

Agriculture And Rural Transformation

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Abstract:

India aim's to be a \$ 10 trillion by 2030. Achieving such an aspirational growth target calls for pulling all the economic growth levers—investment, consumption, exports, and across all the three sectors of agriculture, manufacturing and services. Hence, our focus in this paper is to study how agriculture can contribute to the \$5trillion and \$ 10 trillion economy.

Keywords: Agriculture, manufacturing, technology, institutions.

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I. Introduction

India aim's to be a \$ 10 trillion by 2030. Achieving such an aspirational growth target calls for pulling all the economic growth levers—investment, consumption, exports, and across all the three sectors of agriculture, manufacturing and services. Hence, our focus in this paper is to study how agriculture can contribute to the \$5trillion and \$ 10 trillion economy. We will analyse what are the existing challenges in Indian agriculture, and what kind of transformations are required to meet these challenges. This paper shall focus on changes in techniques and technology, policies and institutions as the main driving force in agriculture.

II. Performance And Issues In Agriculture

Trends in agricultural output:

Intrinsically agriculture matters as it is the primary source of livelihood for about 58 per cent of India's population. 80 percent of India's poor are rural. Agriculture provides food for the nation, so food security is important.

Gross Value Added by agriculture, forestry and fishing is estimated at Rs. 1,855,632 crore, contributing 14.4 percent to India's GVA in FY18-19. Agriculture sector contributes 1 percent to the GDP of high income countries such as US, UK etc., 6 percent among the upper middle income countries like China and Brazil and 15 percent lower middle income countries such as India, Egypt, and Indonesia.

Total food-grain production increased from 51.99 million tonnes in 1950-51 to a record 284.95 million tonnes in 2018-19. India is the largest producer (25% of global production), consumer (27% of world consumption) and importer (14%) of pulses in the world. Rice production has increased from 20.58 million tonnes in 1950-51 to 74.29 million tonnes in 1990-91 and 111.6 million tonnes in 2018-19. Production of wheat has increased from 6.46 million tonnes in 1950-51 to 55.14 million tonnes in 1990-91 and 102.2 million tonnes in 2018-19. Coarse cereals production increased from 16.09 million tonnes in 1950-51 to 42.9 million tonnes in 2018-19. India ranks first in milk production, accounting for 20 per cent of world production. Milk production in India has been increasing steadily over the years from 55.6 million tonnes in 1991-92 to 176.3 million tonnes in 2017-18, at an average annual growth rate of 4.5 percent. India ranks second in fruits and vegetables production in the world, after China. As per National Horticulture Database published by National Horticulture Board, during 2017-18, India produced 97.3 million metric tonnes of fruits and 184.4 million metric tonnes of vegetables.

Farmer's Income and landholding size

The Situation Assessment Surveys of NSSO show that the average monthly income of agricultural households in current prices increased from Rs. 2115 in 2003 to Rs.6426 in 2012- 13. The share of cultivation in total income is the highest at 46% in 2003 and 48% in 2013. The share of income from animals rose while that of wages and non-farm business declined in 2013 as compared to those of 2003. Apart from a paltry income, farmers are facing rising indebtedness, lesser financial inclusion, and absence of insurance facility.

Since the first agriculture census over 45 years ago, the number of farms in India has more than doubled from 71 million in 1970-71 to 145 million in 2015-16, while the average farm size more than halved from 2.28

hectares (ha) to 1.08ha. The majority of India's farms (86%) are less than 2ha. The bulk of which are located in the poorer states such as Uttar Pradesh and Bihar.

Issues

Given that large section of the population still depends on agriculture, productivity per person and livelihood issues are serious concerns. Agriculture in India has achieved grain self-sufficiency but the production is highly resource intensive and cereal centric. Diversifying production of crops and designing careful price and subsidy policies can encourage the production and consumption of nutrient rich crops. Criticism of the MSP policy is that it is limited to few crops (mainly rice and wheat) and few states. Even for commodities covered, not all farmers are able to sell their produce at the MSP in other regions. Focusing mainly on rice and wheat is creating problems for diversification. The resource intensive ways of Indian agriculture has raised serious sustainability issues too. Increasing stress on water resources of the country would definitely need realignment and rethinking of policies. By the early 2000s, productivity per hectare of staple crops wheat and rice had grown steadily and total food-grain production had more than doubled. The Green Revolution policies have, however, failed in raising farmer incomes, especially for the small and marginal cultivators. Over the last two decades, the real incomes of small and marginal farmers have fallen by as much as 30 per cent due to rapidly increasing input costs, weather-related shortfalls in yields, widening price swings, and lack of access to technology, finance, and markets. This has resulted in increase of farm indebtedness, leading to over 3,00,000 farmer suicides since 1995 and farmer unrest in many areas of the country. It becomes important to make farmers' income and prosperity the central theme of agricultural planning for the future.

If Indian agriculture has to contribute to the \$5 trillion economy, it should focus on raising farmer's income which relies on improvement in crop productivity, improvement in livestock productivity, resource use efficiency or savings in the cost of production, increase in the cropping intensity, diversification towards high value crop, improvement in real prices received by farmers, access to better markets, and shift from farm to non-farm occupations.

This paper will analyse how technology, institutional and policies can transform Indian agriculture so that this sector can contribute to the \$ 5 trillion economy.

III. How Technology Can Transform Rural India.

How can technology address farmer's income?

How can technology address the issue of farmers getting right price for their produce?

How can technology address the issue of sustainability of agriculture?

As we have discussed in the previous section that the challenges for agriculture today are increasing profitability for farmers, which requires us to emphasize on production, distribution and storage, giving farmers better access to markets and fair price and make agriculture sustainable in the long run. We will analyse below how technology can transform Indian agriculture by addressing some of these challenges. The future of agriculture lies in leveraging technology, riding on change drivers – Artificial Intelligence, Internet of things and block-chain technology. Can these drivers change transform rural India?

Currently farmers choose crops on the basis of the trends of the last season. Technology can assist them in making right growing choices by carefully analysing demand, pricing and fluctuations in weather conditions. This will create a better balance between supply and demand. Technology enabled farming tools can be a boon for small farms. Technology based crop advisory around crop planning, pest-control, disease mitigation can be very useful. Using artificial intelligence (AI) crop pest management will help farmers in early identification of pests just by clicking the photo of the pest and using AI to detect it. This will facilitate early intervention and thus reduction of losses due to pest attack. Apart from with this, technology can also help farmers avail crop insurance and credit that are rightly priced. This can be possible by analysing data from various sources including land records, weather analysis, historical and current satellite imagery and remote monitoring using drones

The single greatest challenge is enabling farmers to realise better prices for their produce. Most farmers face many obstacles to get right income for their production. These include the distance from markets, dependence on local moneylenders and traders for access to capital, little knowledge of price movements, the need for ready cash at harvest, the cost of transport to markets, the control of markets by trader cartels, and the lack of nearby and inexpensive storage facilities.

Digital solutions are seen as a way to overcome many obstacles. Online price discovery and marketing platforms would provide farmers transparency and unmediated market access.

In the traditional model, middlemen walk away with a large chunk of a farmer's income. E-marketplaces that can connect buyers and farmers directly can dis-intermediate the chain and offer better incomes to farmers. An effective cold chain system is the need of the hour for Indian agriculture. Most of the existing cold storage units are outdated. Technology enabled cold storage chains that are controlled using smart devices can prevent

post-harvest losses. Automated grading and sorting of crops using robotics and machine vision, can also reduce efforts and wastage in the supply chain.

Sharing economy models that allow shared usage of high-cost equipment like tractors can decrease financial burden on the farmers. This model can help farmers use tools and machines on a per usage basis instead of investing a high cost on outright purchase. With growing usage of smartphones, farmers can tap into the wisdom of the crowds, other knowledgeable farmers and agronomists to take inputs during the growing period.

We have to find ways where technology can help support farmers to secure and grow income levels, while helping them navigate worsening climate-related risks.

Of course, the right investments in technology only work when paired with infrastructure development and right policies.

IV. Policies And Institutions In Agriculture

We should focus on designing the agricultural policy to focus on the best returns a farmer can get from his land.

Policies to address producer's income:

1. Solution for agriculture lies in non-agriculture: Indian agriculture should move towards diversification of agricultural livelihoods through agri-allied sectors such as animal husbandry, forestry and fisheries can enhance livelihood opportunities, strengthened resilience and increase the productivity per person in agriculture.
2. Need to Shift from Cereal Biased Policies: Government policies have been biased towards cereals particularly rice and wheat. It procures rice and wheat based on minimum support prices in few states. Cereal-centric policies also provide subsidies for fertilisers, water, power, credit and seeds. Large part of the subsidy goes to these two crops. These subsidies also benefit large farmers, few states and irrigated areas and have adverse impact on soil quality, water quantity and quality and human health. Punjab, Haryana and other states have been focusing mainly on rice and wheat because of government support to these crops. There is a need to shift from cereal-centric policies to non-cereal focused policies. Diversification of cropping pattern is obvious for improving agricultural growth, incomes of farmers and environmental sustainability.
3. Agricultural credit for small and marginal farmers and digitization of land records.
4. Beyond Harvest: warehousing, storage, value chains, food processing, exports: Agriculture has to go beyond farming and develop value chain, comprising farming, wholesaling, warehousing, logistics, processing, and retailing. Exports can be included in this holistic approach.
5. Policies to address market issues and fair price for farmers and sustainability: Encouraging contract farming through the State Governments by promulgating of Model Contract Farming Act, up-gradation of Gramin Haats to work as centers of aggregation and for direct purchase of agricultural commodities from the farmers, e-NAM to provide farmers an electronic online trading platform, distribution of Soil health cards to farmers so that the use of fertilizers can be rationalized, increase water efficiency through Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)-“ Per drop more crop”, better insurance coverage to crops for risk mitigation under Pradhan Mantri Fasal Bima Yojana (PMFBY), providing total interest subvention up to 5 per cent (inclusive of 3 per cent prompt repayment incentive) on short-term crop loans up to R3 lakh, thus making loan available to farmers at a reduced rate of 4 per cent per annum and extended the facility of Kisan Credit Card (KCC) for animal husbandry and fisheries related activities .

V. Conclusion

Sustainable agricultural policy requires efforts to not only support and protect farmers from the vagaries of the monsoon and market forces but also to create an enabling institutional framework. Hence, we should emphasize on the importance of agricultural universities, extension services and cooperative institutions which will support small and marginal farmers.

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