ANALYSIS OF STRUCTURAL TRANSFORMATION AND DEVELOPMENT OF AGRICULTURE SECTOR IN INDIA

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ABSTRACT

India is principally an agricultural country. Agriculture, with its allied sectors, is unquestionably the largest livelihood provider in India. Indian agriculture has undergone rapid transformation in the past two decades. The policy of globalization and liberalization has opened up new avenues for agricultural modernization. It accounted for 17% of the GDP in 2012, and is still the largest economic sector and a significant piece of the overall socio-economic development of India. At this context, the paper briefly review of the status and performance of Indian agriculture, especially during the last two decades, its relative importance and contribution to the Indian economy, and also presents the various driving forces of agricultural growth and provide suggestions regarding what could be the way forward, given our objectives of accelerated growth, inclusiveness and the reducing of poverty and hunger.

KEYWORDS: Agriculture, Agri-GDP, Gross Capital Formation, Principal Crops, Sustainable Growth.

INTRODUCTION

Agriculture is a critical sector of the Indian economy. Though its contribution to the overall Gross Domestic Product (GDP) of the country has fallen from about 30 percent in 1990-91 to less than 15 percent in 2011-12, a trend that is expected in the development process of any economy, agriculture yet forms the backbone of development. An average Indian still spends almost half of his total expenditure on food, while roughly half of India’s work force is still engaged in agriculture for its livelihood. Being both a source of livelihood and food security for a vast majority of low income, poor and vulnerable sections of society, its performance assumes greater significance in view of the proposed National Food Security Bill and the ongoing Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) scheme.

The experience from BRICS countries indicates that a one percentage growth in agriculture is at least two to three times more effective in reducing poverty than the same growth emanating from non-agriculture sectors. Given that India is still home to the largest
number of poor and malnourished people in the world, a higher priority to agriculture will achieve the goals of reducing poverty and malnutrition as well as of inclusive growth. Since agriculture forms the resource base for a number of agro-based industries and agro-services, it would be more meaningful to view agriculture not as farming alone but as a holistic value chain, which includes farming, wholesaling, warehousing (including logistics), processing, and retailing. Further, it may be noted that in the last two Five Year Plans, it is clearly mentioned that for the economy to grow at 9 per cent, it is important that agriculture should grow at least by 4 per cent per annum.

Achieving an 8-9 percent rate of growth in overall GDP may not deliver much in terms of poverty reduction unless agricultural growth accelerates. At the same time ‘growth with inclusiveness’ can be achieved only when agriculture growth accelerates and is also widely shared amongst people and regions of the country. All these factors point to just one thing: that agriculture has to be kept at the center of any reform agenda or planning process, in order to make a significant dent on poverty and malnutrition, and to ensure long-term food security for the people.

OBJECTIVES OF THE STUDY

- To analyze the role of agriculture in Indian economy
- To make a detailed analysis of growth in agricultural sector over the two decades.
- To examine the contribution of agriculture to the Indian GDP.
- To identify the major drivers of agricultural growth

DATA SOURCE AND METHODOLOGY

The study based on secondary data collected from various journals, booklets, periodicals and reports published by various government institutions such as Agricultural Census in India, Directorate of Economics and Statistics, Department of Agriculture And Cooperation of Ministry of Agriculture, Ministry of Rural Development, National Sample Survey office of Ministry of Statistics and Program Implementation, Planning Commission, International Food Policy Research Institute and other published online sources. The simple tabular and graphical tools and percentage analysis were used in this study.
RESULTS AND DISCUSSION

Fig 1.1: Sectoral Composition of GDP

Source: CSO

The agriculture sector in India has undergone significant structural changes in the form of decrease in share of GDP from 30 percent in 1990-91 to 14.5 percent in 2010-11, indicating a shift from the traditional agrarian economy towards a service dominated one (Fig.1.1). This decrease in agriculture’s contribution to GDP has not been accompanied by a matching reduction in the share of agriculture in employment. About 52% of the total workforce is still employed by the farm sector which makes more than half of the Indian population dependent on agriculture for sustenance (NSS 66th Round). However, within the rural economy, the share of income from non-farm activities has also increased.

Fig1.2: Averagesize(ha)of holdings as per different Agriculture Census(for all size groups)

Source: Department of Agriculture and Cooperation, Agricultural Census Division, Ministry of Agriculture.
The average size of operational holdings in India has diminished progressively from 2.28 ha in 1970-71 to 1.55 ha in 1990-91 and further declined to 1.23 ha in 2005-06 (Fig. 1.2). As per Agriculture Census 2005-06, the operation of marginal holdings (area less than 1 ha) has increased from 61.6 percent in 1995-96 to 64.8 percent in 2005-06. This is followed by about 18 percent small holdings (1-2 ha.), about 16 percent medium holdings (more than 2 to less than 10 ha.) and less than 1 percent large holdings (10 ha. and above).

Growth Performance of Agriculture

**Fig.1.3: Growth Rates: GDP (overall) and GDP (Agriculture & Allied Sectors)**

Source: CSO

The growth performance of the agriculture sector has been fluctuating across the plan periods (Fig. 1.3). It has witnessed a growth rate of 4.8 per cent during the Eighth plan period (1992–97). However, the agrarian situation saw a downturn towards the beginning of the Ninth plan period (1997–2002) and the Tenth plan period (2002–07), when the agricultural growth rate came down to 2.5 percent and 2.4 percent respectively. This crippling growth rate of 2.4 percent in agriculture as against a robust annual average overall growth rate of 7.6 per cent for the economy during the tenth plan period was clearly a cause for concern. The trend rate of growth during the period 1992-93 to 2010-11 is 2.8 percent while the average annual rate of growth in agriculture & allied sectors- GDP during the same period is 3.2 percent.
The increasing divergence between the growth trends of the total economy and that of agriculture & allied sectors suggests an under performance by agriculture (Fig 1.4). It is also significant that unlike the overall economic growth pattern, agricultural performance in India has been quite volatile (the Coefficient of Variation (CV) during 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 indicating that high and perhaps increasing volatility is a real challenge in agriculture, which is likely to increase in the years to come in the wake of climate change.

Regional Variations in Growth

The Indian agriculture growth pattern has been highly varied at the state level. Since agriculture is a state subject, the overall performance of the agriculture sector in India largely depends on what occurs at the state level. There is a wide variation in the performance of different states. During 2000-01 to 2008-09, the growth performance of agriculture in Rajasthan (8.2%), Gujarat (7.7%) and Bihar (7.1%) was much higher than that of Uttar Pradesh (2.3%) and West Bengal (2.4%). The recent dynamics of erstwhile poor performing states like Orissa, Chhattisgarh and Himachal Pradesh showing strong growth in agriculture can be seen from Fig. 1.5 & 1.6.

Fig. 1.5: Average Annual Growth Rate (%) of Gross State Domestic Product from Agriculture & Allied Sector, 1994-95 to 1999-2000

Source: CSO. Note: GSDP estimates are at 1999-2000 prices.
Crop-Specific Growth

During 2010-11, food grains production was 244.78 million tonnes, comprising of 121.14 million tonnes during Kharif season and 123.64 million tonnes during the Rabi season. Of the total food grains production, production of cereals was 226.54 million tonnes and pulses 18.24 million tonnes. As per second advance estimates for 2011-12, total food grains production is estimated at a record level of 250.42 million tonnes which is 5.64 million tonnes higher than that of the last year production. Production of rice is estimated at 102.75 million tonnes, Wheat 88.31 million tonnes, coarse cereals 42.08 million tonnes and pulses 17.28 million tonnes. Oilseeds production during 2011-12 is estimated at 30.53 million tonnes, sugarcane production is estimated at 347.87 million tonnes and cotton production is estimated at 34.09 million bales (of 170 kg. each). Jute production has been estimated at 10.95 million bales (of 180 kg each). Despite inconsistent climatic factors in some parts of the country, there has been a record production, surpassing the targeted production of 245 million tonnes of food grains by more than 5 million tonnes during 2011-12.

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 Table 1.1. In the case of wheat, the growth in area and yield have been marginal during 2000-01 to 2010-11 suggesting that the yield levels have plateau for this crop. This suggests the need for renewed research to boost production and productivity.
Table 1.1: All India Average Annual Growth Rates of Area, Production and Yield of Principal Crops (%)

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<td></td>
<td>A</td>
<td>P</td>
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<tr>
<td>Rice</td>
<td>0.70</td>
<td>2.09</td>
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<td>Wheat</td>
<td>1.62</td>
<td>4.52</td>
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<td>Maize</td>
<td>0.85</td>
<td>2.24</td>
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<tr>
<td>Coarse Cereals</td>
<td>-2.42</td>
<td>-0.08</td>
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<td>Total Cereals</td>
<td>-0.12</td>
<td>2.29</td>
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<td>Gram</td>
<td>0.88</td>
<td>3.86</td>
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<td>Tur</td>
<td>-0.45</td>
<td>1.89</td>
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<tr>
<td>Total Pulses</td>
<td>-0.91</td>
<td>1.06</td>
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<tr>
<td>Total Food grains</td>
<td>-0.27</td>
<td>2.19</td>
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<tr>
<td>Groundnut</td>
<td>-2.25</td>
<td>-2.40</td>
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<tr>
<td>R&amp;M</td>
<td>2.28</td>
<td>4.82</td>
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<tr>
<td>Soyabean</td>
<td>11.01</td>
<td>16.37</td>
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<tr>
<td>Oilseeds</td>
<td>0.75</td>
<td>2.53</td>
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<tr>
<td>Sugarcane</td>
<td>2.25</td>
<td>3.16</td>
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<tr>
<td>Cotton</td>
<td>1.42</td>
<td>0.93</td>
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All the major coarse cereals display a negative growth in area during both the periods except for maize, which recorded an annual growth rate of 2.68 per cent in the 2000-01 to 2010-11 period. The production of maize has also increased by 7.12 percent in the latter period. In pulses, gram recorded a growth of 6.39 percent in production during the same period driven by expansion in the area under cultivation. Soya bean has recorded a high rate of growth in production in both the periods, driven primarily by expansion in area under cultivation. In fact oilseeds as a group have shown some significant changes in the two decades: the production growth rate has more than doubled in the decade of 2000s over the previous decade, driven both by productivity gains (e.g. groundnut and soya bean) as well as by area gains.

The average annual growth rates of production and productivity of groundnut during 2000-01 to 2010-11 are abnormally high due to high fluctuations in the production and productivity during the years 2002-03, 2006-07 & 2007-08. The trend growth rates in the production and productivity of groundnut during 2000-01 to 2010-11 work out to 1.66 per cent and 2.63 per cent respectively. Fruits & vegetables have shown a higher growth in production and area in 2000-01 to 2010-11 as compared to 1990-91 to 1999-2000.
The biggest increase in the growth rates of yields in the two periods, however, is in groundnut and cotton. Cotton has experienced significant changes with the introduction of Bt cotton in 2002 (Fig. 1.7). By 2011-12, almost 90 percent of cotton area is covered under Bt. cotton, production has more than doubled (compared to 2002-03), yields have gone up by almost 70 percent, and export potential for more than Rs.10,000 crore worth of raw cotton per year has been created. More such revolutions to accelerate Agri-growth are needed.

The shares of fruits & vegetables and livestock have shown an increasing trend in recent years implying that they have been growing at a much faster rate than the traditional crops sector. Given the rising share of high value commodities in the total value of agricultural output and their growth potential, this segment is likely to drive agricultural growth in the years to come. Being highly perishable in nature, this segment requires faster and better linkages between farms and firms in terms of logistics, processing and organized retailing. This would entail institutional changes that can incentivize entrepreneurs to invest in building efficient and faster value chains that reduce wastages, and increase the incomes of the farmers at the bottom of the chain.

**Drivers of Agricultural Growth**

**Investment**

Fig. 1.8: Per cent Share of Agriculture & Allied Sector in Total Gross Capital Formation.

Source: CSO Note: All the figures are at 2004-05 prices.
In recent years, the share of Gross Capital Formation (GCF) of agriculture & allied sector in total GCF has floated between 6 to 8 percent whereas it was around 18 percent during the early 1980s (Fig.1.8). This indicates that the non-agriculture sectors are receiving higher investment as compared to agriculture & allied sector over the plan periods resulting in growth disparities. Though this is in line with the overall falling share of agriculture in the overall GDP, and also conforms to the development process observed elsewhere in the developing world, yet keeping in view the high population pressure on agriculture for their nourishment, there is need for substantial increase in investment in agriculture.

**Fig. 1.9: Gross Capital Formation in Agriculture as a percentage to Agri-GDP**

![Graph showing Gross Capital Formation in Agriculture as a percentage to Agri-GDP from 1951-56 to 2002-07](source: CSO. Note: All the figures are at 2004-05 prices.)

The key indicator in drivers of Agri-growth is Gross Capital Formation in agriculture as a percentage to Agri-GDP. This indicator, GCF in agriculture & allied sector as percentage of Agri-GDP, increased from 7.0% during the First Plan (1951-56) to 10.8% during the Fifth Plan (1974-79), after which it followed a declining trend up to Eighth Plan (1992-97) when it came down to 8.8 percent. From the Ninth Plan (1997-2002) onwards, a reversal in trend has been achieved partly due to the efforts of government schemes and programs, resulting in an increase in GCF to 13.9 percent of GDP (Agri) during the Tenth plan (2002-07). It has further risen to 18.7 percent of Agri-GDP during the first three years of the Eleventh Plan. Thus, as a percentage of Agri-GDP, the GCF (Agri) has more than doubled during the last decade (Fig. 1.9). Yet, the agriculture GDP growth has not accelerated commensurately, though it has improved over the growth rates achieved in the Ninth and Tenth Five Year Plans.
It is interesting to note that while public investment in agriculture is critical and important, in actual terms, it forms about 20 percent of the total investment in agriculture; 80 percent comes from the private sector (Fig. 1.10). In the early 1980s, for example, the share of the public sector and private sector (including household sector) in gross capital formation in agriculture was roughly equal, but by the early 2000s, the share of the private sector was four times larger than the share of the public sector at 2004-05 prices. Moreover, the private sector responds much better and faster to the incentive structures in agriculture. Hence, along with bringing in greater public investment in agriculture, there is a need for bringing in reform in the incentive structure.

**Emerging Demand—Supply Imbalances**

With the Indian economy growing at 8 percent and higher expenditure elasticity of fruits & vegetables and livestock as compared to cereals, there is an increasing pressure on the prices of such high value perishable commodities. The per capita monthly consumption of cereals has declined from 14.80 kg in 1983-84 to 12.11 kg in 2004-05 and further to 11.35 kg in 2009-10 in the rural areas. In the urban areas, it has declined from 11.30 kg in 1983-84 to 9.94 kg in 2004-05 and to 9.37 kg in 2009-10. The agricultural production basket is still not fully aligned to the emerging demand patterns.
Trade in Agricultural Commodities

Fig 1.11: Trend in Trade of Agricultural Commodities

The policy reforms of the 1990s more or less eliminated the bias against agriculture by lowering industrial tariffs and correcting for the overvalued exchange rates which lead to an improvement in the terms of trade in favor of agriculture. This was followed by a calibrated liberalization of Agri-exports and imports. As a result, Indian agriculture has increasingly been opened to global agriculture with the ratio of agricultural exports and imports as a percent of Agricultural GDP rising from 4.9 percent in 1990-91 to 12.7 percent in 2010-11. (Fig 1.11) This is still low as compared to the share of India’s total exports and imports as a percent of India’s GDP at 55.7 percent. India is a net exporter of agricultural commodities with agricultural exports constituting 11 percent of India’s total exports. However, the share of agricultural exports in India’s overall exports has been declining from 18.5 percent in 1990-91 to 10.5 percent in 2010-11.

Public-Private Participation in Indian Agriculture

The private sector involvement in Indian agriculture is a recent development. This is apparent in initiative such as infusion of new technologies like BT cotton, hybrid seed technology in maize; in a mainstreaming of the fragmented small holders by integration of rural business service hubs (RBHs) at the back end and agro-processing industry and organized retailing at the front end. Successful examples like Bt cotton, hybrid maize, pusa basmati rice, etc. suggest beneficial outcomes comes from public sector partnership with the private sector farmer groups and the like.

Future breakthrough technologies in agriculture will come increasingly from the private sector, and India’s private sector has the strength to multiply those technologies and to reach millions of farmers (big and small) in the fastest possible way. There is a need to channelize
these sources in an orderly manner, so that in the process, apart from the private sector profitability, the farming community is also benefited. This will assist in pushing Indian agriculture to a higher and more sustainable growth which would be the most powerful engine for poverty reduction. For areas where the private sector has not shown much interest such as rain fed areas, tribal areas, natural resource management, pulses, millets, the role of public research system would continue to be critical.

**Price Policy**

Though with economic liberalization and gradual integration with the world economy, relaxation of export controls on several agricultural products since 1991 have helped agricultural exports, there are still occasional interventions by the government (for example, export bans on wheat and rice, or limits on the stocking of grains by private trade that dissuade the private sector players from investing in the agri-system). However, one of the main government interventions in the agricultural markets currently is its policy of minimum support prices (MSP) for agricultural commodities. For procurement of horticultural commodities which are perishable in nature and not covered under the Price Support Scheme, with a view to protect the growers of these commodities from making distress sale in the event of bumper crop during the peak harvesting periods when the prices tend to fall below the economic cost of production, a Market Intervention Scheme (MIS) is implemented on the request of a State/UT Government which is ready to bear 50 percent loss (25 percent in case of North-Eastern States), if any, incurred on its implementation.

**Marketing and Warehouse Facilities**

In the context of food grains policy, concern has been raised about simultaneous occurrence of high food inflation and large food grains stocks in our granaries. It has been argued (Kaushik Basu, 2011) that, in creating a better food grains policy, it is imperative that the entire system of food grains production, procurement, release and distribution is looked at. Besides improving storage facilities there is a need to redesign the mechanics of procurement and release of food grains to the market to ensure that the impact on prices is substantial in the desire direction. An improvement in marketing conditions and encouragement to private sector participation can be achieved by reforming the Agricultural Produce Marketing Committee (APMC) Acts. Appropriate changes in the APMC Acts can boost private sector investment in developing regularized markets, logistics and warehouse receipt systems,
futures markets, and in infrastructure (such as cold storage facilities, quality certification, etc.) for imports and exports. This is particularly relevant for the high value segment that is currently hostage to high post-harvest losses and weak farm-firm linkages. The introduction of the Model Act in 2003 was directed towards allowing private market yards, direct buying and selling, and also to promote and regulate contract farming in high value agriculture. Although many states have adopted the new Model Act, with modifications, its impact on farmers in terms of better prices for their produce and a reduction in the high differences between farm harvest prices and consumer prices is not yet visible.

SUGGESTIONS

1. The government has to play a more proactive role as coordinator, facilitator and also as a regulator. Higher investment in basic infrastructure like roads, canal waters, watersheds, check dams, etc. will attract private investment in other areas of the agriculture & supply chain.

2. Moreover, the private sector responds much better and faster to the incentive structures in agriculture. Hence, along with bringing in greater private investment in agriculture, there is a need for bringing in reforms in the incentive structure.

3. Bringing in reforms to streamline domestic markets and expanding the infrastructure and institutions to connect local markets with global markets, will go a long way in improving India’s competitiveness and the benefits from trade liberalization.

4. There is always a trade–off between allocating money through subsidies or by increasing investments. The investment option is much better for sustaining long-term growth in agricultural production.

5. There is a need to channelize the sources in an orderly manner, so that in the process, the farming community is benefited and it will assist in pushing Indian agriculture to a higher and more sustainable growth which would be the most powerful engine for poverty reduction.
CONCLUSION

As the economy develops, high-value agriculture becomes increasingly important, both as a share in agricultural output and in the food basket. The overview provided in this study suggests that a future road map for high-value agriculture development should focus on investment in technology development and dissemination, basic infrastructure, improve the technical capacity of producers and other players in the value chain, institutional support in core functions of production, logistics and marketing through concerted public sector support and active public-private partnerships, and provision of inputs, in particular planting materials for fruits and seeds for vegetables.

At present, the agriculture sector alone would hardly be in a position to create additional employment opportunities to sustain the livelihood of the rural households. This calls for creation of additional employment opportunities in the non-farm and manufacturing sector, especially in agro based rural industries which have area specific comparative advantage in terms of resources endowment and development possibilities. This alone would be able to make agriculture viable in a sustainable manner.

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