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Dynamics of Agricultural Growth in India

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I

INTRODUCTION

I consider it a great honour to be invited as one of the Chief Guests of the Inaugural function of the 71st Annual Conference of the Indian Society of Agricultural Economics. The Society has made enormous contributions to the study of agricultural economics in India. It has stimulated the development of a body of knowledge on this subject which is impressive by any standards and has also been at the forefront of policy thinking on this subject. I feel particularly privileged to deliver this lecture in this event which is coinciding with the Silver Jubilee Year of the University of Agricultural Sciences, Dharwad, which has been at the forefront of development of agricultural economics in the country.

The four themes chosen for this Conference, viz., Agricultural Development Perspective and Strategy Planning for the 12th Five Year Plan, Climate Change, Innovations in Agricultural Credit Market and Role of ICT – are the corner stones of the transformation that is taking place in the way Agricultural Economics is going to be practiced in the country.

My lecture will focus on the growth of India and examine whether agricultural growth is keeping pace. I will talk about the trends observed in agricultural growth over the last two decades including the rising prominence of 'high value agriculture'. The other aspects I will dwell on are the thrust areas for accelerating agricultural reforms and the production side interventions that are required. I will, of course, cover Aadhaar and the beneficial role it can play in reaching out to the farming community.

II

INDIA IS GROWING

India is being recognised as the global power in key economic sectors with consistently high economic growth. The economy has performed well on the growth front, averaging 8.2 per cent in the first 4 years of the Eleventh Five Year Plan. Even though the economy has slowed down somewhat in 2011-12, we are still likely to average a gross domestic product (GDP) growth of around 8.2 per cent over the

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Eleventh Plan period, according to the Approach Paper to the 12th Five Year Plan. India and the other emerging markets have seen an increased influx of foreign capital partly aided by the continuing economic problems in Europe and the United States. The political and economic stability have also contributed to the inflow of foreign capital. Of course, the capital requirements for Indian industry remain high given the rapid expansion of the economy, which means FDI investments are easily absorbed. Portfolio investment in India in the 2009-10 fiscal year broke all previous records resulting in a steep rise in the equity markets. Between April 1, 2009 and November 8, 2010, the BSE Sensex zoomed from 9,901 points to an all-time closing high of 21,004 points. That index has been doing a roller coaster and is now hovering around the 17,000 mark.

TABLE 1. GDP AT CONSTANT PRICES AND YEAR-ON-YEAR PER CENT CHANGE

(per cent)

Year	GDP (Rs. billion)	GDP growth (YOY)
(1)	(2)	(3)
2005-06	3249.1	-
2006-07	3564.6	9.7
2007-08	3893.5	9.2
2008-09	4155.0	6.8
2009-10	4487.4	8.0
2010-11	4873	8.6

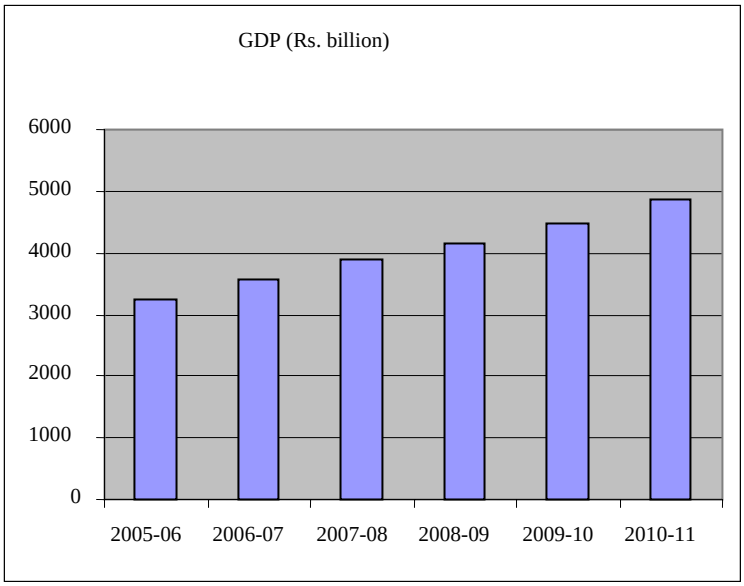

Figure 1. GDP from 2005-06 to 2010-11 (Projection for 2011-12).

The Indian economy, on the eve of the Twelfth Plan, is characterised by strong macro fundamentals and good performance over the Eleventh Plan period, though clouded by some slowdown in growth in the current year, continuing concern about

inflation and a sudden increase in uncertainty about the global economy. The objective of the Eleventh Plan was faster and inclusive growth and the initiatives taken during this plan period have resulted in substantial progress towards both objectives. Inevitably, there are some weaknesses that need to be addressed and also new challenges that needs to be faced. Some of the challenges themselves emanate from the economy's transition to a higher and more inclusive growth path, the structural changes that come with it and the expectations it generates. There are external challenges also arising from the fact that the global economic environment is much less favourable than it was at the start of the Eleventh Plan. These challenges call for renewed efforts on multiple fronts, learning from the experience gained, and keeping in mind global developments.

III

BUT, AGRICULTURAL GROWTH IS NOT KEEPING PACE!

While industry and services have grown, agricultural sector has lagged behind. Information technology sector is growing consistently at 30 per cent every year but agriculture has not even achieved 4 per cent growth. The contribution of agricultural sector to national Gross Domestic Product (GDP) has continued to decline over the years; while that of other sectors, particularly services, has increased. Agriculture as a component of GDP has shrunk from 55 per cent in 1951-52 through 44 per cent in 1970-71 to 31.4 per cent in 1990-91 and 14.6 per cent in 2009-10 (at 2004-05 prices), respectively. In terms of composition, out of a total share of 14.6 per cent of the GDP from agriculture and allied sectors in 2009-10, agriculture alone accounted for 12.3 per cent, followed by forestry at 1.5 per cent and fisheries at 0.8 per cent (CSO, 2011). The share of agricultural exports in total export value declined from about 18.5 per cent in 1990-91 to about 10.6 per cent in 2009-10, while the share of agricultural imports to total imports increased from 2.8 per cent in 1990-91 (pre-reforms period) and reached a high of 8.2 per cent in 1998-99 and declined to about 4.4 per cent in 2009-10 (Government of India, 2010). Nonetheless, agriculture remains a major source of employment, absorbing about 52 per cent of the total national workforce in 2004-05, down from about 70 per cent in 1970-71.

TABLE 2. COMPONENTS OF GDP

(*per cent*)

Year	Agriculture	Industry (including construction)	Services
(1)	(2)	(3)	(4)
1951-52	55.4	15.4	29.3
1961-62	49.4	19.5	31.1
1971-72	43.1	22.5	34.5
1981-82	37.6	24.6	37.9
1991-92	30.3	25.6	44.1
2001-02	24.0	25.0	51.0
2009-10	14.6	28.5	56.9

Another noteworthy trend is the massive urbanisation that has taken place in the Indian economy. At the beginning of the last century, only 1 in 10 Indians was an urban dweller while today 1 in 4 Indians lives in cities. With the world becoming increasingly flat and the economy becoming more and more global, it is expected that this trend will further accelerate.

A weakness in the economic performance thus far is that growth in the farm sector (agriculture and allied activities), though better than in the Tenth Plan, remains short of the 4 per cent Plan target. The farm sector has grown at an average rate of around 3.2 per cent during the first four years of the Eleventh Plan and assuming conditions remain favourable in 2011, the average farm sector growth in the Eleventh Plan period may be a little over 3 per cent. This is a marked improvement from the average growth of about 2.2 per cent during the Tenth Plan period. Still, with half of our population dependent on agriculture and allied activities, we need faster farm sector growth to percolate to benefit the poor small and marginal farmers, many of whom are women. The below target growth in this sector is one of the reasons for increase in food prices over the last two years. Global development experience, especially from the Brazil, Russia, India and China (BRIC) countries, reveals that one percentage point growth in agriculture is at least two to three times more effective in reducing poverty than the same magnitude of growth emanating from non-agriculture sector.

Since agriculture is a State subject, the Centre will have to work hand in hand with the states to bring coherence in policies and strategies. The overall investment in agriculture, which has dipped to less than 10 per cent of agriGDP in 2002-03 has substantially risen and today stands at more than 21 per cent of agriGDP. Higher levels of investments in agriculture, both by the public and private sector can yield much better results if the reforms are undertaken to streamline not only the incentive structures for the farmers, but also the institutional framework in which agriculture and related activities take place. Seeds and irrigation are priority areas, which can be catalysts for raising productivity on the supply side. On the demand side, there is urgent need to remove most of the controls that have denied a unified and seamless all India market for most agri-products. Finding the most effective ways of ushering in these changes must be a key priority area in the Twelfth Plan.

IV

AGRICULTURAL GROWTH IN LAST TWO DECADES

The Eleventh Plan had sought to reverse the deceleration of agricultural growth which occurred in the Ninth Plan and continued into the Tenth Plan. It has had some success in that foodgrain production touched a new peak of 241 million tonnes in 2010-11 and growth in agriculture in the Eleventh Plan is likely to average 3.3 per cent per year as compared to 2.2 per cent in the Tenth Plan. However, we need to

redouble our efforts to ensure that 4 per cent average growth, if not more is achieved in the Twelfth Plan period.

Although rural incomes have increased and rural poverty has reduced over the years, the gap between urban and rural incomes has widened quite sharply because agriculture has grown slower than the other sectors and because employment growth in non-agriculture has not been enough to sufficiently reduce the population dependent on agriculture. Productivity gains from the Green Revolution reached a plateau by the end of Eighth Plan, causing per capita food grain production to decline thereafter. Agriculture did diversify towards horticulture, animal husbandry and non-food crops, but agricultural GDP growth averaged only 1.9 per cent during 1997-98 to 2004-05. Farm incomes increased even less since terms of trade turned against agriculture during this period, indicating inadequate demand and lack of rural purchasing power. This prevalence of an agrarian crisis, particularly in the rain-fed areas of the country, established that, in addition to stressed natural resources and very inadequate rural infrastructure, there was clear evidence of technology fatigue, rundown delivery systems in credit, extension and marketing services and of insufficient agricultural planning at district and lower levels.

A few significant schemes like Rashtriya Krishi Vikas Yojana (RKVY), National Food Security Mission (NFSM), Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA) were introduced as a structural response by the Union Government and are being implemented with support from the State Governments. There has been a positive response as agricultural GDP growth accelerated to average 3.7 per cent growth during 2005-06 to 2010-11, partly because of the initiatives taken since 2004. This, however, is still below the 4 per cent target set in successive plans from Ninth Plan onward and has not been sufficient to prevent unacceptably high food inflation in the context of very volatile world prices and in the wake of a severe drought in 2009. Nonetheless, although high food prices are clearly a setback for inclusive growth, this has improved agriculture's terms of trade and prevented further fall in farm incomes relative to overall GDP (agriculture's share in nominal GDP in 2010-11 was about the same as in 2004-05). While this has restored confidence to some extent, inflation itself is causing concern among farmers who are not only facing higher costs but also adverse effects of certain policies adopted to cope with inflation, e.g., export bans. Moreover, there are some farmer concerns arising from the effect on wages of MGNREGA. Higher wages and assured availability of jobs have resulted in scarcity of farm labour at least in some seasons. The Twelfth Plan should explore the feasibility of synergising the activities of MNREGA with agricultural operations. Since introduction of MNREGA has taken a paradigm shift in the rural sector, we need to explore possibilities of innovations and application of most suitable mechanisation and technology for Indian conditions.

4.1 *Trends in Agricultural Demand and Its Composition*

On the demand side, a 9 per cent growth of the economy as a whole is expected to generate the demand to support 4 per cent growth in agriculture with foodgrains growing at about 2 per cent per year and non-food grains (notably, horticulture, livestock, dairying, poultry and fisheries) growing at 5 to 6 per cent.

The challenge is how to feed India's growing population with rising incomes, but limited land and water resources. The economy is expected to grow strongly and, as the NSSO survey data for 2009-10 on household expenditure reveals, an average household still spends nearly half of its expenditure on food and food products. Thus, the pressure on food demand is likely to remain strong over the Twelfth Plan period while consumption is likely to be more diversified as cereals now account for only 15 per cent of the total consumption expenditure. The food consumption basket is getting increasingly diversified and though cereals still dominate, this dominance is being increasingly eroded by rising expenditure on fruits, vegetables, milk, eggs, meat and fish which together is sometimes referred to as the "high value" segment. This transformation of the Indian food consumption basket is in line with expectations.

(A) *High Value Agriculture Has Come Here to Stay*

Throughout the world, major shifts in dietary patterns are occurring, even in the consumption of basic staples towards more diversified diets both in the urban and rural areas as well as among the rich and poor households. Rising income, urbanisation, a change in dietary preferences, socio-demographic factors, increased awareness about the health benefits of fruits and vegetables, food industry marketing and policies of trade liberalisation over the past two decades have been major market drivers for the growth of high value agriculture. To meet the changing demands, production systems are also moving towards high value crops, but the extent and pattern of such shifts vary across regions/states due to agro-climatic, socio-economic and demographic factors.

(i) *Trends in Area and Production of Major Crops/Crop Groups*

An analysis of the trend between triennium ending (TE) 1983-84 and TE 2008-09 reveals the following:

- Net area sown declined from 142 million hectares to 140.8 million hectares, whereas total cropped area increased from 176.4 million hectares to 194 million hectares.
- The area under foodgrains declined by about 6 million hectares.

- The share of foodgrains in total cropped area declined from about 73 per cent to about 63.8 per cent.
- The area under pulses has remained almost stagnant, while the area under wheat and rice increased.
- The biggest loser has been coarse cereals where the area under cultivation has declined from 41.5 million hectares to 33.6 million hectares.

The decline in area under food grains resulted in increase in area under other crops. The largest beneficiary of this decline were oilseeds during the decade of 1980s, when the area under oilseeds increased from 18.5 million hectares in TE 1983-84 to 26 million hectares in TE 1993-94 but area under oilseeds remained stable between TE 1993-94 and TE 2008-09. The share of oilseeds in total cropped area increased significantly from less than 10 per cent in the early-eighties to 14.8 per cent in the early nineties, which marginally declined to about 14.3 per cent in TE 2007-08. The area under cotton, which declined by about half a million hectares between TE 1983-84 and TE 1993-94, increased by more than 2 million hectares between TE 1993-94 and TE 2008-09. Another beneficiary of decline in area under food grains was high-value crops mainly fruits and vegetables. The area under fruits and vegetables increased by about 8.5 million hectares between TE 1983-94 and TE 2007-08. The share of area under fruits and vegetables in total cropped area, which was less than 3 per cent in TE 1983-84 increased to over 5 per cent in TE 2007-08.

The above data clearly show that crop pattern shifted towards oilseeds, sugarcane and fruits and vegetables during the 1980s, whereas in the 1990s and 2000s, the shift was more towards fruits and vegetables, cotton and sugarcane and other non-food crops.

(ii) *Dynamics of High Value Agriculture*

The relative importance of food grains has declined during the past two decades. At the all-India level, the share of food grains in total value of output from agriculture and allied sectors (excluding forestry and logging) has fallen from 31.3 per cent (at 1999-2000 prices) in TE 1983-84 to 26 per cent in TE 2003-04 and reached a level of 24.7 per cent in TE 2007-08. The decline in share was more pronounced in the case of cereals where it declined from 26.6 per cent in TE 1993-94 to 21.7 per cent in TE 2007-08, whereas the share of pulses declined from 4 per cent to 3 per cent during the same period. Due to shift in demand pattern towards high value crops, the farmers are also responding to market signals and gradually shifting production-mix to meet the growing demand for high value commodities. This is reflected in the changing share of high value crops in total value of output from agriculture. There is a clear shift from food grains towards fruits and vegetables, livestock products and fisheries. The share of high-value commodities/products (fruits and vegetables, livestock products and fisheries) increased from 37.3 per cent in TE 1983-84 to 41.3 per cent in

TE 1993.94 and reached a level of 47.4 per cent in TE 2007-08. At the all-India level, the importance of livestock products has also increased. The share of livestock in total value of agricultural output has increased from 20.6 per cent in TE 1983-84 to 23.9 per cent in TE 1993-94 and 26.1 per cent in TE 2007-08. Among livestock products, the contribution of milk has increased at a faster rate from 12.7 per cent in TE 1983-84 to 17.4 per cent in 2007-08 compared with meat (from 3.4 per cent to 4.5 per cent. The share of fisheries has also increased from 2.7 per cent in TE 1983-84 to 4.6 per cent in TE 2003-04 but marginally declined to 4.4 per cent in TE 2007-08.

India is one of the major producers of fruits and vegetables with an estimated production of 188.7 million tonnes (64.3 million tonnes of fruits and 124.2 million tonnes of vegetables) in TE 2008-09. At the all-India level, the share of fruits and vegetables in the total value of agricultural output increased from 14.1 per cent in TE 1983-84 to 15.4 per cent in TE 1993-94 and 16.9 per cent in TE 2007-08. This has happened largely due to increase in area and marginal improvements in productivity of fruits and vegetables. The increase in share of high value crops in the total value of output from agriculture was slow between TE 1983-84 to 15.4 per cent in TE 1993-94 and 16.9 per cent in TE 2007-08. This has happened largely due to increase in area and marginal improvements in productivity of fruits and vegetables. The increase in share of high value crops in the total value of output from agriculture was slow between TE 1983-84 and 1993-94 and accelerated in the post-reforms period. The trends in growth rates of value of output from agriculture and allied sectors provide interesting insights. During the eighties, fisheries witnessed the highest growth (6 per cent) followed by oilseeds (5.6 per cent), condiments and spices (4.7 per cent) and livestock (4.6 per cent). The crop sector grew at a lower rate of 2.5 per cent, cereals recorded 3.2 per cent growth, and pulses grew at 1.7 per cent, lowest among all crops/sub-sectors. However, during the nineties almost all crop groups/sub-sectors except fruits and vegetables and condiments and spices, experienced deceleration in growth rates. The output of fruits and vegetables increased at a much faster rate (6.3 per cent) during the nineties compared to growth rate (2.2 per cent) in the 1980s as well as other crop groups/sub-sectors. During the 1990s, condiments and spices also witnessed acceleration in rate of growth in output. The livestock sector grew at an annual compound growth rate of 3.7 per cent (milk 4.3 per cent and meat 2.6 per cent) compared with 4.6 per cent in the eighties. However, during the 2000s, the performance of crop sector improved and growth rate increased from 1.8 per cent in 1990s to 2.4 per cent in 2000s.

Growth rate in fibres was the highest (17.2 per cent), mainly because of Bt cotton effect, followed by oilseeds (6.4 per cent). Food grains output increased by about 2.4 per cent while the rate of growth in livestock sector was almost the same (3.8 per cent) as during the 1990s. There was a slowdown in growth of fisheries (2.9 per cent in 2000s compared with 4.7 per cent in 1990s), milk output (3.6 per cent) and condiments and spices (3.5 per cent). Growth rate of fruits and vegetables was also lower (3.5 per cent) in the 2000s compared to growth rate (6.3 per cent) in the 1990s.

It is evident from the above analysis that high growth of high value agriculture achieved during the 1990s could not be maintained in the 2000s mainly because of slowdown in the growth of fruits and vegetables and fisheries sectors. However, the crop sector grew at about 3.5 per cent during the 2000s because of better performance of fibres, cereals, pulses and oilseeds in the recent years.

V

THRUST AREAS FOR ACCELERATING AGRICULTURAL REFORMS

I would like to recall and reinforce the thoughts elucidated by Montek Singh Ahluwalia in the same forum on an earlier occasion since they are very topical and relevant to what we are discussing. He has outlined six key elements of economic reforms and then goes on to identify the six thrust areas that would help accelerate agricultural reforms.

The six key elements common to all economic reforms are:

(a) Sound macro-economic management which will ensure the success of other policies and therefore as crucial for economic performance. This called for fiscal discipline in the sense of containing the fiscal deficit of the Government within reasonable limits.
(b) Large-scale liberalisation and deregulation of the domestic economy in search of greater efficiency.
(c) A redefinition of the role of the public sector involving some withdrawal from the public sector, ranging from wholesale privatisation in some cases to more cautious programmes of disinvestment and part privatisation in others.
(d) Openness to trade and foreign investment flows. This led to efficiency, technological dynamism and international competitiveness.
(e) Financial sector reform that would facilitate reallocating resources from inefficient to efficient users.
(f) A well designed safety net component aimed at mitigating any possible short term impact on the poor, and ensuring that the poor also benefit from general economic growth.

As a corollary, the six areas that we should focus on to accelerate the pace of agricultural reforms and achieve the 4 per cent growth are: (a) Public investment vs. subsidies in agriculture; (b) The impact of the new trade policies on agriculture; (c) Extending deregulation to agricultural activity; (d) The interface between the credit system and agriculture; (e) The role of agro-processing in stimulating agricultural development; and finally, (f) Technology development and research.

5.1 *Public Investment vs. Subsidies in Agriculture*

Most of the investment that is required to accelerate agricultural growth would be in the public sector though the private sector can also play a role. However, the available data on public investment in agriculture is disturbing and shows a steady decline in real public investment in agriculture since 1980. If this declining trend has to be reversed then we have to figure out how the required increase in public investment in agriculture since 1980. If this declining trend has to be reversed then we have to figure out how the required increase in public investment in agriculture and related sectors is to be financed. The new economic policy advocates two ways of increasing public investment in agriculture – they can be financed either by reducing other unproductive public investment in non-essential sectors from which the State should withdraw, or by increased public saving which would enable higher levels of public investment without adding to the fiscal deficit. In areas that are ripe for private sector investment the State should disinvest from earlier investments and use the proceeds of such disinvestment for investment in agriculture and related sectors. However, the major contribution of public investment in agriculture must come from improved public savings, generated by policies which achieve higher revenues and reduce current expenditures. This alone is a sustainable solution.

Another aspect that needs analysis is the growing subsidy component. It is to be noted that the decline in public investment in real terms after 1980, which has caused a lot of public angst, has been accompanied by a sharp increase in total subsidies in this period. The total subsidies on chemical fertilisers alone for the year 2009-10 stood at Rs. 61,264 crores. It is important to strike the right balance between subsidies and public investment in order to achieve an optimal utilisation of limited resources.

Input subsidies in agriculture result in benefits only upto a point, beyond which it would lead to considerable inefficiencies. If we reduce inefficient input subsidies, we can increase public investment in agriculture. Such a reallocation would be economically efficient because it would reduce input price distortions, and it would also encourage agricultural growth because the resources saved would go into much needed public investment. The restructuring would also be distributionally more advantageous, because the present subsidies go disproportionately to relatively more prosperous agricultural areas, as well as to the more prosperous sections of the farming community, while the new investment could be so designed to spread the benefits more equitably. It is assessed that various subsidies including the hidden subsidies that go into the rainfed areas of the country account for only 5 to 6 per cent of the total subsidies. This is not a fair distribution considering that rainfed areas constitute the majority.

5.2 *Trade Liberalisation and Agriculture*

The process of trade liberalisation envisaged in the new economic policy has actually proved beneficial, with a significant inter-sectoral transfer of resources towards agriculture. Sometimes there is an apprehension that the policy of liberalising agricultural exports will create domestic scarcity and hurt domestic consumers. However, it is important to recognise that the agricultural exports stimulated by the new policies will typically be at the higher end of the value spectrum, i.e., basmati rice rather than coarse rice, durum wheat rather than ordinary wheat, alphonso mangoes rather than ordinary varieties, etc., and an increase in relative prices of these items will in general not affect the poorer consumers. In any case, consumer interest cannot over-ride the benefits that will accrue to the agricultural producer.

5.3 *Extending Deregulation to Agriculture*

Unlike the industrial sector that was governed by the Licence Raj, agriculture had no restrictions on production. However, there had been restrictions on inter-state and sometimes even inter-district movement of produce. The need for an active private trade that can compete with the official procurement agencies and help the farmer realise better prices, through seamless boundaries and trade barriers cannot be over-emphasised. The APMC Act needs to be amended in all the States as those designed to protect the farmers' interests as these markets have themselves developed vested interests.

The second sector that needs a relook is the regulation on land holding. Many a times, the smaller land holding becomes economically unviable for the poor farmer. Therefore, there is a need to redesign the existing land laws and facilitate the introduction of a 'lease market' for easy leasing in and leasing out of land. This will see better response if it is accompanied by greater employment opportunities buttressed by skill development in the non-agricultural sector.

5.4 *Credit for Agriculture*

Agricultural growth and modernisation need to be underpinned by an efficient credit system capable of providing an expanding flow of credit for both investment and working capital.

5.5 *The Role of Agro-Processing*

Agro processing plays a key role in the development of the agriculture sector. Lower duty rates on metals and plastics reduces the cost of packaging which is also very important. Freer access to technology and foreign investment also encourages

technological upgradation in both agricultural technology and food processing technology, all of which is needed. A structured removal of excessive controls and regulations that exist in the agro-processing sector (e.g., sugar) is necessary for accelerating agricultural growth. The positive response to deregulation of sugar industry over the last decade and half is manifest in the substantive increase in domestic sugar production.

5.6 *The Role of Technology*

The critical importance of technology was dramatically demonstrated in the 1970s by the Green Revolution which saw an impressive growth in yields following the introduction of new wheat and rice varieties. However, the technology associated with the Green Revolution had its limitations that restricted its applicability to areas of assured irrigation. However, it is not feasible to have assured irrigation in many areas of the country. For agricultural growth to be extended to these areas and achieve 4 per cent growth, it is necessary to develop technology that is suitable for these conditions. The biotechnology revolution provides the possibility for developing such technologies. Genetic engineering opens up the prospect of developing new varieties which can flourish with less dependence on water and chemical inputs, and this could provide the basis for substantial increases in production in areas where at present progress has been limited. Reduced dependence upon chemical fertilisers and pesticides is also desirable because of environmental considerations, which are causing increasing concern. An environment should be created where both public and private sector can work synergistically to develop the technology that is required to accelerate agricultural growth.

VI

PRODUCTION SIDE INTERVENTIONS

To meet the expected demand of the country's growing population, food grain production has to be 350 mt by 2050, up from 241 mt today. The more general, but significant points of intervention on the production side which are identified in the Approach to the 12th Five Year Plan are:

Water Management

The first and perhaps the most important component is vastly superior water management which involves a wide and diverse range of issues, namely:

- Steps to greatly improve governance in water management through Water User Associations such as Pani Panchayats and similar PRI based institutions.

- A focus on Command Area Development and the rehabilitation and physical modernisation of existing major irrigation systems.
- Extensive rainwater harvesting assisted by space based maps with active ground truthing and convergence with other development schemes.
- Comprehensive aquifer mapping and extensive ground water recharge.
- Move towards sprinkler and drip irrigation and away from flood irrigation.
- Assuring irrigation to much more land far beyond the present 42 per cent of arable land.
- Integration of these activities with existing surface reservoir based canal irrigation.

The exact mix of these interventions will vary from place to place and only a locally grounded agriculture development strategy will successfully achieve the most desirable outcome.

Soil Nutrient Management

Soil is the basic natural resource that supports life on earth. Indiscriminate use of synthetic chemical fertilisers can seriously disturb the natural soil ecosystem. Chemical fertilisers are highly subsidised in India and the amount of fertiliser subsidy has grown exponentially during the last three decades from a mere Rs. 60 crore in 1976-77 to an astronomical Rs. 61,264 crore in 2009-10 and is likely to exceed the budgeted subsidy of Rs. 58,000 crore in 2010-11. Such heavy subsidies often encourage an imbalance in soil nutrition. Although there is still a need to increase fertiliser use in many parts of the country, the overuse of chemical fertilisers in many other areas has resulted in severe degradation of soils. The way forward is to rejuvenate soil and restore soil health through addition of soil organic matter in bulk quantities and also micro nutrients. Since agriculture will continue to require the use of chemical fertilisers, policy must encourage application of customised or appropriate mixtures relevant to the soil conditions and to specific crops. The ongoing change in the subsidy regime to nutrient based subsidy (NBS) and deregulation of retail price must be completed soon to improve nutrient uptake efficiency and minimise waste and contamination of groundwater and water bodies. The existing policy needs to be improved by incorporating best practices of soil fertility management.

Promotion of IPM/NPM Practices and SRI

Successful adoption of NPM (Non-Pesticidal Management) and SRI (System of Rice Intensification) in several rainfed and irrigated cropping systems in the past decade, has led to increased policy and research attention to these systems. While some state governments, Andhra Pradesh, Tamil Nadu, Bihar and Orissa have been

particularly attentive to increased adoption of these productivity enhancing, cost effective and eco friendly production practices, a nationwide support for such knowledge intensive (as opposed to input intensive) alternatives that are ideal for rainfed areas, is required.

New Technologies for the Farm Sector

Technology is a prime mover of productivity in agriculture where natural resources are fixed. Studies have shown that at least one-third of the future growth in productivity should come through innovation in crop technologies. Investment in agricultural research and development to bring out new varieties and breeds for a wide range of crops and animal resources is a priority in the farm sector. India's expenditure on agricultural R & D and education is currently about 0.6 per cent of the GDP from agriculture and allied activities and this definitely needs to be raised at least to 1 per cent. Technology generation in India is largely undertaken by the public funded National Agricultural Research System (NARS) comprising the ICAR and State Agricultural Universities (SAUs). A worrying feature is that States currently underfund SAUs, leading to both shortage of skilled human resources and of location-specific problem solving. The central funding of NARS must therefore involve ways of incentivising adequate State spending. This is particularly so in the case of rainfed agriculture where there is a need for different ways of working in these public research organisations. The shift from mere technology generation to greater understanding of contexts is imperative; with enhanced research on seasonality, location-specific soil-crop-water interactions and linkages with other rural resource demands like drinking water.

Rainfed Agriculture

Within the farming sector, rainfed agriculture is a major constraint in raising overall agricultural growth and bridging regional inequalities. Some 200 million hectares in India constituting 62 per cent of the total geographical area of the country fall in this category and represent the geography with the largest concentration of poverty. They span several agro-ecological regions. Productivity of rainfed agriculture has lagged, causing widespread distress. This can be mitigated through strengthening watershed development programme supported in terms of soil management, seed availability, support price, market access, agricultural research investments, etc.

Seed Systems

Seeds are a critical input for long-term sustained growth of agriculture. Timely availability of certified quality seeds with good yield potential continues to be a

major problem. In India, more than four-fifths of farmers rely on farm saved seeds leading to a low seed replacement rate (SRR). Concerted efforts are essential in ensuring timely availability of quality seeds as well as increasing the Seed Replacement Rate. In rainfed areas that are vulnerable to high climatic risks, the seed systems have to be oriented towards meeting shortages on account of this risk.

Linking Small Producers with Markets

The small and marginal farmers now constitute over 80 per cent of farming households in India. They have only very small quantities of marketable surplus. Moreover, their staying power is low because of their extreme poverty. As a result, these farmers sell off most of their produce in the local markets at very low prices immediately after the harvest. Thus, farmers suffer even in years of a good harvest, since they are not able to get good price realisation. The obvious solution is for these farmers to aggregate their produce and reach bigger markets where they can get a better price for their produce. This was the original idea behind marketing co-operatives but these have delivered effectively only in a few cases. Alternative models based on the idea of Producers' Companies and Commodity Interest Groups are now beginning to take off. Moreover, with the growth in the Self Help Group (SHG) movement and development of SHG federations across the country under the NRLM, options for crop produce aggregation and collective marketing are widening. Banks could fund this activity, with the use of liquid instruments like warehouse receipts. The institutional structures, including a regulator, are now in place and it is expected that the Twelfth Plan period will see substantial volumes flowing through the system.

VII

AGRARIAN DISTRESS

Having said that, I emphasise that one cannot lose sight of the distress being faced by the farming community in the country. Several related factors have resulted in a situation which could be described as agrarian crisis. There has been a decline in the trend growth rate of production as well as productivity for almost all crops from the mid-nineties. Further, the value of output from agriculture has been declining from the late nineties. Second, there is an excessive dependence of a large section of the population on agriculture (in 2004-05 nearly 64 per cent of the rural persons were from households whose members have major activity status - either self-employed in agriculture or agricultural labour). This also indicates that rural non-farm employment opportunities are limited. Third, with declining size-class of holding and an increasing preponderance of marginal holdings (63 per cent as per 2000-01 agricultural census) along with poor returns from cultivation indicates that income for farm households is very low. Fourth, the much talked about green revolution had a

greater focus on rice and wheat under irrigated condition by passing crops and regions under rainfed or dry land conditions (which is three-fifths of the 141 million hectares of net sown area in the country during 2003-04). There has been a failure to capitalise on the vast network of institutes to provide and regulate new technology (including the usage of biotechnology), and a virtual absence of extension service. Fifth, the neglect of agriculture in plan resource allocation has led to a decline of public investments in irrigation and other related infrastructure. Sixth, supply of credit from formal sources to the agricultural sector is inadequate leading to greater reliance on informal sources at higher interest burden. Last, but not the least, with changing technology and market conditions the farmer is increasingly being exposed to the uncertainties of the product as well as factor markets (Misra, 2007). The increasing incidence of farmers' suicides is symptomatic of a larger crisis, which we cannot afford to lose sight of. Though farmers' suicides appear to be a part of larger social crisis, they do have objective economic crisis as the reason behind them, which have been amply demonstrated by empirical in recent days.

VIII

AADHAAR AND AGRICULTURE

The Unique identification Authority of India (UIDAI) was established in January 2009, as an attached office to the Planning Commission. The purpose of the UIDAI is to issue a unique identification number (Aadhaar) to all Indian residents that is (a) robust enough to eliminate duplicate and fake identities, and (b) can be verified and authenticated in an easy, cost-effective way. The UIDAI's approach will keep in mind the learnings from the government's previous efforts at issuing identity.

8.2 *Aadhaar and Its Application*:

Aadhaar is a 12 digit random number issued to every Indian resident seeking it voluntarily. The UIDAI has been mandated to generate a unique identity number for every resident based on a set of comprehensive biometrics, namely, all 10 fingerprints, both irises and face photo. In order to protect the privacy of an individual a minimal set of demographics limited to name, date of birth/disclosed age, place of residence and gender are collected.

The second important mandate of the Authority is to provide 24 x 7 online authentication service which will facilitate the service provider, both within Government and private domains to link their service(s) to Aadhaar by developing appropriate applications. This will result in improved efficiency and effectiveness of the delivery system and bring about greater transparency and objectivity in the interface between administration and the resident.

8.3 *Financial Inclusion Through Aadhaar*

This section discusses one of the potential applications of the UID – the use of the number in driving financial inclusion, and in enabling a micropayments solution that the poor can use to access financial services. While the demand for financial inclusion has gained urgency over the last few years, initiatives in India to expand financial infrastructure date back several decades, since the building of rural co-operative credit banks in the 1950s, and the spread of bank networks in the 1970s and 1980s.

These initiatives have paid off over the years – India's bank branches are well-networked, particularly across urban India. But despite these efforts, access to finance has remained scarce in rural India, and for the poorest residents in the country. Today, the proportion of rural residents who lack access to bank accounts remains at 40 per cent and this rises to over three-fifths of the population in the east and north-east of India.

This exclusion is unfortunate. Economic opportunity is after all, interwined with financial access. Such financial access is especially valuable for the poor – it offers a cushion to a group whose incomes are often volatile and small. It gives them opportunities to build savings, insure themselves against income shocks and make investments. Such savings and insurance protect the poor against potentially ruinous events-illness, loss of employment, droughts, and crop failures. However due to the lack of access to financial services, many of the Indian poor face difficulties in accumulating savings.

To mitigate the lack of financial access in India, the RBI has focused on improving the reach of financial services in new and innovative ways-through no-frills accounts, the liberalisation of banking and ATM policies, and branchless banking with business correspondents (BC), which enables local intermediaries such as self-help groups, post offices and kirana stores to provide banking services. These efforts have also included the promotion of core-banking solutions in regional rural banks; and the incorporation of the National Payment Corporation of India (NPCI) as an apex switch, for payments and settlements.

In recent years, ATM and core banking, as well as greater mobile connectivity have also become two powerful engines of financial access. Mobile phones in particular present an enormous opportunity in spreading financial services across India. These technologies have reduced the need for banks to be physically close to their customers, and banks have been consequently able to experiment with providing services through online as well as mobile banking. These options, in addition to ATMs, have made banking accessible and affordable for many urban non-poor residents across the country.

Since the UID enables remote authentication of identity, it empowers the poor in making electronic transactions in small, micro-amounts, remotely and at low-cost, through BC networks connected by mobile phones. The model would thus be

accessible and affordable across the country. Such Aadhaar-enabled micropayments approach can be bring about universal financial access for the poor – they would be able to access their accounts on the move, wherever they are, through any mobile phone, from any BC or bank. The UID-enabled bank account can thus be a global address for residents, similar to an email id or a mobile phone number.

Over the last few years, we have seen critical reforms implemented towards creating a payments solution for the poor. The Aadhaar number helps integrate these reforms and leverage the technology already in place into an effective micropayments solution. This can bring low-cost access to financial services to everyone, a short distance from their homes. Since the Government is now contemplating direct cash transfer to the beneficiary instead of indirect subsidies as a welfare measure, Aadhaar enabled Financial Inclusion will play a crucial role in improving the way service is delivered to the agricultural sector. It would be possible to determine targeted entitlements and transfer the cash subsidies electronically to the farming community on a more equitable basis.

IX

CONCLUSION

In concluding, I must state that while India is growing, there is a lot that needs to be done to ensure that agricultural growth also keeps pace. Growth needs to be inclusive to ensure that the full benefits reach the target segment of the population. It has to cover all regions and all States.

In a recent report "India@7billion", UN Population Fund describes India as a 'population billionaire' with baby Nargis, the world's seven billionth person born in Uttar Pradesh on 31st October, 2011. India today has 1.21 billion people and is expected to overtake China and become the world's most populous country by 2025. This would put tremendous pressure on natural resources and we would have a challenge in providing food, water, health, shelter, sanitation and jobs to all. We will, have to leverage the 'demographic dividend' of the youth bulge since 50 per cent of India's population will be under the age of 25. That means more working hands join the work force. The challenge is to channelise this additional workforce to accelerate the growth of agriculture in the country, by making it a modern enterprise with appropriate infusion of capital, technology, skilled resources and relevant reforms.

I have outlined some issues which are by no means a comprehensive list of all the issues facing Indian agriculture. There are others which I am sure will surface in the discussions in the course of the Conference. My purpose was only to illustrate of the important areas of agricultural strategy, and to indicate that workable solutions to accelerate agricultural development can be found within the framework of our policies. I am sure the Conference will deliberate on all these issues. I wish the Conference a great success.

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