

ISSUE BRIEF

Transforming Indian Agriculture:

A Policy Framework to Guide US-India Partnership

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Agriculture has formed the backbone of India's economy for many decades and remains crucial to providing food security for the country's growing population. It constitutes a major pillar of India's economic growth and a significant contributor to its growing exports sector. Indian agriculture is the country's largest employer with one hundred and forty million smallholder farmers and an additional sixty million people employed directly or indirectly in farming operations. Together, these two hundred million people represent more than 40 percent of India's working population.

Though India is one of the top five agricultural economies in the world, Indian agriculture is at a serious inflection point. This sector faces multiple challenges, including lagging yields in key crops as compared to global averages¹, restricted market access, lack of competitive prices for produce, and limited water availability. The latter leaves farmers to rely on rain-fed agriculture severely impacted by climate change. All these factors have eroded farm incomes, created increased pressure on government subsidies, and affected rural livelihoods.

The growth and success of agriculture is important for India's long-term economic growth, enhancing its global and export competitiveness, improving rural livelihoods, and creating a sustainable agricultural eco-system. This brief outlines the policy framework required to make these goals a reality.

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1 "India's crop yields lower than United States, India, and China," *The Economic Times*, November 22, 2016, <https://economictimes.indiatimes.com/news/economy/agriculture/indias-crop-yields-lower-than-us-europe-and-china/articleshow/55558872.cms?from=mdr>.

FOOD SECURITY DEPENDS ON FARMING

The Covid-19 global pandemic and the resulting challenges have highlighted the importance of agriculture in ensuring food security worldwide. The pandemic has affected everyone, but developing nations and rural farming communities face a far greater risk. While nations imposed stay-at-home quarantine orders, farmers across the world continued to go out and farm to ensure adequate food production. Most of these are smallholder farmers, who farm on less than 2 hectares of land each, but together account for nearly 80 percent of the world's total food production.²

In March 2020, when India imposed a national lockdown to slow the spread of Covid-19, its agriculture sector had to ensure continued operations and build strong collaboration within the farming eco-system for uninterrupted food production and supply. As an immediate response to the crisis, India's government introduced several short-term fiscal stimulus measures to support farmers and rural communities.

Further, in June 2020, the government introduced long-term amendments to three critical farm sector laws which have been around for more than five decades: the Farmers' Produce Trade and Commerce (Promotion and Facilitation) Ordinance, the Farmers' (Empowerment and Protection) Agreement on Price Assurance and Farm Services Ordinance, and the Essential Commodities (Amendment) Ordinance Act. These watershed reforms will provide farmers better market accessibility and price for their produce.

In order to build effectively on these amendments, India needs



An Indian farmer in his field. Source: PrasannaPix

a broader set of policy reforms targeting everything from farm input to output in order to facilitate a complete transformation of Indian agriculture. In addition to policy reforms, the transformation requires strong collaboration among all players in the agri-value chain to achieve three key goals:

- 1 To help Indian farmers increase crop productivity with better yields per hectare of cultivable land. This has to be done while driving sustainable agricultural practices including water conservation and improved soil health.**
- 2 To enhance farm profitability and generate sustainable farm incomes.**
- 3 To deliver rural prosperity by helping job creation and creating better lives for farming communities.**

ONE INDIA, ONE AGRICULTURE MARKET

With regard to output, the recent agriculture sector reforms empower Indian farmers to connect directly with buyers and sell their agricultural produce beyond their local market places. The removal of barriers to inter-state and intra-state trade will expand the traditional market place boundaries and give farmers alternate options such as electronic trading platforms. Farmers will no longer be confined to their local *mandis*—*mandi* is the Hindi word for market place—and can reduce their dependence on intermediaries to achieve optimum price realization. These reforms will also enable farmers to enter contract farming with private sector players and establish a framework for price guarantees and purchase of their agricultural produce.

MAKING INDIA AN AGRICULTURAL POWERHOUSE

Now that the Indian government has initiated the journey of transformation, the next step is to broaden the scope of reform with policies focused on agriculture input and timebound targets focused on technological innovations, capacity building with targeted agronomy knowledge dissemination, affordable financing for farmers, and crop risk mitigation tools. Several states in India have already introduced targeted state-level policies for agriculture which, if implemented diligently, will contribute to vibrant eco-systems that encourage greater investment in agriculture. This will help enhance the overall global competitiveness of Indian agriculture.

² George Rapsomaniki, *The Economic Lives of Smallholder Farmers*, Food and Agriculture Organization of the United Nations, 2015, <http://www.fao.org/3/a-i5251e.pdf>.



Women transplanting rice saplings in an Indian rice field. Source: Nandalal Sarkar from Pixabay

To reach India's goal of agri transformation, there are six areas to focus on:

1 Improving farm-to-fork competitiveness of major crops. Consider horticulture as an example. India has a significant opportunity to improve productivity and quality of horticulture crops both for domestic and export markets. Creating end-to-end crop value chains with focused state clusters and strong linkages to Farmer Producer Organizations³ (FPOs) will enable the country to achieve this goal. In addition, there is an urgent need to modernize the subsidy regime that moves toward enhancing crop competitiveness and targeted direct benefit transfers which support improvements in farming practices apart from livelihood support for subsistence farm communities.

A viable model is the global, multi-stakeholder Better Life Farming (BLF) alliance, which works with partners across the agri-value chain to support smallholder farmers in developing economies to increase crop yields and farm incomes. The BLF alliance has global partners that include Bayer with its expertise in seeds, crop protection, and agronomy; IFC, the development finance institution for impact assessment; and Netafim for drip irrigation technologies. In India, the BLF alliance works with additional local partners including Yara Fertilisers for soil and nutrient management; DeHaat, AgriBazaar, and Big Basket as off-takers;⁴ Tata Trusts for expanding reach to FPOs; and Axis Bank for financing. Similarly, in smallholder markets in other developing countries, the BLF alliance works with strong local partners who can train farmers on good agricultural practices, financial literacy, and improved market linkages.

3 An FPO is formed by a group of farm producers, and operates as a registered body with producers as shareholders in the organization. It deals with business activities related to farm produce and essentially constitutes a small-scale farmer cooperative that works for the benefit of its member producers.

4 Off-takers help improve market linkages, especially for smallholder farmers with limited market access. They help achieve better prices for farmers' produce.

In India, the Better Life Farming initiative has led to a doubling of crop yields and tripling of farm incomes among participant farmers. It has also created price transparency in the market place, increased the bargaining power of smallholders, and promoted clusters of rural agri-entrepreneurs. A signature social innovation has been its commitment to gender-smart agriculture. Though women contribute significantly to Indian agriculture, they are not integrated into mainstream farming operations. This creates challenges for female smallholder farmers in accessing agri-inputs, training, and farming advisory services. The prevalence of traditional socio-cultural norms and gender-based notions also hinder them from seeking additional support or even making their voices heard. These challenges, compounded by the responsibilities of managing households and being the primary caregivers for their families, prevent women from acting as key decision makers for their family farms. Bayer's gender-smart approach involves onboarding female agronomists for extension services and female agri-entrepreneurs to extend its reach to thousands of other female farmers.



Indian farmer and his daughter picking cotton in field.
Source: Triloks

By 2025, the Better Life Farming initiative aims to empower 2.5 million smallholders in India through access to modern agri-inputs and better public health. These smallholders will be served by five thousand agri-entrepreneurs across horticulture, corn, and rice crops.

- 2 **Facilitating innovation to transform food production.** India needs to accelerate the introduction of new technologies in seeds, crop protection, fertilizers, biotechnology, and gene editing to match pace with other competing agricultural nations. This means shortening product registration timelines and fast-tracking critical innovations for timely response to emerging threats like the fall armyworm⁵ that could devastate corn cultivation.

Biotech-led innovations can revolutionize agriculture. The introduction of Bt cotton in India in 2002 altered the country's global competitiveness in that sector. India transformed from a net importer to become the largest producer and second largest exporter of cotton globally. In India's large cotton-growing states, the higher yields enabled by Bt cotton technology changed the lives of farmers by generating higher income and enabling better livelihoods. Building on the success in cotton, the government must extend biotech reforms to introduce these technologies for other key crops.

For biotech regulatory reforms to work well, they need to be introduced in conjunction with reforms for crop protection. This calls for a holistic regulatory regime focused on breeding, crop protection, and biotechnology to mitigate risk and improve yields significantly. A case in point can be seen in the production of oilseeds such as soybean, mustard, and cotton. There is an urgent need for integrated reforms which can significantly reduce India's dependence on edible oil imports and increase India's exports of cotton and oil meal.

- 3 **Promoting sustainable agriculture that reduces use of limited natural resources such as water.** India needs smarter ways to conserve its limited water supply and reduce the dependence on monsoons for a successful crop season. This means reviewing traditional agricultural practices and crop cultivation based on local ecological situations.

For example, rice farming in India is more suited to states with better water availability, compared to states that have

5 The fall armyworm is an insect that spreads rapidly and represents a serious threat to agriculture. It cannot be eliminated, and once present, requires extensive effort to manage. It exists in Asia, sub-Saharan Africa, and the Near East, and has a high probability of spreading to southern Europe. <http://www.fao.org/fall-armyworm/en/>



Drone flying over farm. Source: DJI-Agras from Pixabay

lower groundwater reserves and must rely on irrigation. If the land under rice cultivation in the North Indian states of Punjab and Haryana is diversified to include crops like corn and cotton, it will help conserve water. To drive such crop switches competitively, farmers need reforms to the incentives and subsidy regimes. At the same time, the export competitiveness of rice has to be preserved by improving crop yields and quality. This requires adoption of a holistic crop management system and driving more hybridization.

- 4 Reducing the cost of farmer financing, widening access to farm credit, and risk-mitigation products for commodity price fluctuations.** In this area, building on the recent agri-reforms, the government has already widened the access to farm credit and now should consider targeted incentives to encourage learning and use of risk-mitigation products. This will give farmers price protection for either their entire produce or a part of the farm produce for the year.
- 5 Minimizing wastage of agricultural produce in the harvesting and post-harvest phase.** This involves handling, grading, storage, processing, packaging, transportation, and marketing activities until the product reaches the consumer. Loss of horticulture produce in crops like

tomatoes is a major problem in the post-harvest chain. Such losses mean a waste of food in a country where hunger and malnutrition are already a challenge. Food losses also diminish the value of farmers' efforts, investment in agri-inputs, and scarce resources such as water.

Food aggregation, food processing, better logistics infrastructure, and retail demand aggregation at the local level can minimize food losses and help increase supply of fresh, healthy, local foods. Currently, non-aggregation of produce for crops like wheat causes a demand-supply mismatch. With the recent government reforms focusing on demand-based agriculture rather than production-based agriculture, farmers will be encouraged to grow what the market needs. India needs to invest more in on-farm storage facilities in smaller capacities to help farmers increase the shelf life of their produce. In addition, food logistical chains need to add cold storage transportation equipment such as refrigerated trucks.

- 6 Digitizing India's farm-to-fork eco-system with targeted solutions on weather mapping, agronomic advisory, and crop quality.** Digital technologies can help overcome the challenges of scarce natural resources and support sustainable food cultivation. For example, drones can be

used for precision spraying of crop protection chemicals. They can also monitor crop progress and help implement targeted interventions during the crop cycle. Accurate application of drone technology can also help farmers overcome safety and international trade barriers for exports. Other smallholder markets including China and Thailand have increased their use of drones in the agriculture sector to improve productivity and reduce operator exposure. India needs to fast track policies to promote introduction of drone solutions to preserve its global competitiveness in agriculture.

OPPORTUNITIES FOR GREATER US-INDIA PARTNERSHIP

India and the United States share a history of strong collaboration in agriculture. With this in mind, India's growing agriculture sector can offer the United States tremendous bilateral opportunities in the areas of food production, product and technology innovations, farm mechanization, logistics, storage, and automation.

Further, India could become a cost-effective strategic supplier to the United States for key agri-food products with closed-loop agri-value chains. It offers a significant scope of contract farming to cater to the needs of US consumers, thereby creating additional food supply channels for US markets and benefitting Indian farmers with secured markets. In return, the United States can help India develop value chains for new crops, such as sugar beet, to cater to global markets.

Further, Indian companies can collaborate with US counterparts to share advanced cultivation practices used on large US farms with smaller farms in India. This will help Indian farmers achieve better returns on investment and support higher food production. It will also drive the consolidation of farms with technologies that can create economies of scale.

On the storage side, India can learn from US innovations in on-farm storage models for small volumes of food produce. This will prove crucial for Indian farmers, leading to a reduction in food loss, secured produce, and the achievement of better market prices. Smallholder farming presents another area for collaboration. Both India and the United States can work on collaborative models and technologies to support the needs of smallholder farmers in India. These technologies can then be successfully replicated in other smallholder markets in Asia and Africa.

Finally, the digital innovation and farm mechanization strength of the US agricultural sector can help digitize and streamline several aspects of India's agri-value chain. Currently, Indian farmers are implementing mechanization across all kinds of farm operations such as corn harvesters, corn dryers, and sugarcane planters. If brought to India, US technology could increase and improve on-farm mechanization benefiting both countries. IOT (internet of things) used in relation to farms and logistics can prevent wastage of food produce as well as level supply and demand variations.

ON THE CUSP OF A BREAKTHROUGH

The breakthrough moment for Indian agriculture has arrived. To seize the moment and enhance the global competitiveness of Indian agriculture, the government in New Delhi needs to expand and deepen the market reforms, introduce more holistic changes to the agricultural sector, and create value chain collaborations to support Indian farmers. Those measuring India's success and growth must not only focus on increased farm incomes, but also sustainability efforts to conserve water, while increasing crop productivity with the limited land available for cultivation.

The growth and sophistication of multi-stakeholder conversations focused on owning and driving the transformation of Indian agriculture provides a strong reason for optimism. With the Indian government initiating the process with significant market reforms, the country is set to usher in a decade that could witness agriculture contributing significantly to India's aspirations to become a \$5 trillion economy.

ABOUT THE AUTHOR



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