

# Role of Agriculture in Bihar's Development

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**Abstract:** Bihar's agricultural development in the latest 15 years between 2005-06 and 2019-20, presents a mixed picture. Agriculture growth was around 4.7 per cent, which was above the national average of 3.6 per cent and in the latest five years, its performance was even more commendable, with an average annual growth rate of 7.1 per cent. However, agriculture productivity of two of its major crops, rice and wheat, is lower than the national average, despite the relatively high private investment in yield augmenting inputs such as fertilisers, certified seeds, tube wells and farm machines. Bihar's agriculture has diversified impressively through dairy development although productivity in milk production is lagging behind other major milk producing states, but poultry development has not taken off. In this paper, we study the composition, sources and drivers of agricultural growth in Bihar with a view to identifying the factors that explain the paradox of low agricultural productivity and high use of productivity augmenting inputs. Major difficulty that farmers in Bihar face is the lack of marketing infrastructure, resulting in their inability to reap the price incentives given by the Government of India in the form of minimum support price. Livestock development has not achieved its potential because of strategic deficiencies. In dairy, productivity has remained low because germ plasm from superior breeds has not been used. In poultry, the culture of contract farming involving large integrator companies has not yet been adopted. In the light of these findings, the study makes five principal recommendations to stimulate agricultural growth and productivity in the state, viz., improve the quality and quantity of rural power supply by strengthening transmission and distribution and obtaining separation of feeders for irrigation.

**Keywords:** Agriculture, Crop Production, Agriculture Road Map, Climate, Farm Management.

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## 1. INTRODUCTION

In the past 60 years, Bihar agriculture has made remarkable improvement in food grain production. During this period, India has turned from a food deficit to a food surplus country, despite the increase in population. The state has also made strides in the diversification of agriculture from cereals to high value commodities. It is not only the world's second largest producer of wheat, rice, fruits and vegetables and cotton but also the largest producer of milk and pulses. However, the performance in agricultural development has been uneven across states. Some states like Punjab in the earlier days, Gujarat and more recently Madhya Pradesh have seized growth opportunities and forged ahead. Others like Odisha and Uttar Pradesh have lagged behind in several development indicators. Bihar, on the other hand, has recorded a high agriculture growth rate in recent years as compared to other states. Between 2005-06 and 2014-15, the agricultural sector in Bihar grew at 5.6 per cent as compared to the national average of 3.6 per cent. However, this growth rate has been extremely volatile due to recurring natural disasters and is highly sensitive to the choice of the initial and final years. Moreover, productivity in agricultural crops remains low vis-à-vis the national average despite the use of significant productivity augmenting inputs such as fertilisers, quality certified seeds, farm machines, etc., in the state. There has also been impressive diversification of agriculture particularly through dairy development, but again, the productivity in milk production lags behind the milk productivity of major milk producing states in India. In this paper, we explore the reasons behind this paradox of low agricultural productivity and high use of inputs in crops, and robust expansion but low productivity in dairy, while analysing the sources and drivers of agriculture growth in Bihar.

## 2. AGRICULTURE ROAD MAP

Agriculture Road Map was started in 2008. The first agricultural road map concluded with a Krishi Karman Award to the state for ever highest rice production at 81 lakh MT in 2011-12. This also led to commendable progress in seed sector and agriculture extension. Now the second agricultural road map(2012-2022) is being implemented in the state. It includes programmes of not only the production related departments such as agriculture and animal, dairy and fishery resources department, but also the detailed programmes of Water Resources, Minor water resources, Energy, Land Reforms, Forestry and Environmental protection, Food Processing Industry, Cooperative, Rural Road and Flood and Drought related departments. The agriculture road map gives a holistic approach to agriculture developments and it needs to be implemented at the country level. The second agriculture road map of Bihar envisages an investment of Rs. 1.5 lakh crore in 5 years. Such large amount of investment in agriculture could only come through appropriate central scheme. However, the central scheme should provide adequate flexibility to states for choosing scheme components, its rate of assistance and mode of sanction and implementation. A Cabinet Sub Committee has also been constituted to monitor the preparation and implementation of the Agriculture Road Map.

The Task Force has thoroughly deliberated the existing status of Agricultural development and has prepared a perspective plan for Agricultural Development for the remaining two years of 12th five year plan and for the 13th five year plan. An Interim report has been prepared which may subsequently be further developed. The Interim report includes production related subjects such as Crop, Horticulture, Milk, Meat, Fish, Egg and also the supportive subjects such as irrigation, power, co-operatives, approach road, plantation and green coverage. It envisages an investment of Rs. 2.72 lakh crore from 2015-16 to 2021-22.

## 3. VISION FOR CROP PRODUCTION

Qualitative increase in crop productivity may be emphasized as there is limited scope for increase in area. Current fallow and other fallow land may be brought under cultivation with appropriate interventions. Zaid season may be emphasized similar to Kharif and Rabi seasons. Crop and varietal diversification may be introduced. Quality of production and value addition has to be emphasized. The outreach of most modern crop production technology may be facilitated upto the last farmers. Region and Agro Climatic specific crop, variety and technology may be identified and promoted. While increasing crop production and productivity, soil, water, animal and human health may be conserved and protected.

Seed is critical for the development of agriculture. The public sector seed companies have become totally inadequate to cater to the needs of the farmer. The private seed business particularly through the multinational seed companies are making farmers entirely dependent on their avarice interest. There is a need to substantially increase investment in public sector seed production, processing and Marketing. Local seed companies may also be promoted to reduce the dependence on multinational seed companies. In addition to the crop seed planting material for horticultural crops are important. Similarly animal breeds and fish fingerlings are important for their productivity and quality. Whereas scientific innovations in seed industry would be helpful in achieving production targets but it would also be important to preserve and promote traditional varieties of crops and indigenous breeds of animals.

Sugarcane is the major cash crop in Bihar. In India Sugarcane is a major commercial crop for Sugar industries. In Bihar, it is grown in an area of 2.65 lakhs hectare with an average productivity of 69.72 ton per hectare and sugar recovery of 9.22 % against the national average of 68.8 t/ha and 10.17% respectively. Sugarcane Research Institute, Pusa (Bihar) is the only research institute committed to sugarcane research. It was established in 1936. A proposal to set up a new sugarcane research institute has been sent to ICAR which needs immediate attention. Climate change, declining soil health, emerging new disease and pest, labour scarcity and abiotic stresses are severely affecting cane productivity and sugar recovery. Sugarcane seed replacement rate is only about 10 % against the desired level of 33 %. Sugar sector needs a revival package.

Generation of appropriate agricultural technology and its dissemination to the farmers are becoming more and more challenging in the context of the climate change. Both the numbers and the quality of the technically qualified person in agriculture are grossly inadequate. There is a need to step up investment in agricultural research, education, extension. The whole ICAR system, agricultural universities and the state department of agriculture needs to be revisited for their current strength and weaknesses and every such institution should be strengthened to meet the future demand. New initiatives initiated by Bihar Agricultural University such as Kisan choupal, Kisan Gyan Rath and direct video

conferencing with farmers have proved immensely useful. Such experiences may be suitably replicated at the country level.

Agricultural planning is much dependent on the statistical input generated through age old system. It needs a relook with appropriate input from remote sensing technologies. Local and decentralized planning can only capture the unique situation and harness the local potential. Reliable information for village agriculture as unit should be promoted and public planning should be based on the village level data.

Agriculture marketing will be one area which need focussed attention. The basic infrastructure such as the dry and cold storage are grossly inadequate in states like Bihar. The state took a bold step to abolish APMC Act in 2006. However there are no alternative models in the country. Structural innovations to foster agriculture marketing should be developed.

Procurement of food grains must be assured and to make it effective FCI and CWC must create adequate storage infrastructure and FCI should make arrangements to procure food grains including Maize and pulses from the farmers.

Small farm agriculture is a compulsive situation and to make it viable is the highest challenge. Integrated farming may be a solution and it needs to be encouraged. Animal husbandry and fisheries are the key sectors besides crops and horticulture. There is a need to focus research on small animals such as rabbit, rat and reptiles to increase the food basket. The importance of small animals has duly been recognized by FAO and a national level perspective will further help the cause of food and nutritional security of the small and marginal farmers. Urban and peri urban agriculture offer new avenues and a perspective plan should be prepared to encourage urban agriculture.

High input cost particularly chemical fertilizers and pesticides would continue to pose challenge for the viability of small farm agriculture. Nutrient based subsidy regime for chemical fertilizers has led to skewed use of NPK fertilizers. Stable price of Urea and ever increasing price of P and K fertilizers are leading to excessive use of urea and frugal use of P & K. There is an urgency to restore the optimum balance. Organic farming technologies may be promoted to utilize the locally available resources. Bihar has a robust vermi compost and bio fertilizer programme which needs to be replicated. Similarly green manure programme has been implemented with much success. Agriculture Road Map aims at reaching vermi compost, bio fertilizer and green manure in every plot in 5 years. Soil test based fertilizer application and soil health card to all eligible farmers be granted in the stipulated time.

Farm mechanization saves cost and improves quality. Bihar has unique experience in implementing a massive farm mechanization programme. Mechanization software has been developed for transparency and accountability. All transactions are on line and farmers are benefitting from it.

Use of modern Agricultural technology is important for increasing production and productivity. SRI, Zero tillage, high density plantation and other appropriate technologies are promoted under the agricultural road map. Such technologies should constantly be developed and promoted in the farmers field.

Eastern states particularly Bihar has large untapped irrigation potential. There should be national policy to help states to harness the irrigation potential and any investment on this count should be supported through a national programme.

Flood and drought have become recurrent feature in Bihar. Paradoxically, north Bihar is ravaged by flood and south Bihar by drought in same year. Similarly wild animals such as blue bull are proving a threat to agriculture. In such an unstable situation farmers are hardly able to make an investment and therefore agriculture largely remains traditional and subsistence. There is an urgent need to have a comprehensive policy to mitigate risk of contingent situations in agriculture.

The challenges of climate change are becoming more and more apparent. This would pose greater challenges for agriculture. To mitigate the adverse impact we need to explore more and more crops and animals in the food basket. There is a dangerous trend of shrinking food basket limited to few crops and varieties. Bio diversity within the species and among the species must be restored. Diversification among enterprises and diversification of varieties will have an important role to play in the coming times. Urban and peri urban agriculture would continue to draw attention and subtle planning would be required to foster it.

Quality control of the agri inputs would continue to be important. Therefore a strong network of analytical lab of soil, seed fertilizers pesticide, residue analysis would be very important.

#### 4. CROP PRODUCTION STRATEGY

**Inputs:** Production, availability at farmers' accessible places, timeliness, cost and quality.

**Minimizing cost and maximising return:** Promotion of technologies and management practices which tend to decrease cost of cultivation and maximize return.

**Sustainable production system:** Utilization of land, water and labour resources for best possible crop mix to suit to the conditions arising out of the global climate change. Crop and Enterprise diversification will be key to the sustainable production system. Recycling of organic wastes for use as organic fertilizers.

**Extension:** Transformation of agriculture information to knowledge and science into technology for agriculture scientists, students, farmers and extension workers. Reorganisation of extension to make it efficient, accountable and transparent.

**Special attention to** difficult physiographic situations viz. Tal, Diara, Saline, Acidic soils.

**Respect & Reward:** Restoring respect to the agriculture as profession for farmers, students, scientists and extension workers.

**Financial outlay for major programme:-**

|  | 2015-16 | 2016-17 | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2011-22 | Total |
|--|---------|---------|---------|---------|---------|---------|---------|-------|
| Seed plan                                    | 183     | 191     | 214     | 231     | 243     | 255     | 272     | 1590  |
| Horticulture                                 | 352     | 377     | 403     | 428     | 453     | 478     | 504     | 2995  |
| Oil Fertility Management                     | 564     | 645     | 725     | 805     | 886     | 966     | 1047    | 5638  |
| Quality control                              | 38      | 40      | 39      | 40      | 41      | 43      | 53      | 294   |
| Mechanization                                | 601     | 652     | 753     | 854     | 955     | 1056    | 1157    | 6028  |
| Extension                                    | 410     | 525     | 590     | 655     | 720     | 785     | 850     | 4535  |
| Soil & Water Conservation                    | 80      | 105     | 130     | 155     | 180     | 205     | 230     | 1085  |
| Application of remote sensing in agriculture | 1       | 2       | 3       | 3       | 3       | 3       | 3       | 18    |
| Agriculture Research & Education             | 574     | 685     | 532     | 512     | 492     | 472     | 482     | 3749  |
| Total  | 2803    | 3222    | 3388    | 3683    | 3973    | 4263    | 4598    | 25931 |

Production Milestone: (Unit Production in lakh MT)

| Year/Item              | 2017   | 2022  |
|------------------------|--------|-------|
| Rice                   | 93.63  | 126   |
| Wheat                  | 65.75  | 72    |
| Maize & Coarse Cereals | 63.43  | 90.65 |
| Pulses                 | 29.2   | 36    |
| Oilseeds               | 3.14   | 4.5   |
| Fruits                 | 60.37  | 80    |
| Vegetables             | 186.11 | 225   |

#### 5. CONCLUSION

The study shows that the Bihar has diversified agriculture production in favour of horticulture and commercial crops at very slower rate during the post-bifurcation period. But, it is important to highlight that the area under food grains still occupies more than 86 percent of total cropped area due to the traditional cropping pattern as well as traditional food habits. Therefore, area, production and yield of non-food grain crops are more stable as compared to food grain crops.

The urgent need of the hour is to increase Investments in rural infrastructure for water management/soil conservation/construction of roads to link rural area with urban area etc. With appropriate technology, infrastructure and policy support, it is possible to reverse the declining trend in food grain production and check the migration of the people from Bihar to other states.

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