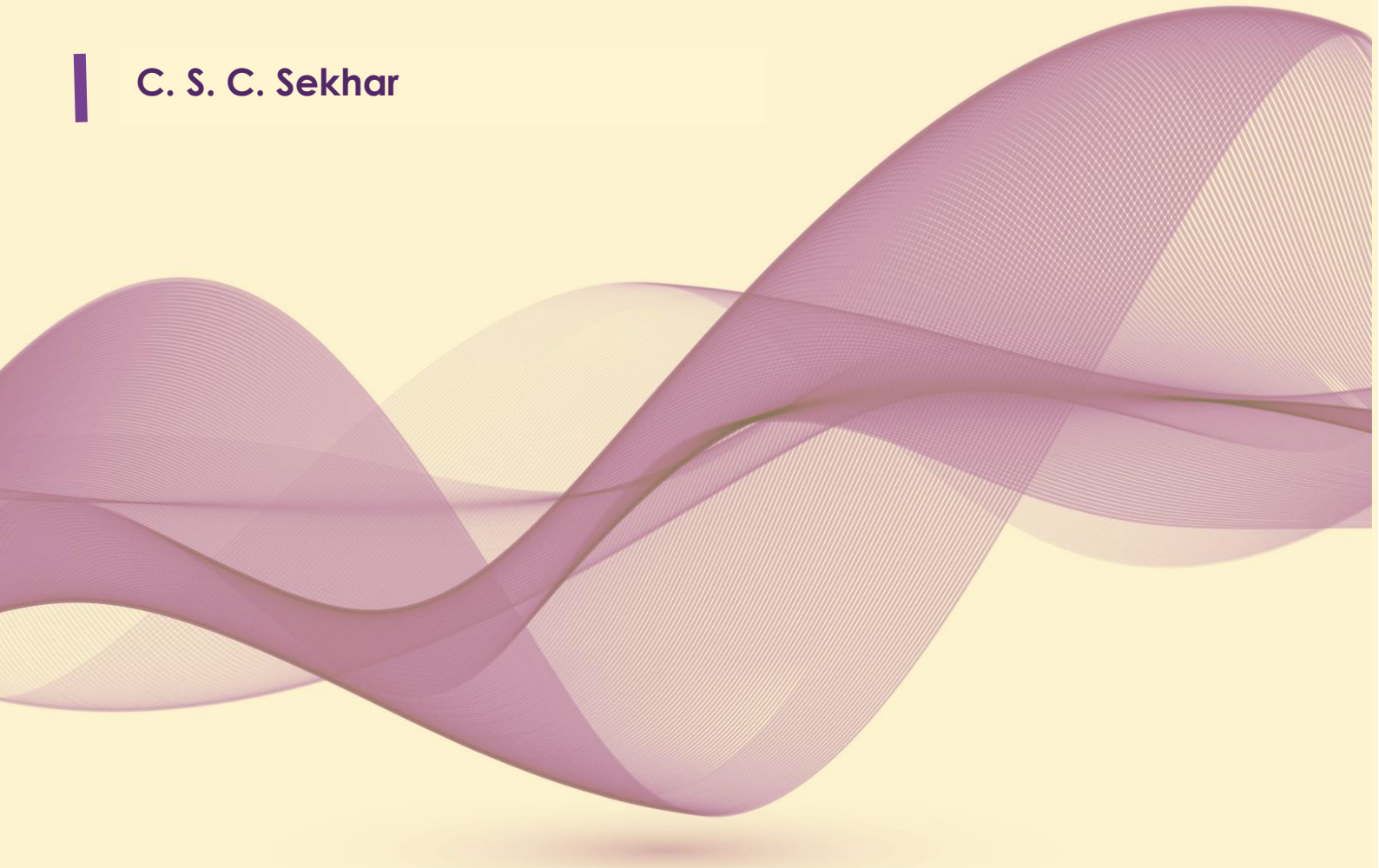
Price or income support to farmers?

Policy options and implications

C. S. C. Sekhar



2021

IEG Working Paper No. 420

सत्यमेव परमो धर्मः

March 2021

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C.S.C. Sekhar[1][2]

Abstract

The recent farm laws enacted by the Indian Parliament have sparked a major debate over the importance and the form of public support for farming in India. At the centre of the discourse are issues related to price support, income stabilization, fair trade and the role of government. The Government of India and the state governments have launched several programs in recent years to provide support to farmers. Some of the policy initiatives of the Central Government included major departures from the past. An ambitious price support program (PM-AASHA) was launched in 2018 with a vastly enhanced minimum support prices (MSP). For the first time, a direct income support program (PM-KISAN) was launched in 2019 to make direct transfer payments to farmers. The present study explores the scalability and feasibility of these programs. Different models of price and income support have been analyzed and a comparative picture has been drawn. The study finds that direct income transfers have several advantages over MSP-procurement system. However, given the crucial role of food stocks for food security, a differentiated policy may be needed for staple and non-staple food crops. A judicious policy mix may be needed considering the supply-demand conditions of different crops, affordability of food prices to the poor and ensuring a minimum income to farmers.

Keywords: *Indian agriculture; minimum support price; public support; food security; farm laws*

[1] Institute of Economic Growth, University of Delhi; csekhar@iegindia.org

[2] This is a revised version of the paper presented in seminars at Madras University, IIT Delhi, IIM Ahmedabad and Institute of Economic Growth. I would like to thank the participants of these seminars for useful suggestions. The usual disclaimer applies.

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Price support vis-à-vis income support to farmers: Policy options and implications

During the mid-1960s, self-sufficiency in food production was the overarching policy concern in Indian agriculture, which was instrumental in promoting the green revolution. Thereafter, policy concerns have been changing every decade or so. The focus of green revolution on well-endowed regions like Punjab, Haryana, West Uttar Pradesh and Coastal Andhra Pradesh led to a rise in inter-regional inequalities. Hence, by the 1980s balanced agricultural growth became the focus of policy. However, large quantum of input subsidies and output price support led to increasing resource degradation and deceleration in capital formation in agriculture. There was severe stagnation in agricultural growth from 1995-96 to 2004-05, mainly as a result of the deceleration in public investment and capital formation that started in the early 1980s and continued into the mid-1990s. Important initiatives were launched from the middle of the first decade of the new millennium to address the growth stagnation. Focused initiatives such as National Food Security Mission (NFSM) and National Food Security Act (NFSA) were launched to achieve rapid increase in food production and to provide economic access to food respectively, which helped in improving agricultural growth, increasing food production and addressing hunger. However, viability of farming continued to remain a major concern. The current policy priority is focused on ensuring a minimum level of incomes to farmers. The present government, while assuming office in 2014, had announced doubling farmers' income as one of its major objectives.

There are several pathways to increase farmers' income. Important among these are i) increasing productivity ii) reducing cost of production iii) ensuring higher price iv) making direct income transfers etc. These pathways are not mutually exclusive and can be used in conjunction with one another. Many of the initiatives taken in the past belonged to the first two categories, that is, increasing the productivity or/and reducing cost of production. Even the recent programs by the present government to increase irrigation coverage, improve soil fertility or reducing farmers' risk - such as the Pradhan Mantri Krishi Sinchai Yojana (PMKSY), soil health card scheme and Pradhan Mantri Fasal BimaYojana (PMFBY), to name a few, fall in this category. However, during the last three years, the focus has shifted to the third and fourth components, that is, providing

higher prices to farmers and direct income transfers. First, efforts were made in the direction of helping farmers in a better discovery of market prices through a network of agricultural markets (called e-NAM or Electronic National Agricultural Market) in 2016. This was followed in September 2018 with a more ambitious public price support program called PM-AASHA (Pradhan Mantri Annadata AaySamrakshhan Abhiyaan). In the Interim Budget of 2019, the Union Government announced a direct income transfer program, called PM-KISAN (Pradhan Mantri Kisan Samman Nidhi). These two initiatives, PM-AASHA and PM-KISAN, are major departures from the past in their nature, scope and coverage. The first is a price support program, more in the nature of deficiency price payments, rather than the longstanding MSP-procurement system. The second is a lumpsum direct income transfer to farmers. Neither of these has been attempted in the past.

The main objectives of the present study are twofold – first is to assess the rationale for public support to agriculture and the second is to make a comparative analysis of the two major support programs currently in operation in India. The rest of the study is organized as follows. The rationale for public support is discussed in Section 2 followed by a description of the major support programs in Section 3. This is followed by an analysis of the implications and a comparison of these programs in Sections 4 and 5. Section 6 concludes.

2) Need for public support to agriculture

Economic sustainability is the main concern for farm households since the ability to continue in farming depends on the capacity to remain financially viable over time. Farm profitability has critical implications not only for farmers' welfare but also for national food security (Tey and Brindal 2015). Several arguments have been forwarded for extending public support to agriculture. There is a vast literature on the need for public support to agriculture, multiple market failures in agriculture and the rationale for price vis-a-vis income support programs.

2.1 Market failures in agriculture

The first reason for public support to farming is rooted in the multiple market failures, particularly in the developing and underdeveloped countries. The inverse relationship between land size and land productivity on the one hand and the direct relationship

between land size and labour productivity (Khusro 1964, Sen 1962 and 1966, Rudra 1968, Srinivasan 1972, Bardhan 1973, Helteberg 1998) on the other - are well-established in literature and are now accepted as *stylized facts*. The multiple market failures afflicting the factor and product markets and the resulting inter-linkages among these markets are hypothesized to underlie these phenomena (Braverman and Stiglitz 1982, Basu 1983). There is some evidence of weakening of these inter-linkages particularly of the IR in recent times due to the effect of technology (Deininger et al. 2018, Barrett et al. 2010) and when comprehensive measures such as TFP are used, rather than the usual partial measures of productivity (Rada and Fuglie 2019). Some of the 'market failures' explanations advanced in this literature merit a brief discussion here.

i) **Labour market:** Labour dualism was first proposed by Sen (1962) as a major factor for the IR. Labour dualism refers to the prevalence of different intensities of family labour on small and large farms. It is observed that small farms employ a lot more of family labour than the large farms. The missing labour markets for women and children, non-clearing labour markets due to low wage rates (below the reservation wage) and lower skill endowments of rural labour (that prevent them to moving to urban occupations) are some of the factors for this intensive application of family labour on small farms. This, *ceteris paribus*, leads to ***higher land productivity***, because of the better quality and commitment of family labour (in comparison to hired labour). On the other hand, large farms incur higher supervision costs of the hired labour, leading to *lower output per unit of land (*Heltberg 1998). However, given the limits to increasing land productivity beyond a threshold and due to the better access to credit of large farmers (which results in higher farm investment and mechanization), the *output/income per capita* is expected to be higher on large farms. ***Thus, the output per unit land is inversely proportional and output per capita is directly proportional to the land size.***

ii) **Land Market:** Now the question arises as to why the small farmers do not augment their landholdings, through land leasing or purchase, so that they can realize higher per capita incomes? The reason lies in the rigidity (failure) of land markets. Land lease markets in most developing countries, including India, are severely restricted through strict regulations on land leasing. In many

states in India, land leasing (or tenancy) is outlawed and even where allowed the regulations are designed to discourage leasing out. These ambiguous and inexpedient legislations in land lease markets lead to imperfections that are further exacerbated by Marshallian inefficiency and transaction costs (Skoufias 1995 as cited in Heltberg 1998). Augmenting land through purchase is also limited due to the limited access of small farmers to institutional credit (Heltberg, 1998). The asset and collateral value of land, social prestige associated with land ownership, insurance and hedge functions - together drive up the value of land way above the value of output that can be derived from the land. This necessitates institutional credit for purchase of land, to which many small farmers have little or no access. When exogenous shocks, like droughts occur, distress sales by the small farmers lead to land purchases by large farmers, because of their wealth and better access to credit, leading to further consolidation of land at the higher end (Binswanger and Deininger, 1997, Heltberg, 1998). As already seen, large farms are less productive (land) and this consolidation of land at higher end leads to further exacerbation of the IR.

iii) **Credit market:** Lower collateral value of smaller land holdings and poor social networks of small farmers lead to limited access to institutional credit (Braverman and Guasch 1986, Holden and Binswanger 1998). This failure of the credit markets affects not only land purchases but also the overall farming activity in several ways. On the production side, farm investment and timely purchase of inputs gets affected. Small farmers cannot undertake cultivation of riskier crops that yield high returns. As a result, they get stuck in a 'low return-low risk' subsistence farming. Absence of credit for consumption smoothing further complicates this scenario. Thus, the imperfections in credit and insurance markets together make small farmers risk-averse.

Due to these imperfections in factor markets, the factor price ratios implicitly faced by the farm households will differ (Brandt 1987). Under the assumption of profit maximisation, the optimal factor combinations will differ among farm households along with the output-input ratios. If factor markets in rural areas operate effectively, then the small landholdings with excess supply of family labour will be able to hire out some of the family labour or lease in some land to overcome the constraint (Brandt 1987). However, when land and

labour markets are imperfect, these same households must use their land more intensively by applying more labour and other inputs per unit of land. The adverse effect of these market imperfections is relatively more on the small and poor farmers than large and rich farmers (Holden and Binswanger 1998). Poor farmers are more likely to be rationed out of credit markets and will have less ability to smoothen consumption (coping strategies). Further, poverty is transmitted across generations through these market imperfections (Singh and Binswanger 1988).

A failing market can also affect a non-failing market in peculiar ways. If there are imperfections in food markets such as lack of spatial integration, then marginal farmers may not increase production of cash crops even if the price of cash crops increases. This is because the higher prices of cash crops might induce an increase in cash crop production and a decline in food production. Small farmers therefore increase area under food crops to meet their food requirements. This perverse response in cash crop production is due to the failure in food markets.

In the context of increasing cost of cultivation and inadequate output price realisation, among others, improving the functioning of factor as well as product markets in rural areas is a key concern for the welfare of farm households. To address the inefficiencies created by rural market imperfections, government interventions - in the form of support prices, procurement, input provision, subsidies–also assumes importance. Along with it since market imperfections and constraints are so pervasive for the farm households; they devise strategies to reduce the welfare costs of these market failures with meagre resources at their disposal (De Janvry and Sadoulet 2006).

2.2 Unique nature of farming, risk and insurance

Farming activity is unique and risky. Any production activity must involve production of an output ‘q’ and a realization of output price ‘p’. Depending on the market structure, the producer has control over either ‘q’ or ‘p’. For example, in a perfectly competitive market, each producer is a price taker and therefore has no control over ‘p’ but can control q in the short/medium run. Under oligopoly or monopoly producer has control over both p and q but can only choose either ‘q’ (Cournot) or ‘p’ (Bertrand) at any given time as the strategic variable (but not both). However, the situation in agriculture is different. Agriculture is perhaps the only activity where the producer has little or no control over either ‘p’ or ‘q’.

He has no control over ‘p’ because the price is realized with a large time lag after the production decision is taken. He has no control over ‘q’ due to the dependency over weather and the resultant uncertainty and, abiotic stresses like pests. Because of this link with weather and abiotic stresses, which are similar in effect over large geographic regions, movements in production tend to be similar across a large number of farms. This, in turn, affects the market price. This systemic or the covariate risk is a very important feature of agriculture. The output risk to ‘q’ and the price risk to ‘p’ constitute the twin risks that afflict agriculture in a major way. Because of these twin risks, farm incomes tend to be highly uncertain. It is this inherent risk in farming, rather than the ‘inefficiency’ of farmers, which makes a compelling case for support to agriculture

2.3 Role of insurance markets

The next question that arises is the role of insurance. Given the riskiness of farming, why not make use of the insurance markets?

An important consideration in insurance markets is the insurer’s vulnerability/ insolvency/ruin. Simply stated the insurer seeks to minimize his own vulnerability to the risk that he is insuring against. The classic Cramer-Lundeberg Model (Swedish mathematician Filip Lundberg 1903, Harald Cramer, 1930) proposed the ruin theory (risk theory or collective risk theory) which underlies most of the insurance markets. According to this theory, premiums arrive a constant rate from customers but *claims* arrive according to a Poisson process and are identically and independently distributed (iid) non-negative random variables. In case of agriculture, assumptions regarding the claims do not hold. *Claims* (or the yield distributions) are not identical because of the differences in endowments among farmers, such as irrigation, access to technology etc. The claims are also not independent because the risks arise due to weather events that are synchronized and contemporaneous across farms. For example, if an upland farmer’s land is damaged due to flooding the water will flow downward damaging other farmers’ lands too. Similarly, when a drought occurs, it affects vast regions and the claims are unlikely to be independent of one another. Because of the large number of claims in such events, there is a huge increase in the payouts and transaction costs of the insurer, increasing insurer’s vulnerability and insolvency.

Due to this higher probability of private insurer’s risk and vulnerability, public support is considered to be a better option. There are many other arguments that are invoked in

favour of public support to agriculture. Some of these include positive externalities of agriculture, inter-sectoral linkages for growth, agriculture's critical role in providing employment to illiterate and semi-skilled workforce (Binswanger and d'souza 2012; Himanshu et al. 2010; WDR 2008), Strategic importance of food particularly during major crises (Johnson 1975, Sekhar 2003) and the welfare function of the state.

3) Current programs in India

In this section, we will analyze some of the important farm support programs currently in operation in India. These will be analyzed under the broad categories of price support and income support programs.

3.1 Price Support programs

Price support can be ensured in two ways. The first is through direct procurement from the farmers at a pre-announced support price or MSP. The second way is to allow farmers to sell in the open market and if the market price (received by the farmer) is lower than the MSP, the difference is reimbursed to the farmer. This method has the advantage of avoiding the costs of storage and transportation that result from physical procurement. Both these programs are in operation in India. The direct procurement scheme is called the 'price support scheme' or the PSS. The second one is called the 'price deficiency payment system' or PDPS. We will briefly discuss these programs below.

3.1.1 Price Support Scheme (PSS) or Public Procurement

The price support scheme or the public procurement has been in operation for more than five decades. Paddy and wheat have been the main beneficiaries of this system. This scheme has now been extended to cover pulses, oilseeds and copra under PM-AASHA. Under this system a minimum support price (MSP) is announced for each crop before the sowing season. The MSP is based on cost of cultivation / production of various crops; supply-demand scenario in the country; inter-crop price parity; international supply-demand and price scenario. Government is obligated to purchase the grain offered by the farmers at MSP, subject to certain quality standards. Food Corporation of India (FCI), NAFED and state marketing agencies participate in the procurement process. The procured grain is stored by FCI and distributed to poor consumers through a public distribution system (PDS) at a subsidized price i.e. central issue price or CIP. The

difference between the economic cost and the CIP constitutes the consumer subsidy, which is borne by the Central Government. The stocked grain is also used for maintaining emergency food reserves, welfare schemes of the government, market price stabilization, and sometimes exports by the government as well as private sector.

As can be seen, provision of remunerative prices to farmers and foodgrain management are inextricably linked. The agricultural price policy, public procurement and distribution of grains through PDS are integral components of the overall food management system. To devise an effective policy framework, a holistic approach encompassing all these sub-systems is needed.

Until the early 1990s country had a dual pricing system — MSP and procurement prices after which the procurement price was gradually abolished. At present, the MSP serves as the *de facto* procurement price. This resulted in a continually increasing MSP, due to the ever-rising cost of production. Since MSP is also the procurement price, this led to an increase in government procurement. However, the CIPs remained frozen since 2002 leading to increase in food subsidy and frequent buildup of huge stocks. Consequently, the accumulated stocks with the government put an upward pressure on the market prices, as supply in the market went down. This resulted in frequent episodes of food inflation. The resulting gap between PDS price and market price led to large scale diversion of grain and leakages.

Since 2004-05, the MSP of wheat has increased from Rs. 630/- per quintal to Rs.1840/- per quintal in 2019-20. Similarly MSP of paddy (common) has increased from Rs.560/- per quintal to Rs.1760/- per quintal in 2019-20. However the CIPs of wheat and rice for AAY, BPL and APL families has not been revised since 2002. The implementation of NFSA involved further lowering in CIP to Rs 2/- and Rs 3/- per kg for wheat and rice respectively across the country. As a result, the gap between economic cost and CIPs has been increasing and food subsidy incurred by the Government has risen substantially. Although MSPs are announced for about twenty five commodities, only rice and wheat are procured in a sustained way, that too from only few states. Sugar, pulses and cotton have some mechanisms in place but have proven largely inadequate with frequent gyrations in prices. Even with this limited coverage, there are frequent instances of stock build-ups and lack of storage space. Procurement, storage and distribution require large physical storage

space and marketing infrastructure. The fiscal costs of procuring, storing and distributing even two grains - rice and wheat - have proven to be quite formidable! In such a scenario, is it possible to undertake procurement of such large number of commodities for which MSP has been hiked? It appears a highly unlikely option.

3.1.2 Price Deficiency Payment System (PDPS)

As already mentioned, in PDPS the farmer is free to sell in the open market and if the market price falls below the MSP, government steps in and makes a **deficiency payment which is equal to the difference between MSP and the market price.** As this system does not involve public procurement, the costs on account of procurement, storage and distribution are avoided. Also, the system retains the incentive effects of MSP. However, one difficulty is to operationalize the system effectively. Although theoretically the farmer is free to sell anywhere from a village market to a local trader to a city wholesaler, it becomes practically impossible to collect and collate this data for millions of farmers. Therefore, it becomes necessary to restrict sale to some designated location, say a local APMC mandi. This largely restricts the utility of the scheme. Also, since the price in a mandi changes every hour, there is a need to consider some sort of average price in the mandi to calculate the deficiency payment. At present, the monthly modal price in the mandi is used (for details see Sekhar et al. 2018).

Since the deficiency payments are based on the difference between MSP and a single price (monthly modal price), the payments will be different for different farmers – larger for farmers who sell at lower price and vice-versa. This has two adverse effects – first, the farmer(s) will have little incentive to look for the best possible price in the market since, in any case, s/he will be compensated for the difference (moral hazard problem). The second is that the farmers may try to dispose of the inferior produce through PDPS (adverse selection problem). Such produce, which will otherwise fetch a low price or may even remain unsold in the absence of PDPS, will fetch a full MSP under the PDPS. A major limitation of PDPS is that it is a counter cyclical payment i.e. farmer gets a higher payment when market price is low and vice versa. This insulates the farmer from the market and does not help in market development or in improving the market price. This implies that the government intervention (in the market) needs to be continual. Since the demand side is completely ignored (because of the assured price), farmer is unlikely to adjust supply in accordance with demand. This may result in frequent instances of supply

outstripping demand, which can create problems for finding market outlets. However, many of these problems can be addressed through a differentiated MSP and a judicious policy mix of partial procurement and a dovetail with e-NAM (for a detailed account of the problems with PDPS and possible solutions, see Sekhar et al. 2018).

3.2 Income Support Programs

Unlike the price support programs, these programs are more in the nature of income support. A payment is made directly to the farmers, based on historical data. Area, yield and price of a crop of his choice (or few crops) need to be registered by the farmer (Sekhar and Bhatt, 2012). Farmer is not required to actually produce these crop(s) though. The farmer is paid a lump sum amount, based on the historical production record and he is free to produce crops of his choice. This system is expected to affect supply and demand in a minimal way since the payment is not linked to marginal (current) production, unlike the price support programs. Several countries, such as USA and China have adopted this system.

There are three broad approaches to making direct payments

i) based on production of various crops
ii) based on area under different crops
iii) a fixed payment per farm.

The first approach is appropriate when there is are authentic records of historical production of individual farmers. The second approach is suitable when the record of past production is not very accurate but the details of cropping pattern are relatively more reliable. The third approach is suitable when the area and production details at the granular level of individual farms are either not available or are not very reliable but the data on land possessed/operated is relatively more authentic. Some of the recent programs by the Union Government and some of the state governments fall in this category.

3.2.1 DP based on past production: A payment rate is fixed for each crop, similar to minimum support price. Eligible crops are notified in each region based on the cropping pattern of the region. The farmer may then select a set of crops, based on his/her cropping history, and a base year of his/her choice (in the last five years). A payment, which is a

product of the fixed payment rate and production of the crop in the base year, may be made to the farmer every year.

Direct payment based on production = payment rate × production of the crop in the base year

The payment is made to the farmer, irrespective of whether the farmer actually produces the crop in the current year or not. In fact the farmer may be allowed to grow any other crop that s/he deems profitable. In this way, direct payments can be viewed as a sort of universal basic income (UBI) to the farmers, subject to the crops and base year chosen. With this flexibility to grow other crops, farmers are not restricted to only crops that receive direct payments. For example, a farmer can receive payment for wheat, but in any given year may grow soybeans. *Thus, the farmer's cropping decisions are based only on expected market price and variable costs of production. The cropping pattern under direct payments is unlikely to be distorted in favour of few crops, unlike in case of MSP or PDPS.*

3.2.2 DP based on area: The second approach is similar to the first one, except that cost of cultivation per unit land and the area cultivated are the parameters used in the benefit calculations instead of production and MSP. This system is intended to cover the basic cost of production of the farmer for his crop mix.

Direct payment based on area = cost of cultivation per unit area × area under the crop in the base year

The likely expenditure for these two types of direct payments is presented in Tables 1 and 2. Table 1 presents the expenditure for production-based approach while Table 2 presents the same for an area-based approach. We have not used the latest data for these computations, because direct payments are by design calculated on the basis of historical data to avoid any effect on current production. The annual expenditure on production and MSP based payments works out to about Rs 276840 crores, even for covering 50% of the average production during 2015-16 to 2017-18 (Table 1). The annual expenditure on area and CoC works out to about Rs 172278 crores, for covering 50% of the average area under cultivation during 2014-15 and 2015-16 (Table 2, col. 8). As can be seen, the expenditure under an area-based DP is much lower.

Table 1: Direct Payments (PRODUCTION AND MSP BASED)

	Average (2015-16 to 2017-18)		Expected Direct Payments (in crores)			
	Production	MSP	@50% of production	@60% of production	@70% of production	@80% of production
	(7)	(8)	(9) = 0.5×(7) ×(8)	(10) = 0.6×(7) ×(8)	(11) = 0.7×(7) ×(8)	(12) = 0.8×(7) ×(8)
Rice	109.01	1497	81573	97888	114203	130517
Wheat	96.83	1628	78838	94606	110374	126142
Jowar	4.59	1644	3769	4523	5277	6031
Maize	25.73	1372	17646	21176	24705	28234
Bajra	8.98	1343	6029	7235	8441	9647
Gram	9.22	3967	18293	21952	25610	29269
Arhar	3.89	5042	9814	11777	13740	15703
Urad	2.78	5008	6962	8354	9746	11139
Moong	1.92	5217	5017	6020	7023	8027
Masur	1.27	3867	2455	2946	3437	3929
Groundnut	7.79	4233	16492	19790	23088	26387
Rapeseed & Mustard	7.68	3683	14142	16970	19798	22626
Soybean	10.90	2808	15310	18372	21434	24496
Sunflower	0.25	3950	499	599	699	798
Total	**290.85**		**276840**	**332208**	**387577**	**442945**

Source: *Foodgrains Bulletin*, DoF&PD; *Agricultutral Statistics at a Glance 2019*, MoA&FW, GoI

Table 2: Direct Payments (AREA AND CoC BASED)

	Average (2014-15 and 2015-16)		Expected Direct Payments annually (in Rs. crores)	Expected Direct Payments annually for 50% of the area (in Rs. crores)
	Area ('000 acres)	CoC-A2 (per acre)		
Rice	109512	12547	137405	68702
Wheat	77354	9852	76213	38106
Jowar	15298	7177	10980	5490
Maize	22489	10306	23179	11589
Bajra	18058	6495	11729	5864
Gram	20813	7631	15883	7941
Arhar	9771	8871	8668	4334
Urad	8589	4643	3988	1994
Moong	8559	3175	2717	1359
Masur	3431	5596	1920	960
Groundnut	11706	14375	16828	8414
Rapeseed & Mustard	14431	6293	9081	4541
Soybean	28144	8981	25276	12638
Sunflower	1346	5132	691	345
Total	**349502**	**9512**	**344556**	**172278**

Source: *Agricultutral Statistics at a Glance 2019* and Estimatres of Cost of Cultivation / Production, DES, , MoA&FW, GoI,

Note: 1. CoC-A2 has been calculated as an area-weighted average of the state level cost of cultivation (A2).
2. The states covered occupied 94% to 100% of the total area under the crop

3.2.3 DP per farm

This approach has been adopted in many of the recent programs launched by the Central Government and some of the state governments in India.

PM-KISAN Program: Government of India

An important announcement in the Interim Budget 2019-20 of the Government of India is related to direct income transfer to farmers. A program called Pradhan Mantri Kisan Samman Nidhi (PM-KISAN) has been announced under which Rs. 6,000/- per year will be provided to each farm household with cultivable land upto 2 hectares (5 acres). This amount will be provided in three equal instalments of Rs 2000/- each and will be deposited directly into the beneficiaries' accounts. The program is totally funded by the Government of India. As per the latest Agricultural Census 2015-16 data released recently, there are about 99858 thousand marginal landholdings (less than one hectare) and 25777 thousand small landholdings (one to two hectares) in India. Therefore, there were in all 125635 thousand landholdings eligible for the benefits under the PM-KISAN program. The program has now been extended to cover all the farm households in the country.

Rythu Bandhu Program of Telangana

The Government of Telangana announced the "Agriculture Investment Support Scheme", popularly called the "RythuBandhu" program, in the kharif season of 2018-19. The avowed objective of the program is to relieve farmers from the debt burden. An initial allocation of Rs 12,000/- crores was made in the Budget. Under the program, investment support was provided to agriculture and horticulture crops by way of a grant of Rs 4,000/- per acre per season to support i) purchase of seeds, fertilizers, pesticides ii) meet labour costs and iii) make investments for field operations. Prior to the launch of the program, a farmer-wise survey "land records updation program (LRUP)" was undertaken to update the land records.

KALIA Scheme of Odisha

The scheme Krushak Assistance for Livelihood and Income Augmentation (KALIA) was launched by the Government of Odisha in the rabi season of 2018-19. The program aimed to cover marginal (<1 ha) and small farmers (1-2 ha); landless agricultural households and completely vulnerable rural households. Under the program, a financial assistance of Rs.25,000/- per farm family over five seasons was to provided to small and marginal farmers so that farmers

can purchase inputs like seeds, fertilizers, pesticides and use assistance towards labour and other investments. To the landless households, a financial Assistance of Rs.12500/- was to be provided for agricultural and allied activities like rearing small ruminants, fishery, mushroom cultivation and bee-keeping, etc. The vulnerable cultivators / landless agricultural labourers, who are old, and suffer from disability/ disease and are vulnerable for any other reason, were to be provided financial assistance of Rs. 10,000/- per family per year to enable them to take care of their sustenance.

4 Implications of Price and Income support programs

In this section we analyze the implications of extending the MSP coverage to all the major food crops (other than rice and wheat) vis-a-vis enhancing direct payments under PM KISAN so as to cover the basic cost of cultivation of the farmer. These two programs are analyzed in detail because these are the major programs of the Central government currently in operation in the country.

4.1 Price Support Programs

As has been discussed, price support through MSP can be ensured in two ways. The first is through physical procurement and the second is through the 'price deficiency payments system (PDPS)'. Although procurement is the first best solution to ensure MSP, there are two major constraints - physical storage capacity and administrative capability (governance). Therefore a combination of public procurement and PDPS may need to be adopted to ensure MSP for all crops.

We will analyze below the actual constraints and implications of such a system. We consider fourteen major crops for our analysis here - cereals (rice, wheat, maize, bajra and jowar), five major pulses (gram, arhar, moong, masur and urad) and four major oilseeds (groundnut, sunflower, soybean and rapeseed & mustard). We have excluded sugarcane and cotton because the mechanism for procurement of these crops are quite different. We have used the data on production for the year 2019-20 (Fourth Advance Estimates), which is the latest available. We analyze the scope for physical procurement and deficiency payments and also explore possible alternatives.

Storage constraint

The first major constraint to physical procurement is the storage. The total production of these fourteen crops in the country was 321 million tons in 2019-20 (Table 3). The marketable surplus ratios (MSR) of these crops (*Agricultural Statistics at a Glance*, 2019) range from 67% (jowar) to 99% (sunflower). Using these ratios, the expected marketed surplus (MS) works out to 261 million tons (Table 3). As per the estimates of the GoI (2015), the storage capacity of the FCI, state agencies, central warehousing corporation and co-operative sector was only about 98 million tons. Given this storage constraint, which also currently holds the existing stocks of food grains and other crops like cotton, it may not be possible for the government to procure more than 30% of the marketed surplus. This translates into approximately 78 mt. The rest needs to be absorbed by the private market, for which DPs are needed.

Fiscal costs

The second issue is the fiscal costs of procurement and DPs.

a) Expenditure on direct procurement

Rice and wheat procured by the government are distributed through the PDS at a highly subsidized issue price of Rs 3 per kg and 2 Rs/kg respectively. In 2019-20, the economic cost of these cereals was Rs 26/kg and Rs 34/kg respectively (Table 3). The difference between the economic cost and the issue price constitutes the consumer subsidy. If MSP is to be ensured to all the crops considered here, these crops need to be procured at MSP and there needs to be a mechanism for their orderly disposal too. Assured MSP will most likely induce a positive supply response in the short run, which could lead to the supply of these crops overstripping demand. Then these crops also need to be disposed at subsidized prices. The average ratio of economic cost to MSP of rice and wheat during the last four years was 1.78. Assuming that the same ratio holds for these other crops and that these crops can be disposed at 50% of their MSPs, the subsidy to FCI and other agencies works out to 256250 crores (Table 3 & 5).

b) Expenditure on Deficiency Payments

As already noted above, government can procure only 30% of the marketable surplus due to storage constraints and the remaining 70% of the MS needs to be absorbed by the market. When the market price falls below the MSP, DP needs to be paid to offset this difference. Steeper the fall of market price below the MSP, larger is the DP. Assuming an average fall of 20% of the

market price below MSP, which is a more likely scenario for most crops considered here, the quantum of deficiency payments works out to Rs 83841 crores (Table 3 & 5).

Thus, the total expenditure on account of government procurement plus deficiency payments works out to Rs 340091 crores annually (Table 3 & 5). From this amount, by subtracting Rs 108688 crores which was the expenditure already incurred in the form of food subsidy for procurement of wheat and rice in 2019-20, we get the additional expenditure needed for providing MSP coverage to other crops. This works out to Rs 231403 crores, which amounts to an increase of 95% over the food subsidy (of Rs 242836 crores) budgeted in the 2021-22 Union Budget! In other words, the food subsidy needs to be almost doubled to provide assured MSP support to major food crops other than wheat and rice (Table 5).

4.2 Income Support Programs

PM-KISAN is presently attempting per farm direct income transfers by making a lump sum payment of Rs 6,000/- per annum. However, the economic rationale for this amount is not clear and it does not appear to be based on any systematic analysis of the costs incurred by the farmers. Thus, we have tried to arrive at a more scientific estimate based on cost of cultivation. The present quantum of support appears grossly inadequate, as is illustrated below. We have used the following methodology for the computation. The average cost of cultivation *per farm* has been computed using the crop & state-specific data on cost of cultivation published by the Commission for Costs and Prices (CACP).

There are various cost concepts called A1, A2, B1, B2, C1 and C2 covering different cost components. We have used the A2 cost of cultivation, which represents the basic cost (incurred by the farmer) on inputs and land leased. Combining this crop & state specific A2 cost data with the area under different crops in each of the states and the number of small and marginal holdings in the country, we have computed the weighted cost of cultivation per farm. We have used the data of the same fourteen crops considered for our earlier computations. The landholdings data is collected from the latest *Agricultural Census* 2015-16. We have used the historical data of 2015-16 to ensure minimum distortionary effect on marginal production.

The following step-wise procedure has been adopted for calculating the average cost of cultivation *per farm*

i) First, the weighted cost of cultivation per acre for each crop has been computed using the area in different states under the crop as weights.

ii) Next, the crop-wise cost of cultivation of all the fourteen crops is aggregated into a single measure of *cost per acre*, using the respective area under the crops at the national level as weights (Table 3)

iii) Next, we have computed the *cost of cultivation per farm* for each land category (marginal, small,...) by multiplying the *cost of cultivation per acre* (derived in step ii), with the average size of land holding in that category (Table 4). The cost of cultivation of a farm is expected to increase with the size of the farm. Smaller farms have a lower cost and vice versa.

iv) Finally, we derived an aggregate measure of the *cost of cultivation per farm* for all the land categories by using the number of marginal and small holdings as weights, since these two categories constitute more than 86% of the total number of landholdings in the country (Table 4).

Using this procedure, the average annual *cost of cultivation per farm* works out to Rs 16769/- (Table 4). This is nearly 2.8 times the current payment under PM-KISAN, which is Rs 6,000/- per annum. But given the limited fiscal space available to the Union Government at present, providing even half of this amount may be useful. In that case, the total expenditure comes to Rs 122187 crores (Table 4), which is much less than that under the procurement plus deficiency payments system. Also, if rice and wheat holdings that get the benefit of MSP are excluded, then this expenditure may be even less. However, care should be taken to see that these payments are based on past data on costs and areas so that the production at the margin (current production) is not affected. This is to ensure that farmers align their supply in accordance with the demand but at the same time get an assured basic income. Since only a part of the cost is met through these payments, farmers will also have the incentive to reduce costs and improve efficiency. Covering only a part of the cost also has the advantage of encouraging states to top up from their own funds, making it possible for both the Centre and States to claim ownership of the program.

4.3 Comparison of PSS and the Enhanced PM KISAN

The main support programs currently in operation in India belong to price support (PSS) and *per farm* income support (PM KISAN) categories. Under PSS, extending MSP coverage to all the major food crops, in addition to rice and wheat, entails almost doubling the food subsidy budgeted in the 2021-22 Union Budget (Table 5). In terms of the current GDP of agriculture (or AGDP) in 2019-20, the percentage of food subsidy will increase from 7 percent to 15 percent if the MSP coverage is extended (Table 6, Figure 1). In terms of the overall GDP, the corresponding increase is from 1.2 percent to 2.3 percent. On the other hand, direct transfers in the form of enhanced PM KISAN payments are fiscally prudent. The current budgeted payments of PM KISAN are 2.7 percent of AGDP which will increase to 3.8 percent if enhanced payments are made. The corresponding increase as a percentage of GDP is from 0.4 percent to 0.6 percent (Table 6, Figure 1).

TABLE 3
Crop-wise production, marketable surplus and fiscal costs

	Production and Marketed Surplus (million tons)			MSP, Economic Cost and Subsidy (Rs/qtl)				Payments for procurement and Deficiency Payments (Rs. Crores)			Average Area and weighted cost of Cultivation	
Crop	Production 2019-20 (4th AE)	Marketed Surplus Ratio (avg of 2012-13 to 2014-15)	Expected Marketed Surplus	MSP	Economic cost	CIP	Consumer subsidy	Subsidy to FCI and state agencies to procure at MSP and dispose off rice & wheat at NFSA rates and others at 50% of MSP (in crores)	deficiency payments @20% below MSP	Total	Area ('000 acres)	CoC-A2 (Rs per acre)
Rice	118.43	82.62	97.85	1760	3419	300	3119	91562	24109	115672	109512	12547
Wheat	107.59	74.79	80.47	1840	2582	200	2382	57497	20729	78227	77354	9852
Jowar	4.73	67.13	3.18	2440	4349	1220	3129	2981	1085	4066	15298	7177
Maize	28.64	86.45	24.76	1700	3030	850	2180	16196	5893	22089	22489	10306
Bajra	10.28	72.10	7.41	1950	3476	975	2501	5561	2023	7585	18058	6495
Gram	11.35	88.12	10.00	4620	8235	2310	5925	17778	6469	24247	20813	7631
Arhar	3.83	86.51	3.31	5675	10116	2838	7279	7235	2632	9867	9771	8871
Urad	2.04	87.54	1.79	5600	9982	2800	7182	3848	1400	5248	8589	4643
Moong	2.46	89.47	2.20	6975	12433	3488	8946	5907	2149	8056	8559	3175
Masur	1.18	91.12	1.08	4475	7977	2238	5739	1851	674	2525	3431	5596
Groundnut	10.10	93.46	9.44	4890	8717	2445	6272	17753	6459	24212	11706	14375
Rapeseed & Mustard	9.12	91.95	8.38	4200	7487	2100	5387	13545	4929	18474	14431	6293
Soybean	11.22	96.05	10.77	3399	6059	1700	4359	14088	5126	19214	28144	8981
Sunflower	0.22	99.49	0.22	5388	9604	2694	6910	448	163	610	1346	5132
Total	321.17		260.85					256250	83841	340091	349502	9512

Source: *Foodgrains Bulletin*, DoF&PD; *Agricultutral Statistics at a Glance 2019*, MoA&FW, GoI

Notes
1. Economic cost for rice & wheat refers to the projected EC is based on last three years. For other crops it is based on the average ratio of EC/MSP of rice & wheat from 2015-16 to 2019-20

2. Consumer subsidy is calculated assuming a CIP based on NFSA prices for rice and wheat. For other crops the CIP is assumed to be 50% of MSP.

3. MSR is the average of 2012-13 to 2014-15

TABLE 4

Expenditure under present PM-KISAN and enhanced PM KISAN

	Number (in '000)	%	Cost of Cultivation A2 per farm (Rs)
Number of farm holdings as per Agricultural Census 2015-16			
Less than 1 ha (average size assumed to be 0.5 ha)	99858	79	11890
1-2 ha (average size assumed to be 1.5 ha)	25777	21	35670
Number farms upto 2 ha	125635	100	
Total number of farms	145727		
Payment Rates			
PM-KISAN payment per farm	6000		
Average CoC-A2 per acre of marginal plus small categories	9512		
Weighted CoC-A2 PER FARM of marginal plus small categories	16769		
Expenditure (in Rs. Crores)			
PM-KISAN @6000 per farm	**87436**	Payment per farm (Rs)	6000
Budget Estimates for PM KISAN in 2021-22	**65000**	Payment per farm (Rs)	6000
Under enhanced PM KISAN covering 50% of weighted COC-A2 per farm	**122187**	Payment per farm (Rs)	8385

Source: 1) Agricultural Census 2015-16

2)Cost of Cultivation of Principal Crops, various issues

3) Union Budget, 2021-22

Table 5

VARIOUS SCENARIOS OF THE ESTIMATED ANNUAL EXPENDITURE ON PRICE SUPPORT PROGRAMS AND DIRECT PAYMENTS (Rs. Crores)

	Crop Coverage	PRICE SUPPORT SCHEME			DIRECT PAYMENTS	
		Subsidy to FCI and state agencies to procure at MSP and dispose off rice & wheat at NFSA rates and others at 50% of MSP (in Rs crores)	Deficiency Paymets for 20% fall in market price (Rs crores)	Total payments to FCI & state agencies PLUS deficiency payments (Rs. Crores)	PM-KISN current budgeted amount in 2021-22 (Rs crores)	Enhanced PM-KISAN covering 50% of the cost of cultivation (A2) per farm (Rs Crores)
1	Expenditure for only Rice and Wheat	149060	44839	193898	-	-
2	Expenditure for rice+wheat+oilseeds	194893	61515	256408	-	-
3	Expenditure for rice+wheat+oilseeds+pulses	231512	74840	306352	-	-
4	Total expenditure for rice+wheat+oilseeds+pulses+ coarse cereals	256250	83841	340091	65000	122187
5	AGDP (2019-20) at current prices	3257443				
6	GDP (2019-20) at current prices	20339849				
7	Food Subsidy in 2019-20 RE	108688				
8	Additional Expenditure for legalizing MSP excluding the Food Subsidy in 2019-20 (4 minus 7)	231403				
9	Budgeted food Subsidy in 2021-22	242836				
10	Total Food Subsidy in 2021-22 if MSP is legalized (8+9)	474239				
11	Percentage increase in budgeted Food Subsidy of 2021-22 (8 as a percentage of 9)	95%				

Source: Tables 3 & 4 and *National Account Statistics*

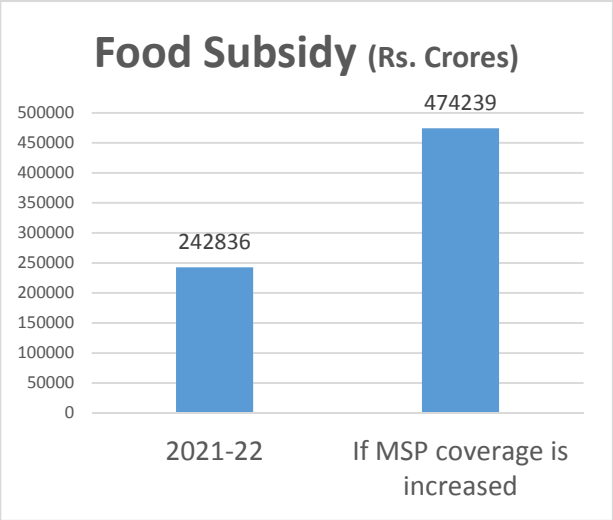
Table 6

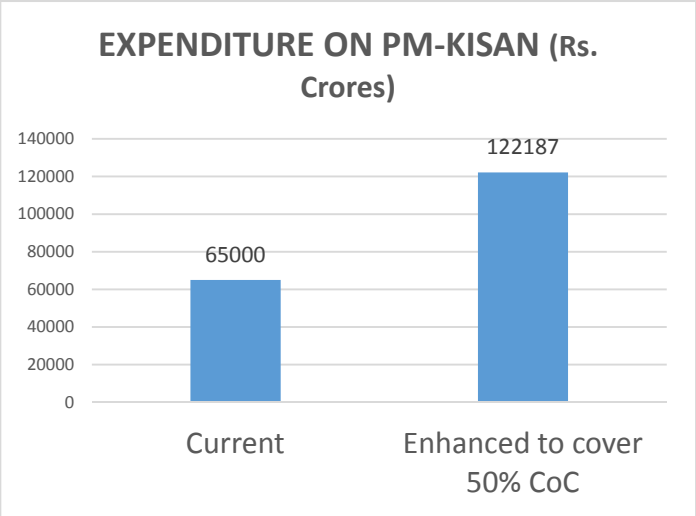
Comparative Scenario of legalizing MSP and enhancing PM KISAN payments

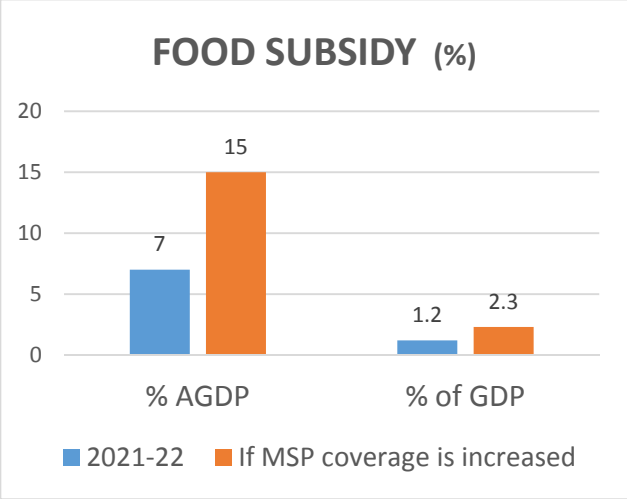
	Expenditure (crores)	PERCENTAGE OF	
		GDP in Agriculture & allied (AGDP) 2019-20	Total GDP 2019-20
Food subsidy in 2021-22			
a) Budgeted	242836	7	1.2
b) If MSP is legalized for all 14 crops	474239	15	2.3
PM KISAN payments			
a) Budgeted @6000 per annum per farm	65000	2.7	0.4
b) If payment is enhanced to cover 50% of CoC-A2 per farm	122187	3.8	0.6

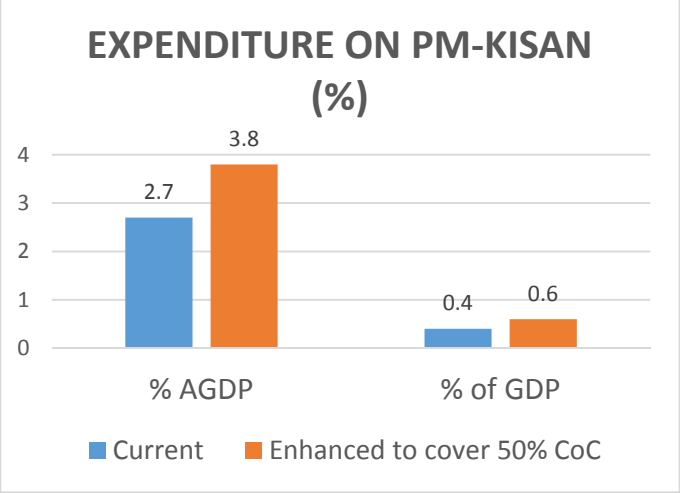
Source: Table

FIGURE 1









Source: Table 6

5 Advantages and Limitations of the two systems

The present stalemate over farm laws seems to be long-drawn and the implementation of the laws appears to be stalled for some time. This hiatus provides an opportunity for all the sides to step back and think through some of the important issues.

MSP-procurement system has been in operation for more than five decades and has served a useful function of providing incentives to farmers. The system has served country exceedingly well in the past food crises of mid 1970s, 2008 and the recent Covid crisis. However, the system has largely benefitted very few crops in a few regions. There are estimates which suggest that the MSP-procurement system have benefitted only 7 percent of the farmers and only 10 percent of the output in the country (Niti Aayog, 2021). Also the MSP-led dominance of rice and wheat in states like Punjab resulted in an overuse of scarce resources and has led to severe depletion of groundwater table. The ever-increasing MSPs and very low issue prices have led to large accumulation of stocks and burgeoning food subsidy.

Direct income payments offers a viable alternative. An important advantage of the direct payments is that the benefits are not linked to current production and procurement of any particular crop, unlike the MSP-Procurement system. Thus the benefits can be extended to crops other than rice and wheat. Also, since the benefits are not contingent on production of any particular crop, the supply should be more aligned to the market demand conditions and the consequent effect on supply-demand imbalance will be minimal (Sekhar et al 2018, Gulati et al. 2018).

However, this very advantage could also turn out to be a major limitation in case of crops crucial for food security. A very important function of MSP is to incentivize farmers to devote more area to MSP crops like rice and wheat. MSP has nudged farmers to align their cropping patterns to meet the country's food security needs. The absence of this link (between production and incentive structure) in case of direct payments may adversely affect the supply of these crops. Therefore, it is very important to continue the MSP-procurement system for rice and wheat that are crucial for food security of the country.

The other important advantage of DP system is that there is no need of procurement, storage and distribution of *all* the commodities. This leads to much lower fiscal costs and lesser storage infrastructure. Direct payments increase farm income, land values and producer wealth thereby

facilitating additional investment and increasing credit-worthiness of farmers through lowering risk of default (Westcott and Young 2004). Reduction in risk of default can lead to lower interest rates facilitating an increase in investment. All these factors could reduce farmer's risk aversion (Chavas and Holt 1990). However, a major limitation of the direct income transfer, as implemented presently under PM-KISAN, is that the benefits are linked to legal possession of land. Assistance is not provided to tenants, landless agricultural labourers and other vulnerable sections of the rural society. In this respect, the KALIA scheme provides a better coverage, as compared to PM-KISAN or RythuBandhu programs. Another major limitation of these programs is the poor maintenance of land records, except in few states such as Telangana. This may largely limit the usefulness of the program, although some efforts are underway, to get updated information on land records from the states.

6 Conclusion

The MSP- public procurement system has served the country well during the recent Covid crisis as well as the earlier food crises in the 1970s and 2008. This system is the lifeline in states of Punjab and Haryana and any hasty dismantling of the system will severely affect livelihoods of farmers in these states. Also, there is a vast public distribution system with nearly 80 crores beneficiaries, which crucially depends upon the supplies from public procurement. Also, international grain markets are not reliable sources of supply for a large country like India (Sekhar 2003). In view of all these considerations, the MSP-procurement system needs to be continued for rice and wheat and if possible be extended to pulses.

However, it is time to move away from the price-based system to an income-based system for non-staple food commodities. The current PM KISAN program is an attempt in this direction but the support of Rs 6000/- per annum per farm under the program appears grossly inadequate and is also not based on any systematic analysis of the costs faced by the farmer. Our estimate of the average cost of cultivation comes to Rs 16769/- per annum per farm, which is 2.8 times the current level of support under PM KISAN. If fiscal space is limited for the Union government, providing half of the cost may be considered, which will entail an expenditure of 122187 crores annually, which is only 3.8 percent of the current GDP (2019-20) from agriculture & allied activities and 0.6 percent of the GDP. On the other hand, if procurement-deficiency payments system is opted for the non-staple food crops also, then the food subsidy will be much higher.

In view of the various issues related to procurement & storage; supply-demand mismatch; moral hazard & adverse selection in deficiency payments system and the substantially higher fiscal costs vis-a-vis the direct payments, shift to income-support from price-support may be needed for non-staple food crops.

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University Enclave, University of Delhi
(North Campus) Delhi 110007, India
Tel: 27667288/365/424
Email: system@iegindia.org