Agriculture Marketing in India: Perspectives on Reforms and Doubling Farmers' Income

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India's target of achieving a $5 trillion economy by the financial year 2025-26 needs to be supported by a transformed and reformed agriculture sector, which would significantly improve the income of farmers. It is, therefore, imperative that the agriculture sector should support the milestone by focusing on transformative reforms. The paper examines the critical challenges faced by Indian farmers in the existing agriculture marketing system, while proposing an agenda for agriculture marketing and export reforms for making farming financially sustainable. It underscores the urgency for the development of rural infrastructure and efficient agri-value chains. The paper highlights the need for encouraging small and marginal farm holders to move from subsistence farming to modern farm enterprises. The electronic National Agriculture Market (e-NAM), is expected to lead to significant increase in income of farmers. Effective implementation of comprehensive agricultural reforms, with a focus on agriculture marketing reforms, could lead to sustainability of Indian agriculture, and facilitate the achievement of doubling farmers' income by 2024-25, while mitigating agrarian distress.

Keywords: agriculture marketing reforms, doubling farmers' income, electronic National Agriculture Market, agri-value chains, agriculture export reforms

INTRODUCTION

India's target of achieving a $5 trillion economy by the financial year 2025-26 needs to be supported by a transformed and reformed agriculture sector, which would significantly improve the income of farmers. It is, therefore, imperative that the agriculture sector should support the milestone by focusing on transformative reforms, while targeting an annual agriculture gross value added (GVA) growth of 5 percent, while supporting an average annual growth of gross domestic product (GDP) of 8 percent.

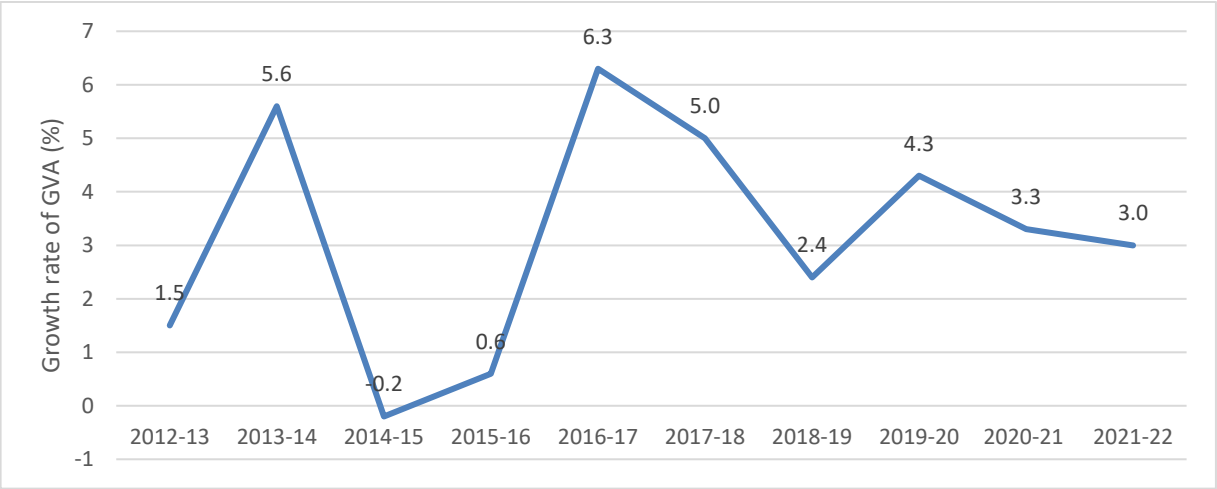
This paper presents an overview of the agriculture and allied sector in India, followed by an examination of the critical challenges faced by Indian farmers in the existing agriculture marketing system, while proposing an agenda for agriculture marketing and export reforms for making farming financially sustainable. It underscores the urgency for the development of rural infrastructure and efficient agri-value chains. The paper highlights the need for encouraging small and marginal farm holders to move from subsistence farming to modern farm enterprises integrated to efficient agri-value chains. It also reflects on managing the VUCA (volatility, uncertainty, complexity and ambiguity) world of farmers in India by doubling their income, while mitigating agrarian distress.

AGRICULTURE SECTOR IN INDIA: AN OVERVIEW

Growth Trend of India's Agriculture and Allied Sector GVA

The average annual growth of agriculture and allied sector GVA during the ten-year period 2012-13 to 2021-22 stood at 3.2 percent. The period witnessed sharp dips in the growth in 2012-13 (1.5 percent), 2014-15 (-0.2 percent) and 2015-16 (0.6 percent) (Figure 1), due to less than normal monsoon rainfall in these years. On the other hand, good monsoon rains resulted in high growth rates in agri-GVA during the years 2013-14 (5.6 percent), 2016-17 (6.3 percent), 5.0 percent (2017-18), and 4.3 percent (2019-20) (Figure-1). However, in spite of India making great strides in terms of food security and being the leading producer of rice, wheat, pulses, sugarcane and cotton, agriculture in the country continues to be heavily dependent on monsoon rains.

FIGURE 1
INDIA'S AGRICULTURE AND ALLIED SECTOR GVA GROWTH (%)



Sources: Data accessed from: (1) Press Note on First Revised Estimates of National Income, Consumption, Savings and Capital Formation 2018-19, MoSPI, Government of India; (2) Press Note on Provisional Estimates of Annual National Income, 2020-21, 31 May 2021, MoSPI, Government of India; and Press Note on Provisional Estimates of Annual National Income, 2021-22, 31 May 2022, MoSPI, Government of India

Production of Major Crops

India recorded its highest ever foodgrain production of 315.7 million tonnes (MT) in 2021-22 (Table–1), which was 1.2 per cent over the previous year's figure, and 5.7 per cent above that of the pre-pandemic year 2019-20. The CAGR of foodgrain production during the ten-year period 2012-13 to 2019-20 was 2.6 percent, with the CAGRs of rice, wheat and nutri/coarse cereals at 2.4 percent, 2.2 percent and 2.6 percent, respectively. Pulses recorded the highest CAGR of 5.0 percent, due to sharp increase in production in 2016-17, as farmers were encouraged to grow pulses, on account of significant increase in minimum support prices (MSPs), announced by Government of India (GoI).

India had produced a record 37.7 MT of oilseeds in 2021-22, having grown at a CAGR of 2.5 percent during the ten-year period 2012-13 to 2019-20 (Table 2). Among oilseeds and commercial crops, groundnuts experienced the highest CAGR at 5.6 percent (Table 2). The CAGRs of other crops were much lower, viz., soybean (0.5), sugarcane (2.4 percent), cotton (-0.6 percent), and jute and mesta (-1.8 percent).

TABLE 1
PRODUCTION OF FOODGRAIN IN INDIA

(Million Tonnes)

Crops	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	CAGR (%)
Rice	10.5	10.7	10.5	10.4	11.0	11.3	11.6	118.9	124.4	130.3	2.4
Wheat	93.5	95.9	86.5	92.3	98.5	99.9	103.6	107.9	109.6	106.8	2.2
Nutri/ Coarse cereals	40.0	43.3	42.9	38.5	43.8	47.0	43.1	47.8	51.3	50.9	2.6
Pulses	18.3	19.3	17.2	16.3	23.1	25.4	22.1	23.0	25.5	27.7	5.0
Total Foodgrains	**257.1**	**265.1**	**252.0**	**251.5**	**275.1**	**285.0**	**285.2**	**297.5**	**310.7**	**315.7**	**2.6**

Source: Fourth Advance Estimates of Production of Foodgrains for 2021-22. Ministry of Agriculture and Farmers' Welfare, GoI and author's calculations.

TABLE 2
PRODUCTION OF OILSEEDS AND COMMERCIAL CROPS IN INDIA

(Million Tonnes)

Crops	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	CAGR(%)
Groundnut	4.7	9.7	7.4	6.7	7.5	9.2	6.7	9.9	10.2	10.1	5.6
Soybean	14.7	11.9	10.4	8.6	13.2	10.9	13.3	11.2	12.6	13.0	0.5
Other oilseeds	11.6	11.2	97.4	9.9	10.7	11.3	11.5	12.1	13.1	14.6	2.9
Total nine oilseeds	**30.9**	**32.7**	**27.5**	**25.2**	**31.3**	**31.5**	**31.5**	**33.2**	**35.9**	**37.7**	**2.5**
Sugarcane	341.2	352.1	362.3	348.4	306.1	379.9	4054.2	3705.0	405.4	431.8	2.4
Cotton#	34.2	35.9	34.8	30.0	32.6	32.8	28.0	36.1	35.2	31.2	-0.6
Jute & Mesta##	10.9	11.7	11.1	10.5	11.0	10.0	9.8	9.9	9.3	10.3	-1.8

Million bales of 170 kgs each
Million bales of 180 kgs each
Source: Fourth Advance Estimates of Production of Commercial Crops for 2021-22. Ministry of Agriculture and Farmers' Welfare, GoI and author's calculations.

Status of Sectors Allied to Agriculture

Horticulture production in 2021-22 recorded a decrease of 0.4 per cent at 333.3 MT, from the previous fiscal year, although it continued to exceed foodgrain production India. While the production of fruits is estimated to increase marginally from 102.5 MT to 102.9 in FY22, the production of vegetables is estimated to decline from 200.4 MT to 199.9 MT during the same period.

Animal husbandry and fisheries sector is one of the primary drivers of growth in the rural economy. The livestock sector had grown at an impressive CAGR of 7.93 per cent (at constant price) from 2014-15 to 2020-21 (GoI, 2022 a). India continues to be the largest milk producer in the world, with the production having grown by 5.8 per cent in FY21 to reach 210 MT (GoI, 2022 a). The fisheries sector too grew at a strong CAGR of 9.3 per cent (at constant prices) during 2014-15 to 2020-21 (GoI, 2022 b).

CRITICAL CHALLENGES FACED BY INDIAN FARMERS

The criticality of agriculture for sustainable and inclusive growth of the Indian economy can be gauged from the fact that, the sector provides employment to about 41.5 percent of the total workforce in India, but contributes only about 15.5 percent (2021-22) to the country's real GVA (GoI, 2022) Some of the critical challenges faced by Indian farmers are discussed in the following sub-sections:

Small Size of Operational Holdings and Low Income of Farmers

About 86 percent of operational holdings in India are in the small (less than 2 hectare) and marginal (less than 1 hectare) categories, and the average size of an operational holding is only 1.08 hectare (ha). Due to fragmentation and disorganization, farmers face constraints in procuring inputs like seeds and fertilizers at reasonable prices, lack bargaining power in the market for realizing better value for their produce, and have inadequate access to technology, extension services, market, credit and crop insurance. As a result, majority of the small and marginal farm holders are unable to realize optimal value from their farming operations, resulting in agrarian distress.

The average monthly income of an agricultural household during July 2012 to June 2013 was as low as INR 6,426 ($111.30), as against its average monthly consumption expenditure of INR 6,223 ($107.80) (GoI, 2017). As many as 22.5 percent of the farmers live below the official poverty line. According to the NABARD All India Rural Financial Inclusion Survey (NAFIS) (NABARD, 2018), the average monthly income of agriculture households in India was INR 8,931 ($137.95) in 2016-17. Further, a wide variation was observed by NAFIS among states with respect to the average monthly income of agricultural households. States like Punjab (INR 23,133, i.e., $357.32), Haryana (INR 18,496, i.e., $285.70), Kerala (INR 16,927, i.e., $261.46), Gujarat (INR 11,899, i.e., $183.80) and Himachal Pradesh (INR 11,828, i.e., $182.70) reported high income, which indicates that this sector has been making a sizeable contribution to the economy of these states. On the other hand, agricultural households from Jharkhand (INR 6,991, i.e., $107.98), Andhra Pradesh (INR 6,920, i.e., $106.89), Uttar Pradesh (INR 6,668, i.e., $103.00), Bihar (INR 7,175, i.e., $110.83)), Tripura (INR 7,592, i.e.,$117.27), Odisha (INR 7,731, i.e., $119.42) and West Bengal (INR 7,756, i.e., $119.80) reported low average monthly income (NABARD, 2018).

According to the Report of the Committee on Doubling Farmers' Income (GoI, 2017), technology fatigue is manifesting in the form of yield plateaus, and India's yield averages for most crops at global level do not compare favorably. At the same time, the costs of cultivation are rising. Further, there has been an alarming rise in the magnitude of food loss and food waste. Finally, the markets do not assure the farmer of remunerative returns on his produce (GoI, 2017).

Fragmented and Distortions-Ridden Agriculture Markets

A critical problem faced by India's agriculture sector is the fragmented and distortions-ridden state of agricultural markets. One of the major reasons for low income of farmers is unremunerative prices for their produce due to lack of a competitive market structure, which is bereft of transparent price discovery system. With majority of farmers belonging to the small and marginal category, they lack the bargaining power to

sell their produce at remunerative prices in the Agriculture Produce Marketing Committee (APMC) markets.

More often than not, farmers are forced to sell their produce at unremunerative prices due to distress sales during the immediate post-harvest season, because of their lack of holding capacity, and the exploitation by traders and middlemen (*arhatiyas*) in APMC markets. Also, in an open economy, sometimes the price shocks that emerge in global markets are imported into domestic markets. Lack of aggregation of produce makes it uneconomical for farmers to transport their produce to the APMC markets for their sale. APMC Acts of states require that farm produce is to be sold only at regulated markets through registered intermediaries. Therefore, bereft of options for alternative and competitive marketing channels near the farm gate, small and marginal farm holders, on most occasions sell their produce at unremunerative prices.

Farmers lack knowledge about consumer demand across India, which is critical to develop efficiency in agriculture value chains. This is also influenced by various economic considerations, and on the technical and logistical capabilities to connect the produce, involving post-production activities of aggregation/assembly/pooling, sorting/ assaying/testing, transportation, food/agro-processing, storage, distribution and retail (GoI, 2017). There is also a lack of transparency in price discovery, which restricts returns to farmers. Marketing, as a support function, helps to direct the other activities, for greater optimization of the costs involved and for improved value realization (ibid.).

GoI announces Minimum Support Price (MSP) in respect of 23 commodities. However, wheat and rice are the major commodities which are procured by state agencies at MSP, from only a few states. Hence, 92.7 per cent of procurement of wheat of 43.3 million metric tonnes (MMT) by the Food Corporation of India (FCI) and state agencies, during Rabi Marketing Season (RMS) 2021-22, was from the states of Punjab (30.5 per cent), Madhya Pradesh. (29.6 percent), Haryana (19.6 percent) and Uttar Pradesh (7.4 percent) (FCI, 2022). In case of rice, Punjab (21.2 percent), Telangana (13.5 percent) and Andhra Pradesh (7.6 percent), together procured 42.3 percent of the total procurement of 59.2 MMT during Kharif Marketing Season (KMS) 2021-22 (FCI, 2022 a). However, the same is not true in respect of other states and other commodities like pulses and oilseeds, and farmers have been found to receive prices below MSP. The wholesale market prices of three major crops vis-à-vis MSP are presented in the following tables.

TABLE 3
MARKET PRICE OF PADDY AS % OF MSP - KMS 2021-22

States	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22
West Bengal	89	87	87	94	93	93
Uttar Pradesh	84	104	102	101	98	93
Punjab	101	101	-	-	-	-
Andhra Pradesh	84	90	80	96	97	99
All India average	96	99	104	104	104	105

Note: After procuring over 80 per cent of the expected paddy arrival in Punjab's APMC markets in KMS 2021-22, the state government decided to close down 300 wholesale markets/purchase centres by 10 November 2021 as paddy arrival in these markets had declined.
Source: Author's calculations based on data accessed from https://agmarknet.gov.in/ and Commission for Agricultural Costs and Prices (CACP), GoI.

The wholesale prices of paddy during Kharif Marketing Season (KMS) 2021-22 in West Bengal, the largest paddy producing state, and Andhra Pradesh remained below MSP during the post-harvest months, and the average farmer suffered on account of prices ruling below MSP (Table 3). The prices remained

above MSP in Uttar Pradesh (during November 2021, December 2021 and January 2022) and Punjab, due to strong procurement of the crop by government agencies.

The states of Madhya Pradesh, Punjab and Uttar Pradesh are the major producers of wheat and are also the states which lead in terms of procurement of the grain by government agencies. Due to the strong procurement system in these states, wholesale market prices have exceeded the MSP during the post-harvest months during RMS 2022-23 (Table 4). Farmers in these states, therefore, benefit from the procurement system.

TABLE 4
MARKET PRICE OF WHEAT AS % OF MSP - RMS 2022-23

States	Apr-22	May-22	Jun-22	Jul-22
Madhya Pradesh	107	108	102	106
Punjab	100	100	100	103
Uttar Pradesh	101	102	101	103
All India average	113	111	113	116

Source: Author's calculations based on data accessed from https://agmarknet.gov.in/ and CACP, GoI.

Table 5 shows that during October 2021-February 2022, the prices of *arhar/ toor* a variety of pulses in the APMC markets of major producing states, viz. Maharashtra, Madhya Pradesh, Karnataka and Gujarat, as also the all-India average (except January 2022) prices remained below MSP. In Madhya Pradesh which is the second largest producer of *arhar*, the prices ranged between 64.3 per cent of MSP in October 2021 and 93.5 per cent in December 2021. Therefore, the average farmer in these states were forced to sell their produce below MSP.

TABLE 5
WHOLESALE PRICES OF ARHAR AS A PERCENTAGE OF MSP

	Oct-21	Nov-21	Dec-21`	Jan-22	Feb-22
Maharashtra	94	91	91	95	98
Madhya Pradesh	64	70	93	84	87
Karnataka	99	94	90	95	96
Gujarat	89	83	87	92	88
All-India average	94	86	90	103	97

Source: Author's calculations based on data accessed from https://agmarknet.gov.in/ and CACP, GoI.

A number of farmer groups have been demanding a legal status for MSP, so that under no circumstances farmers would have to sell their produce at below MSP. In the absence of efficient agriculture markets in India, MSP is a kind of insurance mechanism for farmers against price volatility. However, as explained by noted agricultural economist Dr Ashok Gulati, asking for legal status for MSP is untenable as Government of India does not have the wherewithal to buy all the 23 commodities, and private players fearing legal action would shun buying. Mandating MSP would lead to disappearance of export markets, disruption in domestic supply chain, unmanageable surpluses and an unaffordable subsidy burden (Kumar, 2020). In the current scenario of complex demands in a surcharged atmosphere, a tectonic shift to a highly decentralised food and agriculture management, giving more legal authority, financial support and responsibilities to states may be an option worth considering (ibid.). Interestingly, the Commission for Agricultural Costs and

Prices (CACP) in its Kharif Policy 2018-19 had suggested a legislation conferring on farmers 'the Right to Sell at MSP.' The DFI Committee observes, that though MSP is an important intervention by the government, it is not sufficient by itself. The honoring of the MSP through its use in procurement is a more substantive condition in making MSP mechanism effective. Hence, there is need for a bouquet of procurement tools that can cater to different commodities in different ways (GoI, 2017).

DOUBLING FARMERS' INCOME

Government of India has envisioned the achievement of doubling farmers' income (DFI) by the year 2024-25. However, this is a humongous task, and more so in the context of the pandemic. The following seven-point strategy for DFI is mostly under implementation: (i) irrigation with focus on water-use efficiency, viz. "per drop more crop" (PDMC) through *Pradhan Mantri Krishi Sinchayee Yojana* (PMKSY); (ii) quality seed and soil health, (iii) investments in warehouses and cold chains; (iv) value addition through food processing; (v) electronic National Agriculture Market (e-NAM); (vi) increase in the coverage and effective implementation of the national crop insurance scheme *Pradhan Mantri Fasal Bima Yojana* (PMFBY); and (vii) promotion of ancillary activities like dairy, poultry, bee-keeping and fisheries.

The strategy for DFI, involving increase in private investment by 6.62 per cent per annum from the base year 2015-16 at the national level, also includes among others: (a) promoting higher agricultural growth in less developed regions, including rainfed areas, with a focus on marginal and small holders; (b) strengthening livestock related activities and crop diversification to high value produce like horticulture, in line with market signals; (c) shifting priority focus to post-production management and the agricultural marketing system; (d) sizeable increase in institutional credit to farmers; (e) allocation of more resources by state governments towards minor irrigation; and (f) incentivizing private corporate sector to participate in investments in agriculture (GoI, 2017). In order to achieve DFI, GoI can use income policy to protect the poor, free up prices for farmers, and allow private trade to stock and operate freely and have unhindered exports (Gulati and Hussain, 2017). What is also needed is continuance of the direct benefit transfer scheme PM-KISAN, with a reasonably higher allocation, along with top-up by states, on the lines of YSR-Rythu Bharosa-PM-KISAN of the state of Andhra Pradesh.

AGRICULTURE MARKETING REFORMS IN INDIA: MAKING FARMING FINANCIALLY SUSTAINABLE

Early Efforts at Agriculture Marketing Reforms

A series of reforms in quick succession was undertaken by GoI, beginning from 2002, in response to the changes in trading environment during 1990s. The reforms included the Removal of (Licensing Requirements, Stock Limits and Movement Restrictions) on Specified Foodstuffs Order, 2002 and 2003, under which paddy/rice, coarse grains, sugar, edible oilseeds and edible oils, pulses, jaggery, wheat products and hydrogenated vegetable oil or vanaspati were removed from the list of Essential Commodities Act (1955). Further, the prohibition on futures trading in agricultural commodities was removed in 2003. While these were important reforms, they did not include agriculture marketing reforms, as agriculture marketing is a state subject, and, hence, it required reform by respective states. Nevertheless, GoI undertook several initiatives to facilitate agriculture marketing reforms in states. The Expert Committee set up in by Ministry of Agriculture, GoI, in its report submitted on 29 June 2001, suggested various legislative reforms as well as the reorientation of the policies and programmes for the development and strengthening of agricultural marketing in India. The committee noted that there were stringent controls on the storage and movement of several agricultural commodities, which were acting as a disincentive to farmers, trade and industries. The State Agricultural Produce Marketing Regulations Act and the Essential Commodities Act had to be amended to remove restrictive provisions, preventing the emergence of an efficient and competitive marketing system. Further, it was felt that a negotiable warehousing receipt system could be introduced through appropriate legal change, for agricultural commodities to enhance institutional lending to the agricultural marketing sector, and to improve price-risk management

In view of the foregoing, the Ministry of Agriculture, GoI, set up a committee under the chairmanship of K M Sahni, which drafted and finalised the model legislation after holding discussions with the officials of state governments. The model Act, viz. the State Agricultural Produce Marketing (Development and Regulation) Act, 2003, was shared with all state governments for implementation. Some of the major provisions of the Model Act are: (i) more than one market can be established by private persons, farmers, cooperatives and consumers in a market area; (ii) there will be no compulsion on the growers to sell their produce through existing markets administered by the Agricultural Produce Market Committee (APMC); (iii) a new chapter on contract farming was added to facilitate and promote smooth progress in contract farming; (iv) provision made for the direct sale of farm produce to contract farming sponsor from farmers' field without the necessity of routing it through notified markets; (v) provision made for imposition of single point levy of market fee on the sale of notified agricultural commodities in any market area and discretion provided to the state governments to fix graded levy of market fee on different types of sales; (vi) registration for market functionaries provided to operate in one or more than one market areas; and (vii) provision made for the purchase of agricultural produce through private yards or directly from agriculturists in one or more than one market area (Chand, 2016).

Electronic National Agriculture Market (e-NAM)

A pathbreaking agriculture marketing reform initiative by GoI is the electronic National Agriculture Market (e-NAM), which envisages setting up of a common e-market platform across the country, has been deployed in 1,000 regulated wholesale markets in 18 states and 3 union territories. The e-NAM is expected to lead to significant benefits to farmers through higher returns, while benefitting buyers through lower transaction costs, and consumers through stable prices. It is also expected to facilitate the emergence of integrated value chains in major agricultural commodities across the country, and encourage the setting up of scientific storage and movement of agri-commodities. Smallholder farmers can benefit if they were to find ways for aggregating produce on their own, bypassing the middlemen (*arhatiyas*) and even the local market in the process. This is where farmer producer organizations (FPOs)/ farmer producer companies (FPCs) can play a key role, by facilitating aggregation and creation of volumes that is intrinsic to the success of e-NAM. The government needs to incentivize and regulate the development of FPOs, and not seek to form or control them directly (Gulati et al, 2020). However, it has been observed that creating a seamless, unified national market for agriculture produce, as e-NAM is supposed to do, even a state-wide market has been difficult due to resistance from existing market players. The success of e-NAM would depend on GoI's efforts to influence state governments to dismantle the existing structure and operations of APMC markets by amending the APMC Acts and implement e-NAM as seamless national hi-tech markets competing with each other, and ultimately benefitting the farmers.

Better price realization for farmers will serve as an important incentive for raising productivity and production, and in turn lead to higher growth of output. In many states, farm harvest prices prevail below the MSP in the harvest period and shoot up subsequently. e-NAM will help check such market imperfections. Some states like Punjab and Haryana desperately need diversification in crop pattern away from paddy–wheat rotation. However, this has not been happening due to unattractive market for alternative crops. e-NAM is expected to promote market-driven diversification and reduce dependence of farmers in these states on MSP and public procurement. The success of e-NAM in improving competitiveness and integrating pan-India markets will require assaying facilities created in various markets to ascertain quality traits as quality variations are quite large in agricultural commodities. Also, each APMC market will require forwarding agents to handle the produce for buyers from outside the market (Chand, 2016).

According to Chand (2016), the price dispersion at farm-gates and between them and wholesale markets is large for most crops. He has further emphasized that there is a need for a mindset shift that looks at market-linked realization, instead of administered returns to farms to take agriculture into enterprise mode, and goes on to assert that the marketing system has to develop options that address the price dispersion between wholesale markets and farm-gate. This will lead to market led price realizations and not gratuitous cost-plus price mechanism only. Farmers' well-being is directly linked to their ability to carry out exchange at markets of choice (Chand, 2016).

Though e-NAM will improve competitiveness in markets through larger participation of buyers and more transparent system of bidding, it should not be considered a panacea for all deficiencies in agricultural markets in India. e-NAM necessitates some reforms proposed in model APMC Act whereas it will not address some vital issues having bearing on conduct and performance of market (Chand, 2016).

A Blueprint for Agriculture Marketing Reforms

There are four important areas for agri-marketing reforms, which are not part of e-NAM, viz: (i) direct sale by farmers to buyers, processors, or, contract marketing without bringing produce to APMC market; (ii) establishment of private markets with treatment at par with APMC. Even under e-NAM, market committee will continue to hold its monopoly power in terms of offering a platform for sale/ purchase; (iii) removal of legal barriers to entry of organized and modern capital and investments into agricultural marketing.; and (iv) rationalization of market fee, commission charges, cess and taxes and development charges (Chand, 2016).

It is imperative to work out strategies to capture the totality of marketable surpluses generated by the farmers. This calls for the creation of an enabling market environment with in-built mechanism to absorb as high a percentage as possible or the minimum 60 per cent of the surpluses, through an efficient market environment (GoI, 2017). Further, there is a need for information at regular intervals to optimize the agri-business value chain system. The information would not only help to make market linked decisions during crop planning, input sourcing and harvest timelines, but also provide due cause for the right sized and rightly located infrastructure, such that capacity creation is with market flow and throughputs in mind (GoI, 2017).

GoI's vision of DFI signified a paradigm shift in agriculture policy from ensuring food security to income security of farmers, by maximizing their gains through post-production activities. The enactment of Farmers' Produce Trade and Commerce (Promotion and Facilitation) Act, 2020 (FPTC Act, 2020), Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services Act, 2020 (FAPAFS Act, 2020) and Essential Commodities (Amendment) Act, 2020 (ECA, 2020), was an attempt by GoI, to usher in a comprehensive agri-marketing reforms. However, the Acts have been repealed, in response to the year-long agitation by a section of farmers against the Acts. It is, therefore, imperative for the central and state governments, along with agriculture scientists, economists, farmers, agri-tech companies, corporate sector, and all stakeholders to start a consultative process to facilitate state governments to enact agriculture marketing reform Acts, and for GoI to enact a law facilitating easy inter-state movement of agri-commodities/ produce. Further, in order to develop an efficient nation-wide agri-marketing system, e-NAMs need to be scaled up to cover all APMC markets in 28 states and 9 union territories, and made more efficient. Further, all private markets and accredited warehouses should be linked to e-NAMs.

Agriculture marketing reforms are expected to transform Indian agriculture from predominantly subsistence farming to profitable farm enterprise based farming, integrated to efficient agri-value chains. This transformation would enhance farmers' income significantly. It also reflects on managing the VUCA (volatility, uncertainty, complexity and ambiguity) world of farmers in India by mitigating agrarian distress.

Futures and Options

The prices of agricultural commodities are generally at their lowest during the harvest season as the supply far exceeds the immediate, short-term demand, and increase significantly during the lean season when the demand exceeds the supply. This adversely affects the farmers who realize lower prices of their produce in the harvest season. Futures markets provide a market mechanism to balance this imbalance of the supply–demand pattern of agricultural commodities. Trading in futures not only provides price signals to the market of today, but also of months ahead, and affords guidance to sellers (farmers/ growers/ processors) and buyers (consumers) of agricultural commodities in planning ahead and, in financing and marketing commodities from one season to the another. While commodity exchanges in India were allowed only futures trading in commodities, the Securities and Exchange Board of India (SEBI) has, subsequently, laid out rules for the introduction of commodity options. The launch of options will boost overall market

participation and also complement the existing futures and make the commodities market more robust and efficient. The combination of futures and options can give market participants the benefit of price discovery of futures and simpler risk management of options. However, SEBI has banned futures and options trading in major agriculture commodities, viz. gram (*chana*), mustard seed, soybean and its derivatives, crude palm oil, *moong* (pulses), paddy (Basmati) and wheat on 21 December 2021, for a period of one year, as part of GoI's efforts to curb inflation. While the impact of a ban on futures and options on curbing inflation is debatable, it prevents market participants, most importantly the farmers in the spot market, of a crucial source of price information. Spot markets (viz. the APMC markets) for agricultural commodities are fragmented across geographical locations, and futures prices provide a critical reference point for pricing in these spot markets.

DEVELOPMENT OF RURAL INFRASTRUCTURE AND EFFICIENT AGRI-VALUE CHAINS

Creation of Rural Infrastructure

Investment in rural infrastructure is a pre-condition to enable the acceleration of agricultural growth, creation of new economic opportunities, and generation of employment. The Union Budget 2021-22 had made available the Agriculture Infrastructure Fund (AIF) to APMCs for augmenting their infrastructure facilities. Also, 1,000 more APMC markets were to be integrated with e-NAM. There are about 17 million farmers registered in the existing 1,000 e-NAMs, which have displayed transparency and competitiveness into the agricultural market. The AIF, with a corpus of INR 1 trillion ($13.1 billion) was created by GoI under *Atma Nirbhar Bharat Abhiyan* (Self-reliant India Mission), for the development of farm-gates and aggregation points, and post-harvest management infrastructure. The scheme involves credit support by banks and financial institutions to primary agricultural credit societies (PACS), marketing cooperative societies, FPOs, self-help groups (SHGs), farmers, joint liability groups (JLG), multipurpose cooperative societies, agri-entrepreneurs, startups and central/state agency or local body sponsored public-private partnership projects. Interest subvention and credit guarantee for loans up to INR 20 million ($ 0.26 million) is also available to eligible borrowers.

Further, setting up of mega food parks, integrated cold chains, food processing units, agro-processing clusters, and implementation of Operations Greens Scheme, under GoI's comprehensive package of *PM Kisan SAMPADA Yojana* (PMKSY), will not only provide a big boost to the growth of food processing sector in the country but also ensure higher income to farmers, while creating huge employment opportunities especially in the rural areas, reducing wastage of agricultural produce, and enhancing the export of processed foods. The Production Linked Incentive (PLI) Scheme for the food processing sector introduced by GoI is a step in the right direction.

Efficient Agri-Value Chains

India is the largest producer of milk in the world, with production having increased from 146.3 MT in 2014-15 (GoI, 2021) to 210 MT in 2021-22 (FAOSTAT). Dairying is an important secondary source of income for millions of rural households engaged in agriculture. The success of the dairy industry has resulted from the integrated co-operative system of milk collection, transportation, processing and distribution, conversion of the same to milk powder and products, to minimize seasonal impact on suppliers and buyers, retail distribution of milk and milk products, sharing of profits with the farmer, which are ploughed back to enhance productivity and needs to be emulated by other farm produce/producers. A focus on dairy value chain could significantly improve the income of smallholder farmers. Therefore, in order to double income of farmers, it is important to focus on dairy value chain through FPOs/ FPCs and cooperatives. India is also the second largest producer of fish, fruits and vegetables in the world. Promotion of efficient value chains for horticulture, poultry and fisheries, involving FPOs/ FPCs, could significantly give a fillip to the income of small and marginal farmers.

AGRICULTURE EXPORT REFORMS

India ranks among the top ten exporters of agricultural products in the world. According to WTO's World Trade Statistical Review 2021, the country's share in global agricultural exports increased from 1.1 percent in the year 2000 to 2.2 percent in 2020, valued at $39 billion. India's agriculture exports grew by a robust 20.4 per cent in 2021-22, to touch $50.2 billion. In order to catch-up with Brazil ($89 billion) and China ($82 billion), India needs to bring about structural reforms in the agriculture sector, including a stable trade policy regime (Roy, 2021). A focus on reforms in agriculture marketing and agriculture exports for doubling farmers' income by 2024-25, would be an appropriate recipe for stimulating the agriculture sector.

The Agriculture Export Policy (AEP), 2018 of GoI, aims at achieving an export target of $60 billion by 2022 and $100 billion within a few years, thereafter. This is indeed a challenging task, and achieving the target would involve a paradigm shift from a "business-as-usual" approach to a well-calibrated, comprehensive, strategic and result-oriented agri-export policy and action plan.

The agri-export strategy should include integration of value-added agri-produce with global value chains (GVC), by adopting the best agricultural practices involving productivity gains and cost competitiveness. Also, in order to boost exports of dairy products and make the dairy sector globally competitive, GoI needs to consider the development of Dairy Export Zones (DEZs) in collaboration with state governments (Roy, 2021). The AEP has recommended the establishment of Agriculture Export Zones (AEZs), to facilitate value addition of agri-commodities for increasing exports in a WTO compatible manner. In order to ensure higher income to farmers, FPOs need to be linked to AEZs to supply SPS-compliant agri-products.

Concerted efforts by GoI, state governments, export promotion agencies, financial institutions, exporters, food and agro processing industry, agri-tech start-ups, FPOs/FPCs, and all other stakeholders in the agri-export value chains, would be able to address a whole range of issues pertaining to the promotion of agriculture exports. Further, comprehensive reforms in the agriculture sector could propel India into the top bracket of agricultural exporters in the world, while attaining $100 billion in exports of agriculture and food products by 2026-27 (Roy and Roy, 2022).

CONCLUSION

The full benefit from linking agricultural markets in India and putting them on electronic platform will be available to farmers when a single trading license is valid across the country and when a farmer gets the option to sell her/his produce in any market throughout the country. The unfinished agenda for agriculture sector reforms would include pursuing tenancy reforms, significantly raising R&D spending on modernization of agriculture through artificial intelligence and blockchain technology for increasing crop productivity and resource-use efficiency, strengthening of agri-tech start-up ecosystem, and skilling of farmers who could be taken out of farming to be gainfully employed along efficient agri-value chains. Further, inclusion of agri-marketing in the Concurrent List (applicable to both Government of India and State Governments) of the Constitution of India (from the present State List), needs to be thoroughly debated nationally by all stakeholders and prioritized by the government. Effective implementation of comprehensive agricultural reforms, with a high priority accorded to agri-marketing reforms, could lead to sustainability of Indian agriculture, and facilitate the achievement of doubling farmers' income by 2024-25, while mitigating agrarian distress.

ENDNOTES

1. USD-INR Exchange Rates used in the paper:
2. USD 1 = INR 57.74 June 29, 2013
3. USD 1 = INR 64.74 June 30, 2017
4. USD 1 = INR 76.18 March 25, 2022

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