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## **Impact of Public Investment in Irrigation Projects on Foodgrain Productivity**

**Ashok Kumar and S.P. Bhardwaj\***

The study attempts to examine the nature and extent of disparity in public investment in major and medium irrigation across states, and examine the long-run effect of public investment in major and medium irrigation on foodgrain productivity across major states of India. The study is based on state-wise time series secondary data published by Central Statistical Organisation and Reserve Bank of India on public investment in major and medium irrigation. The study includes major foodgrain growing states which cover about 90 per cent area under foodgrains. The Polynomial Distributed Lag (PDL) Model was applied to examine the long-term effect of public expenditure in major and medium irrigation on foodgrain productivity. The analysis showed that disparity among the states on the basis of expenditure on per hectare of gross cropped area in each state has marginally increased over plan periods. The results obtained from PDL model showed that in states of Andhra Pradesh, Karnataka and Orissa, there was a lag of six years in attaining the 100 per cent effect of public expenditure in major and medium irrigation projects on food grain productivity, while in Gujarat, a lag of 9 years was observed for realising the full potential of public expenditure on foodgrain productivity, Kerala recorded a lag of 11 years, and in Maharashtra and Rajasthan a lag of 7 years was observed and a twelve year lag was observed in states like West Bengal, Punjab and Assam for realising the 100 per cent effect of public expenditure on foodgrain productivity.

## **Small Farmers: Decline or Persistence? A Policy Response**

**Vidyarthi Vikas<sup>†</sup>**

An attempt is made to examine the economic viability of agricultural farm activity between 1960-61 to 2002-03 based on secondary data provided by NSSO and farm management data (1954-55), which was used by A.M. Khusro (1973). It also examines the credit allocation for agriculture and its significance. The results revealed that 94.8 per cent operational land holdings have not provided subsistence to the marginal and small farmers and are not economically viable. There is inexorable downward pressure on farm size and increasing concentration in the

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lowest size group and increasing inequality in agrarian structure. The increasing trend of small farm size is due to several factors, namely, high population pressure coupled with limited non-farm employment, persistent trend of land diversion to non-farm use, and traditional practices of land inheritance, and land sub-division and fragmentation. This raises the question regarding economic viability of small/tiny holding and subsistence of small farmer. Due to small farm size, rural farm households have to diversify their income to meet their family needs. Strategic policies are needed to increase household income in the rural areas by increasing access to land resources, financial resources and raising production per unit of land coupled with promoting off-farm employment. Reform policies, non-traditional farm mix with traditional farm structure have played an important role in improving small farmer incomes.

### **Revamping MGNREGS in the Twelfth Plan: Implications from Village Level Implementation Status in the Central Uttar Pradesh**

**Brahm Prakash, A.K. Sharma, Mohd. Ashfaque and Rakesh K. Singh\***

Based on both primary and secondary data the paper attempts to analyse the progress made under the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) so far at the national level with particular focus on Central Uttar Pradesh at the ground level. As of December 2010 the scheme has provided employment opportunities to 41 million households during 2010-11. It has also strengthened the social and gender equity dimensions as the SC, ST and women constitute 23, 17 and 50 per cent of the workers under MGNREGA in 2010-11. The number of total works taken up has also increased from 8.35 lakh in 2006-07 to 68.50 lakh in 2010-11. The data on work undertaken under the scheme revealed that the maximum percentage of works sanctioned were for water conservation followed by rural connectivity and provision of irrigation facilities to land owned by SC/ST/BPL and Indira Awas Yojana beneficiaries. Although MGNREGA has emerged as a powerful tool of economic redistribution and social equity, the analysis at the micro level shows that the programme is also facing a number of challenges like administrative inefficiency, lagging behind the target (only 54 days employment provided against the target of 100 days in a year), poor quality of work, delayed payment of wages, no emphasis on improving skills of the labourers, work without executing agency, rampant corruption, low productivity and risk for jeopardising the food security of the country etc. The study emphasised that in addition to civil works, some skilled activities like data feeding, assistance in surveys, complete enumerations/censuses are also urgently required under the scheme for literate rural youths. This will on the one hand, encourage the literate youths towards this scheme

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while on the other hand, help in proper recording of information at the village level itself for better monitoring at some future date or for effective social auditing. The detailed action plan of civil works to be carried out should be prepared and approved by a responsible technical committee so that work on water conservation may get constructed based on hydrological and environmental considerations. There should also be a website for each village panchayat or at least at a block development level updated daily and open for viewing panchayat-wise all details, so that any learned/responsible person of the village residing outside village may also view and play an effective role in social auditing. Such provisions, if made under the scheme, will help in curbing the rampant practice of repeatedly reporting some civil works.

### **Targets for an Inclusive Faster Growth: Prospect of Dairy Sector in India for the Twelfth Five Year Plan**

**K.K. Datta<sup>†</sup>, Shiv Raj Singh<sup>†</sup>, Bulbul Nagrale<sup>†</sup> and Uttam Bhattacharyya<sup>‡</sup>**

The study has mainly focused on understanding the approach adopted and pathways to achieve development objectives in the dairy sector and lessons learnt in order to integrate with other sub-sectoral activities of the agricultural production systems to improve the stability, reduce the volatility and enhance the rural livelihood through inclusive participation of the disadvantaged sections. Since the bovine population are more evenly distributed than the landholdings, dairy and other livestock sectors provide the means for more inclusive and equitable growth of the landless, marginal and small dairy households. It is essential to support that the landless, marginal and small holder dairy producers because they are generally competitive and are likely to endure for some time, particularly where the opportunity cost of family labour and wages remain low. The most compelling evidence towards this is the continued dominance of smallholders in all the states, even where there is steady economic growth like Gujarat. The results showed that the income from off farm, dairy farm and livestock source has an equalising effect on the distribution of total income for all categories of farm households, which otherwise corroborates the hypothesis of relative income equalising effect through dairying and livestock farming compared to distribution of incomes through crop. Demand for milk and milk products will provide an avenue for resource poor farmers to increase production, improve their livelihoods, reduce malnutrition and thereby contribute to the goal of overall poverty alleviation. The future growth has to sustain primarily through enhanced productivity and not with the increase of livestock population. In the Indian dairy sector, around 22 per cent milk is processed into the small and tiny units; they have the capability to manufacture the traditional dairy products in the

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rural and urban settings. But the problem with the small and tiny milk processing units are they are unable to scale up the business to a large scale because the market size is limited for them and they are using labour intensive technology. So there is need to support the tiny, small and medium size dairy processing units under formal banking system and collective market based marketing programmes.

### **Performance of the Farm Sector in India and the Question of Inclusive Growth: Agenda for the Twelfth Five Year Plan**

**Apurba Kumar Chattopadhyay\***

The study attempts to analyse the problems of the farm sector and the impact of stagnation of farm sector on employment and livelihood of the population. It evaluates the government measures undertaken to remedy the shortcomings of the farm sector and also provides a draft agenda for the twelfth five year plan to make the development process more inclusive. Using secondary data the paper argues that the widening gap between the growth of agriculture and non-agriculture sector and the mismatch between their share in gross domestic product and share in total employment has posed a structural problem that needs to be addressed immediately. Particularly, the increasing gap in the productivity of different sectors and thus the average incomes of workers engaged in agriculture and non-agriculture occupations has accentuated the existing inequality and thus has promoted imbalances. The main factors responsible for agricultural crisis are deterioration of terms of trade in agriculture, poor progress of irrigation and fertiliser use, decline in supply of electricity to agriculture, stagnation in capital and very poor progress of cropping intensity. A detailed agenda for action for the Twelfth Five Year Plan has also been spelt out. The strategy would be to raise substantially the farm productivity. This calls for focus on the rainfed areas, diversification of agriculture from just crop farming to livestock and horticulture sectors while simultaneously addressing environmental concerns. Further, the investment levels have to be increased for increasing farm productivity and creating adequate infrastructure for transport, storage and distribution of agricultural produce.

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## **Rural Development Planning in Central India - A Case Study of MNREGA in Sagar District of Madhya Pradesh**

**P.K. Awasthi, D. Rathi and N.K. Raghuwanshi<sup>†</sup>**

The present study has been undertaken with the following specific objectives: (i) to assess the impact of Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA) on durable assets and gainful employment created on sample farms and (ii) to identify the constraints in its implementation and offer suggestions to make the MNREGA more efficient. The analysis is based on data collected by survey method from 100 beneficiaries of MNREGA selected from three villages of Sonpur panchayat of Rahli block of Sagar district of Madhya Pradesh pertaining to the year 2009-10. The findings of the study revealed that under MNREGA investment is made mainly on construction works for community services and thereby creating employment opportunities for the unemployed and under-employed as relief measure. The process would not continue for long and hence the strategy of productive investment be evolved which will provide continuous employment opportunities and income to the rural poor. The present policy of selection of workers, wage rate, number of working days per worker indicate that the scheme are only an ad-hoc measure in the eradication of unemployment and poverty in the process of creating durable community assets. The whole process requires reorientation in its basic premise. The MNREGA must be viewed in terms of employment multiplier while preparing the action plans. It must involve specific programmes to study and see how far the benefits actually reached the target groups. The major suggestions of the beneficiaries to be included in MNREGA were related to provision of larger number of days of employment in off-farm season and increase in wage rate.

## **Past Achievements and Future Concerns of Rice Production in India**

**P. Samal and N.P. Jambhulkar<sup>\*</sup>**

The paper attempts to study the growth in rice production across twelve states, trend in input use, costs and profit in rice cultivation, growth in total factor productivity and discusses the concerns for increasing rice production in India. The data for the purpose were collected from various publications of Directorate of Economics and Statistics, Ministry of Agriculture, Government of India. Rice production growth slowed down during 2000s as compared to the 1970s, 1980s and 1990s at all India level and also in majority of the states. It is also observed from the trend analysis of area and yield that the scope for area growth has been exhausted.

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The cost of cultivation per hectare (ha) has increased and profits per ha has decreased in rice cultivation in majority of the states. The input analysis also revealed that the use of fertiliser and machine labour has increased, while that of animal labour and manure use has decreased over years. The fertiliser use in irrigated states like Punjab, Haryana, Andhra Pradesh and Tamil Nadu has reached 200 kg or more per ha. The human labour and animal labour use have decreased due to increasing level of farm mechanisation. It is observed that the total factor productivity was negative in three states, viz., Punjab, Tamil Nadu and Kerala while it was less than one in three states, namely, Andhra Pradesh, Haryana and Uttar Pradesh, which is a major cause of concern. It is also estimated that at the present growth rate in production, the supply of rice will not be sufficient to meet the demand in future years. The concerns for increasing rice production and problems of degradation of prime rice land, decline in profitability, climate change, water shortage, loss of biodiversity, infrastructural bottlenecks, constraints in input delivery and drudgery in rice cultivation were also discussed. These concerns have to be mitigated through development of appropriate technologies, development of infrastructure and institutions; and government policies. This calls for more research and development funds for increasing rice production in the coming years.

### **Food Safety Regulatory Compliance in India: Policy Challenges and Opportunities**

**M.S. Jairath<sup>†</sup> and Purnima Purohit<sup>‡</sup>**

The study has attempted an appraisal of Indian food safety regulation in terms of its effectiveness and response to changing face of global agri-business by focusing on the case of the arid India. The data on regulatory inadequacy on food safety standards shows that majority of the detentions and rejections of foods from India are not related to highly technical or sophisticated requirements but has raised concerns relating to food hygiene problems arising from failure to meet SPS standards of the WTO. It is inferred from the findings that strengthening domestic market for food safety standards is important prior to expecting them to adapt to international standards. Efforts to signal quality to buyers in the form of scientific grading system is needed for long term sustainability of trade competitiveness. Trust in government institutions, the perceived transparency of regulatory processes and the government risk communication policy and by implication, consumer confidence in the food supply itself would play a critical role in strengthening the Indian Food Control System and thereby making considerable impact on the economic systems of the agricultural sector. The study suggests a three-prong strategy and presents proposals

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to enhance the trade opportunities, build consumers' trust; and educate traders and small farmers.

### **Employment and Asset Creation under NREGA in Maharashtra: Realities and Lessons**

**Jayanti Kajale and Sangeeta Shroff\***

The paper evaluates the working of NREGA in Maharashtra in terms of employment generated and assets created during the three years of the eleventh five year plan with the help of secondary data. It seeks to look at the constraints faced and prospects of the scheme in Maharashtra. The available data suggests that the state has not been able to show a satisfactory performance in terms of employment generation and assets created. It is observed that employment under NREGA has failed to create the level of employment which matched the largest under EGS before 2006. Data relating to expenditure on ongoing/suspended works suggests that though resources have been used for NREGA activities assets have not been created to that extent. It appears that only 22 per cent of the works were completed over the last three years while the rest remained incomplete or suspended. Discussions with officials reveal that the village authorities, which are the main machinery for implementation of NREGA work have come under tremendous stress with the implementation of the Act and do not have the incentive for co-ordinating NREGA activities. Providing employment in time as well as tapping the potential demand for work will go a long way in improved performance of this employment programme and also benefit the agricultural sector of the state.

### **Prioritisation of Investment in Agriculture R&D**

**K. Srinvas, Ranjit Kumar, P.C. Meena and D. Babu<sup>†</sup>**

The study tries to supplement the decisions for investment in agriculture R&D keeping in view the three main objectives of growth: improvement in productivity, equity (reduction in poverty) and sustainability. Modified congruence approach was used in the present study to work out the priorities in agriculture and it was found that there has been shift in priority states when the analysis moves from initial base line (IBL) to final base line (FBL). The ratio of Value of Produce (VOP) and FBL indicate that there is an increased need for more investments in states where the ratio is more than 1.05 and the investment can be traded-off from the states where the ratio is less than 0.95. This study would be a starting point for setting the national priority for the next plan.

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## **Agriculture Strategy for Twelfth Five Year Plan: A Policy Perspective**

**Mahendra Singh\***

The paper analyses the contribution of agricultural sector in poverty eradication and role of livestock and other sub-sectors in agriculture growth in the Eleventh Five Year Plan and sets out the strategy for the agriculture development towards Twelfth Five Year Plan in India. The study has examined the role of state-wise agriculture development on rural poverty eradication in respective states. The state-wise performance of agriculture sector during past decade (2000-01 to 2009-10) and achievement of the various sub-sectors during Eleventh Five Year Plan (2007-12) were analysed. The pertinent issues related to sustainable agriculture development such as stagnation in growth rate of yield of major crops, depletion of groundwater in the region which adopted Green Revolution Technology (GRT) in the early stage, enormous growth in agriculture subsidy, yield gap and low seed replacement rate in rice, wheat and pulses, consumption of groundwater resources in the production process of an agricultural or industrial product or the virtual water concept and impact of schemes for inclusive growth in agriculture sector have discussed. The results showed that agricultural growth and intensity of rural poverty have inverse relationship and agriculture development has contributed significantly in the reduction of rural poverty. The High Value Commodities (HVCs) sector such as livestock, fisheries and horticulture played a seminal role in achieving the target of Eleventh Five Year Plan with higher growth rate in these sub-sectors. The growth rate in the value of agriculture subsidy was higher than plan expenditure during the last decade and the share of agriculture subsidy to agriculture gross domestic product was over 8 per cent. The study suggests that the strategy for Twelfth Five Year Plan should be prioritised on the basis of issues related to sustainable agriculture development. The strategy should focus on strategic research for breaking yield barrier of crops, resistant to abiotic and biotic stress and adoption of resource conservation technologies and water use efficiency through suitable policy instruments. Yield gap should be minimised through research-extension-farmers linkages in low yield and higher potential of crops in respective regions. HVCs sub-sector should given priority through suitable infrastructure development. It is felt that the problem of labour scarcity and higher wage can be resolved if Mahatma Gandhi National Rural Employment Guarantee Scheme is withdrawn for short period of sowing and harvesting time in respective state.

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

**B.S. Naregal and G.B. Betadur<sup>†</sup>**

The paper tries to examine the role of agricultural development perspective in India during the planning era and suggests the strategic planning for agricultural development for the XIIth five year plan. The study mainly relies on the secondary data and information. Various statistical tools such as percentages, ratios, tabulation, etc. are used to analyse the secondary data and the study covers the period right from 1950-61 to 2010-11, i.e., all planning era, except few years of XIth plan. Agriculture in India has shown remarkable progress during post-green-revolution period. The package approach adopted since the mid-sixties has opened up entirely new dimensions of growth in the agricultural sector and has raised a large segment of the agrarian economy from its subsistence nature. Under the impulse of new technology the farmers are responding to market incentives and fluctuation and is thus participating in a more meaningful manner in the economic development of the country. However, the Planning Commission is silent on some issues like food security, strengthening price support systems, creation of price stabilisation fund for agricultural, commodities, universalising crops insurance, protection to peasantry from subsidised imports of agricultural commodities and land reform. Thus there is need to address the challenges of the agricultural sector through comprehensive and co-ordinated efforts. Renewed attention needs to be paid to improving farm production and productivity through better utilisation of agricultural inputs, proper marketing infrastructure and support, stepping up of investment in agriculture with due emphasis on environmental concerns and efficient food management.

### **Impact of Mahatma Gandhi National Rural Employment Guarantee Act in Chhattisgarh: Some Lessons for the Twelfth Five Year Plan**

**N. Khan, Arvind Dangi and H.O. Sharma\***

A study was undertaken to evaluate the performance of Mahatma Gandhi Rural Employment Guarantee Act, and draw lessons for forthcoming Twelfth five year plan. Out of all the states of India, Chhattisgarh state has been selected for the study as this is one of the backward states of the country and as there is more opportunities for development through employment creation. The study is based on secondary data collected for the year 2008-09 to 2010-11 from the website [www.nrega.nic.in](http://www.nrega.nic.in) and

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from the Office of the Commissioner Rural Development, Raipur, Chhattisgarh. The Act was implemented in Chhattisgarh, on February 2, 2006. The district wise secondary data on caste wise and gender wise household job cards were prepared, number of employment days generated, work completed, social auditing inspection and mode of payment has been collected for the study. Mean percentage, relative change over the year 2008-09 has been considered to draw conclusions. The study revealed that the households completed 100 days of employment and a decreasing trend were noticed, i.e., from 7.50 per cent in 2008-09, to only 5.87 per cent in 2010-11. This might be due to the fact that the bottom level planners do not have clear cut vision of how to generate employment. This means there is need to involve agricultural scientists, thinkers and planners in the policy implementation. This programme should be tuned up with Comprehensive District Agricultural Plan(C-DAP). The study concluded that the NREGA not only provided employment to the weaker sections of the society but also strengthened the financial health of post office and commercial banks in the rural area.

### **Lessons from the Past Experiences for Participatory Groundwater Management in the Twelfth Five Year Plan**

**M. Lavanya and S. Senthilnathan<sup>†</sup>**

The paper views groundwater as a common pool resource and explains that it can be effectively managed by collective action/participatory management. It also reviews the scope for local regulation in intensively used groundwater systems. It brings together a number of examples of local management of groundwater from various socio-political backgrounds in the countries like Pakistan, India, Egypt and Mexico. The examples are few and far between and show a mix of failure and success in demand and supply management of groundwater. Yet in the cases where local regulation has worked, it has often been the only thing that did so. The examples also show that – in contrast to conventional policy recommendations – effective groundwater management can occur without quantified groundwater rights and without central regulation, the document makes the case for such measures as bridging the knowledge gap, making hydrology less esoteric and casting the net wide in awareness building and also increasing the chance of finding local champions, promoters and trouble makers. There are a number of recurrent themes in such spontaneously developed examples of local regulation: the power of correct and accessible hydro-geological information; the possibility of making more use of demand and supply management strategies; and the important supportive role of local governments. It also focuses on the current situation that India faces in groundwater over-exploitation. The results from the successful case studies from Andhra Pradesh

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are used to derive the conclusions. The lesson is that promoting local groundwater regulation is not difficult, costly or sensitive and can reach the necessary scale. Participatory groundwater management by forming Groundwater User Associations (GUAs) could be a possible attempt. Further research on the subject would give fruitful results if the issues like free electricity, cropping systems dynamics, land development and water harvesting policies, government policies indirectly supporting non-agriculture and agriculture-non-agriculture use trade-off were addressed appropriately. Hence policies encouraging research on ground water management by forming user groups and implementing the same could be a feasible attempt in the twelfth five year plan.

### **An Analysis of Effect of Water Scarcity on Indian Agriculture**

**D. Kumara Swamy and C.V. Hanumanthaiah\***

An attempt is made to discuss the effect of water scarcity on Indian agriculture through an analysis of different forms of water resources that are supporting Indian agriculture since Independence to recent period and change in percentage composition of various water resources and the adverse affects of water scarcity on agriculture and finally suggests the suitable measures to required at planning and field level. The data has been collected from various secondary sources. It is noted that the most important thing about water scarcity is that it hits first the poorest section of the country by adversely affecting agricultural production as a major share of below poverty line population in the country are small and marginal farmers. So all planning and policy making should and must concentrate on provision of continuous supply of irrigation water for agriculture and thus strike a balance between depletion and recharge in the case of groundwater. Efficient use of rainwater by different means of water harvesting techniques and proper distribution of river water is the need of the hour.

### **Growth Performance of Agriculture in Jammu and Kashmir: Trends, Patterns and Determinants**

**Rajeev Sharma<sup>†</sup>**

Agricultural sector is predominant in the economy of Jammu and Kashmir and provides livelihood to the majority of the population. The paper attempts to understand broadly the performance of agriculture in the state of Jammu and Kashmir. In particular the study has looked into the pace and patterns of agricultural

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growth and then the determinants affecting the agricultural growth in the state of Jammu and Kashmir since the 1960s. For the purpose, the overall period (1960-61 to 2007-08) is divided into five sub-periods; namely, initial green revolution period (1960-61 to 1980-81), immediate pre-reform period (1980-81 to 1990-91), post-reform period (1990-91 to 2007-08), immediate post-reform period (1990-91 to 2000-01) and recent period (2000-01 to 2007-08). The study relied on secondary sources of information to realise the objectives of the study. Trend analysis of growth has been carried out and suggests that the growth in agricultural sector followed a distinct pattern when compared with all India and its neighbouring states: that is, shown as an increase in the output of agriculture especially during the post-reform period. Thus, the main focus of the paper is to seek out the contributing factors behind this growth in the state of Jammu and Kashmir. The analysis of determinants brings to the fore the fact that apart from area under non-food grains and cropping intensity, terms of trade, per capita income and gross irrigated area also made positive and significant contribution to the output of agriculture. From the policy point of view, the results thrown up by the analysis suggests that the state has to organise agriculture in such a manner that the limited land resource is made to yield maximum returns through the application of modern technology. This would increase the well-being of those dependent on the agricultural sector for their livelihood.