Monograph
No-111

Transforming Indian Agriculture: Evolution of Technology, Policy Reforms, and Market Liberalization for Enhancing Farmers' Incomes

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June
2025

Monograph Series No. - 111

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February - 2023

CMDR Monograph Series No. – 111

Title : Transforming Indian Agriculture: Evolution of Technology, Policy Reforms, and Market Liberalization for Enhancing Farmers' Incomes

Author Name : A Amarender Reddy

Publisher : Centre For Multi-Disciplinary Development Research (CMDR), Dharwad

Printer's : M/s. Basaveshvar Offset Printers, Dharwad.

First Edition : June - 2025

ISBN No. : 978-81-948826-5-7

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Citation : Amarender Reddy **A. (2025)**, Transforming Indian Agriculture: Evolution of Technology, Policy Reforms, and Market Liberalization for Enhancing Farmers', CMDR Monograph No-111 - Centre for Multi-Disciplinary Development Research (CMDR), Dharwad.
ISBN No. : 978-81-948826-5-7

Copies : 100

Published by :

The Director
Centre for Multi-Disciplinary Development Research (CMDR)
Dharwad, Karnataka, India
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Preface

The primary purpose of launching the CMDR Monograph Series was to provide a platform for social science researchers to share their valuable thoughts, long-term research outputs, and outcomes on a specific area.

The Monograph Series is envisioned as a cornerstone initiative to advance scholarly discourse, preserve methodological rigor, and bridge theoretical insights with real-world applications.

Indian agriculture has undergone significant transformations driven by technological advancements, strategic policy reforms, and market liberalization, all aimed at improving farmers' incomes and ensuring sustainability.

From the Green Revolution to digital agriculture, innovations have played a key role. The novelties in agricultural research, which brought practices like precision farming, climate-resilient crops, and AI-driven advisory services, have enhanced productivity and reduced risks for farmers. Initiatives like NeGPA (National e-Governance Plan in Agriculture) facilitate access to data-driven decision-making.

The union government interventions, such as PM-KISAN, KCC (Kisan Credit Card), and MSP (Minimum Support Price) frameworks, aim to provide financial security, improve credit access, and stabilize farm incomes. Additionally, digital land records modernization helps farmers secure ownership rights and streamline transactions.

The shift towards open markets, digital trading platforms like eNAM (Electronic National Agricultural Market), and contract farming has enabled farmers to negotiate better prices, diversify cropping patterns, and reduce dependence on middlemen. The interplay of these factors is crucial for advancing agricultural resilience, ensuring equitable growth, and fostering an environment where traditional wisdom is harmonized with modern innovation.

Dr. Reddy has made excellent efforts to bring all the important policies and technological interventions for ensuring food security on one platform. The analysis of the interventions helps policymakers to design need-based interventions with special reference to the marketing of agricultural produce.

I extend my sincere thanks to Dr. Amarendra Reddy for taking the pains to bring out the beautiful contents and presenting them in an intellectual manner.

Basavaprabhu Jirli
Director

Transforming Indian Agriculture: Evolution of Technology, Policy Reforms, and Market Liberalization for Enhancing Farmers' Incomes

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Abstract: India's recent farm laws sought to liberalize agricultural markets and attract private investment into infrastructure such as cold chains, warehouses, and aggregation centres. However, concerns about increased exposure to market volatility triggered widespread farmer protests demanding a legally guaranteed Minimum Support Price (MSP). This paper critically analyzes the farm laws using secondary data drawn from government reports and scholarly literatures. It highlights how the MSP policy, while successful in ensuring price assurance for paddy and wheat, has largely excluded pulses and oilseeds, contributing to nutritional imbalances and undernourishment among women and children. Farmers cultivating these neglected crops face market uncertainties, resulting in low profitability, poor production incentives, and a growing reliance on imports. The paper proposes a reformed MSP framework based on a price insurance model. It recommends: (i) continued procurement of paddy and wheat to support food security objectives; (ii) implementation of a Price Deficiency Payment Scheme (PDPS) for the remaining 21 MSP-notified crops; and (iii) using MSP as a signal price to guide production in fragmented markets. The findings underscore the need for a balanced approach that aligns market reforms with inclusive and stable income support mechanisms for farmers.

Keywords: Farm laws; Farmers income; price insurance; price policy; JEL classification: Q11; Q13; Q13; D24

1. Introduction

India's rural economy has experienced substantial transformation over the past several decades, marked by a sharp decline in agriculture's contribution to the GDP — dropping from 47.6% in 1960-61 to just 14.4% by 2010-11 and to 16.0 per cent 2023-24 (Government of India, 2024; Kotwal *et al*., 2011; Gulati and Juneja, 2022; Chand *et al*., 2022). The share of agriculture in rural income was declined from 57% to 39% but the declination of rural employment from 78% to 64% (Chand *et al*., 2017; Birthal *et al*., 2022) indicates low productivity and high dependence on agriculture. The agriculture sector everywhere is a risky business, especially for small-scale farmers who operate it in precarious conditions in developing countries like India (Mosley and Verschoor, 2005; Gulati *et al*., 2021). In India, close to 87% of farmers operate on land holdings smaller than two hectares, with about 69% cultivating less than one hectare (Upadhyaya, 2018). These marginal and small farmers contribute 51% of agricultural output with 46% of operated land (Singh, 2020). Since independence of India, there are several milestones in Indian agriculture like green revolution, milk revolution, poultry revolution and fisheries revolution and horticultural revolution which contributed to boosting incomes of the farmers and also food and nutritional security and healthy lives (FAO, 2017). However, farmers' incomes remain low and there are significant regional differences in incomes, food and nutritional security (Chand *et al*., 2015), this paper critically reviews food and nutrition security policies, farmers' incomes and suggest policy recommendations for reducing poverty, zero hunger.

2. Objectives of the study

Given this background the paper examined the existing policy scenario in farm sector and how the new farm laws will be beneficial to farmers and also look in to alternate policies to enhance farmers' incomes.

3. Methodology and data

The paper is based on secondary data collected from various government reports mainly (i) Commission for Agricultural Costs and Prices (CACP), (ii) Agricultural Statistics at a Glance, Ministry of Agriculture, Government of India, (iii) Crop and Season Reports, AGMARKNET, Food Corporation of India (FCI) reports, NSSO Agricultural Situation in India reports and (iv) various Government of India published sources. The data related to cost of production, Minimum Support Price (MSP), market arrivals and prices, procurement and open market operations of FCI, mode of sale and sale prices, farmers income etc., are collected for analysis. Simple statistical tools like descriptive statistics are used.

4. Results

4.1 Evolution of agricultural policies and reforms for food security and safety in India

The evolution of agricultural policies and technologies in India spans over centuries, marked by key reforms, technological advancements, and policy shifts. The detailed timeline is given in Table 1. In the pre-independence era, agriculture was largely feudal and subsistence-based. The Berar Cotton and Grain Market Act (1887) introduced regulated markets, followed by the Royal Commission on Agriculture (1928), which highlighted the urgent need for market reforms. The Bengal Famine of 1943 highlighted the need for food security, leading to the introduction of the Public Distribution System (PDS) in 1944.

After independence (1947), the focus shifted to food self-sufficiency. The Essential Commodities Act (1955) and State Trading Corporation (1956) were established to regulate prices and trade. The Green Revolution (1960s), marked by the introduction of High-Yielding Varieties (HYVs) and fertilizers, significantly increased food production. The Food Corporation of India (1964) and formalization of the PDS (1965) strengthened food security.

In the 1970s, the White Revolution (Operation Flood) boosted milk production, while the Silver Revolution enhanced poultry output. The Blue Revolution (1985-1990) promoted aquaculture, making India a leading fish producer. The Golden Revolution (1991-2003) focused on horticulture and vegetable production.

The 1991 economic reforms encouraged private sector entry, leading to the introduction of GM crops (2002) and the Model APMC Act (2003) to promote market reforms. The eNAM (2016) created a unified digital agricultural market.

Recent years saw significant policy reforms with the New Farm Laws (2020) aimed at liberalizing agricultural trade. However, they were repealed in 2021 following massive farmer protests. Overall, India's agricultural journey reflects continuous policy adaptations and technological advancements, driving food security, rural development, and market efficiency.

Table 1. Timeline of important policies and technologies introduced in India for food security

Year	Policies/technologies
1700	Almost 100% under small petty traders (small, feudal)
1764	Invention of the Spinning Jenny
1769	Development of the Steam Engine
1769	Introduction of the Water Frame
1779	Mechanization of Textile Production
1778	The Rise of Iron Production
1785	Development of the Power Loom
1829	Steam-powered Railway Locomotive
1886	India's first regulated market (Karanja), Maharashtra
1887	First legislation being the Berar Cotton and Grain Market Act
1928	Royal Commission on Agriculture
1937	Agricultural Produce Marketing (Grading & Marketing), Act
1939	Regulated Markets Act in Bombay Presidency.
1943	Bengal Famine, 2nd World War
1943	Restrictions on inter-state trade of food grains
1944	Public Distribution System (PDS) Introduced on a limited scale during World War II
1947	First Agricultural Produce Market Committee (APMC) market at Karanja
1955	Essential Commodities Act (stock limits)
1956	State Trading Corporation
1956	Agricultural Produce (Development and Warehousing) Corporations Act
1961	PL-480. Ship to mouth; every 15 minutes one ship from USA (1961-69)
1962	HYVs tested (1962-64)
1962	National Cooperative Development Act
1963	Agricultural Produce Marketing Committee (APMC) Act
1964	Food Corporation of India (FCI) Act
1965	HYVs released across India
1965	Jai Jawan-Jai Kisan slogan (Indo-Pakistan War)
1965	Public Distribution System (PDS) formalised for food grains.
1965	18,000 ton of HYV seeds imported
1967	Production increased three folds, no place to store food grains, stored in schools.
1969	Poultry revolution (silver revolution) led by private sector
1970	Operation flood to increase milk production led by cooperatives
1980	Prevention of Black Marketing & Supply of Essential Commodities Act
1985	Blue Revolution (1985-1990) to increase fish production led by private sector.
1986	The Bureau of Indian Standards Act 1986
1991	Vegetable Revolution (golden revolution (1991-2003) led by small farmers.
1992	Milk and Milk Products Order (MMPO)
1998	Jai Jawan-Jai Kisan, Jai Vignan
2002	GM crops (cotton) led by private sector
2003	Model APMC Act (Agricultural Produce Marketing Committee) Act
2006	Forward Contract (Regulation) Amendment Act
2007	The (Warehousing Development and Regulation) Act
2016	Model Agriculture Land Leasing Act

2016	Electronic National Agriculture Market (eNAM)
2017	Model Agricultural Produce and Livestock Marketing (promotion and facilitation) Act
2018	Model Contract Farming Act
2019	Jai Jawan, Jai Kisan, Jai Vignan, Jai Anusandhan slogan
2020	New Farm Laws enacted with focus on liberation of agriculture
2021	New Farm Laws repealed after farmers agitation

4.2. Reasons for low farm income

The National Sample Survey Office (NSSO) defines a farmer in its Situation Assessment Survey (SAS) as: A person engaged in agricultural production activities on any land, regardless of the ownership status of the land. It includes individuals involved in crop production, animal husbandry, poultry, fishery, beekeeping, sericulture, etc. To be classified as a farmer, the individual must have operated at least 0.002 hectares (around 20 square meters) of land during the reference period (typically the previous agricultural year). The definition covers both landowners and tenant farmers who cultivate land or engage in agricultural activities. It also includes households earning at least ₹4,000 annually from agricultural activities, even if they do not own or lease land. This broad definition ensures that the survey captures both land-owning farmers and agricultural laborers or tenant farmers who are actively involved in cultivation or related activities. The income of farmers from various sources is presented in Table 2. The average monthly income of an agricultural household was Rs 10,218 (paid out expenses approach) and Rs.8337 (both paid out expenses and imputed expenses) (Times of India, 2020) and this indicate how alarming the farmers' economic condition is?

Table 2. Average monthly income (Rs) from different sources per agricultural household during July 2018 - June 2019

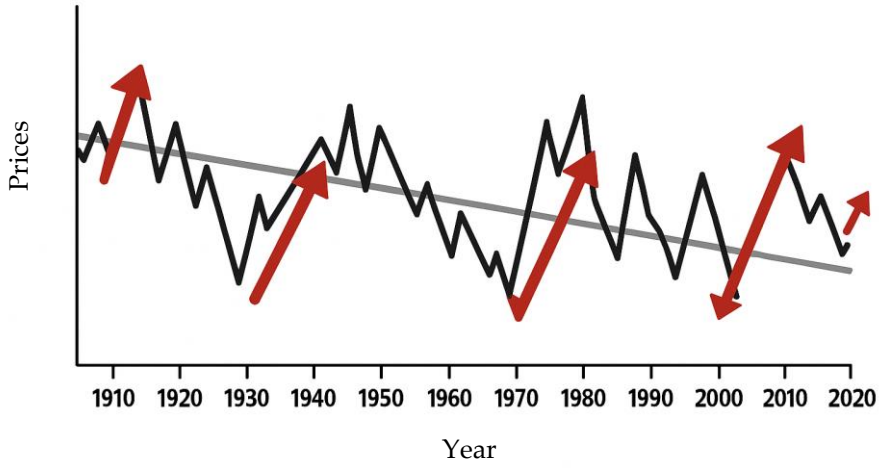
Components of income	Paid out expenses approach	Both the paid out expenses and imputed expenses
Income from wages	4,063	4,063
Income from leasing out of land	134	134
Net receipt from crop production	3,798	3,058
Net receipt from farming of animals	1,582	441
Net receipt from non-farm business	641	641
Total income	10,218	8,337

Source: NSS Report No. 587: Situation Assessment of Agricultural Households and Land and Livestock Holding of Households in Rural India, 2019

The reasons for declining the share of agriculture in rural household income are

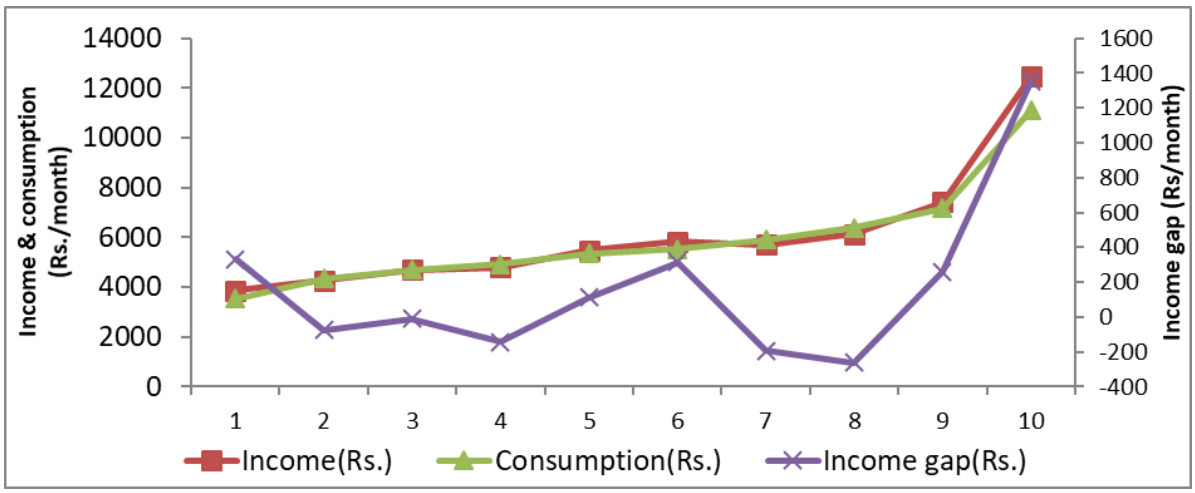
4.2.1. Declining terms of trade: As economies develops, the share of agriculture in countrie's, domestic product is reducing. This is applicable to all the countries and also regions (Figure 1). As a result of declining demand for agricultural commodities vis-a-vis non-agricultural goods and services like ICT, mobiles and automobiles, the income share and hence the price received for agricultural produce declined. This is called declining terms of trade to agriculture; this is leading to less capital investments and abandonment of agriculture (Dholakia and Sapre, 2013; Colman, 2009; Narayanamoorthy, 2006).

Figure 1. Long run agricultural commodity prices (deteriorating terms of trade for farmers).



4.2.2. Income Consumption gap: Figure 2 presents data from the recent NSSO 2012-13 round, depicting the monthly income and expenditure of agricultural households, categorized into ten deciles based on Monthly Per capita Consumption Expenditure (MPCE). The 1st decile represents the lowest income group, while the 10th decile represents the highest. The data reveals that up to the 8th decile, farmer households spend more than their income, indicating that their earnings are insufficient to meet their consumption needs. Only households in the 9th and 10th deciles have incomes higher than their expenditures. These income gaps highlight the financial strain on the majority of agricultural households, forcing them to rely on debt to meet daily expenses. This dependence on informal credit sources further entraps them in a vicious cycle of indebtedness (NSSO, 2014; Reddy *et al*., 2020).

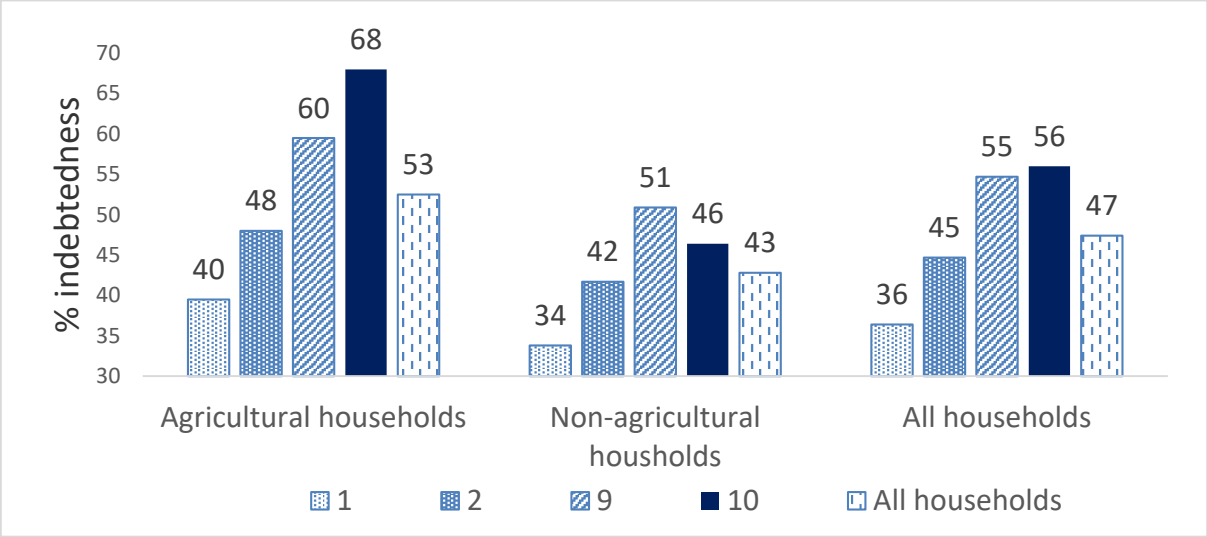
Figure 2. Decile wise monthly income and consumption gap (Rs.) of HHs-2012-13.



4.2.3. Indebtedness: Among all the decile groups of MPCE, the incidence of indebtedness among agricultural households is significantly higher than that of non-agricultural households (Figure. 3). Interestingly, farmers in the upper decile groups (representing higher income levels) are relatively more indebted than those in the lower deciles. This counter intuitive trend can be attributed to several factors. Farmers in the higher deciles typically own larger landholdings and engage in capital-intensive farming, requiring higher investments in inputs, machinery, and technology. Consequently, they are more likely to access institutional credit (such as bank loans) to finance their operations. The NSSO, 2015-16 data noted that 53% of farmers were indebted,

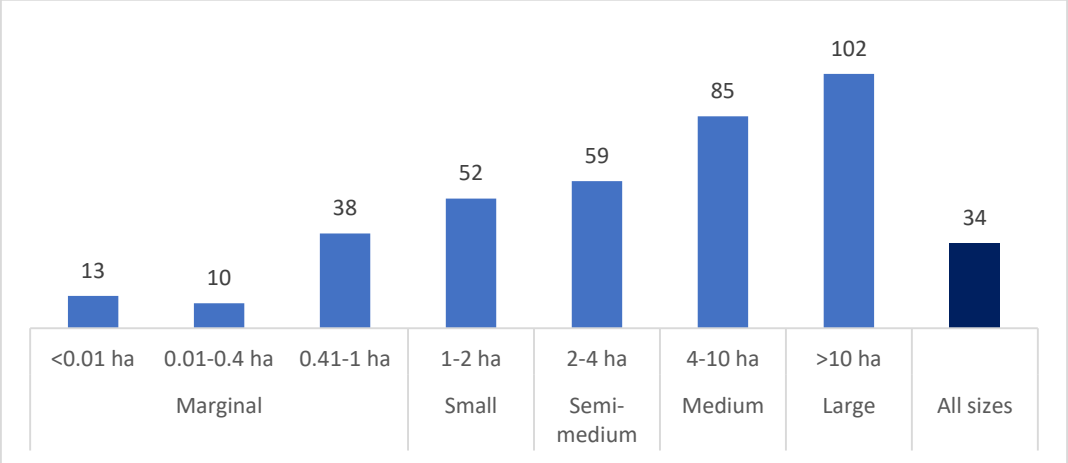
with the share of indebtedness increasing with farm size due to greater access to formal credit channels. Moreover, higher-income farmers often take larger loans to expand their operations or invest in infrastructure, making their absolute debt levels higher. Although their income is higher, their debt-to-income ratio may still be substantial, especially if they face crop failures, price fluctuations, or mounting interest burdens. This results in greater financial vulnerability despite their higher income status (Chand, 2017).

Figure 3. Incidence of indebtedness by decile class of MPCE (%) in 2015-16.



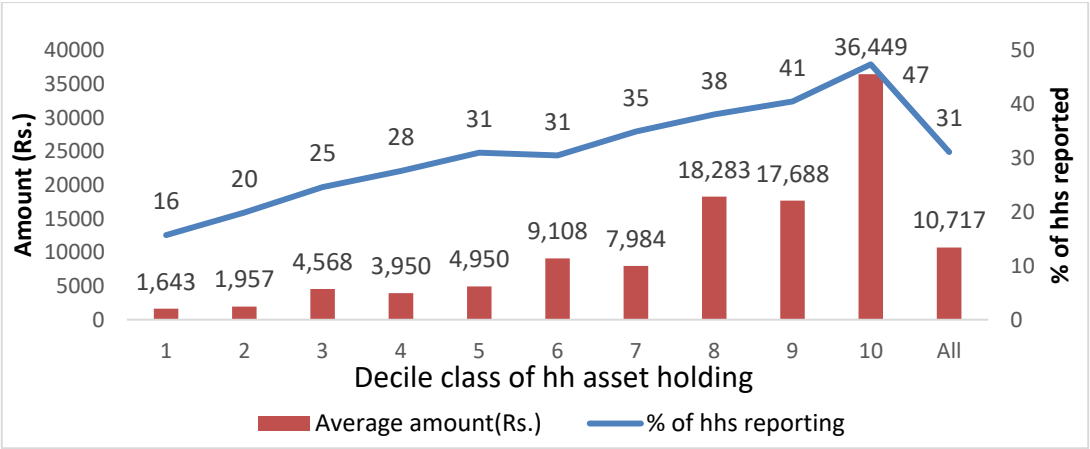
4.2.4. "Doubling farmers' income" is reality for large farmers, but not to small farmers: The number of farms in India more than doubled from 71 million to 145 million between 1970-71 and 2015-16, leading to a significant reduction in average farm size from 2.28 hectares to 1.08 hectares (http://www.economicsdiscussion.net/). This shrinkage is driven by heavy demographic pressure, resulting in the subdivision and fragmentation of landholdings (Padmanabhan, 2018). Several studies indicate that with the increased adoption of farm mechanization, the earlier inverse relationship between farm size and profitability has reversed. Larger farms, which benefit from economies of scale, are now more profitable per hectare compared to smaller farms (Figure 4). As a result, small farmers, despite their intensive efforts, struggle to achieve profitability and often fall into a poverty trap (NITI Aayog, 2016). Evidence shows that marginal farmers' household consumption frequently exceeds their net monthly income from both farming and non-farming activities. According to the 2015-16 Agriculture Census, approximately 100 million farming households face this financial struggle. Furthermore, income growth has been significantly lower for marginal farmers, whereas large farmers have experienced higher income growth. This trend highlights that the strategy of doubling farm incomes is realistically achievable only for the largest land-owning group, leaving smaller farmers behind (Candemir *et al*., 2021).

Figure 4. Income growth (in %) between 2003 and 2013 for different categories of farmers. Source: NSSO Situation Assessment Survey of Agricultural Households.



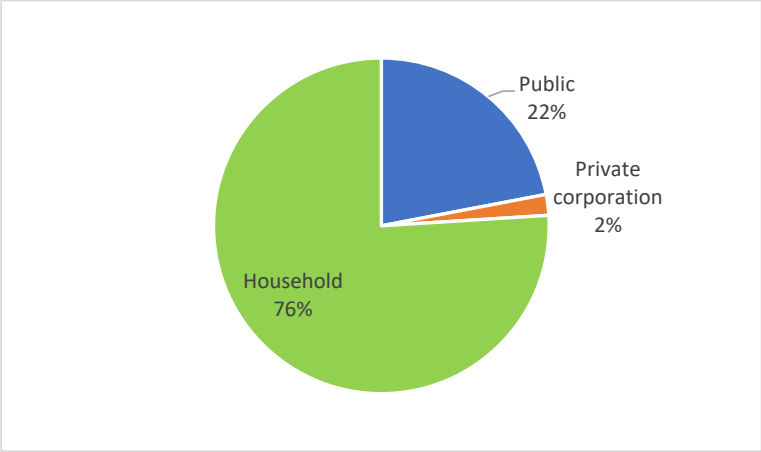
4.2.5. Low investment capability: Due to extreme poverty, limited access to credit, and the burden of debt, lower decile households—primarily marginal and small farmers—are unable to invest adequately in fixed capital compared to upper decile households (Figure 5). This lack of investment becomes a major barrier to achieving higher farm productivity. Furthermore, the inability to invest in capital assets, infrastructure, or even education prevents these farmers from enhancing their production capacity or diversifying their income sources. As a result, they become trapped in a cycle of perpetual indebtedness and low-income vulnerability, making it increasingly difficult to break free from poverty and financial instability.

Figure 5. Percentage of rural households reporting fixed capital expenditure & average amount (2012-13).



4.1.6. Low institutional investment: Another significant factor contributing to the low-income levels of farmers is the rigidity of existing farm laws, which restrict farmers to sell only in APMC mandis and impose stock limits. These regulations limit market access and suppress competition, preventing farmers from securing better prices for their produce. As a consequence, private sector investment in agriculture has remained dismally low, accounting for only 2% of the Gross Fixed Capital Formation (GFCF) in 2017-18 (Figure 6). This lack of investment has triggered a vicious cycle: low prices lead to low farm incomes, which in turn increase farmers' debt burdens and discourage further investment. This continuous cycle perpetuates the low-income trap, making it difficult for farmers to achieve sustainable financial growth.

Figure 6: Sources of GFCF in 2017-18.

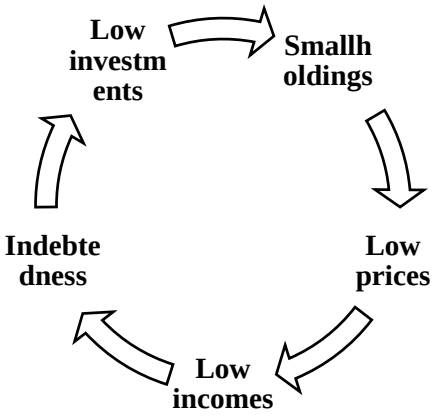


Source: Economic Survey, Govt of India

4.3. The Vicious cycle of low incomes

In developing countries like India, where smallholders dominate the farming community, per capita income is generally low. Due to low agricultural production and the poor prices farmers receive for their output, their purchasing power and savings capacity remain limited. The low level of savings results in a capital deficiency, forcing farmers into indebtedness, which further weakens their ability to invest in productivity-enhancing assets. On the other hand, low purchasing power reduces the demand for goods and services, thereby shrinking the market size. The small market size, in turn, discourages private investment, creating a cycle of underdevelopment. The lack of investment in small farms hampers productivity growth, reducing both output and returns (Figure. 7). This self-reinforcing vicious cycle keeps farmers trapped in poverty, with little opportunity to break freq.

Figure 7: Vicious cycle afflicted the small holders.



4.4. MSP implementation only for paddy and wheat

During the 1960s, faced with a famine-like situation, the Government of India placed a strong emphasis on boosting the production of paddy and wheat. To achieve this, the government introduced High-Yielding Varieties (HYVs), increased fertilizer subsidies, and implemented guaranteed procurement at Minimum Support Prices (MSP). These measures were part of a broader strategy of policy reforms and technological interventions aimed at achieving food grain self-sufficiency, with a primary focus on paddy and wheat production. The introduction of MSP was a key policy tool designed to incentivize farmers by guaranteeing a fair price for their crops announced prior to each sowing season. This price assurance encouraged farmers to

invest more in agricultural inputs and expand production. The MSP also acted as a signal to farmers regarding the competitiveness of different crops across regions, guiding them to cultivate crops that promised returns above their cost of production. However, this narrow focus on paddy and wheat came at the expense of diversified crop cultivation. Over time, the area and production of pulses, oilseeds, and coarse cereals—which are essential for food diversity, nutrition, and health—declined. This shift skewed the cropping pattern, reducing the cultivation of nutrient-rich crops and impacting dietary diversity and nutritional security.

4.5. Production and Procurement of rice and wheat

The cost of crop production varies significantly across states. The figure below illustrates the cost of production for paddy in 2022-23 by state, along with the all-India average, arranged in ascending order of cost (Table 3). It also shows the corresponding relative shares of each state in the total national production. The figure highlights that only a few states—namely Punjab, Andhra Pradesh, Chhattisgarh, Haryana, Bihar, Gujarat, Karnataka, Himachal Pradesh, and Madhya Pradesh—have a lower cost of production than the national average. These states enjoy a comparative advantage in paddy cultivation. In contrast, states where the cost of production exceeds the national average—such as Telangana, Uttar Pradesh, and West Bengal—contribute significantly to the overall production, with shares of 10.2%, 12.5%, and 12.9%, respectively. This is economically inefficient, as it goes against their comparative advantage. Therefore, reducing the area under paddy cultivation in these high-cost states would enhance overall production efficiency.

Table 3. Projected Cost of Production and Yield for paddy and Production Shares during 2022-23

		Cost of production (Rs/qtl)			
States	Yield (qtl/ha)	A2	A2+FL	C2	Share in production(%)
Punjab	70.8	807	907	1530	10.3
Andhra Pradesh	61.2	1106	1232	1732	6.3
Chhattisgarh	42.0	1062	1307	1704	6.6
Haryana	53.4	1140	1331	2090	3.8
Bihar	28.8	1012	1339	1785	5.7
Gujarat	41.0	1153	1363	1673	1.8
Karnataka	50.9	1152	1437	1883	3.4
Himachal Pradesh	30.9	692	1452	1990	0.1
Madhya Pradesh	43.4	1146	1461	1859	4.3
Tamil Nadu	46.3	1423	1589	2035	5.9
Telangana	53.0	1311	1613	2190	10.2
Uttar Pradesh	36.1	1271	1616	2114	12.5
Jharkhand	26.5	1188	1629	2131	1.9
Assam	36.3	1017	1661	1994	4.0
Odisha	43.3	1174	1699	2067	7.0
West Bengal	42.3	1190	1849	2229	12.9
Kerala	41.6	1614	1888	2384	0.5
Maharashtra	21.8	2551	3057	3520	2.9
All-India	43.7	1189	1533	2008	100

Note: Highlighted in grey colour are costs below national average and competitive. Source: Cost of Cultivation data of CACP, Ministry of Agriculture & Farmers Welfare, Govt of India.

The findings in the Figure 8 show that the procurement of paddy was highest in Punjab followed by Telangana, Andhra Pradesh, Chhattisgarh and Odisha. Among various states, Punjab had the highest share in wheat procurement followed by Haryana (Figure 9). However, in recent years, procurement from other states is also increased due to implementation of De-Centralized Procurement (DCP). Agriculturally developed and high productive states like Punjab and Haryana also showed more marketed surplus than other states (Figure 10).

Figure 8. Procurement of paddy 2024 (lakh ton) by state. Source: Food Corporation of India, Annual reports.

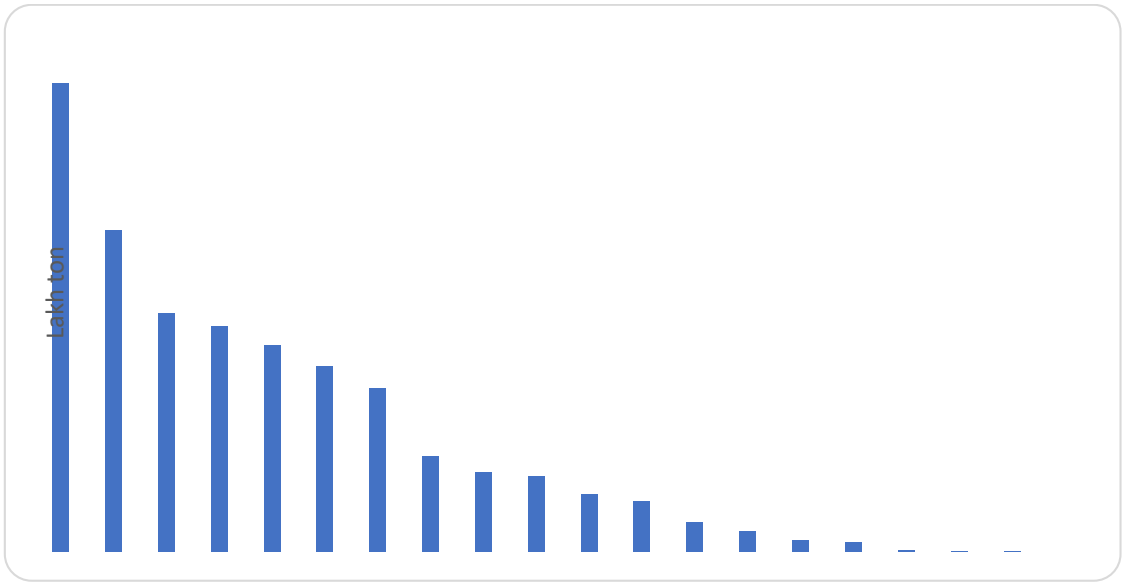
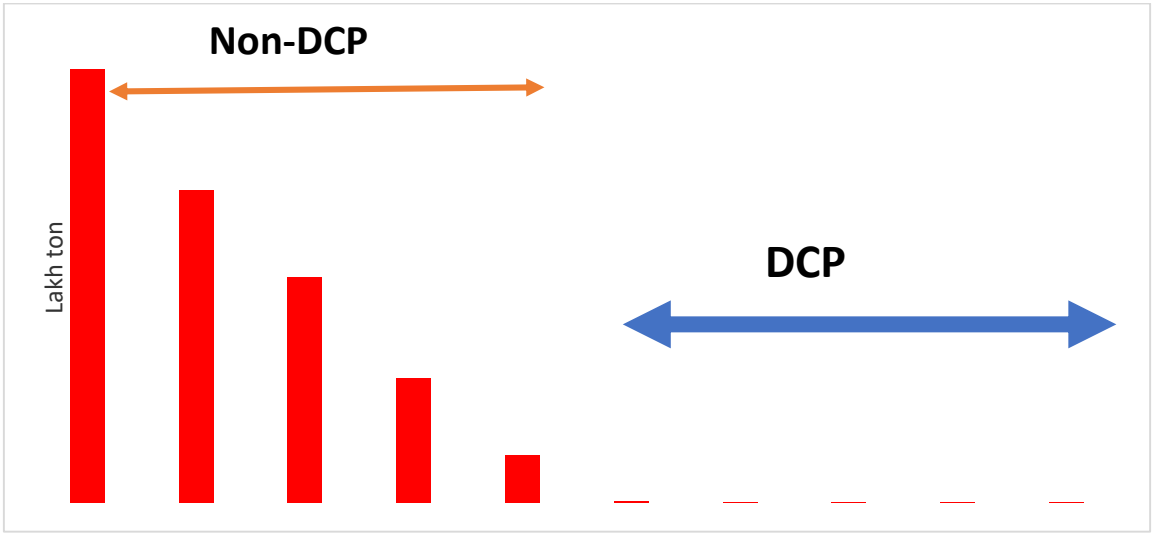
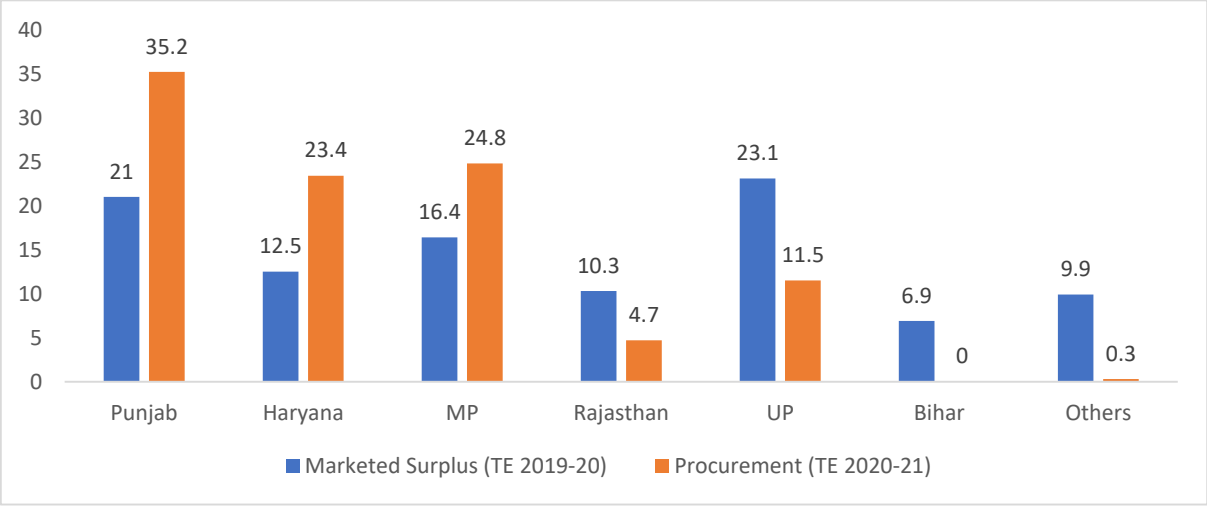


Figure 9. Procurement of wheat 2024 (lakh tonn).



Source: Food Corporation of India, Annual Reports.

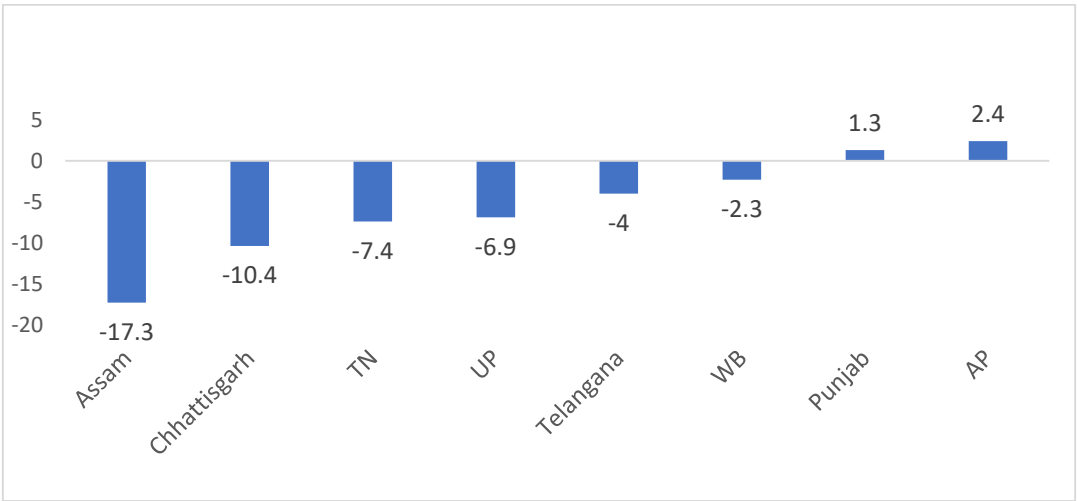
Figure 10. Share of major states in marketed surplus (lakh ton) and procurement of wheat (%) in 2020



Source: Food Corporation of India, various annual reports.

The procurement system in India exhibits significant geographical disparities, with higher procurement concentrated in certain regions and for specific crops, while other regions and crops receive minimal or no procurement support. Additionally, the MSP system suffers from imbalances and inherent deficiencies, resulting in only around 10% of farmers benefiting from it, while the majority remain vulnerable to market fluctuations. This scenario highlights the urgent need for policy reforms aimed at enhancing marketing efficiency and expanding procurement operations to neglected regions and under-procured crops. Strengthening the procurement framework through wider coverage and equitable support would ensure that a larger share of farmers can benefit from price stability and income security. Even for paddy, states with weak procurement operations like Assam showed market prices are far below MSP, while in states with stronger MSP operations the market price is sometimes above MSP (Figure 11).

Figure 11. Average difference (%) between market price & MSP in major states (Kharif paddy, 2020).

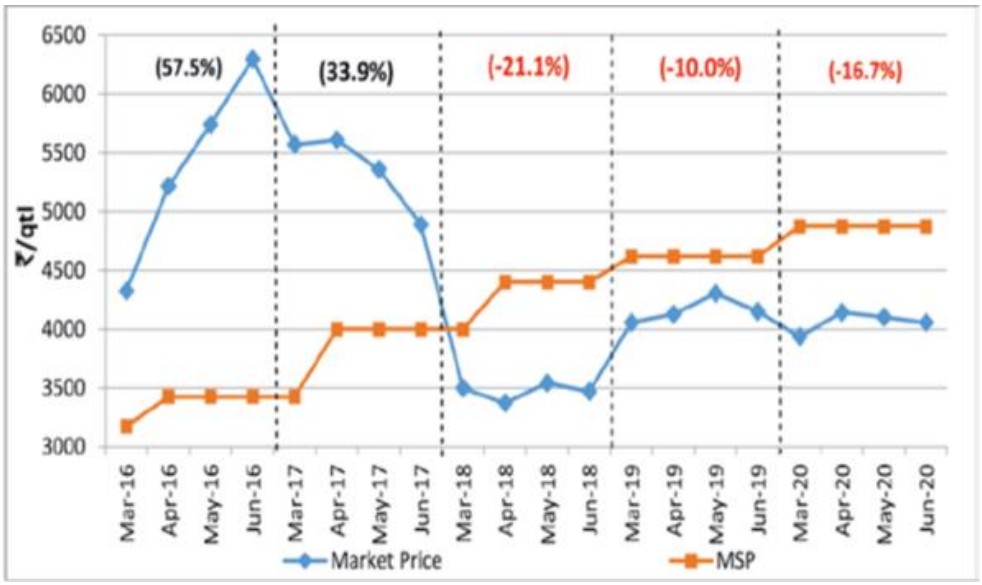


Source: CACP, 2021

4.6. Trends in Price

India achieved record production of pulses in 2017-18, making the country self-sufficient in pulses, and gram alone accounts for nearly 70 percent of rabi pulses output. Gram production recorded a significant increase during 2016-17 but India also imported a large quantity of yellow peas, a close substitute for gram, during that time.

Figure 12. Trends in Domestic Market Price vis a vis MSP of Gram (CACP report, 2021).



The high production and large imports led to a drastic fall in domestic market prices during 2017-18 which were much below the MSP. But gradually the market prices showed improvement due to lower production and reduced imports (Figure 12). And finally, a significant development in the gap between MSP and market price was reported as the gap was reduced and market prices were converging towards MSP (Das, 2021). The low market prices were mainly due to depressed prices in few states like Madhya Pradesh, Maharashtra and Rajasthan where farmers have to sell their produce immediately after harvest to meet immediate cash needs. During this period, due to large arrivals in mandi, prices generally rule below MSP (CACP, 2021).

Figure 13. Trends in Domestic market Price vis a vis MSP of safflower (CACP, 2021).



The safflower production has severely declined from a peak of 5.2 lakh to about 22 thousand tonnes in last 3 decades. The low prices along with the low market demand, more remunerative alternative crops and low oil content compared to other oilseed crops are major reasons for decline in safflower production (Aditya *et al.*, 2017). It is evident from the above graph that market prices of safflower seeds were much lower than

MSP during last five procurement seasons from 2016 to 2020. Though market prices have improved during 2019, the gap between market prices and MSP has also increased substantially. There is also a recommendation from government to exclude the crop from MSP scheme due to low production and demand.

4.7. Current status of APMC market

The APMC tax including market fees or mandi charges, rural development fees and commissions to middlemen. But there is a clear non-uniformity in APMC taxes among the states as it is excessively high in Punjab at 8.5 per cent and lowest in Kerala at 0.07 per cent. Mandi charges are too high for almost all states even for a small volume of products. Although there are no mandi charges or rural development fees in Karnataka, agricultural products attract a 3.5 per cent commission charge which is significantly higher than any other states (Table 4). Most of the marginal farmers sold their produce outside APMC markets, either to local traders or others, only 23% sold in APMC mandis. Further, the sales outside APMC are predominantly out of any regulations which resulted in exploitation of marginal farmers (Figure 14).

Table 4. Non-uniformity in APMC charges.

State	Market Fee/ Mandi Charges (%)	Rural Development Fee (%)	Commission/ Other Charges (%)	Total
Andhra Pradesh	1.0	-	-	1% + FC*
Assam	1.0	-	-	1.0%
Chhattisgarh	2.0	-	0.2	2.2% + FC*
Haryana	2.0	2.0	2.5	6.5%
Karnataka	-	-	3.5	3.5%
Kerala	-	-	-	0.07%
Maharashtra	1.05	-	-	1.05% + FC*
Madhya Pradesh	2.0	-	0.2	2.2% + FC*
Odisha	2.0	-	-	2% + FC*
Punjab	3.0	3.0	2.5	8.5%
Telangana	1.0	-	-	1% + FC*
Uttar Pradesh	2.0	-	0.5	2.5% + FC*
West Bengal	0.5	-	-	0.5% + FC*

Note: *FC: Fixed Charges. This includes a commission to society of ₹31.25/qtl on Common Paddy and ₹32/qtl on Grade A paddy. Source: Food Corporation of India

Figure 14. Disposable pattern of crop sold. NSSO situation assessment survey, 2013

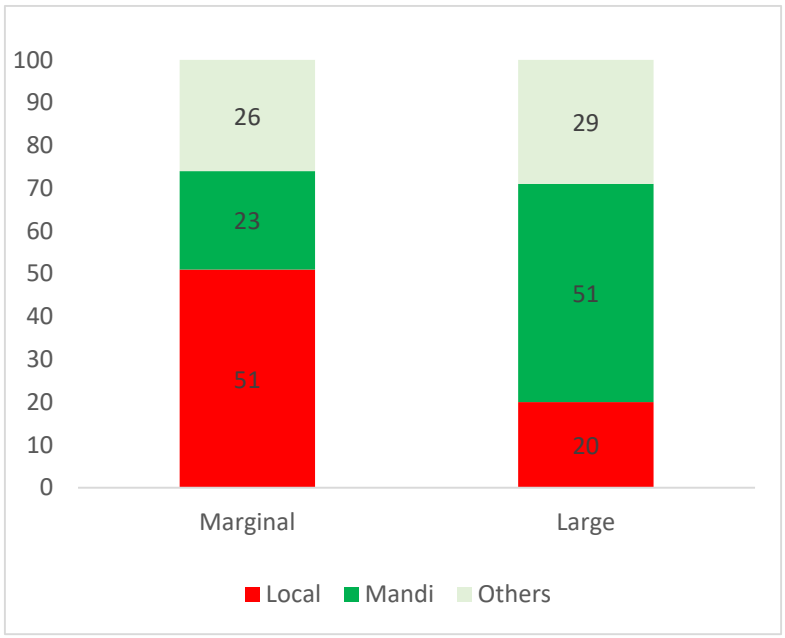


Table 4 indicate that the APMC's mostly be used as a tax revenue source for state governments. Currently, only a small portion of the farmer's produce especially marginal farmers' is sold in the mandi's and the rest is sold outside APMC markets. In this background, the new farm laws are hope to legalize this practice and strengthening the outside markets to reduce exploitation and make them more efficient.

4.8. Inter-state differences in Govt support

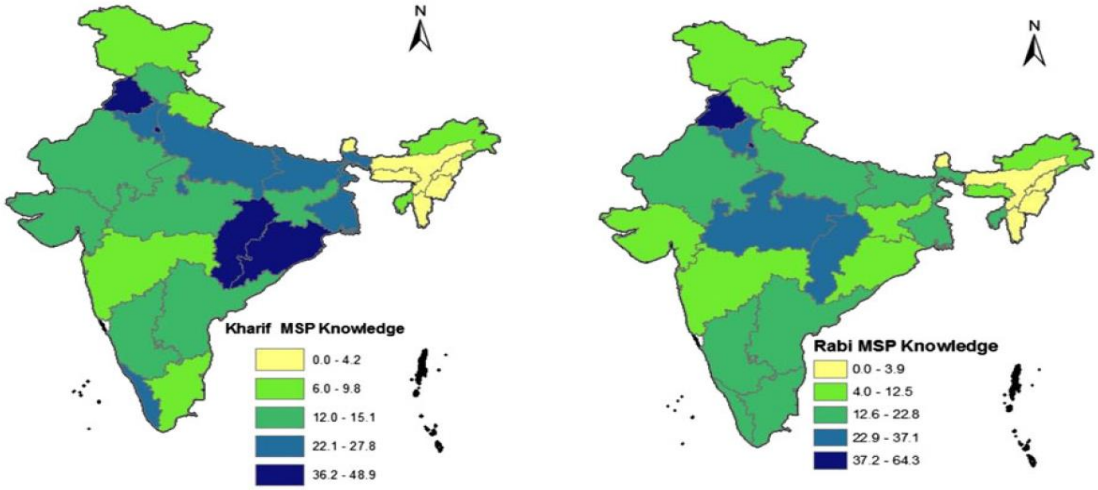
This section deals with the interstate differences in government supports such as MSP operations and fertiliser subsidy.

4.8.1. MSP Operations:

To ensure the successful implementation of the Minimum Support Price (MSP) system, raising farmer awareness is critical. Nationally, only 28.30% of households are aware of MSP for at least one Rabi crop, and 23.13% for Kharif crops. Despite years of policy enforcement, fewer than 25% of farmers knows about MSP for the crops they cultivate. MSP implementation remains uneven, with active procurement and higher awareness concentrated in states like Punjab, Haryana, Chhattisgarh, Uttar Pradesh, and Telangana (Figure. 17). Conversely, farmers in northeastern states, Jharkhand, and regions cultivating less prioritized crops often lack adequate support. This disparity reinforces inequities, as agriculturally advanced states benefit from multiple schemes, further widening income gaps between farming communities.

Challenges such as weak coordination among procurement agencies, insufficient storage infrastructure, and low awareness hinder MSP effectiveness. Procurement remains largely restricted to rice and wheat, leaving other crops underserved and contributing to poor MSP knowledge among growers. Notably, awareness of rice and wheat MSP is higher in major procurement states like Punjab, Haryana, and Chhattisgarh, where historically grains are sourced for public distribution systems (PDS) and buffer stocks (Gulati and Banerjee, 2015). Strengthening outreach and infrastructure in underserved regions is vital to achieving equitable MSP outcomes nationwide.

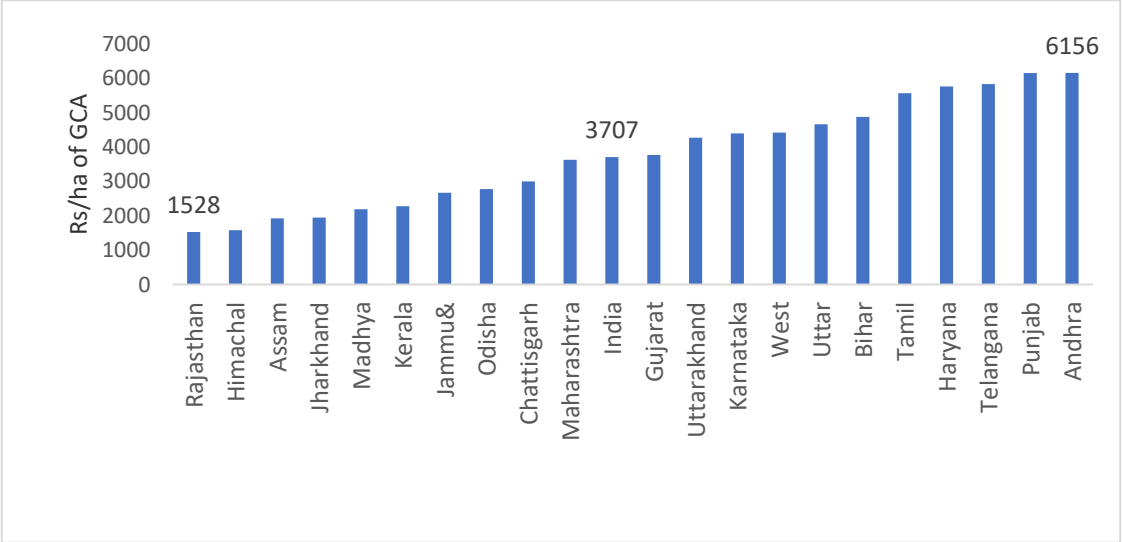
Figure 15. State-wise Awareness of Farmers about Minimum Support Price (MSP) of Crops in Major Crop Seasons (%). Source: NSS Report No. 587: Situation Assessment of Agricultural Households and Land and Livestock Holdings of Households in Rural India, 2019.



4.8.2. Fertilizer subsidy:

The nature and status of agriculture among various Indian states are different due to the diverse climate and soil fertility facilitates cultivation of different crops with varying nutrient requirements. The fertilizer consumption is also bound to vary according to several factors. Therefore, like MSP, fertilizer subsidy is another kind of support provided by government to make the chemical fertilizer available to all the farmers at affordable rates (Praveen *et al.*, 2017) to improve the food production and thus to make the food grains available to all at affordable price.

Figure 16. Fertilizer subsidy (Rs per ha of GCA) (2014-15) (in Rs). Source: Authors calculations from Agricultural Statistics at a Glance, 2016.



Presently, the amount of fertilizer subsidy is concentrated mostly in seven states including Uttar Pradesh, followed by Maharashtra, Karnataka, Madhya Pradesh, Andhra Pradesh, Punjab and Gujarat. These seven states together holding 57.09 per cent of the country's GCA and receives 62 per cent of the total fertilizer subsidy distributed. The share of subsidy per ha of GCA is highest in the states of Andhra Pradesh, Punjab, Telangana and Haryana, and lowest in Rajasthan (Figure 16), Maharashtra, Chhattisgarh and Madhya Pradesh. Although most of the states receive subsidy almost equal to their share in GCA, Uttar Pradesh, Andhra

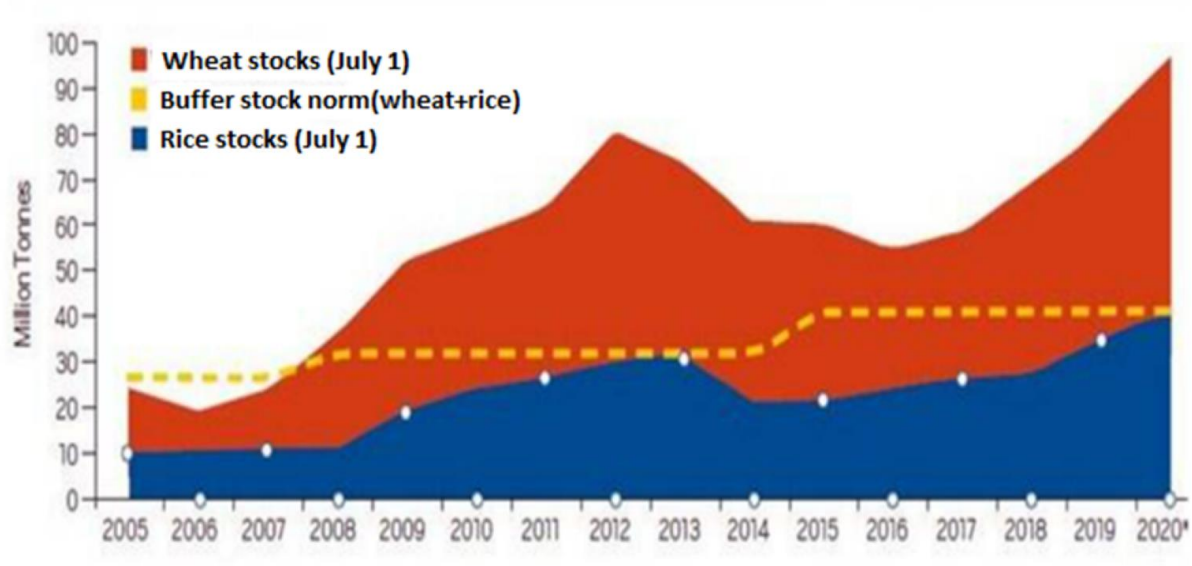
Pradesh, Punjab, Haryana and Telangana receive greater subsidy than their share in GCA (Saini and Kozicka, 2014).

4.9. Efficiency of current procurement system of rice and wheat

4.9.1. Procurement operations

Past studies indicates that while India has achieved significant agricultural growth through government initiatives, persistent malnutrition, food insecurity and poverty remain critical challenges. To address these issues, the buffer stock policy serves as a safeguard against supply shortages during dips in agricultural output. Under this system, the government acquires grains—either through direct purchases from farmers at Minimum Support Prices (MSP) or open market acquisitions—to fulfill the needs of welfare programs and maintain strategic reserves. This approach aims to stabilize food availability during crises though its effectiveness in reducing hunger and food insecurity and also acts as regular supply of food grains through ration shops for Below Poverty Level households.

Figure 17. Food buffer stock norm and actual stocks from 2005 to 2020. Source: FCI annual reports, 2020 and 2021.



Since last several years, India's food grain buffer reserves exceed twice the mandated buffer stocking thresholds (Figure 17). As of 2020, the economic cost estimates for rice and wheat stood at ₹37,026 and ₹27,026 per tonne, respectively. Historical data reveals that, barring a brief period between 2005 and 2007 when reserves dipped below required levels, stockpiles have consistently surpassed official norms in recent years. This has resulted in an excess of approximately 50 million tonnes (MT) of grains—valued at around ₹1.5 trillion—with annual interest burdens of nearly ₹10,000 crore.

Two primary factors drive heightened procurement: supply and demand dynamics. On the supply side, rising Minimum Support Prices (MSPs) have positioned the government as the primary purchaser of surplus grain. Simultaneously, expanding obligations under national food security programs compel agencies like the Food Corporation of India (FCI) to intensify procurement efforts. This problem is intensified by open-ended procurement policies followed by various state governments. Consequently, the government now acquires a dominant share of marketable produce (in some states like Telangana and Chhattisgarh more than 90% of marketed surplus), creating systemic pressures to manage oversized reserves while balancing welfare commitments (Nirmal, 2020).

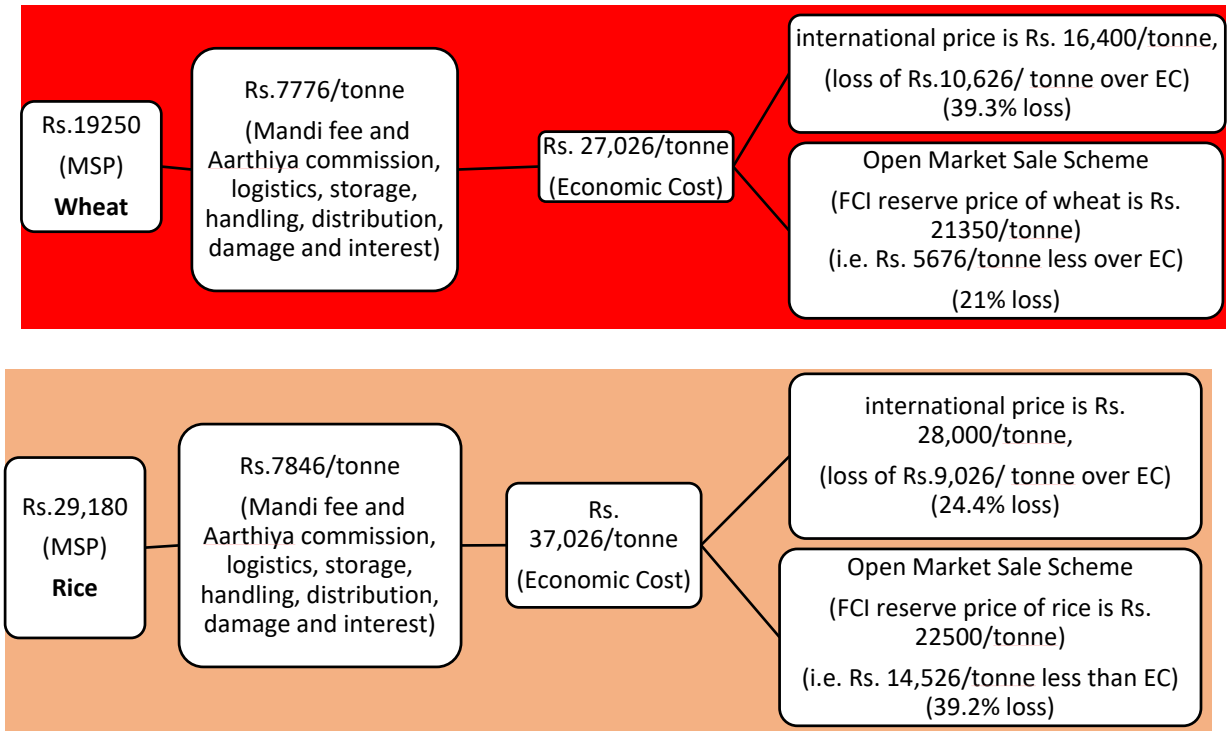
4.9.2. Operations of Buffer stock

The cost of grain management comprises acquisition costs—including pooled procurement costs and associated incidentals—and distribution expenses. When combining the Minimum Support Price (MSP) with expenditures on logistics, storage, handling, and distribution, the total economic cost is estimated at ₹37,026 per tonne for rice and ₹27,026 per tonne for wheat (as shown in the figure below) in 2020 (Figure 18). Recently, the cost of maintaining buffer stocks has been increasing, primarily due to rising procurement-related expenses such as storage, handling, transportation, and other logistical charges.

At the same time, the government has reduced the reserve prices of rice and wheat to facilitate the disposal of surplus buffer stocks. In the Open Market Sale Scheme (OMSS), rice is priced at ₹22,500 per tonne in 2020, down from ₹27,850 one year back, while the reserve price of wheat has been lowered to ₹21,350 per tonne in 2020 from ₹22,450 one year back. These revised prices are significantly below their respective economic costs, and the reductions have widened the existing gap between sale prices and actual costs.

The main reasons behind this price cut include excess stock levels, limited storage capacity, and declining demand for grains in the open market in recent years. As a result, the widening cost-revenue gap has placed considerable financial stress on the Food Corporation of India (FCI), which is incurring losses of approximately 39.2% on rice and 21% on wheat sold under OMSS in year 2020. Similar trends are being observed in international grain markets as well.

Figure 18. Economics of buffer stock operations for the year 2020. Source: Authors calculations from FCI annual reports, various issues.



After elaborating the efficiency of the procurement system, it can be said that the practice of procuring more than stipulated buffer quantities lead to certain imbalances. Therefore, there is a necessity for offloading the excess stock in the international or domestic market, which could lead to a price crash. Also, it could lead to a loss when the international market prices or the FCI reserved prices are lower than the actual economic cost of the stock which is inflated by the excess expenditure on handling, logistics, storage and distribution of the produce.

4.10. Procurement policy biased against other crops

4.10.1. Procurement against production

India has moved from a situation of scarcity of pulses during 2015-16 and witnessed unprecedented shortage and inflation due to successive droughts. The favourable monsoon and the continued enthusiasm in farmers have boosted the production and resulted in the highest ever production of pulses in the country at 25.42 MT during 2018. Despite, this biasedness can be noticed among the other crops than rice and wheat such as pulses and oilseeds. The Tables 5 and 6 indicate the vast difference of the share of procurement of grains against the total production.

Table 5. Production vs. Procurement of Pulses.

Year	Production (Million Ton)	Procurement (% of production)
2012	17.1	0.01
2013	18.4	0.52
2014	19.3	0.26
2015	17.2	0.17
2016	16.3	0.00
2017	23.1	0.03
2018	25.4	6.37
2019	22.1	18.94
2020	23.2	6.52

Source: Food Corporation of India, annual report, 2020.

Table 6: Production vs. Procurement of Rice and wheat.

	Rice		Wheat	
Year	**Production (Lakh Ton)**	**Procurement (% of production)**	**Production (Lakh Ton)**	**Procurement (% of production)**
2015-16	1044.1	32.8	922.9	24.9
2016-17	1097.0	34.7	985.1	31.3
2017-18	1127.6	33.9	998.7	35.8
2018-19	1164.8	38.1	1036.0	32.9
2019-20	1179.4	43.3	1071.9	36.4

Source: Food Corporation of India, annual report, 2020.

As of now, the only crops that see substantial procurement by the government are rice and wheat. The government is more concerned about these grains as these represent food security. Another reason of reluctancy of the government for pulse procurement is its rising MSP. The MSP of pulses is almost three times that of wheat and rice. However, whatever the reasons, pulses along with the oilseeds have been discriminated against rice and wheat and it is economically unfeasible to increase their procurement under MSP. But at this

time when the demand for pulses is soaring, there is a need to build some alternate mechanisms as pulses and oilseeds are poor man's crops.

4.11. Sale of crop output

The deficient monsoon years during 2015 and 2016 resulted in sharp fall in production of pulses in the country. The government increased the MSP for pulses and stepped-up imports to control prices and also ensure stability in prices as well as provide MSP to farmers under the Price Support Scheme (PSS).

However, the disposal of a huge volumes of procured stocks of pulses under the Open Market Sale Scheme (OMSS) by NAFED faces a significant challenge, particularly in the depressed market conditions. Since pulses are prone to infestation during prolonged storage, so the timely disposal of stocks assumes significance. The average price recovery in the disposal of PSS stocks under OMSS by NAFED has been even less than MSP. Therefore, the market price continues to prevail at a much lower level than MSP (Table 7).

Table 7. Disposal of pulses under open market sale scheme by NAFED.

	Year	**MSP (Rs/qtl)**	**Avg rate of disposal (Rs./qtl)**	**Volume of OMSS Disposal (lakh tonne)**	**Loss % over MSP**
Tur	2019	5675	3583	4.1	36.9
Gram	2019	4620	4236	9.6	8.3
	2020	4875	4014	3.9	17.7
	2021	5100	4862	7.3	4.7
Moong	2019	6975	4545	3.0	34.8
	2020	7050	5949	2.1	15.6
	2021	7196	6752	0.6	6.2
Masur	2019	4475	3566	0.9	20.3
	2020	4800	4428	0.3	7.7
Urad	2019	5600	3350	2.0	40.2
	2020	5700	4875	1.5	14.5
	2021	6000	5360	1.3	10.7

Source: NAFED, 2021 annual report.

The disposal of pulses procured under the PSS by NAFED has been a challenge as the federation incurs heavy losses in the open market, and sale of stocks depresses market prices. Lack of government policy for the sale of pulses stocks like wheat and rice is a major constraint for ensuring nutritional security to a large mass of people without impacting the market prices (Jayan, 2018).

4.12. Market price below MSP

In recent years higher agricultural production brings optimism for India's rural economy, however, crop profitability has declined sharply – particularly for pulses and oilseeds (Table 8). This challenge stems not from MSP policies themselves, but rather from procurement limitations. The primary driver of shrinking farmer incomes has been consistently low market prices coupled with low yields for these crops. The situation is exacerbated by two key factors: disproportionate procurement focusses on rice and wheat, coupled with inadequate infrastructure, which prevents farmers of other MSP-covered crops from realizing their benefits (The Economic Times, 2017). Whenever, there is increase in production, market prices have fallen below MSP thresholds, leaving farmers without the promised price security despite their increased output (Sharma, 2020).

Table 8. Sale price of various crops.

Crop	Average sale price
Soybean	6-15% less than MSP
Groundnut	25-40% less than MSP
Sunflower	35% less than MSP
Mustard	15-20% less than MSP

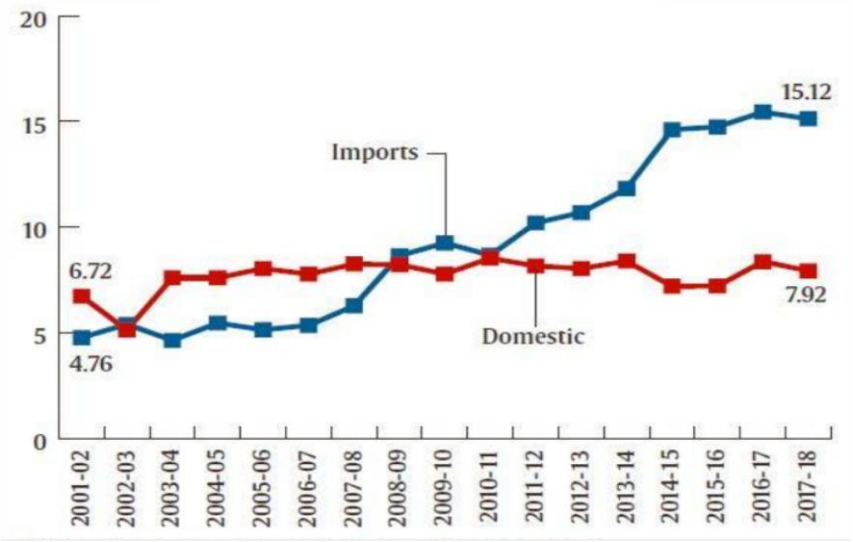
Source: CACP reports, 2021

4.13. Inadequacy in production of pulses and oilseeds

Figure 21 illustrates the significant disparity between domestic production and imports of edible oil in India. The country currently produces less than half of its total edible oil requirement. This shortfall is primarily attributed to factors such as rainfed cultivation conditions, high seed costs, small landholdings with limited access to resources, and a low seed replacement rate, all of which contribute to low productivity levels.

At the present consumption level, estimated at 23.5 million tonnes annually, domestic production from both primary and secondary sources meets only about 40% of the demand. The remaining 60% is fulfilled through imports. Due to the sluggish growth in oilseed production, the gap between demand and supply persists, necessitating substantial import volumes to meet national consumption needs (Arora, 2013).

Figure 19. Edible oil: imports versus domestic production (million tons).



Source: Agricultural Statistics at a Glance, 2020.

To enhance domestic availability of edible oils and reduce the country's heavy reliance on imports, the Government of India has launched the National Mission on Edible Oils – Oil Palm (NMEO-OP). This initiative aims to boost indigenous oilseed production through improved cultivation practices, research support, and consumer awareness campaigns. Currently, India imports approximately 15 million tonnes of edible oil annually, incurring an import bill of over ₹70,000 crore. However, the country has an underutilized refining capacity of nearly 30 million tonnes, with only about 45% of it being operational, according to the Solvent Extractors' Association (SEA). To address this imbalance, the government has been promoting the import of crude rather than refined oil, enabling better utilization of domestic refining infrastructure and create employment in the sector.

Regulatory hurdles are hindering release and adoption of Genetically Modified (GM) Mustard, even though it is having potential to expand area and production of edible oilseeds. Approved for environmental release after extensive scientific review, GM mustard can help bridge the yield gap in mustard cultivation—a key oilseed crop in India. With higher productivity, improved resistance to biotic and abiotic stresses, and greater oil content, GM mustard can contribute to increasing domestic edible oil output substantially. And also open up scope for introducing GMO crops in other edible oilseeds like soyabean, where there is a lot of scope.

Reviving the edible oil sector will require a multi-pronged approach: enhancing productivity through technology adoption (like GM crops), expanding area under oilseeds, improving seed quality and distribution, supporting price incentives, and strengthening processing and value chains (Reddy and Bantilan, 2012). Combined, these efforts can help India reduce its import dependence and achieve greater self-sufficiency in edible oils. Similar strategies have to be followed in pulses to reduce import dependency (Reddy *et al.,* 2023).

4.14 Reformation of agricultural policy

Agriculture in India has traditionally been one of the most heavily regulated sectors, governed by a complex framework of rules and controls imposed by both the central and state governments. Following independence, the country adopted a strategy aimed at achieving self-sufficiency in staple crops like rice and wheat. Early agricultural policies focused on expanding the area under cultivation, implementing land reforms, promoting community development, and restructuring rural credit systems to enhance access to finance. To support these goals, the government introduced a range of interventions, including input subsidies, minimum support prices (MSP), public procurement and storage systems, distribution networks, and protective trade policies. However, in contrast to the extensive liberalization witnessed in many other emerging economies, India's reform initiatives largely bypassed the agricultural sector, leaving it relatively insulated from broader economic transformation (Chand, 2018). Liberalization and market reforms started in 2003 onwards with Model APMC Act and followed by Forward Contract (Regulation) Amendment Act in 2006.

4.15. Long period of policy paralysis

The Indian agriculture is plagued by countless challenges such as soil degradation, climate change, declining incomes, inflation, severe socioeconomic ripple effects, underinvestment and unproductive land. Besides, social, market and economic pressures add onto their distress. Interestingly, prices of the farm commodity are simultaneously rising for the consumer but the farmer is getting a rough deal (The Hindu, 2021). During the famine situation of 1943, when the domestically produced food was not enough to quell the hunger of the country's population, India imported more food from other countries and directly feed the people without storage**.** It is very surprising that the acts and regulations which were put in place during that period to tackle this ‘ship to mouth’ situation are still being perpetuated in this era when India is self-sufficient in food production especially staple foods. There was the existence of redundancy of several acts and legislations such as Essential Commodities Act of 1940s and 1950s for stock limits, restrictions on inter-state trade, APMC Act. Also, 1990 economic liberalisation which was for industry and service and agriculture was completely ignored, Green revolution/White revolution that were mostly central government initiative. The presence of a large number of petty traders (small and feudal) and the lack of infrastructure in the sector and high cost of intermediation constrained the access of about 30-35 per cent less food grain by the consumer. Further the leakage of about 46 per cent of food grains from FCI-PDS system clearly indicated the existence of corruption in the system. Therefore, it is clear that due to certain vested interests, several much-needed reforms were hindered from being implemented in due time.

4.16. Lack of dynamism in agricultural markets

The National Agricultural Policy of 2000 emphasized encouraging private sector involvement to boost technology adoption, attract investments, and provide stable markets for agricultural produce. However, private sector engagement in agriculture has remained limited. A key reason is the lack of reform in wholesale markets governed by the Agricultural Produce Market Committee (APMC) Act. These markets impose steep charges, including market fees, market cess, and commissions, and operate under the authority of state

governments, which grants them monopolistic control. Rather than fostering a competitive market environment, APMCs have often hindered private investment and restricted farmers to selling only in state-regulated market yards. Additionally, the inadequate post-harvest infrastructure and limited private storage options have resulted in high levels of crop wastage—up to 35%. On the other hand, the sharp fall in prices at harvest and the surge in off-season prices have created opportunities for political manipulation at the local level. In light of these persistent challenges, the government was compelled to reconsider and reorient its agricultural policy toward a more market-friendly and investment-driven approach.

4.17. Context of liberalisation of agricultural markets (new farm laws, September 27, 2020)

Multiple Economic Surveys have highlighted concerns over the functioning of Agricultural Produce Market Committees (APMCs) and the monopolistic structures they support. While improvements in market efficiency are necessary, they alone do not ensure fairness or equity for all stakeholders. After years of policy stagnation, a comprehensive reform in agricultural marketing was seen as essential. The introduction of the new farm laws marked a strategic shift intended to liberalize agricultural markets and enhance the livelihoods of farmers, especially the small and marginal ones who constitute nearly 85% of India's farming population and have been the most disadvantaged under the existing APMC-dominated regime.

Over the years, the central government encouraged states to adopt model agricultural market reforms, but with limited success. The new farm laws aimed to overcome these limitations by creating a unified national market, increasing private sector participation, and expanding the choices available to farmers. These reforms were designed to allow farmers to sell their produce beyond the confines of state-licensed mandis, and to facilitate smoother interstate trade by removing barriers created by state-level APMC legislations. The goal was to reduce inefficiencies and revenue losses that farmers often experienced under the previous system.

Importantly, the reforms also enabled contract farming, providing a legal framework for farmers to enter into pre-agreed contracts with agribusinesses, processors, exporters, or retailers. This was intended to ensure assured markets, reduce price risks, and improve access to technology and inputs. Additionally, the laws proposed amendments to the APMC Acts and the Essential Commodities Act to remove restrictions on the storage and movement of agricultural commodities, thus promoting private investment in post-harvest infrastructure (Chand, 2020). By addressing challenges like weak infrastructure and multiple intermediaries, the reforms aimed to increase price realization and empower farmers with greater autonomy in marketing their produce.

4.18. Repeal of new farm laws (repealed 1st December 2021)

In September 2020, the Government of India enacted two new farm laws and amended the Essential Commodities Act of 1951, aiming to liberalize agricultural markets and attract private investment. These reforms were introduced as part of a broader effort to complete the market-oriented transformation of Indian agriculture that began with the economic liberalization of 1991. While many considered the new laws historic and transformative—particularly in offering farmers more choices, reducing middlemen, and improving price realization—they also faced sharp criticism and widespread protests, especially from farmers in Punjab and Haryana.

Opposition stemmed from fears that the reforms would weaken the minimum support price (MSP) system, dismantle APMC mandis, and expose small and marginal farmers to exploitation by large corporations. Concerns were also raised about the dilution of the role of traditional market intermediaries, though the government argued that the new laws would benefit millions of farmers by enhancing market access, encouraging contract farming, and reducing post-harvest losses.

Despite prolonged negotiations and public outreach efforts, the protests intensified, leading to a significant political standoff. Eventually, in response to sustained pressure from farmer unions—primarily

from Punjab and Haryana—the central government announced the repeal of the three farm laws. The formal withdrawal took place on December 1, 2021, marking a rare reversal of a major policy decision.

4.18.1. The Farmers' Produce Trade and Commerce (Promotion and Facilitation) Ordinance, 2020 (FPTC Act)

Among the three farm laws, the Farmers' Produce Trade and Commerce (FPTC) Act was the first. In the wake of the economic disruptions caused by the COVID-19 pandemic, the government saw an opportunity to introduce bold policy measures to address longstanding structural challenges in agriculture. The FPTC Act was enacted with the aim of providing farmers with alternative marketing options beyond the regulated APMC mandis, which had been criticized for lack of transparency and inconsistent enforcement of rules.

The Act establishes a legal framework for farmers to sell their produce in designated "trade areas" outside the APMC markets, thereby creating multiple avenues for transactions. It encourages the use of digital platforms and e-commerce in agriculture and includes provisions for registering traders and recording transactions in these trade areas. One of the key benefits of the Act is that it permits direct procurement from farmers' fields, allowing them greater autonomy in price negotiation (Chand, 2020; The Hindu, 2021b).

By creating a level playing field between APMCs and private players, the FPTC Act promotes healthy competition and is expected to streamline the agricultural value chain. It is particularly beneficial for smallholder farmers, as it supports market diversification, reduces excessive intermediation, and can potentially enable farmers' groups to sell directly to consumers. Overall, the Act seeks to foster a more efficient, transparent, and farmer-centric marketing environment.

4.18.2. The Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services Ordinance, 2020 (APAFS)

The Agreement on Price Assurance and Farm Services (APAFS) Act represents a streamlined and enhanced approach to contract farming, building on earlier models already adopted by several states. Unlike the previous frameworks that often-involved complex procedures and state-specific compliance burdens, this Act simplifies the contractual process and focuses primarily on securing pre-agreed prices for agricultural produce. It also facilitates the provision of farm inputs and services by buyers to farmers.

The Act offers a more farmer-friendly structure than traditional contract farming agreements, with several provisions designed to safeguard farmers' interests—especially in light of their expectations around post-harvest prices. The agreement is structured to ensure that farmers are not bound by rigid terms and instead have the flexibility to negotiate in a more transparent and predictable environment.

A prominent example of this model in practice is seen in the dairy sector. Nestlé, a global food company, has successfully implemented contract-based arrangements with dairy farmers in India. The company provides technical assistance, veterinary services, and essential inputs while operating a highly efficient supply chain. Farmers receive weekly payments based on milk quality, particularly its fat and solids-not-fat (SNF) content, ensuring fair and performance-based pricing (Chand, 2023).

4.18.3. Essential commodities (amendment) Act, 2020

The amended legislation focuses on essential agricultural commodities such as cereals, pulses, potatoes, onions, edible oilseeds, and oils, with the objective of reducing apprehensions among private investors regarding excessive government intervention. Under the revised provisions, the central government is permitted to regulate the supply of these commodities only in exceptional situations—such as war, famine, severe price surges, or natural disasters.

The Act introduces a framework for imposing stock limits based on price triggers: a 100% rise in the retail price of perishable horticultural produce or a 50% increase in the price of non-perishable food items. By

limiting arbitrary controls, the policy is expected to encourage large-scale private investment in infrastructure such as storage facilities, cold chains, and transportation networks. This, in turn, could help minimize food wastage, stabilize prices across regions and seasons, and prevent sudden market collapses.

Additionally, the legislation provides for proper documentation and tracking of privately held storage facilities, including details on quantity and location, contributing to better transparency and supply chain management.

4.19. Pre-requisites for successful implementation of Acts

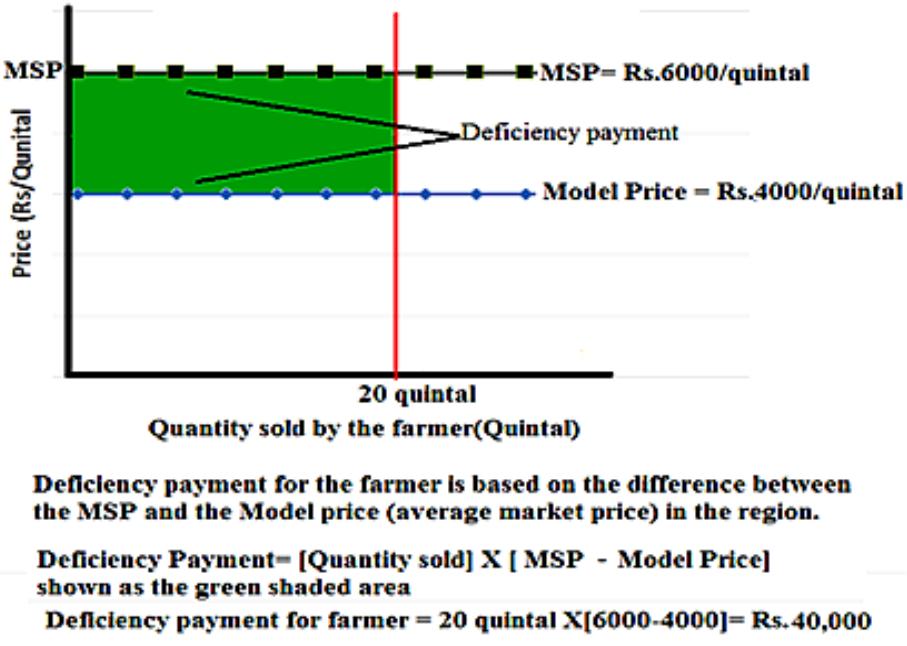
For the proper implementation of these Acts the FPOs, local level institutions, farmers collectives, SHGs should be encouraged to be pro-active. Along with this, the proper registration and tracking of transactions in trade area are mostly required. In order to modernize the existing mandis and strengthen the agriculture market infrastructure in the country for effective implementation of new laws, government has also been providing financial assistance through various centrally sponsored schemes. Also, towards this aim, government has taken initiative to expand eNAM (electronic National Agriculture Market) by integrating an additional 1,000 mandis to enhance farmers' access to multiple markets and buyers across the country and also to bring transparency in trade transactions with the intent to improve price discovery mechanism (Reddy, 2021; Reddy, 2018).

In such kind of a setup, the farmers, consumers and the large corporate houses will stand to gain whereas the small-scale middlemen, commission agent, state government revenues and APMC market committees will accrue a loss.

5. Way forward

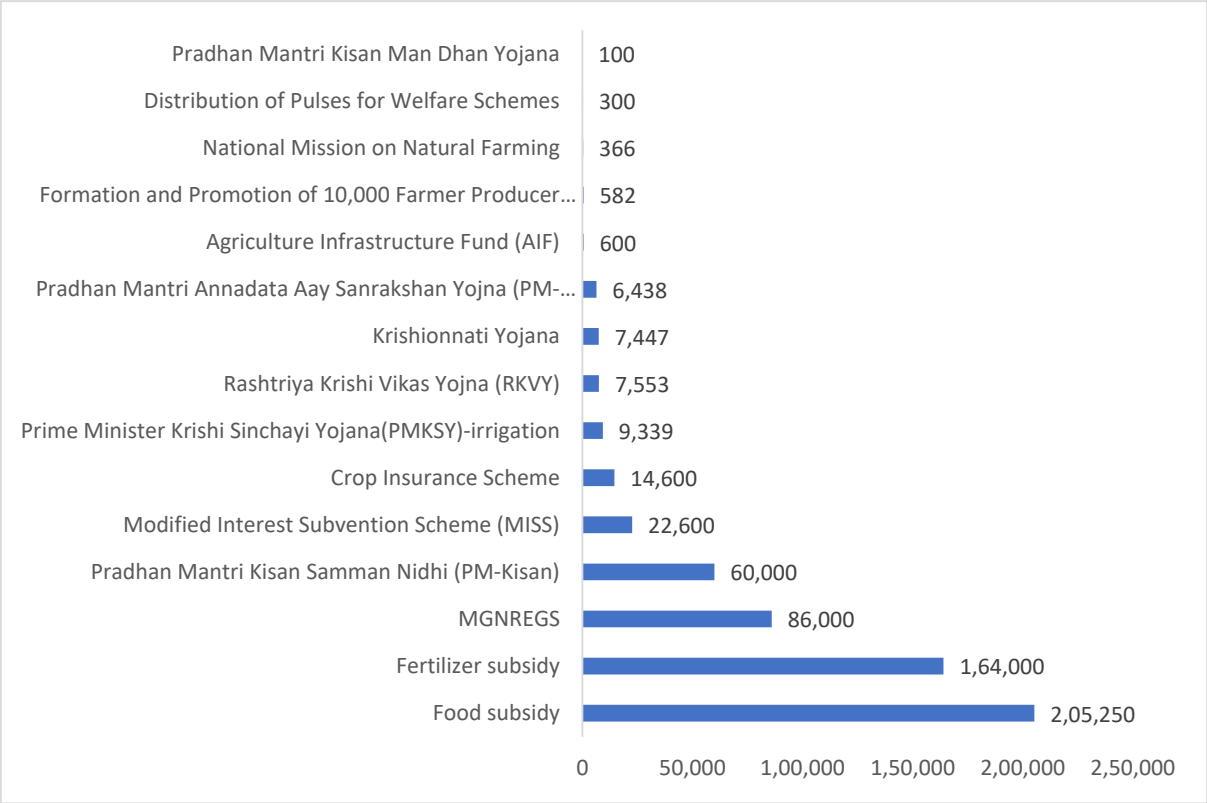
From the above discussions, it has realized that there is a need for gradual shifting of scheme from assured price to assured income. For that purpose, this paper suggests two alternatives. First one which is the alternative to MSP operation is, shift to a Price Deficiency Payment (PDP) system, where paddy and wheat could be procured under MSP up to the necessary levels to meet the PDS demands but beyond that it must be disbanded and the remaining 21 crops should be provided PDP (Figure 20). The PDP system is more efficient than physical procurement.

Figure 20. MSP based Price Deficiency Payment Mechanism. Authors calculations.



The other alternative is the modification of Crop insurance to income insurance scheme, the PMFBY, which needs to cover the price risk in addition to the yield risk. The irrigation should be strengthened and the budget under agriculture subsidies should be pooled under this for providing income insurance (Figure 21). This will prevent market distortion and assure the farmers a minimum income.

Figure 21. Budget allocation in year 2024-25 (Rs crore).



Source: Economic Survey, 2025.

So, after all the discussions the paper suggests the academicians and researchers to take the responsibility of ensuring sustainability and equitability as well as achieving market efficiency along with the intervention of government by providing some safeguard.

5.1. Policy conclusions

In India, the new farm laws are intended to opening up agricultural economy and exposing farmers to free market opportunities. On the fear of exposing to market volatility, farmers are agitating for guaranteed minimum support price. Although, MSP policy achieved its objective of providing assured prices for paddy and wheat farmers and also abundant supply of food grains, it neglected other crops like pulses, oilseeds, fruits and vegetables, resulted mass undernourishment among children and women. Under the existing MSP policy with complete focus on paddy and wheat with utter neglect of other crops, farmers of pulses and oilseeds are exposed to market vagaries and volatility, resulted in low production, low profitability and excessive dependence on imports.

5.2. Assuring MSP for all crops is not possible

On the other hand, as per the farmers demand if government guarantee MSP for all crops, it will be a gigantic task, needs huge budget allocations, support from state and local marketing boards to evolve economically feasible solutions given that the state capabilities are limited and vary. Some states like Punjab are historically in better position to procure their major crops, paddy and wheat, while some other states like

Bihar and Orissa have limited capabilities. Because of this, Punjab and Haryana farmers received higher prices then farmers in East-Indian states like Bihar over several decades.

In addition, except paddy and wheat, there was no proper procurement mechanism for the remaining 21 crops for which MSP is announced. Although under decentralised procurement system, some states are procuring pulses and oilseeds, they just cover less than 5% of the production.

India cannot depend on achieving target of doubling farmers' incomes just by procuring only paddy and wheat that too from only a handful of states. The current MSP policy is hugely discriminatory against rainfed farmers who grow pulses, oilseeds, fruits and vegetables, and constitute more than 70% of the 12 crore farm families in India.

Even under ideal situations, the actual procurement at MSP cannot reach more than 20% of farmers, hence cannot be a solution to increasing farmers' incomes. The actual procurement was less than 5% of market arrivals for pulses and oilseeds and even for paddy and wheat it reached only about 20-30 % farmers in 2019 crop season.

The prices of oilseeds were less than 10 to 30% in most of the markets during the recent kharif season. The biased policy also contributing to huge import of edible oils each year incurring enormous cost to Indian exchequer to the extent of Rs.70,000 crore. Whereas fruits and vegetable are entirely out of the MSP procurement policy.

In the changed scenario of surplus food production with buffer stocks exceeding 2-3 times of the normal requirement, the past biased MSP policy will do more harm than the good. Now it is time to broad base MSP policy to other crops to encourage crop diversification to contribute to not only food security but also nutritional security.

5.3. No private investments under old MSP policy

Due to extensive government involvement in food markets, the participation of the private corporate sector in agriculture has remained minimal. Currently, it accounts for less than 2% of the total investment in the agricultural sector and under 0.5% of overall corporate investment in the Indian economy. This limited engagement by large corporations, combined with the dominance of small-scale traders, has resulted in a significant lack of investment in critical infrastructure such as warehouses, cold storage facilities, aggregation centers, and transportation networks. As a consequence, agricultural trade and marketing continue to function with substantial inefficiencies and rely heavily on outdated systems and technologies.

5.4. The new farm laws encourage investments and new technology

The new farm laws provide congenial long-term environment to promote free markets in which price discovery takes place based on demand and supply, hence will incentivize crop diversification to high value crops like pulses, oilseeds, fruits and vegetables. It will also encourage huge corporate investments in food processing sector both in supply chain development as well as retail sector. This will ultimately enhances farmers' incomes through backward linkages.

5.5. Modified MSP policy as price insurance

Although the new farm laws will help in encouraging much needed private investments in agricultural infrastructure like cold chains, warehouses, collection centres and aggregation centres, they cannot ensure stable and remunerative prices to farmers. Hence, there is a need for modifying the past MSP policy to safeguard the farmers from high volatility and also low prices. Although crop insurance schemes like Prime

Minister Fasal Bhima Yojana (PMFBY) was in implementation, it covers only production risk with complete neglect of price risk.

Under the new farm laws, the role of the MSP policy should be altered in such a way that (i) Procurement of paddy and wheat meets the needs of procurement for food security, (ii) Price Deficiency Payment Scheme (PDPS) for remaining 21 crops and (iii) Provide signal price for crops with fragmented markets.

To modify the MSP policy to meet the above three objectives is a balanced act, which require different operational modalities.

5.6. Procurement of paddy and wheat

The first objective of meeting the needs of procurement of food grains for Public Distribution Scheme (PDS), the existing Price Support Scheme (PSS) for paddy and wheat needs to be continued with the emphasis on decentralised procurement with more responsibility of procurement to state government agencies, cooperatives and farmer producer companies.

Under PSS only for two commodities, government is spending about Rs. 2 lakh crore every year on food subsidy. To expand it to all 23 crops, some estimates indicated that it may cost up to Rs.18 lakh crore, which is beyond the capacity of both central and state governments in terms of finances and also logistical arrangements.

5.7. Price deficiency payment for remaining 21 crops

The remaining 21 crops for which MSP is announced have to be covered under PDPS, under this, farmers are paid the difference between MSP and the modal price of the market, with no procurement and farmers are free to sell in open markets. It is most efficient method, as it eliminates all logistic costs relating to procurement, storage and offloading. It is neutral to crops and geography. It can be operational for any crop anywhere even in remotest parts of India.

The implementation of the PDPS is easy and feasible across the country, as all the necessary information for direct transfer of price deficiency payment like farmers identification, land records, bank accounts are collected under already fully functional PM-KISAN scheme. The model price of all the APMC markets is available under AGMARKNET. Only additional information needed is the quantity sold by each farmer, which can be estimated based on acreage data collected by state department of agriculture at the beginning of the season or actual submission of sale receipts.

The PDPS was implemented in the past in Madhya Pradesh under Shavantar Yojana. However, there are some design problems in the scheme, where in some problems in estimation of model price leading to collusion among traders and farmers to artificially push down the model price, so that the deficiency payment will be higher. These design problems in estimating model price can be overcome by the benchmarking with international price or with past price, which is immune to manipulation.

The implementation of PDPS schemes is not dependent on the capacity of the government to procure through APMCs or any other agency, hence farmers fear of neglecting the APMC markets under new laws will be eased.

5.8. Price signal for scattered markets

The price support scheme covers paddy and wheat, while PDPS will cover the remaining 21 crops. Still there are some crops which are not covered both in PSS and PDPS, which are generally thinly produced in

wide areas with fragmented markets. For these crops, estimating the model price may be difficult as there are no nation-wide markets. However, there is a scope for exploitation of these farmers by middleman due to very scattered, thin and fragmented markets, to safeguard these farmers, modified MSP policy should provide signal price, so that all market participants will adhere to the signal price in the long run in the absence of markets for price discovery.

Overall, with the implementation of new farm laws, role of MSP policy also needs to change to accommodate pro-market price insurance policy options.

Funding: No funding sources used for this paper.
Ethics: No ethical issues exist for this paper. No conflicts of interest

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Annexure 1. Status of adoption of reforms with respect to 12 identified areas and notification of rules thereunder provision-wise are given in the table below:

Si. No.	Area of Reforms	State adopted the reform provision in Act	Notified the rules
1	Private market	A.P., Arunachal Pradesh, Assam, Chhattisgarh, Goa, Gujarat, Haryana, H.P., Jharkhand, Karnataka, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Odisha, Punjab, Rajasthan, Sikkim, Tamil Nadu, Telangana, Tripura, U.P., Uttarakhand, W.B. and Chandigarh (26 states/UTs).	A.P., Chhattisgarh, H.P., Karnataka, Maharashtra, Odisha, Punjab, Rajasthan, Sikkim, Telangana, Tripura, U.P., Uttarakhand, W.B. and Chandigarh (15 states/UTs).
2	Direct Marketing (wholesale purchase from farm gate outside the market - yard)	A.P., Arunachal Pradesh, Assam, Chhattisgarh, Goa, Gujarat, Haryana, H.P., Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Punjab, Rajasthan, Sikkim, Tamil Nadu, Telangana, Tripura, U.P., Uttarakhand, W.B. and Chandigarh (26 states/UTs).	A.P., Chhattisgarh, Haryana, H.P., Karnataka, M. P., Maharashtra, Punjab, Rajasthan, Sikkim, Telangana, U.P., W.B. and Chandigarh (14 states/UTs).
3	Declaring warehouse/silo/cold storage as deemed market –yard	A.P., Arunachal Pradesh, Assam, Gujarat, Haryana, Jharkhand, Karnataka, Manipur, Meghalaya, Nagaland, Tamil Nadu, Telangana, Tripura and U.P.(14 states/UTs).	A.P., Karnataka, Telangana and U.P.(4 states).
4	e-Trading Platform	A.P., Arunachal Pradesh, Assam, Goa, Gujarat, Haryana, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Nagaland, Punjab, Rajasthan, Tamil Nadu, Telangana, Tripura, U.P., W.B. and Chandigarh (21 states/UTs).	A.P., Goa, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Punjab, Rajasthan, Telangana, U.P., W.B. and Chandigarh (12 states/UTs).
5	Single point levy of market fee	A.P., Arunachal Pradesh, Assam, Chhattisgarh, Goa, Gujarat, Haryana, H.P., Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Odisha, Punjab, Rajasthan, Sikkim, Tamil Nadu, Telangana, Tripura, U.P., Uttarakhand, W.B. and Chandigarh (27 states/UTs).	A.P., Chhattisgarh, Goa, Gujarat, Haryana, H.P., Karnataka, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Sikkim, Tamil Nadu, Telangana, U.P., Uttarakhand, W.B. and Chandigarh (19 states/UTs).
6	Single Unified License	A.P., Arunachal Pradesh, Assam, Chhattisgarh, Goa, Gujarat, Haryana, H.P., Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Odisha, Punjab,	A.P., Chhattisgarh, Goa, Gujarat, Haryana, H.P., Karnataka, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Sikkim, Tamil Nadu,

		Rajasthan, Sikkim, Tamil Nadu, Telangana, Tripura, U.P., Uttarakhand, W.B. and Chandigarh (27 states/UTs).	Telangana, U.P., Uttarakhand, W.B. and Chandigarh (19 states/UTs).
7	Rationalization of market fee	A.P., Arunachal Pradesh, Assam, Goa, Gujarat, H.P., Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Odisha, Rajasthan, Sikkim, Tamil Nadu, Telangana, Tripura, U.P., Uttarakhand, W.B., NCT of Delhi and Puducherry (25 states/UTs).	
8	Rationalization of Commission charges	A.P., Arunachal Pradesh, Assam, Chhattisgarh, Goa, Gujarat, H.P. (partial), Jharkhand, Karnataka (partial), M.P., Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Odisha, Sikkim, Tamil Nadu, Telangana, Tripura, U.P., Uttarakhand, W.B., and Puducherry (24 states/UTs).	
9	Reciprocity of trading license	Arunachal Pradesh, Assam, Gujarat, Jharkhand, Manipur, Meghalaya, Nagaland, Tripura and U.P(rules). (9 states). (Note: Neither any states have notified the rules nor entered into MoU.)	
10	De-regulation of F &V	A.P., Arunachal Pradesh, Assam, Chhattisgarh, Gujarat, H.P., Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Nagaland, Odisha, Rajasthan, Sikkim, Tamil Nadu, Tripura, U.P., W.B. and NCT of Delhi (21 states/UT).	
11	Exemption of market fee for direct sale to processing units by farmers/FPOs at their premises	Karnataka, Maharashtra, Rajasthan, U.P. and NCT of Delhi (5 states/UT).	
12	Exemption of market fee on produce brought from other state for processing	A.P., Arunachal Pradesh, Chhattisgarh, Goa, Karnataka, Rajasthan, Tamil Nadu, Telangana, U.P., Uttarakhand and NCT of Delhi (11 states/UTs).	

Source: National Policy Framework on Agricultural Marketing.
https://agriwelfare.gov.in/Documents/HomeWhatsNew/Draft_National_Policy_framework_AgriMarketing_25112024.pdf