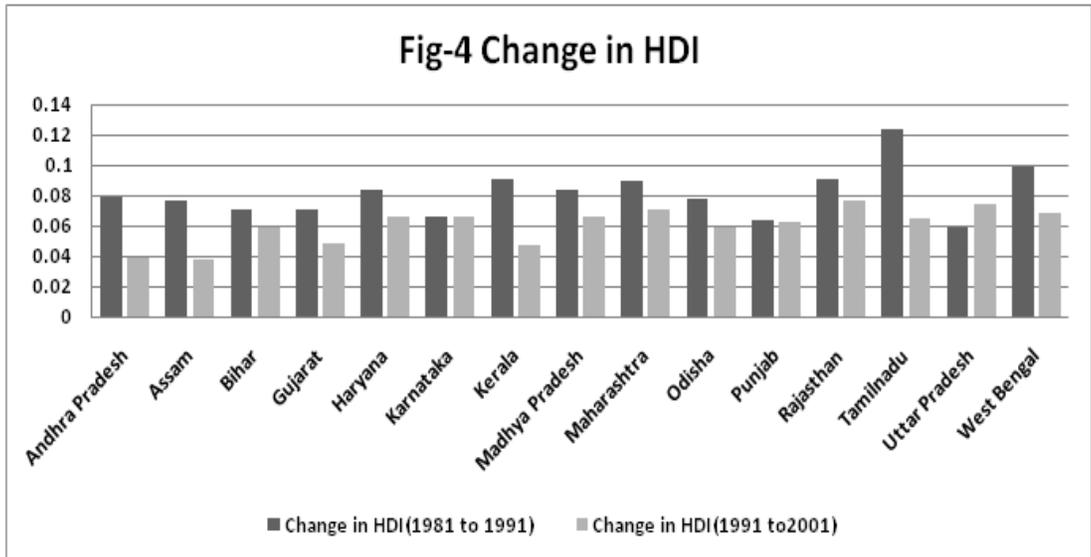
The standard deviation in HDI among states is highest that is 0.115 in 2007-08 which implies increasing disparity after 2001. Changes in HDI in different states are calculated and shown in table-3. HDI value registered highest increase in Kerala. Between 1981 to 1991, Tamil Nadu achieved highest increase in HDI.

Table-3 Change in HDI

States	Change in HDI(1981 to 1991)	Change in HDI(1991 to 2001)
Andhra Pradesh	0.079	0.039
Assam	0.076	0.038
Bihar	0.071	0.059
Gujarat	0.071	0.048
Haryana	0.083	0.066
Karnataka	0.066	0.066
Kerala	0.091	0.047
Madhya Pradesh	0.083	0.066
Maharashtra	0.089	0.071
Odisha	0.078	0.059
Punjab	0.064	0.062
Rajasthan	0.091	0.077
Tamilnadu	0.123	0.065
Uttar Pradesh	0.059	0.074
West Bengal	0.099	0.068
India	0.079	0.091

Source- Computed using EXCEL data Analysis

The changes in HDI are shown in bar chart Fig-4.



The Spearman rank correlation matrix is shown in table-4. There is high rank correlation indicating no improvement in HDI rank over time.

Table-4 Rank Correlation Matrix

	HDI 1981	HDI 1991	HDI 2001	HDI 2007-08
HDI 1981	1.00			
HDI 1991	0.96	1.00		
HDI 2001	0.88	0.93	1.00	
HDI 2007-08	0.94	0.97	0.89	1.00

Source- computed by the Author

Income disparity and Convergence in India

Income disparity exists among Indian states but many researchers found that less developed states are growing faster than developed states. It is evident, that disparity has risen and India has experienced divergence in regional incomes. The economic growth in Indian economy has been highly unequal. Data reveals that states such as Goa and Gujarat, which already had relatively higher per capita GSDP, registered remarkable growth in this year, whereas states with low incomes, such as Orissa and Bihar, registered negative growth in per capita GSDP. Table-5 indicates in descriptive statistics of SDP per capita for 53 years. The range and standard deviation is more for developed states and less for less developed states. Hence there has been income divergence among Indian states over time.

Table 5: Descriptive statistics SDP per capita (in Indian Rupees at 1993-94 prices) for the period (1960 – 2012) for 15 major Indian states (N=53)

State	Mean	Std. Dev.	Min.	Max.	Skewness	Range
Andhra Pradesh	12552	19108	316	78958	2.01	78642
Assam	7959	9959	395	40475	1.65	40080
Bihar	4449	5864	245	27202	2.14	26957
Gujarat	16166	24096	436	104261	2.06	103825
Haryana	18807	28490	382	119158	2.05	118776
Karnataka	13120	18853	373	76578	1.85	76205
Kerala	14801	21496	373	88527	1.86	88154
Madhya Pradesh	8036	10325	338	44989	1.80	44651
Maharashtra	17821	25621	463	103991	1.86	103528
Orissa	8438	11883	275	49241	1.89	48966
Punjab	16518	21454	407	84526	1.62	84119
Rajasthan	9812	13606	388	59097	2.01	58709
Tamil Nadu	15464	23571	430	98628	2.05	98198
Uttar Pradesh	6604	8193	307	33616	1.65	33309
West Bengal	10714	14659	452	61352	1.83	60900

Source- CSO

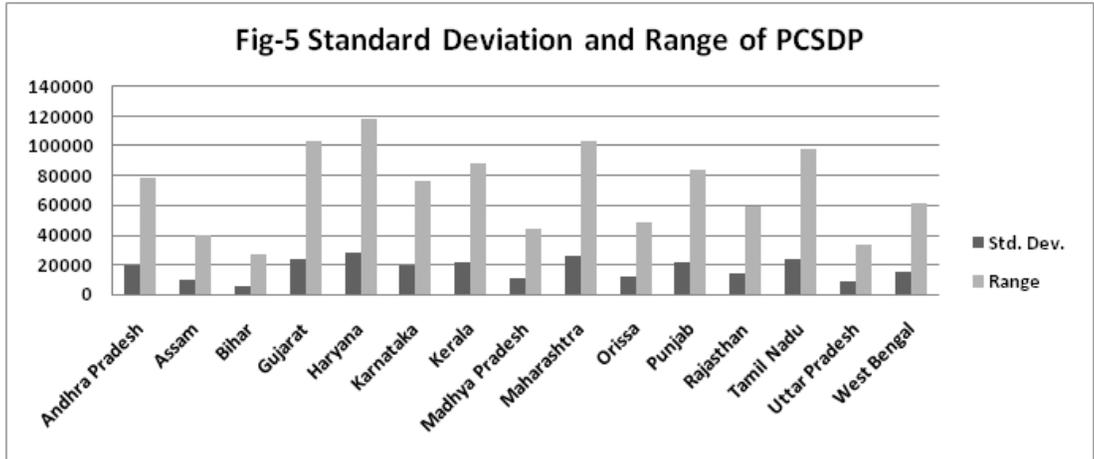
Table-6 PCSDP/PCNDP

State	Mean	Std. Dev.	Min.	Max.	Skewness	Range
Andhra Pradesh	0.94	0.11	0.78	1.16	0.60	0.38
Assam	0.83	0.14	0.59	1.08	-0.10	0.49
Bihar	0.51	0.12	0.30	0.72	-0.34	0.42
Gujarat	1.28	0.12	1.04	1.54	-0.04	0.5
Haryana	1.42	0.20	0.95	1.77	-0.67	0.82
Karnataka	1.07	0.06	0.95	1.18	0.05	0.23
Kerala	1.15	0.12	0.92	1.34	0.00	0.42
Madhya Pradesh	0.81	0.11	0.58	0.97	-0.65	0.39
Maharashtra	1.39	0.17	1.10	1.68	-0.18	0.58
Orissa	0.76	0.07	0.64	0.91	0.14	0.27
Punjab	1.50	0.19	1.08	1.81	-0.59	0.73
Rajasthan	0.92	0.10	0.73	1.14	0.06	0.41
Tamil Nadu	1.13	0.17	0.87	1.45	0.26	0.58
Uttar Pradesh	0.71	0.12	0.49	0.90	-0.66	0.41
West Bengal	1.01	0.10	0.86	1.20	0.13	0.34

Source- CSO

$PCSDP/PCNDP = \text{SDP per capita as a fraction of National GDP per capita} = \text{SDP per capita in state } i / \text{National GDP per capita}$

The standard deviation and range are plotted in Fig-6. It is clear from table-6 that standard deviation is more for developed states like Haryana, Punjab, Tamilnadu and less for Odisha, Bihar, Madhya Pradesh.



It implies that the ratio PCSDP/PCNDP has improved more in developed states. Looking at range values, the improvement in ratio is more also in developed states. Hence there has been income divergence in India over time.

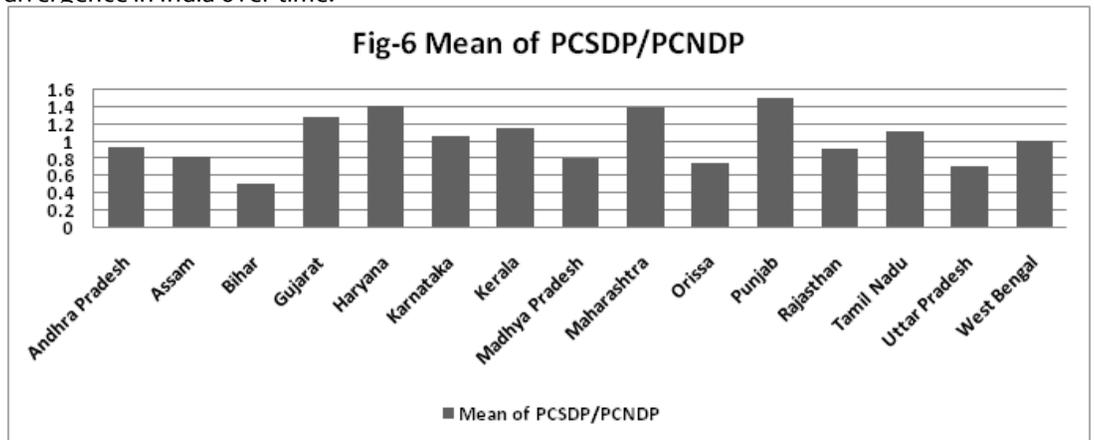


Table-7 shows rank correlation between Rank of PCSDP and Rank of HDI. The correlation coefficient is 0.875 which is strong and positive. It indicates that generally income rich state has more HDI value in India.

Table-7 Correlation Matrix between Rank of PCSDP and Rank of HDI

	Rank of PCSDP	Rank of HDI 1991
Rank of PCSDP	1	
Rank of HDI 1991	0.875	1

Conclusion

Most of the research studies examining income convergence across Indian states reveal that most studies find significant income divergence. The findings of the present study confirm the absence of income and HDI convergence in India. This is in line with the findings of the existing literature studying income convergence across Indian states. Most rational and reasonable point from the study that while economic growth is an important tool for improving living conditions of people but its reach and impact vary a lot across the states. This absence of convergence of human development across Indian states is a serious area of concern so far overall development of the states are concerned. Therefore the study concludes with the observation that absence of convergence of human development across Indian States which is a serious area of concern. Further investigation can be worked out about the causes of this non-convergence of HDI among the different states in India and what are the important factors which influence Human Development in a significant manner, The important inference from the study that regional disparity in Human development can not be reduced by income growth only. There is need to invest heavily in social sectors by less developed states to reduce interstate disparity.

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Inter-Regional, Social Class and Gender Disparity in Higher Education in India

Kabita Kumari Sahu¹

The objective of the paper is to analyse the interstate disparity in higher education infrastructure and enrolment, inter class disparity in higher education among SC/ST and to examine gender disparity in Higher education in India. The study is based on secondary data from MHRD, Government of India, All India Survey on Higher Education, 2011-12 and RBI database. The interstate disparity in GER is less among ST students as compared to SC. The GPI is higher in Kerala and Chandigarh and the GPI for SC students is lowest in Bihar followed by Rajasthan. The Union Government's expenditure on higher education to various states is also grossly uneven. Goa spends 17.79 per cent of total expenditure on higher education which is highest among states but it is only 1.78 in Sikkim which is lowest. It is necessary to remove the regional and social imbalances prevailing in the access to higher education.

JEL Code- I 23

Key Words: Disparity, Expenditure, Gross Enrolment Ratio, Higher Education

Introduction

Education is the key to harnessing India's demographic dividend. It is the key parameter in the growth strategy of any developing nation and has rightly been accorded an honored place in the society. It is considered to have the potential to effect change in the system of social stratification. Indian higher education currently the third largest in the world, is likely to surpass the US in the next five years and China in the next 15 years to be the largest system of higher education in the world.

Higher education (HE) in India has seen significant expansion since Independence, both in terms of institutional capacity and greater enrolment. The total numbers of universities have increased from 25 to 642 and the number of colleges from 700 to 34908 between 1950 and 2013. This increase in numbers can be attributed to the substantial addition of private universities and colleges and the initiative of the government in increasing access to higher education by establishing new institutions.

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The total enrolment increased from a meagre 0.1 million in 1947-48 to 17 million in 2010-11 a remarkable increase indeed. However, the marginalised sections-Scheduled caste and Scheduled tribes population are in disadvantageous position with respect to higher education. For the scheduled castes population, the total gross enrolment rate in higher education increased from 17.48 in 2009-10 to 21.82 in 2010-11. The gross enrolment rate in higher education for Scheduled Tribe had increased from 16.02 in 2009-10 to 17.91 in 2010-11. At all India level in 2010-11, while the enrolment rate in higher education for Scheduled caste was 21.83, for Scheduled Tribes it was 17.91 and for the general group it was 30.64. The emergence of knowledge economy and challenge of global competitiveness are important factors influencing equity, relevance and quality of higher education (Prakash, 2007). The expansion of higher education in India is accompanied by widening disparities which has three dimensions, namely, regional disparities, group disparities and disparities between sexes. The variations in GER are a good indicator of existing disparities in higher education development among the states.

Higher Education Infrastructure in India

In the process of expansion of higher education the problem of disparity has been more acute. There is also region-wise imbalance in the distribution of colleges and universities. The maximum numbers of colleges were distributed in the southern region, which has resulted into concentration of colleges in particular region. The distribution of institutions of higher education is uneven among the states. The data presented in the Table -1 examines the distribution of state wise universities and colleges, student teacher ratio, percentage of female, SC and ST enrolment to assess the present scenario of higher education in India.

Table 1. State wise Higher Education Infrastructure in India

Sl. No.	State	University per 1 crore population	Colleges per 1 lakh population	Teacher Student Ratio	Female Enrolment (per cent)	SC Female Enrolment (per cent)	ST Female Enrolment (per cent)
1	Andhra Pradesh	5.55	48	15	42.2	44.06	40.66
2	Arunachal Pradesh	21.74	16	35	40.2	23.21	40.99
3	Assam	2.89	13	21	50.4	48.11	49.59
4	Bihar	1.93	6	44	39.6	34.95	41.51
5	Chandigarh	28.57	19	19	43.2	45.01	51.94
6	Chhatisgarh	6.66	18	20	44.7	42.26	46.14
7	Delhi	14.93	9	19	43.7	40.62	40.83
8	Goa	13.70	32	14	49.3	48.86	48.28
9	Gujarat	6.29	25	27	41.7	42.39	47.46
10	Haryana	8.68	33	22	44.7	42.79	32.28
11	Himachal Pradesh	26.24	38	22	47.4	46.73	48.90

12	Jammu and Kashmir	8.76	21	32	50.6	48.49	42.85
13	Jharkhand	3.64	7	40	44.0	37.74	51.54
14	Karnataka	7.03	44	13	45.9	43.57	42.16
15	Kerala	5.09	30	14	58.5	64.96	55.41
16	Madhya Pradesh	4.55	24	24	39.2	43.63	45.00
17	Maharashtra	3.92	34	22	42.4	42.97	36.07
18	Manipur	11.03	26	18	52.3	48.94	45.15
19	Meghalaya	33.78	17	19	56.8	30.49	62.26
20	Mizoram	27.52	22	15	47.8	42.63	48.20
21	Nagaland	20.20	22	18	37.6	29.60	38.13
22	Odisha	4.53	23	21	43.9	44.56	46.22
23	Puducherry	24.39	64	8	49.0	47.32	31.89
24	Punjab	6.86	28	20	39.1	39.55	23.90
25	Rajasthan	6.56	32	26	39.1	34.48	35.80
26	Sikkim	98.36	14	14	42.2	42.85	51.50
27	Tamil Nadu	8.18	30	14	46.2	47.73	46.24
28	Tripura	750.00	9	23	40.2	38.48	37.85
29	Uttar Pradesh	56.32	20	30	49.6	49.36	43.64
30	Uttrakhand	1.00	32	31	50.2	49.32	54.68
31	West Bengal	2.85	8	34	41.6	40.75	40.02
32	All India	5.30	25	42	44.4	44.31	43.05

Source: All India Survey on Higher Education, 2011-12, MHRD (2012)

The Number of Universities in various states and union territories of India were 642 in December 2011. Universities and University level institutions were highest in Tamil Nadu (59) followed by Uttar Pradesh (57). It means 18 per cent Universities were in these two states. There is state-wise disparity in all these institutions which are related with higher education. The lop sided growth of the universities was visible from the analysis of the data. As per table-1, the University per 1 crore population in India is 5.30. The states having less number universities per 1 crore population compared to India are West Bengal, Uttrakhand, Odisha, Maharashtra, Madhya Pradesh, Kerala ,Jharkhand, Bihar and Assam. Uttrakhand and Bihar have poor university infrastructure in India. The number of colleges per one lakh population is also low in Bihar, Jharkhand, West Bengal and Tripura and Delhi. The number of colleges per one lakh population and teacher student ratio. Bihar has highest teacher student ratio in

higher education and Puduchery has the lowest. Table-2 shows the summary statistics of higher education infrastructure. The average teacher student ratio is 22.39 which is not as per the prescribed norm of 15 by the University Grants Commission. The female enrolment in higher education for all is 45.27 but it is 44.10 for ST female and 42.79 for SC female. So, the performance of ST female is better than the SC female in higher education.

Table-2 Summary Statistics

SI No	State	University per 1 crore population	Colleges per 1 lakh population	Teacher Student Ratio	Female Enrolment (per cent)	SC Female Enrolment (per cent)	ST Female Enrolment (per cent)
1	Mean	39.41	24.65	22.39	45.27	42.79	44.10
2	Median	8.18	23.00	21.00	44.00	42.97	45.00
3	S.D	133.32	12.88	8.38	5.22	7.50	7.79
4	Range	749.00	58.00	36.00	20.90	41.75	38.36
5	Minimum	1.00	6.00	8.00	37.60	23.21	23.90
6	Maximum	750.00	64.00	44.00	58.50	64.96	62.26

Source- Computed by the Author using EXCELL

It is necessary to analyse the significance of difference in enrolment of ST and SC females in higher education. The t-test results are displayed in table-3. The p value of t-test in both one and two tail test is more than 0.1. Hence, the difference in SC and ST female enrolment is not significant.

Table-3 t-Test: Two-Sample Assuming Unequal Variances

	SC Female Enrolment (per cent)	ST Female Enrolment (per cent)
Mean	42.79	44.10
Variance	56.24	60.70
Observations	31.00	31.00
df	60.00	
t Stat	-0.68	
P(T<=t) one-tail	0.25	
t Critical one-tail	1.67	
P(T<=t) two-tail	0.50	
t Critical two-tail	2.00	

Source- Computed by the Author using EXCELL

Table-4 shows the correlation matrix among the Higher Education Infrastructure in India. The universities per one crore population has low negative correlation with colleges per one lakh population, student teacher ratio, female enrolment. It implies that more number of universities in a state has no impact on enrolment. The colleges per one lakh population have positive correlation with female enrolment. So, female enrolment can be increased by establishing more colleges in states. Student teacher ratio has negative correlation with female enrolment. Hence, it is suggested that more teachers in higher education can improve female enrolment.

Table-4 Correlation Matrix

	University per 1crore population	Colleges per 1lakh population	Teacher Student Ratio	Female Enrolment (per cent)	SC Female Enrolment (per cent)	ST Female Enrolment (per cent)
University per 1crore population	1.00					
Colleges per 1lakh population	-0.24	1.00				
Student Teacher Ratio	-0.04	-0.53	1.00			
Female Enrolment (per cent)	-0.17	0.19	-0.27	1.00		
SC Female Enrolment (per cent)	-0.12	0.34	-0.32	0.60	1.00	
ST Female Enrolment (per cent)	-0.11	-0.27	0.00	0.58	0.25	1.00

Source- Computed by the Author using EXCELL

Students Enrolment in India: Gross Enrolment Ratio (GER)

One of the important parameters of higher education is gross students' enrolment ratio in India. The variations in GER are a good indicator of existing disparities in higher education development among the states. During the period 2011-12, all states improved their GERs in higher education. While the GER increased by three times in states such as Andhra Pradesh and Tamil Nadu and it doubled in many of the major states while the increase was relatively less in states such as West Bengal. The inter-state disparities in enrolment (GER) increased over a period of time. A close examination of the state level data will indicate that larger gains in GER took place mainly in those states where private institutions accounted for a good share of the total institutions and enrolments. The exceptions are smaller states and union territories such as Delhi, Chandigarh etc. The GER during 2011-12 is given in table-5.

Table-5 Gross Enrolment Ratio (2011-12)

Sl. No.	States	All Categories			SC			ST		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
2	Andhra Pradesh	33.3	26.4	29.9	28.2	22.9	25.6	29.5	19.2	24.2
3	Arunachal Pradesh	22.5	20.2	21.3				27.1	22.7	24.8
4	Assam	14.6	14.8	14.7	12.8	12.2	12.5	15.7	16.0	15.9
5	Bihar	14.0	10.8	12.5	9.4	6.1	7.8	15.9	14.0	15.0
6	Chandigarh	33.2	54.4	42.2	15.3	22.5	18.5			
7	Chhatisgarh	11.0	10.1	10.5	8.8	7.3	8.1	4.9	4.5	4.7
10	Delhi	38.9	39.0	38.9	19.7	17.0	18.5			
11	Goa	21.5	25.9	23.5	21.0	24.5	22.7	11.8	13.6	12.7
12	Gujarat	18.1	14.7	16.5	18.3	15.1	16.8	9.5	8.7	9.1
13	Haryana	28.3	27.7	28.0	18.3	16.6	17.5			
14	Himachal Pradesh	24.6	25.1	24.8	13.9	13.9	13.9	19.0	19.6	19.3
15	Jammu and Kashmir	21.8	24.0	22.8	8.9	12.1	10.5	8.0	5.8	6.9
16	Jharkhand	10.2	9.5	9.9	6.5	4.9	5.8	5.3	6.0	5.6
17	Karnataka	24.9	22.7	23.8	17.5	14.2	15.8	15.8	12.7	14.3
18	Kerala	17.8	25.6	21.8	12.0	21.8	16.9	12.9	15.0	14.0
20	Madhya Pradesh	22.0	14.6	18.5	13.7	10.9	12.4	8.4	5.8	7.1
21	Maharashtra	28.1	24.3	26.3	25.7	22.0	23.9	14.2	8.6	11.4
22	Manipur	30.4	29.9	30.2	55.0	54.6	54.8	20.5	18.2	19.4
23	Meghalaya	16.3	18.5	17.4	33.5	32.5	33.0	13.6	16.1	14.9
24	Mizoram	19.6	18.3	19.0	78.4	112.7	90.8	20.0	18.4	19.2
25	Nagaland	18.2	13.4	15.8				11.7	12.8	12.3
26	Odisha	18.3	15.0	16.6	10.0	8.4	9.2	7.2	6.0	6.6
27	Puducherry	40.4	36.3	38.3	31.3	26.6	28.8			
28	Punjab	22.4	23.6	23.0	8.0	8.8	8.4			
29	Rajasthan	20.6	15.5	18.2	14.1	9.3	11.8	15.1	10.1	12.7
30	Sikkim	28.9	27.4	28.2	28.9	26.8	27.8	15.6	22.4	19.0
31	Tamil Nadu	43.2	36.8	40.0	30.3	26.7	28.5	36.1	29.1	32.5
32	Tripura	14.6	10.2	12.4	12.6	8.5	10.6	8.3	4.8	6.4
33	Uttar Pradesh	17.5	17.2	17.4	12.6	13.2	12.9	23.6	17.2	20.5

34	Uttrakhand	30.1	32.3	31.1	17.1	17.2	17.2	39.1	41.4	40.2
35	West Bengal	15.4	11.8	13.6	10.2	7.6	9.0	7.7	5.3	6.4
	All India	22.1	19.4	20.8	15.8	13.9	14.9	12.4	9.7	11.0

Source: AISHE 2011-12

Table-6 Summary Statistics of GER

	All category			SC			ST		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Mean	21.53	20.06	20.82	20.81	21.06	20.76	15.74	14.10	14.92
S.D 7.78	7.69	7.51	16.39	22.38	18.40	9.01	8.73	8.67	
Variance	60.55	59.12	56.35	268.79	500.84	338.62	81.13	76.15	75.18
Kurtosis	1.12	-0.76	0.23	6.38	12.80	9.18	1.34	2.94	2.13
Skewness	0.96	0.37	0.67	2.38	3.33	2.82	1.26	1.41	1.31
Range	33.00	27.30	30.10	71.90	107.80	85.00	34.20	36.90	35.50
Minimum	10.20	9.50	9.90	6.50	4.90	5.80	4.90	4.50	4.70
Maximum	43.20	36.80	40.00	78.40	112.70	90.80	39.10	41.40	40.20

Source- Computed by the Author using EXCELL

Table-6 shows the summary statistics of GER. The interstate disparity in GER is more among SC female because ($SD=22.38$). The disparity is less among ST students as compared to SC. Another measure of disparity is range which is also higher for SC students than ST students. The t-test result of GER of SC and ST are shown in table-7. The p value is 0.08 in one tailed test which implies that the difference between GER of SC and ST is significant at 10% level.

Table-7 t-Test: Two-Sample Assuming Unequal Variances

	GER SC	GER ST
Mean	20.76	14.92
Variance	338.62	75.18
Observations	24.00	24.00
df	33.00	
t Stat	1.41	
P(T<=t) one-tail	0.08	
t Critical one-tail	1.69	
P(T<=t) two-tail	0.17	
t Critical two-tail	2.03	

Source- Computed by the Author using EXCELL

Gender Parity Index in Higher Education

Gender Parity Index (GPI) is calculated by dividing the female GER by the male GER. A GPI of 1 indicates parity between sexes; a GPI that varies between 0 and 1 means a disparity in favour of males. The GPI is higher than 1 in Kerala and Chandigarh which implies that female enrolment in higher education is more in SC, ST and in all category students. The GPI for SC students is lowest in Bihar followed by Rajasthan.

Table- 8 Gender Parity Index in Higher Education in India (18-23 years)

Sl.No	States	All categories	SC students	ST students
1	Andhra Pradesh	0.79	0.81	0.65
2	Arunachal Pradesh	0.89		0.84
3	Assam	1.01	0.95	1.02
4	Bihar	0.77	0.65	0.88
5	Chandigarh	1.64	1.47	
6	Chhatisgarh	0.92	0.83	0.91
7	Delhi	1.00	0.86	
8	Goa	1.21	1.16	1.16
9	Gujarat	0.81	0.83	0.92
10	Haryana	0.98	0.91	
11	Himachal Pradesh	1.02	1.00	1.03
12	Jammu and Kashmir	1.10	1.36	0.73
13	Jharkhand	0.93	0.76	1.14
14	Karnataka	0.91	0.81	0.80
15	Kerala	1.44	1.82	1.16
16	Madhya Pradesh	0.67	0.79	0.69
17	Maharashtra	0.86	0.86	0.60
18	Manipur	0.98	0.99	0.89
19	Meghalaya	1.13	0.97	1.19
20	Mizoram	0.93	1.44	0.92
21	Nagaland	0.74		1.09
22	Odisha	0.82	0.83	0.82
23	Puducherry	0.90	0.85	
24	Punjab	1.05	1.10	

25	Rajasthan	0.75	0.66	0.67
26	Sikkim	0.95	0.93	1.44
27	Tamil Nadu	0.85	0.88	0.81
28	Tripura	0.70	0.67	0.58
29	Uttar Pradesh	0.98	1.05	0.73
30	Uttrakhand	1.07	1.01	1.06
31	West Bengal	0.76	0.75	0.69
	All India	0.88	0.88	0.78

Source: AISHE 2011-12

The results of chi-square test of GPI of SC and ST indicate that the difference is not significant as the significance value is 0.325.

Table-9 Chi-Square Tests of GPI SC with GPI ST

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.920E2 ^a	380	.325
Likelihood Ratio	132.092	380	1.000
Linear-by-Linear Association	3.045	1	.081
N of Valid Cases	24		

Public Expenditure on Higher Education

Education in India, as in most of the countries of the world, is mostly a state-sponsored activity. Total expenditure on higher has increased significantly after Independence. However, with the advent of economic reforms during 1990s, budgetary allocations to higher education have been squeezed off and this sector has suffered badly. Moreover, whatever growth has been seen in the quantum of government spending on higher education, it was offset by increase in prices, increase in population and increase in number of students in this sector. These trends taken together with the rising enrolment led to sharp decline in real per student expenditure. The adverse macro economic conditions and increased competition for scarce public funds have reduced many governments' capacity to support higher education which resulted into mismatch between demand of higher educational services in the country and its supply. Even after six decades of independence, higher education is still not accessible to all the sections of the people. Inter-state variations in terms of access, equity and quality have further aggravated the problem. Unsatisfactory funding pattern is mainly responsible for this crisis of higher education across different states in the country. It is therefore imperative to carry a exhaustive study of public expenditure pattern across major states of India.

Higher education expenditure increased substantially in the past decade, especially during the Eleventh Five Year Plan period. During the past decade public expenditure on higher education increased by

around four times at current prices and by more than two times in real terms. In fact the share of higher education in the state budgets remained at around 16-17 per cent in the past decade. In fact, RUSA is an effort to reach a better balance in allocation of resources between Centre and State governments in higher education.

Table 10 Public Expenditure on education in 2010-2011

State	Elementary (%)	Secondary (%)	Adult (%)	Higher (%)	Technical (%)	Others (%)
Andhra Pradesh	46.28	29.1	0.43	17.19	6.15	0.84
Arunachal Pradesh	64.09	25.08	1.2	6.73	0.64	2.26
Assam	56.36	25.29	0.39	13.63	1.55	2.78
Bihar	58.76	23.73	1.01	14.32	0.45	1.74
Chhattisgarh	63.92	23.73	0.12	8.77	1.66	1.81
Goa	20.67	52.76	0.38	17.79	5.94	2.47
Gujarat	65.22	20.9	1.54	7.34	3.35	1.66
Haryana	49.21	34.25	0.04	12.19	4.22	0.09
Himachal Pradesh	61.52	29.8	0.07	7.09	0.98	0.54
Jammu & Kashmir	48.06	37.07	0.41	10.6	2.83	1.03
Jharkhand	70.89	13.48	...	12.31	2.84	0.48
Karnataka	50.53	30.83	0.11	13.07	2.21	3.24
Kerala	39.09	40.28	0.13	14.92	4.57	1.01
Madhya Pradesh	63.95	25.01	0.01	7.9	2.22	0.91
Maharashtra	45.36	42.99	0.07	7.58	3.19	0.81
Manipur	44.59	34.79	1	16.71	0.87	2.04
Meghalaya	48.62	30.18	0.64	14.29	2.59	3.67
Mizoram	53.11	24.51	0.73	10.65	1.14	9.86
Nagaland	50.66	38.17	0.3	7.27	1.23	2.37
Odisha	55.01	26.57	0.1	16.13	1.48	0.71
Punjab	24.88	63.37	0.03	9.65	1.31	0.76
Rajasthan	57.5	34.81	0.42	5.5	0.63	1.13
Sikkim	45.34	39.34	0.02	1.78	0.08	13.45
Tamil nadu	41.18	42.16	0.04	11.12	2.25	3.25
Tripura	28.55	53.96	4.23	7.46	1.1	4.69
Uttarakhand	47.4	41.91	...	5.78	3.19	1.72
Uttar Pradesh	52.6	34.85	...	10.52	1.12	0.9
West Bengal	32.38	49.18	0.26	13.76	2.86	1.55

Source: MHRD (2012b)

Table-11 Descriptive Statistics of Public expenditure on education

Summary Statistics	Elementary	Secondary	Adult	Higher	Technical	Others
	(%)	(%)	(%)	(%)	(%)	(%)
Mean	49.49	34.58	0.49	10.79	2.24	2.42
Standard Deviation	12.40	11.21	0.84	4.06	1.56	2.87
Sample Variance	153.86	125.64	0.70	16.51	2.45	8.21
Minimum	20.67	13.48	0.00	1.78	0.08	0.09
Maximum	70.89	63.37	4.23	17.79	6.15	13.45
Range	50.22	50.09	4.23	16.01	6.07	13.36

Source- Computed by the Author using EXCELL

The descriptive statistics of public expenditure on education shows that the average expenditure on higher education is only 10.79 per cent of total education expenditure. The standard deviation of higher education expenditure among states is 4.06 which imply that there is considerable disparity in higher education expenditure in India. Goa spends 17.79 per cent of total expenditure on higher education which is highest among states but it is only 1.78 in Sikkim which is lowest. Since the range value is 16.01 per cent, it shows that there is high degree of disparity in percentage of higher education expenditure in India.

Though education comes under concurrent list, the primary responsibility of higher education expenditure lies with the state governments. The share of education in Gross State Domestic Product (GSDP) is the most widely used indicator to measure the priority given to education across states in India.

Table-12 Expenditure on Higher Education – As per cent to GSDP

States	Expenditure on Higher Education as % to GSDP			
	1980-81	1990-91	2000-01	2009-10
Andhra Pradesh Pradesh	0.54	0.61	0.59	0.29
Bihar	0.11	0.49	0.02	0.57
Gujarat	0.20	0.32	0.36	0.14
Haryana	0.30	0.34	0.37	0.29
Karnataka	0.48	0.48	0.51	0.21
Kerala	0.52	0.66	0.53	0.36
Madhya Pradesh	0.23	0.32	0.42	0.21
Maharashtra	0.31	0.33	0.45	0.19
Odisha	0.40	0.59	0.48	0.58

Punjab	0.28	0.38	0.29	0.24
Rajasthan	0.34	0.35	0.27	0.15
Tamil Nadu	0.51	0.42	0.35	0.24
Uttar Pradesh Pradesh	0.22	0.3	0.28	0.22
West Bengal	0.36	0.52	0.47	0.39
India	0.36	0.45	0.48	0.41

Source: Analysis of Budgeted Expenditure (Different Years), Ministry of Human Resources Development, Various Reports, RBI.

Analysis of expenditure on the higher education as per cent to GSDP across major states reveals the importance being given to higher education in these states. A high percentage of GSDP devoted to these sub sectors of education denotes a higher level of attention on investment in this area. During 1980-81, the expenditure on higher education was 0.36 per cent of GDP. During 1990-91 and 2000-01, the proportion of expenditure on higher education was 0.45 and 0.48 per cent which has reduced to 0.41 per cent in 2009-10. For all the time period under study, states like Karnataka, Kerala, Maharashtra and Tamil Nadu were spending relatively higher proportion of their GSDP on higher education. The data also shows that for most of the states as well as India, proportionate expenditure on higher education has shown a declining trend after 1990-91. Moreover, the table reveals that there exists wide inter-state disparity in terms of public expenditure on higher education. Most of the states, which are spending very less on higher education, are witnessing lower college population index and lower gross enrolment ratio in higher education. Lower per capita spending and huge disparity in terms of spending across different states in the sector has further aggravated the problem. It is quite unfortunate to note that the amount of money spent by state governments on higher education is not efficiently utilized.

Conclusion

There has been massive expansion of higher education in India, but it has not been able to cope with the task of catering to India's teeming millions. There has been growth in the number of educational institutions, but the gap in regional disparities seems to be widening. Thus a number of problems are creating adverse effects on our system of higher education. Resolving these issues are difficult but not an impossible task. Various Committees have been appointed in India to look into India's system of Higher Education. If we start implementing these recommendations, a way can be initiated for improving higher education in the correct direction. The quality enhancement in the higher education is a collective effort. The teachers, the members of managements, the participation of students', the participation of educationists, the participation of experts of information technology, infrastructure all these elements should be collectivity involved in the process of enhancing qualitative higher education.

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“An Analysis of Regional Disparities in Agricultural Development in India”

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As agriculture is considered to be the vital cog in the wheel of Indian economy. Economic prosperity of the country depends upon long term sustainable development of agriculture with minimisation of disparities among the states. The disparities in agriculture among the different regions of India are result of various factors connected with each other. The present paper analyses the objective of regional disparities in agricultural development in different states of India on a number of indicators like percentage of agricultural workers, percentage of net sown area, inputs use, percentage of net irrigated area, cropping intensity, total agricultural productions and productivity, percentage of agriculture contribution to state GDP etc. Keeping the objective in view, the data for analysing the study have been collected from various secondary sources. The relative variations, ranks and percentage growth in various aspects of agricultural development of different states have been computed during the period under consideration. Finding of the study shows existence of high inter-state disparities in agricultural development in the country over the years. The disparities in agricultural development among the different states emanate from numerous factors including credit-availability, monsoon, technology, topographical features, historical, institutional, natural and socio-economic factors. The study suggests the policy makers to increase the government expenditure in agricultural infrastructure including irrigation, technology, crop varieties and credit facilities, and to focus on the underdeveloped regions for removing the disparities and achieving inclusive and sustainable agricultural development in the country.

Key Words: Agriculture, Regional Disparity, Productivity, Technology, Percentage Growth

Introduction

Agriculture has a significant role in the socio-economic fabric of India as it is the source of livelihood for more than 60 percent of the population of India. Agriculture has shifted its meaning from ancient and traditional one to modern and scientific way of cultivation of crops to bring multiple effects on productivity with a given level of input use. In 21st century, diversification of agriculture is essential, and furthermore, crop rotation and multiple cropping are required to maintain the quality of the soil by altering its different uses. When Indian agriculture comes into picture, it is very much unpredictable

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because of its climatic pattern, marked with uneven and erratic monsoon. There is wide variation in average rainfall ranging from 1200 cm in places like Cherapunji and Mawsyanaram to the places situated in desert areas which are receiving less than 10cm of average rainfall. A regional variation in agriculture is bound to occur in a country like India where climatic conditions vary from one part to another. Advent of Green Revolution added to the disparities in a greater way by facilitating the use of modern and scientific techniques in the states. States like Punjab, Haryana, Uttar Pradesh etc easily imbibed this technology as inputs in agriculture whereas the states which are situated in undulating topographical regions having small size of land holdings found it extremely difficult to manage and operate the scientific technology, HYVs seeds, fertiliser, pesticides, irrigation etc. In the states situated in north-eastern parts of the country, located in hilly areas, the impact of the Green Revolution was found to be very negligent. Although measures were taken during 1980's and 1990's to improve the productivity in north-eastern and eastern states, paving way for some positive sign, the disparities, as a matter of fact, continued to thrive. In hilly and sloppy areas, soil erosion was a major bottleneck to retain the soil fertility, as the top soil got washed away during heavy rain because of large scale deforestation, adding to the misery.

Review of literature

Raman, R. and Kumari, R. (2012) have worked upon district-wise regional disparities in agricultural development in Uttar Pradesh. They viewed that population pressure and lack of specific regional policies adversely affected the regional agricultural development. Singh, K. (2011) has specifically focused on the impact of banking sector reforms upon rural agricultural finance. She found that banks in general preferred to lend to economically better sections than the lower sections of the society, leading to backwash effect. Kumar, S. and Gupta, S. (2015) revealed that the cropping pattern at state level transformed from food grains to high value crops but the transformation was not uniform across the states. They have suggested that the investment in new and modern technology in the rural agricultural lands must be encouraged so as to reduce the disparities. Satyasai, K. J. S. (2012) empirically examined the relative access of different categories of farm household to formal credit and its impact on fertilizer use. His finding clearly indicated that inequalities in distribution of number of loans gave rise to regional disparities in agricultural credit vis-a-vis rural finance. Das, A., Senapati, M. and John, J. (2009) have illustrated that there are wide regional disparities in the disbursement in agricultural credit by scheduled commercial banks. At the same time, the share of agricultural GDP in total GDP was falling. Chand, R., Garg, S. and Panday, L. (2009) emphasised that there was a vast variation in productivity of crop sectors across districts in the country and in most of the states. This clearly called for a regionally differentiated strategy for future growth and development of agriculture sector in the country. In general, very low and low productivity districts were characterised by low rainfall, low irrigated area and lesser amount of fertilizer use. Jain, V. and Singh, S. (2014) suggested that the financial institutions should be developed for rapid financial inclusion of marginal, small, dalit and tribal farmers. So far, the banking system has catered to the financial needs of the medium and large farmers. Once the marginal farmers have adequate access to credit, the performance of agriculture is bound to improve. Using Principal Component Analysis technique and constructing district-wise

agricultural development indices, Patra, R. (2014) has analysed the spatio-temporal variations in agricultural development in Odisha from 2001-02 to 2011-12. His findings illustrated that the high and yawning disparities were due to the differences in location, topography, natural endowments, technology adoption, irrigation spread, crop diversification and commercialization in agriculture. For moderating spatial inequalities and achieving a less imbalanced regional development in agriculture, he has suggested to increase public investment in agricultural infrastructure including irrigation, establishing appropriate farming systems, developing suitable and affordable technology and crop varieties, augmenting credit delivery and designing region and crop-specific plans and strategies.

Objective, Data Sources and Methodology

The main objective of this paper is to find out the disparities in agricultural development in different states of India. Keeping the objective in view the data for analysing the study have been collected from various secondary sources like Reserve Bank of India, NSSO, Central Statistics Office, Ministry of Statistics and Programme Implementation, Gol, Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare, Gol, Department of Agricultural Research and Education, Gol, Registrar General of India, Census of India, Gol, and Indian Economic Survey. Statistical tables have been represented through ranks and percentage of growth to analyse and explain the various issues related with the regional/state-wise disparities in agricultural development in India.

Regional Disparities in Agricultural Development in India

India as a land of agriculture is preoccupied with better climatic conditions; still it is unevenly distributed in terms of agricultural production and productivity. When we divert our focus towards the nature and types of soil availability, which is considered as the main determinant of the types of food crops to be produced, it is seen that the soil widely varies from one region to the other. In this study, the state-wise disparities in terms of production, yield and productivity, employment creation, contributions to state GDP, cropping intensity, inputs used in agricultural production i.e. fertilisers, pesticides, value of output, agricultural labour have been analysed and discussed.

Factors Affecting Regional Disparity in Agriculture

Variability in agricultural growth and development between states and regions underwent various changes due to advancement in technology, irrigation facilities, HYV seeds, pesticides, chemical fertilizers etc. But there are some factors which are very difficult to be avoided in the present circumstances. The factors which are greatly responsible for differences in agricultural disparities include;

- a) *Climate and Topography*: In India, physical features are quite unevenly distributed, giving rise to difference in temperature as evidenced from the fact that longitudinal extend of India is from 8°4' N to 37°6' N latitudes. Because of this vast extent of land mass, temperature decreases with increasing distance from equator. Indian sub-continent consists of various types of land forms such as plains, plateaus, mountains, coastal areas, desert lands etc that will off course lead to difference in productivity.

- b) *Lacuna in Land Reform Measures*: The land reform measures which were introduced in the 1950s and 1960s like abolition of zamindari system, fixation of ceiling, consolidation of holding etc. were not properly implemented. Small land holding farmers are not capable to utilise modern technology which reduces the per hectare productivity.
- c) *Unavailability of Agricultural Credits and Markets*: This has been a very serious problem faced by the Indian farmers that loans are not being sanctioned to them due to either lack of collateral or farmers inability to repay back due to crop failure. As natural factors sometimes betray the farmers, it leads to loss of crops and, rather unfortunately, farmers' suicides.
- d) *Soil Erosion*: Mass erosion of top most layer of the soil takes place specifically in mountainous areas; the regions which are located in these areas have to suffer from loss of fertility of the soil hence giving rise to less production and productivity.
- e) *Difference in Monsoon*: Indian monsoon is very peculiar in character, some areas receive very scanty rainfall, where some other areas receive plentiful rainfall. Due to these variations, production of food crops varies not only in amount of crop production but also in types of crops produced.
- f) *Cropping Patterns and Multiple Cropping*: The parts of the country where there are perennial flow of river and those regions which are well connected with canal irrigation are expected to grow crops more than once, but those areas which completely rely upon rain for cultivation can't go for the same.
- g) *Agricultural Inputs and Green Revolution*: Green Revolution which came to India in mid 60's reflected a biased result favouring north-western part of the country basically where modern technology could be applied without hesitation but the same was not possible to hilly and uneven areas of the country and to the small acres of land.

Area Under Agriculture

India's agricultural land is the culmination of arable land, and land under permanent crops and pastures. Around 35% of its agricultural irrigated land refers to the agricultural areas purposely provided with water, including land irrigated by controlled flooding. Lands are usually fertile near the river belts; northern alluvial belts are more fertile than any other regions in India. Different types of soil suits for different crops, for example black soil which is plentifully found in western parts of the country is most suitable for cotton and sugarcane production. Similarly hilly areas are favourable for coffee and tea production.

The availability of agricultural land for cultivation is decreasing year by year due to encroachment for building houses, institutions, industries etc. The per capita availability of agricultural land is going to decrease in a faster rate in near future showing the negative growth in the per capita availability of land-man ratio, there by agricultural land- man ratio.

Most of the states have shown negative growth because of the encroachment of lands for building infrastructures, industries, human settlements etc. States like Manipur (42.4%), Meghalaya (25.55%), Nagaland (24.59%), Mizoram (18.37%) etc. ranking high in the order, are situated in the north-eastern

hilly areas of the country show positive growth, reason being the clearance of forests and conversion of them to agricultural land. Negative growth is observed in states like Odisha (-24.31%), Jharkhand (-10.16%), West Bengal (-4.11%), Jammu & Kashmir (-0.53%) etc which are lowest ranking states as these states are shifting towards modernisation, and growth of industries and rapid growth of human settlement escalated the denudation of agricultural land.

North-eastern states and Himalayan states such as Manipur (42.4%), Nagaland (32.16%), Meghalaya (25%) etc rank high showing the positive growth as in case of net sown area. Madhya Pradesh, the state of India having highest forest cover in India, is also following the above states as farming practices are shifting and new non-agricultural lands are converted for agricultural purposes. When we talk about the states having negative growth between this period, sharp rising of population and decreasing importance of agriculture are observed to be the main reasons behind it. Lowest ranking states include Odisha (-41.31%), Kerala (-12.25%), and Goa (-3.5%); the factor responsible for this are same as in case of net sown area.

In regard to cropping intensity we find a mixed result where some states have positive growth whereas others show negative results. States like Karnataka (-1.9%), Nagaland (-7.27%), Sikkim (-4.67%), Maharashtra (-2.92%), Odisha (-2.33%), Andhra Pradesh (-1.9%), and West Bengal (-0.77%) are having negative percentage of growth where as others have positive percentage of growth led by Tripura (38.41%) and Gujarat (18.12%). Although growth is either positive or negative the cropping intensity shows great spatial variation with higher level in northern plains like Punjab, Himachal Pradesh, West Bengal and low in the states of dry and less rain fed areas such as Rajasthan, Gujarat, Maharashtra etc.

Green Revolution with Biased Result

Green Revolution started in India due to its popularity in Western Europe, after the term was popularised by father of green revolution Sir Norman Borlaug because of his *technical invention per hectare productivity multiplied*. On the other hand noticing these changes Dr. M. S. Swaminathan (regarded as father of Indian Green Revolution) brought the same to India to experiment in agricultural fields. Green Revolution started in India during 1965 having the sole motto of increasing the productivity and yield rate of different food crops and non-food crops to supplement its ever growing population visa-vise to incur foreign earning through increasing agricultural export. This revolution started to boost the per hectare productivity and to supplement to the large growing population of the country, but this method of HYVs seeds along with chemical, fertilizer, pesticides etc could only be applied to limited crops and to limited areas. This specifically benefited the production of wheat followed by rice, whereas the application of technology and green revolution required large tracts of land where mechanised farming is possible but India is known by small and marginal land holdings. Punjab, Haryana, Western Uttar Pradesh and some western regions of the country got benefited by application of this technology but the same was not possible to be implemented in north-eastern and hilly areas of the country.

It is seen that states lying to the north and north-western part of the country are mostly benefited after the implementation of modern technology and mechanized farming techniques. On the contrary,

southern and north-eastern part of the country faced many hurdles to implement the same in their agricultural fields; thereby green revolution gave rise to biased result towards few states ignoring others badly. Chhattisgarh (56.11%), Gujarat (48.11%), Delhi (33.33%), and Odisha (24.46%) ranked highest in utilization of modern technology; besides, training to the farmers and rural agricultural labourers played a vital part in implementation of mechanized tools in these states. The states which ranked lower were Jammu & Kashmir (-30.60%), Kerala (-10.62%), and Madhya Pradesh (0.65%), Many of these states have small patches of plain areas which are not suitable for application of modern technology.

Agricultural Inputs and Labour

Agricultural inputs are defined as products permitted for use in organic farming. These include food stuffs, fertilizers, and permitted plant protection products as well as cleaning agents and additives used in products. The growing of crops is not an easy process and requires a lot of inputs to get a desired level of output starting from the sowing of seeds till the harvesting of crops. In India as most of the farmers are either less literate or completely illiterate, they are unaware about different input techniques to be applied in agriculture. It is obvious from the fact that less educated and less developed states use less fertilisers and pesticides. Although more and more use of chemical and fertiliser aggravate the quality of the soil but they helps in increasing the productivity of crops. The states/regions which fall under the category of higher input utilization basically results in high productivity. Agricultural labourers are those who are directly or indirectly involved in tilling the land or involved in agricultural field to earn a living. In India agricultural labours are plentifully found yet there is less development in agriculture. The states situated in hilly areas, where other employment opportunities are not available, people easily turn themselves to the low paid agricultural activities, and this gives rise to low productivity in agriculture. In India this scenario is peculiar increasing disguised unemployment.

Fertiliser consumption per/ha in agricultural crops in India increased between 2006-07 to 2012-13 by 22.81 percent which shows that people are gradually applying fertiliser during cultivation of crops to increase the productivity. Barring some of the states like Odisha (-30.5%), Tamil Nadu (-10.30%), Andhra Pradesh (-7.02%), Gujarat (-1.34%), and Karnataka (-0.09%), other states show an increasing trend in fertiliser consumption. Among them, Odisha registered the highest percentage of negative growth amounting to 30.50 whereas Kerala registered the highest percentage of positive growth of 83.70. The fertilizer consumption is required basically in cash crops and in the areas of inferior soil types to increase per hectare productivity.

Differences in Yield, Production and Productivity

Yield, production and productivity might be considered as a similar concept but they are different from each other. The production of food grains in large states has to be more than the other because of availability of man power and natural resources i.e. land, but productivity is mainly concerned about the per hectare production. The regions with irrigation facilities provide more productivity than the other regions. In India some central, western and northern states are growing rapidly in production of agricultural crops, reason being their acceptance and innovation in irrigation. Output from agriculture

is unpredictable, the states which emphasise in agriculture as their important source of livelihood and income generation activity are able to get good returns, and reverse is true for the states those which gives less importance to agriculture.

As production needs to be increased for supplying food to growing population, barring a few states, others show positive growth. If the food shortage occurs, the future brains from the rural areas will die from hunger and malnutrition that is why each and every state is striving hard to use modern scientific method to increase productivity. Apart from states like Mizoram (-66.29%), Tamilnadu (-35.09%), Kerala (-33.11%), Manipur (-14.93%), and Karnataka (-1.12%), other states registered positive growth led by Gujarat (177.91%), Chhattisgarh (163.45%) and Goa (105.10%) etc.

Between the period 2004-05 and 2011-12, 25.78 percentages of growth occurred in India as a whole in terms of yield of food grains. Bihar (76.00%), Tamil Nadu (68.72%), Chhattisgarh (41.36%), and Maharashtra (38.15%) registered the highest percentage of growth, contributing largely to the supply of food grains. States like Goa (-7.49%), Himanchal Pradesh (-0.62%) etc followed the negative path.

When we analyse the total value of output from agriculture by respective states between the years 2004-05 and 2011-12, we find that there is positive growth led by Chhattisgarh (66.81%), Nagaland (65.87%), Karnataka (54.04%) etc having more than 50 percentage of growth, this is because of improved irrigation facilities and adoption of new technology in production process, whereas states like Kerala (-11.89%), Goa (-10.85%), and Meghalaya (-0.14%) show negative percentage of growth during this period.

Agriculture as a Contributor to State Gross Domestic Product

The contribution of agriculture to national Gross Domestic Product of India is continuously decreasing over the years. Here the percentage growth is calculated by taking the sum of money value of agricultural output in 2011-12 in correspondence with sum of money value of agricultural output in 2004-05. There might be a decrease in percentage contribution from agriculture to total state GDP but output from agriculture increased between these two periods. Large states and less developed states have shown the highest percentage of growth between these two periods. Agriculture contribution at least at substantial level to the GDP is to be maintained and the negative growth of contribution is to be checked for smooth development of the economy.

The study shown that the GSDP from agriculture and allied sectors at constant prices (2004-05) between 2004-05 and 2011-12. Varies among States, for example - Jharkhand (77.66%), Tripura (76.27%), and Sikkim (70.80%) are the states where highest amount of percentage growth is seen. Jharkhand accounted for 77.66 percentage of growth in agriculture and allied sectors between 2004-05 and 2011-12, whereas Punjab (-18.11%), which is considered to be the agriculturally well developed state, shows the negative growth between these years along with Kerala (-47.57%). The states having more agricultural area under their belt show average percentage increase in contribution to state Gross Domestic Product. Overall, India is showing a negative trend in percentage of contribution of agriculture to National Gross Domestic Product which was more than 50 percent in 1950's declined to 14 percent.

The above table speaks about the contribution of agriculture to the total Gross State Domestic Product of the respective states. Punjab (22.73%), Uttar Pradesh (20.85%), Tripura (20.58%), and Manipur (20.32%) are the leading states in terms of contribution of agriculture to their respective states' GDP, whereas states like Uttarakhand (8.51%), Maharashtra (6.67%), Tamil Nadu (7.05%), etc. fall in the category of states contributing less to their state GDP in terms of primary sector. The contribution of agriculture also gives us a clue that most of the states, where the contribution is more, are little bit less developed than the others.

Major Findings

- States like Manipur, Meghalaya, Nagaland, Mizoram etc show positive percentage growth in net sown area and total cropped area, on the other hand negative percentage growth is observed in states like Odisha, Jharkhand, Jammu & Kashmir, West Bengal etc.
- Tripura and Gujarat are the leaders in percentage growth in cropping intensity, whereas states like Nagaland, Maharashtra, Sikkim, and Odisha delivered negative results.
- Chhattisgarh, Gujarat mapped up to the adoption of high yielding variety of rice production, whereas Jammu and Kashmir shows the highest negative growth.
- Kerala registered highest percentage growth in fertilizer consumption, whereas Odisha shows highest negative growth.
- Chandigarh, Delhi and Jammu & Kashmir are leading in percentage growth in terms of labour supply to agricultural sector, whereas Goa, and Kerala are the states which have diverted their labourers to non-agricultural sectors.
- In terms of food grains production most of the states registered positive growth led by Gujarat, Chhattisgarh, and Goa, but the states which are showing negative path include Kerala, Tamil Nadu, Karnataka, Mizoram, and Meghalaya.
- In case of yield of food grains, Bihar, Tamil Nadu, Chhattisgarh, and Maharashtra registered the highest percentage growth, whereas states like Andhra Pradesh, Goa, Manipur, Odisha, Himanchal Pradesh etc followed the negative path.
- In case of total value of output, Gujarat, Karnataka, Manipur, Nagaland, and Chhattisgarh show positive results, whereas Goa, Kerala, Manipur etc travelled towards negative growth.

Tripura, Sikkim, Tamil Nadu, Jharkhand are leading states in positive percentage growth in terms of contribution to state GDP, whereas Punjab and Kerala are showing highest percentage negative trend of contribution from agriculture to state GDP.

Suggestions and Conclusion

The study clearly indicates the existence of high inter-state disparities in agricultural development in the country over the years. The disparities in agricultural development among the different states emanate from numerous factors including credit availability, monsoon, technology, topographical features, and historical, institutional, natural and socio-economic factors. The study suggests the policy makers to increase the government expenditure in agricultural infrastructure including

irrigation, technology, crop varieties and credit facilities, and to focus on the underdeveloped regions for removing the disparities and achieving inclusive and sustainable agricultural development in the country. Besides there is a severe need of policy makers to intervene into the system by making suitable policies, focusing on the minimisation of the disparities in agricultural growth in and across the regions of the country. This doesn't mean decreasing the growth of faster growing states but to accelerate the growth of lower performing states. Innovative and efficient management of ground water is the need of hour in the areas of water deficiency. There is also a need to focus on small, minor irrigation projects and watershed facilities which are cheap and affordable considering the issue of irrigation. Farmers are to be facilitated by the local govt. through soil testing, dissemination of technology, knowledge and expertise to focus for better productivity and increased production. High rate of investment in crop research, infrastructure, market development and appropriate policy should be undertaken by the concerned authorities to enhance the agricultural production, thereby reducing the regional disparities in agricultural development in the country.

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Disparity in Growth of Literacy in India

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The present paper attempts to analyse the progress of literacy in India along with its growth at National level as well as among the States. It also studies the gender gap in literacy rate. Further it analyses the region wise and gender wise disparities in growth of literacy among the States of the Nation.

Keywords: Literacy Rate, Gender Gap, Disparity

Introduction

“New Technologies, including mobile telephones, also offer fresh opportunities for literacy for all. We must invest more and I appeal to all member States and all our partners to redouble our efforts – political and financial – to ensure that literacy is fully recognised as one of the most powerful accelerators of sustainable development. The future starts with the alphabet.” Thus speaks Irina Bokova, UNESCO Director-General on International Literacy Day 2015 with utmost concern as 781 million adults across the world still lack basic literacy skills of which two-thirds are women. The literacy rate is 86.3 % in world, but it varies from 99.2% among developed nations to 64.0% in sub-Saharan Africa. The most concerning fact is that over 75% of the World’s illiterates are found in South Africa, West Asia and Sub-Saharan Africa of which again two-thirds are women. Even in USA, 32 millions constituting 14% of adults are unable to read.

Our country, India is a vast country with a huge population of 121 crores (Census 2011), with 43.2 crores of illiterates. In its first census 1951, the level of illiteracy was very high to the extent of 81.67% of population. It has been reduced to the level of 25.96 % in 2011. Efforts have been made through various measures to remove the darkness of illiteracy during the whole period of planning till date. Although complete success has not been reached, the level of achievement has not been so grim, as UNESCO has honoured the Nation for its achievements in growth of literacy in its International Day 2015. The literacy rate in India has reached the level of 74.04% in 2011. But gender disparity persists as the female literacy rate is only 65.46 % against the male literacy rate of 82.14 %. Even there is disparity in the position of literacy among the States of the Nation.

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Review of Literature

Various scholars and researchers have made studies on growth of literacy, factors contributing to the growth of literacy, and also the causes behind the inter-state as well as inter-region disparities in literacy level of the Nation.

Bharat Ratna Sir M. Visweswaraya states that *progress in every country depends mainly on the education of its people and it is the sovereign remedy for all economic ills*. Education enables personality development, improves standards of living of people and helps in expansion of human resource of the Nation. It is one of the important ways to overall development of the country.

Literacy is the door, which when opens, shows the way for multitude of knowledge and provides access to education. Thus attainment of education is possible through literacy only, as it empowers one to gain ability to read and write. The ability to read and write enables one to enter into the vast ocean of knowledge. Hence emphasis has been laid upon raising literacy by bringing 86th amendment in Constitution of India. The addition (21A) made in its article 21 states that *the State shall provide free and compulsory education to all children of the age of six to fourteen years in such manner as the State may, by law, determine* (Juneja, 2004).

Literacy helps in development of a nation in multifarious ways. It has been the broad parameter of the Educational Development Index (Yadav et al, 2001). It has also been found that lack of literacy seems to possess low per capita income, High infant mortality rate, low life expectancy, serious undernourishment, widespread communicable diseases and more number of persons under below poverty line.

In a study on “How female literacy affects fertility in case of India” Sharma and Retherford (1990) found that female literacy has direct effect on fertility and indirect effect on reducing child mortality. Lawrence King in a study on public health in developing countries envisaged that public health may be better improved by reducing illiteracy than raising average income. He has further stated that the literacy is the only predictor of public health while the poverty is not a reliable predictor.

But it is astonishing that the academic standards in schools are sliding. In Kerala it has been observed in a study conducted by the Accountant General. Despite highest (37% of the state’s annual budget) public spending on education, the standards of the students is not up to the mark. It has been found that 5 % of the students in class VII cannot identify alphabets, 35 % of them cannot read or write their mother tongue. Of course, it might be due to the glut of teachers (Devasia, 2015). G.P.C. Nayar linked this fall in standards of students to the no failures policy which results in 100% pass percentage up to the secondary level.

Thus the study on the level of literacy in our country and its disparity in different States as well as the regions of the Nation has much significance. Therefore the present study has been undertaken to look into the matter with the following objectives.

Objectives of the Study

- To study the progress of literacy in India.
- To compute the growth rate of literacy in different States as well as of the Nation.
- To find inter-State disparity in literacy of the Nation.
- To analyse the gender-wise disparity in progress of literacy among the States.

Methodology

The present study is based on 28 States instead of 29 States of the Nation taking into account undivided Andhra Pradesh as it has been divided into two States i.e. Andhra Pradesh and Telengana recently (2015). The decadal growth rates of all the States and the nation in case of male, female and both taken together (total literacy) during 2011 over 2001 is computed.

Decadal Growth Rate of Literacy = $[(L_1 - L_0)/L_0] * 100$ where L_1 is Literacy Rate of 2011
And L_0 is Literacy Rate in 2001.

The States are classified basing upon the magnitude of the growth rates of literacy and disparities among them have been analysed.

Findings of the Study

Progress in Literacy in India

The literacy in India has remarkable strides as it has reached 74.04 % in 2011 from a very low level of only 18 % in 1951 (Table-1). The efforts by Government to raise the literacy rate (52 % in 1991) took four decades to make about half the population able to read and write, but needed two more decades to make it reach about 3/4th (74.04 % in 2011) of the population of the nation. Thus there is more than four-fold increase in literacy rate in the nation during these six decades starting from 1951 to 2011, but it has to rise further to reach the world average level of literacy rate which is found to be 86.3 per cent.

The gender-wise analysis of literacy in India shows that 27 % of the male population in India during 1951 were literate, which doubled in three decades in 1981 as the male literacy rate reached 55 % and trebled in 2011 as it reached 82 %. In case of female population there is eight fold increase in literacy rate as it has reached 65 % in 2011 from a very low level of only 8 % in 1951.

The gender gap in literacy rate in India has taken an inverted u-turn over these six decades. It was 19 % in 1951, which was more than the total literacy rate of the Nation (18 %) in that year. The gap increased to the level of 25 % in 1961 and to 26 % in 1981 with a marginal fall to 24 % in 1971. It remained stagnant at 26 % in 1991. Since then, it has been declining. But the gap has reached the level of 17 % in 2011, which is not much less than the starting year. Although the male-female gap in literacy rate has reached lowest in year 2011, the achievement is not highly significant. But it is a matter of satisfaction that there is a declining trend in this gap in recent decades.

Table-1 : Progress of literacy rate in India from 1951 to 2011

(in percentage)

Year	Total literacy rate	Male literacy rate	Female literacy rate	Male-Female Gap
1951	18	27	08	19
1961	28	40	15	25
1971	34	45	21	24
1981	43	55	29	26
1991	52	65	39	26
2001	65	75	53	22
2011	74	82	65	17

Source: Census Reports.

Growth of literacy rates and inter-state disparity in literacy in India

The total literacy rates as well as male and female literacy rates of the States as per the census reports along with the growth of literacy rates in 2011 over 2001 have been presented in Table-2. It is noticed that the literacy rate of the Nation stands at 65.38% in 2001. The state of Bihar is in lowest rank with 47.53% literacy and Kerala stands first with 90.92% among the States in 2001. In case of male as well as female literacy, Kerala possesses highest position and Bihar possesses the lowest position. The range of variation in the male literacy rates was 33.88% whereas in case of female literacy rates the range of variation was much higher at 54.29% among the States. All the other States lie in between Bihar and Kerala.

Table-2 : Gender wise and State wise Literacy Rates with its Growth rate in 2011 over 2001 in India

(IN PERCENTAGE)

NAME	2001			2011			GENDER GAP	GROWTH OF LITERACY		
	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL		MALE	FEMALE	TOTAL
JK	65.75	41.82	54.46	78.26	58.01	68.74	20.27	19.03	16.19	26.22
HP	86.02	68.08	77.13	90.83	76.60	83.78	14.23	5.59	12.51	8.57
PB	75.63	63.55	69.95	81.48	71.34	76.68	10.14	7.74	12.26	9.62
UK	84.01	60.26	72.28	88.33	70.70	79.63	17.63	5.14	17.32	10.17
HR	79.25	56.31	68.59	85.38	66.77	79.64	18.61	7.74	18.58	16.11
RJ	76.46	44.34	61.03	80.51	52.66	67.16	27.85	5.30	18.76	9.88
UP	70.23	42.98	57.36	79.24	59.26	69.72	19.98	12.83	37.88	21.54
BR	60.32	33.57	47.53	73.39	53.33	63.82	20.06	21.67	58.86	34.27

SK	76.73	61.46	69.68	82.29	76.43	82.20	10.86	13.76	24.36	17.97
AR	64.07	44.24	54.74	73.69	59.57	66.95	14.12	15.01	34.65	22.31
NL	71.77	61.92	67.11	83.29	76.69	80.11	6.60	16.05	23.85	19.37
MN	77.87	59.70	68.87	86.49	73.17	79.85	13.32	11.07	22.56	15.94
MZ	90.69	86.13	88.49	93.72	89.40	91.58	4.32	3.34	3.80	3.49
TR	81.47	65.41	73.66	92.18	83.15	87.75	9.03	13.14	27.12	18.46
ML	66.14	60.41	63.31	77.17	73.78	75.48	3.39	16.68	22.13	19.22
AS	71.93	56.03	64.28	78.81	67.27	73.18	11.54	9.56	20.06	13.85
WB	72.58	60.22	69.22	82.67	71.16	77.08	11.51	6.56	18.17	11.36
JH	67.94	39.38	54.13	78.45	56.21	67.63	22.24	15.47	42.74	24.94
OD	75.95	50.97	63.61	82.40	64.36	73.45	18.04	8.49	26.27	15.47
CH	77.86	52.40	65.18	81.45	60.59	71.04	20.86	4.61	15.63	8.99
MP	76.80	50.28	64.11	80.45	60.02	70.63	20.51	4.86	19.37	10.17
GJ	80.50	58.60	69.97	87.23	70.73	79.31	16.50	8.36	20.70	13.35
MH	86.27	67.51	77.27	89.82	75.48	82.91	14.34	4.11	14.46	7.30
AP	70.85	51.17	61.11	75.56	59.74	67.66	15.82	6.65	16.75	10.72
KA	76.29	57.45	67.04	82.85	68.13	75.60	14.72	8.60	18.59	12.77
GA	88.88	75.51	82.32	92.81	81.84	87.40	10.97	4.42	8.38	6.17
KL	94.20	87.86	90.92	96.02	91.98	93.91	4.04	1.93	4.69	3.29
TN	82.33	64.55	73.47	86.81	73.86	80.33	12.95	5.44	14.42	9.34
INDIA	75.96	54.28	65.38	82.14	65.46	74.04	16.68	8.14	20.60	13.11

Source: Census Reports of 2001 and 2011.

According to the reports of census 2011, the literacy rate of India reached 74.04 % while the male and female literacy rates reach 82.14% and 65.46% respectively. Among the States, Kerala maintained its status of rank one among the States with 93.91% in total literacy, 96.02 % in male literacy and 91.98 % in female literacy. So also, Bihar maintained its lowest status in total and male literacy rates with 63.82% and 73.39% respectively. In case of female literacy rate it has improved one position leaving Rajasthan to be lowest with 52.66%. It remained next to Rajasthan with 53.33% in female literacy rate and all the other States of the Nation lie in between.

The gender gap in literacy is 16.68 % in national level during 2011, which has reduced by 5 points to this level, from 21.68 % in 2001. This reduction in gender gap is a sign of improvement in female literacy

rate in India in recent years. Among the States, the gap is lowest (3.39%) in case of Meghalaya whereas it is highest in case of Rajasthan (27.85 %) in 2011. The State of Kerala comes next to Meghalaya in gender gap of 4.04 % in literacy. Out of 28 States, 10 States, namely, Jammu & Kashmir, Uttarakhand, Haryana, Rajasthan, Uttar Pradesh, Bihar, Jharkhand, Odisha, Chattisgarh and Madhya Pradesh have higher gender gap than the gap at national level (16.68 %). The rest of the eighteen States have lower gender gap than the national level male female gap in literacy rate.

The performance in growth rate of literacy in 2011 over 2001 is presented in Table-2. It is observed that Bihar has highest growth rate in total literacy (34.27 %), male literacy (21.67 %) and female literacy (58.86 %). The State of Kerala possesses lowest growth rate both in total literacy (3.29 %) and male literacy (1.93 %). But in female literacy, Mizoram has the lowest growth rate of literacy (3.80 %).

The growth rate of literacy in 2011 in national level is 13.11 %. Hence thirteen States including Jammu & Kashmir, Haryana, Uttar Pradesh, Bihar, Sikkim, Arunachal Pradesh, Nagaland, Manipur, Tripura, Meghalaya, Assam, Jharkhand, Odisha and Gujarat have more growth rate than the growth rate of literacy in national level. In case of both male literacy and female literacy growth, twelve States comprising Uttar Pradesh, Bihar, Sikkim, Arunachal Pradesh, Nagaland, Manipur, Tripura, Meghalaya, Assam, Jharkhand, Odisha and Gujarat have higher growth rate than the national level while Jammu & Kashmir and Karnataka have higher growth rate at the national level in only male literacy. Thus it shows that in majority of States, the growth rate of literacy in total as well as male and females have been not satisfactory as it is found to be less than the national average.

Inter-State disparity in literacy of the Nation

When States are classified on the basis of the literacy rate above or below the National level of literacy (Table-3), it is observed that fifteen States consisting of Himachal Pradesh, Uttarakhand, Haryana, Sikkim, Nagaland, Manipur, Mizoram, Tripura, West Bengal, Gujarat, Maharashtra, Karnataka, Goa, Kerala and Tamil Nadu possess higher literacy in male, female and total literacy rates than national average in literacy. Nine States consisting of Jharkhand, Rajasthan, Uttar Pradesh, Bihar, Arunachal Pradesh, Jharkhand, Chhattisgarh, Madhya Pradesh and Andhra Pradesh have lower literacy in male, female and total literacy rates than the national average. The rest of the four States including Punjab, Meghalaya, Odisha and Assam lie in between. It shows that the performance of Jammu & Kashmir and Rajasthan from northern, Arunachal Pradesh from north eastern, Andhra Pradesh from southern and Uttar Pradesh, Bihar, Jharkhand, Chhattisgarh and Madhya Pradesh from central States in literacy is less satisfactory, which needs special attention.

The State of Punjab and Meghalaya have total and male literacy above but female literacy below the National level of literacy. Assam is the only State having Total and Male literacy below but Female literacy above National level of literacy. Odisha is an exception where Total and Female literacy rate is below but Male literacy is above the National level of literacy. The States having low level of female literacy needs special care for raising girls education.

Table-3 : Classification of States Basing on National Level of Literacy (2011)

Above National Literacy Level in Total, Male and Female Literacy	Below National Literacy Level in Total, Male and Female Literacy
HP,UK,HR,SK,NL,MN,MZ,TR,WB,GJ,MH,KA,GA,KL,TN	JK,RJ,UP,BR,AR,JH,CH,MP,AP
Total and Male literacy above but Female literacy below National level	Total and Male literacy below but Female literacy above National level
PB, ML	AS
Total and Female literacy above but Male literacy below National level	Total and Female literacy below but Male literacy above National level
Nil	OD

Gender wise Disparity in Literacy among States in India

There is no State in India having less than 50 % of literacy rate in 2011. The lowest state level literacy among females is 52.66 % and the national average in total literacy is 74.04 %. Hence for classification of the States based on growth rates, five classes comprising very high (90 % to 100 %), high (80 % to 90 %), medium (70% to 80 %), low (60% to 70 %) and very low (50% to 60 %) have been made as presented in Table-4. It can be noticed that Kerala is the only State which has very high literacy rate both among males as well as females in 2011. The States of Mizoram, Tripura and Goa have very high male literacy , but high female literacy. The State of Himachal Pradesh has very high male literacy but medium female literacy. Nine States comprising Punjab, Uttarakhand, Sikkim, Nagaland, Manipur, West Bengal. Gujarat, Maharashtra and Tamil Nadu have high male literacy but medium female literacy. Meghalaya lies in the medium level in both male as well as female literacy. These fifteen States have medium, high or very high rate of literacy in both male and female literacy rate.

Table-4 : Genderwise Disparity in Literacy among States in 2011

Female Literacy Rate

Male Literacy Level		Very Low	Low	Medium	High	Very High
	Very Low					
Low		MP				
Medium		JK,UP,BR,AR,JH,AP	AS	ML		
High		RJ	HR,OD,CH,KA	PB,UK,SK,NL,MN,WB,GJ,MH,TN		
Very High				HP	MZ,TR,GA	KL

Out of the rest of thirteen States, Madhya Pradesh has low male literacy and very low female literacy rate. The States of Jammu & Kashmir, Uttar Pradesh, Bihar, Arunachal Pradesh, Jharkhand and Andhra Pradesh have medium male literacy but very low literacy rates. Rajasthan has high rate of male literacy and very low rate of female literacy. Assam has low female literacy and medium male literacy rate. The rest of four States comprising Haryana, Odisha, Chhattisgarh and Karnataka have low male literacy but high male literacy rates. Hence these States have either low or very low female literacy rates, which call for special efforts to bring improvement in female literacy share.

Conclusion and Policy Implications

The present study in this paper concludes that about three-fourths of our population have become literates leaving only one-fourth to be literate. But the efforts made by the States as well as the central Government for raising literacy has been satisfactory, but could not succeed to reach the world literacy rate of 86.3%.

The State of Kerala maintains its position of highest rank in each of total, male and female literacy rate among the states of the nation while the State of Bihar has its lowest position in case of total literacy and male literacy rate in 2011. Rajasthan has achieved the lowest rank in female literacy among the states of the nation.

The gender gap in literacy has not been reduced in the country, although the rate of literacy among both males as well as females has improved over the years. The gap was 18% in 1951, which is 17% in 2011. It shows the stagnancy in male female literacy gap. Among the States, Rajasthan has the highest and Meghalaya has the lowest gender gap in literacy. Kerala, although attains highest position in male as well as female literacy rate, has second lowest position in gender gap in literacy next to Meghalaya.

The growth of literacy either in total, male or female literacy among States is found to be higher in case of those having relatively low level of literacy and lower in case of the high literate States of the Nation. Among the States of Nation, Bihar has the highest growth of rate of literacy in total, male as well as female literacy while the State of Kerala has lowest growth rate in total and male literacy. In case of growth rate of female literacy rate Mizoram has the lowest position among the States. Another observation that can be made is that more than half number of States (about 15) possess lower growth rate in total, male and female literacy than the growth rate at national level.

When the disparity in literacy rates among the States of the nation is considered, it is found that fifteen States have more percentage of literacy than the percentage at the National level of literacy which coincides with the fact that these States have lower growth rate than the growth rate of literacy in National level. Nine States have less percentage of literacy than the national level in each of total, male and female literacy. If region-wise disparity in literacy is observed, the western region which includes Maharashtra, Gujarat and Goa has less variation in literacy level. In all other regions like northern, north-eastern, eastern and southern regions the disparity in literacy rates is higher among the States of the regions.

If gender wise disparity in literacy rates among the States is studied, it is found that there is no State with very low (50% to 60 %) level of literacy rate in male literacy, but there are eight States with very low level of female literacy rate. It is also observed that there are fourteen States with high (80 % to 90 %) male literacy rate and five States with very high (above 90 %) male literacy rate, while only three States have high female literacy rate and one State (Kerala) with very high female literacy rate. It shows the disparity among States in gender wise spread of literacy in the Nation. Besides this, if quality of literacy is concerned, the performance seems to be grim. A study among 577 districts of the nation in 2014, by 'Pratham', an NGO shows that 25 % of class VIII, 74 % of class V and 75 % per cent of class IV students are unable to read the books of class II (Bala, 2015).

This study leads to the conclusion that there has been quantitative expansion of literacy in India, but the disparity in its expansion both region wise and gender wise needs serious attention of Government as well as the society to realise the importance and its impact of literacy in transformation of the very structure of the nation. Particularly the State Governments should be very much careful in imparting its duty to make its people really literate. Then only a Nation can dream of a knowledge society for its citizens.

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Disparity in Education: A Gender Based Analysis

Aparajita Biswal¹ and Bibhuti Bhusan Patro²

Three goals of Education for All (EFA) have been emphasized on Commitments to gender equality in education sector. Based on the goals of EFA, bridging the gender gap in education has been a major concern and challenges for most developing countries. Problems of gender disparity and discrimination begin with access to schooling. Achieving gender equity in and through education has been a long standing goal of the education policy in India since national policy Education 1986. The Government, in accordance with its constitutional mandate and policy recommendations of NPE, has taken several initiatives to provide educational facilities to all sections of society more particularly girls.

Despite having enabling policies and considerable action through various plans since independence girls in India suffer from widespread prejudices. Many studies have already pointed out a close linkage between gender and participation in education. In spite of the general improvement, the situation in specific states continues to remain a matter of concern for policy makers. In Odisha, disparities have increased steadily in this sector. Gender inequality in education can also be explained to a considerable extent by religious preference, regional factors, and civil freedom. On the other hand gender differences in the opportunity to enjoy good education, and employment are related to the socio- economic and financial differences between men and women. Inequality prevails mainly among the male and female, among the castes and among the districts of Odisha. This paper mainly gives emphasis on the region wise gender inequality, rural and urban areas and among different castes in the state of Odisha along with some suggestions.

Key Words: Gender Disparities, Inequality, Education, Policy.

This paper studies the education situation in Odisha with special focus on gender equality. The objectives of the paper are as follows:

1. To study the causes of gender inequality in education.
2. To highlight the gender disparities in Odisha and in India.
3. To study the gender gap in education between regions (urban and rural).
4. To focus the gender disparity between different backwards castes (SC and ST).
5. Some practical and pro –active suggestions to reduce gender inequality among the male and female, among the different caste groups, among the districts of Odisha.

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Causes of Gender Disparity in Education

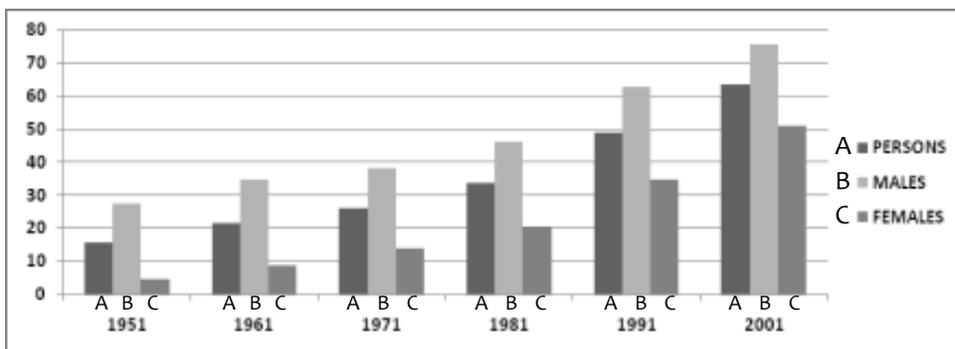
There are various factors responsible for gender inequality in the state with respect to health, education and employment. These are explained below:

1. **Poverty:** Poverty is a major cause of inequality with respect to gender and caste.
2. **Unemployment:** Unemployed people always discriminate among boys and girls in providing them good education and health. Male child always preferred to the female child which creates inequality.
3. **Access to Institutions:** Lower caste people have lack of access to institution than higher castes people which creates inequality.
4. **Low levels of credit access and Wage rate:** This shows inequality among the rural and urban and among the male and female in case of employment structure.
5. **Social Exclusion and Conflict:** The main axis of exclusion in rural Odisha is forged along the lines of caste and ethnicity. Caste based exclusion is manifest in the developmental status of different social groups. In terms of key variables like literacy and landownership, higher castes have fare considerably better than the SC and the status of the tribal is considerably lower than any other social group.

Status of Education in Odisha

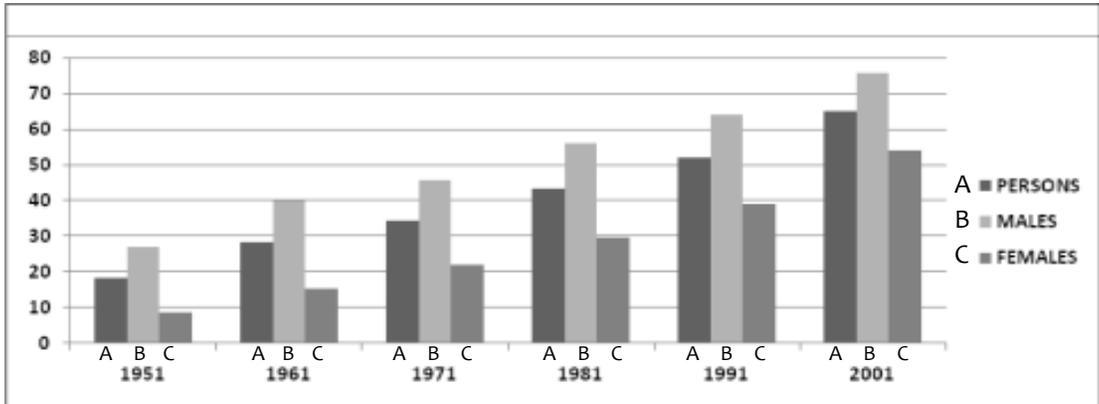
Education is an important parameter and the rate of Literacy is one of the vital indicators for determining the living condition of the people in a region. The impact of rural literacy rate on the percentage of rural families living below the poverty line is significant which is found by Kar (2009). So, to reduce poverty, education can be a powerful instrument. But the literacy rate in Odisha is found to be unsatisfactory. As per 2001 census, the literacy rate of Odisha is 63.61 per cent as against 65.38 per cent at all India level. In order to facilitate comparison, the caste and sex-wise literacy rates of 1971, 1981 and 1991 censuses for Odisha and India have been calculated by taking total number of literates and total population. It is observed from the study that the literacy rates have improved in successive censuses irrespective of caste and sex both in Odisha and India. The sex-wise aggregate literacy rates were found to be more in India compared to that in Odisha. But, the difference between the literacy rates of Odisha and India was marginal. Another important feature observed is that compared to male literacy rate, the female literacy rate was less both in case of Odisha and India.

Figure-1 : Literacy Rate of Odisha: 1951-2001(in %age)



Similarly in every 10 years the gap between male and female in Odisha and India increases from 1951-2001 but the gap between male and female is more in case of Odisha than in India. In 1951 the female literacy rate in India was 8.86% whereas in case of male it was 27.16%. In 2001 the female literacy rate in India was 54.16% whereas in male it was 75.85%.

Figure-2 : Literacy rate of India: 1951-2001(in percentage)



The literacy rate of India is shown below which shows that in 2001 the gap between male and female in Odisha is more than the gap between male and female in India. If we compare the percentage growth of gap between Odisha and India (1951-2001) we found that in 1951 the gap between gender of Odisha was 22.8% which increased in 1961 and further decreased in 1971. In 2001 the gap was 24.98%. Similarly the growth rate of inequality in 1961 was 14.17%, which was decreased in 2001 to -12.07%. In 1951 the gap between genders of India was 18.3% which was increased in 1961 to 23.99% and in 2001 it was 21.69%. The growth rate of inequality of India in 1961 was 34.92% and in 2001 it was -12.68%.

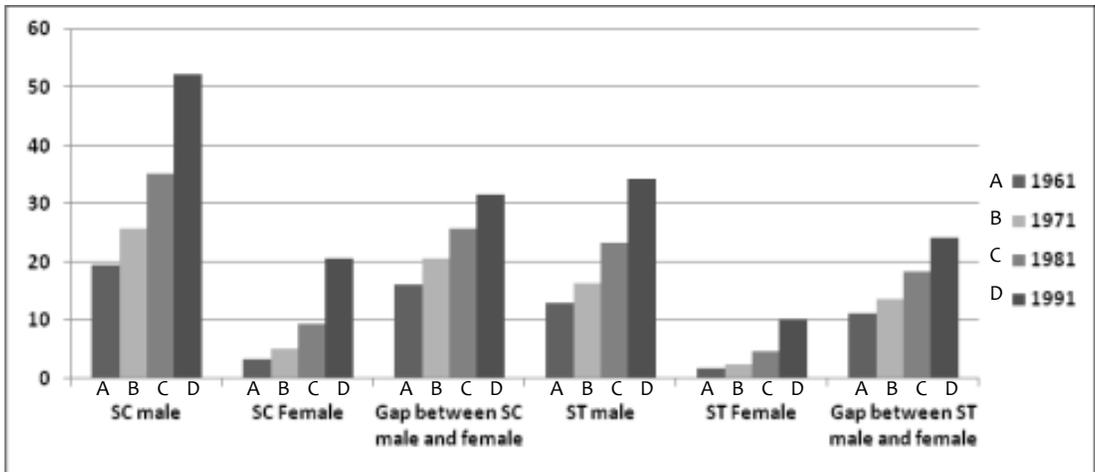
The above figure shows that in the year 1961 the growth of gender disparity in India was more than that of Odisha, in 1971 the growth of gender disparity was negative in both the cases, in 2001 both in Odisha and in India the gender disparity was reduced to -12.07%.

Having the focus on the district wise literacy rate among the male and female in Odisha we find that in Khurda and Jagatsinghpur the education level is much better than the other regions. In Khurda the female literacy rate is highest among the other districts, and in Jagatsinghpur the male literacy rate is highest than the other districts. Similarly in Malkanagiri the female literacy is least (21.28%) and in Nabarangpur male literacy is lowest than other districts. In Khurda the Literacy gap between male and female is less than other districts of Odisha. In Boudh the Literacy gap between male and female is more than other districts of Odisha.

The gender inequality is again more prominent in case of different backward castes such as ST and SC. In 1961 the literacy rate of the SC male was 19.6% which increased to 52.42% in 1991. Similarly female literacy rate in 1961 was 3.44%, increased to 20.74% in 1991. Similarly in case of ST category also the literacy rate of male and female increased. But the matter of concern is that the gap and inequality between male and female literacy rate also increased.

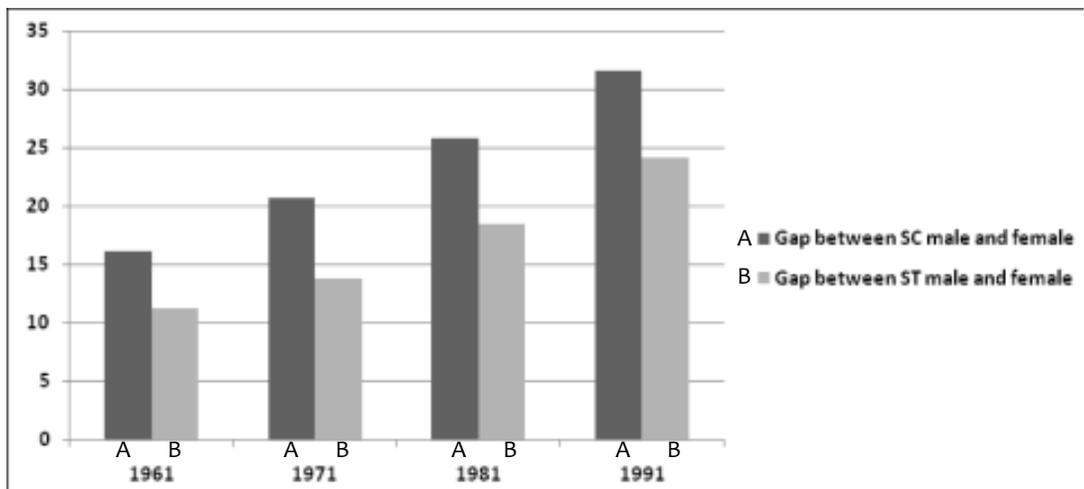
The diagrammatic representation of literacy rate of SC and ST caste in odisha shows that the literacy rate in case of both male and female has increased from the earlier decades. The gap between SC and ST male and female was more in 1991. This discrepancy is shown in following diagram.

Figure- 3 : Literacy Rates of Odisha (SC/ST): 1961-1991 Census (in %age)



If we study on the percentage of gap between SC male and female we found that in 1961 the gap percentage was 16.18% and in 1991 the gap percentage was 31.68%. Similarly in case of ST the percentage of gap between ST male and female in 1961 was 11.27% and that was in 1991 the gap percentage was 24.23%, which is shown in following diagram.

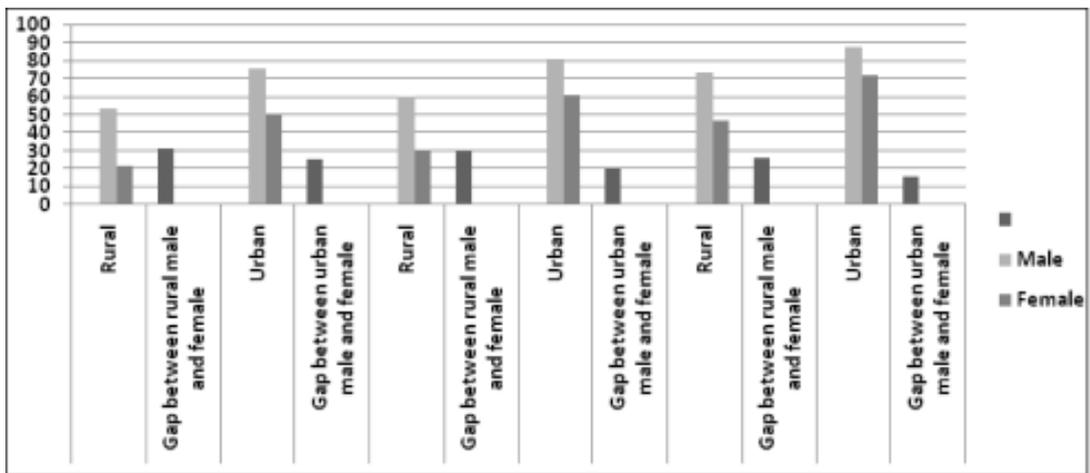
Figure-4 : Literacy rates of Odisha (SC/ST):1961-1991 Census (in %age)



The above diagram shows that in 1961 the % gap between SC male and female is more than the % gap between ST male and female. But in 1991 the percentage gap between SC and ST is more than in other years. Similarly a study on gender gap in rural and urban regions of the state highlights a large disparity between male and female.

What we find out from our study is that the rural male literacy is more than the rural female literacy in 1981-2001. Similarly the urban male literacy is more than the urban female literacy in 1981-2001. In 1981 the rural male literacy was 53.54% and the female literacy rate was 21.99%, and urban male literacy rate was 76.38% and urban female literacy was 50.95%. Similarly in 2001 the rural male literacy was 73.57% and the female literacy rate was 47.22%, and urban male literacy rate was 88.35% and urban female literacy was 72.68%. The bar diagram which is based on the above data shows that male literacy in every year is much more than the female literacy rate. The male literacy in both rural and urban case is also much more than the female literacy rate. In 2001 the male literacy is 88.35. There is inequality among the male (urban) and male (rural) literacy rate like in female cases.

Figure-5: Rural-urban gender gap in Literacy rates of Odisha (SC\ST):1981-2001Cencus in %age)



This above figure shows that in 1981 the gap between the rural male and female literacy is more than the gap in urban area and we also find same case in 1991 and also 2001.

Suggestions and Conclusion

- All poverty alleviation programmes and development plans whether being undertaken by national governments or inter-governmental bodies are gender-sensitive. This means that recognizing women stands at the crossroads between production and reproduction, between economic activity and the care of human being, and between economic growth and human development. They are workers in both spheres – those most responsible and therefore with most at stake, those who suffer most when the two spheres meet at cross-purposes, and those most sensitive to the need for better integration between the two.
- Due to gender disparities and cultural stereotypes lying outside the classroom, many females are deprived of a primary education and encouraged to take a traditional role within the household, while their male counterparts attend school. Over the years however, the Government of odisha has recognized the power of investing in primary education to reverse the effects of

poverty. Together with outside organizations like the United Nations, UNICEF, and the World Bank, the state has intervened to help the female population to gain equal access to primary education in order to fight extreme poverty and improve their quality of life.

- Effective governance is necessary for reducing inequality education.
- Empowering women to participate in the economy, leadership and education because of the critical untapped role of women in development.
- Advancing equal access to gender-responsive health and education services.
- Increasing women's voice in decision-making, leadership, and peace-building.
- Empowering women economically and improving their livelihood security.
- Practical and proactive policy measures to stop violence against women and girls at home, in their communities, and in disaster and conflict situations

To conclude, education is an important aspect of human life and a vital component of a growing economic system. An educated society can build a healthy social system. Thus in the emerging post liberalization situation; it is the requirement that the gender disparity in education should be the least possible. With the proper implementation of the policies in relation to compulsory education and violence against girls at the family and community level may lead to a long lasting and sustainable way to stop the gender disparity and to expand justice to a girl child.

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Developing Agriculture for Achieving Food and Nutrition Security in Odisha

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The Concept

Food security and nutrition security are different but closely related concepts. To achieve nutritional security food security is a necessary but not a sufficient condition. Over time the concept of food security has undergone considerable changes. As it is widely recognized today, the concept has been broadened beyond food supply and includes access, vulnerability and sustainability. The International Conference on Nutrition held in Rome in 1992 defines food security as the most basic form of physical, social and economic access by all people at all time to sufficient, safe and nutritious food which meets dietary needs for an active & healthy life. Thus, food security means not only enough food but also good food. Hence, food insecurity implies lack of access to sufficient amount of safe & nutritious food and it might be due to unavailability of food, insufficient purchasing power to have it and inadequate utilization at the household level because of poor condition of health.

Dynamics of Food and Nutrition Security in India

India faced two major problems of food security at the time of Independence viz; one, the threat of famine and consequent acute shortage of food grains due to low agricultural production and other, the chronic energy deficiency due to low dietary intake because of poverty and low purchasing power. Accordingly, the achievement of self-sufficiency in food grains production at the macro level was accorded high priority in the initial years of planning. The Green Revolution strategy adopted since mid-1960s has been able to increase the production of food grains ahead of the increase in population. As a result the country has moved from chronic shortages during 1950s and 1960s to an era of surplus and export in most food items in recent years. Added to this, because of several policy interventions made from time to time such as Food for Work Programme, Public Distribution System, Integrated Child Development Programme, Mid-Day Meal Programme and the latest being the enactment of Food Security Act, 2013, it has become possible to achieve great success in making available right quality and quantity of food stuffs to the right places and persons at the right time and at affordable prices. However, in spite of so much success achieved in increasing quantity of food grains production and launching different programmes to meet the food demand of the growing population, India ranks 20th among the leading countries in terms of serious hunger situation (Global Hunger Index Report, 2015). The latest estimation of World Bank (November, 2015) reveals that more than one-third of world's malnourished children live in India. The prevalence of under-weight children in India is also among the highest in the world.

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In the context of food and nutrition security in the country we come across notably two streams of thought. While scholars like Nasurudeen et al. 2006, Acharya 2009, Menon et al., 2009 are of the opinion that because of increased food grains production and mounting stock of buffer stocks while food security problem at the national level has been solved, yet there are millions of food insecure and undernourished people in different regions particularly in poor, backward and rain-fed areas. The other group of scholars such as Radhakrishna and Ravi 2004, Thorat and Lee 2005, Golait and Pradhan 2006, Svedberg 2008, Kanjilal 2010 etc who have dwelt extensively on nutrition aspect have expressed concern on large scale under-nutrition/ malnutrition prevailing at the household level among the vulnerable sections in the country. Analyzing empirical data on food and nutrition security, study of Kiresur and Chourad, 2015 has reported wide spread food insecurity in terms of low calorie intake and under-nutrition prevailing at the household and individual level. Taking the available data, the Planning Commission observes that about 8 percent Indians do not get two square meals a day and every third child born in the country is under-weight (Planning Commission, 2011).

Odisha Economy: A Brief Background

Before discussing the food and nutritional security issues prevailing in Odisha it is very much of importance to briefly present the state economy as we see today. Largely the state economy presents a dual scenario. Along with a small, rich and diversified urban sector, there is a large, poor and backward rural economy with high concentration of people on agriculture for livelihood. As per the latest available data more than 60 percent of the working population of the state operating in agriculture contribute 16.30 percent to state's GSDP while less than 40 percent engaged in industry and services sectors share 83.70 percent of the state's GSDP (in 2013-14, at 2004-05 prices). More over, the contribution of agriculture sector to the state's GSDP has been declining steadily over time-from 36.22 percent in 1991-92 to 16.30 percent in 2013-14. However, due to lack of sufficient employment diversification in the rural areas, the dependence on agriculture continues to remain high resulting in size of farm holding getting smaller and thus becoming increasingly unviable for providing adequate livelihood. In recent years (between 2003-04 and 2011-12) the state economy has witnessed remarkably high growth in GSDP of 6.5 percent per annum (CAGR as worked out). However, during this period agriculture sector has shown a low growth rate, of around 3 percent. As regards the standard of living of the people of the state measured in terms of incidence of poverty and average monthly per capita consumer expenditure, we find some mixed results. Though the incidence of poverty in the state has been reduced substantially by 24.61 percentage points (25.11 percentage points in rural areas and 20.31 percentage points in urban areas) between 2004-05 and 2011-12, yet Odisha continues to be second poorest state after Bihar among major states and there is high incidence of poverty (35.69 percent) in rural areas. As regards consumer spending on different food items, we find it has undergone significant changes over time. The share of cereals in the food commodities has declined while that of high value commodities like milk and milk product, vegetables and meat have gone up (NSS Reports, Various Issues). However, in spite of all these changes noticed in the recent years, food insecurity and under-nutrition/ malnutrition continue to remain high in the state. Analyzing NSS data, recent study of Panda, 2016 shows that the per capita calorie intake in the state though remains high yet compositionally it remains below the required norm and there is also great deal of disparity in calorie intake between

expenditure classes. Examining inter-state differences in food and nutrition security, Golait and Pradhan's study (2006) indicates prevalence of considerable food insecurity and malnutrition at the rural household level in Odisha.

Emerging Issues

It is widely held view that agriculture has the great potential to alleviate poverty and improve food and nutrition situation among vulnerable rural communities. In the post World Food Summit, 1996 the nutrition security being considered an integral part of food security, strategies to incorporate nutrition objectives into agriculture development have been given priority in India. In place of earlier approach which was largely focused on enhancing production and productivity in agriculture, the present approach lays emphasis on better nutritional outcomes. Besides the most recent study of Gulati et al., 2012 at the national level has shown that there is strong, significant and negative relationship between agricultural performance and malnutrition ($r = -0.773$). In view of the fact that in Odisha a large proportion of workforce depend on agriculture for livelihood and agriculture is largely a low yield economic activity, there is need for improving crop yield and diversification towards cultivating high value agricultural commodities to reduce hunger and under-nutrition in the state. Improving agricultural performance is a critical and necessary condition if not a sufficient condition to reduce malnutrition in the state. On this backdrop, the present study is mainly an attempt to examine the trends in the pattern food grains production and the changes in people's preferences towards food items over time. In addition, the study also investigates into the incidence of child under-nutrition prevailing in the state and explores the possible relation between agricultural performance and child under-nutrition across districts. The specific objectives of the study are the following:

- (i) to examine the trend and pattern of food grains production in the state over time,
- (ii) to highlight the changes in the dietary habits of the people in quantitative terms as well as expenditure incurred on different food items,
- (iii) to analyze the incidence of child under-nutrition prevailing in Odisha and compare the same with major states of the country,
- (iv) to explore the possible relation between agricultural performance and child under-nutrition across districts,
- (v) to suggest policy for reducing the under-nutrition/ malnutrition in the state.

Data and Methodology

The study is based on secondary data drawn from different published sources of Government of India, Government of Odisha, and other agencies working at the national and state levels. The Compound Annual Growth Rate (CAGR) is worked out to estimate the decadal growth trends in the production of Cereals, Pulses and Food grains in the state. The formula used is

$$Y = a + b^t$$

Where

Y = Production of Cereals/ Pulses/ Food grains.

t= time variable in year

a= constant

b= (1+i) where i =compound growth rate

Correlation Co-efficient between Gross District Domestic Product of Agriculture including Livestock (GDDPA) per hectare of Gross Cropped Area and percentage of underweight children for different districts is worked out to measure the extent of relationship between the two variables. The formula used is: $r = \frac{\sum xy}{\sqrt{\sum x^2 \times \sum y^2}}$, where x is the GDDPA / GCA, Triennium Ending 2011-12 and y is the percentage of underweight children in different districts.

Trends in Food grains Production

Table -1 presents decadal trends in the growth of food grains production with its major components and compares the same with population growth in the state for the period from 1950-51 to 2009-10. As we notice, the state has made rapid progress in food production over time. The compound annual growth rate (CAGR) of food production (cereals and pulses) has increased from 2.55 percent during 1950s to 2.73 percent during 1980s and further to 5.50 percent during 2000s though in the intervening decades ie; during 1960s and 1970s it registered a slow down to 1.00 and 0.09 percent respectively and a negative growth rate (-2.31 percent) during 1990s. A close look at the component-wise growth rate over the period reveals that cereals and particularly rice being the predominant crop in the state, the growth performance of rice has influenced the overall growth performance of cereals as well as food grains in different decades. The decades showing better growth rates of cereals and rice exhibit better growth rate of food grains. The annual growth rate of pulses has shown an increasing trend from 1.56 percent during 1950s to 8.14 percent in 2000s with fluctuations in the intervening decades.

A comparison of growth rate of food production with population growth over the total period from 1950-51 to 2010-11 reveals that the food production has outstripped population growth rate in the state. During this total period, while the food production has increased from 23.94 MTs in 1951-52 to 87.70 MTs in 2010-11 - an increase of more than 266.3 per cent, the growth in population has been 187 per cent. However, decadal analysis in this context shows some mixed results. In three out of six decades that is during 1950s, 1980s and 2000s, the food production out-stripped population growth, while during 1960s and 1970s the growth rate in food grains production was below the population growth rate. During 1990s (between 1990-91 and 1999-2000) the state witnessed a negative growth rate in food-grains production. All these reveal a high volatility in the growth rate of food-grains production in the state over time while the population growth consistently increases though in a decelerating manner in recent decades. This urges for stabilizing food grains production in the context of achieving sustainable and long-term food security in the state.

Changes in Food Intake (Cereal Consumption) in the State

In estimating the incidence of malnutrition consumption surveys carried out by NSSO are widely used by the scholars. These surveys provide important data on access to food and allocation of expenditure on different food items by the households. Given the conceptual problems in the calorie intake to determine nutritional status, the access to food and its composition is considered as the basic though not only factor that affects nutritional status of the individual.

NSS data on consumption over the years reveal that people's dietary behavior both in rural and urban areas of the state has undergone significant changes. Particularly the cereals consumption of people at large has steadily declined and its place has been taken by increased consumption of pulses, milk and milk products, fish, meat and eggs. Since changes in dietary pattern indicate improvement in food security and nutritional status, we have here attempted to present the trends in the cereals consumption among the rural and urban population of the state. Accordingly, the consumption of total cereals and of individual items of cereals over the period from 1993-94 to 2011-12 pertaining to rural and urban areas is presented in Table-2. From the data analysis the following aspects emerge.

- i) First, cereal consumption among the people in both the rural and urban areas has declined. However, interestingly the decline in cereal consumption is found higher in rural areas than in urban areas. The cereal consumption in rural areas which was 15.93 kgs in 1993-94 has declined to 13.58 kgs in 2011-12. In the urban areas during the same period the decline in cereal consumption has been from 13.38 kgs to 11.40 kgs.
- ii) Secondly, within the cereals, rice continues to be the major food commodity for the people of both rural and urban areas though we notice a steady decline in rice consumption in favour of wheat in both areas.

Changes in Pattern of Food Expenditure in Rural Odisha

Changes in per capita monthly consumption expenditure on different food items among the people of rural Odisha are presented in Table-3. As we notice, not only the share of food expenditure in the total expenditure has declined but also the pattern of expenditure on different food items has undergone marked changes. Food expenditure as a proportion to total expenditure has declined from 75 percent in 1972-73 to 68 percent in 1993-94 and further to 52 percent in 2011-12. Within food expenditure while there has been a sharp decline in the share of expenditure on cereals, the share of expenditure of non-cereal items like pulses, vegetables, milk, meat and fish has increased. As it is seen, the proportion spent on cereals which was 52 percent in 1972-73 has fallen to 39 percent in 1993-94 and further to 18 percent in 2011-12. The percentage of expenditure on pulses, milk, vegetables, meat, fish has however shown a significant increase over time.

Nutritional Status in the State

Having discussed that food grains' availability (production) has shown a fluctuating trend while population growth has increased all along and there has been marked shift in the dietary preferences of the people from cereals to non-cereal food, it is pertinent here to highlight on the nutritional status prevailing among the people in the state. Since the children constitute the most vulnerable sections of the society from the point of view of nutritional stress we have here analyzed their nutritional status following anthropometric measures. State-wise data on child undernourishment are available from two sources viz; (i) National Nutrition Monitoring Bureau (NNMB) and (ii) National Family Health Survey (NFHS). However, between the two sources, the data collected by NFHS are considered more appropriate in view of its wider coverage and competitiveness and as such we have in this paper used NFHS data for analysis. NFHS has so far conducted four rounds of survey ie; in 1992-93, 1998-99,

2005-06 and 2015-16 in the country. Since published data for 2015-16 for Odisha are not available, we have here used the data of three earlier surveys such as 1992-93, 1998-99 and 2005-06 for examining the trends in child nutrition.

Following the Gomez classification the nutritional status among the children is measured with the help of three anthropometric indicators such as height-for-age, weight-for-height and weight-for-age are used. While low height-for-age (Stunted) is taken as indicative of chronic under-nourishment, low weight-for-height (Wasted) indicates acuteness of undernourishment. The low weight-for-age (Underweight) reflects both the features of chronic and acute undernourishment.

Table-4 presents data on the percentage of children suffering from malnourishment under three indicators at three points of time - 1992-93, 1998-99 and 2005-06. From the data it is revealed that the percentage of children suffering from both chronic and acute malnourishment (low weight-for-age) has declined from 52 percent in 1992-93 to 50 percent in 1998-99 and further to 44 percent in 2005-06 in the state and as we see the decline in this type of malnutrition (underweight) is found faster during the second period (by 0.70 percentage points annually between 1998-99 to 2005-06) than in the first period (by 0.30percentage points annually between 1992-93 to 1998-99). Analysis of data on chronic malnourishment (stunted) and acute malnourishment (wasted) separately also reveals that in both contexts there has been decline in the incidence of child malnourishment in the state over the period.

A comparison of the incidence of child malnutrition in Odisha vis-a-vis some major states including all-India average is presented in Table-5. It shows that the children suffering from under-nutrition in the state which was 52.4 percent in 1992-93 increased to 54.4 percent in 1998-99 and then has subsequently declined to 44 percent in 2005-06. However, in spite of the recent decline in the child malnutrition in the state, Odisha remains among the top five states in terms of incidence of child malnourishment in the country.

Association between Agricultural Productivity and Under-nutrition across Districts

In explaining the underlying factors on child malnutrition, the UNICEF's report, 1998 is very much categorical when it states that at the individual level the immediate cause includes inadequate food and dietary intake (less than the required intake of calories). The availability of adequate food at the household level is governed by a number of factors out of which the agricultural performance happens to be a crucial one. In Odisha agriculture being the primary occupation for a large majority of rural households with home-grown agricultural commodities to depend upon for basic food, we have here made an attempt to explore the relation between agricultural performance and child nutrition / under-nutrition in a disaggregated way using the district level data. Correlation Co-efficient is worked out between the Gross District Domestic Product- Agriculture including Livestock (GDDPA) per hectare of GCA (taken to denote agricultural performance) and percentage of underweight children below the age of 3 years. The correlation co-efficient value is worked out to $r = -0.37$ indicating negative and significant (significant at 5 percent level) relationship between the two variables. In view of this, to understand how the per hectare GDDPA is linked with the percentage of underweight children at the individual district level we have presented the district-wise data in Table-6 to draw some definite inferences. The overall data analysis reveals that the districts showing poor agricultural performance

in terms of lower GDDPA exhibits higher incidence of underweight children and vice versa. However, a few districts such as Bhadrak, Jharsuguda, Keonjhar, Mayurbhanj and Kandhamal exhibit some differences from the above trends. While the districts such as Bhadrak, Keonjhar, Mayurbhanj and Kandhamal exhibit better agricultural performance with higher incidence of child malnutrition, Jharsuguda shows lower agricultural performance and lower incidence of child malnutrition. Interestingly this district is having the lowest incidence of child malnutrition in the state.

Conclusion and Policy Recommendation

The results of the study reveal that growth in food grains production has remained highly volatile while people's food preferences in the state have changed considerably. In terms physical quantities and expenditure incurred, the consumption of cereals has declined and that of high value commodities like vegetables, milk, meat etc increased. However the incidence of child under-nutrition continues to be quite high in the state and Odisha remains among the top five child malnourished states in the country. The level of agricultural performance shows a negative and significant relationship with child under-nutrition at the district level. All these suggest for improving productivity in agriculture which in its turn can be a powerful tool to reduce malnutrition among the vast majority of children population of the state. Improvement in agricultural productivity can be achieved through better use of inputs and technology and diversification into high value agriculture. High value agriculture can be instrumental in boosting income of the farmers, particularly the small holders and the resultant effect can be a sustainable means to improve nutritional outcomes. Since malnutrition is multi-dimensional, along with developing agriculture to provide better income and dietary requirements to the vast majority of rural households in the state, different intervention programmes like Mid-Day Meal Scheme, Integrated Child Development Scheme etc., operating in the state need to effectively monitored for providing better diet to the children in improving their nutritional status. Since most the districts in the Eastern Ghats region are found underperforming in agriculture and having high incidence of child malnutrition, there is need for special policy intervention to ameliorate both problems. In addition to broadening intervention in agriculture sector there is need to improve basic health care services like access to safe drinking water, sanitation etc., in these districts.

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Table-1: Decadal Growth Rate of Production of Food Grains in Odisha

Sl. No.	Decade	Total Rice	Total Cereals	Total Pulses	Total Foodgrains	Annual Population Growth Rate
1	1950-51 to 1959-60	2.67	2.62	1.56	2.55	1.98
2	1960-61 to 1969-70	-0.04	0.68	5.44	1.00	2.51
3	1970-71 to 1979-80	-1.13	-0.53	5.03	0.09	1.97
4	1980-81 to 1989-90	3.98	2.97	1.50	2.73	2.01
5	1990-91 to 1999-2000	-1.29	-1.49	-7.90	-2.31	1.63
6	2000-01 to 2009-10	4.96	5.22	8.14	5.50	1.39

Table-2: Per capita Monthly Consumption of Cereals along with its Composition in Odisha over the Years

Year	RURAL			URBAN		
	Rice	Wheat	All Cereals	Rice	Wheat	All Cereals
NSS 50 th Round (1993-94)	15.24	0.38	15.93	11.30	2.00	13.38
NSS 60 th Round (2004)	13.78	0.61	14.57	11.59	1.93	14.00
NSS 63 rd Round (2006-07)	12.57	0.48	13.46	9.60	2.17	11.82
NSS 68 th Round (2011-12)	12.56	0.78	13.58	9.26	2.10	11.40

Data Sources: NSS Different Rounds

Table-3 - Changes in the Expenditure on Different Consumption Items over Years in Rural Odisha

Commodities	1972-73	1977-78	1983	1987-88	1993-94	1999-00	2004-05	2011-12
Rice	0.47	0.46	0.46	0.39	0.37	0.31	0.26	0.16
Wheat	0.03	0.02	0.03	0.01	0.01	0.02	0.02	0.02
Other Cereals*	0.02	0.02	0.01	0.01	0.01	0.01	0	0
Total Cereals	0.52	0.50	0.50	0.41	0.39	0.34	0.28	0.18
Pulses	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.04
Milk & Milk Products	0.01	0.02	0.02	0.02	0.02	0.03	0.03	0.03
Edible Oil	0.03	0.03	0.03	0.04	0.03	0.03	0.04	0.03
Vegetables	0.06	0.05	0.06	0.07	0.09	0.08	0.09	0.08
Fruits	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Meat-fish-egg	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04
Sugar	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.01
Beverages,	0.05	0.04	0.05	0.05	0.05	0.08	0.08	0.08
Spices & Others								
Food	0.75	0.71	0.74	0.69	0.68	0.66	0.62	0.52
Non-Food	0.25	0.29	0.26	0.31	0.32	0.34	0.38	0.48
Total	100.00 (34.96)	100.00 (52.47)	100.00 (98.75)	100.00 (127.51)	100.00 (219.80)	100.00 (410.41)	100.00 (398.89)	100.00 (904.80)

*other cereals include Ragi, small millets, jowar, Bajra and Barley

Figures in parentheses indicate total expenditure per capita per month in rupees

Table-4: Extent of Malnourishment among Children below 3 Years of Age in Odisha

Indicators	1992-93	1998-99	2005-06		
			Total	Rural	Urban
Height-for Age – (Stunted)	49.6	49.0	38.3	39.1	32.9
Weight-for Height-(Wasted)	46.2	30.0	18.5	19.4	12.6
Weight-for Age-Underweight)	52.4	50.0	44.0	45.7	33.3

Table-5 : Odisha's Status in Child Malnourishment Among Major States (percent)

States	1992-93	Rank	1998-99	Rank	2005-06	Rank
Andhra Pradesh	45.0	12	37.7	11	36.5	12
Assam	49.2	6	36.0	13	40.4	10
Bihar	62.5	1	54.3	3	58.4	2
Gujarat	48.1	8	45.1	8	47.4	3
Haryana	34.6	15	34.6	14	41.9	8
Himachal Pradesh	43.7	14	43.6	10	36.2	13
Karnataka	50.6	5	43.9	9	41.1	9
Kerala	27.0	17	26.9	16	28.8	16
Madhya Pradesh	48.5	7	55.1	1	60.3	1
Maharashtra	51.4	4	49.6	6	39.7	11
Nagaland	27.5	16	24.1	17	29.7	17
Odisha	52.4	3	54.4	2	44.0	5
Punjab	46.0	10	28.7	15	27.0	17
Rajasthan	44.3	13	50.6	5	44.0	6
Tamil Nadu	45.7	11	36.7	12	33.2	14
Uttar Pradesh	47.2	9	51.7	4	47.3	4
West Bengal	54.8	2	48.7	7	43.5	7
All-India	51.5	-	47.0	-	45.9	-

Table-6: Agricultural Performance and Child Unde-Nutrition across Districts in Odisha

Districts	GDDPA / GCA (in Rs.) TE 2011-12	Underweight Children (%) 2008
Balasore	26297	31.5
Bhadrak	27610	50.0
Cuttack	25229	13.9
Jagatsinghpur	27180	27.8
Jajpur	20046	47.4
Kendrapara	19846	35.9
Ganjam	14399	54.9
Gajapati	20142	50.7
Puri	21162	27.7
Khordha	23566	44.9
Nayagarh	15845	10.7
Bolangir	18308	47.8
Sonepur	22443	58.2
Angul	15920	45.7
Dhenkanal	21295	30.0
Deogarh	17041	29.9
Sambalpur	17091	52.4
Baragarh	17674	59.9
Jharsuguda	14907	9.9
Keonjhar	22641	50.6
Mayurbhanj	22891	47.7
Sundergarh	16552	56.4
Kalahandi	13939	40.6
Nuapada	12369	57.0
Koraput	20417	43.5
Malkangiri	14111	56.1
Nabarangpur	17464	33.4
Boudh	20608	45.9
Kandhamal	38611	48.7
Rayagada	21730	50.6

Sources: Food Atlas of Rural Odisha and Directorate of Economics and Statistics, Odisha, Relevant Years.

Small Millets and Food Security: A Policy Review¹

Damodar Jena²

Prevalence of malnutrition especially among children and women has been one of the important concern areas in most parts of India including Odisha and Jharkhand. Millets are considered as more nutritious and rich in protein, iron, minerals and other minerals compared to rice and wheat. Millets, being mainly produced in rainfed conditions mostly in hilly tribal areas, have a set of unique features amongst cereals to meet the food and nutritional security. The important constraints which limit the production and consumption of millets are: (a) lack of production support to millets compared to the support given to other crops; (b) near lack of reach of improved method of production and technologies; (c) lack of appropriate post-harvest processing technologies for small millets except finger millet; (d) changes in preference patterns in consumption moving away from them, mainly due to inclusion of only rice and wheat into the Public Distribution System (PDS); (e) lack of public procurement and market support; and (f) absence of public or private funded promotion of millets as a nutritious food category. While a few policy initiatives have been undertaken to promote the production of millets, there is almost no scheme or policy initiative in place to support its consumption. Present-day willingness of policy makers to focus on millets is encouraging, but caution is needed in the design and implementation of enabling measures. While an equal-level playing field should be created for millets in all respects, this need not necessarily mean replication of monocropping with improved variety/hybrid and fertilisers promotion strategy as employed for wheat and paddy. Millet cropping systems as part of diverse rainfed ecosystems and so need of custom-made location specific approaches.

Key Words: Millet, small millet, rainfed, public distribution system, post-harvest technology, enabling approach, production, and consumption.

JEL Classification: D39, E21, E23, L11, O13, O14, Q13, Q15, Q16, Q18, R12.

Millets are usually subdivided into 'large millets' (sorghum and pearl millet) and 'small millets' (finger-millet (*ragi*), barnyard-millet, little-millet, kodo-millet, foxtail-millet and proso millet). Finger millet is often mentioned separately from other small millets. While the paper deals with all millets, 'small millets' are of special concern. Millets are considered as more nutritious and rich in protein, iron, minerals and other minerals compared to rice and wheat.

1 *This article is based on the Action Research Project "Revalorising Small Millets in Rainfed Regions of South Asia" supported by CIDA, Canada and undertaken by a team including DHAN Foundation. The author was part of the team while he was working with Tata-Dhan Academy, DHAN Foundation, Madurai.*

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Millets and food and nutritional security

Food insecurity continues to be one of the important areas to be addressed. It is understood that food security is achieved “when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life” (FAO 2003). The dimension of food security has broadened beyond the availability and access to ‘just’ food to encompass nutrition as well. Stagnating productivity growth and production of rice and wheat, which make up the backbone of the food system in India, endangers future food availability.

The rich nutritional characteristics of millets compared to other major cereals are long-known and documented (Table-1). Millets contain high amounts of proteins and fibre, B-complex vitamins including niacin, thiamine and riboflavin, the essential sulphur-containing amino acid methionine, lecithin, and some vitamin E. They are rich in iron, magnesium, calcium and potassium. The seeds also contain phyto-nutrients, including phytic acid, which is believed to lower cholesterol, and phytate, which is associated with reducing risk of cancer. As the nutrient deficit is a more pressing issue rather than the deficit in calories in India, the relevance of millets in the food system becomes important.

Table-1: Nutrient contents of various cereals

Cereal (per 100g)	Protein (g)	Carbo- hydrates (g)	Fat (g)	Crude fibre (g)	Mineral matter (g)	Calcium (mg)	Phosphorus (mg)	Iron ³⁶ (mg)
Sorghum	10.4	72.6	1.9	1.6	1.6	25	222	5.4
Pearl millet	11.6	67.5	5.0	1.2	2.3	42	296	11.0
Finger Millet	7.3	72.0	1.3	3.6	2.7	344	283	3.9
Proso millet	12.5	70.4	1.1	2.2	1.9	14	206	2.9
Foxtail Millet	12.3	60.9	4.3	8.0	3.3	31	290	2.8
Kodo millet	8.3	65.9	1.4	9.0	2.6	27	188	1.7
Little millet	8.7	75.7	5.3	8.6	1.7	17	220	9.3
Barnyard Millet	11.6	74.3	5.8	14.7	4.7	14	121	18.6
Maize	11.5	66.2	3.6	2.7	1.5	20	348	2.7
Wheat	11.8	71.2	1.5	1.2	1.5	41	306	3.5
Rice	6.8	78.2	0.5	0.2	0.6	10	160	1.8

Source: National Institute of Nutrition, Hyderabad.

Millets as part of rainfed agriculture

Millets are grown mainly under rainfed conditions in India. Many studies indicate that rainfed agriculture development in India will be the kingpin for inclusive growth of the nation, as large part of the poor

rural households live in rainfed agriculture regions. Economic findings show that agricultural growth has the greatest poverty reduction potential compared to any other (urban) sector. Agriculture can stimulate local consumption and production linkages, thereby fuelling local economies. In a recent report the Indian Council for Agricultural Research (ICAR 2011) has reconfirmed the power of agricultural productivity in reducing rural poverty: a 1 per cent productivity increase reduces poverty by 0.65 per cent. One of the historically underemphasized areas within agriculture is rainfed agriculture. Despite India's significant investments in irrigation, around 60 per cent of total area remains rainfed, responsible for about 40 per cent of national food supply (Government of India 2008). Given physical and institutional limits to the indefinite spread of irrigated systems, rainfed farming will remain a central feature of the national agricultural landscape.

Area, production and productivity of small millets

There has been a significant change occurred with regard to millets area, production and productivity. The table below presents a snapshot of the trends in area, production and productivity of sorghum, pearl millet, finger millet and other small millets between 1961 and 2009.

Table-2: Area, production and productivity of millets

State	Crop	Area (lakh ha)			Production(lakh tonnes)			Productivity(kg/ha)		
		1961-66 mean	2002-07 mean	2008-09 annual	1961-66 mean	2002-07 mean	2008-09 annual	1961-66 mean	2002-07 mean	2008-09 annual
India	Sorghum (kharif)	112.44	40.60	28.92	56.24	41.78	30.52	526	1029	1055
	Sorghum (rabi)	69.11	49.12	46.39	32.24	29.66	41.94	456	604	904
	Sorghum Total	181.55	89.72	75.31	88.48	71.44	72.46	487	796	962
	Pearl millet	114.27	93.52	87.53	39.51	81.85	88.87	346	875	1015
	Finger millet	25.48	14.69	13.81	18.88	19.02	20.40	741	1295	1477
	Small millets	46.77	11.13	9.05	18.89	4.90	4.45	404	440	491
Odisha	Finger millet	NA	NA	1.80	NA	NA	1.47	NA	NA	821
	Small millets	NA	0.30	0.16	NA	0.11	0.07	NA	857	462

Source: Government of India, *Status Paper on Millets, 2010*, Directorate of Millets Development.

It has been observed that there is a significant decrease in cultivated area, almost 80 per cent for small millets, 46 per cent for finger millet, 59 per cent for sorghum and 23 per cent for pearl millet. Besides, there is a significant decrease in total production of small millets, almost 76 per cent in India. However, there is a significant increase in the productivity of all millets in India as a whole. But in Odisha, the productivity of small millets has been registered a significant decline (Table-2). Even though the increase in total production of pearl millet, finger millet and Rabi sorghum as compared to that of 1960s levels, per capita availability of all millets has largely declined.

Productivity gap

Though there is a significant increase in productivity of sorghum, pearl millet and finger millet, a wide productivity gap (or yield gap) has been observed by comparing the state average yield (SAY) and outputs from frontline demonstrations (FLD) organized under the Department of Agriculture (Table-3). This gap sheds light on the enormous potential for improvement, as well as the great challenge that lies ahead.

Table-3: Indicative yield gaps for finger millet and little millet in Odisha

Yield gaps SAY mean of 2005-10 compared to FLD	
Finger millet	Little millet
186%	110%

Note: SAY-state Average Yield.

FLD- Front Line Demonstrations.

Source: Source: Government of India, *Status Paper on Millets, 2010*, Directorate of Millets Development.

Changes in consumption

Like cultivated area, a steep decrease in the consumption of all millets has been observed. Tables-4 provides the declining trends of millet consumption during 1972 and 2005 in both rural and urban areas.

Table-4: Consumption trend for sorghum and pearl millet 1972 - 2005 in rural and urban areas

Millets	Rural	Urban
Sorghum	Decline by 70%: from 19.1 to 5.2 kg/per capita/year	Decline by 68%: from 8.5 to 2.7 kg/per capita/year
Pearl millet	Decline by 60%: from 11.5 kg to 4.6 kg/capita/year	Decline by 62%: from 4 kg to 1.5kg/capita/year

Source: ICRISAT, *The Sorghum and Pearl Millet Economy of India, 2011*, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT).

No adequate comparative figures are available on the consumption of small millets other than finger millet, but considering the enormous decrease in their production, a steep fall in consumption can be presumed. The overall fall in demand is often attributed to factors like changing food habits, growing

urbanization, increased incomes, competition from other crops, millets being culturally stigmatized as 'poor man's crop', the time-consuming and back breaking dehulling process, especially for five small millets and the lack of 'modern' millet-based foods in market. Moreover, mere rice and wheat being included in Public Distribution System, the imperative and economic rationale of including millets into the food basket is impaired. The latter can be seen as one of the reasons for the decline in millets consumption.

Barriers to increase in millets production and consumption

Based on the considerations above, increased production and consumption of millets is likely to result in various societal benefits. Finding ways to achieve increase in production and consumption of millets, given the negative trends, are however not straightforward. To elucidate the areas requiring attention, some of the main underlying barriers which have limited and still are limiting the production and consumption of millets are listed (Dhan and Wassan 2012).

- Lower or near absence of production support in terms of input supply and subsidy (seed and nutrients), irrigation support, and marketing support, when compared to the support enjoyed by other crops. This is particularly so for small millets.
- Near lack of reach of improved methods of production and technologies like improved varieties to small millet farmers (except finger millet in certain pockets).
- Lack of organised seed distribution mechanisms to supply good quality seeds for small millet crops in accordance with farmers' preferences. .
- Lack of appropriate post-harvest processing technologies for small millets except finger millet.
- Changes in preference patterns in consumption which resulted in inadequate appreciation of millets and moving away from them (Sanskritisation). This is mainly due to inclusion of only rice and wheat into the Public Distribution System (PDS). This in turn resulted in drastic decline in consumption even where there is production.
- Lack of public procurement and marketing support.
- Inadequate research on production, improvement and food product promotion for small millets.
- Absence of public or private funded promotion of millets as a nutritious food category.
- Lack of available information primarily about small millets, which reduces the ability to introduce policy measures.

Why policy support for millets require?

Millets are not only important for rural livelihoods, but for urban ones as well given their nutritional qualities. Improved nutrition weakens the transmission of poverty from one generation to the next (IAASTD 2009). It was suggested that micronutrient deficiency alone costs India US\$2.5 billion annually (World Bank 2005). Millets provide the much needed food and fodder security especially to the vulnerable groups. It is pertinent to note that food security at national level will only be effective

when regionally important crops are allowed to play their due role in meeting food and fodder needs of the region and thus avoiding the undesirable dependence on other regions as well as a fewer number of food crops for meeting food needs.

Although demand for millets has been declining throughout the years, this may be more attributable to circumstantial factors than conscious choice. A survey report found 79 per cent of respondents willing to include millets into their food basket (India Together 2011). Even so, millets and primarily small millets are in a situation of crisis in India. Amongst the causes for this crisis, historical policy neglect of these crops is an important one. It can be seen that many of the barriers listed in the previous section emerge from such policy neglect. So without addressing the policy related barriers much progress cannot be made in promotion of production and consumption of millets.

Present-day willingness of policy makers to focus on millets is encouraging, but caution is needed in the design and implementation of enabling measures, as good intentions may result in disappointment when policies do not achieve intended results. While an equal-level playing field should be created for millets in all respects, this need not necessarily mean replication of monocropping with improved variety/hybrid and fertilisers promotion strategy as employed for wheat and paddy. As noted earlier millet cropping systems as part of diverse rainfed ecosystems and so need of custom-made location specific approaches.

'Policy' is a broad concept covering many types of measures emanating from different levels of authority and with different operational implications. This paper primarily covers schemes and programmes, which are instruments close to implementation level.

Existing policies on millets in India and Odisha

Few policies exist in India specifically designed for millets and millets farmers. Few policies even explicitly include millets into their objectives and provisions. Over the last decades different national-level initiatives were launched for research on millets encompassing 'All- India Coordinated Improvement Projects' and the establishment of millets-specific research institutes and directorates. But millets never received the same developmental attention as other cereals like rice and wheat. Amongst the reasons for this lack of emphasis on millets are centralised approach for addressing national food security and the optimism that prevailed in

past decades about the ability of rice and wheat alone to provide food security to the nation. Certain traits of millets also played part, like the yield instability associated with rainfed millets production, the lower shelf life of processed grain and the negative social status of millets as a poor man's crop Dhan and Wassan (2012).

The first national comprehensive scheme for millets development is the Initiative for Nutritional Security through Intensive Millets Promotion (INSIMP), introduced in 2011 under the 'National Agriculture Development Programme' (NADP) or 'Rashtriya Krishi Vikas Yojana' (RKVY). INSIMP purports to be an integrated scheme by combining different policy components like demonstration, inputs, seed, post-harvest technology, awareness raising, capacity building and research. It extends to all states and union territories and targets all millets (sorghum, pearl millet, finger millet and other

five small millets). However, only districts with minimum areas under millets cultivation (10,000 ha for sorghum and pearl millet, 5,000 ha for finger millet and 2,000 ha for other five small millets) are eligible for support. As part of the 2011-12 annual budget, Rs 300 crore have been allocated for the scheme's implementation. Rs. 295.00 lakh were allocated for INSIMP during 2011-12 in Odisha

It is too early at the moment to draw overall conclusions about this new scheme, but some preliminary remarks can be made. In a positive light INSIMP can be seen as an expression of the mounting concern over the state of millets and as first attempt to put forward a comprehensive national strategy for millets promotion. At the same time, certain features of the scheme's design seem less than adequate. While the aims of INSIMP appear to be far fetching, it suffers from lack of causality and balance between its different components, raising doubts about the truly integrated nature of the scheme. Particularly there is poor focus on promotion of millets consumption. In a similar vein, the interventions proposed and implementation modalities appear quite 'business as usual' focusing on inputs supply, even though an increasing number of authorities are underlining the importance of new approaches to rainfed farming.

The Dharwad Declaration on Millets (2011) goes even further by criticizing the basic approach of the scheme as harmful for the millet cultivating environment (e.g. INSIMP is inducing the "hybridization, monocropping and chemicalization of millet cultivation"). Moreover, limiting support to farmers in selective millet growing districts discriminates negatively against millet farmers in other areas. This could result in the compartmentalization of millets cultivation, which may negatively reflect on the aim of curbing area losses under millets as well as increasing home consumption of these grains. Further budget allocation for the first period of INSIMP is quite meagre when compared to the changes it intends to bring about.

Internal sources admit that INSIMP implementation was very poor in 2011; too few activities were undertaken in relation to allocated resources. The lack of thorough conceptualization of the policy was part of the problem. For instance, one of the policy components provides for the distribution of seeds to farmers. In fact this component could hardly have been implemented given the lack of available seed. To operationalize such action seed production should have been promoted at least two seasons earlier to ensure sufficient stock. Regardless of the initial difficulties, intentions are there for expanding INSIMP to include more policy components and allocate more funding. This means that the present scheme should rather be seen as a kind-of pilot programme than as a full-fledged policy, meaning that space exists for elaboration and improvement.

Box-1 : INSIMP

This scheme aims to demonstrate the improved production and post-harvest technologies in an integrated manner with visible impact to catalyse increased production of millets in the State. Besides increasing production of millets, the scheme through processing and value addition techniques is expected to generate consumer demand for millet based food products.

- ❖ **Demonstrations** are conducted in districts with minimum identified areas under millets cultivation but where productivity is less than the National Average Yield.

- ❖ **Inputs** are provided in the form of production kits supplied free of charge for maximum 2 ha to all farmers from selected units in selected districts. Kits include micro-nutrients, fungicides, (bio) fertilizers, DAP, urea, potash, pesticides, herbicides, etc. Seeds of improved and hybridized varieties (for 0.4 ha) are distributed as well.
- ❖ **Seed production** is promoted through an incentive for hybrid seeds and High Yielding Varieties (HYVs), of which 75% is passed on to farmers and 25% to seed agencies.
- ❖ **Post-harvest technology** is promoted through the establishment of three national centres for demonstration and training, through the distribution of processing units for various districts and by organizing **capacity building** trainings in post-harvest management.
- ❖ Support is provided for state-initiated **awareness raising campaigns** to stimulate millets consumption.
- ❖ One percent of the funds are made available for different **research** topics.

The Rainfed Area Development Programme (RADP) was launched during the year 2011-2012 as a sub scheme of Rashtriya Krishi Vikas Yojana (RKVY) to address the needs of rainfed areas. It existed as a separate program for several years after which it got subsumed under NADP/RKVY in 2011. It aims to put forward a holistic approach to rainfed area development through the promotion of rainfed farming systems and by focusing on the needs of small and marginal farmers. It promotes integrated farming practices, favours mixed farming systems, minimum soil disturbance, utilization of crop residues and crop rotation. It assists farmers in improving the productivity of existing cropping patterns and in diversifying production. Amongst programme components support for Recommended Cropping Systems (RCS) includes support to millets.

Box-2		
Recommended Cropping Systems on RADP eligible for support involving millets		
<i>(Department of Agriculture and Cooperation, Guidelines for Rainfed Area Development Programme, 2011)</i>		
Type	Practice	Support (max 2 ha)
Rice/wheat based	Rice-wheat-sorghum + cowpea	25% or 10,000 Rs/ha, or cost of inputs
Coarse cereals based	Sorghum-igeonpea Sorghum-chickpea/ safflower Sorghum/maize-mustard Cowpea- finger millet, Finger millet + soybean-field bean	25% or 5,000 Rs/ha, or cost of inputs
Oilseed based	Soybean + pigeonpea/sorghum-chickpea- rapeseed- safflower Castor-pigeonpea/sorghum/green gram /black gram Sunflower/safflower coarse cereals	25% or 7,500 Rs/ha, or cost of inputs
Fibre based	Cotton+sorghum/pigeon pea/soybean/groundnut/green gram	25% or 10,000 Rs/ha, or cost of inputs
Pulse based	Green gram-finger millet Black gram-barley/rapeseed/mustard/finger millet Cowpea-finger millet	25% or 5,000 Rs/ha, or cost of inputs
Tree/silvi-pastoral	Neem+sorghum	50% or 15,000 Rs/ha or cost of inputs

*Or any other cropping combination recommended by ICAR, SAU, KVK, ATMA

It is difficult to assess this broad-intentioned scheme from the perspective of millets and millet farmers. Subject to the actual application of the stated objectives, such approach could bring a welcome addition to existing agricultural development mechanisms and could provide positive contribution to millet farmers. A quick look at the RCSs in the box above however invites the observation that small millets (excluding finger millet) seem to be largely left outside the scope of this initiative. Budget allocated for RADP for 2011-12 was Rs. 250 crore.

The oldest national level general instrument used to support millets is 'Macro Management of Agriculture' (MMA), operational since the year 2000. MMA includes 27 Centrally Sponsored Schemes supporting the realization of agricultural development programs throughout the country. Millets are covered as a sub- category of coarse cereals under the Integrated Cereals Development Programmes in Coarse Cereals based Cropping Systems Areas (ICDP-CC) launched in 1994. The following amounts were allocated for millets under ICDP-CC in Odisha during 2007-10.

Table - 5: ICDP-CC allocations for Odisha

Crop	Area (Lakh ha)	Activities	Expenditure (Rupees in Lakh)		
			2007-08	2008-09	2009-10
Finger millet	0.71	Demonstration, seed, Farmer Field Schools, Exposure Visit	26.80	37.70	33.74

Source: Government of India, Directorate of Millets Development, Status Paper on Millets, 2010

Though named as 'Integrated Cereals Development Programmes in Coarse Cereals based Cropping Systems Areas', as can be seen from the table only limited activities were taken up as part of this scheme. It is striking that even though the MMA provides a flexible mechanism with extensive budget support to states, so little has been used for millets. Of the approximately Rs 765 crore spent in 2009-10 for MMA the millets component is negligible (Government of India 2010-11). Again within millets, the only small millet receiving attention is finger millet; other small millets are entirely outside the policy scope.

Another important national instrument with a more circumscribed thematic area that explicitly covers millets is the National Agricultural Insurance Scheme (NAIS). NAIS's main objective is to provide insurance coverage and financial support to farmers in the event of crop failure as a result of natural calamities, pests and diseases. Millets are amongst the specified crops for which coverage can be provided. The scheme provides limited premium rates for certain crops in certain circumstances (including millets) and allows premium subsidy to be extended to 50 per cent in case of small and marginal farmers.

A Weather Based Crop Insurance Scheme (WBCPIS) covering millets farmers is operational at both national and state levels, implemented like the NAIS through the Agricultural Insurance Company of India. The fund allocated in 2009-10 and 2010-11 was Rs 50 crore and 100 crore, respectively and 450 crore previewed for 2011-12 (Government of India 2010-11). The eternal problem with the NAIS as well

as similar insurance schemes in India and other countries is that although possibilities to make use of such instruments exist on paper, consistently too few farmers actually make use of them. How to bring these schemes to the smallest farmers remains a question unresolved.

The Minimum Support Price (MSP) instrument is implemented at national level for different crops and plays a major role in farmers' production decisions. MSP is announced for wheat, paddy and coarse cereals including sorghum, pearl millet and finger millet every year. Prices are recommended by the Commission for Agricultural Costs and Prices (CACP) and fixed by the Department of Agriculture and Cooperation (DAC) for the whole country. All the covered grains conforming to quality standards are bought at this price when offered at specified procurement centres. Purchased grains are further distributed throughout the country by the Food Corporation of India (FCI) for the PDS and other food-based welfare schemes.

MSP can be a very effective instrument for providing market security to farmers and boost production of a supported crop. The system is however wholly dependent on effective **procurement** practice. As shown in the table below, comparative MSPs and price increases are in the same range for rice, wheat and millets. Nevertheless, the mechanism has not functioned to the benefit of millet farmers for the simple reason that public procurement based on these prices has been very scarce.

Table - 6: Comparative picture of MSPs for food grains fixed by GOI over the period 1977-2010

Year	Rice (common)	Wheat	Sorghum		Pearl millet	Finger millet
			Yellow	Maldandi		
1977-78	77	110	74	-	74	74
1987-88	150 (95)	173 (57)	135 (82)	-	135(82)	135 (82)
1997-98	415 (177)	455 (163)	360 (167)	-	360 (167)	360 (167)
2007-08	645 (55)	1000 (120)	600 (67)	620	600 (67)	600 (67)
2008-09	850 (32)	1080 (8)	840 (40)	860 (39)	840 (40)	915 (53)
2009-10	950 (12)	1100 (2)	840(0)	860(0)	840(0)	915 (0)
% increase over 1977-78	1134	900	1035	-	1035	1136

Note: Figures given in parenthesis indicate % increase over previous period/year.

Source: Government of India, Status Paper on Millets, 2010, Directorate of Millets Development.

Several state governments have been procuring coarse grain including Andhra Pradesh, Bihar, Chhattisgarh, Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra and Rajasthan. In order to encourage the consumption of coarse grains under the Public Distribution System next to wheat and rice, coarse grains are being made available at Central Issue Price (CIPs). As a result of these measures, the allocation of coarse grains under TPDS has increased.

The other side of the coin of MSP and procurement are the Public Distribution System (PDS) and other food-based welfare schemes. If the former is oriented to production, the latter relate to consumption measures aiming to achieve food and nutritional security for the entire population. At

the time of writing, the National Food Security Bill (NFSB) is pending final adoption. It purports to be a landmark framework policy which aims to finally throw off the “burden of hunger and malnutrition”. An allocation of Rs1, 60,887 crore for 2011-12 was announced for the Bill’s implementation, amounting to an increase of 17 per cent over the previous period spending on social welfare and to 36.4 per cent of total plan allocation (Government of India 2011-12).

The present version of the Bill proposes inclusion of millets into the PDS under the heading of ‘coarse grains’. During preparation this inclusion was strongly advocated with the arguments that it would improve nutritional status and would help to create a large demand for the benefit of millet farmers. Millets in the PDS is not a new idea; the possibility was already noted in the Tenth Five Year Plan and was promised by the National Policy for Farmers (2007) five years ago. According to the Ministry of Consumer Affairs, Food and Public Distribution website, coarse grains have already been made available under the PDS at 50 percent of economic cost for BPL families, 70 per cent for above poverty line (APL) families and at Rs 200 per quintal for AAY families in certain states (Government of India, Ministry of Consumers Affairs). Even earlier singular state-level initiatives have been undertaken to include millets into welfare schemes. However they do not appear to have been successful, primarily due to negative social connotations with these grains. Such experiences underline the importance of awareness raising and positive image building particularly in areas where millets are perceived as inferior grains.

The question with the NFSB is not as much about the novelty of its provisions, but whether they can create sufficient thrust to make lasting and significant changes in favour of millets. Many details remain to be specified under the NFSB and much regional work will need to be done to achieve feasible models for millets inclusion. For example necessary measures need to be taken to address the short shelf life of dehulled products of small millets other than finger millet, which may involve technology related, infrastructure and procurement related initiatives. This calls for adequate fund provisions for piloting various options available to find the suitable one. Nevertheless adoption of this Bill would present a great opportunity for constructive action. Necessary caution should be taken to avoid the same problem of sidelining of small millets as seen in many other schemes.

Implementation of the NFSB through the PDS and the various food-based welfare schemes is likely to differ from state to state, particularly regarding the grains that will actually be included for distribution. Tamil Nadu, in its “Approach to the 12th Five Year Plan” states the aim of including ‘nutritious grains’ (clearly referring to millets) into the PDS. The “Public Distribution Scheme Policy Note 2011-12” however does not yet mention this inclusion neither for the covered period, nor for the next.

Regarding welfare schemes, Tamil Nadu has allocated a sum of Rs 1278.25 crore for the MGR Nutritious Meal Programme 2011-12 and Rs.1784.77crore for the Integrated Child Development Scheme (ICDS) 2011-12. Initiatives implemented under these schemes like the Noon Meal Programme, National Programme of Mid-Day Meal, Supplementary Nutrition, Take Home Ration etc. are meant to reduce hunger and improve nutrition by providing meals and supplementary nutrition to beneficiaries of different age, gender and social status.

While some of the mentioned schemes and programmes exist at national level and the NFSB sets minimum nutritional standards to be achieved per meal for different age groups, various details

including menu composition remain state-administered. In Tamil Nadu millets are not part of the menus in the majority of food schemes, which do include rice, dhal, vegetables, potatoes, eggs, gram etc. Finger millet flour (5% of total composition) is included in the menu under Supplementary Nutrition under ICDS which is provided 300 days per year to malnourished children between 6 and 36 months and pregnant women and nursing mothers. Government is also considering the introduction of other millets into the ICDS.

Conclusion

To conclude, only limited policies and schemes explicitly include millets. There are no exclusive Government schemes/projects/ programs for small millets. Of the available schemes, the most important ones are Initiative for Nutritional Security through Intensive Millets Promotion (INSIMP) as part of Rashtriya Krishi Vikas Yojana” (RKVY), Rainfed Area Development Programme (RADP) as part of Rashtriya Krishi Vikas Yojana” (RKVY), Integrated Cereals Development Programmes in Coarse Cereals based Cropping Systems Areas (ICDP-CC) under Macro Management of Agriculture(MMA). There is lot of variations across the states on how they utilise these opportunities for promoting millets. Further most of the states usually focus on sorghum, pearl millet and finger millet and leave out many of the small millets while implementing these schemes.

Of the schemes mentioned, INSIMP is the only comprehensive initiative to support millets. Being the first year it has faced many starting problems. This scheme is expected to continue in the years to come. It is too early at the moment to draw overall conclusions about this new scheme, but some preliminary remarks can be made. In a positive light INSIMP can be seen as an expression of the mounting concern over the state of millets and as first attempt to put forward a comprehensive national strategy for millets promotion. While the aims of INSIMP appear to be far fetching, it suffers from lack of causality and balance between its different components, raising doubts about the truly integrated nature of the scheme. Particularly there is poor focus on promotion of millets consumption. In a similar vein, the interventions proposed and implementation modalities appear quite ‘business as usual’ focusing on inputs supply, even though an increasing number of authorities are underlining the importance of new approaches to rainfed farming. The present scheme can be seen as a kind-of pilot programme than as a full-fledged policy, meaning that space exists for elaboration and improvement.

In all the other schemes the state has options to include millets and so there is lot of difference in implementation across the states. Besides these schemes there are many state level schemes on various aspects like crop insurance, supply of micro-nutrients, seed production, etc. which include millets as one crop category. As mentioned earlier, even if millets are included under these schemes, most of the small millets are passed over.

While there is countable number of policy initiatives for promoting production of millets, there is almost no scheme or policy initiative in place for promoting consumption. Most of the public food programs do not include millets, except inclusion of finger millet in ICDS in few states. Even earlier singular state-level initiatives have been undertaken to include millets into welfare schemes. However they do not appear to have been successful, primarily due to negative social connotations with these

grains. Such experiences underline the importance of awareness raising and positive image building particularly in areas where millets are perceived as inferior grains. Many details remain to be specified under the NFSB and much regional work will need to be done to achieve feasible models for millets inclusion. Here also there is possibility of unduly side-lining small millets and so necessary design and implementation caution to be taken.

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Food and Nutrition Security in Odisha - Status, issues and way forward

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Abstract

Growth in agricultural production and economic & physical access to food along with other multi-sectoral approach to increase the absorption capacity are essential elements of Food and Nutrition Security . But after so many initiatives over the decades, sub-optimal food distribution and issue related to malnutrition are still considered as the prime threat to human development worldwide- across the region and within the region too (Evita et. al. 2013). Although food production in India has increased, a major percentage of population are undernourished due to lack of proper planning, monitoring and awareness regarding the importance of nutritious food and nutrition practices . The problem of malnutrition is also an issue of concern in the state like Odisha, dominated by poor , SC & ST population. In this backdrop the present study is designed to conceptualize the issue of Food and Nutrition Security along with analyzing the status of different dimensions of Food and Nutrition Security in the state of Odisha and to suggest measures to strengthen the nutrition security net in the state .

Key words: Availability, accessibility, vulnerable section, malnutrition, micronutrient.

Introduction

Food is essential for life but nutritious food is considered as crucial to attain health, education and economic goals both at micro and macro level (FAO - 2012).An individual's economic status and health status are strongly correlated (Thomas et al.- 2002).Good health of an individual depends not only on the quantum of intake but also on quality and composition of food basket. Dietary imbalance causes different types of disorder of which malnutrition and over nutrition are common . Of these two, malnutrition imposes significant cost by reducing physical work capacity & productivity and negative pregnancy & maternal health outcomes in developing and under developed countries (Mukherji- 2010).

Food and nutrition insecurity, which stands as a challenge to the development process, is the manifestation of a tragic combination of poor socio-economic development, lack of health care knowledge among parents, administrative lapses and poor monitoring of operational schemes (Unicef

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- 2008). Growth in income although an essential driver of improved nutrition outcomes, has proved to be insufficient in ensuring a decline in hunger and malnourishment (FAO - 2012). Therefore the multi-sectoral approach of achieving Food and Nutrition Security (FNS) has been gaining importance among planners, policy makers and researchers since last few decades at international, national and local forums. Realizing the importance of nutritious food and long standing effect of nutrition insecurity, United Nations has declared, ensuring access to safe, nutritious and sufficient food round the year to all people particularly poor and vulnerable groups including children, girls, pregnant women, lactating women and older person as one of the pre-conditions for development in its Sustainable Development Goal (SDG - 2015).

Food Security and Food & Nutrition Security

Concepts of food security have evolved over time since the World War II and the earliest definition provided by the historic Hot Springs Conference held in Virginia, USA in 1943, to consider the goal of freedom from want in relation to food and agriculture merely stated, 'a secure, adequate, and suitable supply of food for everyone'. The food crises 1972-74 marked dramatic turning point from an era of food abundance in donor countries to highly unstable food supplies and prices globally. This resulted in food security insurance schemes, which assured international access to physical food supplies and improved food security assurance was achieved through better coordination between donor organizations and agencies and food availability surveillance in recipient countries in the 1970s.

Since the 1974 World Food Conference in Rome, the whole concept of food security has 'evolved, developed, multiplied and diversified' and three main shifts were identified, i.e. (i) 'from the global and the national to the household and the individual'; (ii) 'from a food first perspective to a livelihood perspective'; and (iii) 'from objective indicators to subjective perception'. With the successes of the green revolution in 1980s, increasing food production and food availability in many parts of the world, mainly in Asia and Latin America, the awareness of the persistent vulnerability of specific communities to hunger due to decline in their purchasing power led to the concept of food security being broadened to include both physical and economic access to food. In the 1990s, with the approach of the millennium, the primacy of reducing global hunger and undernutrition within the development agenda and the recognition of the human right to adequate food and nutrition was reaffirmed internationally. Reduction of hunger and under nutrition was increasingly seen in the context of overall development, poverty reduction and the achievement of the Millennium Development Goals (MDGs). According to FAO, food insecurity was defined as, 'a situation that exists when people lack secure access to sufficient amounts of safe and nutritious food for normal growth and development and an active and healthy life'. The 1996 World Food Summit held at FAO in Rome, adopted the following definition: 'Food security exists when all people at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.' Subsequently, with the sole addition of the word 'social' to the phrase 'physical, social and economic access', the amended definition was reaffirmed officially by FAO in the 2009 Declaration of the World Summit on Food Security. This document also reiterated that the four pillars of food security are availability, access, utilization and stability. Thus according to the currently accepted definition,

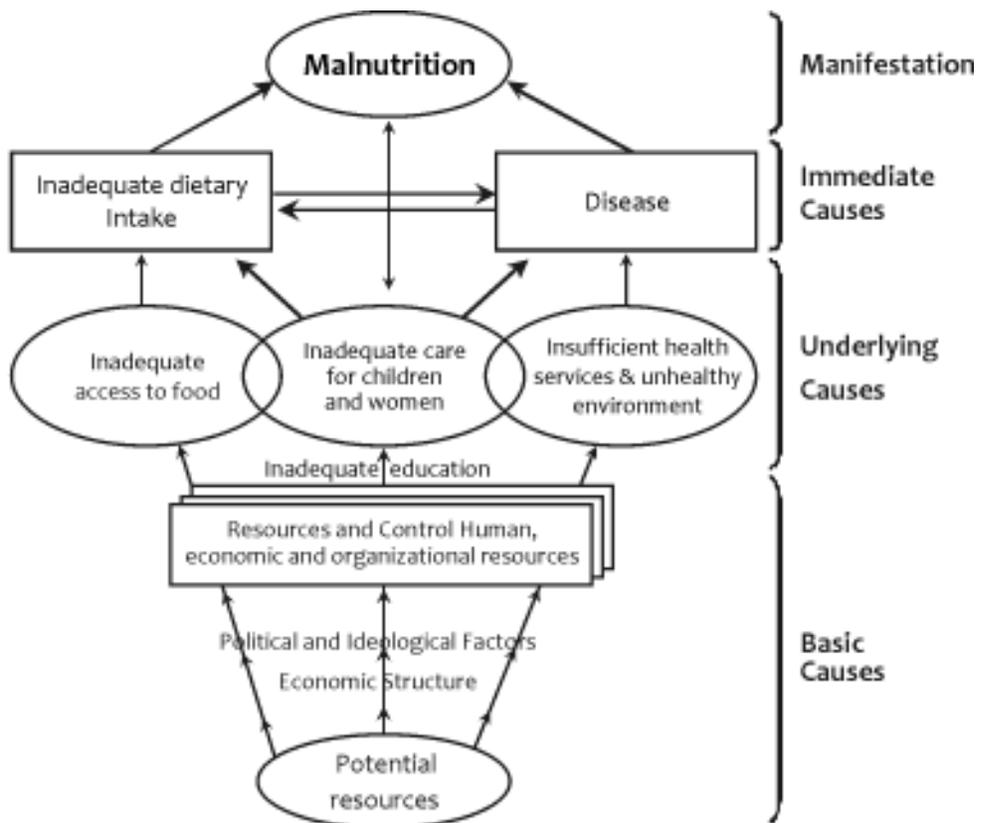
‘Food Security’ is achieved when it is ensured that ‘all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life’. Food is here defined as any substance that people eat and drink to maintain life and growth. As a result, safe and clean water is an essential part of food commodities. This definition already includes aspects of nutrition but was not sufficiently elucidated.

The term ‘nutrition security’, on the other hand, emerged in the mid-1990s and focused on food consumption by the household or the individual and on how that food is utilized by the body and thus in principle is more than food security. From a nutritional perspective, adequate utilization refers to the ability of the human body to ingest and metabolize food. Alongside nutritious and safe diets, an adequate biological and social environment, and adequate utilization of the nutrients in food became the components of Food and Nutrition Security(FNS).

The Conceptual Framework of Malnutrition

Conceptual framework of malnutrition (Unicef), states that inadequate dietary intake and unsatisfactory health condition are two immediate causes of malnutrition. Absence of proper care in households and communities is the third necessary element of the underlying causes of malnutrition.

Conceptual Framework of Malnutrition (UNICEF 1991)

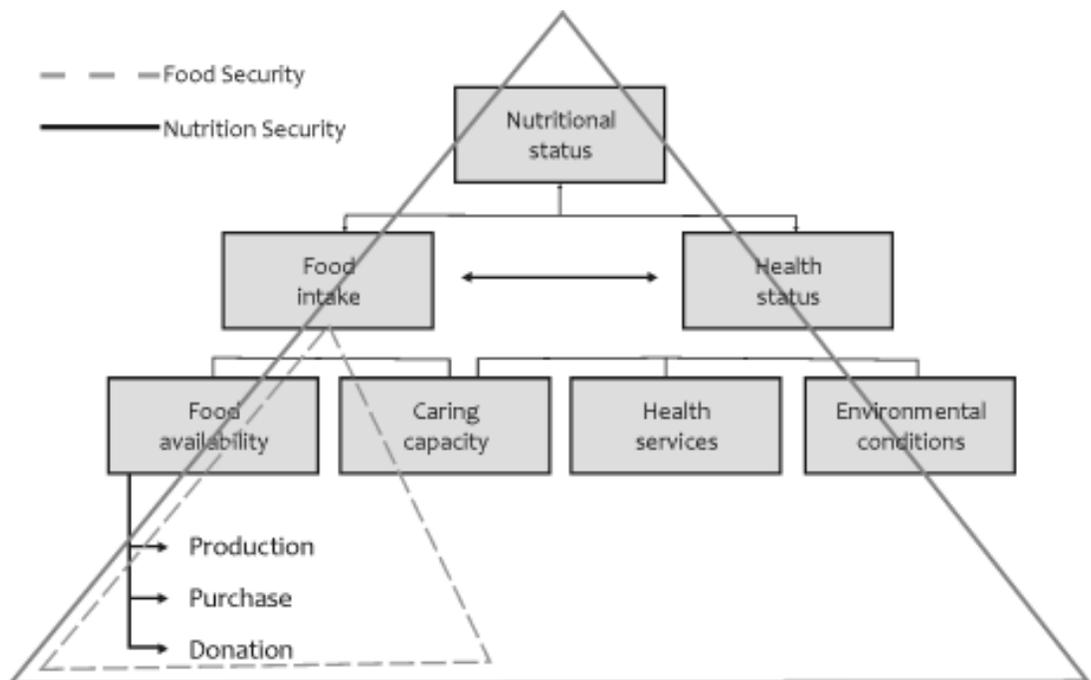


This conceptual framework recognizes that human and environmental resources, economic systems, political and ideological factors are basic causes that contribute to malnutrition. This model relates the causal factors for under-nutrition with different social-organizational levels. The immediate causes affect individuals, the underlying causes relate to families, and the basic causes are related to the community and the nation.

The Conceptual Framework of Food security and FNS at Household level

Figure below depicts a simplified causal model linking nutritional status with ecological determinants at household level. In this conceptual framework, the nutritional status is an outcome of food intake and health status. However, the underlying causes of health - environmental determinants and health services have been presented in different boxes. A reduced state of health may be due in part to tenuous access to health care, poor housing and environmental conditions, and is possibly worsened by malnutrition, which predispose individuals to diseases. The distinction between health services and environment is necessary to select appropriate intervention strategies. The four underlying determinants of food intake and health status are influenced by four determinants. In addition, each determinant has several contributing factors.

Food Security VS Food & Nutrition Security



All the above determinants of food and nutrition security are categorized into three important indicators i.e. adequacy of food, adequacy of care for children & women and adequacy of health & sanitation (FAO 2012).

Objectives

In this back drop the present study is designed to analyse the status of food and nutrition security in the state of Odisha with following objectives

- ❖ To study the adequacy of food in the state of Odisha .
- ❖ To analyse the nutrition status of children and women in the state of Odisha .
- ❖ To study the adequacy of health and sanitation in the state of Odisha .
- ❖ To suggest policy measures to increase the food and nutrition status in Odisha

Methodology

Present study is based on secondary data collected from different published and unpublished sources. Published sources like National Sample Survey (NSS) rounds, National Family Health Survey (NFHS), Nutrition Base Line Survey (NBSL) etc. are used for the purpose. Nutrition Base Line Survey is conducted by Department of Women and Child Development, Government of Odisha during 2010-2011 in fifteen high burden district (HBD) and five non-high burden district (NHBD) which are identified by a composite index of vulnerable considering the indicators like schedule tribe concentration, poverty and illiteracy. Adequacy of food in the state is analysed by considering the factors like production of different food items, trends in the change in prices of basic goods, incidence of poverty and monthly per capita consumer expenditure (MPCE) on different items. Nutrition status of children and women is analysed by interpreting the factors like stunted children, wasted children, anemic children, children having deficiency of vitamin A, nutrition practice of mothers, health care practices of pregnant women and young women. Analysis of adequacy of health and sanitation, focuses on the factors like average MPCE on medical and education, government expenditure in different sectors, coverage of safe water supply, and the achievement in providing hygienic provision.

Findings of the study

Adequacy of food in the state of Odisha

Adequacy of food is one of the important indicators of food and nutrition security. In the present study availability and accessibility of food are taken as two important components of adequacy of food. With an objective to analyse the degree of availability of food and accessibility food, data related to food production, change in price of food items, poverty level and monthly per capita consumer expenditure on different food & non-food items are collected and presented below .

Production of different crops in Odisha

Availability of food primarily depends up on the production of food grain. Keeping this in view data related to production of different crops in the state of Odisha over the years are presented in the Table -1. It is observed that production of rice, maize & ragi has increased and production of wheat & jowar has decreased. But when production of all cereals are taken together, an increasing trend with erratic behavior in the trend of production is observed. So far as the production of pulses is concerned all items are found to be increased. Oil seeds production taken together is also found to

be increased and among other crops, production of sugarcane and potato is decreasing over the years . In total it is found that production of food crops over the years is increasing in the state of Odisha .

Table - 1 : Production of different crops in Odisha('000 MT)

Crops	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
(A) Cereals									
Rice	6859	6825	7541	6813	6917	6828	5807	9497	7613
Jowar	6	6	6	6	6	5	-	5	5
Bajara	2	1	1	2	2	2	-	5	5
Maiza	102	103	147	135	175	299	212	227	264
Ragi	40	43	47	41	37	47	31	44	46
Wheat	4	6	9	7	6	4	2	2	1
Other cereals	10	9	9	8	10	-	16	9	10
Total(A)	7023	6993	7761	7012	7153	7192	6069	9786	7941
(B)Pulses									
Gram	23	24	26	25	34	33	30	32	36
Tur	98	106	113	119	112	124	115	128	124
Other pulses	216	221	245	237	252	270	102	264	259
Total(B)	337	351	384	381	398	427	247	424	419
Total food grains(A+B)	7360	7344	8145	7393	7551	7619	6316	10210	8360
Oil seeds									
Groundnuts	106	88	103	96	89	86	79	82	87
Sesamum	13	11	10	7	10	12	5	94	6
Rape seed	3	3	3	3	3	3	2	4	4
Linefeed	10	11	12	11	12	12	-	12	11
Casterseed	9	11	11	11	10	9	8	8	8
Others	22	26	33	24	26	100	72	64	54
Total(C)	163	150	172	152	150	222	166	264	170
(D) Other crops									
Sugarcane	1073	1274	1069	646	490	903	885	952	937
Tobacco	-	3	3	3	2	2	2	1	1
Potato	75	79	94	76	97	76	63	65	71
Chillies	63	64	64	64	64	65	74	74	74
Ginger	31	32	32	33	118	118	135	134	134
Total (D)	1242	1452	1262	822	771	1164	1158	1226	1217
Grand total (A+B+C+D)	9054	9203	9857	8655	8747	9373	7991	12134	10144

Source: (a) Directorate of Agriculture and Food Production, Odisha.

(b) Directorate of Economics & Statistics, Odisha

(c) Directorate of Horticulture, Odisha

Average retail price of essential commodities in Odisha

Change in the retail price of a commodity is one of the important factors of measuring the degree of accessibility of the product by common people. Keeping this issue in view, change in average retail price of some essential commodities over the years is collected and presented in the Table 2. It is revealed from the table that the average price of all essential commodities have increased over the years.

Table - 2 : Average retail price of some essential commodities in Odisha

Particulars	2004	2005	2006	2007	2008	2009	2010	2011	2012
Rice	8.47	8.93	9.11	10.73	11.34	14.58	15.18	17.02	18
Wheat	9.31	9.72	11.51	13.85	12.67	14.31	14.6	15.13	15.40
Mung dal	24.04	29.14	39.35	38.78	36.17	67.97	76.1	68.67	69.68
Mustard oil	55.53	50.6	50.7	60.15	62.5	64.24	72.35	77.97	92.69
Palm oil	50.79	45.13	48.54	54.08	58.1	48.8	49.02	59.72	66.03
Sugar	17.23	20.03	21.01	16.33	16.39	32.46	35.22	33.35	37.21
Salt	2.43	2.62	2.38	2.92	2.79	4.22	9.52	10.05	11.02
Potato	6.82	7.12	8.19	8.95	9.07	13.41	8.58	8.82	13.28
Onion	8.44	9.75	7.51	13.29	11.93	15.37	18.4	16.36	13.63
Maida	11.5	12.16	14.39	15.67	15.5	17.86	20.71	21.23	22.12
Atta	10.5	10.83	13.05	14.07	14.16	16.34	18.95	19.57	20.59
Suji	11.99	11.87	14.95	16.48	16.52	19.2	21.07	21.83	22.54

Source: Directorate of Economics and Statistics, Government of Odisha

Status of poverty in Odisha

Poverty is another important factor which determines the degree of accessibility to essential commodities by common people. To know the status of changing trend in poverty in the state of Odisha, data are collected and presented in the Table 3. It is found that percentage of people below poverty line has been reduced from 66.18 percent (1973-74) to 37 percent (2009-10).

Table - 3 : Status of poverty in Odisha

Year	Poverty(%)
1973-1974	66.18
1977-1978	70.07
1983	65.29
1987-1988	55.58
1993-1994	48.56
2004-2005	57.20
2009-2010	37.00

Source: Directorate of Economics and Statistics, Government of Odisha

MPCE for food and non-food items in Odisha

With an objective to know the changing trend of expenditure on different items in Odisha, data related to MPCE on food and non-food items in rural and urban Odisha along with its comparative position to all India average is collected and presented in Table 4. It is observed that percentage of MPCE on food items has reduced from 64.11 percent (55th NSS round) to 51.98 percent (68th NSS round) and percentage of MPCE on non-food items has increased from 35.89 percent (55th NSS round) to 48.02 percent (68th NSS round) in rural Odisha. So far as urban Odisha is concerned, percentage of MPCE on food items has reduced from 56.95 (55th NSS round) to 39.26 (68th NSS round) and percentage of MPCE on non-food items has increased from 43.05 (55th NSS round) to 60.74 (68th round). Data related to the per capita expenditure for Odisha as percentage of all India average shows that expenditure on food items has reduced from 76.76 percent of national average in 55th NSS round to 70.29 percent of national average in 68th NSS round and corresponding figure for non-food items has increased from 72.34 percent in 55th NSS round to 73.89 percent in 68th NSS rounds. Thus, it is found that over the years percentage of consumption expenditure of households on food item is decreasing and that of on non-food item is increasing in Odisha.

Table 4 - Percentage of MPCE in food and non-food items in Odisha

NSS rounds	Rural		Urban		Per Capita Expenditure for Odisha as % of all-India average	
	Food	Non-food	Food	Non-food	Food	Non-food
55 th	64.11	35.89	56.95	43.05	76.76	72.34
56 th	62.85	37.15	48.23	51.77	79.3	84.48
57 th	63.04	36.96	48.83	51.17	61.75	78.91
58 th	58.71	41.29	44.37	55.53	73.47	85.84
59 th	58.04	41.96	47.16	52.84	71.80	81.38
60 th	58.44	41.56	47.65	52.35	73.32	82.26
61 th	61.57	38.43	49.93	50.07	71.39	71.96
62 th	56.58	43.42	44.72	55.28	73.71	76.90
63 th	57.85	42.15	42.15	57.85	65.96	81.69
64 th	58.22	41.78	42.27	57.73	72.37	97.74
66 th	56.49	43.51	41.39	58.61	-	-
68 th	51.98	48.02	39.26	60.74	70.29	73.89

Source: Directorate of Economics and Statistics, Government of Odisha

MPCE on selected food items in Odisha

Average MPCE on selected food items in Odisha as well as in India over the years is collected and presented in Table 5 to know the changing trend of consumer expenditure among different food

items. It is observed that average consumer expenditure on all essential commodities in rural and urban areas over the years has increased and the rate of increase in average MPCE in Odisha is found to be less in comparison to national average both in rural and urban area.

Table 5 - Average MPCE on selected food items in Odisha(Rs.)

Particulars	Odisha (64 th NSS round)		India (64 th NSS round)		Odisha (65 th NSS round)		India (65 th NSS round)	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Cereals	136.57	163.88	124.08	130.62	166.55	203.4	153.13	175.52
Gram	.44	.18	1.14	1.75	.57	.60	2.15	2.92
Cereal substitutes	.00	.00	.48	.51	.01	.00	.88	1.27
Pulses etc	16.13	30.09	23.7	31.2	32.32	43.57	39.73	51.55
Milk & reitd	10.5	57.34	60.18	106.64	27.07	62.07	116.13	186.47
Edible oil	21.49	37.46	33.29	46.43	31.56	41.56	48.22	63.62
Meat, fish, egg	25.34	53.14	26.31	39.47	39.32	63.24	45.62	66.94
Veg	49.95	84.57	48.53	64.34	68.64	88.96	61.88	81.4
Fruits(Fresh)	6.37	20.79	10.69	24.32	11.76	25.6	19.18	42.02
Fruits(Dry)	.34	2.21	2.87	6.7	.55	2.81	5.59	13.85
Sugar	7.47	11.6	12.35	14.67	12.73	17.23	23.64	27.69
Salt	1.77	2.5	1.48	1.83	2.93	3.14	2.46	2.75
Species	11.25	18.26	16.34	20.38	22.05	27.62	28.78	36.99
Beverages	37.8	125.97	42.89	93.52	54.24	138.82	74.59	169.9
Food items	325.42	607.99	404.33	582.43	470.3	718.63	621.98	922.89
Non-food items	233.53	530.36	368.03	889.11	434.5	1111.20	665.2	1554.11
Total	558.95	1438.4	772.36	1471.5	904.8	1830.3	1287.18	2477

Source: Directorate of Economics and Statistics, Government of Odisha

Thus it is observed that while on the one hand the availability of food items increases with an increase in the production of different type of crops, on the other hand, the accessibility to food items decreases due to an increase in average retail prices of different essential commodities in Odisha. Besides this, it is also found that poverty and percentage of MPCE on food items in comparison to non-food items is reducing, whereas average MPEC on different food items is increasing.

Nutrition status of children and women in the state of Odisha

Nutrition status of children and women plays equally important role in the analysis of food & nutrition security. With an objective to know the status of nutrition security among children and women in the state of Odisha, indicators like stunted children, wasted children, anemic children, children having deficiency of vitamin A, nutrition practice of mothers, health care practices of pregnant women and young women etc are used and data related to this are presented below.

Nutrition status of children in Odisha

Data related to the nutrition status of children in Odisha as per WHO growth standard is collected and presented in Table 6. Children between the age group of 0-3 years and 3-6 years are observed separately and categorized into normal, moderately undernourished, severely undernourished & under weight. It is found that among the children between the age group of 0-3 years, 62.87 percent are normal, 31.83 percent are moderately undernourished, 5.32 percent are severely undernourished and 37.15 percent are underweight in the year 2011-12. Corresponding figure for the year 2013-14 is found to be 72.26 percent, 25.57 percent, 2.17 percent and 27.74 percent respectively. Data regarding the nutrition status of children in the age group of 3-9 years reveals that 63.89 percent are normal, 32.30 percent are moderately undernourished, 3.76 percent are severely undernourished and 36.06 percent are underweight in the year 2011-12. Corresponding figures in the age group of 3-9 years are found to be 72.54 percent, 26.09 percent, 1.37 percent and 27.46 percent respectively in the year 2013-14. Thus, it is found that nutrition status of children in Odisha is improving very slowly and needs special care.

Table 6 - Nutrition status of children in Odisha (As per WHO growth standard)

Year	Total children	Children weighed	Normal children (%)	Moderately undernourished (%)	Severely undernourished (%)	Under weight (%)
Children between 0 – 3 years						
2011-12	1826524	1724247	62.87	31.83	5.32	37.15
2012-13	2479657	2359089	68.92	28.04	3.14	31.18
2013-14	2442569	2356350	72.26	25.57	2.17	27.74
Children between 3 – 6 years						
2011-12	1351103	1242443	63.89	32.30	3.76	36.06
2012-13	1745041	1626312	69.17	28.75	2.09	30.84
2013-14	1716557	1622362	72.54	26.09	1.37	27.46

Source: Directorate of Economics and Statistics, Government of Odisha

Data related to stunted, wasted, anemic children etc. in NHBD and HBD are collected and presented in Table- 7. It is found from the table that among the children in the age group of 0-59 months, 32 percent and 39 percent of children of NHBD and HBD respectively are found to be underweight. Again it is revealed that 36 percent children in the age group of 0-59 months in NHBD and 41 percent of children in the same age group of HBD are found to be stunted. So far as the percentage of wasted children in the age group of 0-59 months are concerned it is found that 25 percent and 23 percent children in NHBD and HBD respectively are wasted. Data related to the anemic children in the age group 6- 59 months shows that 55 percent children in NHBD and 66 percent children in the HBD are anemic. Again it is observed that only 80 percent and 84 percent children in the age group of 9-59 months in NHBD and HBD respectively are given one dose of vitamin A.

Table 7 - Nutrition status of children in Odisha

Categories	% of under weight children (0-59 months)		% of stunted children (0-59 months)		% of wasted children (0-59 months)		% of anemic children (6-59 months)		% of children given one dose of vitamin A (9-59 months)	
	NHBD	HBD	NHBD	HBD	NHBD	HBD	NHBD	HBD	NHBD	HBD
SC	36	38	35	39	26	24	62	63	74	84
ST	48	42	45	42	30	25	64	72	84	80
Lowest WI	47	42	47	43	31	22	64	72	79	78
Highest WI	22	28	28	32	22	64	72	53	84	90
Illiterate	40	42	39	43	29	23	67	71	70	77
HS & above	21	34	25	31	24	22	46	51	92	94
Boys	34	41	37	42	27	24	52	66	80	85
Girls	30	38	33	40	22	22	57	66	79	83
Over all NBSL	32	39	36	41	25	23	55	66	80	84

Source: Department of Child and Women Development, Government of Odisha

Nutrition status of women in the state of Odisha

Nutrition status of women is considered as one of the important components of nutrition security of a state. Keeping this view data related to nutrition status of women in Odisha is collected and presented in Table 8. It is revealed from the table that 53 percent of pregnant women NHBD and 58 percent of pregnant women of HBD are anemic. Only 59 percent of mother having the children of 0-36 months in NHBD have received 3 ANC during last pregnancy and corresponding figure for HBD is only 52 percent. It is found that 66 percent and 73 percent of adolescence girls in NHBD and HBD respectively are anemic. So far as use of iodized salt by household is concerned it is revealed that only 46 percent households in NHBD and 57 percent households in HBD are using iodized salt regularly. Again it is also found that 81 percent and 60 percent of mother having children in the age group of 0-36 month in NHBD and HBD districts respectively have delivered their children in healthy facilities.

Table 8 - Nutrition status of women in the state of Odisha

Categories	% of pregnant women who are anemic		% of mothers (children age 0-36 months) received 3 ANC during last pregnancy		% of adolescence girls (11-19 years) who are anemic		% of household using iodized salt		% of mother (children age 0-36 months) delivered in any healthy facilities	
	NHBD	HBD	NHBD	HBD	NHBD	HBD	NHBD	HBD	NHBD	HBD
SC	58	61	58	53	66	74	44	59	80	69

ST	68	59	39	45	80	77	30	49	59	47
Lowest WI	70	60	35	42	76	77	26	48	59	41
Highest WI	42	47	78	73	54	67	66	76	94	86
Illiterate	69	60	38	43	82	77	28	46	66	44
HS & above	38	40	90	76	49	70	77	78	96	93
NBSL total	53	58	59	52	66	73	46	57	81	60

Source: Department of Child and Women Development, Government of Odisha

Status of nutrition practice in the state of Odisha

Nutrition practice adopted by mother for children plays an important role in determining the nutrition status of a state. In this connection data related to practice of breastng, initiating complementary feeding and receiving complimentary immunization in NHBD and HBD of Odisha are collected and presented in Table 9. It is found that 65 percent and 58 percent of children between the age group of 6-24 months of NHBD and HBD respectively have exclusively breasted for six months. 71 percent of children in the age group between 0-23 months in both NHBD and HBD have breasted within 1 hour of birth. Again it is revealed that 79 percent and 85 percent of children in the age group of 6-23 months in NHBD and HBD respectively have initiated complimentary feeding during 6-8 months of birth. So far as the receiving complimentary immunization in the age group of children between 12-23 months is concerned it is found that 70 percent of children in NHBD and 66 percent of children in HBD have taken complimentary immunization.

Table 9 - Status of nutrition practice in the state of Odisha

Categories	% children (6-24 months) exclusively breasted for six months		% children (0-23 months) breasted within 1 hour of birth		% children (6 – 23 months) initiated complementary feeding during 6-8 months		% children (12-23 months) received complementary immunization	
	NHBD	HBD	NHBD	HBD	NHBD	HBD	NHBD	HBD
SC	60	57	71	71	74	83	63	64
ST	75	63	62	70	86	84	78	64
Lowest WI	77	62	58	70	86	84	74	59
Highest WI	63	54	76	75	76	86	70	72
Illiterate	66	62	66	68	80	83	64	60
HS & above	71	54	81	80	85	89	79	85
Boys	65	57	67	71	78	84	68	66
Girls	65	59	75	71	81	85	72	66
Over all NBSL	65	58	71	71	79	85	70	66

Source: Department of Child and Women Development, Government of Odisha

Thus, it is found that nutritional status of children in Odisha is increasing but the rate of improvement is not satisfactory. In spite of so many multi sectoral intervention programme a big percentage of children are found under-nourished, under-weight, stunted, wasted. So far as the nutrition status of

women is concerned, a good number of women and adolescent girls in HBD and NHBD are found anemic. Again it is also revealed that a large number of households in HBD and NHBD are not using iodized salt. Regarding nutrition practice of women it is found that large number of women do not have breast feeding of their children for first six month . And breast feeding in one hour of birth which is highly recommended on nutrition ground is also not practiced sincerely in Odisha. Initiating the complimentary feeding and receiving complimentary immunization in time are also matters of concerned in the state.

Status of heath and sanitation in the state of Odisha

After adequacy of food and nutrition status of children & women, health & sanitation is considered as the third important pillar of food and nutrition security programme. With an objective to analyse the status of these indicators of FNS in Odisha data related to the average MPCE on medical and education, government expenditure in different sectors, coverage of safe water supply, achievement in hygienic provision are collected and presented in tables below.

Average MPCE on medical and education in the state of Odisha

One of the important indicators of nutrition security is understanding the importance of heath which largely depend on the education status of the people. Keeping this in view data related to average MPCE on medical and education are collected and presented in Table 10. It is found that average MPCE on education is very less in rural Odisha in comparison to urban Odisha. Average MPCE on education in Odisha is also found lesser than that of average MPCE of India in both rural and urban area. Again it is found that average MPCE on medical (institutional) in rural Odisha is less in comparison to urban Odisha. Average MPCE of Odisha on education is also relatively less in comparison to Indian average in both rural and urban area. It is observed that average MPCE on medical (non-institutional) is much higher than average MPCE on medical (institutional) in urban area in comparison to rural area in Odisha and average MPCE on medical (non-institutional) of India in both rural and urban area is also found to be higher in comparison to rural and urban of Odisha too .

Table 10 - Average MPCE on medical and education in the state of Odisha

Particulars	Odisha (NSS 64th)		India (NSS 64th)		Odisha (NSS 65th)		India (NSS 65th)	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Education	11.87	129.62	28.53	104.83	22.25	110.21	50.69	193.09
Medical (Institutional)	5.48	13.73	13.75	19.4	15.09	24.76	30.31	51.60
Medical (Non-Institutional)	26.33	46.58	34.92	56.87	44.52	100.04	64.52	98.85

Source: Directorate of Economics and Statistics, Government of Odisha

Government expenditure on different sectors in the state of Odisha

With an objective to know government initiatives to increase the education, health and sanitation status in the state data related to government expenditure on general education, medical & public

health and water supply & sanitation are collected and presented in Table 11 . It is observed that government expenditure on general education has increased from 16.63 percent in the year 2005-2006 to 17.98 percent in 2014-15 .Expenditure on medical & public health has decreased from 0.12 percent in 2005-06 to 0.03 percent in 2014-15 .Similarly expenditure by government on water supply & sanitation has also reduced from 2.3 percent in 2005-06 to 1.65 percent in 2014-15.

Table 11 - Government expenditure on different sectors (%) in the state of Odisha

Year	General Education	Medical & public health	Water supply & sanitation
2005-06	16.63	0.12	2.3
2006-07	15.24	0.1	1.63
2007-08	17.89	0.1	2
2008-09	20.07	0.1	1.27
2009-10	21.4	0.08	1.37
2010-11	21.38	0.07	1.74
2011-12	19.18	0.06	1.62
2012-13	18.44	0.05	1.56
2013-14	17.68	0.04	1.58
2014-15	17.98	0.03	1.65

Source: Directorate of Economics and Statistics, Government of Odisha

Status of safe water provision in the state of Odisha

One of the important indicators of sanitation status is availability of safe drinking water. It is revealed from Table 12 that as on 2014 only 67.27 percent of SC dominated , 64.26 percent of ST dominated and 64.43 percent of other habitations are covered under safe water provision in Odisha. If only pipe water supply and provision of tube well will be considered it is found that 23.76 percent and 40.95 percent of Odisha are covered under PWS and tube well respectively.

Table 12 - Status of safe water provision in the state of Odisha(As on 2014)

Particular	Achievement(%)
SC dominated habitation covered	67.27
ST dominated habitation covered	64.27
Other habitation covered	64.43
Covered under PWS	23.76
Covered under tube well	40.95

Source: Directorate of Economics and Statistics, Government of Odisha

Status of hygienic provision in the state of Odisha

Status of hygienic provision in term of achieving the target in providing facility of latrine and toilet in the state of Odisha is presented in the Table 13. It is found that as on 2012-13 only 55.97 percent of targeted individual households have been provided latrine facility,14.54 percent achievement is made in providing sanitation coplexes,99.51 percent of schools and 98.89 percent of anganwadi centers are covered under the provision of toilet .

Table 13 - Status of hygienic provision in the state of Odisha

Achievement up to	Individual household latrine	Sanitation complex	School toilet	Anganwadi toilet
Target	7056648	818	70663	25160
2001-02	0.18	0	0.002	0
2002-03	0.72	0	2.01	0
2003-04	3.95	0.12	7.82	0
2004-05	8.39	0.12	10.34	0.099
2005-06	12.62	1.10	13.69	3.48
2006-07	18.14	1.34	24.24	24.18
2007-08	24.89	1.58	46.48	41.98
2008-09	29.48	2.20	70.07	56.76
2009-10	37.12	5.86	90.26	76.10
2010-11	49.21	8.06	95.09	81.90
2011-12	5.44	13.56	97.91	95.09
2012-13	55.97	14.54	99.51	98.89

Source: Directorate of Economics and Statistics, Government of Odisha

Thus, it is observed that a very small size of monthly consumption expenditure is spent for education and medical purposes in the state of Odisha . Size of expenditure towards medical (non-institutional) is found to be more in comparison to size of expenditure toward medical (institutional) in both rural and urban area. Percentage of government expenditure towards health, education and sanitation is also found to be declining over the years in the state . Coverage of supplying safe drinking water and hygienic provision in terms of latrine & toilet is a matter of concern.

Conclusion

Food and nutrition security is an essential and integral part of development process. Although growth in income is considered as basic essential for increasing nutrition standard, it is proved to be insufficient in reducing hunger and malnutrition . After seven decades of planning era with so many programmes, food and nutrition status in India is a matter of concern and situation of Odisha is also equally grave. Odisha is lagging behind in all the three internationally accepted dimensions of food and nutrition security i.e. adequacy of food, adequacy of care for children & women and adequacy of health & sanitation. So far as the adequacy of food in Odisha is concerned, it is found that availability of food, in a few crops has increased over last few years but rapid increase in the prices of essential goods along with prevalence of poverty has affected the accessibility of food . Besides, it is also found that monthly per capita consumer expenditure towards non-food items is increasing in comparison to food items. Regarding nutrition status of children, it is revealed that undernourishment, stunting, wasting is still an issue of concern and number of anemic women & adolescence girl is also found to be higher in the state of Odisha too. Again a large number of households are found using non-iodized salt but a quite good number of mothers were found to have delivered their children in safe and healthy environment in the state. Although nutrition practice adopted by mothers has

increased, a large number of them are not following the prescribed practice of nutrition. Regarding the status of health and sanitation, it is found that government expenditure towards health, education and sanitation in Odisha is reducing over the years. Although average MPCE towards education and health is increasing, expenditure towards health (institutional) is reducing. Status of coverage of safe water supply is at an improved state whereas hygienic provision falls short of achieving the target.

Policy implication

- The most important intervention that is needed is to stabilize the production of different crops and price of different essential commodities along with change in composition of food baskets understanding its nutrition value in state of Odisha.
- Proper monitoring system of existing nutrition programmes and introduction of area specific & problem specific target oriented revamped / new programmes along with mass nutrition literacy programme may be introduced in the state of Odisha.
- Steps may be taken to allocate more funds towards health, education, sanitation sector and time bound implementation/ completion of existing programmes must be ascertained.

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An Assessment of Nutritional Status and Food Pattern of Children: A Case Study in Puri and Jagatsinghpur Districts of Odisha

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The present paper makes an attempt to examine the nutritional status and food pattern of school going children (6 – 14 years age-group) with different social groups and different income levels of their families in the two districts of the state of Odisha. A comparative study has been undertaken in one developed area under Pipili block in Puri district and one underdeveloped area under Balikuda block of Jagatsinghpur district. Malnutrition continues to be the wide spread problem in Odisha even though there has been significant improvements in food production and advancement in science and technology in the last sixty years. Not only that various poverty alleviation programmes had been implemented in the past to bring in overall economic improvements of the poor but also in recent years many nutrition related programmes like School Mid-day-Meal Programme (MDM); the Integrated Child Development Schemes (ICDS) including Supplementary Nutrition, Nutrition and Health Education, Health Care, Immunization and Child Care and Pre-School Education; National and State Old Age Programme (NOAP & SOAP); and Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) have been introduced in the state. This apart, other social security programmes as well as programmes which exclusively benefit women like ASHA KARMI under National Rural Health Mission are also being launched in the State. Malnutrition is therefore a very serious problem and a real challenge before the administration and the society at large.

Key words: Malnutrition, Nutritional Status, Food Pattern, BMI.

Introduction

Health is a prerequisite for human development and is an essential component for the well being of the mankind as a whole. Food is the main factor to energize the human body to perform various functions and lead to a healthy life. Food that we take daily contains various nutrients which are present in the form of chemical substances. Such nutrients include proteins, fat, carbohydrate, vitamins and minerals. The foods containing these nutrients are classified into cereals, pulses, nuts and oil seeds, vegetables, fruits and milk products and meat etc. These foods keep the body healthy and create immune power and sustain in work activities to generate income. The nutritional status of an individual is often the result of many inter-related factors. It is influenced by food intake, quantity, quality and physical health. There are two contrasting nutritional concerns faced by both developed

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and developing countries. First is the nutritional deficiency, known as undernourishment or under nutrition or malnutrition. Such type of malnutrition is caused by insufficient food supply or is the result of our body not getting enough of the nutrients it needs causing underweight in the body which could result in high mortality rate caused by infection. Children are more at risk for serious complications due to nutritional deficiencies than adults. Clearly, high levels of under nutrition and stunting, which make children susceptible to physical and mental disability as well as reduced productivity when they grow up, will affect economic growth and wipe out the country's 'demographic dividend'. According to some studies, such types of malnutrition are commonly found in African and South-East Asian countries and affect their GDP. The second type of concern is the excessive possession of nutrition in the diets which is known as "over nourishment" or excessive intake of food which causes obesity and other life style-related diseases like diabetes mellitus, hyperlipidemia and hypertension. Thus, the spectrum of nutritional status spreads from severe underweight (under nutrition) to obesity (over nutrition). These two extreme cases are the two dimensions of malnutrition.

Out of 186 countries India is the No.1 in underweight population and 5th in obesity in 2014 as revealed by a new study recently published in the Lancet. India with 102 million men and 101 million women underweight leads the world in being the home to over 40% of the global underweight population. China is a distant second with about 8% of underweight men and over 12% of underweight women and has come out as 1st rank in having obese population. While India and China continue to have the largest number of underweight people in the world, both the countries have also broken into the top five in terms of obesity. However, India has experienced a surge in obesity. It had 4 million obese men or 1.3% of the global obese population in 1975, but in 2014, it zoomed into the fifth position with 9.8 million obese men and third rank with 20 million obese women.

Politicians and businessmen often take pride in India being one of the world's few fast growing economies. A recent report from the international development charity, Water Aid, (2016) offers a grim reality check to this optimistic picture where it shows that, at 48 million, the country has the largest number of children under the age of five suffering from stunted growth. Despite accelerated growth in the last three decades the country continues to suffer from worse child malnutrition than virtually every Sub-Saharan African country with lower per capita income. India alone accounts for a third of the 159 million children under five, who suffer from stunted growth globally, and the country enjoys the dubious distinction of leading Nigeria and Pakistan, as rank 2nd and 3rd, respectively on this parameter. This malnourishment is primarily the result of poor sanitation and the lack of access to clean water and personal hygiene. India accounts for 60% of open defecation in the world which has a direct impact on child health.

The Economist magazine, has stated in an article in its 23 September 2010 edition, "Nearly half of India's small children are malnourished: one of the highest rates of underweight children in the world, higher than most countries in sub-Saharan Africa. More than one-third of the world's 150m malnourished under-fives live in India." In January 2011, the then Prime Minister Manmohan Singh went on to lament, "The problem of malnutrition is a matter of national shame", while releasing the much publicized Hunger and Malnutrition (HUNGAMA) Report. ICDS, the biggest social programme in the

world, has nevertheless not been able to address maternal and child malnutrition in the 41 years of its existence, though there are improvements. At this backdrop, India needs steps for preventive and managing malnutrition for preventing these two contrasting nutritional concerns

The Study Area and the Methodology

In Odisha, the nutritional status of the children gives an alarming picture. A recent official statement of the government has revealed that many children, a large section of them from the tribal belt, are malnourished. According to this report there are at least 8.39 lakh children (22.17%), who are malnourished or extremely malnourished. The rate of malnourishment is very high among children in undivided Koraput region, a tribal dominated area. Maximum 36.27% children (28,744) are malnourished in Malkangiri district followed by 35.78% children (53,563) in Koraput. The rate was 35.25% (49,281) and 33.36% (32,536) in Nabarangapur and Rayagada districts respectively. In continuation of the story of child death in Kasipur block of Rayagada district 15 years ago where 24 people had died after eating mango kernel, recently, the state government has admitted that 22 tribal children have died because of malnutrition at Nagada village in Jajpur district. Such death has occurred mainly because women there do not have any idea about family planning and give birth to too many children even when they are under age. Secondly, the inaccessible nature of the terrain has been the main hindrance for the villagers to avail any medical services and also to access other benefits as provided to others living in plains.

Against this backdrop, a cross-sectional study has been undertaken to examine anthropometric profile and nutritional status of 418 number of sample children aged between 6-14 years of age with different social groups in the sample households in Pipili block of Puri and Balikuda block Jagatsinghpur districts of Odisha chosen on a random method. In the study we have listed the household first and used Tippets table and have selected every fifth household. This Study is based on the anthropometric measurement, body mass index (BMI), including height, weight, and age. It adopted various methods like in- depth interviews, observation and focused group discussion. The study adopts a purposive random sampling method by which the sample block and the sample villages are being selected. Besides, the income, education, food pattern, calorie intake and BMI status of the children have been taken into consideration which are critically important for assessing health aspect of the children and in turn all the people.

Nutritional status is evaluated using internationally accepted World Health Organization (WHO) BMI guidelines. Body mass index (BMI), is computed using the following standard equations: $BMI (kg/m^2) = Weight (kg) / height (m^2)$. The following cut-off points are used: Under Nutrition: $BMI < 18.5$, Normal: $18.5 \leq BMI < 25.0$, over weight: $BMI \geq 25.0$. Means and standard deviations of all anthropometric variables and indices were computed. Standard Deviation, mean have been utilized to compute differences in nutritional status.

Objectives

The aims and objectives of the study are framed as

1. To determine the nutritional status of children with the BMI status

2. To examine whether there exists any difference in the nutritional status of children due to the level of income of their family.
3. To examine whether there exists any difference in the health and nutritional status of children due to the social categories.
4. Further, it aims at examining the interrelationship among the food habits and calorie intake of the children in the study area.

Analysis and Findings

To examine and analyze the current health and nutritional status people of the state, data related to various indicators have been collected from secondary sources which are presented in table -1 below.

Table 1 - Health Care Indicators of State

Primary Indicators	Orissa
Infant Mortality Rate	71
Maternal Mortality Rate	303
Neo-natal Mortality Rate	44
Under 5 Mortality Rate	87
Total Fertility Rate	2.4
Contraceptive Prevalence Rate	49.0
Marriage and Fertility	
Percentage of girl's marrying before completing 18 years	37.5
Percentage of Births of Order 3 and above	20.4
Sex Ratio at birth	110
Percentage of children age 20-24 reporting birth of order 2 & above	51.0
Percentage of births to children during age 15-19 out of total births	11.0
Maternal Health	
Mothers registered in the first trimester when they were pregnant with last live birth/still birth (%)	57.7
Mothers who had at least 3 ANC visits during the last pregnancy (%)	66.0
Mothers who got at least one TT injection when they were pregnant with their last live birth / still birth (%)	99.0
Institutional births (%)	43.0
Delivery at home & other places assisted by a doctor/nurse /LHV/ANM (%)	54.6
Mothers who received PNC within 48 hours of delivery of their last child (%)	93.5

Source: DLHS (District Level Household & Facility Survey)-3, 2008

An analysis of health indicators in the State suggests that 37.5 % girls marry before completing 18 age, 20.4 % have 3 and above birth order and 10 % children are not taking TT injection when they were pregnant with their last live birth / still birth which indicates the low health awareness and leads to ill health and low nutritional status.

An analysis of data regarding health and nutrition status in the study area is given in the following tables. The social group-wise distribution of households and sample children in the sample villages are presented in table-2.

Table 2 - Social Group-wise Distribution of HHs and Sample Children in the Sample Villages

Dist	Village	No of HHs	Total Population	6-14 year children	Sample Children	SC	OBC	General
Jagatsinghpur	Marichipur	414	1734	60	30	10	10	10
	Dhanuhar	508	2419	70	35	10	20	5
	Ichhapur	116	536	69	35	10	15	10
	Balikuda Total	1038	4689	218	100	30	45	25
Puri	Birapurusotampur No.1	102	481	70	35	8	12	15
	Birapurusottampur DU-2	109	494	60	30	8	12	10
	Purohitapur	127	566	70	35	10	15	10
	Pipili Total	338	1541	200	100	26	39	35
All Total		1376	6230	418	200	56	84	60

Source: Primary Data from Field survey

The above data reveal that out of total 6230 population, from Pipili block of Puri district, 200 children (6-14 years) have been selected for the study. On the other hand, out of total 4689 population, from Balikuda block of Jagatsinghpur district 218 children (6-14 years) have been selected for the study. All the sample children were canvassed with the well designed questionnaire and were taken their height with measuring tape and weight with weigh machine and analyzed for the research purpose.

An analysis of occupational pattern of sample households suggests that out of total 122 households in Jagatsinghpur district, 36.89% of households are engaged in Agricultural activities, 24.59% engaged in Agricultural labour, 16.39% engaged in Non-Agricultural labour, 13.11% of people are engaged in Business, 12.30% engaged in service.

In Puri district, 38.82% of households are engaged in Agricultural activities, 15.29% engaged in Agricultural labour, 18.82% engaged in Non-Agricultural labour, 15.29% engaged in Business, 12.94% engaged in service. An analysis of data on income level suggests that in Jagatsinghpur district 94.27% households are under below poverty line (BPL). It reveals that the children counterparts have no such income to afford for proper diet, so the mal nutrition has become major problems in the study area. In Puri district, 85.89% households are under below poverty line (BPL), which indicates that the children in Puri district are getting more food than the children in Jagatsinghpur district.

To gather knowledge of nutritional status of Children and their consequences due to nutritional deficiencies and expenditure incurred have been collected and estimated in table-3. The study documented the occurrence of diseases during the previous year of the collection of data. The data in this respect were collected in different seasons.

Table 3 - Profile of Ailments of Children

District	Village	Total Children	Not attended any PHI	Fever	Cold	Cough	Any critical Disease	Total Children Affected
Jagatsinghpur	1	2	3	6	7	10		11
	Maricipur	30	3	10	11	5	1	10
		%	10.00	33.33	36.67	16.67	3.33	33.33
	Dhanuhar	35	4	10	13	8	0	12
		%	11.43	28.57	37.14	22.86	0.00	34.29
	Ichhapur	35	5	10	16	3	1	8
%		14.29	28.57	45.71	8.57	2.86	22.86	
Total	100	12	30	40	16	2	30	
	%	12.00	30.00	40.00	16.00	2.00	30.00	
Puri	Birapurusotampur No.1	35	5	10	9	11	0	5
		%	14.29	28.57	25.71	31.43	0.00	14.29
	Birapurusottampur Dhakina Uttar No-2	30	3	13	8	6	0	4
		%	10.00	43.33	26.67	20.00	0.00	13.33
	Purohitapur	35	2	15	7	11	0	6
		%	5.71	42.86	20.00	31.43	0.00	17.14
Total	100	10	38	24	28	0	15	
	%	10.00	38.00	24.00	28.00	0.00	15.00	

Source: Field survey

N.B.-Figures in Parentheses represent percentage to the respective totals

A cross examination of the data provided in table-3 indicates that out of the total sample children in jagatsinghpur district, about 12 per cent has responded that they had not attended any public health institutions for treatment. In other words one can say that they have not suffered from any serious diseases during the year 2015. Out of the rest sample, 30% children have suffered from various types of fevers, 40% suffered from cold, 16% suffered from cough and 2% suffered from critical diseases. In Puri districts, 10% children not attended in any medical as they were in good health condition. Out of rest, 38% suffered in fever, 24% suffered in cold, 28% suffered in cough and no critical diseases found in this district.

It also reveals that about 30 per cent Children had suffered from various health ailments due to severe anemic (bloodlessness) conditions which is followed by skin diseases (12%) basically the unhygienic condition in Jagatsinghpur district. In comparison, 15 per cent Children had suffered from various health ailments due to severe anemic (bloodlessness) conditions. To add to this analysis, their average expenditures incurred to cure their illness during the last year were also estimated. To make a simplified explanation the categories of expenditures are being restricted to two only, viz., modern and traditional methods.

Nutritional Status Of The Sample Children

A critical examination of various aspects on nutritional status of children in the study area and their parent's perception about a perfect health, causes of the health ailments, expenditure on treatment, income, education, expenditure, food habit, calorie intake and BMI suggest that the health profile of the Pipili block of Puri district is found to be comparatively higher than Balikuda block of Jagatsinghpur district. Low health profile of children in Jagatsinghpur district is characterized by the additional fact of a high birth rate of low birth weight babies and lack of basic post-natal care for the newborns. In addition to these, lack of access to adequate nutrition and safe drinking water mostly in the rural and backward areas are other underlying factors which contribute to the lower health status of the people. In spite of the backwardness of the block, Balikuda contributes a few numbers of deaths in TB and Malaria. Public health care facilities in Balikuda block comprise of 21 functioning Sub-Centre, 1 PHC & 1 PHC (N) which cater to the health needs of the people who reside in a scattered area of the block.. There is under utilization of existing public health infrastructure facilities due to a combination of reasons. It has been observed that some regions suffer disproportionately in terms of lower access to health services due to the lack of availability of staff, especially the services of health specialists.

The average BMI of the total number of children in each age group was estimated and provided in table-4 for further analysis. To obtain a clear comparative picture of the Body mass Index (BMI) of those children has been prepared and given below for further analysis.

Table 4 - Age-wise average BMI Status of children 6-14

Village	6	7	8	9	10	11	12	13	14
<i>Puri (Pipili Block)</i>									
Birapurusotampur No.1	24.2	24.8	23.7	18.5	16.2	17.8	17.9	18.2	18.3
Birapurusottampur DU-2	23.6	23.5	22.4	17.4	16.1	18.4	18.5	18.4	18.5
Purohitapur	23.4	23.6	19.5	17.4	16.8	18.6	17.6	18.2	18.5
Average	23.18	23.4	21.1	17.7	16.16	18.25	18.3	18.26	18.4
<i>Jagatsinghpur(Balikuda Block)</i>									
Marichipur	22.4	22.5	20.7	17.2	15.6	18.8	18.9	19.3	15.5
Dhanuhar	19.7	18.9	17.7	17.3	15.5	18.3	18.7	19.2	19.4
Ichhapur	18.2	18.4	17.6	16.5	15.6	18.2	17.8	18.6	18.8
Average	19.6	19.42	18.35	16.95	15.5	18.35	18.5	19	17.9

Source: Field survey

It is revealed from above table that the normal BMI status of children in Puri district is 23.18, 23.4 and 21.1 in the age of children 6,7 and 8, respectively. The BMI status of under nutrition children is 17.7, 16.6 and 18.25 in the age of children 8,9 and 10 respectively as per WHO guideline. Compared to Jagatsinghpur district, the BMI status children in Puri district, the normal BMI status of the children is 19.6 and 19.42 in the age group 6 and 7 respectively. It indicates that higher age groups of children are in under nutrition than lower age groups. In other words, the children in Puri district have more BMI than children of Jagatsinghpur district. Due to the responsibility to foster and nurture their child, they ignore to their own health status, which leads mal nutrition.

To understand BMI status, mean and Standard Deviation of age, height and weight of each child has been measured and depicted in table-5.

Table 5 - Age-wise & social group-wise average BMI Status of children 6-14

Village/ Age →	6	7	8	9	10	11	12	13	14
<i>Puri (Pipili Block)</i>									
SC	22.5	22.4	21.5	17.5	16.2	17.8	17.9	18.2	18.3
OBC	23.4	23.5	20.4	17.8	15.9	18.4	18.8	18.4	18.5
GENERAL	23.6	24.3	21.3	17.8	16.4	18.6	17.6	18.2	18.5
Average	23.18	23.4	21.1	17.7	16.16	18.25	18.3	18.26	18.4
<i>Jagatsinghpur (Balikuda Block)</i>									
SC	22.4	22.5	20.7	17.2	15.6	18.8	18.9	19.3	15.5
OBC	19.7	18.9	17.7	17.3	15.5	18.3	18.7	19.2	19.4
GENERAL	18.2	18.4	17.6	16.5	15.6	18.2	17.8	18.6	18.8
Average	19.6	19.42	18.35	16.95	15.5	18.35	18.5	19	17.9

Source: Field survey

It is revealed that BMI status is decreasing with the increase of age group in both sample districts. In comparison to Jagatsinghpur district, BMI status of children in Puri district is comparatively higher.

Table 6 - Mean & Standard deviation of age, Height & Weight of Sample Children

Variable	JAGATSINGHPUR		PURI	
	Mean	SD	Mean	SD
Age(Years)	10.2	9.96	11.4	8.45
Height(cm)	114	4.56	118	4.31
Weight(kg)	21.9	2.93	25.6	2.1
BMI(kg/m ²)	16.85	3.84	18.38	3.24

Source: Field survey

The study reveals that the average age, height, weight and BMI are higher in Puri district in comparison to Jagatsinghpur district. It indicates that low age with low height and weight result under nutrition (< 18.5) as per WHO guide line. From the point of standard deviation, the data shows very low performance. Thus, it can be inferred that the effect of socio-economic developmental factors takes some time to put some positive impact on the health and nutritional status of the children. It indicates

the fact that higher nutritional status is positively correlated with the level of education. It indicates the fact that higher nutritional status is positively correlated with the level of development, which can mainly be ascribed to higher education and awareness of the children.

Furthermore, to examine how the literacy level of children influences the nutritional status, the BMI data of the children have been computed taking into consideration of the literacy level (literate/illiterate). Those computed data are presented in table-7

Table 7 - Social group-wise BMI Status of the children

Social Group	No. of Children	Puri		Jagatsinghpur	
		No.	BMI	No.	BMI
General	65	35	20.6	30	17.4
OBC	65	30	17.8	35	16.8
SC	70	35	16.75	35	16.2
Total/ Average	200	100	18.38	100	16.8

Source: Field survey

N.B.-Figures in Parentheses represent percentage to the respective totals

A close look at the above table reveals that the general children have more BMI status than the SC and OBC children. The distinction between social groups of children is that lower caste children have lower awareness regarding health.

A comparative analyses of the Body Mass Index(BMI) of the social group of Children reveals that the fact that higher caste has put some impact on the nutritional status of sample children but the analysis indicates that the health and nutritional status of the children are more influenced by the increase in age, which indicates that increase in general level of awareness (along with the increase in age) combined with high awareness contributes to a greater degree towards the health aspect of the Children. Hence, there is significant difference in the health and nutritional status of the children due to the level of social status of the children, i.e., higher and lower caste is accepted which means it has got some impact on the children but it should be associated with a specific awareness programmes to be initiated by the Government and other concerned agencies.

The BMI has been calculated and the average BMI are computed for a comparative scrutiny. All those figures are provided in table-8 below.

Table 8 - Income group-wise BMI Status of children

Poverty Line	Puri		Jagatsinghpur	
	No.	BMI	No.	BMI
BPL	115(94.26)	18.4	73(85.88)	18.2
APL	7(5.74)	23.5	12(14.12)	22.4
Total/ Average	122(100.00)	18.57	85(100.00)	18.4

Source:Primary Data from Field survey

Figures in Parentheses represent percentage. An examination of the above table indicates that most of the Children families are living below the poverty line in sample villages. The BMI figures presented in the table indicate the average BMI computed for the number of children. The BMI status of children in Puri district is higher than Jagatsinghpur district.

All the above analyses (with the help of the mean Body Mass Index (BMI) of Children prove some important points which has been proved by data analysis is that it influenced by the socio-economic developmental factors as the BMI status of the children. In this study, as we consider those villages which are within a radius of 4-5 kms from the Block headquarter or a big town, so the developmental factors include, a) better and modern treatment/health facilities for the children b) better arrangement of various awareness programmes on health and nutritional status of the people and more particularly of the children c) Association of the people and the children with people of other caste and creed who are more advanced etc. Though, it has been found out that in certain cases the BMI status of the literate and illiterate children does not reflect a particularly higher status in our sample children (as it is commonly expected) but the fact that recurrence of a higher BMI in tune with the increase in age of children in case of socially advanced children reflects that along with the increase in awareness level which plays some interactive role. All these factors taken together prove that there exists a joint/interactive impact of the variables like nature of locality; 'literacy level' or level of education of the children 'income level of their family' etc on the health and the nutritional status of the Children. Thus, all the analyses with the help of the Body Mass index (BMI) made above indicate the factor which really influences the health and nutritional status of the Children within the age group of 6-14 years.

The data regarding the daily food intake of each child was collected. All care was taken to scrutinize and cross check that information. The various types of food were weighed, using simpler and standard techniques. As it was also discussed earlier that the Recall Methods have been used as they are less reactive. Twenty-four hour recalls, in which the previous day's intake is queried in detail (for instance, foods, amounts of food, preparation techniques, and condiments) are easiest for individuals to complete. The data reported are converted from foods such as cereals and pulses etc. Also, to accommodate the seasonal and other variations the food composition and the dietary intake of the children for thirty days, which was divided into various sub-groups in accordance with different types of food calendar, were studied followed by the children. These multiple recalls can be thought of as sampling from an individual's ongoing food behavior. All those data collected were computed and tabulated for the analyses and compared with the Recommended Dietary Allowances (RDA) developed by the ICMR for a healthy woman within the age group of 6 to 14 years. The children of Puri district are taking rice, roti, milk whereas the children of Jagatsinghpur district taking waters rice, vegetables and fish.

The data in relation to these diets were assessed and the mean food intake of various categories of the children are weighed and presented as the 'Observed Intake' in the following tables and compared with the RDA. The corresponding figures are presented in table -9 below.

Table 9- Mean Food Intake

Sl. No	Food Stuffs	RDA	Puri		Jagatsinghpur	
			Observed Intake	% Deficit (-) %Surplus(+)	Observed Intake	% Deficit (-) %Surplus(+)
1	Cereals	150-200	170	(-)2.85	168	(-)4.00
2	Pulses	40-50	42	(-)6.67	40.5	(-)10.00
3	Vegetables	30-50	31	(-)22.50	28	(-)30.00
4	Leafy Veg.	50	40	(-)20.00	41	(-)18.00
5	Oil &Fats	200	74	(-)37.00	74	(-)37.00
6	Flesh Foods	30-40	28	(-)37.78	22	(-)51.11
7	Fruits	20-25	18	(-)20.00	16	(-)28.89

Source: Field survey

As observed from the above table that the observed mean food intake shows a negative trait in comparison to the RDA, which indicates a lower amount of food intake by the Children. An examination of the comparative figures reveals that the boys are consuming about 385 less flesh foods than the RDA, followed by Oils & fats (37%), Roots and Tubers (33.33%), Vegetables (22.50%), Fruits (20%). On the other hand, though less than RDA in comparison to other food stuffs the Children consume more cereals and pulses than other food stuffs. Similarly, the Children girls also consume food stuffs lesser than the RDA. As reported and computed by us the girls consume about 51% less flesh foods followed by oils and fats (37.375), Vegetables (30%) and Fruits (28.89%). Though, the girls consume more cereals and pulses but it also falls short of the RDA (4% for cereals and 10% for pulses) as shown in table-10.

Table 10 - Calorie Intake of Sample Children (Puri & Jagatsinghpur)

Sl. No	FOOD STUFS	Food Intake	Calorie	Protein	Carbo-hydrate	Fat	Carotin	Vit-C	Calcium	Iron
1	Rice	172	595.12	11.01	135.88	0.69	0.00	0.00	15.48	1.72
2	Kolath	5	16.05	1.10	2.86	0.03	3.55	0.05	14.35	0.00
	Mung	5	17.40	1.23	0.08	0.06	2.45	0	14.35	0.34
	Harada	23	78.89	5.77	13.57	0.16	62.1	0	15.87	1.74
	Biri	5	17.35	1.20	2.98	0.07	1.9	0	7.70	7.00
3	Pumpkin	7	1.75	0.10	0.32	0.01	3.5	0.14	0.70	0.03
	Patato	10	9.70	0.16	2.26	0.01	2.4	1.7	1.00	0.05
	Brinjal	5	1.20	0.07	0.20	0.02	3.7	0.6	18.00	0.02
	Tamato	3	0.69	0.06	0.11	0.00	5.76	0.93	0.60	0.05
5	Kosala	14	6.30	0.56	0.854	0.07	35.7	1.4	55.58	0.49
	Other*	26	7.80	0.96	0.754	0.104	452.4	9.1	39	1.1
4	Khamba Alu	8	9.60	0.10	2.256	0.024	0.48	1.92	3.68	0.02
	Mushroom	10	4.30	0.31	0.43	0.08	0	0	0.6	0.15
6	Tola seed	50	360.50	16.73	11.97	27.3	0	0	210	39.69

Sl. No	FOOD STUFS	Food Intake	Calorie	Protein	Carbo-hydrate	Fat	Caroti n	Vit-C	Calcium	Irone
7	Chicken	5	8.65	0.67	0	0.665	30	0	3	0.10
	Mutton	10	11.80	2.14	0	0.36	0	0	1.2	0
	Pig	10	15.00	1.93	0.13	0.75	0	0	1	0.63
8	Mango	4	2.96	0.02	0.676	0.016	109.72	0.64	0.56	0.05
	Tamarind	10	11.50	0.58	1.82	0.21	25	0.3	10.1	0.03
	Amla	2	1.16	0.01	0.274	0.002	0.18	12	1	0.02
			1177.72	44.70	177.43	30.62	738.84	28.78	413.77	53.23

Source: Field survey

It is observed from the above table that calorie intake by children in sample area is 1177.72 which is less than 2400 calorie (For BPL standard). The result shows that under nutrition among the children due to low calorie intake.

Conclusion

The study reveals that the children in Puri and Jagatsinghpur districts are under severe nutritional stress. But compared to the sample children of Puri district, the nutritional status of sample children in Jagatsinghpur district is found to be worse off. However, the analysis clearly indicates that the children belonging to SC and OBC communities are more vulnerable than general caste belonging children as the general households are more health conscious than other two social groups in Balikuda block of Jagatsinghpur district. In Pipili block of Puri district, general caste children are more nutritive than the children belonging to SC and OBC categories. Therefore, it is imperative that immediate nutritional intervention programmes are initiated among this population. Such programmes would be beneficial in not only reducing the rates of malnutrition, but also its associated maladies of morbidity and mortality. Efforts to reduce under nutrition depend on reducing poverty and raising people's living standards by improving the quality of homes and by increasing access to clean drinking water and adequate sanitation. Such interventions have positive impacts on health, and implementing these also goes some way towards fulfilling people's basic human rights. The time has come to take a hard look at ICDS. Therefore it is suggested that the capacity building of front line workers like anganwadi workers, Ashas, ANMs, Supervisors, CDPOs be enhanced. The collaboration of NGOs and Corporate Sectors be ensured to bring their expertise in areas of management and accountability. The programmes like school mid-day meals and ICDS should not be abandoned but it imperative to revisit, redesign and rebrand them. For the sake of those millions of Indian children who deserve a better future and who are now miserable, should not be allowed to die on getting a bout of diarrhoea or pneumonia just because they did not get the right nutrition in the first two years of life.

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Initiatives on Eradication of Food Insecurity in Urban Odisha through Corporate Social Responsibility – Policy Matters!!

Digambar Chand¹ and Muralidhar Majhi²

Government of India and the State governments are making consistent efforts to make the development more inclusive and wide based. Promoting the uptake of CSR amongst SMEs requires approaches that fit the respective needs and capacities of these businesses, and do not adversely affect their economic viability. The pace seems to be not enough to match the growth. It gets evident from slow progress in the human and social development. For this the rapidly growing corporate sector may grow immensely. The Aahar scheme is being sponsored by Odisha Mining Corporation (OMC) in Cuttack and Bhubaneswar, Odisha Power Generation Corporation (OPGC) in Rourkela and Odisha Industrial Infrastructure Development Corporation (IDCO) in Sambalpur. Tata Steel is supporting the scheme in Berhampur. The present study aims at finding coping strategy of food insecurity and implementation of Aahar Yojna by Government of Odisha. The concept of coping strategies is used to mean any action aimed at obtaining food or income during times of stress, either through production or through formal and informal exchange and claims. Households use a number of coping strategies ranging from one or more principal coping strategies to various complementary strategies; switching between principal and complementary activities during chronic food shortage. A principal coping strategy is characterized by providing a main source of food and income for a household, substituting for farming which is relatively regular and reliable, while complementary coping strategies are opportunistic and often irregular, providing some food or income for shorter time periods. By using Simple Random Sampling and Test of Significance of Proportion the present study concludes with permanent solution of poverty eradication and food insecurity by Corporate Sector.

Key Words: Corporate Social Responsibility, Food insecurity, Coping Strategy, Urban poor

Odisha has historically witnessed higher incidence of poverty. The state witnesses wide regional, social and general disparities in development. All regions have not shared the gains of development in an equitable manner. 'A comprehensive poverty-reduction strategy should focus on not only growth enhancing but also inequality-reducing measures. Economic reforms have aligned wages according to an individual's ability, because ability is largely related to education levels, and with expanding market opportunities. It is expected that the more educated will enjoy higher income growth than the less educated. The effects of urban reforms can also be reflected in changes in expenditure patterns. The shares of expenditures on health care, education, and housing have

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increased dramatically, largely as a consequence of urban reforms. Education and healthcare provide individuals with better capabilities to cope with social costs of adjustment and to capitalize on new economic opportunities. Widespread access to basic education and healthcare might be one of the major reasons behind rapid reduction in China's poverty in the process of economic reforms. The changes in poverty are the net consequences of the positive effects of rapid economic growth and the adverse effects of worsening income distribution. Since economic growth has the largest impact on poverty reduction, the government should continue its reforms to enhance growth and augment employment. The near future will be a great challenge for the Chinese government to extend benefits of growth to all members of society, including the urban poor. In the long run, the government should also design policies to promote small business development to reduce the unemployment rate as a result of the collapse of the SOEs. (Zhang & Fan, 2002)

The changes in poverty are the net consequences of the positive effects of rapid economic growth and the adverse effects of worsening income distribution. Since economic growth has the largest impact on poverty reduction, the government should continue its reforms to enhance growth and augment employment. However, the gains of growth have not significantly trickled down to the poor. Future policies to reduce poverty should operate in tandem on a broader front with other broad-based development strategies such as reducing inequality and establishing safety nets. (Fang, 2002)

Challenges of Urban Poverty

With growing urbanisation urban poverty has become a gnawing reality. Lack of toilet facilities and potable water added to their health woes. In the absence of dedicated health care system for the urban poor, the infant mortality rate and maternal mortality rate have been decreased. So far India's policy planning focuses on wide spread of rural poverty, However, the issues of urban poverty has not been adequately addressed. Housing, water, sanitation, health, education, social security, livelihoods and the special needs of vulnerable groups such as women, children and the aging. They face a constant threat of eviction, removal, confiscation of goods and have virtually no social security cover. Some 54 percent of urban slums do not have toilets; public facilities are unusable due to a lack of maintenance.

Statement of the problem

Decision to migrate is mostly a choice – except in some compelling circumstances and needs to be examined in terms of economic outcomes. Rural exodus is backed by economic rationale and attempts to understand gains accruing to individuals from migrations in terms of poverty outcomes. It reveals that migrants, disadvantaged in terms of caste, education and residency, earn poor returns in migration. It has called for a shift in focus of policy to address poverty as demographic changes and intense migration have dampened poverty reduction rates in urban areas. Increasing migration has led to movement of poverty from rural to urban area. It is apparent that poverty is associated with stress, chronic strain, a low level of social support and problematic family relationship, low social network, low organisational involvement. The urban poor are exposed to unemployment, crime, victimisation and chronic strain during economic hardship. All these factors are acting and reacting upon one another and keep the poor lower self esteem, and their sense of control over life. Urban poverty in

India added a whole new breed of revolting aspects like diseases, violence (more than at the countryside), disintegration of communities and the social fabric. Organising slum communities, extending sewage systems and electricity to slum areas, and constructing public toilets that will be maintained by the community. Government of India and the State governments are making consistent efforts to make the development more inclusive and wide based. Promoting the uptake of CSR amongst SMEs requires approaches that fit the respective needs and capacities of these businesses, and do not adversely affect their economic viability in India. The pace seems to be not enough to match the growth. It gets evident from slow progress in the human and social development. For this the rapidly growing corporate sector may grow immensely. The Aahar scheme is being sponsored by Odisha Mining Corporation (OMC) in Cuttack and Bhubaneswar, Odisha Power Generation Corporation (OPGC) in Rourkela and Odisha Industrial Infrastructure Development Corporation (IDCO) in Sambalpur. Tata Steel is supporting the scheme in Berhampur.

Objectives of the Study

The present study aims at

1. Finding coping strategy of food insecurity and implementation of Aahar Yojna by Government of Odisha.
2. Policy matters concern with coping strategy of people in urban Odisha

Data Source & Methodology

Simple Random Sampling was used for choosing the city . Sambalpur City was selected for the research study. Primary data of 100 respondents were collected. Test of Significance of Proportion was used .

To achieve the very objective of the research the following hypotheses were developed and tested for drawing valid statistical inferences.

H_0 : There is no significant difference of proportion of views of respondents with regard to the statement

H_1 : There exists a significant difference of proportion of views of respondents with regard to the statement

$$Z = \frac{p - P}{\sqrt{(PQ/n)}} \sim N(0,1)$$

Where p = Sample proportion

P = Population proportion = 0.5

$Q = 1 - P = 0.5$

The Critical value of $Z_{0.05} = 1.96$ (Two tailed test)

If the calculated value of $|z|$ is greater than the critical value, the null hypothesis is rejected. Otherwise it may be accepted.

If the calculated value of $|z|$ is greater than the critical value, the null hypothesis is rejected. Otherwise it may be accepted.

Since the Z value is insignificant (at 0.05 level of significance) for the statements as mentioned, the null hypothesis may be accepted at 5% level of significance.

Discussion and Results :

There are four main components of urban growth, namely: (i) natural increase; (ii) net migration to urban areas; (iii) reclassification of settlements as towns or its declassification as a result of changes in the nature of economic activities and acquisition of urban characteristics; (iv) the extension of boundaries of cities and towns (Bhagat & Mohanty, 2009) (Bhagat, 2009) Countries with high initial poverty rates and poverty gaps, and high-income inequality are particularly vulnerable to food price increases in countries already equipped with effective targeting mechanisms, such as conditional cash transfers, the strategy that would produce faster results at lower costs would be to scale up such programs rather than designing tools to identify new poor (Dessus & Hoyos, 2008). (Dessus, 2008) Slowly people settled more permanently. The sex ratio in the town became more equal, partly because the workers' families also migrated to the town and because of natural population growth. Decisions to migrate, to take up a certain job, the allocation of labour within the family, are finally personal decisions, determined by personal considerations and perceptions of needs and possibilities, as well as external forces. (Haan, 1997)

Table 1: Test of Significance of Proportion

SL. No	Statement	P	q	Z	Remarks
1	Is Aahar Yojna necessary for Urban area?	0.01	0.47	0.6	Accept Ho
2	Is it a Yojna for creating vote bank?	0.02	0.4	2	Reject Ho
3	Do the beneficiaries save the subsidy amount for launch?	0.03	0.35	3	Reject Ho
4	Does it destroy work culture in urban area?	0.04	0.26	4.8	Reject Ho
5	Does the corporate sector come forward to eradicate food insecurity in urban area?	0.05	0.48	0.4	Accept Ho
6	Do you think "Feeding the beneficiaries is justified in urban area"?	0.06	0.29	4.2	Reject Ho
7	Do the beneficiaries need employment opportunities in corporate sector?	0.07	0.46	0.8	Accept Ho
8	Does Aahar Yojna help in developing work efficiency?	0.08	0.82	6.4	Reject Ho
9	Does it decrease the revenue collection of the state?	0.09	0.21	5.8	Reject Ho
10	Is it a permanent solution for eradicating food insecurity in urban area?	0.1	0.22	5.6	Reject Ho

Source: Primary data 2014-15

As cities grew, so did the slums, "welcoming" more rural migrants and creating more urban poverty in Odisha. Strong political will makes a difference, considering that other countries in the same

situation managed very well their transition despite a few controversies (e.g. China). As the poor need to survive in more expensive big cities, they technically have more money than rural residents but they also spend it all very quickly to feed themselves. In the above table one can observe that Null Hypothesis accepted in Statements No.1, 5 &7 at 5% level of significance. Further, Null Hypothesis rejected in Statements No. 2, 3,4,6,8,9 &10 at 5% level of significance .

Conclusion with suggestions:

The poorest of the poor are unfortunately often not organized into communities anymore. This lack of social fabric makes them all the more fragile to their environment and face many shocks (rise in food prices, not finding a job for a few days, etc) as they can't rely on anybody for temporary help. This means that public policies should pay extra attention to so-called poor organizations in so far as they may represent in fact special interests within the larger "poor community". Local governments act upon the lack of infrastructure and industries, the limited access to training and job-hunting support. The following points may be recommended.

- a) Importance may be given to access to training and job-hunting support
- b) Infrastructure and logistics may be given importance.
- c) Specific target group may be fixed for the sustainable development of right people through corporate social responsibility (CSR)
- d) The value of community-building and social harmony in reducing poverty may be add -on programme in social security scheme.

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Nutritional Security of Children and Food Security Programmes in Odisha: An Inter District Analysis

Sadhana Satapathy¹

Eradication of Malnourishment has since long become the goal in successive policy resolutions of all the countries in general and developing countries in particular. In fact, SDGs 2015-2030 aims to end all forms of malnutrition by 2025 including achieving internationally agreed targets on stunting and wasting in children less than 5 years of age.

Children under five are the most vulnerable to malnutrition. However, most of the welfare schemes are not children specific. In this context, children who are just below the international weight norm should also receive the most attention in any use of public money.

Nutritional status of children is of tremendous importance in the hunger prone state of Odisha. The NFSA is going to be implemented in the state. However, the BPL enumeration in Odisha has become controversial with inclusion of ineligible people as beneficiaries.

The present paper examines the status of nutrition of children across different districts of the state of Odisha and the lacunae of food intervention programmes implemented so far.

JEL Classification- 11, 13

Keywords: Government Policy, Health, Malnutrition

Introduction

The development of any country is reflected through various indicators such as education, employment and eradication of poverty. However, the basis of all these is the sheer survival of human beings which in turn depends on food. On the other hand, provision of food is not enough as nutrition i.e to absorb food is also equally important. There is an inter linkage among food, nutrition and health conditions which make a person able-bodied for further activities in life such as pursuing education and employment etc. In this respect, the nutritional security of a child up to five to six years is of utmost importance.

Nutritional improvement has since long become goals in successive policy resolutions of all the countries in general and developing countries in particular. In fact, the Sustainable development Goals (SDGs) 2015-2030 targets to end hunger and achieve food security in the form of ensuring

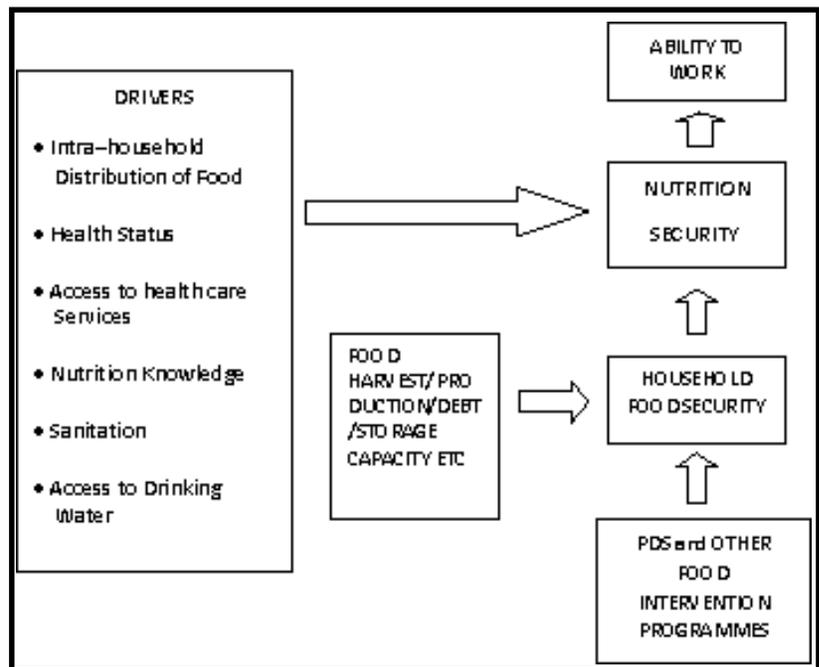
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access by all people including infants , to safe ,nutritious and sufficient food all year round(Goal no 2).The aim is to end all forms of malnutrition by 2025 including achieving of the internationally agreed targets on stunting and wasting in children under 5 years of age and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons-the vulnerable people.

Nutritional Status and Food Security: There was a time the policy makers were of the opinion that providing food at a subsidised price would take care of calories and therefore hunger and lift the standard of living. However, this has not happened so far. Food Security and nutritional security are interlinked. At the World Food Summit held at Rome in1996, food security was defined as “access by all people at all times to enough quantities of nutritionally adequate and safe food for an active and healthy life”. Food security includes at a minimum: (a) the ready availability of nutritionally adequate and safe food and an (b) assured ability to acquire acceptable food in socially acceptable ways. (Socially acceptable ways has also been defined as ways without resorting to emergency food supply, scavenging and stealing or other coping strategies.).

Figure 1 below shows one way of linking food security and nutritional status. Consumption and utilisation of sufficient and nutritionally adequate foods by the individuals lead to nutritional security. Similarly, access of households to sufficient and nutritionally adequate foods leads to household security which in turn leads to nutritional security. Among the factors influencing the consumption and utilisation of food, **access to health care facilities** and **access to water and sanitation** are quite important and can be treated as drivers of nutritional status(see Stuart,G , Wable,Gargi and others).

Figure -1 :



One out of every three deaths of children under five is the result of malnutrition. Upto 2-3% of GDP is lost to under nutrition (World Bank Report2006). Global Nutrition Report 2014-15 shows that nearly

every country has a serious health problem owing to malnutrition in one of its forms. Forty-five percent of all mortality of children under age 5 is linked to malnutrition (Black et al. 2013). India contains about 40 percent of the world's stunted children under the age of 5 and nearly 50 percent of the wasted children (UNICEF 2013). Thus, the focus should be narrowed down to malnutrition of children between zero to six years and food security. The question one may ask here is that are there sufficient schemes and if so, are they working?

Controversies in Measurement of Nutrition: The concept and measurement of nutrition adopted by India as well as other countries has been on the basis of WHO specifications since 2006. Malnutrition is measured on the basis of height and weight. Typically, the burden of child malnutrition is reported separately for wasting, stunting, underweight, and micronutrient deficiencies. However, children can experience multiple deficits concurrently (Khara and Dolan 2014; McDonald et al. 2013). Wasting means too thin for their height and stunting means too short for their age.

Recently, Panagariya's article (2014) suggested that WHO standards may not be appropriate to measure malnutrition in India stating that Indians are genetically predisposed to have smaller bodies compared to richer countries and also Sub Saharan Africa and hence can never catch up with any globally accepted reference for height and weight (read WHO). This opened a Pandora's box. The approach was criticised vehemently by others (Gargi Wable et al 2014) justifying the relevance of WHO standards. Secondly, NFHS and NNMB surveys (the latter is based on scientific methods such as serum test) also find gross level of under nutrition among Indian women and children which justifies adoption of WHO standard of measuring malnutrition..

Moreover, Gillespie (2014) emphasises that nutritional status of an individual is driven by various interacting forces and processes. At an immediate level, an individual's dietary intake interacting with his/her health status is paramount, but these variables are themselves determined by underlying household and community level drivers (including food security, health services access, water and sanitation and child caring capacity and practices etc)(Gillespie).

Similarly, Coffey et al (2014) argue that disease environment is also as important as nutrition/malnutrition. Food is obviously important and so is the disease. Disease and food interact in key ways. For example intestinal infection, mainly caused by open defecation, is likely to have a greater effect on height (**stunting**) than mortality. In India, population density being high, open defecations often happen near where children live. The Food-Disease environment explanation, though a relatively newer concept has already been emphasised by quite a few studies (Spears, 2013, Checkley et al 2008 and others, cited in Coffey's article). Thus taking the above factors into account, the present paper relies on WHO data provided by various government sources for the analysis of nutritional status.

The preliminary data suggest that India has accelerated its progress on stunting, wasting, and exclusive breastfeeding compared with earlier figure. Stunting had fallen from 48 percent in 2005–2006 to 39 percent in 2014.⁹ As the *Global Nutrition Report 2014* noted, this reflects almost a doubling of the rate of decline compared with the period 1999–2006. Stunting declined in every state, with the magnitude of the declines fairly even across most states. 65% of infant and neo-natal mortality rate in India and over 46% children under five years in Odisha are malnourished. Chronic poverty is rampant in a broad majority of Odisha's population.

Coming to **Odisha**, chronic poverty is rampant in a broad majority of Odisha's population. In the BPL survey in 2002, 76,84,371 households in Odisha were found below the poverty level. An overwhelming majority of the Adivasis, Dalits and large majority of rural labourers, small and marginal farmers, suffer from chronic poverty and malnutrition. Eight districts of Odisha- Bargarh, Dhenkanal, Nayagarh, Khordha, Puri, Kandhamal, Balangir Rayagada- are in the top hundred districts of India in case of Infant Mortality rate (IMR).

The present paper, instead of looking at food intake, tries to focus on status of the key factors behind the malnutrition of the children for different districts of the state of Odisha which are equally important to look at because provision of food would increase the nutritional security only when the drivers are controlled.

Objective and Methodology of the Paper: The objectives of the paper are as follows:

1. To have an inter-district comparison of nutritional status of children of the state of Odisha.
2. To analyse the status of driving forces for malnutrition of all the districts of Odisha.
3. To analyse the extent of food availability and pilferage of food provided by food intervention programmes in the state.

The paper is based on district level secondary data mostly taken from Census 2011 and Economic Survey of Odisha. Simple statistical tools such as percentage and ranking based on percentages have been used. The paper is divided into five sections including this section of introduction. Section II discusses the nutritional status of Odisha as a whole and aims to have an inter district comparison of the nutritional status of children in the state. In section III, the status of the districts of Odisha on the basis of three drivers of nutritional status i.e. health, access to water and sanitation has been analysed. Section IV discusses the food security Programmes and their viability in the state. Finally in the section V, findings of the paper have been discussed and suggestions have been drawn.

Inter District Comparison of Nutritional Status in Odisha

Nutritional Status of Children in Odisha: Focusing on the nutritional status of children under 3 years of age, one finds (Table 1) that during the period 1992-93 to 2005-06, the percentage of underweight children has declined for Odisha from 52.4% in 1992-93 to 44% in 2005-06.

Table 1 - Nutritional Status of Children (NFHS I, II, III), Odisha and India

Variable		2005-06			1998-99	1992-93
		Total	Urban	Rural	Total	Total
Children under 3 years		Odisha				
Stunted	(%)	38.3	32.9	39.1	44	44.9
Wasted	(%)	18.5	12.6	19.4	24.3	23.4
Underweight	(%)	44	33.3	45.7	54.4	52.4
		India				
Stunted	(%)	38.4	31.1	40.7	45.5	na
Wasted	(%)	19.1	16.9	19.8	15.5	na
Underweight	(%)	45.9	36.4	49	47	51.5

Source: National Family Health Survey I, II, III; 1992-93, 1998-99; 2005-06 respectively

This figure is marginally better than the India's average across the rural-urban classification in 2005-06. Odisha has done better vis-a-vis India in terms of percentage point decrease between 1992-93 and 2005-06. Similarly, the percentage of stunted (too short for the age) children under three years in Odisha is marginally better than all India average. However, in terms of percentage of wasted children (too thin for height) under three years Odisha figure shows a remarkable improvement over the said time period. Needless to say that the percentage of underweight, stunted and wasted children is still quite high for Odisha.

Table 2 below shows the comparative statistics of stunting and wasting percentage for India and Odisha. Odisha has fared well compared to India in stunting but not in wasting.

Table 2 : Comparison of Children under age 5, Odisha and India 2005-06 to 2013-14

	Stunting(%)		Wasting (%)	
	2005-06	2013-14	2005-06	2013-14
India	48	39	20	15
Odisha	45	38	20	18

Source: Ministry of Women and Child Development (2015).Global Nutrition Report, page 20.

Table 3 below shows the nutritional status of 0-3 years and 3-6 years old children of Odisha as a whole for three consecutive years. The figures show that at present, nearly 29% of children aged 0-3 years and 3-6 years are under nourished and almost 26% of them in both age groups are moderately under nourished. Nearly 2% and 1.37% of them are severely undernourished in the age group 0-3 and 3-6 years respectively. Similarly percentage of underweight children (less than 2.5 kg) is 27.74 and 27.46 percent for the 0-3 and 3-6 age groups respectively.

Table 3 :Nutritional Status of Children in Odisha (As per WHO Growth Standard)

Year	% of children weighted	0-3 Years				Underweight (%)*
		Normal(%) *	Moderately Under nourished(%)	Severely Under nourished		
			<-2 S.D to - S.D(%)*	<-3S.D(%)*		
2011-12	94.4	62.87	31.83	5.32	37.15	
2012-13	95.14	68.92	28.04	3.14	31.18	
2013-14	96.47	72.26	25.57	2.17	27.74	
3-6 Years						
2011-12	91.96	63.89	32.3	3.76	36.06	
2012-13	93.2	69.17	28.75	2.09	30.84	
2013-14	94.51	72.54	26.09	1.37	27.46	

Source: Odisha Economic Survey 2014-15 *% of weighed children

2.2. Inter-District Disparity in Nutritional Status in Odisha: Since a disaggregated data for the districts would give a better picture it was thought that a comparison of districts for a particular point of time will suffice. Table 4 below shows the inter district disparity in nutritional status of children of 0-3 and 3-6 years for the year 2009-10. One finds that in all districts percentage of malnourished girls is as

usual higher than that of boys in the 0-3 years age group. However, in 3-6 years age group, there is an exception in three districts- Jagatsinghpur and Subarnapur are the two where the percentage of malnourished girls is marginally lower than that of boys in 3-6 age group and Kendrapada where it is same for both sexes in 3-6 age group. This substantiates the bias against the girl child.

Similarly, if one compares the districts one finds that Jagatsinghpur and Puri- both advanced districts- have the lowest percentage of malnourished boys in 0-3 year and 3-6 year age group respectively. On the other hand Rayagada and Malkangiri-both KBK districts- have the highest percentage of malnourished boys in 0-3 year and 3-6 year age group respectively. For the girls Jagatsinghpur has the lowest percentage of malnourished in both the groups and Rayagada again has the highest percentage in both the age groups. Moreover, all the KBK districts are having a very high percentage of malnourished children across gender and age groups.

Table 4: District wise Nutritional Status of Children 0-6 Years, 2009-10 (Malnourished Children in %)

District	0-3 Years			3-6 Years			0-6 Years		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Anugul	50.60	56.35	53.35	47.40	51.29	49.27	49.06	53.90	51.38
Balangir	51.07	52.98	52.01	52.43	54.36	53.38	51.62	53.54	52.57
Baleshwar	48.23	51.80	49.98	49.62	51.86	50.71	48.90	51.83	50.33
Bargarh	53.42	56.65	55.01	52.81	53.80	53.30	53.16	55.44	54.29
Bhadrak	56.63	56.68	56.65	55.34	56.48	55.90	56.08	56.59	56.33
Boudh	49.65	56.79	53.21	53.91	55.26	54.58	51.68	56.06	53.86
Cuttack	38.84	42.46	40.59	38.30	39.58	38.92	38.58	41.08	39.79
Debagarh	49.67	55.29	52.43	53.47	53.94	53.69	51.39	54.70	53.00
Dhenkanal	44.35	48.43	46.28	42.55	45.26	43.83	43.51	46.96	45.14
Gajapati	56.58	58.93	57.75	55.48	56.76	56.12	56.12	58.03	57.07
Ganjam	50.90	52.63	51.74	49.82	52.05	50.90	50.41	52.36	51.36
jagatsinghpur	35.11	36.53	35.81	38.04	37.88	37.96	36.49	37.17	36.82
Jajpur	50.35	50.95	50.65	46.24	49.80	47.98	48.48	50.43	49.43
Jharsuguda	50.96	59.10	54.91	55.01	61.89	58.37	52.85	60.41	56.54
Kalahandi	52.71	59.10	55.85	56.70	61.87	59.25	54.26	60.19	57.18
Kandhamal	51.37	56.37	53.84	49.51	53.89	51.68	50.57	55.30	52.91
Kendrapada	45.76	46.07	45.91	44.12	44.12	44.12	45.00	45.16	45.07
Kendujhar	56.07	59.18	57.61	56.02	58.46	57.23	56.05	58.88	57.45
Khordha	39.09	42.11	40.54	41.07	44.07	42.52	39.96	42.98	41.42

koraput	60.74	62.49	61.61	61.08	60.05	60.57	60.90	61.37	61.13
Malkangiri	61.94	65.45	63.68	61.51	63.36	62.44	61.74	64.48	63.11
Mayurbhanj	50.55	58.78	54.60	53.24	59.54	56.34	51.85	59.14	55.44
Nabrangpur	61.12	62.96	62.04	60.82	62.50	61.66	60.98	62.75	61.87
Nayagarh	43.80	48.90	46.21	49.26	52.19	50.65	46.39	50.47	48.32
Nuapada	52.34	60.08	56.18	58.33	63.63	60.96	54.84	61.57	58.18
Puri	36.03	37.22	36.61	36.74	38.46	37.59	36.37	37.83	37.09
Rayagada	62.12	65.76	63.92	61.07	64.28	62.65	61.70	65.18	63.42
Sambalpur	54.15	60.36	57.20	57.59	61.86	59.68	55.77	61.06	58.37
Subarnapur	47.47	49.10	48.27	42.37	42.21	42.30	45.22	46.03	45.62
Sundergarh	54.96	63.10	58.93	57.01	63.18	60.05	55.95	63.14	59.47
Odisha	50.61	54.22	52.38	50.66	53.38	52.00	50.64	53.84	52.21

Source: Calculated from data in Gender Disparity Report, Orissa, 2010, Directorate of Economics and Statistics

Percentage of underweight children is also another way of looking at malnutrition. It is a reflection of undernourished mothers as well. Table 5 shows the percentage of underweight children for the different districts and the result is same i.e. most of the KBK plus districts are on the higher side of the range. Dhenkanal is having the lowest percentage of underweight children. Some of the advanced districts like Jagatsinghpur, Jajpur and Cuttack have a higher percentage than the state average implying that it is a problem in a significant way.

Table 5: Children with birth weight less than 2.5 kg(%), Odisha

Total	Total	Rural	Urban
Odisha	21.6	22	19.2
Anugul	22.5	23.1	19.4
Balangir	17	17.1	16
Baleshwar	23.3	24.1	16.1
Bargarh	18.5	18.4	19
Baudh	22.6	23.1	-
Bhadrak	18.5	19	15.1
Cuttack	22.7	23.1	21.3
Debagarh	19.1	19.9	10.4
Dhenkanal	14.2	14.1	14.3
Gajapati	24.5	25	20.8

Ganjam	26	26.5	23.3
Jagatsinghapur	22.4	21.9	27.3
Jajapur	22.3	22.4	-
Jharsuguda	18.7	19.4	17.6
Kalahandi	18.9	18.8	-
Kandhamal	28	28.4	22.2
Kendrapara	19.1	19.4	13.3
Kendujhar	19.1	19.1	19.6
Khordha	20.9	22.4	18.3
Koraput	33	33.8	29.8
Malkangiri	24.1	24.1	24.1
Mayurbhanj	25.4	25.9	18.5
Nabarangapur	30.1	31	-
Nuapada	19.4	19.5	-
Nayagarh	18	18.1	-
Puri	21.5	21.1	24.3
Rayagada	21.9	22.4	18.5
Sambalpur	18.6	20.8	15.3
Sonapur	18.4	18.7	14.9
Sundargarh	19.9	20.4	18.8

Source: Annual Health Survey 2012-13

The Drivers of Nutritional Status: An Analysis of Different Districts of Odisha

As already mentioned, the nutritional security is also dependent on other non food factors which in turn are responsible for sustenance of nutritional status. Three factors- health status, sanitation and access to drinking water are considered in this paper. Number of government health institutions and health sub centres per 1000 population represents status of health. Only 13 districts are having an average better than the state average of 0.20565. Most of the high ranking districts are very backward KBK districts. It implies that they have got required governmental intervention. However, the figure is pathetic considering the fact that for Malkangiri the highest amount of health facilities is only 0.33units per thousand population. If one takes out the relatively advanced districts from the figures (assuming that developed districts attract private health care facilities), we can infer that the health situation has not improved for these districts.

Similarly the districts are ranked on the basis of access to sanitation. Number of toilets available per 1000 population for each district has been taken as a proxy for access to sanitation. The number of household toilets, the number of school toilets and number of anganwadi toilets are clubbed together for each district (data from Economic Survey 2013-14). For Odisha the figure is 97 toilets per thousand population. The figure ranges from 57.27 toilets per thousand population (Kandhamal) to 162.43 toilets per thousand population (Jagatsinghpur). Only thirteen districts are having the average more than the state figures. Surprisingly Kandhamala is one of them.

As per 2011 census, 78 per cent of households do not have any latrine within their premises and 76.6 percent households still are in the habit of open defecation. Only 11 out of thirty districts are having the percentage of households having latrine facilities within their households which is higher than the state average (22.4%). The lowest ranking districts are part of KBK districts.

For Odisha as a whole, 22.4 percent households have drinking water in their own premises while 42.2 percent households have water sources near their premises. If one looks at the 2011 census data on drinking water facilities, only 11 districts have a higher than 22.4 percent (state average) of households within their premises. Seventeen districts are having percentage of households having water near their premises which is higher than the state average. About 35.4 percent of households in Odisha have access to drinking water away from their premises. Table 8 gives the status of different districts of Odisha. It shows that 15 districts have a higher percentage than the state average (35.4%) regarding fetching of water from far away.

Food Security in Odisha

Food security is a complex sustainable development issue, linked to health through nutrition. Food insecurity could lead to a cycle of malnutrition, deficiency, diseases, poor food absorption and heightened food insecurity. In this regard, the state government has been implementing various poverty reduction programmes including SGSY / NRLM, MGNREGA and other programmes for generation of wage employment and gainful self-employment. In addition, food security is being provided through heavily subsidised rice at the rate of rupee one a kg for all BPL households in non-KBK and KBK regions, Targeted Public Distribution Programme (TPDS), Antyodaya Anna Yojana (AAY), Mid-day Meal Programme (MDM), Emergency Feeding Programme (EFP) and Supplementary Nutrition Programme (SNP) are implemented in the State. All these are aimed at maintaining household food security as well as nutrition of children.

National Food Security Act (NFSA) had caught global attention for its sheer scale and ambition aiming to provide highly subsidised grains to 67% of the country's population. More than 3.26 crore people of Odisha out of the total population of 4.2 crore, would get benefits under NFSA. The components of NFSM are NFSM-Rice, NFSM Wheat, NFSM-pulses. Fifteen and ten districts of Odisha are included under NFSM-Rice and NFSM-pulses respectively. It is too early to comment on the success/failure of the NFSA act since it is yet to be implemented.

The Report **Food Security Atlas of Rural Odisha** finds out an index on the basis of three broad food

security indices (three A) i.e. production factors, influencing Availability, household and individual Access to food and Ability to Absorb food. The report identifies, on the basis of Food Security Outcome Index (FSOI) and Food Security Index (FSI), eighteen districts out of thirty districts of Odisha as priority districts for food intervention programmes. It further emphasises that seven districts (Kandhamal, Malkangiri, Gajapati, Rayagada, Koraput, Boudh and Keonjhar) need urgent attention in terms of food intervention.

By covering the children under five in special food intervention programmes, the state could meet its MDG target of reducing by half the incidence of child malnutrition. Similarly, an improvement in the nutritional status of the most under-nourished mothers would also have inter-generational benefits in reducing the incidence of low-weight births.

Table 6 below gives a picture of per capita PDS food grain intake in Odisha and India for the period 1999-2000 to 2007-08. It shows that purchase of PDS rice is falling in both rural and urban Odisha. Similarly, the per capita purchase of wheat is almost zero in rural areas and negligible in urban Odisha implying the relative importance of rice in the state. This purchase may be assumed to have fallen further after the introduction of @ Rs 2/kg recently by the state government.

Table 6 : PDS Foodgrain intake, Odisha and India 1999-2000 to 2007-08 (both APL and BPL)

Per Capita Purchase of PDS Rice(kg/month)					
Rural					
	1999-2000	2001-02	2004-05	2006-07	2007-08
Odisha	1.53	1.2	0.9	1.29	1.93
India	?	0.7	0.84	1.05	1.18
Urban					
Odisha	1.34	0.2	0.31	0.71	0.97
India	?	0.4	0.54	0.75	0.69
Per Capita Purchase of PDS Wheat(kg/month)					
Rural					
Odisha	0	0	0	0.01	0
India	?	0.2	0.35	0.31	0.39
Urban					
Odisha	0.34	0	0.02	0.09	0.05
India	?	0.1	0.17	0.22	0.21

Source: Reetika khara, "Trends in Diversion of grain from the Public Distribution System", Economic & Political Weekly, Vol.XLVINo.21.

Irrespective of different forms of food security programmes so far, including NFSA, the large scale diversion of grains from PDS is a matter of concern for policy makers. Diversion refers to proportion of

grain that doesn't reach the beneficiary households (Khera) which differs from government's definition. Khera, in her article, has analysed about diversion of foodgrain from different states. Her estimate of diversion is based on NSS data. She has done it by matching the off take by state governments from FCI with data on household purchases from PDS shops collected by N.S.S. off take refers to the amount of grain that the state takes from the FCI for distribution through PDS. Table 7 below shows the percentage of grain off take that doesn't reach households. It shows a very high percentage for Odisha compared to India as a whole.

Table 7 : Diversion of PDS Foodgrain in Odisha and India 1999-2008

% of grain offtake that does not reach Households						
year	Odisha			India		
	Rice	Wheat	Foodgrain	Rice	Wheat	Foodgrain
1999-2000	26.8	87.5	36.7	9.9	48.6	23.9
2001-2002	21.4	?	21	18.2	66.8	39
2004-2005	74.1	99	76.3	41.3	70.3	54
2006-2007	53.4	91.5	57	39.6	61.9	46.7
2007-2008	46.2	97.1	50.2	37.2	57.7	43.9

Source: Reetika Khera(2011), "Trends in Diversion of grain from the Public

Distribution System", EPW, Vol.XLVINo.21.

The intention behind the discussion of the above two tables is to show the link between purchase and diversion. This is whether due to low income of the people or due to non-availability of food grains is yet to be tested.

Coming to children specific schemes for food security, one finds there is hardly any for children between 0-6 years group in general and 3-6 years group in particular. Taking the high drop out rate into account, there is a possibility of more children beyond 6 years of age might be malnourished.

Conclusion and Suggestions

Not only does nutrition contribute to many aspects of sustainable development, but the evidence shows that sustainable development, broadly speaking, leads to better-nourished people. At a national level, countries and states that have done especially well in tackling malnutrition have done so through combinations of progress in scaling up nutrition interventions and progress in development indicators(Viet Nam, Brazil, Bangladesh, Nepal and the state of Maharashtra in India).

Subsidized distribution of food grains, nutrition provision and food for work programme are some options to counter the food insecurity. However, corruption in identifying the beneficiaries is another problem. For example, according to TOI report, as on 7th January, 1.26 lakh names of ineligible beneficiaries have been deleted from NFSA ration card beneficiary list.1.43 lakh have applied to withdraw names from NFSA list. Most of the people who have filed for applications for withdrawal of their names are government employees or those with a sound financial standing including political leaders. This implies that more poor people could have benefited and the process also becomes more time taking in Odisha.

One must understand that nutritional security goes beyond food security as one understands the term. The latter means ensuring adequate availability of food grains to provide calorie and, may be, protein needs of the people, while the former implies adequate supply of micronutrients such as vitamins and minerals as well. As one moves up the development ladder, this becomes a more relevant indicator of food security. To ensure nutritional security, increased availability of diverse types of food such as millets, pulses, fruits and vegetables, foods of animal origin (milk, eggs, meat, fish), besides cereals, is essential. Under nutrition-specific interventions are those that target the immediate determinants of under nutrition with the primary goal of improving people's nutritional status.

However, the food subsidies in India are limited to cereals and to some extent to pulses only. In this context, one can suggest that a) Child nutrition specific programmes other than current programmes should be introduced; b) looking at the neo natal and post neo natal mortality rate more care is required for new mothers; c) Now since the gram panchayats are in charge of direct expenditure, they should be sensitised about it and d) New mothers and children up to five years should be specially included in PDS to avail nutrition specific foods. Rising prices of pulses and other micro nutrients may make it very difficult on the part of Odisha government to bring such a huge percentage of malnourished children out of the trap. Thus ensuring food security and at the same time improving nutritional status of children is a challenge for the state as a whole.

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Food Consumption Pattern in Odisha with Special Reference to Nayagarh District

B P Mahapatra¹ and B Patro²

Food security is achieved at the individual, household, national, regional, and global level when all people, at all times, have physical and economic access to safe and nutritious food sufficient to meet their dietary needs and food preferences for an active and healthy life. On the other hand, food insecurity is defined as a situation that exists when people lack secure access to sufficient amounts of safe and nutritious food for normal growth and development and an active and healthy life. (World Food Summit, 1996). From this definition, it can be inferred that sustainable food and nutritional security ensures the availability, access and the utilization of nutritionally rich but culturally acceptable food for all times and so that all people can lead a healthy and active life. One of the major variables which affects the food security of the population is monthly per capita expenditure (MPCE). This variable has popularly been used to understand the consumption pattern. To understand the food and nutritional security of Odisha, a field survey was conducted in February 2015 in Nayagarh district. The size of the sample was 400 households. The proposed article is basically the findings of this field study. Analysis of the consumption pattern has been made in the sample villages on the basis of the land holding category as well as social category. Besides, findings from several rounds of National Sample Survey Organisation (NSSO) have also been mentioned in the proposed article to understand the consumption pattern of Odisha.

JEL: D10, D11

Keywords: Consumption Expenditure, Expenditure Elasticity, Food Security.

Introduction

Food security is an interesting topic to policy makers, practitioners, and academicians around the world because the consequences of food insecurity can affect almost everyone in the society. Food security, at individual, household, national, regional and global levels is achieved “when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their

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dietary needs and food preferences for an active and healthy life". (World Food Summit, 1996). This definition indicates that the concept of food security is based on three pillars-availability, access and utilization of food. Availability of the food is a macro concept and the state has a pivotal role in ensuring it. But availability of food in a country cannot ensure the access to food. Access to food is determined by the entitlements of the individual members in household. To understand the access to food, its indicator has to be identified and measured.

Access to food is measured prominently by purchasing power determined by income. However, now a days, household consumption expenditure is being used as a proxy for income. World wide, household consumption and expenditure surveys (HCEs) and living standard measurement are popularly used to measure poverty (i.e. monetary expenditures as a proxy for income). Data on food expenditures usually reflect only the monetary value of foods. Yet more accurate measurement of household food acquisition requires estimation of the quantities of foods acquired (to be able to estimate, e.g., the quantity of food consumed per capita, diet diversity, or dietary energy availability per capita).

In India, National Sample Survey Organization (NSSO) regularly provides the data on consumption expenditure based on sample collected from field. It provides state specific data on consumption expenditure. It covers the pattern of consumer expenditure for socio economic groups in urban and rural area. For example, in Odisha, NSSO divides the region into three-Coastal, Northern and Southern and data are available on the basis of the region both for urban and rural area.

However, district specific consumption data are not found from NSS rounds. Therefore, this article attempts to explain the food consumption pattern in Odisha with a special reference to Nayagarh district. While NSS data have been used to find out the consumption pattern of Odisha, the findings from the sample survey carried in 400 households in Nayagarh district explain the consumption pattern in Nayagarh district. The paper is divided into three sections. Introductory section provides theoretical background. Intermediate section provides the consumption pattern for Odisha from various NSS rounds and consumption pattern of Nayagarh district from the field survey. The final section concludes the research article.

Theoretical background

In the economic theory, the relationship between income level and the quantity purchased is interpreted by income consumption curves. German economist Ernst Engel had established this approach first in the 19th century. Since then the curve that shows the influence of the changes in the consumer income on the quantity demanded is called Engel curve.

Engel curves were widely examined by using different econometric methods for different groups of goods. For example, Working (1943) proposed the log-linear budget share specification, which is known as the Working-Leser model. Leser (1963) found that this functional form fit better than some alternatives. Houthakker (1957) analysed the income elasticities of 30 different countries for four different expenditure groups. Chesher and Rees (1987) estimated the income elasticity of demand for cheese, meat, and fats in Great Britain by assuming that price does not change during the period

of the survey. Banks et al. (1997) analysed Engel curve and consumer demands with the help of British data. You (2003) used models in the study where food, transportation, cigarette and alcohol expenditures were examined with Engel functions.

In estimation of Engel curves, total expenditure is commonly used as a proxy of income for two reasons (Deaton, 1997; Tansel, 2002): First, total household expenditure tends to be more accurately reported, is easier to measure than total household income, and is measured with less error of measurement particularity in developing countries. Second; income may be subject to transitory fluctuations since savings allow smoothing of expenditure over time. Thus, the total expenditure elasticities are calculated instead of income elasticities.

The choice of an appropriate functional form in estimating Engel's curve is very important. There are many functional forms that are used to estimate Engel curves. In this article, a double logarithmic functional form is used to estimate expenditure elasticities. This functional type has proven to be the most appropriate way of estimating the expenditure elasticity of demand because of its simplicity and quite easy estimation and interpretation (Ahmed et al., 2012). Also, expenditure coefficient is the coefficient of elasticity and there is no need of calculation.

The expenditure elasticity represents the percentage of change in the quantity demanded as a response to the percentage change in the income level. According to Engel curve, the commodities are classified into two categories as necessities and luxuries. If the income/expenditure elasticity of demand for certain goods is less than one, such goods are necessities and if it is larger than one, it would be luxury goods.

Households primarily tend to satisfy their household's basic needs and as the level of wealth increases, the share of expenditure on necessities such as food decreases. The analysis of changing food consumption pattern over time reveals a clear picture of living standard and the economic growth of the country. This would help in designing appropriate policies related to food production and distribution.

Pattern of Consumption Expenditure in Odisha

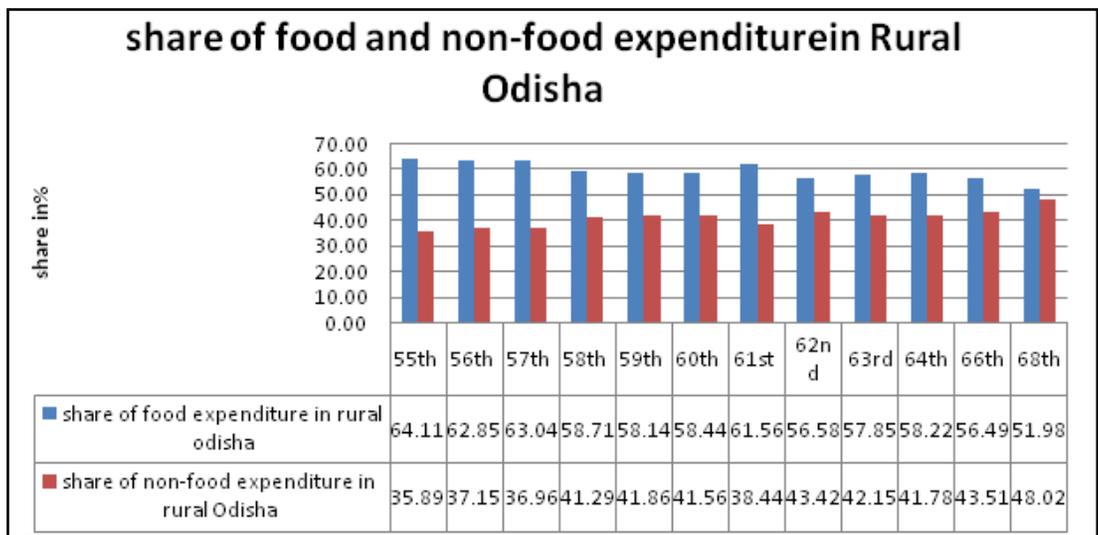
The National Sample Survey Office (NSSO) conducts nationwide household consumer expenditure surveys at regular intervals as part of its "rounds", each round normally of a year's duration. The NSS consumer expenditure survey aims at generating estimates of average household monthly per capita consumer expenditure (MPCE), its distribution over households and persons, and its break-up by commodity group, separately for the rural and urban sectors of the country, for States and Union Territories, and for different socioeconomic groups. These indicators are amongst the most important measures of the level of living of the respective domains of the population. The distribution of MPCE highlights the differences in level of living of the different segments of the population and is an effective tool to study the prevalence of poverty and inequality. These numbers enable the apex planning and decision-making process to allocate the nation's resources among sectors, regions, and socio-economic groups, and assess the "inclusiveness" of economic growth.

Beginning from the first round (1950-51) of the National Sample Survey (NSS), data on household consumer expenditure were collected in every round up to NSS 28th round (1973-74). After the NSS 26th round, the Governing Council of NSSO decided that the surveys on consumer expenditure and employment-unemployment situation might be undertaken together on a large scale once in every five years. Accordingly, “quinquennial” surveys on consumer expenditure and employment-unemployment surveys were conducted in the 27th, 32nd, 38th, 43rd, 50th, 55th, 61st and 66th rounds of NSS, at roughly 5-year intervals.

Share of Food vs Non-Food Consumption Expenditure in Odisha

The NSS estimates of per capita consumption expenditure, adjusted for inequality, is a proxy for per capita income reflecting a significant dimension of access to food. The standard of living of a region can be gauged from income measures such as per capita gross and net domestic products as well as from the levels and patterns of consumer expenditures.

Figure1: Share of Food and Non-food expenditure in Rural Odisha



Source: Various NSS rounds.68th NSS round(2011-12)

In 55th round, the share of the food was 64 percent and non-food was 36 percent. In 68th round, the food share has been declined to 52percent and non-food increased to 48percent.This indicates the preference of the people of Odisha of non-food to food. The increased trend in non-food has been more visible in recent times i.e after 64th round. The consumer of Odisha gets richer if the consumer expenditure is any indication. For example, the Monthly Per Capita Expenditure for rural Odisha was Rs.373and now it has been increased to Rs.905.The growth is 143% in comparison to 165percent growth in rural India during 55th round and 68th round.

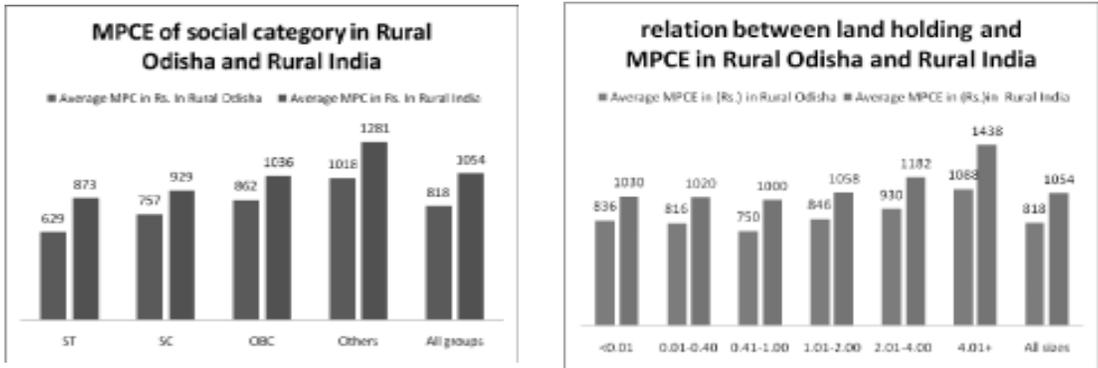
Table1: Average MPCE on Food and Non-food of Rural Odisha and Rural India

(Amount in Rs.)

Rounds	Rural Odisha			Rural India		
	Food	Non-Food	Total	Food	Non-Food	Total
55th round	239.25	133.92	373.17	288.8	197.36	486.16
(%)	64.11	35.89	100	59.04	40.6	
56th round	246.66	145.82	392.48	278.6	216.33	494.93
(%)	62.85	37.15	100	56.29	43.71	100
57th round	193.96	113.71	307.67	276.4	221.92	498.32
(%)	63.04	36.96	100	55.47	44.53	100
58th round	229.27	161.21	390.48	292.3	239.2	531.5
(%)	58.71	41.29	100	55	45	100
59th round	230.93	166.26	397.19	298.6	255.59	554.19
(%)	58.04	41.96	100	53.88	46.12	100
60th round	241.98	172.11	414.09	304.6	260.1	564.7
(%)	58.44	41.56	100	53.94	46.06	100
61st round	245.56	153.33	398.89	307.59	251.19	558.78
(%)	61.57	38.43	100	55.05	44.95	100
62nd round	260.45	199.87	460.32	333.15	291.38	624.53
(%)	56.58	43.42	100	53.34	46.66	100
63 rd round	265.3	193.27	458.57	363.42	331.75	695.17
(%)	57.85	42.15	100	52.28	47.72	100
64 th round	325.42	233.53	558.95	404.33	368.03	772.36
(%)	58.22	41.78	100	52.35	47.65	100
66 th round	404.22	311.37	715.59	497.07	455.96	953.03
(%)	56.49	43.51	100	52.16	47.84	100
68 th round	470.3	434.49	904.79	621.96	665.21	1287.17
(%)	51.98	48.02	100	48.32	51.68	100

Source: Economic Survey of Government of Odisha 2014-15

Figure 2: Consumer Expenditure among Socio-Economic Category in Odisha:



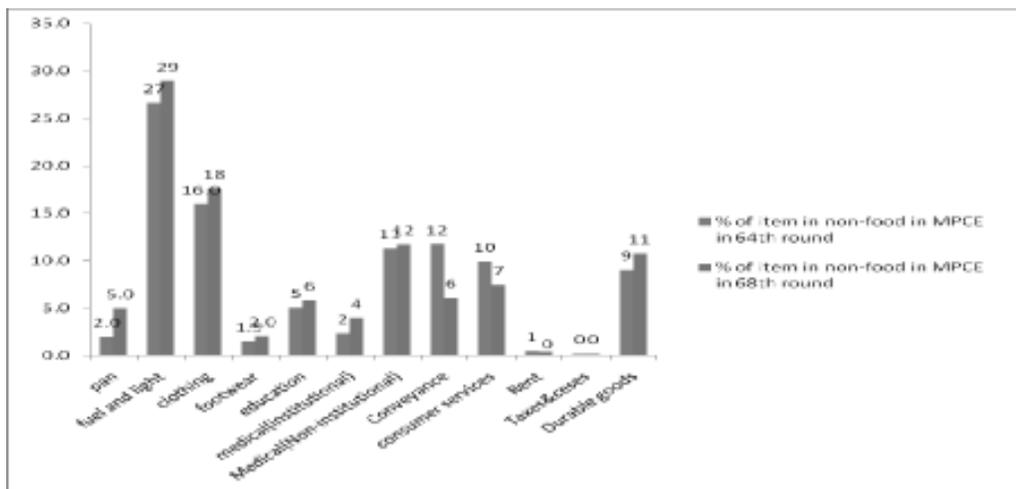
Source 66th NSS Round Report No.544

From the figures, it is found that, the standard of living is better for the others including general category followed by OBC, SC and by ST. Similarly, there is a positive correlation between land holding and consumption expenditure. If land holding is assumed as the wealth for the farmers, we can find the rich farmer consumes more than the poor farmer in both rural Odisha and Rural India.

Consumption Pattern within Food and non-Food categories in Odisha:

A comparison has been made between the 64th round and 68th NSS round. It has been found that still cereals are the dominant food in Odisha. But the share has been declined from more than 40 percent in 64th round to 35percent in 68th round. However, the share of expenditure on raw cereals or staple foods like rice and wheat falls and that of processed foods, meat and other items increases. Among non-food items, consumption of durables, and consumption of medical, clothing, fuel & light have increased.

Figure 3: Share of Food items in MPCE in Odisha in 64th and 68th NSS rounds



Source: NSS 64th and 68th Round

Consumption Pattern of Nayagarh District

Five villages-Gohirbadu, Mardakota, Barkola, Nuagaon and Barapalla in Nayagarh district were chosen for a sample survey as part of the doctoral research of the first author.80 households were taken from each village. This survey was intended to assess the food and nutritional security in Nayagarh district. To understand the household food security, consumption expenditure data have been collected. The food components are cereal, sugar, edible oil, pulses, milk, vegetable, meat/fish/egg, fruits, salt and beverages. Similarly, among non-food, medical. education, clothes, fuel&electricity, conveyance and tobacco have been found as prominent. Among the average MPCE in Nayagarh district, food share of the cereal is dominant with 37 percent followed by vegetable with 20 percent, meat/fish/egg with 14 percent and pulses with 10 percent. Among the non-food, the share of the clothing is the highest with 30 percent followed by education at 23 percent and medical with 16 percent. The share of tobacco is at 12 percent which may be a cause of health concern. When the MPCE for food is Rs.573, for non-food is Rs.406.The average monthly consumption expenditure is Rs.979.**This is more than the all rural Odisha figure of Rs.905 as per 68th NSS.**

Total expenditure is divided into food and non-food expenditure. By taking Total expenditure as an independent variable and food and non-food expenditure as dependent variables, it has been found that total expenditure explains the non-food expenditure by 61 percent and food expenditure by 39 percent. The results are shown in the table.

Dependent variable: MPCE_ Non-Food (Sample size n= 400)

	Coefficient	Std. Error	t-ratio	p-value
const	“191.494	15.6605	“12.2278	<0.0001***
MPCE total	0.610546	0.0147295	41.4506	<0.0001***

$R^2=0.81$ Adjusted $R^2=0.81$ percent *** 1 percent level of significance

Dependent variable: MPCE Food (Sample size=400)

	Coefficient	Std. Error	t-ratio	p-value
const	191.494	15.6605	12.2278	<0.0001***
MPCE total	0.389454	0.0147295	26.4405	<0.0001***

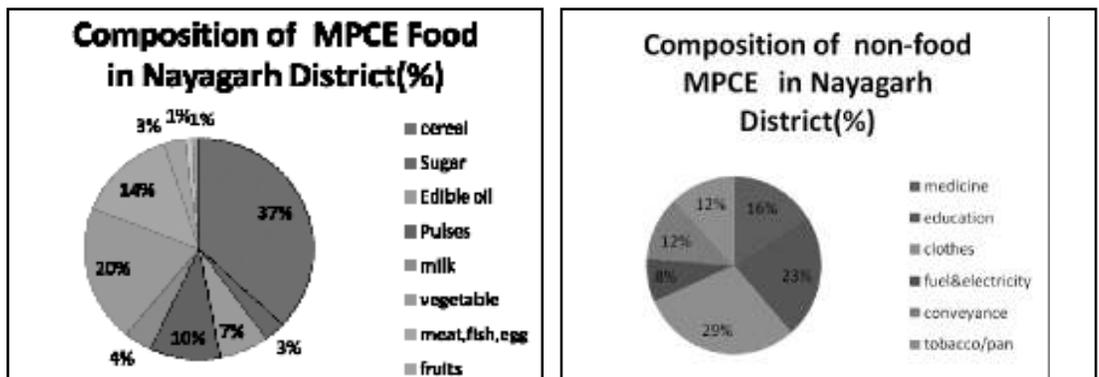
*** 1 percent level of significance $R^2 = 0.637$ Adjusted =0.63

Table 2: Monthly Consumption Expenditure on Food and Non-Food in Nayagarh District

Items	Gohirbadu		Mardakota		Barkola		Nuagaon		Barapalla		Average of five villages	
	Amt (Rs.)	share (%)	Amt (Rs.)	share (%)	Amt (Rs.)	share (%)	Amt (Rs.)	share (%)	Amt (Rs.)	share (%)	Amt (Rs.)	share (%)
cereal	205	38	209	33	220	41	228	33	195	42	211.4	37
Sugar	18.57	3	21.3	3	17	3	23	3	19	4	19.774	3
Edible oil	38.39	7	43	7	34	6	48	7	41	9	40.878	7
Pulses	50	9	68.8	11	65	12	67	10	48	10	59.76	10
milk	18.97	4	28.7	5	8	1	27	4	23	5	21.134	4
vegetable	105.71	20	127.5	20	111	21	148	21	67	14	111.842	20
meat,fish,egg	79	15	86.7	14	73	14	100	14	60	13	79.74	14
fruits	15.27	3	31.5	5	6	1	41	6	4	1	19.554	3
salt	7.44	1	5.6	1	4	1	6	1	5	1	5.608	1
beverages	0.35	0	6.8	1	0	0	2	0	6	1	3.03	1
MPCE(Food)	540.26	100	629	100	538	100	690	100	467	100	572.852	100
medicine	119.64	26	73.2	15	52	16	50	9	24	12	63.768	16
education	91.44	20	102.5	21	91	29	130	23	47	24	92.388	23
clothes	123.53	27	137.3	28	74	23	217	39	49	25	120.166	30
fuel&electricity	42	9	28.9	6	51	16	24	4	26	13	34.38	8
conveyance	51	11.0	67.3	14	28	9	66	12	30	15	48.46	12
tobacco/pan	36	8	81.7	17	23	7	72	13	22	11	46.94	12
MPCE (non-food)	464	100	491	100	317	100	559	100	199	100	406	100
Total (MPCE)	1004.26		1120		855		1249		666		978.852	

Source: Primary Data

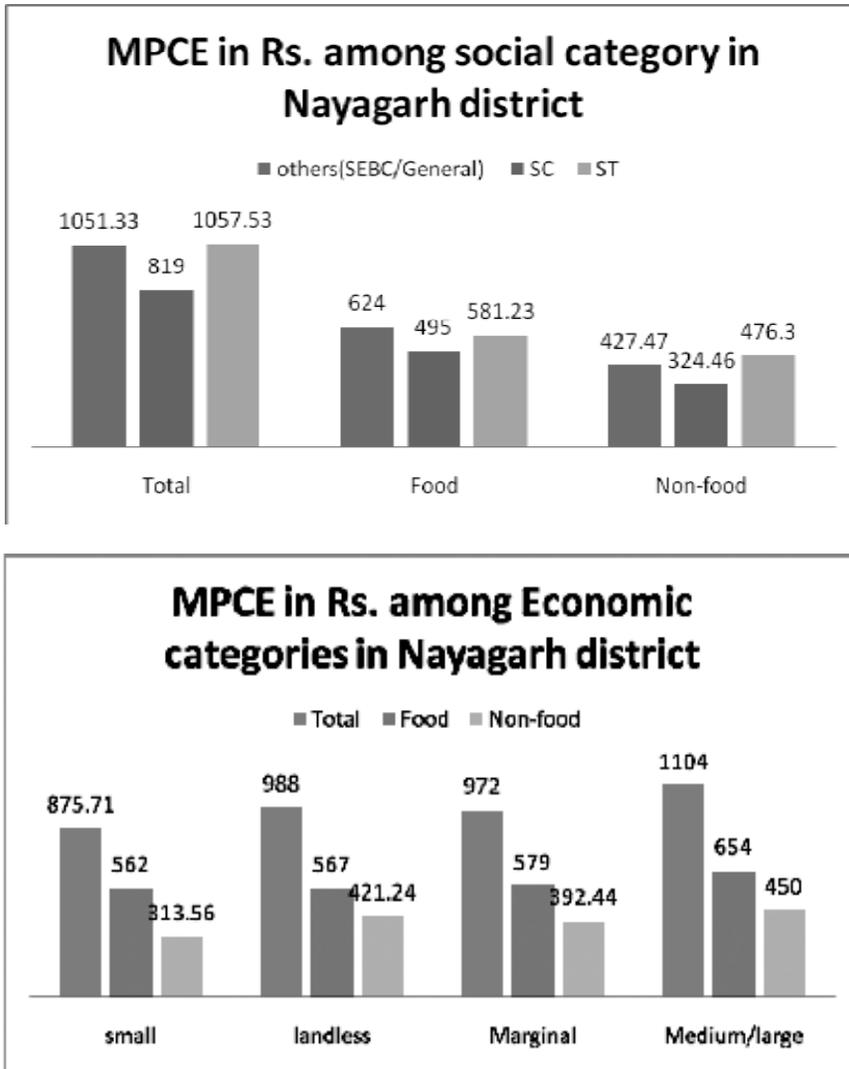
Figure 4: Composition of MPCE food and non-Food in Nayagarh District



Source: Primary Data

The share of food MPCE is 58percent and non-food is 42 percent. In food category, cereal expenditure with 37 percent is dominant followed by vegetable expenditure with 20 percent. In non-food category, expenditure on clothes with 29 percent is dominant followed by education with 23 percent.

Figure 5: MPCE among Socio-Economic category in Nayagarh District



Source: Primary Data

The MPCE among ST is Rs.1057 which is higher than the MPCE of SC community(Rs.819).Similarly, the MPCE of marginal is more than that of small and landless. It indicates that consumption expenditure is not positively correlated with the land holding status of the households.

Table 3: Components of Food Expenditure and Non-Food Expenditure in Nayagarh District:
Dependent variable: MPCE Food (n=400)

MPCE of Food items	Coefficients	p-value	Adjusted R-square	
cereal	0.857087	<0.0001***	0.27	Significant
sugar	8.15453	<0.0001***	0.17	Significant
Edible oil	4.59129	<0.0001***	0.17	Significant
Pulses	3.57495	<0.0001***	0.21	Significant
milk	2.14457	<0.0001***	0.15	significant
vegetable	1.94419	<0.0001***	0.37	significant
Meat/fish/egg	2.26317	<0.0001***	0.31	significant
Fruit	2.19423	<0.0001***	0.16	significant
Salt	15.2263	0.0003	0.03	Not significant
Beverages	1.37613	0.1145	0.03	Not significant

*** 1 percent level of significance

The impact of cereal, sugar, edible oil, pulses, milk, vegetable, meat/fish/egg and fruit is significantly affecting the food expenditure. However, salt and Beverages are not significantly affecting the food expenditure.

Table4: Correlation between /among various components of food Groups

cereal	sugar	Edible oil	pulses	milk	
1.0000	-0.1240	-0.1076	0.0410	0.0830	cereal
	1.0000	0.6331	0.4298	0.1065	sugar
		1.0000	0.3864	0.0823	Edible oil
			1.0000	0.1772	pulses
				1.0000	milk
vegetable	Meat/fish/egg	fruit	Salt	Beverages	
0.0254	-0.0507	-0.0141	-0.1298	0.0138	cereal
0.4735	0.4756	0.2706	0.3170	0.0345	sugar
0.4837	0.5302	0.1821	0.3773	-0.0370	Edible oil
0.4729	0.4159	0.1476	0.2413	-0.1257	pulses

0.0895	0.1857	0.2719	0.0867	-0.0108	milk
1.0000	0.5395	0.1959	0.2757	-0.0513	vegetable
	1.0000	0.2475	0.3427	-0.0389	meatfishegg
		1.0000	0.0928	0.1526	fruit
			1.0000	-0.1069	salt
				1.0000	beverages

Source : primary data

The correlation coefficient matrix is presented in the table from which we can find the degree of association of MPCE for various items. MPCE for cereal is inversely related to sugar edible oil, meat/ fish/egg, fruit. At the same time there is a positive correlation between cereal expenditure and expenditure on vegetable, pulses, milk.

Table5: Own price, Cross price and Expenditure Elasticity of Food Items in Nayagarh district

Items	Price of								Total Expenditure	Size of the Family
	Cereal	Sugar	Edible oil	Pulses	Milk	Vegetable	Meat/egg/fish	Fruit		
Cereal	1.68	-1.30	-1.01	-1.28	-1.48	-0.61	-1.32	0.50	0.67	0.53
Sugar	0.80	-0.45	0.008	-0.0006	-0.35	0.83	-0.51	0.05	0.52	-7.84
Edible oil	0.44	-0.34	0.06	0.01	-0.24	0.13	-0.56	0.04	0.45	-19.89
Pulses	2.65	-2.50	-1.17	-1.35	-1.59	-0.73	-1.76	0.45	0.47	-0.36
Milk	-1.63	0.45	-0.66	-0.78	0.007	-0.55	-0.17	0.28	0.49	3.31
Vegetable	3.86	-3.53	-2.14	-2.63	-3.11	-1.27	-3.3	1.01	0.84	-0.49
Meat/ fish/Egg	2.78	-2.49	-1.41	-1.71	-2.05	-0.84	-2.18	0.64	0.87	-35.24
Fruit	4.78	-6.34	-5.35	-6.29	-5.44	-3.65	-5.57	2.30	1.30	2.07

Source: Primary data

Expenditure Elasticity of Food items: When the regression in the form of log log function is run, the coefficients of independent variables were known as expenditure elasticity. The table explains own price elasticity, cross price elasticity and expenditure elasticity of demand for cereal, sugar, edible oil, pulses, milk, vegetable, meat/fish/egg, fruit. The demand for food items is represented by the MPCE of the respective food. All the food items are superior goods as the expenditure elasticities are positive. However, the fruit is considered as a luxury item as the expenditure elasticity is more than unity. The elasticity of meat/fish/egg is 0.84, which is closer to unity. It is followed by vegetable and cereal. Cereal is a substitute for sugar, edible oil, pulses, vegetable, meat/fish/egg and fruit whereas it is complementary.

Conclusion

The article examines various rounds of results of national sample survey to find out the food consumption pattern in Odisha. If we examine the NSS rounds from 55th round to 68th round, we can find that food share has declined from 64 percent in 55th round to 52 percent in 68th round, whereas the share of the non-food items has increased from 36 percent in 55th round to 48 percent in 68th round. In rural Odisha, MPCE of the ST community is the least with Rs.629 and of the SC community with Rs.757, OBC Rs.862 and for others, the highest at Rs.1018. Similarly, there is a positive correlation between the land size and MPCE.

In Nayagarh district, the total MPCE is explained by food by 61 percent and non-food by 39 percent. Among food, the share of cereal is the highest with 37 percent followed by vegetable with 20 percent and meat/fish/egg with 14 percent. Among the non-food groups, share of the clothes is the highest with 30 percent followed by education at 23 percent and medical expenditure at 16 percent. The share of the food expenditure is 59 percent with Rs.573 and share of the non-food expenditure is 41 percent with Rs.409. The average MPCE in sample villages is Rs.979. The MPCE among ST is Rs.1057, which is higher than the MPCE of SC community (Rs.819). This scenario reflects the backwardness of the SC community. Similarly, the MPCE of marginal, is more than that of small and landless. It indicates that consumption expenditure is not positively correlated with the land holding status of the households. The impact of cereal, sugar, edible oil, pulses, milk, vegetable, meat/fish/egg and fruit is significantly affecting the food expenditure. However, salt and Beverages are not significantly affecting the food expenditure. MPCE for cereal is inversely related to sugar, edible oil, meat/fish/egg, fruit. At the same time there is a positive correlation between cereal expenditure and expenditure on vegetable, pulses, milk. All the food items are superior goods as the expenditure elasticities are positive. However, the fruit is considered as a luxury item as the expenditure elasticity is more than unity. The elasticity of meat/fish/egg is 0.84, which is closer to unity. It is followed by vegetable and cereal.

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Food Security: Can Odisha Comply within Next Half-century?

Sandhya Rani Das¹ and R. P. Sarma²

Food is the most important requirement of human beings to maintain life. World Bank as back as in 1986 has defined food security as “access by all people at all times to enough food for an active and healthy life.” This is a most simple definition without specific on any aspect of it. It is a multidimensional concept. In 1996 World Food Summit held in Rome, after elaborate discussion adopted this definition of Food Security as a working definition to tackle the problems of food material. According to food summit, “Food security exists when all people, at all times, have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.” (FAO, 2008)

This definition indicates four dimensions of Food Security: (1) Physical availability of food materials, (2) economic and physical access to food, (3) utilization of food, and (4) stability of all the three dimensions over time. The food security problem appeared in the economic situation when the world faced food crisis in the several parts of the world.

Food security generally conceived as availability of main food grains of wheat and rice or only cereals for consumption. but for a healthy living it is not just cereals but other food materials or nutritious food is required for healthy living. and hence only adequate availability of cereals cannot be taken as food security for the people. Hence in food security apart from cereals the following three have to be included under food items, for the purpose of Nutritional Security

(1) Adequate quantity of pulses has to be included for a balanced nutritious good for an individual.

Dimensions of Food Security

Nutritional security is built on three pillars, which can be taken as dimensions of food security, and each has to be analyzed accordingly for the overall security of nutrition for the people.

- (1) **Food Availability:** This dimension of availability of sufficient quantity of food in the country/world. It must be available consistently. This dimension addresses the supply side of food security and expects sufficient quantities of quality food from domestic agricultural production and imports. This is simply a statistical calculation of availability of food in the country from local agricultural production, level of stock and net availability of food stuff from imports/exports.
- (2) **Food Access:** Food Access is another dimension of Food Security which encompasses income, expenditure and buying capacity of individuals and households. This addresses whether the households and individuals have adequate resources to acquire appropriate quantity and quality

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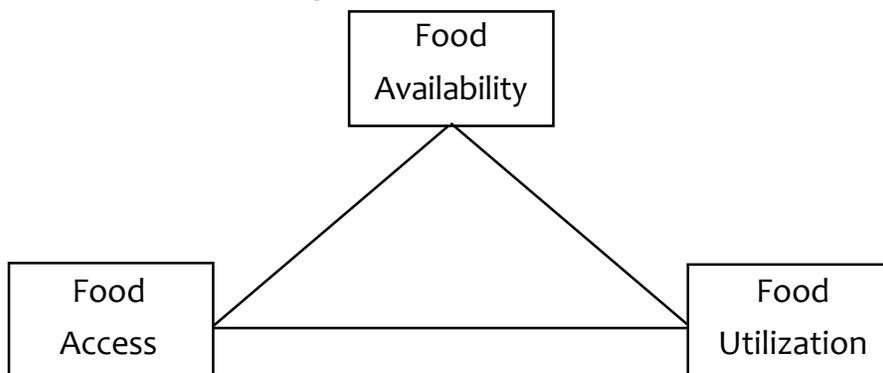
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of food. Some of the indicators of this dimension at different levels of food price, wage rate, percapita food consumption, meal frequency, employment rate have to be assessed for this purpose. The dimensions of these can be assessed by Vulnerability Analysis and Mapping (VAM) investigations and Food Access Surveys helps to tackle the problems of Food Access and help to solve food security problems.

- (3) **Food Utilization:** Utilization of Food is equally important for nutritious food security. This addresses not only how much food the people eat but also how and what they eat. It also covers the process of food preparation, intra-household food distribution, problems of water, sanitation and also health-care practices. The nutritional outcome of the food taken by the individuals depends on how food is prepared/cooked.

The three dimensions of food security are shown in Fig.1. And each pillar is equally important in achieving and maintaining food security in the world.

Fig. 1: Pillars of food Security.



Food security is one of the major elements of development and poverty alleviation and has been the goal of an economy now. According to the state of food insecurity estimates of FAO (2012) around 87 crores of people in the world estimated to be under nourished, of which 85.2 crores are from the developing economies of Africa and south East Asia. .

The types of food Security

Food security or Insecurity is divided into two for intensive analysis: (1) Community Food Security and (2) Household Food Security.

Community Food Security: “Community food security exists when all citizens obtain a safe, personally acceptable, nutritious diet through a sustainable food system that maximizes healthy choices, community self-reliance and equal access for everyone.” (Public Health of British Colombia) According to this definition achieving food security seems Utopian even though it is an ideal one. No country could hope to reach this reality. Hence Food Security has been defined which is measurable and achievable. However, in whatever manner it is defined enough to eat regularly for active and healthy life is the most essential need of the people. Many developing economies of south Asia and Africa have not yet been able to fulfil this need.

Household Food Security: Food need is actually a house-hold problem. But this problem is not given emphasis when ever food Security is being discussed, it is discussed in a general way for the total population. Household food security involves that needs of food for a healthy life for all its members in terms of quality, quantity and culturally acceptable. It is found, especially in developing countries, during the periods of food insecurity in the family parents' diet, both in quality and quantity are diminished and children are given more attention with regards to diets. Bur these problems do not come to forefront in any analysis of food security as it is most complicated to analyse, but it should be the focus of food security.

FOOD SECURITY IN ODISHA

Availability of Food Grains

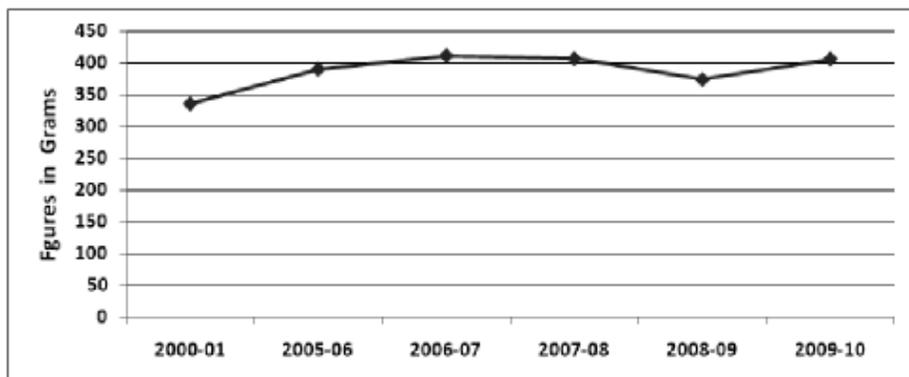
Rice is the main food grain produced in Odisha, even though other cereals and millets are produced in hill areas in limited manner. As irrigation facilities are limited to about 33 percent from all sources the yield rate is one of the lowest in the country. Apart from this as a result of frequent climatic changes the production fluctuates from year to year. During the seven year period from the year 2007-08 to 2013-14 the annual cereal production fluctuated from 70.12 lakh tones to 97.82 lakh tonnes and average production remained 70 lakh tonnes.

In India net availability of cereals per capita per day remained at 366.2 grams in 2000-01 which increased to 407 grams in the year 2010-11. There is no change in the estimated grams of food availability percapita in the years 2009-10 and 2010-11. The figures show that an individual for a two meals in a day available only around 204 grams of cereals per meal.

The trend of growth of percapita per day availability of cereals in India is shown in Fig.1.

Estimates of percapita and per day availability of cereals for Odisha are not available. Total production of cereals in 2013-14 of 76.41 lakh tonnes, computed on the basis of 2011 population of Odisha per day percapita availability comes to only 50 grams. Imports of cereals into Odisha and the stocks available in the state are not included in this estimate. Comparison of Odisha figures to national figures of per day percapita gives a very miserable situation. Nutritious food security still provides a gloomy picture.

Fig. 1: Percapita Per day Avalablity of Food Grans in India



Sours: Economic Survey, India, 2011-12

For a nutritious food in Odisha at least pulses, vegetables and non vegetarian items of fish and meet have to be included, even avoiding milk and fruits. Availability of other items in the food in case of an Odisha dish is so low it is not worth mentionable.

Production of these five food items individually and total is presented in Table 1.

Composition of non-cereal items in a meal now gradually improves. In the year 2007-08 cereals constituted 86 percent of a meal but now in 2013-14 it came down to 75 percent. The growth of total food items and growth of cereal are shown in Fig. - 2, which clearly indicates the position of the non-cereal component of a diet in Orissa. In 2007-08 the non cereal component was formed 16.23 percent of a diet, which increased to 33.39 percent in 2013-14. Even though it is a good improvement, but seeing the low quantity of percapita diet it is not relevant from the point of view of Food Security.

Table 1 - Agricultural Products in Odisha, 2008-14

Quantity in Lakh Tones

Year	Cereals	Pulses	Meat	Fish	Veg.	Total
2007-08	77.61	3.84	0.59	3.50	4.64	90.18
2008-09	70.12	3.81	1.15	3.74	4.83	83.65
2009-10	71.53	3.98	1.28	3.71	7.14	87.64
2010-11	71.92	4.27	1.38	3.82	7.37	88.76
2011-12	80.60	2.47	1.38	3.81	9.74	98.00
2012-13	97.86	4.24	1.41	4.10	11.87	119.48
2013-14	76.41	4.18	1.51	4.14	15.69	101.93
Per Day percapita Grams	50					

Source: Economic Survey, Odisha, 2011-12 and 2014-15,

Fig.1, indicates growth of cereal production and production of other food items in Odisha from 2007-08 to 2013-14. The production of vegetables made good progress only during the last three years of the study.

With regard to the production of, eggs, milk and fruits even though total production is available but it is difficult to compute percapita and per day components. Production of these three items is not satisfactory during the periods under study. The production figures are shown in Table 2.

Poverty and Food Security

Food security analysis cannot be separated from poverty analysis. The families have to be taken as poor who are insecure in getting sufficient food daily. As per recent NSS round there is wide disparities in the incidence of poverty in urban and rural sectors. In case of Odisha in both rural and

urban areas the incidence of poverty remained high compared to the national figures. The poor families are insecure with regards to food. About 33.44 percent of urban population who are poor can be taken as insecure in food but in rural areas about 29.06 percent are poor and food insecurity is less in rural Odisha.

Conclusion

Percapita per day availability of cereals in Odisha comes to be only 50 grams calculated on the basis of 2011 population and production of cereals for the year 2013-14. Of course the official and un-official imports of food grains into Odisha have not been included in the computation. This is far below the national figure. Per capita Per Day (PPD) availability of food materials is about one-fourth of national figures. PPD cannot be de-linked from poverty figures. Odisha's poor people according to head-count basis in 2014-15 on the estimated population of 4.33 crore is 29.12 percent. Accordingly poor people in Odisha now are 1.30 crores who are below poverty line, for them there is no food security. Reduction of poverty and providing food security to them is not an easy task.. An integrated project of food security and poverty elevation is urgently required. It is still a Herculean task to achieve. But one cannot be frustrated; more vigorous activities have to be taken up in both rural and urban sectors to provide security in food consumption and eradication of poverty. If food consumption is secured the poverty can be reduced. Let us hope! It is only a hope to achieve within next half century!

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Role and Effectiveness of PDS in Ensuring Food and Nutritional Security-An Inter-state Analysis with Special Reference to Odisha

Minati Sahoo¹ and Jnyan Ranjan Sahoo²

Food and Nutritional security is one of the basic criteria for the formation and improvement of human capital. Odisha, despite of being an agrarian economy, is one of the poorest and most backward among all Indian states. With this backdrop, the present study intends to examine the role and effectiveness of PDS in ensuring food and nutritional security in Odisha. At first, an assessment has been made with regard to the situation of food and nutritional security on the basis of the dimension of access, availability and absorption in Odisha. Further, to what extent PDS contribution to food and nutritional security in Odisha in comparison to other states has also been analyzed in the current paper. At last, the discrepancies in the system have been identified and measures are suggested that will help to remove the anomalies and make the delivery mechanism more effective.

JEL classification: I31, I38, Q22

Keywords: Agrarian economy, Dimensions, Human capital

Introduction

It is a matter of great happiness that when many of the developing nations in 21st century are struggling to cope up with the impact of economic slowdown or stagnation, Indian economy is growing on a consistent growth path (Mohan and Kapur, 2015). But ironically this growth is accompanied by the mass poverty and vast unemployment. Thus widespread poverty resulting in chronic and persistent hunger is the single biggest scourge of the developing world today (National Nutritional Policy, 1993). Poverty and hunger are co-related. Wide prevalence of poverty and the inability of a large section of the population to buy food or to establish entitlement over an adequate amount of food lead to hunger (Sahu, 2012). Though India has improved its ranking in the global hunger index by moving up to fifty-five from sixty-three, but fighting hunger remains a challenge. This is because 190 million people in India go hungry daily. Among the Indian states, Odisha ranks fifth in terms of highest multidimensional human poverty index (Kumar, Kumar and Sonu, 2015).

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Despite of the fact that Odisha is one of the richest bio-diversity regions in South-East Asia (Centre for Environment Studies, 2007), it is the least developed and most backward state in India (Ministry of Finance, 2013). State suffers from high incidence of poverty, low average per-capita monthly consumption expenditure, high infant mortality rate, low life expectancy and lowest HDI among majors states of India. The state even witnesses acute regional and social disparities in development with large rural-urban divide (Economic Survey of Odisha, 2014-15). It is one of the leading and backward performers in terms of Human Development Index (HDI) among all Indian states (Thorat, 2007).

Food and nutritional security is one of the basic criteria for the formation and improvement of human capital. The food security concerns include not only the problems of physical availability of food stocks as well as economic and physical access to food stocks, but also biological utilization of food consumed. The identification of the importance of knowledge of nutrition is not a new process. However, in the 1990s, there were significant efforts to define and identify the nutritional requirements of people as well as emphasis on the importance of a balanced nutritious diet in ensuring overall food security. One of the main arguments that have been favoured for the nutritional security is that people's food security does not automatically translate into their nutritional well being. In addition to have access to foods that are nutritionally adequate and safe, people must have knowledge and skills to acquire, access to health services and healthy environment to ensure effective biological utilization of the foods consumed. Thus, an actual nutritional status is thus determined by a number of interrelated factors of which food security is only one. However, it needs to be reiterated that attaining food security in terms of just physical and economic access to food is a necessary condition for attaining the more holistic state of food security that subsumes nutritional security. A country can be said to have achieved complete food and nutritional security if each and every person in that country is able to consume 'an adequate and balanced diet' on a regular basis (Gautam and Kumar, 2012). But Odisha has witnessed an increase in the proportion of population suffering from acute calorie deprivation. The percentage of population consuming less than 1890 kcal has increased from ten percent in 1993-94 to fifteen percent in 2004-05 and this figure is higher than that of national average which is thirteen percent (Athreya et al., 2008). Thus, a large section of population in the state has limited access to food in terms of their entitlement. In order to meet the necessities of such section of population at affordable price and to fulfil their nutritional requirement, Public Distribution System in our country has evolved as a measure of poverty alleviation and food security. With this backdrop, an attempt has been made in the present study to analyse the role and effectiveness of PDS in ensuring food and nutritional security with special reference to Odisha. Specifically, following are the objectives of this study:

1. To assess food and nutritional security on the basis of the dimension of access, availability and absorption in Odisha.
2. To what extent PDS contributes to food and nutritional security in Odisha.

I. Assessment of Food and Nutritional security in Odisha

Food security is a subject which closely touches upon the well being of the majority of our people (Ray and Ray, 2011). It includes not only the problems of physical availability of food stocks as well as economic and physical access to food stocks but also biological utilization of food consumed (Athreya et al., 2008). In other words, food insecurity is a situation where people consistently consume diets inadequate in calories and essential nutrients. Thus, the food and nutritional security has three dimensions: Access, Availability and Absorption. The parameters used here to measure these three dimensions are: Access (percentage of population BPL, monthly per capita consumption expenditure); Food availability (instability in cereal production, deficit of food production over consumption) and absorption (life expectancy at age one, infant mortality rate, nutritional status of children below three years). On the basis of these parameters, an assessment of food and nutritional security is made in the present section which is discussed below.

1. Access

It is determined by the bundle of entitlements that is related to people's initial endowments, what they can acquire and the opportunities open to them to achieve entitlement sets with enough food either on their own endeavor or through state intervention or both (*ibid*). Percentage of population BPL and Monthly Per capita Consumption Expenditure (MPCE) are used as the determinant to measure the accessibility criteria.

1.1. Percentage of population BPL

Still after sixty-seven years of independence, there are twenty-one percent of population who are in clutches of poverty. In common parlance, poverty may be defined as a situation of common deprivation of the basic needs of human life. For example: lack of quantitative or qualitative food, lack of basic health care, lack of minimum shelter and lack of primary education and a minimum standard of living. Poverty is very acute in Odisha in comparison to other states of India.

The Economic Survey of Govt. of Odisha 2014-15 shows that poverty head count ratio in Odisha has declined from sixty-six per cent in 1973-74 to thirty-three per cent in 2011-12. This has been possible due to the several poverty eradication programmes that have been undertaken by the state to reduce poverty. The state has also recorded highest reduction in poverty among all major states. But still Odisha is the second largest poor state with thirty-three percent of populations under the clutches of poverty.

1.2. Monthly Per Capita Consumption Expenditure

The severity/extent of poverty can also be known by monthly per capita consumption expenditure (MPCE). Thus, it is a determinant to measure the accessibility. It can be seen from the same Economic Survey that average monthly per capita consumption expenditure has increased over the years increased from Rs 373 in (55th NSS round/1999-2000) to Rs 905 in (68th round/2011-2012) in rural areas. During the same period, MPCE in urban areas has also increased from Rs 618 to Rs 1830. Thus MPCE in Odisha has risen over the period of time. But an inter-state comparison shows that the state is having the lowest MPCE for both in urban and rural areas.

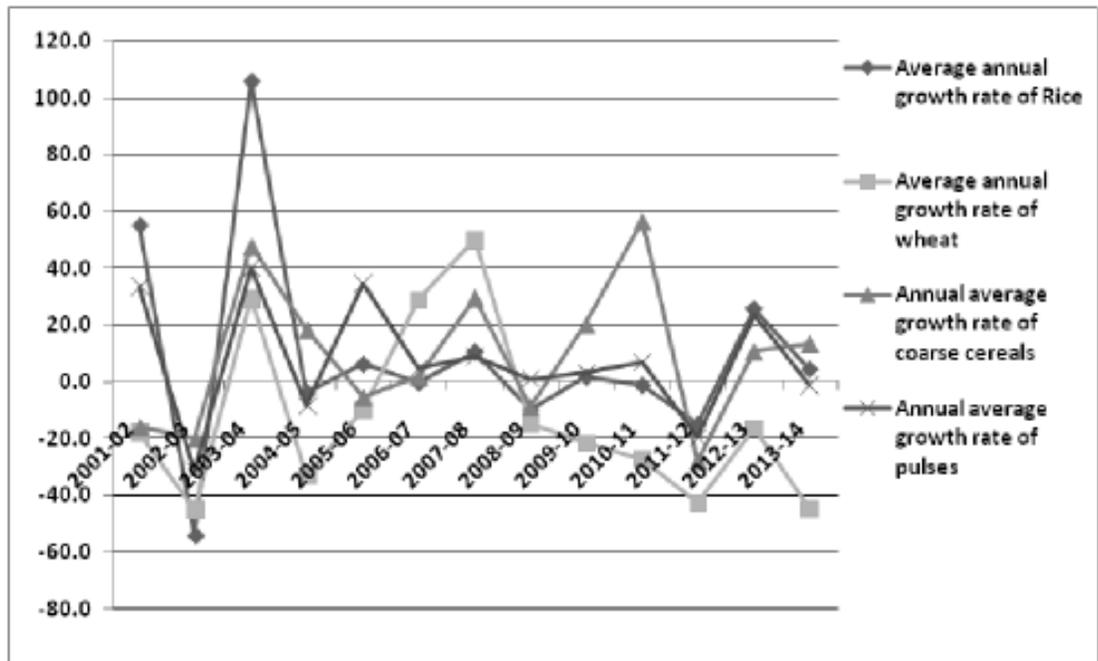
2. Availability

From the above Economic Survey, it can be inferred that a large section of population in Odisha lacks accessibility of food security. It is also important to consider availability dimension. It is defined as the physical availability of food stocks in desired quantities. Instability in food grain production and deficit of food production over consumption is used to measure this component of food security.

2.1. Instability in food grain production

The different food grains that are produced in Odisha are rice, wheat, coarse cereals and pulses. Rice is the major crop that is grown and forms a significant proportion of food grains. Figure 1 shows wide fluctuation in the production of different food grains in the last fourteen years which marked the nature of instability.

Figure 1: Average annual growth rate of production of food grains in Odisha from 2001-02 to 2013-14



Source: Compiled by author

2.2. Deficit of food production over consumption

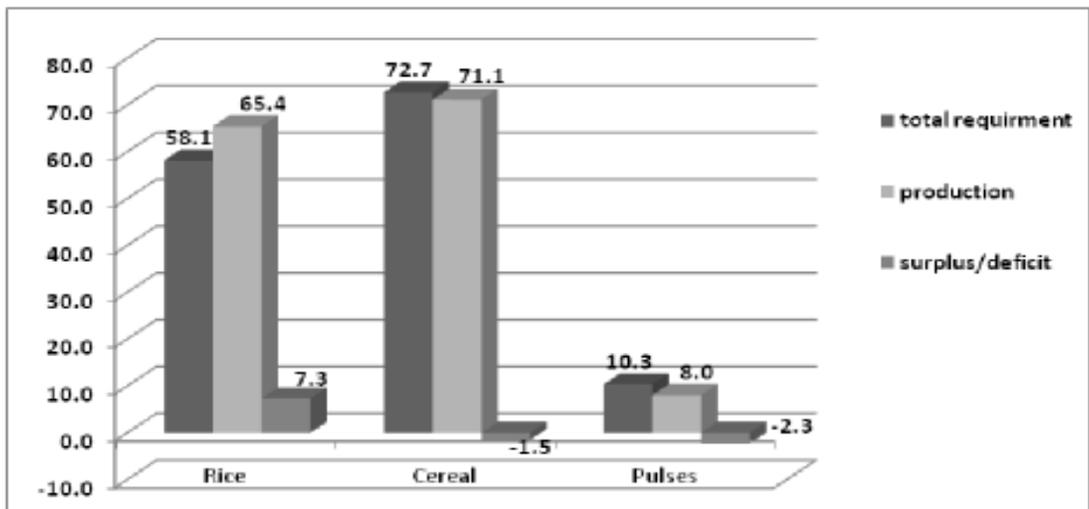
Mere production of food grains does not guarantee food security. In order to judge the availability dimension, it is important to know about the marketable surplus of these food grains. The marketable surplus refers to the surplus of produce after meeting the household's consumption for food and other requirements. Table-1 shows the marketable surplus of rice, cereals and pulses in Odisha from 2001-02 to 2011-12. But it could be seen that though the state enjoys a marketable surplus in rice it suffers deficit in cereals and pulses (figure 2).

Table 1: Consumption and production of food grains in Odisha from 2001-02 to 2011-12 in lakh ton

Year	Projected Population	adult equivalent to 88%	Rice			Cereals			Pulses		
			total requirement	production	surplus/deficit	total requirement	production	surplus/deficit	total requirement	production	surplus/deficit
2001-02	370	325	54.4	71.5	17.1	68.0	75.4	7.4	9.7	7.0	-2.7
2002-03	375	330	55.1	32.4	-22.7	68.9	35.9	-33.0	9.8	4.58	-5.2
2003-04	380	335	55.8	67.3	11.5	69.8	71.1	1.3	9.9	6.2	-3.7
2004-05	385	339	56.6	65.4	8.8	70.7	69.6	-1.1	10.1	6.3	-3.8
2005-06	390	344	57.3	69.6	12.3	71.7	74.3	2.6	10.2	7.9	-2.2
2006-07	396	348	58.1	69.3	11.2	72.6	74.3	1.7	10.3	8.7	-1.7
2007-08	401	353	58.8	76.6	17.7	73.5	83.5	9.9	10.5	9.1	-1.4
2008-09	406	357	59.6	69.2	9.6	74.5	76.4	1.9	10.6	9.9	-0.6
2009-10	411	362	60.4	70.2	9.8	75.5	77.5	2.0	10.7	9.6	-1.1
2010-11	417	367	61.2	69.3	8.1	76.5	77.7	1.2	10.9	10.0	-0.9
2011-12	422	372	62.0	59.0	-3.1	77.5	67.0	-10.6	11.0	9.2	-1.8

Source: Statistical abstract of Odisha, 2012

Note: requirement of rice is 400 gm, cereals is 500 gm and pulses is 50 gm per adult per day

Figure 2: Average marketable surplus/deficit of food grains in Odisha from 2001-02 to 2011-12 in lakh ton

Source: Compiled by author

3. Absorption

It is generally defined as biological absorption of the food consumed. This in turn is related to several factors such as nutritional knowledge and practices, stable and sanitary physical and environmental conditions to allow for effective biological absorption of food and health status. Life expectancy at age one, infant mortality rate, percentage of nutritional status of children less than three years are used as the criteria to measure absorption.

3.1. Life expectancy at age one

Health is an important determinant of well being. Good health enhances the capabilities of a human wellbeing to work and participate in economic development. Life expectancy at birth (LEB) is one of the main health indicators. Economic Survey 2014-15 also shows an inter-state comparison of life expectancy at birth. Though over the years LEB has improved in Odisha, still it is second lowest for males and fourth for females as on 2011-15.

3.2. Infant Mortality Rate (IMR)

Like LEB, IMR is also another health indicator that shows the health wellbeing of a region. The same Economic Survey also shows the IMR of Odisha in comparison to the other major states. It can be seen that though IMR in Odisha has declined over the years but still it is very high. Further, Odisha is having the second highest IMR as on 2011.

3.3. Nutritional status of children less than three years

Nutrition is very important for the sound health particularly for children who are in growing stage. Child weight can be viewed as the output of a health production function whose inputs also include elements such as nutrition intakes, exposure to infections and health care. The Economic Survey also shows the nutritional status of children less than three years in Odisha from 2011-14. It depicts that still about thirty percent of children are under nourished. Though the figure is on decline but it is very slow. This shows that large number of children are suffering from malnutrition and need urgent attention from the government.

Thus from the above, it is evident that Odisha suffers from food and nutritional insecurity. On the basis of accessibility it is found that vast sections of population are living below poverty line which shows lack of purchasing power to access food and even MPCE is also very low on food as compared to other major states. With respect to availability component, production of food grains is highly unstable and there is marketable deficit in cereals and pulses which satisfies the nutritional aspect of health. The third criterion which is related to absorption shows that Odisha also suffers from very high IMR, Low LEB and poor nutritional status of children. Therefore, it becomes pertinent on the part of government to intervene through some public policy in the interest of people at large. No doubt, various programmes have been undertaken by the government. But of all these programmes, Public Distribution System (PDS) has evolved as a major policy instrument which aims at not to provide essential commodities to the people particularly weaker sections at reasonable price but also to make significant contribution in raising the nutritional standard of the poor (Kavita, 2014).

II. Contribution of PDS to the food and nutritional security-An interstate analysis with special reference to Odisha

Over the years, the role of PDS has expanded enormously as food security and poverty alleviation measure to become a permanent feature in the Indian economy and it evolved as a major instrument of government economic policies. In 1992, PDS was replaced with Revamped Public Distribution System to focus more on BPL. It distributes essential commodities like rice, wheat, sugar, kerosene and edible oil through fair price shops at subsidized price. With this context, how far it has succeeded in achieving its objective of providing food security to the households particularly in Odisha is examined in this section. Off take quantity refers to amount that is actually purchased by the states and then distributed to fair price shops. Our study shows that five states (U.P, T.N, Maharastra, W.B and A.P) account for forty-seven percent of the total PDS off take. Whereas the share of poor states likes Jharkhand, Chhattisgarh, Odisha is very low. This shows that there are inter-state variations in terms of off take of PDS food grains and are mainly biased towards southern states. Further it is also essential to have an insight with regard to the number of households that are getting benefit from PDS for possession of ration card.

NSSO Report, 2011-12 shows that only forty-seven percent in Odisha have ration cards under BPL category whereas five percent have it under Antodaya category in rural areas. Similarly in urban areas two percent under Antodaya category and sixteen percent under BPL category have ration cards. But surprisingly thirty percent in rural areas and sixty-six percent in urban areas have no ration cards in Odisha which is the second poorest state in India. But states like A.P, Karnataka, and Chhattisgarh have more number of ration card holders though their poverty head count ration is less than Odisha.

The same NSSO Report also shows that the percentage of dependence of households in rural areas of Odisha on PDS rice (Which is the staple food of the state) is only fifty-five percent, whereas on other sources it is more than ninety percent. That means dependence of households for consumption of rice is very less in comparison to other states in the context of second poorest state. Whereas in states like A.P, Tamil Nadu, Kerala, we could see the dependence on PDS is more than seventy percent. In case of wheat, it can be seen that only 11% and 12% of households depend on PDS in rural and urban areas. But, the dependence of rural and urban Odisha on wheat from other sources is 50 % and 65% respectively. These percentages are high for states like Maharashtra, M.P and Gujarat where wheat is the cereal food grain.

Thus from this section it is evident that Odisha despite of one of the poorest state, households are getting less benefit from PDS. This is because percentage of households having no ration card is comparatively more in Odisha than in other states in both rural and urban areas. Further, PDS is only providing rice and wheat to poor, neglecting the nutritional status of poor. Even with respect to rice, PDS caters only thirty percent and sixteen percent of the household consumption in rural and urban areas respectively. Even the proportion of households depending on other sources is more in both rural and urban areas in comparison to their dependence on PDS for the consumption of rice. Though PDS is working to provide food and nutritional security to people in Odisha but it has failed in its attempt.

III. Conclusion and Policy implication

It is evident from the above discussion that Odisha is suffering from food and nutritional insecurity. PDS as a biggest welfare programme has been introduced by the government to provide food and nutritional security to the poor and marginalized section of population. Through a wide range of networking, PDS is trying to serve the people at their door step in terms of providing essential items at subsidized price on regular basis. To some extent it has succeeded in achieving its objectives. But, there are some constraints and loopholes in the working of the scheme to achieve the desired objectives. It has been found that there is wide variation in the distribution of off-take food grains. Further, benefits of PDS are not reaching to the actual beneficiaries for whom it is meant. There is a large number of BPL who is excluded from PDS benefits. Thus benefits from PDS to poor are limited. There is also diversion of subsidized food grains to open market. This shows the problem of leakages in the PDS operation. Furthermore, by providing only cereals food grains like rice and wheat, PDS is ignoring the nutritional aspect of poor.

In the present scenario, food and nutritional security is one of the most significant human development aspects. There should be reduction in inter-state variation in terms of PDS off take keeping in mind the size of population of the state and its requirement. There is need of improvement in the administration of PDS. Further, the selection procedure of BPL beneficiaries should be improved. Stringent rules and laws should be implemented to check the diversion of supplies to open market. To improve the nutritional status of poor section, protein based items like Pulses and Ragi needs to be included in the scheme. And structural reforms should be introduced for the better working of PDS in the interest of poor and marginal section of the community.

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Food Security Issues of Odisha: Related Concerns

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Odisha is one among the EAG states under the focus of the central government for its low health indicators. One of the major causes of these health issues is the huge scale of malnourishment and undernourishment among the population in the state. Thus any issue of food security has to address both the quantitative and quality aspect. While more than 80% of the population of the state depends on agriculture, its contribution to the NSDP has shown a declining trend. There has been less diversification of crops with a higher dominance of foodgrains. Yet the yield per hectare when compared state-wise and district-wise reflects a low performance due to low commercialisation of agriculture in the state which is practiced more for domestic consumption. Along with the low absorption of modern technology and high subjectivity to the vagaries of the climatic changes, the state faces the problem of food security. This paper throws light on some of these issues related to food security in the state.

Keywords: Cropping Pattern, Cultivation, Foodgrains, Food Security.

Introduction

Food security is defined as the accessibility to the right quantity of nutritional food by all for a healthy and active life (World Food Summit, 1996). So it refers to not only the production and availability of foodgrains but their physical and economic accessibility as well, which necessitates the existence of an effective delivery system. Thus lack of food security is the cause behind mass scale malnutrition, deficiency diseases and inability to absorb food. These symptoms of food insecurity in turn take a cyclical form with food insecurity leading to ill-health and deficiency diseases which in turn leads to low food absorption thus aggravating food insecurity.

Thus overall the food security of a region can be assessed at each level in terms of 3 broad indices which are:

1. Availability of foodgrains measured in terms of productivity.
2. Accessibility to food at the individual and household level.
3. The ability of food absorption estimated in terms of the existing problem of malnutrition and deficiency diseases.

Objectives

The objectives of the present study are:

1. To analyse the area, yield and productivity of some major foodgrains in the state.
2. To assess the functioning of the public food delivery system through the PDS.

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Hypothesis of the Study

1. Declining foodgrain production is one of the reasons for the issue of food security.
2. The public distribution system has failed to address the issue of food security adequately.
3. The above factors along with other social and economic factors have affected the food safety among the vulnerable group.

Food Security issues of Odisha

Odisha has a population of 4.19 crore according to 2011 census with a decadal growth rate of 13.97% over 2001-2011. It has a rural population of 3.49 crore with a decadal growth rate of 11.98% over this period.

The state has a HDI of 0.442 in 2011 ranking 19th among the major states. Though this is an improvement over the years from 0.404 (ranking 11th) in 2001, yet there exists wide inter-district variations. While Khurda ranks 1st with a HDI of 0.736, it is 0.370 for Malkangiri ranked at 30th. The Infrastructure Development was found to be 160.04 for Khurda ranked first while for Malkangiri it is 75.65 ranked at 27. Thus the HDI was found to vary immensely with the infrastructure development of the region in vital fields like education, health etc (Annual Plan, 2012-13).

It has a huge marginalised population of nearly 40% of SCs (17.13%) and STs (22.85%), according to 2011 census. These tribes are mainly concentrated in the north western districts consisting of Sundargarh, Keonjhar and Mayurbhanja and South-western districts consisting of Koraput, Kalahandi, Phulbani and Bolangir. Being poor, they face social and political deprivation, having limited access to food security. Over this the depletion of forest resources has hampered their source of livelihood further depriving their economic condition and food accessibility. Similar is the condition of the Schedule

Table 1 - Status of Food Security in Districts of Odisha

Secure	Moderately Secure	Moderately Insecure	Severely Insecure	Extremely Insecure
Jharsuguda	Nayagarh Cuttack Jagatsinghpur Balasore	Dhenkanal Mayurbhanja Puri Kendrapara Deogarh Anugul	Balangir Nabarangpur Jajpur Sambalpur Sonepur Sundargarh Keonjhar Bhadrak Bargarh Boudh Kalahandi Ganjam Koraput	Nuapada Rayagada Gajapati Malkangiri Kandhamal

Source: Food Security Atlas of Rural Orissa

castes (SCs) who are mainly concentrated in the 4 coastal districts of Ganjam, Cuttack, Balasore and Puri. These marginalised populations are away from the development process of the other parts of the state and the benefits of Public distribution system of subsidised food availability. Mainstreaming these groups has been the biggest challenge to the issue of food security for the state. It is to be worth mentioning here that the schedule area of the state consists of 45% of the total geographical area of the state.

It can be seen that only Jharsuguda district is found to be secure followed by the coastal districts of Balasore, Jagatsinghpur, Cuttack and Nayagarh being moderately secure. Rest 24 out of 29 districts (leaving out Khurda) comes under estimated food insecurity issues divided into moderately insecure (6 districts), severely insecure (13 districts) and extremely insecure (5 districts). Thus 83% of the state is reeling under food insecurity problems.

Food insecurity condition leads to several coping mechanism particularly among the poor and vulnerable groups. This ranged from limiting the quantity and frequency of intake of food, borrowing of food or money to buy food, changing the consumption pattern with regard to food and non-food items etc. The pattern takes inhuman form in case of crisis exposing these underprivileged groups to disease and deprivation. One such mechanism is 'maternal buffering', i.e., the mother deliberately lowering her intake of food to feed her children. Also it takes the form of dependence on low quality food like wild tuber or leafy vegetable consumptions, low quality cereals etc. This has been mainly observed among several remote villages and tribes (Odisha Development Report, 2004).

One aspect of the overall agricultural productivity depends on the land utilisation pattern in the state (as reflected in Table 2). It is seen that the forest area has remained constant over the decade from 2000-01 to 2013-14 showing an increase of 6% from 1990-91 to 2000-01. However the land cover under miscellaneous trees has shown a decline of 44 % (from 1990-2001) to 29% over the next decade. There has been an increase in the percentage of land put to non-agricultural use, barren and unculturable land as well as current fallow. The Net Sown area in the state has been declining by 7% on an average over these decades. Thus the overall land available for cultivation is declining being diverted to other non-agricultural use and due to urbanisation. The estimated average size of the land holding for all social groups has declined to 1.15 ha in Odisha (GoO, 2010-11).

The overall land utilisation pattern has significant effect on land availability for agriculture and its productivity. The rapid degradation of forest resources has made the state vulnerable to flood and droughts. Similarly, increased sedimentation of the delta channels results in flood besides creating the problem of waterlogging in the coastal deltas. Again the destruction of the coastal mangroves has increased the susceptibility of the state to frequent cyclonic storms originating in the Bay of Bengal.

Table 2 - Land utilisation pattern in Odisha

(Area in 'ooo' hectare)

Year	Geog. Area	Forest area	Misc. Tree	Perm. Pastures	Culturable waste	Land put to non-agri use	Barren and unculturable land	Current fallow	Other fallow	Net sown area
1990-91	15571	5476	859	726	597	746	499	150	214	6304
2000-01	15571	5813	482	443	392	999	843	430	340	5829
2013-14	15571	5813	342	494	375	1298	840	756	229	5424
% Change from 1990-91 to 2000-01		+6%	-44%	-39%	-34%	+34%	+69%	+186%	+59%	-7.5%
% Change from 2000-01 to 2013-14		No change	-29%	+11%	-4%	+30%	-0.3%	+76%	-33%	-7%

Computed from the data

Source: Directorate of Agriculture and Food Production, Odisha

Due to low productivity of agriculture and unremunerated earnings the farmers are either left with no work in off-season and are also found to divert themselves to other works. This has immense adverse effect on the man-power availability for cultivation. The percentage of cultivators and agricultural workers to total workers has shown a declining trend over the years in the state (Table 3). This shows the migration of the agricultural workers to other occupations over the years. There has been a decline of about 12% agricultural workers to total workers from 1981 to 2011.

Table 3 - Percentages of Cultivators and Agricultural Labourers to the total workers in Census Years

Year	% of cultivators and agricultural labourers to total workers in the Census years
1981	74.70
1991	73.00
2001	64.70
2011	61.80

Source: Economic Survey 2014-15

Another way to assess the food security issue is through the variation in the Engel's ratio over the years. The Engel's ratio is the ratio between the share of food expenditure to the total expenditure and is thus indicative of the standard of living of the people. The Engel ratio for the state of Odisha is found to be higher than the national level for all years from 1999-2000 to 2011-12. However it has shown a fluctuation over the years. Overall it has declined from 64.11% in 1999-2000 to 39.26% in 2011-

12. The food absorption rate was further analysed from the consumption of rice and wheat in Odisha based on monthly per capita consumption (in Kg) shown in Table 4.

Table 4 - Monthly Per-capita rice and wheat consumption in odisha and at all india level (kg)

NSS Round	Odisha				India			
	Rural		Urban		Rural		Urban	
	Rice	Wheat	Rice	Wheat	Rice	Wheat	Rice	Wheat
1	2	3	4	5	6	7	8	9
50 th July 93- June 94	15.2	0.4	11.3	2	7	4.4	5.3	4.7
68 th July 11 th – June 12th	12.56	0.78	9.26	2.09	6.13	4.42	4.66	4.32

Source: NSSO, Government of India

While the consumption of cereals (rice and wheat) has shown a decline in terms of monthly per capita consumption in rice and marginal increase in wheat consumption, it has increased in terms of MPCE in rupee terms (Table 5). This is indicative of the fact that the overall increase is due to an increase in price of these cereals over the years and not due to actual consumption in kind. As can be seen, while the price of wheat and mustard oil has increased by 65% on an average, that of rice, Mung dal and sugar has increased by more than 100%. This makes the most basic cereal consumption inaccessible to a huge population who cannot afford them.

Table 5 - Average Retail Price of Some essential commodities in Odisha (Rs/kg/ltrs)

Commodities	2004	2012	% change
1	2	3	4
Rice(Common)	8.47	18.00	112.5
Wheat	9.31	15.40	65
Mung Dal	24.08	69.68	189
Mustard Oil	55.53	92.69	67
Sugar(free sale)	17.23	35.92	108

Source: DE and S, Odisha

Though Odisha has shown an increase in the total plan expenditure in the 12th plan over the 11th plan by about 134%, yet it is much less when compared with other states like Kerala (201%), Madhya Pradesh (182%), Meghalaya (150%), Tamil Nadu (153%) etc. Even Bihar has shown an increase by 225% over this period. This reflects the spending on infrastructure in the agriculture and allied sectors like

irrigation facilities, storage etc. Thus the state has lagged behind other states on this front of agricultural spending.

The state experiences a huge fluctuation in the production of foodgrain because of the high dependence on monsoon as well as the vulnerability to natural calamities. For instance, in 2013-14 the foodgrain production was 83.60 lakh tonnes compared to 63.16 lakh tonnes in 2011-12 and 102.10 lakh tonnes in 2012-13. Table 6, shows the area, production and yield of foodgrains in major producing states over the period 2011-12 and 2012-13. In the table the states have been arranged in decreasing order of percentage share of production during 2012-13. Odisha ranks at 11th position out of the 17 major foodgrain producing states in India with a production of 8.35MTs in 2012-13. Though this is an improvement over the production level of 6.41 in 2011-12, yet the state ranked behind many other states in terms of some major agricultural indicators. Only 28.50% of its area is under irrigation in 2010-11 compared to 76% in U.P., 98.5% in Punjab, 63.5% in Andhra Pradesh etc. Also there exists inter-district variations in the area, production and yield of Kharif and Rabi foodgrains in the state (Table 7). The variability is found to be less for yield of Kharif crops over the Rabi crops which reflects a huge coefficient of variation (C.V.) of 78% (approx.). Same is the observation for production of Kharif and Rabi foodgrains, where the C.V. is almost double of that of the former. Overall the variation in yield in terms of kg./ha is found to be less than the C.V. of production (in '000' MTs).

Table 6 - Area, Production and Yield of Foodgrains during 2011-12 and 2012-13 in major producing states along with coverage under irrigation

(Area-Million Hectares, Production –Million Tonnes, Yield – Kg./Hectare)

State	Area	% to All India	2012-13#	% to Production	Yield	Area	% to All India	2011-12	% to Production	Yield	Area under Irrigation (%) 2010-11
UP	19.96	16.61	50.84	19.91	2547	20.13	16.14	50.28	19.39	2498	75.80
Punjab	6.59	5.49	28.07	10.99	4258	6.51	5.22	28.39	10.95	4361	98.50
MP	14.13	11.76	23.42	9.17	1657	13.5	10.82	20.39	7.86	1510	45.90
Rajasthan	12.17	10.13	18.03	7.06	1482	14.44	11.58	19.47	7.51	1348	26.40
Andh.Pradesh	6.85	5.70	17.93	7.02	2616	7.29	5.84	18.36	7.08	2519	63.50
WB	6.09	5.07	16.51	6.47	2711	6.04	4.84	15.99	6.17	2647	49.30
Haryana	4.39	3.65	16.22	6.35	3698	4.63	3.71	17.96	6.93	3879	86.40
Bihar	6.71	5.58	15.62	6.12	2329	6.7	5.37	14.05	5.42	2097	64.40
Karnataka	7.42	6.18	10.93	4.28	1472	7.43	5.96	12.10	4.67	1629	27.00

Maharashtra	10.11	8.41	10.69	4.19	1057	10.86	8.71	12.54	4.84	1155	17.60
Odisha	5.04	4.19	8.35	3.27	1658	4.92	3.94	6.41	2.47	1303	28.50
Chhattisgarh	5.04	4.20	7.63	2.99	1514	4.96	3.98	6.87	2.65	1385	28.90
Gujarat	3.68	3.06	7.32	2.87	1990	4.74	3.80	8.87	3.42	1871	45.50
Tamil Nadu	2.89	2.41	6.29	2.46	2175	3.21	2.57	10.15	3.91	3162	62.20
Assam	2.52	2.10	4.76	1.86	1889	2.74	2.20	4.66	1.80	1701	4.60
Jharkhand	2.31	1.92	4.30	1.68	1861	2.32	1.86	4.18	1.61	1802	7.00
Uttarakhand	0.93	0.77	1.80	0.71	1939	0.59	0.76	1.85	0.71	1947	43.10
Others	3.33	2.77	6.64	2.60	@	3.38	2.71	6.77	2.61	@	-
All India	120.16	100.00	255.36	100.00	2125	124.75	100.00	259.29	100.00	2078	47.80

@-Yield rate is not worked out due to low area/production in individual states.

4th Advanced Estimates. * Provisional

Source: Directorate of Economics and Statistics, Department of Agriculture and Cooperation

Table 7 - District-wise Area, Yield and Production of Total Foodgrain in Odisha

(A-Area in '000'ha, Y-Yield in Kg./ha, P-Production in '000' MTs)

Sl. No.	District	Total foodgrain								
		Kharif			Rabi			Total		
		A	Y	P	A	Y	P	A	Y	P
1	Balasore	206.93	1714	345.61	55.90	1827	102.15	262.83	1738	456.76
2	Bhadrak	155.68	1857	289.11	18.92	747	14.14	174.60	1737	303.25
3	Bolangir	292.20	1534	448.13	75.89	530	40.23	368.09	1327	488.36
4	Sonepur	115.81	1982	229.59	54.75	1948	106.98	170.56	1972	336.27
5	Cuttack	137.05	1792	245.60	115.30	507	58.51	252.35	1205	304.11
6	Jagatsinghpur	87.47	1572	137.48	55.68	451	25.10	143.15	1136	162.58
7	Jaipur	132.99	1314	178.31	58.78	378	22.22	191.77	1046	200.53
8	Kendrapada	132.68	1234	163.75	80.37	460	37.01	213.05	942	200.76
9	Dhenkanal	116.78	1219	142.36	48.03	431	20.69	164.81	989	163.05
10	Anugul	144.88	623	90.19	45.87	447	21.89	190.75	588	112.08
11	Ganjam	369.34	1404	518.45	218.80	513	112.19	588.14	1072	630.64

12	Gajapati	77.28	1481	144.44	23.52	644	15.15	100.80	1286	129.59
13	Kalahandi	329.74	1879	619.53	156.08	1331	207.76	485.82	1703	827.29
14	Nuapada	168.29	1284	216.04	47.14	621	29.28	215.43	1139	245.32
15	Keonjhar	239.56	1071	256.67	49.58	616	30.52	289.14	993	287.19
16	Koraput	227.29	1471	334.24	48.65	1205	58.64	275.94	1424	392.88
17	Malkangiri	123.39	1890	233.24	23.19	705	16.34	148.58	703	249.58
18	Nabrangpur	218.22	2410	527.83	20.89	1400	29.25	239.11	2330	557.08
19	Rayagada	140.98	1574	221.94	26.28	786	20.65	167.26	1450	242.59
20	Mayurbhanj	326.90	900	294.28	28.54	784	22.38	355.44	891	316.66
21	Khandhamal	85.29	1270	108.32	16.18	372	6.02	101.47	1127	114.34
22	Boudh	79.27	1102	87.35	24.45	528	12.90	103.72	967	100.25
23	Puri	120.97	1543	186.60	99.34	963	95.66	220.31	1281	282.26
24	Khurda	102.90	1667	171.58	55.66	507	28.20	158.56	1260	199.78
25	Nayagarh	110.16	1549	170.69	70.79	305	21.58	180.95	1063	192.27
26	Sambalpur	167.59	963	161.32	39.82	2305	91.77	207.41	1220	253.09
27	Baragarh	298.80	1505	449.84	85.72	3402	293.19	384.52	1932	743.03
28	Deogarh	58.38	637	37.17	8.46	457	3.87	66.84	614	41.04
29	Jharsuguda	65.36	575	37.58	8.04	690	5.55	73.40	588	43.13
30	Sundargarh	259.97	668	173.53	30.27	680	20.58	290.24	669	94.11
31	Total	5092.15	1414	7199.77	1690.88	929	1570.10	6783.04	1293	8769.87
Col 1 -30	Mean	169.74	1389.47	240.69	56.36	884.67	52.35	226.17	1213.07	288.99
Col 1 -30	Stdev	86.996	440.96	146.85	45.03	689.26	63.53	117.99	430.65	196.62
Col 1 -30	C.V.	51.253	31.74	61.015	79.88	77.91	121.36	52.169	35.50	68.03

Source: Government of Odisha, Odisha Agriculture Statistics, 2010-11

As already mentioned, the mere productivity of foodgrain would not ensure its accessibility. It is determined by its physical and economic accessibility. The economic accessibility is influenced by livelihood security. For instance employed people would have better economic accessibility to food relative to the unemployed or one with casual employment status. Again economic accessibility

would be futile without physical accessibility to the needed food which in turn can only be guaranteed by an effective delivery system.

Pds System In Odisha

The system of distributing essential commodities by the govt. to the people who are unable to purchase these commodities at the prevailing market price is called the public distribution system (PDS). The PDS system was introduced to provide food security to the people living below the poverty line. The proper functioning of the PDS is the responsibility of the central govt. as well as the state government. The responsibility of the central government is to procure, transport, store and allocate food grains whereas the responsibility of the state government is not only to identify the families coming under this system and allocate them the food grains at reasonable prices through ration cards issued to them but also to monitor and supervise the proper functioning of the system in the state. As far the state of Odisha is concerned, there is utmost importance of PDS as compared to other states of India, because out of the total population of 43.34 million, 32.59% of people of Odisha are living below the poverty line (BPL) greater than that of 21.92% of people of India living BPL. Further the economy of Odisha is largely dependent on agriculture. Out of the total population, 61.8% people of Odisha are dependent on agriculture which is more than the percentage of population of India i.e. 53% depending on agriculture (Census 2011). The economic development of Odisha is dependent on agriculture which is heavily dependent on rainfalls. But the shortage of rainfalls and frequent occurrence of natural calamities (Cyclone, flood and draught) in the state aggravate the problem of poverty. Further increase in population of the state is another factor for more requirements of foods from PDS. So, the central govt. has to supply essential foods and increase its quantities to the state from time to time. Even if the PDS is functioning in the state for more than a decade in the state and has been modified several times as per the need to provide food security to the poor, still it failed in reducing poverty, malnutrition and hunger of the state as the scheme has some flaws in its functioning because of presence of some leakages in its delivery system. The following table shows amount of off-take and consumption of food grains by the state from the PDS with percentage of leakages in the system.

Table 8 - Per Centage of Leakages in the PDS in Odisha

Year	Total off-take of rice and wheat from PDS (in MMTs)	Total consumption (MMTs)	Leakage (in MMTs)	Leakage (in %)
2004-05	1.15	0.36	0.79	68.6%
2009-10	1.83	1.27	0.56	30.6%
2011-12	2.44	1.54	0.9	36.8%

Source: NSSO 68th round

MMTs - Million metric tonnes

Table 8 shows that total off-take of rice and wheat by the state govt. from PDS increased from 1.15 MMTs in 2004-05 to 1.83 MMTs in 2009-10 and 2.44 MMTs in 2011. Total consumption from the PDS is also increasing from 0.36 MMTs 2004-05 to 1.27 MMTs in 2009-10 and 1.54 MMTs in 2011-12. This is

because of increase in population and frequent natural calamities in the state. But the percentage of leakage in the system declined from 68.6% in 2004-05 to 30.6% in 2009-10 and 36.8% in 2011-12. This is because government is taking many steps to reduce leakages in the PDS to give proper food security to the poor to reduce malnutrition and hunger in the state.

Problems of PDS in Odisha

However the functioning of the delivery system in the state has been found to be inflicted with many lacunas some of which has been highlighted below:

Ghost cards: Existence of ghost cards in the state among the ration cards holders provided by PDS makes the essential commodities out of the reach of the poor people. Out of the total ration card holders in Odisha 88,418 ration cards are ghost cards. About 68,571 ghost cards are from BPL group which is the highest as compared to that of 9970 and 9877 from above the poverty line (APL) and Antyodaya Annapurna Yojna (AAY) respectively (Ministry of food supplies and consumer welfare, 2010).

Multiple ration cards: There are multiple card holders under PDS system in the name of the persons of their family members who are not even eligible for the ration card as per their age. Out of the total of 85 lakh ration cards holders in Odisha, about 98,320 are bogus cards. In Sundargarh district there are 21,092 ghost cards as compared to that of 17,478 of Khurda and 13,005 of Jagatsingpur (Justice Wadhwa Commission, 2011).

Lack of storage facility: In the state as there is shortage of storing houses, large amount of food grains kept in open places till they are distributed to the poor people. So, a large amount of the food grains gets damaged and rotten resulting in less availability to the poor. Thus, the PDS in the state here fails in providing food security to the poor for reducing malnutrition and hunger. Poor people of the rural areas are also getting very less amount of kerosene as compared to their required amount from the FPSs.

Low quality of food grains: Most of the commodities provided through PDS in the state are of low quality as there is adulteration by the dealers of the fair price shop (FPS).

Black marketing: The dealers of the FPS are not distributing the actual quantities of food grains supplied by the central government for the poor. They are storing a large amount of the food grains and selling them in the open market at a high price. A study made by Local Business and Institution, Odisha found that beneficiaries of PDS are getting 7 kilo grams(Kg) of wheat as against 15 Kg provided by the government and 20 to 23 Kg of rice as against 25 Kg. So the beneficiaries are deprived of their actual share due to these malpractices.

Low purchasing power: There are many poor beneficiaries in the state under PDS who can ill-afford even the essential commodities from the FPSs.

Illiteracy and ignorance: In most cases the intake of food grains from the FPSs are less because of their ignorance regarding the actual quantities of food grains supplied for them under PDS. For instance, about 47% poor of Keonjhar district took fewer quantities of foods than actual amount

supplied for them by the government as compared to that of 39% in Koraput district (Mishra, P.R., Rout P., 2009).

Less accessibility: People taking commodities from the FPSs are not only irregular but also less in numbers, because of the distant location of the FPSs from their houses as they are less in number. This creates spatial inaccessibility for the poor people, particularly in the tribal areas. In Malkanagiri, as most of the people are living in forest, they are unable to collect the food from the FPSs at all the time. Even if some of them are coming to the FPSs after walking a long distance, they get to know about the non-availability of the stock of food grains by the dealers (Johani, 2014).

Autonomy of the retailers: The retailers of the FPSs supply the commodities to the beneficiaries for a few days and open their shops for a few hours. So, most of the poor from the interior areas cannot access the commodities. About 31% of poor people of Kalahandi district failed to collect the commodities from the FPSs as these shops are opened for a few number of days as per the convenience of the retailers (Mishra, P.R., Rout P., 2009).

Conclusion

Thus in Odisha while on one hand there is the problem of meeting a vast number of people in food insecurity, the issue gets aggravated by the existing socio-economic and human created factors. The agricultural productivity is failing to match the pace of population growth. The marginalisation of the small farmers leads to their migration thus lowering the agricultural labourers to total workers ratio. Though the consumption of foodgrains shows an increase in terms of their expenditure, they show a decline in terms of their real consumption in kind. The existing lacunas in the operation of the PDS deprive the beneficiaries of the food security. The state faces the challenge of not only addressing the food security issues of the poor but also the mainstreaming of the vast marginalised section consisting of the SC and ST population in the state.

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Food Security in Odisha : Challenges & a few Suggestive Measures

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The concept of food security necessitates that timely , reliable and nutritionally adequate supply of food should be available on a long term basis so that it takes care of increase in population and increase in the income of the people. Agriculture in Odisha is quite vulnerable and in the last two years Odisha has witnessed how vulnerable it really is. Thus the issue of food security is related to the efforts made to augment production of food stuffs and making the subsidized food available to the vulnerable targeted section through proper distribution system.

The special agri- budget of the State for 2015-16 is higher by 11.6% over 2014-15 agri budget. The State Government has set food grain production target of 10.1 million tones in the kharif. Poverty due to shortage of food in the society has seen a drastic fall. The agricultural department of Odisha is undertaking various activities like farmer’s meeting, crop awareness programme, crop seminar, kisan mela, training on various types of cultivation, subsidy for setting up of different farm related business private and community irrigation projects. For sustainable procurement & storage of food, the credible private sector ware houses are made more active. National Food Security Act, 2013 has been implemented in the State in November 2015, under which 3 crore and 26 lakh beneficiaries accounting from 78% of the State’s population are eligible to avail the subsidized food grain. A subsidized meal scheme known as Aahar Scheme, implemented on 1st April 2015 , on Odisha day, rice and dal curry provided to urban poor at Rs.5/- per meal by the State Government. Besides many other Central Schemes are implemented so as to achieve food security in the state.

Keywords : Nutritionally adequate supply, subsidized food, sustainable procurement, credible private sector, Aadhaar scheme.

Introduction

Food Security generally implies steps to achieve adequate food production and initiatives to reach food stuffs of right quality and quantity to the right places and vulnerable persons at the right time and at an affordable cost in the form of subsidy. Production of food does not merely mean availability of food grains but to the overall availability of edibles including fruits and vegetables , dairy products ,

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eggs, meat and fish. However, a standard definition of food security includes the necessary macro and micro nutrients, safe drinking water, sanitation, environmental hygiene, primary health care and education so as to lead a healthy and productivity life by every individual. Thus defining a standard measure of food security involves proper attention to both food and non food factors. Further, the concept of food security necessitates that timely, reliable and nutritionally adequate supply of food should be available on a long term basis so that it takes care of increase in population and increase in the income of the people. With a view to ensuring adequate physical availability of food, what needs to take central stage, as Arvind Subramanian, the Chief Economic advisor feels, is focus on agricultural growth and check on food inflation. Agriculture in India is quite vulnerable and in the last two years India in general and Odisha in particular have witnessed how vulnerable it really is, especially in the context of climate change. Thus the issue of food security is related to the efforts made to augment production of food stuffs and making the subsidized food available to the vulnerable targeted sections through proper distribution system. However, to ensure accessibility to subsidized food by the targeted groups, efforts are to be made to provide alternative sources of income for farmers particularly with low holding size and landless agricultural labourers.

Objectives of Study

1. To highlight on the challenges of ensuring food security in Odisha in the context of growing more food crops by bringing reforms in farm sector.
2. To discuss the policy measures taken by the Government of Odisha to provide subsidized grain to the targeted section as a right to food campaign.
3. To provide a few suggestions for improving food production sustainable procurement and better distribution of food to the vulnerable group of the state.

Farm sector reform in the State to face challenges of food insecurity

Odisha has witnessed a significant development in last few decades in all the sectors including agriculture. Poverty due to shortage of food in the State has seen a fall from 57.2% in 2004-2005 to 37% in 2009-10 and 28% in 2014-15. Though Odisha's economy is now becoming less agricultural, more industrial and more service oriented, still Odisha is considered as a predominantly agricultural region. Agriculture provides employment for the 65% work force in Odisha. Horticulture based farming is the other factor providing livelihood to the small land holders of the State. Odisha is under a huge coverage of National Horticulture Mission as the State emerges as a hub of export for such produces. Sericulture in the State has already attracted the attention of the Central Government. For the last consecutive 3 years, the Odisha government has been announcing a special package through separate budget, for the development of agriculture and allied sectors. The special agri-budget for 2015-16 allocated Rs.10,654.87 crore which is 11.6% higher than 9,542.22 crore earmarked in 2014-15. The State Govt. had set food grain production target of 10.1 million tones (mt) in the khariff, 2015-9.51 mt. of cereals and 0.587 mt. of pulses.

Table 1 - Khariff Food grains production in Odisha.

Cereals	2012 Production (Mt.)	2015 Projected Production (Mt.)	Pulses	2012	2015 Projected production (Mt.)
Rice	6.38	8.240	Arhar	0.13	0.190
Maize	0.65	1.090	Munga	0.11	0.150
Ragi	0.17	0.162	Biri	0.14	0.176

Source : The State Agriculture and Food Production Department.

Procurement and distribution of subsidized Grain for food security by Government of Odisha

Making farmers happy to grow more food and make them prosperous requires procurement of food at high support prices. And, in ensuring better diets and reduced hunger for food security a system of efficient and pilferage proof distribution system is required to provide subsidized food to the malnourished targeted group.

Most of the farmers of the State execute distress sale at the time of harvesting food grains , resulting into the middlemen building stocks when prices are low to sell on highs, thus, creating price arbitrage. So the government of Odisha has decided to engage private sector warehouses to start MSP operations on their behalf. The private players are allowed for procurement. Transportation and Distribution to the PDS are controlled by the State Government. FCI does not have adequate storage facility. Therefore, private sector ware houses have been active in the State for the past several years holding massive stocks of food grains on behalf of their corporate or bank clients. They have proved to be cost effective too. Hence, the government allows private sector as an agent of FCI to collect food grains but only credible private sector players who would agree to make payments to farmers on account payee cheques/on line transfer and who have good corporate governance practices and past experience and provide MSP to farmers are only allowed.

In order to provide subsidized grain to about 75% of rural and 50% of Urban targeted eligible population 5 Kg of rice or wheat or coarse cereals at Re.1, Rs.2 and Rs.1 per kg. respectively per person per month through State Governments under PDS, the Central Government has passed National Food Security Act (NFSA), 2013. The states had been given time till December 31, 2014 to complete digitization of Food Procurement System (FPS) data, godown data, ration card data, supply chain and seed Aadhaar card data etc. but many States including Odisha did not complete the preparatory measures for the scheme. Therefore, in 2014-15, only 11 odd States were entitled for subsidized food grain which completed the preparatory measures. Though Odisha had completed digitization of FPS and godown data, it was lagging behind in ration card data. The date was extended to 31st December, 2015. Odisha government implemented National Food Security Act, 2013 in November, 2015 , covering 14 out of 30 districts in the First phase. The Act rolled out in the balance 16 districts in December 2015. As per guideline 3 crore and 26 lakh beneficiaries accounting from 78% of the State's population are eligible to avail the subsidized food grain under the scheme. However, the number of registration has topped 3 crore and 92 lakh. Thus, many ineligible and bogus application for access to food grains at concessional

rate under the food security scheme has been received by the State Food Supply Department. The department has detected anomalies in case of 76 blocks and 2 municipalities across the State. The government has directed to the Collectors to initiate criminal proceedings against those ineligible families who do not withdraw their applications on or before 15th January, 2016. As per the data released by Food Supply and customerwelfare department of Government of Odisha, out of 79 lakh 55 thousand families, 69 lakhs 53 thousand families have been provided with new ration card.

Eight Exclusion criteria by Odisha Government for Food Inclusion

The New Food Security Act has given considerable leeway to the State Governments to exclude and include house holds in this programme. Traditionally, income and nutrition have been used to determine households eligibility for access to cheap food. Easily verifiable socio-economic Parameters or physical assets are relied upon to determine exclusion or inclusion of beneficiaries according to this Act. The eight exclusion criteria as prepared by the Panchayati Raj Department are –

- 1) Monthly income above Rs.10,000
- 2) Income Tax payee.
- 3) Persons having four wheelers or three or two wheelers
- 4) Business with Tin.
- 5) Electric consumption above 300 units.
- 6) Any State Government or Central Government employee
- 7) persons having tractors, power tillers, fishing boats or other heavy vehicles
- 8) Persons having entrepreneurship and professional tax payees.

Based on the criteria, the government has decided to delete all bogus ration card holders and APLs counted as BPLs due to erroneous registration to facilitate streamlining of the process for implementation of the Act in the State. The exclusion principle has automatic inclusion of persons like Beggars, destitutes, pension holders, widows, particularly vulnerable tribal groups (PTGs) and persons having disabilities of 40% or above. In Urban areas, beggars, rag pickers, domestic workers, street vendors, construction workers, home based workers and rickshaw pullers among others are included in the process.

At present the department of food and PDS supplies wheat and rice for PDS and other schemes like mid-day meal run by the human resource development Ministry, the nutrition programme run by the women and Child Development Ministry, besides welfare homes like jails and nariniketans. The entire subsidy for these programmes run by various Ministries and departments is billed to the department of food. Food subsidy in 2012-13 was Rs.85,000 crore while in 2014-15, it was Rs.1,15,000 crore.

Aahar Scheme by Odisha Government

Ancillary to the centre's Food Security Measure, the Odisha government implemented a subsidized meal scheme known as Aahar Card on 1st April, 2015, i.e. on Odisha Day. On March 2, 2015 the State

Government had announced launching of Aadhaar Scheme taking a leaf out of Amma Unavagam scheme being run in Tamil Nadu under the scheme rice and dal curry provided to urban poor at Rs.5/- per meal. Since the scheme was announced after the budget the State Government had decided that the funding for the scheme would be arranged from Chief Minister Relief Fund and from CSR Fund of corporates. The Government had asked the Tata Steel, Nalco, RSP, MCL, OMC to provide funds as part of their CSR for Aadhaar., OMC Sponsors the Aadhaar programme in Bhubaneswar and Cuttack, Odisha Power Generation Corporation (OPGC) is funding in Rourkela. Odisha Industrial Infra Structural Development Corporation (IDCO) in Sambalpur, while Tata Steel funds the scheme in Berhampur. Initially the scheme has been implemented in five municipal corporations – Bhubaneswar, Cuttack, Berhampur, Sambalpur and Rourkela. Each Corporation will set up cheap food outlets at bus-stand, railway station and hospital areas targeting 1000 urban poor for one outlet. The Government has selected two NGOs – Touch Stone Foundation, a subsidiary of Akshya Patra Foundation and Manna Trust to operate the scheme. The corporates have been asked to send money to these NGOs to run the operations. As per the recent order of the government Aahar scheme will be implemented in all the district headquarters of the State.

Besides, many popular programmes of Central Government are being implemented in the State which ensure food security to the targeted groups. These are like Sampooorna Gramin Rozgar Yojana, Mid-day Meal scheme, Wheat based Nutrition programmes, National Food for work programme, Antodaya Anna Yojana, MGNREGA etc.

The above farm strategy and reform programmes regarding food procurement and distribution policy of subsidized food to the vulnerable section as adopted by the Government of Odisha would go a long way to augment State Domestic product, achieve self sufficient in food, reduce poverty and under nutrition, increase employment and income among farmers of low holding or no holding.

Conclusion

Farm sector in general and food production in particular are facing troubles in Odisha. Therefore, the issue of food security is related to the efforts made to augment production of food stuffs and making the subsidized food available to the vulnerable targeted sections of the state through proper distribution system. Agricultural sector in Odisha has witnessed a significant development as a result of which poverty due to shortage of food in the State has seen a drastic fall. Several schemes launched, projects started and activities undertaken by the Odisha government to enhance socio-economic status of the farming community and achieve both food and nutrition security. Besides many popular programmes of Central government are being implemented in the State which ensure food security to the targeted groups. Moreover, to ensure accessibility to subsidized food by the vulnerable sections, efforts are made to provide alternative sources of income for farmers particularly with low holding size landless agricultural labourers, destitutes, persons having disabilities of 40% and above and others.

Under National Food Security Act, 78% of State's population are eligible to avail subsidized food grain. The Panchayati Raj Department of the State has prepared eight exclusion criteria to determine households eligibility for access to cheap food. As an ancillary to the centre's food security measure,

the Odisha government implemented a subsidized meal scheme known as Aadhaar Scheme on 1st April 2015, under which rice and dal curry provided to urban poor at Rs.5 per meal.

For reducing food insecurity what is primarily needed is to improve farm productivity and accelerate growth in food through more investments in farm mechanization, research and development, cheap credit facilities to farmers, better irrigation, rationalizing fertilizer subsidy, use of quality seeds of food crops with higher nutritional value, multiple cropping and inter cropping. For sustainable procurement and storage of food, the present PDS system needs to be reformed and the credible private sector warehouses are to be made more active for procurement and holding stocks of food grains and start MSP operations which have proved effective too. And, the control of ration shops be handed over to Panchayats and self help groups for improving distribution of subsidized food to the vulnerable section of the society.

Suggestive Measures for Food Security

For improving farm productivity, sustainable procurement of grains and its subsidized distribution to the vulnerable section for reducing food insecurity, the following few suggestions are offered.

1. For food security, agriculture growth in the State in the long period should be driven by infrastructure, irrigation, private investment, competition and technology, i.e. non-price factors but not price factors.
2. Efficiency in production should be made through sprinkler and drip irrigation, 'per drop more crop', effective use of fertilizer, cost saving mechanization, rationalizing fertilizer subsidy, promoting judicious use of fertilizer through soil health cards, use of quality seeds, adoption of sustainable practices. Those measures should be taken which sustain growth without raising the cost of production.
3. Adopting a formal technology policy with regard to soil health, crop protection chemicals, crop nutrients and seed.
4. Organising farming like that of a company in which farmers can be share holders sort of small and medium sized enterprises.
5. Setting up of agricultural training Institute in the State like the Industrial Training Institute to promote advanced farm skills.
6. Connecting progressive farmers of the state to access knowledge, experiences markets and technology as part of digital India.
7. Developing new crop varieties, particularly of food crops with higher nutritional value through adoption of bio-technology particularly, genetic modification and increasing cropping intensity through multiple cropping and inter cropping to accelerate growth in food and agricultural sector.
8. For sustainable procurement, the government should draw a long term road map and allow private players atleast for some years to make operations viable.

10. For avoiding distress sales and spoilage of horticulture produce of the State, adequate cold storages at major producing centres of the state should allow procurement and sale of horticulture products by cold storage players to attract investment in this sector.
11. Food procurement storage and distribution by FCI is monopoly with no accountability leading to rising costs inefficiency. So the present PDS system should be reformed. It should be decentralized with the states taking their own decisions regarding issue prices and quantum of food grain to be supplied.
12. Handing over control of ration shops to gram panchayats and self help groups.
13. Adopting Bangla Desh Model of homestead farming where rural families have been helped to develop kitchen gardens to meet their daily needs.
14. The government should discourage the distribution of manufactured ready to eat food by food manufacturers and contractors for achieving food security since their intention is to accumulate more of profit.
15. The government has to mount an all out war on implementation bottle necks, bureaucratic risks aversion and regulatory uncertainty for achieving food security in the State.
16. For growing more food to ensure food security there must be enhanced budgetary allocations in the budget to improve investment in agriculture, better irrigation, research and development and post harvesting facilities.

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Poverty and Food Insecurity in the KBK Districts of Odisha

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KBK districts of Odisha are one of the poorest regions in India which depend largely on traditional agriculture. Poverty is an overwhelmingly rural phenomenon and is closely linked to low land productivity, limited diversification and seasonal behaviour in agriculture. Though a significant economic development is made during the last decades; still we are not successful to translate macro-level food self sufficiency into micro-level food security of the poor. Overall poverty levels may have declined, but regional disparities and socio-economic inequalities within the states (and also between the states) are clearly visible.

This paper seeks to identify (i) who are the vulnerable and food insecure; (ii) where are they and why they risk food insecurity; and (iii) what options exist to reduce their vulnerability. The livelihood groups like marginal and small scale farming households, labouring rural households, rural artisan households, and most important scheduled tribal households are most vulnerable to food insecurity. The reason lies in limited physical and human asset base, slow economic growth, limited access to welfare provisions and public services, lack of land reforms, limited diversification in agriculture and difficulties in input-market-credit arrangements. To address this problem of food insecurity, there is a need for massive rural development activities particularly promotion of agriculture linked livelihood.

Key words: food insecurity, vulnerability, vulnerable groups, diversification in agriculture.

Introduction

Despite steady economic growth and development in many parts of the world, a significant proportion of population continues to suffer from food insecurity and malnutrition. Millennium Development Goal recognizes that hunger and food insecurity are the core afflictions of poor people. India is the house to more than a quarter of hungry people in the world. The food production per capita has increased by 8.4 percent from 1990 to 2006 (FAOSTAT). Though a significant economic development is made during the last decades; still we are not successful to translate macro-level food self sufficiency into micro-level food security of the poor. Overall poverty levels may have declined, but regional disparities and socio-economic inequalities within the states (and also between the states) are clearly visible. Poverty is a multi-dimensional concept, and one of the dimensions is food insecurity; a combination of both food non-availability and inadequate access to food grains. Food insecurity causes poverty, but is at the same time also a result of poverty.

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Odisha is one of the poorest states of India suffering from “alarming” levels of hunger (Menon et. al. 2009). Even within Odisha, there are sharp differences in the extent of food security between different regions: coastal, southern and eastern (World Food Program & Institute of Human Development, 2008). The Kalahandi-Balangir-Koraput (KBK) region which consists of 8 districts lying in the southern part of Odisha has historically been found to be suffering from chronic poverty, hunger and distress migration (Parida, 2008). Districts along the Eastern Ghats with a higher share of tribal population are most food insecure (World Food Program & Institute of Human Development, 2008). KBK region did attract a lot of attention ever since the news of starvation death from there came out during the mid’80s. Severe food insecurity here is primarily due to the presence of vulnerable rural population who are basically Schedule Castes & Schedule Tribes with poor & marginal livelihood assets or livelihood susceptible to natural disasters.

Objectives

This paper is a study on the main characteristics and causes of food insecurity in KBK districts of Odisha. It seeks to identify (i) who are the vulnerable and food insecure; (ii) where they are and why they risk food insecurity; and (iii) what options exist to reduce their vulnerability.

Methodology

Data regarding the socio-economic condition of the people, sources of livelihood, condition of agriculture, extent of poverty and migration in the KBK region are collected from secondary sources like Odisha Agriculture Statistics, District Statistical Handbook, Districts at a Glance, Statistical Abstract of Odisha, Census of India and Odisha Economic Survey. Besides some published informations, articles, reports and journals are also referred.

Meaning of Food Insecurity

The broad definition of food security has four dimensions: availability, access, utilization and stability. The pillars of food security are vested, that is, food must be available for individuals to access it and without access to food, individuals cannot utilize food or rely on food as a stable resource (Webb et al, 2006; Barrett, 2010). “**Food security** exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life” (World Food Summit, 1996). The causes of food insecurity are many and can result in availability, access or utilization failures (Barrett, 2002). As per an observation made by M.S. Swaminathan, “If people have access to livelihood, they would in general access to food and nutrition. Those who are unemployed, employed on casual basis or under employed, would have limited access to food”. From another point of view, it may be added here that even the ability to buy food will not guarantee food security unless there is an effective delivery system. Food insecurity may be chronic, seasonal or transitory. **Food security indicators** are prevalence of food inadequacy, relative dietary supply index, share of food expenditure by the poor, domestic food price volatility

Food insecurity could lead to a cycle of malnutrition, deficiency, diseases, poor food absorption and heightened food insecurity. Taking chronic energy deficiency (CED) as a measure of chronic and severe under nutrition and malnutrition, and hence an indicator of food insecurity, it has been

estimated that about 57 per cent of the population of Odisha suffer from CED (Odisha Human Development Report, 2004). In spite of fairly comfortable food availability, food insecurity is chronic. Poor nutrition is a key outcome of food insecurity. **Maternal health and food insecurity** are linked, and the harmful effects of hunger are passed from one generation to the next with malnourished mothers having low-weight babies who face a high risk of stunting during childhood. This can lead to a reduced work and earning capacity of the present as well as the next generation.

Poor Socio-economic Condition and Poverty in the KBK Districts

The KBK districts of Odisha occupy a special place in public debates and public policy interventions as being among the poorest regions in the country. Surprisingly, 49 CD Blocks of the region (out of 80) are “**very backward**” and 28 CD Blocks are “**backward**”. Only 3 are developing Blocks: Karlamunda in Kalahandi, Dunguripali in Sonepur and Podia in Malkangiri district. None of the CD Blocks is considered as **developed**. Poverty ratio for the KBK region is much higher than the Orissa average 47.2. An analysis of National Sample Survey (NSS) data (Tendulkar Committee Methodology) indicates that rural poverty got reduced by 21.0 percentage points in KBK region from 73.4 percent in 2004-05 to 52.4 percent in 2009-10 as per MRP Methodology. From 2004-05 to 2011-12, the southern region has registered poverty reduction by 25.40 percentage points. Still then the southern region which includes the KBK region has the highest incidence of poverty followed by the northern region (Odisha Economic Survey, 2014-15). Even families below poverty line were as high as 72.03 per cent (Nuapada 85.70, Koraput 83.81 and Malkangiri 81.88 per cent) in 1997 and 86.04 per cent in 1992 (Census of BPL Families 1992 and 1997). As per an estimate (NSS data for 1999-2000) 87.14 per cent people in this region were below poverty line. Rural poverty in Odisha is 35.69% while urban poverty is 17.29 per cent in 2011-12. In Odisha, 83.3 percent of the people live in rural areas which are 89.95% for rural KBK (92.3% for Kalahandi, 91.9% for Malkangiri, 92.8% for Nabarangpur, 94.4% for Nuapada and 91.8% for Subarnapur district) making **poverty an overwhelmingly rural phenomenon**.

Though there has been significant poverty reduction among ST and SC communities and in southern and northern regions of Odisha, the incidence of poverty in southern and northern regions as well as among ST and SC communities still continues to be high and remains a matter of concern. (Odisha Economic Survey, 2014-15). 39.1 per cent people of the KBK districts belong to **Scheduled Tribe** communities including four Primitive Tribal Groups (PTG), the Bondas, Dadai, Langia, Sauras and Dangaria Kandhas. Even ST population is as high as 50.6, 57.8, 55.8 and 56 percent for Koraput, Malkangiri, Nowrangpur and Rayagada districts respectively. 17.5 per cent of population in the region are **Scheduled Castes**. The KBK districts as a whole constitute 56.7 per cent ST and SC population which is much higher than Odisha (39.9 per cent). 93 sub castes among SCs and 62 sub castes among the STs live in the region. Again, in rural Odisha, poverty rate is 63.52 per cent for the STs, 41.39% for SCs, 24.16% for OBCs and 14.2% for other castes. 96.97% of **ST population** and 88.66% of **SC population** in the KBK region live in **rural areas** (93.7% and 86.51% respectively for Odisha). Among the **slum population** in the region 26.87 per cent are SC and 15.54 per cent ST.

The indicators of development like literacy, rural literacy, female literacy and participation of women in the organised sector are far below the non-KBK region and all Odisha average. These indicators are

still worse for the STs and SCs and also rural and female population from these communities. Participation of **girls, STs and SCs** continues to fall in each higher level of education. A large percentage of children who do not progress from school are from SC and ST groups (Dropout rates at high school level are 65.83 for **STs**, 67.3 for **ST girls**, 70.4 for **SCs** and 71.68 for SC girls) (Statistical Abstract of Odisha 2012). In the Government schools the facilities like drinking water, toilet for girls, toilet for boys, existence of ramp, play ground, library, etc are either absent or inadequate.

Indicators like population density, morbidity, IMR (54 for total, 55 for rural, 56 for female and 58 for rural female), age at marriage, number of children (CBR 22.6 for total KBK and 23 for rural KBK which are 19.8 and 20.2 respectively for Odisha), number of hospital beds, doctors per thousand population, age at marriage, provision of safe drinking water (only 6.24 per cent have tap water) and sanitation (87.21 per cent households in KBK districts have no latrines) also highlight the backwardness of this region. 48.23 per cent of all children born are the third or higher rank order children in the family. Compared to the national average of 36.80 per cent girls marrying below the age of 18 years, this is 66.60 per cent in KBK districts. The population suffer from high morbidity on account of under nutrition as well as other localised diseases (Pal, 2005).

A major proportion of the workers in the KBK region are cultivators (26.79 per cent) and agricultural labourers (48.87 per cent) (2011 census). Malakanagir (48.68) has highest percentage of cultivators followed by Nuapada (31) while Kalahandi (58.08) has highest percentage of agricultural workers followed by Nabarangpur (53.82). Even in other districts agricultural labourers dominate among the workers. **Agriculture** which is the primary source of living in the KBK region is highly underdeveloped owing to vulnerability to natural calamities (Shah et. al., 2007). **Droughts and floods** are common in this region and the **irrigation facilities** are unevenly distributed. Total livelihoods of 75.66 per cent people in the region are linked to agriculture but **poor irrigation facility** and **erratic rainfall** threaten their livelihood. Irrigated area in the region has increased since 2001-02 (24.69 per cent in 2002-03 and 30.88 per cent in 2013-14), but is below the all Orissa average (38.89 per cent in 2013-14) (Odisha Agricultural Statistics, 2014-15). Agriculture in the region is prone to drought, flood, heat wave and pest and disease outbreak (Ex. Rice swarming caterpillar). Sometimes early season drought occurs due to delayed onset of monsoon. Sometimes mid season drought occurs with long dry spell, consecutive two weeks rainless at vegetative/flowering/fruit stage. Terminal drought also occurs with early withdrawal of monsoon. Under irrigation also the situations like delayed/limited release of water in the canals or insufficient ground water recharge occurs due to low rainfall. Unusual rains like continuous high rainfall in short span and heavy rainfall with high speed wind in a short span also occur. Here the fear of outbreak of pests and diseases exist. All these lead to crop damage and uncertainties in production.

Due to diversification of agricultural land into non agricultural purposes **net area sown** in the region (in other regions also) is declining day by day (1768 thousand hectares in 2001-02 and 1683 thousand hectares in 2013-14). Net area sown in the KBK region for 2013-14 is 35.33 per cent of total land area which is highest for Subarnapur (51.71 per cent) district followed by Nuapada (48.31 per cent) and Bolangir (44.44 per cent). Gross cropped area is raised by raising cropping intensity (2568.78 thousand

hectares in 2001-02 and 2817 thousand hectares in 2013-14. Cropping intensity is 167 for the region and highest in Sonepur (190) followed by Kalahandi (184).

Majority of land in the area is **upland** (also lack proper utilization through diversification) and size is uneconomical (**marginal holdings**). 54.91, 60.32, 61.51, 61.27, 63.44, 70.37, 66.84 and 37.5 per cent of total land in Bolangir, Kalahandi, Koraput, Malalkangiri, Nabarangpur, Nuapada, Rayagada and Sonepur districts respectively in 2013-14 are highland (high and medium land together constitutes 75.14, 82.01, 87.5, 83.1, 84.41, 85.18, 92.13 and 69.53 respectively for these districts). It is 60.02 per cent for KBK (47.15 per cent for Odisha) in 2013-14. Among the KBK districts percentage of highland is highest for Nuapada (70.37) and Rayagada (70.37%). Medium and high land together constitutes 82.1 per cent for KBK region (92.13 for Rayagada). Dry land farming and diversification to water resistant crops are yet to be developed. **Uneconomic holdings** make use of technology unprofitable and sometimes impossible and reduce production and productivity of land. While coming to the size group wise distribution of number of operational holdings; the region has only 0.2 per cent large holdings, 2.32 per cent medium holdings, 10.32 per cent semi-medium holdings, 25.12 per cent small holdings and 62.03 per cent marginal holdings. Even in Bolangir district the percentage of marginal holdings is 71.26 followed by 67.32 per cent in Nuapada and 67.18 per cent for Subarnapur. 30.9 per cent of land area in the region is marginal holdings and 32.05 per cent of land small while only 2.9 per cent are large sized holdings. For Malkangiri and Nuapada districts, the percentage of large holdings is only 0.66 and 1.64. Average sizes of holdings for the Scheduled Castes and Scheduled Tribes are 0.96 ha and 1.29 ha respectively in the KBK region. These figures are 0.87, 1.06, 1.26, 0.91, 1.15, 0.99, 0.87 and 0.6 ha for the Scheduled Castes in the Bolangir, Kalahandi, Koraput, Malalkangiri, Nabarangpur, Nuapada, Rayagada and Sonepur districts respectively and 1.16, 1.53, 1.55, 1.41, 1.31, 1.27, 1.17, and 0.88 ha for the Scheduled Tribes for the same districts respectively in 2010-11 (1.26 ha in the region for all social groups).

Agriculture in the region is yet to be commercialised. Diversification to high valued crops is limited due to lack of irrigation and also knowledge. Mono cropping in Paddy still dominates in the region.

A large proportion of people in the region, rural poor and tribal's in particular depend on forests for their livelihood-collecting timber, fire wood and other Non-Timber Forest Produce (NTFP). Most of the females in the district are engaged in Kendu leaf plucking during March and April. Mahul, Chahar, Kendu, Amla, Neem, Tamarind and Sal are some of the species of commercial importance have been heavily depleted due to drought induced environmental stress and exhaustion by poor forest resource dependents in drought years (District Gazetteer, 1986). Depletion of forest species and resources are basically due to uneven distribution of rainfall, intensive use, shifting cultivation, recurring forest fires, grazing, poaching, encroachment, over exploitation of forest resources during scanty years and mining. General public at large has very little access to information on health and vitality of forests. Although one-third (16,131 Km²) of geographical area of this region is recorded as forests, only 11.3 per cent (5473 Km²) is actually dense forest (with crown density over 40 per cent) as per satellite imagery data. It has been further ascertained that 9 per cent (4332 Km²) of forest area is

completely devoid of vegetable cover. Another 13.5 per cent (6327Km²) forests are open having crown density more than 10 per cent but less than 40 per cent. As forests (35.35% of geographical area) are gradually **degraded** over the period of **time**, their **livelihoods** are **threatened** and also result in **food insecurity**.

Poverty and migration in the KBK regions

Although endowed with rich natural resources, Orissa is ranked among the poorest states of the country. Though the State and the districts have improved a lot during the last decade, GDDP, NDDP and Per Capita NDDP of the KBK region is far below the non-KBK region as the districts rank 13th, 17th, 11th, 27th, 23rd, 26th, 22nd and 28th respectively for Bolangir (Rs. 363666 lakh), Kalahandi (Rs. 300286 lakh), Koraput (Rs. 373668 lakh), Malkangiri (Rs. 104352 lakh), Nabarangpur (Rs. 186545 lakh), Nuapada (Rs. 122451 lakh), Rayagada (Rs. 240093 lakh) and Subarnapur (Rs. 114779 lakh) in 2009-10 at 2004-05 prices.

Socio-economic backwardness is the root cause of mass poverty in the region. Incidence of poverty in general and rural poverty in particular is more acute. Chronic drought conditions, high level of food insecurity and chronic income poverty resulting in absolute hunger, regular distress migration and periodic allegations of starvation deaths characterise this region (Government of Orissa, 2004). All the eight districts are ecologically fragile. Soil moisture stress and low water retention capacity contribute to low productivity in agriculture. Due to widespread poverty, illiteracy and recurrence of drought, and scanty situation, out **migration as source of livelihood** is widely practised in the region. Among the migrants, landless agricultural workers and marginal farmers constitute the majority. They migrate in search of wage employment to distant places like Hyderabad, Vishakhapatnam, Bangalore, Tirupati, Raipur, etc. They are persuaded to do so by the labour contractors who send them to work places after advancing a small amount of money for meeting their current consumption needs and debt repayment. Most of the migrants are engaged in the brick kilns, construction works, agricultural works, etc. After joining work at distant places they face exploitation at every stage of their migration period that ranges from 4 to 8 months a year. When they return home, many are left with no savings, making them dependent on credit from the local money lenders who charge exorbitant interest rate. In order to pay the loan and for survival, they migrate again and again.

Odisha has been severely drought affected for 30 years out of the last 100 years (Down to Earth, 2001). Since 1965 there is not a single year when the State has not experienced drought in one or another part. It is not only the recurrence; the drought is striking the areas that never were drought prone. For example, during 1950s, only three districts Klahandi, Bolangir and Koraput were drought affected. But by 1980s, the entire Western Orissa was drought affected and by 1990s, Southern Orissa also had come under the grip of drought. Three of these old and undivided backward districts Koraput, Bolangir and Kalahandi have become vulnerable to recurring droughts and famine like situation which lead to **distress migration** of the poor during the non agricultural season.

The data compiled by Migration Information and Resource Centre (MICR), Aide et Action, a civil society organisation basing on the migration registers mentioned in about 66 villages in 3 blocks (Muribahal, Tureikela, and Belpada) in the Bolangir district suggest that about 1.5 lakh people out of about 13 lakh population in the district migrated out of the state during November to December 2009 and Jan'2010, as they did not get enough of employment opportunities in the domestic sector (countercurrents.org). Among the total migrating population, about 30% belong to SC and 41% are ST. Most of the people being in the landless category and small and marginal farmers, adopt the option of migrating out as a coping up mechanism to the high degree of food insecurity owing to lack of employment, bad show in agriculture, uneven land distribution, loss of forest, so on and so forth. The advance money comes as a big allurement and relief to the helpless families who tacitly agree to a semi-bondage condition under their employers. Generally, they go there as brick makers, brick careers and so on and spend most part of their labour near the brick kiln. They work out 14-16 hours in a day under very harsh conditions. Most of the migrant labourers are habituated to the practice of moving towards their destination soon after the completion of Kharif crop, particularly after Nuakhai (Festival for surrendering the first crop to the Goddess). Even, most of the labourers in Bolangir district migrate with their families.

Food insecurity vulnerability: where and why they are?

The pervasive and chronic food insecurity of poor communities in Orissa is captured by anthropometric measures as over half of the children between 1 and 5 are stunted. Almost half of all **adult women** and three quarters of **all children under three** in Odisha are undernourished. The infant mortality rate for Orissa is higher than any other state in India. The proportion of labouring rural households with an average daily energy intake of less than 1800 kcal (less than 75 percent of the recommended minimum intake) was found to be 43 percent for the Coastal Plains, 57 percent for the Northern Plains and 69 percent for the **Eastern Ghats**. The vulnerable group category with the greatest prevalence of extreme food insecurity (defined as calorie intake per capita per day below 1800 kcal for people who are 40 percent below a poverty line income) was **rural artisan households** (73 percent), while more than half of all **marginal farming households** and **labouring rural households** (52 to 58 percent) were also considered extremely food insecure. Children of labouring rural households and marginal farming households emerged as the most affected by extreme undernourishment (hunger), particularly in the districts of Gajapati and Nuapada where between 56 and 80 percent were found to be consuming less than 1800 kcal per day.

Regional differences are closely linked to differences among social groups, with poverty among castes and especially indigenous tribal people being strikingly higher than other groups. High level of food insecurity is evident in the form of higher mortality and under-nutrition, especially amongst the STs and SCs. Against the overall 43 percent of the children being underweight in Odisha, the share of the STs and SCs was found to be much higher at 59 percent and 59.4 percent respectively (World Food Program & Institute of Human Development, 2008). The issues of food insecurity remain critical for **certain sections of people** even today. While Odisha, including some of the poorest districts, is virtually self sufficient in food grains, there is a significant portion of chronic food insecurity associated

with particular areas (KBK region) and population groups (STs and SCs). Overwhelmingly, these two groups of people are **landless or functionally landless**. The socio-economic condition of the KBK region points out that the vulnerable to food insecurity are the rural people of the region who mainly depend on agriculture and forests for their livelihood. These groups often live in isolated rural areas and have little access to mainstream development or subsidized food from the Public Distribution System. The process of modernization largely marginalized them in economic terms, thereby further threatening their livelihoods. The livelihood groups like **marginal and small scale farming households, labouring rural households, rural artisan households**, and most important **scheduled tribal households** are most vulnerable to food insecurity. The reason lies in limited **physical and human asset base** (education and awareness), slow economic growth, limited access to welfare provisions and public services, lack of land reforms and difficulties in input-market-credit arrangements.

Food insecurity reduction options

Lack of inadequate infrastructure such as road connectivity, irrigation, electricity, credit facility, storage, processing and marketing act as major constraint. A combination of these factors makes the population in the region extremely vulnerable to any kind of economic shock. Existing socio-economic infrastructure is highly inadequate to make frontal attack on poverty and economic backwardness. Full of natural resources but these resources are unutilised or underutilized. Hence, there is a need for development of rural infrastructure in the region along with sustainable use of natural resources.

Livelihood insecurity is the prime cause behind poverty and the ultimate cause of food insecurity in the KBK region. A combination of economic, social, ecological and institutional factors contribute to poverty. To reduce food insecurity and vulnerability poverty eradication is the only solution. Poverty is closely linked to **livelihood insecurity** of the rural population which is linked to poor performance of agriculture and lack of alternate employment. To improve production, productivity and employability in the rural areas **structural transformation** is very important. As increase in food production, grain procurement and distribution to achieve macro-level food self sufficiency was proved insufficient to ensure micro-level food security for the poor; emphasis should be on income generation of the rural poor and their capacity building. Besides, development of rural health, sanitation and drinking water services are also needed. Importance should shift from **“Protection to Production”** and self sustained development.

To address the immediate food needs of the most vulnerable strengthening of disaster management capacities, strengthening anti-poverty programmes for enhanced social protection and food storage are required. Social protection interventions should contribute to sustainable poverty reduction and economic growth at the household and community levels. Since, the KBK districts have been historically found to be nutrient deficient; any form of income transfer would promote greater food consumption. There is also a need for nutrition-sensitive food and agricultural system. Location specific cropping pattern, water management and irrigation, adaptive agricultural research, pro-poor land reform and forest development need be encouraged. Agricultural technology can be used extensively to enhance production and productivity. Linkage of the agricultural sector to the rural non-farm economy should also be taken care of.

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Implementation of National Food Security Act 2012-13 in Odisha: Issues and Challenges Ahead

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The Planning Commission, using National Sample Survey data, estimated that 47% of the population lives below the poverty line. This has declined to 32.6% in 2011-12, however it is still higher than the national average of 21.9%. Additionally, low female literacy, high unemployment, high malnutrition among children (58.4% as against 45.9% in India), re-current multiple natural disasters and low per capita income characterise the situation in the state. A high level of income poverty coupled with poor human development indices give rise to a situation of chronic and endemic food insecurity in the state. Government interventions to ensure food availability and improved nutrition including distribution of subsidised foodgrains and essential commodities through the Targeted Public Distribution System (TPDS) and nutritional support to children and mothers through Integrated Child Development Services (ICDS) and Mid-Day Meals.

The implementation of the TPDS is plagued by targeting errors, prevalence of ghost cards and unidentified households, leakage and diversion of grains etc. across the country. Odisha has been no different. However, in recent years there has been a sincere desire and effort to plug the loopholes in order to streamline and strengthen the TPDS. But to date the efforts have been focused on individual aspects of the system, and the State has not used the available technology to its fullest potential. Therefore those efforts have not delivered the intended results. Key challenges to the functioning of the TPDS in Odisha include inclusion and exclusion error, where non-entitled families are incorrectly given BPL cards and deserving beneficiaries are excluded from the system. Bogus cards or cards in circulation in the names of non-existent or fictitious persons. Duplicate cards where more than one card is issued to the same beneficiary household. The key challenge is shadow ownership of cards where the genuine cards are in the hands of wrong persons either through fraudulent means or by way of pledge for a small fee or after death/migration/transfer of the cardholder.

Introduction

Situated on the east coast of the country, Odisha covers 156 thousand square kilometres and 4.74% of India's landmass. The state with a population of 42 million people is home to the highest proportion

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of disadvantaged inhabitants from the Scheduled Tribe and Scheduled Castes (39% compared to 24% nationally). Human Development Indicators in Odisha are worse than those for India as a whole. More than 83% of the population lives in rural area where levels of poverty are higher than those in the cities and towns of the state, especially in Western and Southern Odisha. These are also the areas where Left Wing Extremists groups are active. Despite experiencing strong economic growth (8% per annum) over the last decade, the state is characterized by high incidence of poverty.

The Planning Commission, using National Sample Survey data, estimated that 47% of the population lives below the poverty line. This has declined to 32.6% in 2011-12, however, it is still higher than the national average of 21.9%. Additionally, low female literacy, high unemployment, high malnutrition among children (58.4% as against 45.9% in India), re-current multiple natural disasters and low per capita income characterise the situation in the state. A high level of income poverty coupled with poor human development indices give rise to a situation of chronic and endemic food insecurity in the state. Government interventions to ensure food availability and improved nutrition primarily include distribution of subsidised food grains and essential commodities through the Targeted Public Distribution System (TPDS) and nutritional support to children and mothers through Integrated Child Development Services (ICDS) and Mid-Day Meals.

Evolution of the concepts from food security to food and nutrition security

Though there is a big difference between the term food security and nutritional security exist but there is a close linkage between the two terms. From the historical perspective the term 'food security' referred to overall national, regional or even global food supply and shortfalls in supply compared to requirements. Since, from the World Food Conference (1974) in Rome, the concept of food security has evolved, developed, multiplied and diversified and in three main shifts were identified **firstly**, from the global and the national to the household and the individual **secondly**, from a food first perspective to livelihood perspective and **thirdly**, from objective indicators to subjective perceptions (Maxwell, 1996).

The success of green revolution initiatives by the developing countries and adoption of high-yield varieties of crops during 1980's helped many parts of the world in increasing national food production and thus food availability especially in many developing countries of the world. However, the persistence vulnerability of specific communities to hunger due to decline in purchasing power led to the concept of food security being broadened to include both physical and economic access to food. The definition of food security was thus broadened to include access or food entitlement (Sen, 1981) and was defined as "the access by all people at all times to enough food for active, healthy life". Food insecurity may be caused by the unavailability of food, insufficient purchasing power, inappropriate distribution or inadequate use of food at the household level (Shetty, 2015).

In the 1990's, the Millennium Development Goals (MDGs) agenda reaffirmed the human right to adequate food and nutrition, reducing global hunger and under-nutrition, poverty reduction etc. In fact food and nutrition security are fundamental to the achievement of the Millennium Development

Goals (MDGs) and to the emerging post-2015 Sustainable Development Goals. Accordingly, FAO defined food insecurity as 'a situation that exists when people lack secure access to sufficient amounts of safe and nutritious food for normal growth and development and an active and healthy life'. Declaration of the World Summit on Food Security (2009) reiterated that the four pillars of food security i.e. availability, access, utilization and stability. The most accepted definition on food security is "all people, at all times have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life".

Nutrition security is emerged in mid 1990's and focused on food consumption by the household or the individual and on how that food is utilized by the body and thus in principle is more than a food security. International Food Policy Research Institute (IFPRI) defined nutrition security as "adequate nutritional status in terms of protein, energy, vitamins, and minerals for household members at all times". Nutritional security is more than food security. The nutrition's adds psychological requirements for different nutrients and the determinants of their bioavailability i.e. the degree to which or the rate at which the nutrient is absorbed and becomes available at the site of psychological activity, health services and healthy environments.

Food security framework emphasizes an economic approach in which food as a commodity has a central focus while nutritional security framework adopts a biological approach in which human beings are central. Nutritional security focus on the vulnerable individuals and their needs associated with non-food factors. There is a paradigm shift in policy formulation from attention to food security at the aggregate level to nutrition security at the level of child, women and man. In this context Swaminathan (2008) defined nutrition security as "physical, economic and social access to a balanced diet, safe drinking water, environmental hygiene, primary health care and primary education. This definition includes both food and non-food factors.

Food and nutrition security is achieved when adequate food (quantity, quality, safety, socio-cultural acceptability) is available and accessible for and satisfactorily used and utilized by all individuals at all times to live a healthy and active life" (UNICEF, 2008). Food and nutrition security exists when all people at all times have physical, social and economic access to food of sufficient quantity and quality in terms of variety, diversity, nutrient content and safety to meet their dietary needs and food preferences for an active and healthy life, coupled with a sanitary environment, inadequate health, education and care (FAO 2011).

Overview of TPDS system

Combinations of various economic, social, ecological and institutional factors are contributing food insecurity in Odisha. High incidence of poverty and income disparity, inadequate employment opportunities in the lean season, a large tribal population living in remote areas with poor connectivity, coupled with periodic occurrence of floods and drought, Odisha has been put in the category of a severely food insecure region. It has been estimated that as much as 57% of state's population suffers

from under nutrition and malnutrition. This is in spite of the fact that per capita cereal consumption of the state is very high and the production matches the level of consumption. The tribal households have limited access to a food safety net, with the sole means for food security often being the Targeted Public Distribution System (TPDS). In this context, the implementation of National Food Security Act 2012-13 in Odisha is a challenge for the Government of Odisha.

The TPDS is one of the government's most important instruments of policy aimed at food security, inclusive growth and public satisfaction. It delivers a minimum requirement of food grains and other essential items at highly subsidised prices to the poor. As one of the oldest welfare-oriented schemes, it is perhaps the most extensive, touching a significant number of citizens in some form or the other. Yet the scheme is reported to be riddled with errors of inclusion and exclusion, rank inefficiency, lack of transparency, poor accountability, inadequate monitoring and enforcement, circulation of an abundant number of bogus and duplicate entitlement (ration) cards, shadow ownership of cards, fraudulent entries and acknowledgements, lack of public awareness, public apathy, political interference, failure of vigilance mechanism, non-application of technology, etc.

The TPDS is operated under the joint responsibility of the central and state governments, with the former responsible for procurement, storage, transportation (up to the district headquarters) and bulk allocation of food grains. The state governments are responsible for distributing these food grains to consumers through a network of Fair Price Shops (FPS). However, as Odisha is a decentralised procurement state (DCP) for paddy, it is responsible for procurement of paddy, milling it into rice, storing and distributing rice to beneficiaries through the TPDS. The state's responsibility includes identification of families under various economic categories, issue of Below Poverty Line (BPL) cards, supervision and monitoring of the functioning of the FPS. States are also responsible for movement of food grains from the district headquarters to the FPS, which requires storage at the block level.

With a network of 29,468 FPS located across 30 districts, the TPDS managed by the Food, supplies & Consumer Welfare Department (FS&CW Department), Government of Odisha (GoO) covers the nook and corner of the state. The FPSs are mostly managed by cooperatives, Grampanchayats (GPs), Self Help Groups and private parties. Under the TPDS, the state distributes about 2.2 million metric tonnes (MT) of rice, 0.5 million MT of wheat, 0.1 million MT of sugar and 0.4 million kilo litres (KL) of kerosene oil every year to about 9 million families comprising 1.25 million Antyodaya Anna Yojana (AAY), 3.69 million BPL and 3.6 million Above Poverty Line (APL) card holders in the state. The scale of procurement of paddy and the resultant rice are 3.7 million MT and 2.5 million MT respectively. The Government of Odisha (GoO) procures paddy from farmers at the Minimum Support Price through network of Primary Agricultural Cooperative Society (PACS) for the Odisha State Civil Supplies Corporation Ltd (OSCS) and other State Agencies like MARKFED, NAFED, TDCC and FCI. The monthly scale of issue and sale price of TPDS items to different categories of beneficiary household in the state is as follows.

Table 1 - Sale price of TPDS items

Commodity	APL		BPL		AAY	
	Quantity	Rate	Quantity	Rate	Quantity	Rate
Rice	25 Kg (in 8 KBK dis-tricts only)	Rs 1.00	25 kg	Rs 1.00	35 kg	Rs 1.00
Sugar			2 kg	Rs13.00	2 kg	Rs 13.00
Wheat	10 kg.	Rs 7.00				
Kerosene Oil	4 Litre	Rs 14.50	4 Litre	Rs 14.50	4 Litre	Rs 14.50

Rate for Kerosene Oil indicated above is the base price and varies from place to place depending on transportation cost

Key Challenges with the current Functioning of TPDS

The implementation of the TPDS is plagued by targeting errors, prevalence of ghost cards and unidentified households, leakage and diversion of grains etc. across the country. Odisha has been no different. However, in recent years there has been a sincere desire and effort to plug the loopholes in order to streamline and strengthen the TPDS. But to date the efforts have been focused on individual aspects of the system, and the State has not used the available technology to its fullest potential. Therefore those efforts have not delivered the intended results. Key challenges to the functioning of the TPDS in Odisha include:

- Inclusion and exclusion errors where non-entitled families are incorrectly given BPL cards and deserving beneficiaries are excluded from the system.
- Bogus cards or cards in circulation in the names of non-existent or fictitious persons. Duplicate cards where more than one card is issued to the same beneficiary household. The key challenge is shadow ownership of cards where the genuine cards are in the hands of wrong persons either through fraudulent means or by way of pledge for a small fee or after death/migration/transfer of the cardholder.
- Inadequate warehousing and storage facilities
- Leakage in supply chain operations due to poor tracking of stock
- Maladministration, lack of transparency poor accountability and inadequate monitoring
- Unavailability of FPS whereby FPS dealers do not make sufficient returns, thereby leading to low incentives on their part to serve beneficiaries and high incentives to divert PDS items to the open market to benefit from the huge price difference.
- Lack of public awareness about their entitlement, public apathy toward the behaviour of the FPS dealers who are often influential individuals in the society and a resultant imbalance of power between beneficiaries and FPS dealers
- Insufficient means of Grievance Redressal leading to beneficiary disempowerment
- Failure in the process of implementation due to inadequate staff, poor record maintenance and low supervision.

- Failure of the Vigilance Mechanisms at various levels of the system
- Inadequate machinery for enforcement of the provisions as laid down in various guidelines and the PDS Control Orders issued by Central and State Governments
- Political interference in the selection of FPS dealers
- Inadequate use of technology that could improve the functioning of the TPDS and leave less room for manual intervention

Salient Features of NFSA

- a. Coverage and entitlement under Targeted Public Distribution System (TPDS):** Up to 75% of the rural population and 50% of the urban population will be covered under TPDS, with uniform entitlement of 5 kg per person per month. However, since *Antyodaya Anna Yojana (AAY)* households constitute poorest of the poor, and are presently entitled to 35 kg per household per month, entitlement of existing AAY households will be protected at 35 kg per household per month.
- b. State-wise coverage:** Corresponding to the all India coverage of 75% and 50% in the rural and urban areas, State-wise coverage will be determined by the Central Government. Planning Commission has determined the State-wise coverage by using the NSS Household Consumption Survey data for 2011-12.
- c. Subsidised prices under TPDS and their revision:** Food grains under TPDS will be made available at subsidised prices of Rs. 3/2/1 per kg for rice, wheat and coarse grains for a period of three years from the date of commencement of the Act. Thereafter prices will be suitably linked to Minimum Support Price (MSP). In case, any State's allocation under the Act is lower than their current allocation, it will be protected up to the level of average off take under normal TPDS during last three years, at prices to be determined by the Central Government. Existing prices for APL households i.e. Rs. 6.10 per kg for wheat and Rs 8.30 per kg for rice has been determined as issue prices for the additional allocation to protect the average off take during last three years.
- d. Identification of Households:** Within the coverage under TPDS determined for each State, the work of identification of eligible households is to be done by States/UTs.
- e. Nutritional Support to women and children:** Pregnant women and lactating mothers and children in the age group of 6 months to 14 years will be entitled to meals as per prescribed nutritional norms under Integrated Child Development Services (ICDS) and Mid-Day Meal (MDM) schemes. Higher nutritional norms have been prescribed for malnourished children up to 6 years of age.
- f. Maternity Benefit:** Pregnant women and lactating mothers will also be entitled to receive maternity benefit of not less than Rs. 6,000.
- g. Women Empowerment:** Eldest woman of the household of age 18 years or above to be the head of the household for the purpose of issuing of ration cards.

- h. Grievance Redressal Mechanism:** Grievance redressal mechanism at the District and State levels. States will have the flexibility to use the existing machinery or set up separate mechanism.
- i. Cost of intra-State transportation & handling of food grains and FPS Dealers' Margin:** Central Government will provide assistance to States in meeting the expenditure incurred by them on transportation of food grains within the State, its handling and FPS dealers' margin as per norms to be devised for this purpose.
- j. Transparency and Accountability:** Provisions have been made for disclosure of records relating to PDS, social audits and setting up of Vigilance Committees in order to ensure transparency and accountability.
- k. Food Security Allowance:** Provision for food security allowance to entitled beneficiaries in case of non-supply of entitled food grains or meals.
- l. Penalty:** Provision for penalty on public servant or authority, to be imposed by the State Food Commission, in case of failure to comply with the relief recommended by the District Grievance Redressal Officer.

Coverage of NFSA

National Food Security Act'2013 came to effect on 5th July 2013. Like other states, Odisha is keen to implement National Food Security Act (NFSA).

1. Under section 10 of the Act, State Government has to identify the priority households in the State by setting its own criteria. The State Government has notified the Exclusion and Auto Inclusion criteria vide notification No: 2069 dated 17th July 2014. The notification has also been published in print media for dissemination among public.
2. The government has identified the beneficiaries by adopting nine exclusion criteria such as monthly income of more than 10,000 in rural areas & excess of 15,000 in urban areas, income, persons having four wheelers or two three wheelers, business with TIN (tax payer identification number), electric consumption above 300 units, any state government and Central Government employee, persons having tractors, power-tillers, fishing boats or other heavy vehicles, persons having entrepreneurship, professional tax payers and household having pucca & fire proof house with more than 3 rooms.
3. Central Government has fixed the ceiling for coverage of Urban and Rural population in Odisha as follows:
 - Rural - 82.17% of rural population
 - Urban – 55.77% of urban population

The targeted beneficiary coverage by the Central Government for Odisha: 82.17% of 349.512 lakh rural population, 55.77% of 69.961 lakh of urban population (as per 2011 census). Thus a total of 326.21 lakh beneficiaries will get subsidized food grains in Odisha under the Act from Government of India.

4. This ceiling translates to 78% of the total population of the State. Snapshot of eligible TPDS beneficiaries under NFSA 2013 is given below:

Table 2 - Coverage of NFSA Beneficiaries in Odisha

	Population as per 2011 Census	Percentage of Coverage		No. of Persons/Families Covered	
		Rural	Urban	AAY Families	Priority Individuals*
Odisha	4, 19,74,218	82.17	55.77	12,64,500	2,72,01,380
India	121, 01, 93, 422	75	50	2,49,99,800	68,83,73,733

* Assuming an average of 4.38 members per family

As per the Section 10 of the Act, the onus of responsibility of identifying the beneficiaries lies with the State Government. The district-wise allocation under NFSA was fixed based on the basis of 2011 census population and taking into account of the percentage of Rural (82.17%) and Urban (55.77%) population as mentioned (Table -3).

Method of identification of beneficiaries

The basic contours of the method of identification of beneficiaries are:

- Creation of applicant database of the applications received from the eligible families (not covered under the approved exclusion criteria).
- Creation of an integrated database of citizens by mapping secondary Government databases including SECC database related to exclusion criteria with NPR database.
- Comparison of applicant database with integrated database.
- Based on the results of match, draft priority list (families in the applicant database without any conflict with the integrated database), suspect lists (conflicting with integrated database) related to exclusion and inclusion criteria are being generated and placed in public domain/displayed at GP/Ward.
- Draft publication of the lists inviting objections, disposal of objections by Blocks/ULBs, scrutiny and discussion in *Gram/Ward Sabha* and approval by Panchayat Samiti and ULB Councils is done.
- Physical verification of suspect lists are being done by Govt. Officials.
- Verification of AAY families are being done by Supply Department field functionaries with FPS registers and their lists.
- Introduction of Ration Card Database Management system to ensure that the Ration Card database is updated regularly. Ration cards shall finally be seeded with beneficiary Aadhaar numbers.
- Printing, lamination and distribution of ration cards.

Challenges Encountered during Implementation of NFSA

Increased number of applicant families such as multiple application form from a single family resulting in 106 lakh applicant households (96 lakh households in 2011 census). Some of districts and Blocks have applicants having more members than their population of 2011 census. About 78 Blocks (24 %) and 2 ULBs crossed the 2011 population, which were termed as critical.

An analysis of Block and GP-wise 2011 Census population with NFSA applicants (individuals) has been hosted in the website under e-Bitaran link to be used to identify & focus removal of ineligible applicants. GPs with over 90% (80 %) enrolment were treated as critical ones

Digitization took a lot of time mainly due to 50% excess applications than estimate. Poor performance of one Vendor in some Districts resulted in cross District transfer of forms causing delays. Lack of documentation of forms received and transferred to CDCs and reconciliation of forms was an issue in some Districts.

Poor verification of forms and documents at Registration Centres by VOs and Nodal Officers, lack of supervision and monitoring has resulted in poor quality of digitization. Poor quality of data entry has resulted in mistakes in the Acknowledgement Slips, their return and subsequent corrections i.e., extra work & delay.

Some Acknowledgement Slips have not been distributed due to absence of applicants especially in ULBs, possible non-residents or duplicates that needs to be verified by Districts. Some Blocks/ULBs have not returned any Acknowledgement Slips for correction till date. This indicates either 100% correct data entry or non-distribution of Acknowledgement Slips; most likely non-distribution. Such handling of Acknowledgement Slips would result in no corrections and erroneous ration cards.