AGRICULTURAL PRODUCTIVITY AND FOOD SECURITY IN INDIA: ISSUES AND CONCERNS

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Abstract

India has been self-sufficient in food grains since the past several decades and has achieved national food security. There are several positive developments associated with the green revolution period. However; this increase in food grains and self-sufficiency in food production at the national level has not ensured food security at the regional or household level and has not led to eradication of malnutrition and starvation in various parts of the country. India may be one of the fastest growing and emerging economies but it has a long way to go in eradicating hunger and food insecurity. Empirical studies support the idea that improvements in agricultural productivity are important for poverty reduction. Thus one needs to stress the fundamental role of agriculture sector in supporting rural livelihoods, generating employment and providing food security. It is most important that productivity should rise. This paper is an attempt to examine the important concerns of deceleration in Indian agriculture growth rate, productivity plateauing, declining public investment and the impact all this has on food security.

Key words. Agricultural Productivity, Hunger, Food Security, Capital Formation.

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Introduction: India has been self-sufficient in food grains since the past several decades and has achieved national food security. There were several positive developments associated with the green revolution period. The agriculture sector became much more insulated from the effects of drought. There was greater commercialization and diversification of cropping patterns from food grains to higher value crops, even for small and marginal farmers. Improvements in the livestock and fisheries sector could be observed. The consumption patterns changed, even for the bottom 30 percent of the population, with the shares of non-cereal food (fruit and vegetables, dairy products) increasing albeit slowly. Per capita availability of food increased as did per capita generation of income.However; this increase in food grains and self-sufficiency in food production at the national level has not ensured food security at the regional or household level and has not led to eradication of malnutrition and starvation in various parts of the country. India may be one of the fastest growing and emerging economies but it has a long way to go in eradicating hunger and food insecurity. It is a paradox that on the one hand there are godowns overflowing with food stocks and on the other it is firmly established amongst the world's most hunger ridden countries with 21% population undernourished, nearly 44% children of less than five year are underweight and 7% of them die before reaching the age of 5 years. The principal cause of hunger, malnutrition and food insecurity is poverty. Over the years, the incidence of both rural and urban poverty has declined considerably. The percentage of persons below the poverty line in 2011-12 has been estimated as 25.7% in rural areas, 13.7% in urban areas and 21.9% for the country as a whole. This is based on the Tendulkar poverty line which is being reviewed and may be revised by the Rangarajan committee. However, the absolute number of poor or food insecure people continues to be sizable especially in rural areas. Agriculture is a powerful tool for poverty reduction and ensuring food security. It is a crucial sector for any developing economy since majority of the hungry and food insecure live in rural areas and depends on agriculture for source of livelihood. The experience of BRIC countries indicate that a one percentage point growth in agriculture is atleast 2-3 times more effective in poverty reduction than the same growth emanating from non-agriculture sector (SIA, 2011-12). Hence its performance assumes great significance for the economy.

Agricultures contribution to food security and hunger is in two ways. Firstly its growth leads to increasing production of food which may, then be available at lower prices so that the poor can afford it and secondly, through providing jobs and incomes that will give the poor means to

access food. Hence it is imperative that agriculture should grow and its productivity enhanced.Empirical studies also support the idea that improvements in agricultural productivity are important for poverty reduction (Mellor 1999). A review of 12 country case studies showed that countries with the highest agricultural growth per worker experienced the greatest rate of rural poverty reduction (Byerlee, Diao, and Jackson 2005). Besides increased agricultural productivity stimulates a pro-poor development process (Thirtle et.al.2001). When agricultural output increases then it leads to increase in the income of farmers who in turn demand goods and services produced by rural poor in non-farming sector (Mellor 1999). The backward and forward linkages then stimulate employment in the rural and urban non-farm sectors. This decreases urban poverty by slowing migration to urban areas and lowering food prices. Thus agricultural growth benefits poor farmers and landless labourers by increasing both production and employment, benefitting both the urban and rural poor through growth in the rural non-farm economy. Growth in agricultural productivity can increase real wage rates, which again directly and indirectly contributes to poverty alleviation (Schneider 2011). Datt and Ravallion (1998) suggest that increased agricultural productivity is related to poverty reduction in India. Their analysis of Indian survey data from 1958-1994 found that higher real wages and higher farm yields reduced absolute poverty and even the poorest benefitted from productivity gains. Dev (1998) also provides evidence from India, suggests that increases in agricultural productivity led to 125% increases in average incomes of the landless. When farmers become rich they substitute hired labour for household labour creating greater employment opportunities. Saxena and Farrington (2003) show that agriculture labour wage rate rising at a rate of 3% per annum during 1970's and 1980's. Ahluwalia (1978) observed an inverse relationship between poverty and agricultural performance for rural India as a whole. According to Lipton (1989) agricultural growth led to decline in rural poverty because the new modern varieties became smallholder friendly, they yielded more even with low inputs, were more pest resistant, and unlike hybrids did not need annual replishment of seeds. They also raise labour use per acre per year thus benefitting poor. Ravallion and Chen (2004) for China and Ravallion and Datt (1996) for India conclude that there is a strong link between poverty reduction and increased agricultural productivity. Thus one needs to stress the fundamental role of agriculture sector in supporting rural livelihoods, generating employment and providing food security. It is most important that productivity should rise. This paper is an attempt to examine the important concerns of

deceleration in Indian agriculture growth rate, productivity plateauing, declining public investment and the impact all this has on food security.

Understanding Food Security: The World Food Summit (1974) defined food security as "availability at all times of adequate world food supplies of basic food stuffs to sustain a steady expansion of food and to offset fluctuations in production and prices." In 1986, the highly influential World Bank report "Poverty and Hunger" focused on the temporal dynamics of food insecurity. The concept of food security was further elaborated in terms of: "access of all people at all times to enough food for an active, healthy life. However by the mid 1990's, food security became a major concern. Access now involved sufficient food, indicating concern with protein-energy malnutrition. The definition was broadened to incorporate food safety and also nutritional balance, reflecting concerns about food composition and minor nutrient requirements for active and healthy life. The 1996 World Food Summit adopted another more complex definition. "Food security, at the 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 dietary needs and food preferences for an active and healthy life".

This definition was again refined in The State of Food Insecurity 2001 report : "Food security [is] a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life".

Essentially, food security can be described as a phenomenon relating to individuals. It is the nutritional status of the individual household member that is the ultimate focus, and the risk of that adequate status not being achieved or becoming undermined. The essential elements of food security are thus adequate availability of food grains, efficient food distribution through trade or governmental agencies and adequate purchasing power in the hands of people. Although nowadays, in India food grains availability is not being considered as a problem due to overflowing food stocks and bumper crops but with yields and productivity plateauing it may pose a severe challenge for food security in future. According to Swaminathan (Hindu 2009), given that India's population is likely to reach 1.5 billion by 2030, the challenge facing the country is to produce more and more from diminishing per capita arable land and irrigation water

resources and expanding abiotic and biotic stresses. India currently produces about 230 million tonnes of cereals to meet the needs of a population of 1.15 billion. Since land is a shrinking resource the pathway for achieving the higher food production can only be through higher productivity per unit of arable land and irrigation water. Factor productivity will have to be doubled, if cost of production is to be reasonable and the prices of our farm products globally competitive. The average farm size is going down and nearly 80 per cent of farm families belong to marginal and small farmer categories. Enhancing small farm productivity and increasing farm income are essential both to meet food production targets and for reducing, hunger and rural unemployment (Swaminathan 2013).

Key issues in food security: The average Indian is food insecure.The Global Hunger Report 2013 showed that India has moved from 65 to 63 in the Global Hunger Index, making a marginal improvement since 2012, but continues to languish far behind other emerging economies. The score for the country improved slightly from 22.9 in 2012 to 21.3 in 2013. However India continued to trail behind Pakistan and Bangladesh on the index. The level of hunger in India remained at 'alarming levels', the report read, noting that it is one of the three countries outside Sub-Saharan Africa to fall in this category. The other two are Haiti and Timor-Leste. The report noted that India continued to record one of the highest prevalence of children under five who are underweight, at more than 40 per cent – one of the three criteria that the index is built on. Malnutrition accounts for 50 percent of under-five deaths. Anaemia in pregnant women causes 20 percent of infant mortality. There are other such statistics showing the extent of hunger and food insecurity in India.

Despite impressive increase in food grains the availability of cereals per capita is only 408 gms per day in 2012. The per capita availability of cereals and pulses declined over the last 15 years. The per capita net availability of pulses is 41 gms per day and the per capita net total food availability is 449 gms per day (GOI: 2013). Nutritionally for a healthy life per capita availability of cereals and pulses per day should be atleast 510 gm per day. Thus the per capita availability of cereals and pulses for Indians is well below the acceptable level of healthy living. It is a matter of grave concern that after attaining the position of self sufficiency that green revolution helped us achieve we have had to resort to import of food grains in recent years Another way of analysing food insecurity is looking at the composition of consumer expenditure.

As can be seen from the table 1 below that the share of expenditure on cereals has declined in both the rural and urban areas in 2009-10, from 2004-05. But again there has not been a corresponding increase in expenditure on milk, fish, meat eggs or vegetables in urban consumption though it has increased for the rural areas. Although the total food expenditure has declined in both rural and urban areas but still in rural area the expenditure on food is more than 50%. Hence the availability of food is important from the poor person's perspective.

Table 1.

Percentage composition of consumer expenditure

Rural						Urban				
Item group	Share in total consumer expenditure					Share in total consumer expenditure				
	1987-88	1993-94	1999-2000	2004-05	2009-10	1987-88	1993-94	1999-2000	2004-05	2009-10
Cereals	26.3	24.2	22.2	18.0	15.6	15.0	14.0	12.4	10.1	9.1
Pulses &products.	4.0	3.8	3.8	3.1	3.7	3.4	3.0	2.8	2.1	2.7
Milk &products	8.6	9.5	8.8	8.5	8.6	9.5	9.8	8.7	7.9	7.8
Eggs,fish,meat	3.3	3.3	3.3	3.3	3.5	3.6	3.4	3.1	2.7	2.7
Vegetables	5.2	6.0	6.2	6.1	6.2	5.3	5.5	5.1	4.5	4.3
Fruits, nuts	1.6	1.7	1.7	1.9	1.6	2.5	2.7	2.4	2.2	2.1
Food total	64.0	63.2	59.4	55.0	53.6	56.4	54.7	48.1	42.5	40.7
*Non-food total	36.0	36.8	40.6	45.0	46.4	43.6	45.3	51.9	57.5	59.3

*Non-food includes expenditure on tobacco, fuel, footwear, clothing, miscellaneous & services and durables.

Source: NSSO, Household Consumer Expenditure Survey 2009-10, Ministry of Statistics and Programme Implementation (MOSPI), GOI.

The NSSO Household Expenditure survey 66th round has also brought to light the deep urban-rural divide in terms of consumption spending (i.e. income). The per capita spending of urban India is almost double of rural India as given in the above table. It noted that the main factor of widening disparities is poor state of agriculture sector and ineffectiveness of social safety net

programmes. Per capita expenditure level of urban population was 88% higher than the rural counterparts. Despite the shift in dietary patterns, food grains will continue to be of paramount importance for household and nutritional security. This is because 1) cereals and pulses are staple foods and there is no perfect substitute between staple and other foods. 2) Food grains constitute leading and cheapest source of energy and protein as compared to other foods and this is vital for food and nutritional security of low income masses. 3) Increased production and consumption of livestock products resulting from rising per capita require high growth in the use of grain as feed for livestock. Therefore food grains will continue to be the main pillars of food security and any slackness in its production translates in to persistent food shocks and adverse impact on poverty (Saxena: 2004).

Trends and Issues in Agricultural Development: The agriculture sector in India has undergone significant structural transformation in the past several years. Its share in the GDP has declined from 30% in 1990-91 to 14.5% in 2011-12. Although this trend is expected during the development process of any economy but what is worrying is that it has not led to a corresponding decline in the share of people dependent on agriculture sector as a source of livelihood. About 52% of the total workforce is still employed on the farm sector (NSSO, 66th round). Another important concern is that the growth rate in the agriculture sector during the entire planning period has been less than the overall growth rate of the economy and it was also lower than the growth rates in rural population and workforce in agriculture, implying that per capita income in agriculture is declining. This gap between the agriculture sector and the rest of the economy began to widen since 1981-82. The gap was most prominent during the tenth five year plan (2002-07), when the overall GDP increased at 7.8% per annum whereas the agriculture sector registered rate of growth of only 2.5%. As noted in the eleventh five year plan(2007-12) there has been a sharp deceleration in the agriculture sector with the growth rate of agriculture GDP slipping from 3.3 % during 1980-81 to 1995-95 to around 2 % in the period from 1995-96 to 2004-05. This shows the underperformance of agriculture and allied sectors. Besides the performance has also been quite volatile. According to the State of Indian Agriculture Report 2011-12, the coefficient of variation (CV) in agricultural growth during period 2000-01 to 2010-11 was 1.6 compared to 1.1 during 1992-93 to 1999-2000. This is almost six times more than the CV observed in the overall GDP growth of the country. This has serious implications for food

security, farmer's income and poverty. There is wide spread rural distress leading to large scale suicides by the farmers in some part of the country. The economic survey 2007-08 had noted a very disturbing fact pertaining to food availability. Between 1950-51 and 2006-07, production of food grains increased at average annual growth rate of 2.5% compared to the growth of population which averaged 2.1% during this period. Hence India attained self sufficiency in food grains. But the rate of growth of food grains production decelerated to 1.2% during 1990-2007, lower than the annual rate of growth of population averaging 1.9%. The per capita availability of cereals and pulses therefore witnessed a decline during this period. (Economic survey 2007-08). Thus protein deficiency remains quite high in the country. Now, even cereal production has stagnated causing per capita availability to decline. This requires renewed emphasis on food security aspects of agriculture since food grains contributes about 65% of total calorie consumption in the country. Given the current trend in the demand- supply balance, especially the increasing use globally of cereals for bio-fuel production, this carries the danger of very large increase either in domestic food grain prices or of the fiscal deficit in case imports are subsidised.

Thus several challenges remain. To meet all the nutritional needs of the growing population, the country will have to produce an extra 5 million tonnes of food grains annually and achieve increase in production of livestock, fish and horticultural products. This has to be achieved inspite of shrinking arable land and farm size, low productivity, growing regional disparity and depletion of natural resource base. Appropriate steps have to be taken to minimize potential adverse consequences of globalization on domestic production, employment and price stability of food stuffs. In spite of huge buffer stocks, 8% of Indians do not get two meals a day and there are pockets where severe under-nutrition takes their toll even today (GOI: 2001).Thus food grains production has to increase.

The sources of growth changed from area expansion in the pre-green revolution period to yield growth in the later periods. From 1949-50 to 1964-65 contribution of area growth was 50.16% while that of yield only 38.41%. The introduction of new technology in mid 1960's resulted in increasing the yield levels of major crops, especially rice, therefore making the yield growth the dominant source of growth of output. Thus during 1962 to 2003-06 the yield growth accounted for 85.2% of growth of output, while contribution of area growth was only 14.4% (Bhalla and Singh: 2009).

Sustained growth in agricultural productivity is critical to improvements in food security. But in recent years productivity, measured as output per hectare, has been stagnating in India. A comparative picture in average annual growth rates of area, production and yield of different crops for two periods 1990-91 to 1999-2000 and 2000-01 to 2010-11 is given in the table below.

Table 2.

All India Average Annual Growth rates of Area, Production and Yield of Principal Crops (%)

Crops/Crop group	1990-91 to 1999-2000			2000-01 to 2010-11		
	Area	Production	Yield	Area	Production	Yield
Rice	0.70	2.09	1.36	-0.39	1.32	1.47
Wheat	1.62	4.52	2.87	0.57	1.39	0.73
Maize	0.85	2.24	1.37	2.68	7.12	4.13
Coarse cereals	-2.42	-0.08	2.03	-0.13	5.00	4.64
Total cereals	-0.12	2.29	2.38	-0.09	1.82	1.69
Gram	0.88	3.86	2.97	4.31	6.39	1.19
Tur	-0.45	1.89	2.03	2.58	1.89	-0.65
Total Pulses	-0.91	1.06	1.82	2.30	4.02	1.21
Total Foodgrains	-0.27	2.19	2.43	0.34	1.95	1.37

Source:State of Indian Agriculture 2012-13. Ministry of Agriculture and Cooperation Directorate of Economic and Statistics, Delhi.

The yield of wheat, cereals, pulses and food grains has declined significantly between the two period's i.e. 1990-91 to 1999-2000 and 2000-01 to 2010-11. This is very distressing because they are important for food security. There has been negative growth in area for coarse cereal in recent years. As far as production and yield are concerned, the growth rate of both has been significantly lower for most crops as compared to 1990's. The period since 1991, therefore

emerges as a kind of watershed in time when growth in Indian agriculture, resurgent from middle 1960's was arrested. (Balakrishnan, Golait &Kumar 2008).

Since yield growth rates are now the predominant source of agriculture output, a steep deceleration in the growth rates of yields in most parts of India should be a matter of concern for the policy makers. The low yield per unit area across almost all crops has become a regular feature of Indian agriculture.

Table-3

Yield of Major Crop in Some Countries 2012

Kg/hectare.

Countries	Rice	Wheat
Egypt	9702	6516
India	3591	3173
Japan	5391	------
China	6744	4995
U.S.A	8349	3115
U.K	----	6657
France	------	7599
World	4,395	3,115

Source: Agriculture Statistic at a glance 2013, Dept.of agriculture and cooperation Ministry of Agriculture, Government of India.

The productivity of wheat and rice, the staple crops and also the ones that is procured by public distribution system for food security is very low in India. As is clear from the table 3, productivity of wheat in India is 48% less than that in UK and almost 64% less than in China. As far as rice is concerned, productivity in India is 53% of the productivity in China and 43% of productivity in USA. Although it has the largest area under wheat and rice cultivation and also happens to be the second largest producer of these crops, but when it comes to productivity it ranks very low in the world. It is also important to note that it is not only the productivity which is low but India also does not produce according to its potential. Table 4, here gives the potential

and actual productivity and the great disconnect between the two. This again is a cause for concern and must be looked into to meet the food security needs in future.

Table.4

Potential and Actual Productivity.

Kgs per hectare.

Crop	Potential	Actual
Rice	4,000/5,810	2,393
Wheat	6,000/6,800	3,177
Jowar	3,000/4,200	962
Maize	6,000/8,000	2,478
Sugarcane	96,000/11,2000	71,667

Source: State of Indian Agriculture, 2012-13, Ministry of Agriculture and Cooperation Directorate of Economic and Statistics, Delhi.

Gross Capital Formation and Public Investment in Agriculture: The yield increases come about through increased investments. In the 1960's there was large scale government investments and this resulted in Green revolution. Provision of improved seeds, subsidized inputs, and new marketing policies was responsible for manifold increase in cereal production. The main reason for deceleration in agriculture growth in post reform period amongst many factors is the significant deceleration in public and overall investment in agriculture. The annual growth rate of public investment in agriculture declined from 4% in 1980's to 1.9% in the 1990's. As a result of the decline in public investment, expansion in irrigation, growth in input usage and technological improvements, all slowed down in the 1990's (Patnaik 2006). This indicates that non-agriculture sector is receiving higher investments as compared to agriculture sector. Though this is in conformity with development process yet keeping in view the high population pressure on agriculture for their sustenance there is need for increase in investment in agriculture and the policy makers have to take into account that unless the situation in agriculture sector improves there cannot be inclusive growth. We will experience a dualistic type of development which doesn't foster well for the objective of food security and elimination of hunger from the country.

The key indicator in drivers of agri-growth is GCF in agriculture as a percent to agri-GDP. This has increased from 14.9 % in 2006-07 to 19.8 % in 2011-12. But when compared with overall capital formation in economy, which is 40% of the GDP, the capital formation in agriculture sector is much lower. Though as percent of agri-GDP, the GCF (agr) has more than doubled during the last decade yet agriculture growth rate has not improved.

Bhalla and Singh (2009) attribute the decline in the rate of growth of yield and output to declining public investment in irrigation and water management and scientific research. This decline in public investment is a serious concern due its negative impact on long term agriculture growth. Gulati and Bathla have estimated that a 10% decrease in public investment leads to 2.4% annual reduction in agriculture GDP growth (Gulati and Bathla, 2002). Less investment in agriculture means less growth of infrastructure, irrigation, rural roads, markets, power extension services, cold storage etc and this affects agricultural growth adversely. A number of economists have pointed that pushing up public investment in agriculture is the basic requirement for growth.

Public investment in agriculture has fallen dramatically since 1980's and so has the share of agriculture in total gross capital formation (GCF).The share of public investment in total investment in agriculture fell from 30% to less than 25% between 1990-91 and 1999-2000 (1993-94 prices). The share of private sector in total investment in agriculture rose from 70% to 75%. In 2004-05 prices the share of public sector investment in total investment in agriculture was only 15 to 20% from 2004-04 to 2010-11, meaning that private sector investment was as high as 75 to 85%. The Gross capital formation in agriculture (GCFA) was only 9.9% of total GCF in 1990-91 and this fell drastically to only 3.5% in 1999-2000 at 1993-94 prices. This brings out the gross neglect of agriculture sector during the 1990's. In terms of 2004-05 prices, the share of GCFA in total GCF was 7 to 8 % during the period 2004-05 to 2010-11. This poor investment in agriculture is one of the causes of slow growth in agriculture in recent years. The share of the agriculture sectors capital formation in GDP was only 2.8% in 1999-2000 and 2.9% in 2010-11.

Increased private investment in agriculture sector is a healthy sign but it cannot compensate for public investment. Most of the public investment is in medium and major irrigation works, rural electrification, rural roads, markets etc. but private investment essentially takes place for short-

term asset building mainly in area of mechanisation. Many of the rainfed and dryland farming areas have underdeveloped or backward infrastructure and it is necessary to undertake massive investments in watershed development, roads etc. here. Private investment does not flow in these directions. In the dryland and rainfed areas once massive public investment is undertaken for development of infrastructure, private investment in horticulture, forestry plantation, livestock, minor irrigation, new technology for crop production will receive a boost up. The focus of enhanced government expenditure should be on investment in rural infrastructure comprising irrigation and water management, processing, storage, marketing apart from timely availability of improved inputs, credit and research. The approach paper to 12 FYP emphasised the need to "redouble our efforts to ensure that 4% average growth" is achieved during the plan if not more. The survey 2011-12 notes that for this incremental productivity gains and technology diffusion across regions is essential. Achieving minimum agriculture growth is a pre-requisite for inclusive growth, poverty reduction, development of the rural economy and enhancing of farm incomes. (Economic Survey, 2011-12)

The expenditure on subsidies crowds out public investment in agriculture research, irrigation, rural roads and power. Lower public investment due to more emphasis in provision of subsidy deteriorates the quality of public services like uninterrupted power supply. The investment option is much better than subsidies for sustaining long term growth in agriculture production and reduces poverty faster. Public investment is critical and important. Hence there is need for greater public investment in agriculture and irrigation remains the dominant component in the overall investment in agriculture. Public and private investment in infrastructure, including irrigation, technological change, diversification and fertiliser are the four major sources of agriculture growth in India. The progress on these fronts slowed down since the 1990s and is partly responsible for agriculture not achieving the 4% growth rate targeted since long. (GOI: 2007)

Conclusion Agriculture is important for food security, poverty alleviation and hunger. Its growth makes food available at cheap rates to poor, wages increase and through linkages helps the non farm sector to grow and is responsible for poverty reduction. This has been amply demonstrated through various empirical studies not only in India but in other parts of the world too. But the Indian agriculture sector is in crisis today. After mid 1990s growth rate in

agricultural output declined sharply. Over the last 50 years, deceleration in the growth of agricultural output was not witnessed for such a long period as seen after 1994-95. Slow growth in agriculture with no significant decline in labour force has created a serious disparity between agriculture and non- agriculture. More than 80% of agricultural holdings in India are of less than 2 hectares and more than 60% of farmers operate less than 1 hectare each. As employment opportunities in the non-farm sectors are growing very slowly, there is very little shift of labour force from agriculture.

Thus decline in agriculture output growth has been a continuing phenomenon for more than a decade The production and productivity is declining and it is not only less than other countries but also below its own potential. The main reason is the decline in investment in the agriculture sector. Though the public investment in agriculture has fallen but the private investment has increased. This is a welcome feature but private investment cannot fulfil the gap since they are not geared towards long term objectives. The rainfed and semi arid regions show the most decline and they need substantial investments in major irrigation projects and other areas like water shed development. But private investment may not be forthcoming here. Another area of concern is the declining gross capital formation in agriculture. It is important because there are still fifty two percent of the population dependent on agriculture for source of livelihood. The poverty level in rural India is still very high and so is the accompanying malnutrition and food insecurity. Improving the viability of smaller holdings by providing access to technology, inputs and credit through appropriate institutions remains a big challenge. Improvement in yields holds the key for India to remain self-sufficient in foodgrains. Hence it is imperative that productivity should increase, through increased public investment, to meet the food security needs and poverty reduction..

References:

1. Ahluwalia M. S. (1978). *Rural Poverty and Agriculture Performance in India* World Bank Reprint Series: Number Sixty, Reprinted from the Journal of Development Studies 1977. Retrieved from www.planningcommission.nic.in/aboutus/speech
2. Bhalla G.S and Gurmail Singh. (2009). *Economic liberalisation and Indian Agriculture: A state wise Analysis*, Economic and Political Weekly, 44 (52), 26 December-1 January, pp 34-44.
3. Byerlee, D., Diao, X., Jackson, C. (2005). *Agriculture, Rural Development, and Pro-Poor Growth, Country Experiences in the Post-Reform Era,* Agriculture and Rural Development Discussion Paper 21. World Bank, Washington DC.
4. Datt, G., and Ravallion, M. (1998). *Farm productivity and rural poverty in India.* Journal of Development Studies 34 (4): 62-85.
5. Datt, Gaurav and Ravallion, Martin (1996). *How Important to India's Poor is the Sectoral Composition of Economic Growth.* World Bank Economic Review 10 (1), pp. 1-25.
6. Dev, S. M. (1998). *Regional Disparities in Agricultural Labour Productivity and Rural Poverty.* Indian Economic Review 23 (2): 167-205.
7. Gulati Ashok and Seema Bathla (2002). *Capital formation in Indian Agriculture: Trends, Composition and implications for Growth.* NABARD Occasional Paper 24, Mumbai.
8. IFPRI (2013). *Global Hunger Report,* International Food Policy Research Institute. www.ifpri.org
9. Government of India (2001). *Report of the Steering Committee of Nutrition.* Planning Commission New Delhi.www.planningcommission.nic.in,
10. Government of India (2013). Ministry of Agriculture and Cooperation. *Pocket Book on Agricultural Statistics* 2013. Directorate of Economics and Statistics, New Delhi.
11. Government of India (GOI) (*2007-08). Economic Survey* New Delhi: Ministry of Finance; 2008.
12. Government of India (GOI) (*2011-012).Economic Survey.* New Delhi: Ministry of Finance; 2012.
13. Government of India (GOI), (2012). *Twelfth Five Year Plan 2012-17.* Volume 11, Planning Commission, Delhi.

14. Government of India (GOI) (2014). *Agriculture Statistics at a Glance 2013.* Ministry of Agriculture and Cooperation Directorate of Economic and Statistics, Delhi.
15. Government of India (GOI), (2012). *State of Indian Agriculture 2011-12*. www.agricoop.nic.in
16. Government of India (GOI), (2007). *Report of the Steering Committee on Agriculture and allied sectors*, for formulation of Eleventh plan (2007-12), Planning Commission April 2007.
17. Islam, R. (2004). *The Nexus of Economic Growth, Employment and Poverty Reduction: An Empirical Analysis.* Issues in Employment and Poverty Discussion Paper 14, Geneva, International Labour Organisation.
18. Klasens, S. (2007). *Determinants of pro-poor growth* [2020 Focus Brief] Washington, D.C:International Food Policy Research Institute. Retrieved from http://www.ifpri.org/sites/default/files/publications
19. Lipton, M. & Longhurst R. (1989). *New Seeds and Poor People*, Baltimore John Hopkins University Press.
20. Mellor, J. (1999). *Faster, More Equitable Growth- The Relation Between Growth in Agriculture and Rural Poverty Reduction Agricultural Policy Development Project* (Research Report No. 4) Washington, D.C. United States Agency for International Development. Retrieved from www.abtassociates.com/reports/19998977199472.pdf.
21. Mishra and Puri (2013). *Indian Economy- Its Development Experience.* 31 revised edition, Himalaya Publishing House, Delhi
22. National Sample Survey Organisation (NSSO) (2011). *Household Consumer Expenditure NSS 66th Round 2009-10.* Ministry of Statistics and Programme Implementation (MOSPI), Government of India.
23. Patnaik, Utsa (2006). *Poverty and Neo-liberalism in India.* Available from: http://www.networkideas.org/featart/jan2007/, accessed on March 31, 2014.
24. Pulapre Balakrishnan, Ramesh Golait and Pankaj Kumar (2008). *Agriculture Growth in India since 1991*. RBI, DRG Paper No.27 Mumbai 2008, p-7.
25. Ravallion, M. & Chen (2004). *China's uneven progress against poverty*. World Bank Policy Research Working paper No.3, 408 September.

26. Saxena, N. & J. Farrington (2003). *Trends and Prospects for Poverty Reduction in Rural India: Context and Options.* ODI Working Papers 198. Overseas Development Institute London U.K.

27. Saxena, N. C. (2004). *Hunger, Under Nutrition and Food Security in India.* Working Paper 44, Indian Institute of Public Administration retrieved from, www.r4d.dfid.gov.uk/PDF/Outputs/ChronicPoverty_RC/CPRC-IIPA44.pdf.

28. Schneider K., Gugerty, M. K. (2011).*Agricultural Productivity and Poverty Reduction: Linkages and Pathways*, The Evans School Review, 1 (1), Spring Retrieved from http//.www.adb.org.

29. Thirtle, C., Irz, X., Lin, Lin, Mckenzie-hill, V., & Wiggins, Steve (2001). *Relationship between changes in agricultural productivity and the incidence of poverty in developing countries* (Report No. 7946). London: Department for International Development. Retrieved from www.odi.org.uk/events/docs/4086.pdf

30. World Bank (1986). *Poverty and Hunger: Issues and Options for Food Security in Developing Countries.* Washington DC. www-wds.worldbank.org/external.

31. World Food Summit (1974). Food and Agriculture organisation.www.fao.org

32. World Food Summit (1996). Food and Agriculture organisation.www.fao.org