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## **RAPPORTEURS' REPORTS**

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### **Agricultural Development Perspective and Strategy Planning for the Twelfth Five Year Plan**

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#### **I**

Economic growth with equity has been the main development objective in India and all the plan efforts are directed to promote inclusiveness of all sections of the society, particularly the rural poor, in the development process. Since most of the rural poor depend on agriculture, acceleration of agricultural growth along with anti-poverty programmes has been the strategy to promote inclusiveness since the Independence. This strategy is still relevant and therefore pursued earnestly by the government. However, renewed emphasis on inclusive growth has arisen mainly from increasing income inequality on account of growth difference between the agricultural and non-agricultural sectors. The success in reducing this disparity during X and XI Five Year Plans (FYPs) has been below the expectation. The agricultural sector could grow by 3 per cent annually, which is much below the target growth of 4 per cent. This is despite the fact that some of the states showed an impressive agricultural growth, even much higher than the target growth. On the contrary, there has been marked increase in the growth of non-agricultural sectors, especially manufacturing and service sectors. In order to address this disparity and alleviate poverty, accelerating agricultural growth with participation of disadvantaged sections and eco-regions is likely to remain main thrust of the XII FYP. This is because of the fact that agricultural growth has been found at least twice as effective in reducing poverty as non-agricultural growth. How to accelerate the agricultural growth? The papers under this theme were expected to explore the approaches and pathways to achieve this development objective.

The development strategy should first spell out various dimensions of the objective of inclusive growth and then suggest necessary policy, investment, institutional and other interventions to address them. The first and foremost challenge is to accelerate agricultural growth and maintain a balance between self-sufficiency in foodgrain production and diversification towards high value crops. This is important for ensuring household food and nutrition security and meeting rising demand for the high value products like fruits, vegetables and livestock products. For the high value crops, a growth rate more than 4 per cent will be needed. Are the current investments and their allocations adequate to achieve the growth target? If not, how can additional

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resources be mobilised, both from public and private sources. The second important issue is improving delivery of public services for raising agricultural productivity and increasing efficiency in the use of public resources. In particular, there is concern for shrinking capacity and reach of public extension services and deteriorating irrigation infrastructure. Agricultural markets, credit institutions, R&D system, irrigation, electricity, etc. are important services with wider participation of public agencies. No doubt, these services are found to be effective, but there is the question of improving their efficiency and increasing their ability to serve the resource poor farmers. A number of policy and institutional reforms have taken place, especially in marketing, credit and irrigation, and research is needed to understand their effectiveness and areas for further improvement. Some of these reforms are implemented through a number of development programmes. For example, capacity building at the state level and mobilisation of state resources through the scheme like *Rashtriya Krishi Vikas Yojana*, were encouraged in XI FYP. Also, the schemes like Food Security Mission, Horticulture Mission, Integrated Scheme for Oilseeds, Pulses and Maize, Integrated Watershed Management Programme, etc. focus on raising productivity in the mission mode. A few programmes for agriculture are commissioned and implemented by different departments, and some of them like Mahatma Gandhi National Rural Employment Guarantee Scheme and the proposed food security bill have important implications for agriculture. There are issues of convergence all these programmes for better effectiveness. What are key lessons from these programmes and how these can be made more effective in XII Plan?

There are some other developmental issues which now need deliberate interventions in the planning efforts. Important among these are the issues of natural resource (land, water, biodiversity, etc.) management and increasing awareness about environment and ecosystem services. What are the policy issues and approaches to raise incentive for increasing ecosystem services, conserve natural resource and protect environment. Mitigation and adaptation to climate change is another important matter and understanding of the policy, associated costs and governance issues is evolving.

The papers on this theme were invited to address the above development challenges and suggest the strategy to improve effectiveness of different interventions and programmes in a cost-effective and sustainable manner. In total, 20 papers were contributed. The papers covered a number of issues, ranging from macro development aspects of Indian agriculture to micro issues at the sub-sector (commodity), regional and programme levels. Most of the papers are based on secondary data, either state or district level, and few are based on farm level information. Most of the papers are fairly wide in scope and used appropriate methodology to arrive at policy conclusions. The following section summarizes the main findings, conclusions and gaps of the contributed papers.

## II

## INVESTMENT, AGRICULTURAL GROWTH AND POVERTY

Agricultural growth during the IX and Xth FYPs was 2.5 per cent which is likely to increase to slightly more than three percent in XI FYP. This growth rate per se is not disappointing, but certainly much lower than overall economic growth which is likely to exceed 8 per cent in XIth FYP. Within agriculture, cereals registered a growth (1.28 per cent) lower than the population growth in Xth FYP, but the former is going to be higher in XIth Plan, achieving a record foodgrain production of 241 million tonnes in 2010-11. Livestock, fruits and vegetables have registered an annual growth more than 3 per cent and their share in the agricultural gross domestic product (AgGDP) is rising. Some states like Gujarat, Bihar and Chhattisgarh with improved delivery of services and inputs have shown impressive agricultural growth.

Agricultural growth has a direct poverty reduction impact through wage and price effects. Incidence of poverty is high (42 per cent) among agricultural labour, particularly in the eastern states, which has declined by one-third during the last 20 years. Agricultural productivity has a strong poverty reducing effect and the inter-state disparity in the agricultural growth has declined moderately since the 1990s. The other important factors reducing poverty are increase in agricultural wages and rural literacy (Anjani Kumar *et al.*). Public investment is important for agricultural growth and there has been higher investment by the government since Xth FYP. The major share of public investment went for irrigation development. But taking a broad definition of investment 'for agriculture,' there are substantial allocations for rural roads and electrification. However, capital expenditure form about one-fourth of the total government expenditure on agriculture and capital formation in agriculture continues to be lower than that in other sectors. Another noteworthy trend is that the share of central government in the total expenditure has risen from 26 per cent in 1995 to 49 per cent in 2009. The growth in private household investment is impressive (11 per cent) during the last decade. The household investment is mainly on farm machinery, transport and minor irrigation. The share of private investment on land improvement has however decreased from 13 to 6 per cent in 1990s (Alka Singh). Disparity in public investment on irrigation is noted and the Gini ratio was 0.49 in Xth FYP. The lag in the impact on foodgrain productivity varies from 6 to 12 years (Ashok Kumar and S.P. Bhardwaj).

Apurba Kumar Chattopadhyay examined the performance of Indian farm sector and noticed widening income disparity on account of slow agricultural growth. Within agriculture, a sharp decline in female labour participation and high rural indebtedness are other issues to be addressed for the inclusiveness. He underscored the need for increasing the productivity of rainfed areas and promoting agricultural diversification. For this, higher investment in rainfed regions, technological interventions and favourable terms of trade for agriculture are necessary. B.S. Naregal and G.B. Betadur also emphasised the need for higher investment, better

infrastructure, land reforms and risk management through price stabilisation and crop insurance for higher agricultural growth. The strategy should clearly link the present situation with the future scenario. Mahendra Singh also noted the role of the high value sector in agricultural growth and suggested interventions for bridging the yield gap through adoption of appropriate technology.

### III

#### SUB-SECTORAL AND COMMODITY ISSUES

For acceleration of agricultural growth and meeting the sectoral targets, it is necessary to analyse the performance and prospects of different sub-sectors and commodities. A few papers have attempted this issue. K.K. Datta *et al.* have examined the prospects of Indian dairy sector to promote inclusive growth. They observed consistent decline in indigenous cow population in all the regions of India, except the northern region. There is an annual growth of 4 per cent in milk production in the country in XI Plan and some states like Andhra Pradesh, Gujarat, Uttar Pradesh and Orissa have shown consistent increase in milk production. The authors emphasised the growth of dairy sector for inclusiveness, as small farmers and landless labourers own 82 per cent of milch animals, produce 52 per cent of the total milk and earn 20-40 per cent of their income. Development of institutions and processing facilities are key to the growth of Indian dairy sector.

P. Samal and N.P. Jambhulkar examined the performance of rice production in the country and possibility to meet the future requirements. The current growth in rice yield is just below the population growth rate. Rice demand will be 107 million tonnes in 2016-17 and 113.3 million tonnes in 2021-22. This demand projection is slightly lower than those made in other studies, but indicates the need for raising rice yield. Also, technological interventions for adaptations to climate change are necessary to sustain the yield growth.

A notable omission in this section is the study of fruits, vegetables and flowers, which are employment and income generating. Studies have shown that small farmers have advantage in growing vegetables and flowers which are of short duration and provide high income (Joshi *et al.* 2007). Market access and technological support, including improved seeds, are important for the growth of this sector. Another important requirement of vegetables, fruits and livestock products is increasing awareness about food safety issues. Although the Prevention of Food Adulteration Act (1954) and the Food Safety and Standard Act (2006) are in place, the restricted or banned pesticides and food ripening chemicals are still being used, which have adverse effect on the export of food items. There is need to build consumers trust and educate farmers and traders about food safety standards (M.S. Jairath and Purnima Purohit). There is no paper on the assessment of compliance cost of these standards but other studies have shown moderate increase in the cost due to the measures needed at various stages of product handling.

## IV

## NATURAL RESOURCE MANAGEMENT

There is an increasing trend in public investment in Indian agriculture during the recent period. The share of public sector in gross capital formation increased from 20 per cent in 2003-04 to 28 per cent in 2008-09. As a result, gross capital formation as a proportion to agricultural gross domestic product (GDP) rose to 15 per cent. Most of the public investment, however, was on irrigation. However, there is no commensurate increase in irrigated area, especially under surface water irrigation. Since the demand for water is going to exceed its supply, water demand management will be a major issue in XIIth Plan (Ahluwalia, 2011). The solution to water scarcity mainly lies in increasing water use efficiency in agriculture which is the largest user of water. The XIth Plan focused on revival of distributaries linked to old canals and revival of watershed development through the Integrated Watershed Management Programme with emphasis on institutional development and rigorous monitoring of the progress (Planning Commission). Some papers have addressed the issue of water management. Dinesh Kumar *et al.* have noted an increasing trend in micro and pressurised irrigation because of farm household investment. In terms of institutional change, they have indicated a shift from development of water to its allocation. They suggested water rights and volumetric pricing for sustainable use of water and reduction of negative environmental externalities. There are also examples of participatory management of groundwater. The studies from developing countries (M. Lavanya and S. Senthilnathan) underscore the need for local regulations in enforcement of quantitative water rights. These regulations coupled with suitable government policies and change in cropping pattern help in significant saving of groundwater. The notable examples are restriction on depth and number of wells in Gujarat, and restriction on water extraction through water user associations in Egypt and through water meters in Mexico. Improved knowledge of farmers about status of water and equity concern in its management were helpful in promoting sustainable use of groundwater in Andhra Pradesh.

Natural resource management is key to sustainable agriculture, but this is rather inadequately discussed in the contributed papers. Most of the papers are on water and land, genetic resources and problem soils are not covered at all. The papers on irrigation mainly discussed the issues of water use efficiency, and effectiveness of institutional reforms, particularly in surface irrigation, is less attempted. Some of these issues are analysed using institutional framework, focusing on organizational rationality, clarity of objectives and enforcement of regulations (Crase and Gandhi, 2009). Incentive for participation in collective solution for water scarcity and adoption of sustainable farm practices is another major factor determining the success. Another major research gap is in the area of land use policy. This is being discussed in the context of access of rural poor to land, aggregation of production by

smallholders, urbanisation and food security, and impact of changing land use pattern on climate change.

## V

## DELIVERY OF FARM INPUTS AND SERVICES

Improving delivery of inputs and services for agriculture is essential for raising the productivity and making best use of public resources. In particular, there is a concern for shrinking capacity of public extension services to reach the farmers. The issues discussed in this regard are participation of farmers and other stakeholders, diversification of service providers, partnerships, human resource development, sharing of cost-benefits, etc. Although there is a large network of animal health centres, access to health and reproductive service is rather limited. The problem of access is severe in agricultural credit where 73 per cent of farm households do not have access to institutional credit. Evidence on macro and sectoral policy issues like making public services accountable to stakeholders and attracting and regulating private sector to complement the public services are important for enhancing their effectiveness. In addition, there are sectoral (market, R&D, irrigation, electricity, etc) specific policy and institutional innovations which were encouraged in XIth Plan. This was partly attempted through various agricultural development programmes. The focus of XIth Plan was on building capacity at the state level and mobilisation of state resources through the scheme like *Rashtriya Krishi Vikas Yojana*. Also a number of schemes in mission mode are in operation. The basic objective of these schemes is to raise agricultural productivity with improved delivery of inputs, technology and associated services. How far these programmes are able to reach the small and marginal farmers? These farmers earn part of their income from non-farm activities (Vidyardhi Vikas). The ways to improve their access to land, markets and financial services needs focused discussion. However, few papers have discussed these issues.

## VI

## DRYLAND AND INACCESSIBLE AREAS

Dryland agriculture occupies nearly 57 per cent of the cropped area and contributes significantly to the production of foodgrains, especially coarse cereals and pulses, oilseeds, fruits and livestock. Agricultural growth has been rather low in the rainfed areas, which is a cause of concern. Increasing agricultural productivity in these areas is essential for inclusive growth. The broad interventions like infrastructure, technology and institutions are also relevant for the development of dryland agriculture (Pal *et al.*, 2003). But there are micro-realities, location-specific constraints and growth opportunities which need to be spelt out for evolving the growth strategy. Since such a strategy will revolve around natural resource-centric interventions, including technological interventions, involving people's participation,

details in terms of investment, institutions and incentives need to be discussed. There is little evidence on these aspects in the contributed papers, except issues related to irrigation discussed above. These issues can be taken for further discussion in the conference.

Another dimension of the inclusiveness is acceleration of agricultural growth in inaccessible areas like hills and arid regions. There is some discussion on these regions in the contributed papers. Virender Kumar has analysed the investment trends and growth strategy of agriculture in Himachal Pradesh. Irrigation development and soil conservation have been the main investment priorities. There is little investment for marketing and dairy development, even though there is evidence of agricultural diversification and increase in the production of vegetables in the state. This is primarily because of decline in overall allocation for agriculture. Rajeev Sharma has examined growth trends in agriculture of Jammu and Kashmir and found that the sector grew at 3.3 per cent, while yield growth was 4 per cent during the last decade. Dry and fresh fruits have registered growth in both the area and the yield. Increase in cropping intensity, irrigation and terms of trade have contributed to the agricultural growth.

## VII

### AGRICULTURAL R&D

Agricultural R&D has been the main source of agricultural growth and poverty reduction in India (Fan *et al.*, 2008). However, there are sometimes questions on the trends in the productivity-enhancing research for pushing the yield frontiers up. Evidence indicates significant impacts of R&D in terms of consolidation of the past productivity gains, improvement of product quality and improving sustainability of production systems (Pal *et al.*, 2006). What are the options to enhance and sustain the research impacts? The first and foremost requirement is higher public investment which is presently growing nearly 3 per cent annually, i.e., a rate equal to agricultural growth. Therefore, research intensity, investment as percentage of AgGDP is hovering around 0.6 per cent for more than a decade. This should be stepped up to 1 per cent of AgGDP but we need to spell out the priorities in terms of regions, institutions and research programmes. Another positive development is rapid growth of biotech R&D industry but only 14 per cent of its turnover is from agriculture (Alka Singh). What are the best ways to harness the potential of biotechnology, at least for non-transgenic technology having little or no bio-safety issues?

Application of economic principles for assessment of regional and commodity priorities has been in vogue for some time. The studies available indicate higher allocation of resources for eastern India and the commodities whose demand is rising sharply, besides continuing emphasis on foodgrains (Pal and Byerlee, 2006). Srinivas *et al.*, applied the modified congruence approach to assess the regional priorities for allocation of R&D investment, using the criteria of higher productivity, poverty



reduction and increasing sustainability of resources. They observed that poorer states, like Bihar, Orissa, Jharkhand, Chhattisgarh and the north-eastern states, should get more share in allocation of the resources. There is little discussion on research programs in the literature and these continued to be determined by 'best judgment' of the peers. The same holds true for agricultural extension system, which is managed by the state governments. There is lack of reliable estimate of extension investment, both financial and manpower, capacity and activities. This is a well known fact that extension system has little resources and responsible for a number of development activities. The discussion on this topic can focus on the lessons from extension reforms in the forms of the Agricultural Technology Management Agency, privatisation, and application of information communication technology.

#### VIII

##### RURAL EMPLOYMENT SCHEMES

Some of the programmes for agriculture are commissioned and implemented by different departments. Some of these like *Mahatma Gandhi National Rural Employment Guarantee Scheme* (MNREGS) and proposed food security bill have far reaching implications for agriculture. The former is impacting in terms of higher cost through increase in rural wages, while food security bill will influence food grain prices. Similarly, the Integrated Watershed Management Programme and the schemes of the Ministry of Water Resources and Ministry of Food Processing directly impact agriculture. There are issues of convergence of all these programs for greater effectiveness. What are key lessons from these programmes and how these can be made more effective in XIIth Plan?

Some papers have evaluated the effectiveness of MNREGS. Jayanti Kajale and Sangeeta Shroff found that performance of MNREGS in terms of asset creation is less than its earlier version of the Employment Guarantee Scheme of 1979 in Maharashtra. Employment created has declined over time perhaps due to less demand for work. Also, there is inadequate capacity and incentive at the village level to coordinate this scheme. Madhya Pradesh having high incidence of poverty, could provide only 29 days of work per household, mainly for construction of community services. The major work under MNREGS in Uttar Pradesh and Chhattisgarh was done for water conservation, rural connectivity and irrigation. There were implementation problems and delay in payment of wages (Brahm Prakash *et al.* and N. Khan *et al.*). One major achievement highlighted by all these studies is that majority of the employment seekers were poor and there is increasing participation of rural women. It was rather difficult to conclude from the available evidence in the contributed papers how far increase in rural wages could be attributed to MNREGS in the recent years.

## IX

## ISSUES FOR DISCUSSION

There are a number of issues which need in-depth discussion, but considering the scope of the conference and time constraints for such a mega topic, the discussion could be centered around strategic policy interventions to accelerate agricultural growth, benefiting the rural poor. Therefore, the focus will be on addressing the supply-side constraints, improving delivery of inputs and services to the farmers, and promoting opportunities for the value creation. The following issues are identified for discussion:

1. Government interventions will remain central to the agricultural development process, especially for infrastructure development and provision of public goods like research services. How to sustain the public investment and attract corporate investment? What regulatory reforms are needed to attract private investment and improve efficiency of the public investment?
2. One of the mechanisms to promote inclusiveness is to increase access of small farmers and landless labourers to agricultural lands. Can tenancy reforms promote this, or should incentives shift to group farming as being promoted in some states like Andhra Pradesh. What interventions are needed to make land acquisition and use policy, including use of common and waste lands, more transparent, equitable and sustainable? Also, information is needed on the strategy to encourage aggregation of small productions to ensure economies of scale.
3. Development of dryland agriculture holds key to higher agricultural growth and reduction of rural poverty. The wet rainfed agriculture in the eastern India constrained with poor infrastructure, high risk because of floods, droughts and biotic stresses, low technology penetration, small fragmented holdings and high incidence of rural poverty. The dry rainfed agriculture of the southern and western regions faces high risk due to moisture stress. The former region needs a wide range of government interventions, while the latter would need a development strategy focusing on conservation and use of water. How to accelerate these developmental interventions?
4. Incentive and institutional innovations are essential for enhancing sustainability of natural resources, including surface irrigation system (canal, tanks, etc). What are the main incentives and organisational requirements to ensure collective actions for common problems? What are the mechanisms to incentivise the farmers to adopt farm practices promoting sustainable use of natural resources (land, water, bio-resources) and increasing ecosystem services like carbon sequestration?

5. Improving delivery of farm inputs and services and ensuring quality standards are essential for increasing agricultural productivity. This requires both improving efficiency and reach of public services like extension, irrigation, animal health, electricity, etc and increasing private sector participation in provision of these services. What kind of organisational and regulatory reforms are needed in this direction?
6. Decentralisation and people's participation through the mega development programmes like Rashtriya Krishi Vikas Yojana and Integrated Watershed Development Programme has been a major departure from the past. What are the lessons from these programmes for their upscaling in XII Plan.
7. Access to agricultural credit is *sine qua non* for modernisation of Indian agriculture, but the performance on this account is far from satisfactory. In the eastern region, nearly two-thirds farm households are excluded from financial services, both formal and informal sources. What are the mechanisms to link resource poor farmers with financial institutions and how to ensure progress of priority sector lending? Also, whether evidence on weather-based crop insurance suggests for their upscaling to cope with risk in agriculture.
8. Technological interventions to bridge the yield gap can pay rich dividends in terms of raising agricultural productivity. There is a need for higher investment in agricultural R&D and improve effectiveness of public extension services. What are the successful examples of diversification of extension services, sustainability of funding and accountability to the stakeholders? How far the new regime of intellectual property rights is serving its objective?
9. Innovations around agricultural value chains are encouraged by the government, including agricultural R&D organisations, but the progress is rather limited. There are innovations for value addition and linking production with the market in fruits and vegetables, but the viable business model which can involve small farmers and improve the efficiency are not available for replication. How far the model APMC Act has been useful in evolving such models?
10. There are disadvantaged sections of the society like tribal and women farmers, agricultural labourers and farmers in harsh production and inaccessible areas. Often these may need local solutions to their problems. Are there adequate efforts to identify the niche products and develop their markets? How can civil society organisations and private sector compliment the government efforts in the development of these disadvantaged sections of the farming community?

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