



Economic Liberalisation And Emerging Trends Of Indian Agriculture

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Abstract

Liberalization policies pushed for deregulation, privatization, and globalization. These changes changed agriculture by focusing on high-value foods, advancing technology, and expanding the export and agro-processing sectors. Even with these improvements, problems like unstable global prices, small farmers not being able to get enough loans, and gaps in technology still exist. India's high-value flower exports and use of genetically modified crops both went up from 2001 to 2010. From 2011 to 2020, the country focused on sustainability, digital agriculture, and growing methods that are resistant to climate change. In recent years, new technologies like AI and drones have changed the way farming is done. However, problems like shrinking landholdings and a lack of water are still very important. The agro-export industry has been strong, but it has to deal with competition, problems with technology, and limited infrastructure. Adopting new technologies, improving public-private partnerships, increasing export surpluses, encouraging the corporatization of agriculture, and pushing for global subsidy reforms are some of the suggestions made to make countries more competitive. For the sector to grow in the long run, it is also important to use sustainable methods and invest in technologies that can handle changes in climate. This research looks at the new trends in Indian agriculture since it became more open to foreign investment. It talks about improvements in gardening, food processing, and digital integration, as well as the problems that come with globalization and differences in technology. In addition, it talks about new government programs and the future of Indian farmland.

ECONOMIC LIBERALISATION AND EMERGING TRENDS IN AGRICULTURE

Indian agriculture has experienced substantial changes over the decades, particularly following the economic liberalization of 1991. Before this period, the fundamental objective of agricultural policy in India was to attain self-sufficiency in food production to address persistent famines and food shortages. The Green Revolution in the late 1960s significantly enhanced India's food grain production, especially in wheat and rice, hence securing food security. Nonetheless, the advantages of these improvements were not uniformly allocated, with specific regions like as Punjab, Haryana, and western Uttar Pradesh becoming significant beneficiaries owing to superior irrigation systems and infrastructure assistance (Chand et al., 2015). The implementation of liberalization policies in 1991 was a pivotal point in Indian agriculture. The reforms sought to integrate the agricultural sector into the global economy, enhancing competitiveness and diversification. The revised economic policy prioritized deregulation, privatization, and globalization, which affected the agriculture sector both directly and indirectly. In the ensuing decades, the sector experienced transitions towards high-value crops, the implementation of new technology, and an increasing focus on agro-processing and exports.

The Impact of Economic Liberalization (1991–2000)

The initial wave of liberalization changes in the 1990s sought to improve market efficiency and increase farmer profitability. Significant modifications encompassed the elimination of constraints on interstate commerce of agricultural products, allowing farmers to market their goods in venues with superior pricing. The abolition of the quota system and the deregulation of agricultural exports enabled Indian farmers to engage in international trade.

The implementation of the Agricultural Produce Marketing Committee (APMC) Act changes aimed to dismantle the monopoly of local mandis, offering farmers new channels for marketing their produce (Gulati & Narayanan, 2003). Throughout this period, agro-exports accelerated, with spices, basmati rice, and cotton emerging as significant providers to foreign exchange revenues.

Notwithstanding these developments, the sector encountered problems, including global price instability and insufficient institutional lending for small and marginal farmers. The government's role in guaranteeing minimum support prices (MSPs) for crucial crops is vital for protecting farmer incomes.

Diversification and Technological Integration (2001–2010)

The early 2000s experienced a transition from conventional food grains to high-value horticulture and cash crops. The initiation of the National Horticulture Mission in 2005 expedited the development of

fruits, vegetables, flowers, and spices, positioning India as one of the foremost producers of horticulture products worldwide (Ministry of Agriculture, 2010).

Technological innovations significantly influenced this era. The introduction of Bt cotton in 2002 signified the onset of genetically modified (GM) crops in India, resulting in enhanced yields and less pesticide application (Qaim et al., 2006). The expansion of e-governance platforms, such as AGMARKNET, enhanced market connectedness and transparency, allowing farmers to obtain real-time pricing and demand data.

The food processing industry has also become a significant catalyst for agricultural expansion. Government incentives, such as tax exemptions and the creation of massive food parks, drew private investments. This period experienced an enhancement in the processing of perishable goods, diminishing post-harvest losses and augmenting exports.

The Rise of Sustainability and Digital Agriculture (2011–2020)

The period from 2011 to 2020 saw an increasing focus on sustainability and environmental preservation in agriculture. The excessive application of chemical fertilizers and pesticides during the Green Revolution period prompted apprehensions over soil integrity and biodiversity. Initiatives like as the Paramparagat Krishi Vikas Yojana (PKVY) advocated for organic agriculture, whereas the Soil Health Card Scheme, introduced in 2015, sought to furnish farmers with insights into nutrient inadequacies in their soil (Sharma et al., 2018).

During this period, digital technology commenced its transformation of Indian agriculture. Mobile applications and digital platforms offered farmers access to meteorological forecasts, agronomic advising services, and market pricing information. Initiatives such as e-NAM (National Agriculture Market), launched in 2016, enabled the consolidation of various APMC markets, establishing a cohesive national market for agricultural commodities.

In reaction to climate change, the government implemented climate-resilient crop types and advocated for water-efficient methods like as micro-irrigation. The Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) aims to enhance irrigation efficiency and minimize water loss.

Emerging Trends and Challenges (2021–2024)

Since 2020, Indian agriculture has progressed, propelled by technical advancements, regulatory reforms, and an increasing emphasis on sustainability. The COVID-19 pandemic exposed weaknesses in agricultural supply chains, leading to heightened investment in infrastructure and technology. E-commerce companies like as Amazon and Flipkart commenced direct sourcing from farmers, circumventing conventional intermediaries.

The government's initiative to promote the utilization of drones and artificial intelligence (AI) in agriculture has gained momentum. Drones are utilized for crop surveillance, pesticide application, and

yield assessment, whereas AI-driven technologies offer predictive analytics for enhanced agricultural management.

India's agro-export sector has demonstrated resilience and expansion, with agricultural exports attaining unprecedented levels in 2023, propelled by heightened demand for spices, basmati rice, and processed goods (APEDA, 2023). The emphasis on export-oriented policies and international trade agreements has significantly enhanced this growth.

Nonetheless, issues such as diminishing landholdings, water scarcity, and the necessity for climate-resilient agriculture persist as urgent concerns. The government's focus on doubling farmer earnings by 2024 has resulted in measures like the Kisan Credit Card (KCC) scheme and heightened investment in agri-tech businesses.

Emerging Trends in Indian Agriculture

1. **Digital Transformation:** The rise of platforms like e-NAM (Electronic National Agriculture Market) has streamlined trade by connecting farmers to buyers online (NABARD, 2022). Digital tools, including AI and IoT, are increasingly used for precision farming, crop monitoring, and weather forecasting (ICAR, 2023).
2. **Expansion of Horticulture:** India remains the second-largest producer of fruits and vegetables globally. Recent data (2023-24) shows exports worth INR 40,000 crore, driven by initiatives such as the National Horticulture Mission (Government of India, 2023). The production of high-value crops like spices and medicinal plants has grown substantially, catering to global demand (FAO, 2023).
3. **Food Processing Growth:** The food processing industry has expanded at an annual rate of 10% since 2020, with investments bolstered by the "Make in India" initiative (World Bank, 2023). Government subsidies for cold storage and transportation have reduced post-harvest losses, previously estimated at INR 30,000 crore annually (Government of India, 2023).
4. **Focus on Sustainability:** Programs like the PM-KUSUM scheme promote renewable energy in agriculture, reducing dependence on fossil fuels (Government of India, 2023). Organic farming has gained traction, with India emerging as a leading exporter of organic products (FAO, 2023).
5. **Agricultural Exports:** India's agricultural exports reached USD 60 billion in 2023, with key commodities including rice, spices, and dairy products (NABARD, 2022). Policies under Atmanirbhar Bharat aim to reduce import dependence and boost agro-exports (World Bank, 2023).

PUBLIC-PRIVATE PARTICIPATION IN INDIAN AGRICULTURE

Public-Private Partnerships (PPPs) in Indian agriculture have emerged as a pivotal strategy to address challenges and leverage opportunities in the sector. This collaboration between the government and private entities facilitates resource mobilization, technology transfer, innovation, and enhanced service delivery. Over the years, PPPs have demonstrated their potential to drive agricultural growth, improve rural livelihoods, and ensure food security while fostering sustainability and resilience.

Historical Context and Evolution

Prior to the liberalization era (pre-1991), Indian agriculture was primarily state-controlled, emphasizing food security and self-sufficiency. Initiatives such as the Green Revolution emphasized the significance of technology but were predominantly government-driven (Pingali, 2012). The 1991 economic reforms was a pivotal moment, highlighting liberalization, privatization, and globalization (Sharma, 2007). This transition promoted private sector involvement across multiple industries, including agriculture.

Since then, public-private partnerships have developed to tackle significant challenges including infrastructural deficiencies, supply chain inefficiencies, and restricted market access. The National Agriculture Policy (2000) expressly emphasized the necessity of private sector participation in agriculture to attain sustainable development (Government of India, 2000). Subsequent initiatives, such the National Horticulture Mission and Rashtriya Krishi Vikas Yojana, further strengthened this collaborative approach (Kumar et al., 2010).

Key Areas of Public-Private Participation

1. Infrastructure Development:

Irrigation Projects: Public-Private Partnerships (PPPs) have played a crucial role in the development of irrigation infrastructure, encompassing micro-irrigation systems. The Atal Bhujal Yojana, initiated in 2018, integrates public financing with private expertise to efficiently manage groundwater resources (World Bank, 2020). **Cold Storage and Warehousing:** Firms such as Adani Agri Logistics have collaborated with the government to create integrated cold chain facilities, thereby minimizing post-harvest losses (Adani Group, 2022).

2. Technology Transfer and Digitalization

Agri-Tech Initiatives: Partnerships with private technology companies such as IBM and Microsoft have introduced artificial intelligence, satellite imaging, and predictive analytics to Indian farmers (IBM Research, 2021). **E-Marketplaces:** Platforms like as e-NAM (National Agricultural Market), backed by

governmental and corporate entities, have transformed market accessibility by linking farmers directly with purchasers (Mukherjee, 2018).

3. Supply Chain and Value Addition

Contract Farming: Companies such as PepsiCo and ITC have participated in contract farming, offering farmers guaranteed markets, high-quality inputs, and technical assistance (Singh, 2002). **Food**

Processing: The Mega Food Parks project, launched by the government, has experienced substantial private investment aimed at improving value addition and export potential (MOFPI, 2021).

4. Capacity Building and Skill Development

Training Programs: Corporates like Mahindra & Mahindra and Bayer have conducted farmer training programs on modern agricultural practices, sustainable farming, and crop diversification (Bayer, 2023).

Financial Literacy: PPPs in collaboration with NABARD have promoted financial inclusion through self-help groups and digital payment systems (NABARD, 2022).

5. Sustainability and Climate Resilience

Renewable Energy Integration: Solar irrigation pumps and renewable energy projects under PPPs have reduced dependence on conventional energy sources (MNRE, 2021). **Climate-Smart Agriculture:** Partnerships with organizations like the World Bank have supported climate-resilient farming practices, addressing issues like water scarcity and soil degradation (World Bank, 2023).

Recent Developments (2020-2024)

1. **Farm Laws and PPPs:** The introduction of farm laws in 2020 aimed to create a conducive environment for private sector participation. Although the laws faced repeal due to protests, they sparked discussions on reforming agricultural marketing and bolstering PPPs (Vishwanath, 2021).
2. **Agri-Startups and Innovation Hubs:** The government's support for agri-startups, through schemes like Agri-Infra Fund, has encouraged innovation. Startups such as DeHaat and Ninjacart have partnered with state institutions to improve supply chain efficiency (Startup India, 2023).
3. **Sustainable Development Goals (SDGs)** As a result of India's commitment to the SDGs, public-private partnerships in agriculture have rapidly grown up, with a focus on ending hunger, using safe methods, and reducing poverty. Partnerships with foreign groups like IFAD and FAO have been very important (FAO, 2022).

4. **Digital Agriculture Mission (2021-2025):** This project, which began in 2021, encourages public-private partnerships to use new technologies in agriculture, such as blockchain, AI, and IoT. Local agri-tech startups and foreign tech companies are two of the most important players (Meena et al., 2022).

Challenges to Indian Agricultural Exports in the Present Regime of Globalisation (2020-2024)

India's agricultural exports have been greatly affected by globalization and liberalization, which have changed both the possibilities and challenges in the sector. In the last few decades, India's farm export industry has had to deal with a number of problems that have made it harder for it to grow in the global market. Globalization has made it easier to get into more markets, but it has also made competition tougher and shown India's agriculture sector's flaws. This part talks about the main problems that India's agricultural exports will face between 2020 and 2024. These problems include tougher competition from other countries, outdated technology, a small export surplus, the lack of corporate involvement in agriculture, and changes in how developed countries handle agricultural subsidies.

Increase in Foreign Competition

One of the most important effects of globalization is that India's farming export markets are now more competitive with goods from other countries. As tariffs and other trade hurdles have been taken down, it has become easier for foreign producers to sell their agricultural goods in other countries. India used to be a major exporter of goods like jute, tea, coffee, and spices. But in recent years, growing countries like Bangladesh, Sri Lanka, and Indonesia have made it hard for India to keep up. These countries have not only made their products better, but they have also found ways to lower prices. As a result, India has lost market share in traditional export areas (Bhattacharya et al., 2021). Bangladesh has now passed India as the biggest exporter of jute, and Sri Lanka and Indonesia have made big steps forward in the tea and coffee markets around the world (Government of India, 2022).

Traditional agricultural goods aren't the only ones facing competition. New export markets like fruits and vegetables are also seeing new companies enter with better quality products and lower production costs. India's share of global agricultural trade has stayed the same, which shows how hard it is to compete with more countries in today's globalized trade world (FAO, 2022)

Technological Backwardness

India's farming sector is still having trouble with technology problems that make it harder for it to compete in global markets. In the agricultural value chain, developed countries use high-yield seeds, precise farming techniques, and mechanized farming operations, but Indian farmers mostly stick to old ways of doing things. Ramesh and Gupta (2023) say that this lack of technology leads to lower agricultural productivity, higher production costs, and lower-quality goods when compared to foreign competitors. For instance, the US and China use genetically modified (GM) products that produce more and are better able to adapt to changes in the weather. However, Indian farmers have a hard time getting their hands on and using these technologies (Kumar et al., 2023).

Indian agriculture also has problems with old tools and not enough space for preparing and storing crops, which causes a lot of food to be wasted after the harvest. India can't offer competitive prices and quality because its technology isn't as advanced as it could be. This makes it harder for India to get a bigger part of the global agricultural market. Not having access to current farming supplies like good seeds, fertilizers, and pesticides makes the problem even worse (Singh & Jain, 2021).

Limited Export Surplus

India's large and growing population makes it hard for the country to ship many agricultural goods. A lot of farming products are used to meet the needs of people in their own country, leaving only a small amount to be exported. During times of food inflation, the Indian government often sends rice and wheat from exports to the country's own market to make sure there is enough food at prices that people can pay (Government of India, 2022). India can't keep a steady foothold in global markets since it is switching from exporting to supplying its own country.

Also, while exports have grown in some areas, like horticulture and floriculture, India's internal demand for other staple foods is making it hard to get enough of them. The low export surplus in important areas like cereals and pulses limits the amount of agricultural goods that can be sent abroad. This makes it harder for India to make more money from its agricultural exports (FAO, 2022). Also, India's ability to be a reliable global provider is further limited by the fact that its export capacities change often because of unstable domestic production caused by things like unpredictable weather and a lack of water.

Corporatisation of Agriculture

The structural problems in India's agriculture industry have been made worse by the fact that agriculture has not been privatized. In developed countries, agriculture is mostly run by big corporations, but in India, agriculture is still mostly spread out. Most Indian farmers are small-scale producers who don't always have the tools and facilities they need to compete on the world market. The corporate farming model has made large-scale farming possible in places like the US, Australia, and Brazil. However, India

hasn't fully embraced it yet because of problems with land fragmentation, a lack of capital, and a lack of skilled labor (Kumar et al., 2023).

There are many good things about becoming a corporation, such as having access to new technology, economies of scale, and better marketing tactics. But in India, most farmers can't take advantage of these benefits because their land is spread out and it costs a lot to make it modern. Because of this, Indian farmers can't match the size and efficiency of their foreign competitors. This makes Indian agricultural goods less competitive on the world market (Ramesh & Gupta, 2023).

Agricultural Subsidies in Developed Nations

Developed countries give big benefits to their farmers, which makes it hard for India to sell its agricultural goods abroad. These subsidies help bring down the cost of making things, which makes the food from wealthy countries more competitive on the world market. Direct payments, price support methods, and lower input costs help farmers in the European Union, the United States, and Canada the most (Singh & Jain, 2021). Others countries also offer subsidies. Indian farmers, on the other hand, get much smaller subsidies, which makes it more expensive for them to make things and harder for them to compete with foreign goods that also get subsidies.

One of the most controversial topics in global trade groups like the World Trade Organization (WTO) is this difference in subsidies. India has always pushed for less agricultural subsidies in developed countries, saying that they mess up global trade and make it hard for developing countries to compete properly (Bhattacharya et al., 2021). India has tried to lower the subsidies, but no real progress has been made. This means that Indian agricultural is still at a disadvantage.

Government Initiatives

1. **Digital Agriculture Mission 2021-25:** The Digital Agriculture Mission 2021–25 encourages the use of AI, blockchain, and drones in farming (NABARD, 2022).
2. **PM-KISAN Scheme:** Government of India (2023) says that the PM-KISAN Scheme helps over 110 million families each year by giving farmers direct income support.
3. **Atmanirbhar Bharat Initiatives:** For the Atmanirbhar Bharat Initiatives, the focus should be on agro-processing, organic farming, and lowering reliance on imports (World Bank, 2022).
4. **Pradhan Mantri Krishi Sinchayee Yojana (PMKSY):** Enhances irrigation productivity through micro-irrigation projects (ICAR, 2023).

Findings and conclusion

The results of the study show that Indian agriculture has changed a lot in the last few decades. As a result of economic liberalization since 1991, India's agriculture has become more connected to the world market. This has made it easier for India to sell goods and for farmers to get to markets through reforms like the Agricultural Produce Marketing Committee (APMC) Act. Even with these improvements, problems like unstable prices, limited credit options for small farms, and outdated technology still exist. Between 2001 and 2010, there was a move toward high-value crops, and new technologies like Bt cotton helped increase crop yields. India became a world leader in horticultural exports thanks to programs like the National Horticulture Mission. E-governance tools also made it easier for businesses to connect with customers. From 2011 to 2020, sustainability was a big deal. Programs like the Soil Health Card Scheme pushed organic farming and methods that are good for the environment. Mobile apps and artificial intelligence (AI) were two examples of digital technologies that changed the way farms were run. In farmland, drones and AI are two examples of new technologies that have come out in the last few years. However, problems like shrinking landholdings, limited water supplies, and the need for climate-resilient farming are still very important.

India has reached a new high in agro-exports, which is a sign of growth in the farming export sector. However, India still faces problems such as stiff competition from other countries, a lack of technology, and a limited export surplus because of high domestic consumption. India is still behind developed countries when it comes to corporatization, which limits the size and efficiency of production. Also, India's subsidies are much smaller than those in developed countries, which hurts the country's ability to compete on a global scale.

In conclusion, economic liberalization and improvements in technology have made a lot of success in Indian agriculture, but the benefits have not been shared evenly, and there are still a lot of problems to solve. The agricultural export industry has shown promise, but its full potential is limited by competition and poor infrastructure. We can help solve these problems in a number of ways. First, getting more people to use new technologies like AI and precision gardening can make things better and more productive. Second, to cut down on post-harvest losses and improve market access, it is important to improve facilities in areas like cold storage, warehousing, and irrigation. Third, to make agriculture exports more competitive on a global scale, money needs to be spent on agro-processing and quality control, and people need to push for changes to trade subsidies. Long-term problems can also be solved by encouraging sustainable farming methods and putting more money into tools that can handle changes in the climate. Lastly, changes to policies that support Public-Private Partnerships (PPPs) can make it easier for businesses to get into new markets and build up their assets. These steps can help Indian agriculture continue to do well on the world market and meet the needs of its growing home market.

Recommendations

1. **Enhanced Technological Integration:** To make the world more competitive, new farming technologies like genetically modified crops, precision farming, and automation should be used more quickly. The government should encourage study and development in farming technology and make it easier for farmers to get it.
2. **Strengthening Public-Private Partnerships (PPPs):** More should be done to make farmland a better place for PPPs, especially when it comes to building infrastructure, managing supply chains, and sharing technology. The government should make rules that make it easier for the business sector to be a part of the agricultural value chain.
3. **Increasing Export Surplus:** India needs to focus on growing its export surplus in order to boost its agricultural exports. Policies that promote extra output, better market connections, and less reliance on domestic consumption should be given the most attention.
4. **Promoting Corporatization of Agriculture:** India should look into and encourage the corporatization of agriculture by setting up ways for small-scale farmers to get the benefits of large-scale farming, like economies of scale, modern technology, and help with marketing.
5. **Subsidy Reforms and Global Advocacy:** India should keep pushing for the end of agricultural subsidies in rich countries through global organizations such as the WTO. Increasing subsidies for farmers in India can help even out the cost of production and make the country more competitive in international agriculture trade.
6. **Focus on Sustainability:** The government should keep pushing environmentally friendly farming methods, like organic farming and technologies that can withstand changes in the temperature. To make sure that farming will be around for a long time, programs like PM-KUSUM and micro-irrigation plans should be made bigger.

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