Title: Is Minimum Support Price Effective in India? Evidence from State-wise Paddy Procurement

Type: Original Research Article

Abstract

Aims: The paper tries to examine the effectiveness of the minimum support price (MSP) policy based on empirical data on price deviations as well as the procurement of paddy crops by various agencies. The cost and gross margin of cultivation are also analysed to add further reliability to the overall assessment of MSP policy.

Data and Methodology: The effectiveness of price policy is examined by studying farm harvest price (FHP) with respect to MSP of Paddy. We have calculated the deviations of FHP of paddy from MSP for the entire study period of 1996-2016, where the positive deviations are taken as an indicator of the effectiveness of price policy. Our study has analysed the procurement data published by the Food Corporation of India (FCI) and the Ministry of Agriculture and Farmers welfare. We also used the unit-level data from the 'Situation Assessment Survey of Agricultural Households', 2012-13 of NSSO.

Results: The MSP policy is found to be effective in Kerala, Madhya Pradesh, and Punjab but ineffective in other major rice-producing states across the country. And in states like Himachal Pradesh, Uttar Pradesh, Bihar, Assam, West Bengal, Jharkhand, Odisha, Andhra Pradesh, Karnataka, and Tamil Nadu, a vast majority of the medium, semi-medium, and small farmers sell their paddy to private agencies, thus making MSP policy for paddy in those states a complete failure. In states such as Haryana and Maharashtra, large farmers are found selling a significant portion of their total marketed surplus to processors.

Conclusion: Overall, at the national level, procurement by government agencies (which stands at 17.2 percent) is far from satisfactory. The policy implication calls for enhancing paddy procurement by government agencies across the farming groups rather than concentrating only on medium and large farmers.

Keywords: MSP, price deviations, procurement, Indian agriculture

JEL Classification: Q13, Q18

1. Introduction

The guarantee of a profitable and reliable crop price is critical for increasing crop production and productivity. The fluctuating price often causes enormous losses to farmers, disincentivises farm investment, and discourages farmers from adopting new technology [3, 5]. Hence, the government's minimum support price (MSP) scheme aims to ensure a minimum price for producers and, through the 'Public Distribution System (PDS), an affordable price for consumers [1, 9]. It encourages farmers to continue farming, make farm investments, and adopt better technologies by controlling price/market risk. MSP policy backed up by effective procurement and awareness creation by extension system may enable more number of farmers to take benefit of this safety net [2]. Furthermore, MSP and yield rates, and MSP and outputs of the crops have long run relations which means effectiveness of the MSP policy can have a positive impact on yield and output [7]. On the advice of the 'Commission for Agricultural Costs and Prices,' the Government of India (GOI) regularly declares MSP for 25 main crops each year. Apart from announcing MSPs for crops and FRPs for sugarcane, the government procures these agricultural commodities through various agencies such as the Food Corporation of India (FCI), National Agricultural Cooperative Marketing Federation of India Limited (NAFED), Cotton Corporation of India (CCI), National Consumer Cooperative Federation of India Limited (NCCF), and the Central Warehousing Corporation (CWC), and so on. Various state governments delegate their agencies to purchase crops from farmers at the MSP.

In his 2018 budget address, the late Mr. Arun Jaitley, the then finance minister, proposed a one-and-a-half-fold increase in MSP and stated that MSP for all crops would be fixed in principle at 50% more than their cost of production (A2+FL cost)[1]. He also gave NITI Aayog the task of finalising the procurement model that will help farmers. Hence, the success of the same increase in MSP is dependent on the procurement models. Currently, two procurement models are under consideration by the government: (i) Market Assurance Scheme (MAS), (ii) Price Deficiency Payment (PDP), and another procurement model being developed by NITI Aayog where procurement by private agencies is also considered. Under the MAS model, the Central

[1] A2 is a cost component that includes all paid-out expenses of the farmer in cash or kind on various inputs such as hired labours, pesticides, fertilizers, seeds, fuel, irrigation and any other inputs from outside. Again, A2+FL refer to A2 cost plus the unpaid imputed value of family labour. Next is C2 which includes the rental or interest loans, owned land and fixed capital assets over and above A2+FL.

government allows states the operational freedom to intervene if the price falls below the MSP and shares a portion of the loss. Farmers are only expected to be compensated for the variations between the government-announced MSPs and the real market prices if the market prices prevail below MSPs under the PDP model.

The crucial question now is how much produce of different crops is procured from farmers by the government that will determine the efficacy of the above procurement models (both central government agencies as well as state government agencies). The response to this question is crucial in determining the feasibility of the government's pricing policies and whether or not a one-and-a-half-fold increase in the MSP would really help farmers. Using NSSO unit-level data on paddy, the main cereal crop, the paper aims to address the above issue. The paper also looks at recent changes in MSP for different crops and the costs and returns of paddy cultivation on a national and state level. In addition to this, the marketed surplus, and paddy procurement are also analysed.

2. Materials and Methods

The empirical analysis has been carried out by taking both secondary and primary data. First, the effectiveness of price policy is examined by studying farm harvest price (FHP) with respect to MSP. Paddy is chosen for the analysis because it is the staple food for most of the populace in India, and price policy is more concerned about food crops than other crops [11]. Paddy is the only crop that the government procures from most agrarian states (NITI Aayog, 2016). We have calculated the deviations of FHP of paddy from MSP for the entire study period of 1996-2016, where the positive deviations are taken as an indicator of the effectiveness of price policy and vice versa [4]. The positive deviation indicates that the market price ruled higher over the MSP, which incentivises the producers. These deviations are adjusted with MSP to find out the extent of deviation from MSP. The mean absolute deviation, which may be positive or negative, is expressed as:

$$MD = \frac{1}{n}\sum_{i=1}^{n}|FHP_i - MSP_i| \quad (1)$$

Where MD is the mean absolute deviation which is positive (negative) if FHP > MSP (FHP < MSP), and *n* stands for the frequency of respective deviations. The degree of deviations is examined by adjusting the mean deviation with respect to MSP and expressed as:

$$MD_{adj} = \frac{1}{n}\sum_{i=1}^{n}[(|FHP_i - MSP_i|)/MSP_i].100 \quad (2)$$

To have a clearer picture of the effectiveness of price policy at the farmers' level, we analyzed the procurement data. The underlying argument is that the price policy is quite effective if the farmers sell their marketable surplus to government agencies rather than local private mandis, input dealers, or other agencies across the farming groups. It is because other than government agencies, other agencies offer a fair price determined by the market and usually below MSP. Sometimes, even the government procurement agencies also procure crops at a price below MSP [5][2]. So this gives a different dimension to the effectiveness of price policy, i.e., equity aspect. The Food Corporation of India (FCI) and the Ministry of Agriculture and Farmers welfare release the data on the procurement of various food grains. However, these figures are aggregative and do not provide details on food crops supplied to non-government organisations. As a result, we do not have access to crop procurement across the farming group. So in this paper, we use the latest unit-level data from the 'Situation Assessment Survey of Agricultural Households' (SASAH), 2012-13 of NSSO. This survey's first and second visits include the 2012-13 Kharif and Rabi seasons, respectively. Since paddy is usually considered a Kharif (rainy/wet season) crop, the data on paddy pertains to the first visit. The study utilizes this data to calculate the percentage of total crops sold by farmers to cooperatives and public agencies, as well as local private agents, processors, input dealers, mandis, and others. The richness of the data also enables us to find out the share of different agencies in the total produce sold by five different farmer categories, i.e., marginal farmers with operational landholding between 0-1 hectares (ha), small farmers having operational landholding between 1-2 ha, semi-medium farmers with operational landholding between 2-4 ha, medium farmers with operational landholding between 4-10 ha, and finally large farmers with higher than 10 ha of operational landholding. The recent changes in MSP of various crops are also looked at.

[2] Das (2020) found that government procurement agencies offer higher price to small and marginal farmers than private shops, input dealers and mandis. But this difference fades away as we proceed on to larger size farmers. This indicates the importance of realization of MSPs for lower farming groups.

3. Results and Discussion

3.1 Pattern of Changes in MSP

In the last few years, the government has raised the MSPs for major agricultural commodities to ensure remunerative prices to farmers to enhance farm production. The MSPs increased significantly in 2011-12 and 2012-13 relative to preceding decades. But a moderate increase in MSPs across all crops is found in preceding years. The latest increase in MSPs in 2018 is, however, significantly higher than the previous average. However, compared to other crops such as moong, bajra, ragi, and jowar, the rise in MSP for paddy (both common and fine categories) is not significant. Also, there is no improvement for wheat, and the change in MSP for certain other crops is smaller than in previous times. The compound annual growth rates of MSP over the period indicate that among all the crops, ragi, jowar, moong, etc., have recorded double-digit growth rates while paddy (both categories) has 7.89 and 5.46 percent throughout 2011-2018 (see Table A1 in the Appendix). So this supports the earlier view.

[Table 1 here]

3.2 Deviations of FHP from MSP in Paddy Producing States

The effectiveness of MSP policy is examined by working out the mean deviations of FHP from MSP and the degree of deviations for the period of 2010-2016 for major rice-producing states. From Table 1, it is observed that in states of Assam, Bihar, Odisha, and Tamil Nadu, West Bengal, the frequency of positive deviations are significantly less than the negative deviations, though Karnataka is an exception. The mean deviations in these states vary from ₹7 to ₹73 per quintal, while the degree of positive deviations in these states varies within the range of 1.68% to 9.6%. Naturally, these states except West Bengal are expected to have FHP ruling over MSP as the demand for paddy consumption is more than supply[3]. But the ground situation is quite contradictory, which renders the price policy in these states completely ineffective. The government intervention is very low in these states, and paddy procurement is also very stumpy

[3] Among the top rice producing states, the positive gap between mean per capita consumption and production (kg) in 2014-15 is found for the states of Assam (163-142), Odisha (178-165), Bihar (72-64), Tamil Nadu (103-84), except West Bengal (165-174), Punjab (10-397), Chhattisgarh (134-243), Uttar Pradesh (48-60). This indicates that states having relatively more consumption in comparison to production are rice deficit states. For details refer to National Accounting Statistics of Ministry of Statistics and Programme Implementation (MoSPI), Govt. of India.

for their public distribution system (PDS). Ali *et al.* (2012) also found evidence of the ineffectiveness of MSP price policy in these states. But in other surplus states, there is a mixed picture of the effectiveness of MSP price policy.

In Andhra Pradesh, Punjab, Haryana, Kerala, Rajasthan, Maharashtra, Himachal Pradesh, and others, the price policy appears to be effective as the positive deviations outweigh the negative price deviations. In these states, the active government intervention to procure the paddy and other measures ensure that the farmers get a fair price. But Uttar Pradesh and also Maharashtra are the paddy surplus state where the price policy is ineffective. In Uttar Pradesh, there are 18 times negative deviations in 20 years, and farmers suffered a massive loss due to low MSP. The mean negative deviation is ₹85 per quintal, which comes around 9.84%. This indicates that government never intervenes in the paddy market either by procuring paddy or regulating the traders. As Ali et al. (2012) pointed out, high production does not result in increased procurement as most of the produce is consumed within the state due to high population pressure. Again, demand for consumption does not lead to the realization of a fair price because of the absence of active and effective government intervention in the agricultural market. Besides this, private traders through collusion also appear to be preventing price signals from reaching the market and farmers. However, just looking at only the price deviations, one would not get a true sense of the effectiveness of the MSP price policy. It only gives the aggregative picture that lacks the equity aspect in procurement. Therefore, we plunge into the analysis of procurement data at a disaggregated level to see whether the small and marginal farmers benefit from the price policy. This analysis will suffice the overall assessment of MSP policy in India.

[Figure 1 here]

3.3 Production, Procurement, and Marketed Surplus of Paddy

Figure 1 shows that, with minor fluctuations, procurement has steadily improved over the years. In 2015-16, it was 34.2 million tonnes, and in 2017-18, it increased to 38.1 million tonnes. Similarly, procurement as a percentage of supply increased from 34.7 percent in 2015-16 to 41.2 percent in 2016-17, as did procurement as a percentage of marketed surplus. As a result, one fact stands out: the quantum of procurement is rising over the period, both as a share of production

and as a percentage of marketed surplus. This is a positive indication since it means that a large number of farmers are joining the MSP network.

Figure 2 depicts the share of different states in overall paddy procurement for the year 2016-17. Punjab procures the most (27 percent), led by Odisha (10 percent), Chhattisgarh (10 percent), Andhra Pradesh (9 percent), and Haryana (8 percent). However, it has been more diversified as the percentage of DCP states[4] has risen from 31% in 2011 to 55% in 2016-17. However, there are still some major rice-producing states, such as Assam, where government agencies lack an effective procurement system. As a result, crop prices are observed to be lower than the MSP.

[Figure 2 here]

We need to analyse the disaggregation of overall procurement by different agencies in order to assess the efficacy of MSP policy. Since procurement involves both state and private agencies, there is often a price differential found between public and private agencies. Usually, the government agencies procure crops at MSP. But the private agencies procure at a price that is determined based on market principles at the time of harvest and found mostly below MSP [6]. But sometimes, the government procurement agencies also procure at a price below MSP. It is evidenced from SASAH data of NSSO (2012-13) that in the case of rice surplus states like Punjab, most of the farmers (68%) sell their produce above MSP. But in a rice deficit state like Bihar, most of the farmers (83.4%) sell below MSP to government procurement agencies. However, there is a mechanism in place to compensate the farmers if the government procurement agencies procure crops below MSP through the PDP Scheme. But there is no such mechanism in place for private agencies to compensate farmers if the price is below MSP[5]. So, in order for the pricing policy to be successful and effective, the government agencies must carry out the majority of the procurement operations. Besides, the procurement network must include small and marginal farmers. Therefore, the disaggregated procurement estimates across farming groups and different entities are examined in the following section. We use unit-level statistics

[4] Food grains are procured from farmers for central government stock (FCI) by state government agencies under the Decentralised Procurement Scheme (DCP). On behalf of the Indian government, the states procure food grains directly, mostly paddy and wheat. The DCP states are Andhra Pradesh (paddy/ rice in 6 Districts),West Bengal (paddy/rice), Chhattisgarh (paddy/ rice), Madhya Pradesh (paddy and wheat), Odisha (paddy/ rice), Karnataka (paddy rice), Tamil Nadu (paddy/ rice), Kerala (paddy/ rice), Telangana (paddy/ rice in 9 Districts),), Punjab (wheat for NFSA obligations only), Uttarakhand (paddy/rice and wheat), Gujarat (wheat), Bihar (paddy/ rice and wheat), Rajasthan (wheat in Alwar District only) and Andaman & Nicobar Islands (paddy/rice).

[5] For details please refer to Das (2020).

from the NSSO's SASAH to find disaggregated procurement figures by various agencies for marginal, small, medium, and large farmers in major paddy-producing states.

[Table 2 here]

3.4 State-wise and Agency-wise Paddy Procurement

Procurement of paddy by government agencies stood at only 17.2 percent in India, resulting in farmers selling a larger part of their marketable surplus to local private players and private mandis. The procurement figures at the state level in Table 2 reveal that Kerala has the highest procurement of paddy by government agencies. Other states where government agencies are procuring a significant part of the total marketable surplus include Madhya Pradesh and Punjab. Surprisingly, in Punjab, one of the agriculturally developed states in India, the share of government agencies stands at 33 percent, much less than the recorded procurement figures in Madhya Pradesh. In other major rice-producing states such as Bihar, Odisha, Tamil Nadu, Maharashtra, Gujarat, and Telangana, the share of procurement by government agencies is mostly below 20 percent, implying thereby an over-reliance of farmers on mandis and private agencies to sell their marketable surplus in these states. In states such as Uttar Pradesh, Andhra Pradesh, West Bengal, Assam, and Karnataka, Haryana, the share of government agencies in total procurement is not even registering a meagre 10 percent. It needs to be noted that procurement by government agencies is relatively non-existent in two eastern states, namely, Assam and West Bengal. In the Northern state of Himachal Pradesh, the government is totally absent when it comes to paddy procurement.

[Table 3 here]

3.5 Farmers Group and Paddy Procurement

Table 3 to Table 7 contains the agency-wise share of paddy procurement across farming groups, namely, marginal, small, semi-medium, medium, and large farmers. It needs to be emphasized that marginal and small farmers are the most vulnerable sections due to price shocks/market risk among all categories of farmers. Again, it has been evidenced that government procurement agencies offer a higher price to marginal and small farmers than private agencies. But this difference declines as the farm size increases. It’s almost nil for large farmers [6; p.63].

Therefore, whatever little marketable surplus these two categories of farmers generate will negatively affect their income security if not sold at MSP. But it has been argued that many factors determine the procurement, out of which farm size is one that has a direct relation with the marketable surplus. Therefore, procurement from large farmers will be more since they have a more marketable surplus. However, this argument is not justified on principle because of a couple of reasons. First, the distribution of landholding in India shows that around 85% of total cultivators are marginal and small farmers. Second, the medium and large farmers may have a sizeable marketable surplus. Still, here we are concerned with the relative share of every group in their own marketable surplus being sold to government agencies. So this indicates the effectiveness of MSP on the ground of equity in procurement. From Table 3, we can observe ineffective support of government machinery to marginal farmers in India as the relative share of government agencies in the total paddy procurement from them stands at only 7.4 percent. This forces marginal farmers to sell a higher portion (more than 90%) of their marketable surplus in mandis or to local private players. Those states where we earlier found that the share of government agencies is significant (namely, Chhattisgarh, Kerala, and Madhya Pradesh) are also doing better in so far as procurement by government agencies from marginal farmers are concerned. In Punjab, 21.6 percent of the marketed surplus of marginal farmers is procured by government agencies. In all other states, including the eastern states where paddy is the main crop, the share of government agencies in total procurement from marginal farmers is very negligible. In states such as Himachal Pradesh, Andhra Pradesh, and Assam, the percentage of government agencies is zero, implying a complete absence of government agencies in the procurement business from marginal farmers. In other major rice-producing states such as West Bengal, Assam, and Odisha, there is more or less the same trend of the negligence of small and marginal farmers. Therefore, in these states, marginal farmers had to sell the majority of their surplus in mandis and to local private players.

[Table 4 here]

Agency-wise procurement from small farmers is shown in Table 4. The share of government agencies in total procurement from small farmers is only at 10.4 percent at the national level. Like the previous trends, states such as Kerala and Madhya Pradesh have registered a significant portion of direct government procurement in total procurement. The same stands at 27.5 percent

in the agriculturally developed state of Punjab. The poor procurement of government agencies is also observed in the case of small farmers in states like Assam, Odisha, Bihar, West Bengal, Uttar Pradesh, Himachal Pradesh, Haryana, Jharkhand, Andhra Pradesh, Maharashtra, and Karnataka. In so far as semi-medium farmers are concerned, the share of government agencies in total procurement of paddy at the national level stands at a meagre 15.5 percent (refer to Table 5). In this category of farmers, government agencies are not doing better in Madhya Pradesh than their earlier performance in the case of marginal and small farmers. The states where government agencies are procuring a major chunk of the marketed surplus of semi-medium farmers are Kerala and Gujarat. Compared to the previous results, the states that have shown significant improvement in government procurement from semi-medium farmers are Odisha, Jharkhand, and Maharashtra. In Punjab, government procurement is at 25.2 percent of marketed surplus from semi-medium farmers. In all other states, government procurement is not at all satisfactory and needs significant improvement.

[Table 5 and 6 here]

The case of medium farmers is shown in Table 6. It can be seen that, at all India level, the share of government agencies in total procurement of surplus paddy from medium farmers stand at 22.2 percent, which is an improvement over previous results. In states such as Kerala, Punjab, and Madhya Pradesh, the performance of government agencies is significantly better than in other states. However, in this category of farmers, there are several states where the performance of government agencies is satisfactory (which was not the case earlier). These states are Bihar, Odisha, and Maharashtra. Table 7 contains the agency-wide procurement from large farmers. It can be seen that the share of government agencies in the total procurement of marketed surplus of paddy from large farmers is at 28.5 percent. The marketed surplus of paddy of large farmers in Kerala is procured entirely by government agencies. In the case of Punjab and Andhra Pradesh, the performance of government agencies is satisfactory. In all other states, except Haryana, Maharashtra, and Uttar Pradesh, the large farmers are selling a major part of their surplus paddy in mandis or to local private players. In Haryana and Maharashtra, the share of processors and others agencies is significant.

[Table 7 here]

From the above discussion, we can safely say that as the farmers' cultivated area increased, as we move from marginal, small, to medium, and large farmers, the share of government agencies in total procurement keep growing at the national level. We find that Kerala, Madhya Pradesh, and Punjab have experienced better procurement figures from government agencies among the states. Therefore, at the aggregate level, government agencies have still not removed their procurement bias against small and marginal farmers in particular. These results align with what Chand (2003) argued that the price policy is effective only in food surplus regions like Punjab and Kerala, and other states.

[Table 8 here]

3.6 Costs and Returns of Paddy Production

This section attempts to relate the cost of paddy production and its gross returns to paddy procurement[6]. The cost of cultivation of two major crops, i.e., paddy and wheat, has increased over the years. Hence, given the rising costs, the farmers must get the remunerative price. But if public agencies do not undertake the procurement, then the farmers may not get a fair price, while the cost of cultivation is the same across the farming groups. We consider both A2 and A2+FL cost concepts here for analysis[7]. Hence, we calculate the gross returns over both costs. It is pertinent to mention here that the gross value of output is estimated at the prevailing market price during harvest season in the village level or cluster of villages where the crop is grown and harvested[8]. Hence it gives a better understanding of returns when compared with the cost of production. From Table 8, a crucial fact stands out. The cost differential between the two definitions is substantial. As a result, the gross returns for A2 and A2+FL are very dissimilar, and the gap is wide. Except for Tamil Nadu, Odisha, and West Bengal, all states have a 70 percent or higher gross return over A2. However, the same gross returns over A2+FL are drastically reduced. For Himachal Pradesh, for example, gross returns over cost A2 were 348

[6] Though, the data in this table pertains to the year 2015-16, but it is quite logical to assume that the procurement scenarios as well as the costs of cultivation don't change markedly within a gap of one year. So linking of this data with procurement can render practical policy implications.

[7] The C2 cost figure provides a more accurate picture of cultivation costs, but it is not available. The C2 figure takes into account the cost of imputed family labour, as well as the rental value of owned land and the rent charged for leased land.

[8] For details about this, please refer to 'Price Policy for Kharif Crops (2017-18)' of the Commission of Agricultural Cost and Prices (CACP), Ministry of Agriculture and Farmers' Welfare, Govt. of India (p-84).

percent, but fell to 58 percent when measured over cost A2+FL. Even in states like Assam, Maharashtra, and Odisha, it is in the single digit.

The most critical and depressing reality revealed by Table 8 is that gross returns over A2+FL cost differ between 2 and 41 percent in states such as Uttar Pradesh, Odisha, Assam, Bihar, West Bengal, Jharkhand, Telangana, and others. These are the states where private agencies do the majority of procurement. So it is a grim fact that farmers in these states do not receive a reasonable price as most of them sell their produce to private agencies and earn meagre gross returns from cultivation. As a result, it may be claimed that farmers in these states reap low returns because they do not receive a fair price or MSP. So, the MSP pricing policy's efficacy is called into question. The gross returns over A2+FL cost in Odisha, for example, are 3.43 percent. To put it another way, it simply means whatever costs are accrued, the total returns are merely 3.4 percent higher than the costs. However, this is the state with the second-highest paddy procurement. On the other hand, farmers earn the lowest returns since they market their crops mostly to private agencies.

4 Conclusions

The paper examined the complexities of MSP and FHP by calculating deviations and degrees of deviations, as well as paddy procurement and linking it to cultivation costs, in order to determine the efficacy of MSP strategy. The government's recent increase in the MSP for many crops will help farmers if the MSP policy's efficacy is assured. However, it is contingent upon how large the procurement network is and who it serves. If the private agencies undertake the bulk of procurement, then the farmers may not get a fair price. Again, if state agencies only buy crops from medium and large farmers, ignoring the small and marginal growers, the MSP scheme would fail. In some major rice-producing states in Southern and Eastern India, we've seen that the majority of farmers sell their paddy to private agencies. Whatever procurement the state agencies do, it is mostly from the medium and large farmers. Except in states like Kerala, Punjab, and Madhya Pradesh, this means that marginal and small farmers are overlooked when it comes to government procurement. In all other states, except these three, the MSP price policy based on these two conditions does not operate successfully. Again, the gross returns over the cost of cultivation in these states are very poor. This is due to the inefficiency of the MSP policy. However, in the state of Haryana, it appears to be effective from the point of view of deviations

of FHP from MSP is worked out. But while linking it to procurement data, we observe that the private agencies undertake a major chunk of the procurement from marginal and small farmers. So these groups are bereft of the benefits of price policy while large farmers reap the benefits. So we conclude that the price policy is effective in Haryana. But its effectiveness could be improved a lot in other regions by widening the government procurement network to accommodate marginal and small farmers.

The study's policy implications calls for strong intervention of government agencies in paddy procurement by (1) raising the amount of procurement done by government agencies and (2) expanding the reach of procurement to include marginal and small farmers. The government should improve the procurement network in order to ensure a fair price to the farmers and a healthy total return on their investment. This study has one limitation: the entire analysis is based on SASAH-NSSO of 2012-13, which contains a time gap compared to the present situation. However, this is the latest data available at the national level on procurement. The next round of data is expected to be released very soon, and we could observe the current dynamics of paddy procurement.

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Table 1: Deviations of FHP vis-à-vis MSP of paddy in various states, 1996-2016

State	Positive Absolute Deviation			Negative Absolute Deviation		
	Frequency	Mean Dev. (₹/Q)	Degree of Dev (%)	Frequency	Mean Dev. (₹/Q)	Degree of Dev (%)
Assam	3	71	5.8	17	164.21	14.46
West Bengal	8	72.83	9.6	12	75.62	10.56
Odisha	2	55	3.65	18	89.44	11.64
Bihar	1	7	1.68	19	63.52	9.41
Tamil Nadu	8	30	3.82	12	46.83	6.44
Karnataka	13	89.69	12.58	6	52.33	6.28
Andhra Pradesh	17	43.9	6.5	3	19.66	2.14
Kerala	20	90.3	12.46	0	0	0
Rajasthan	18	56.27	5.67	2	32	2.34
Haryana	20	72.75	11.55	0	0	0
Punjab	17	75.87	12.17	3	44.55	5.15
Maharashtra	12	50.75	5.01	8	37	3.62
Uttar Pradesh	2	32	5.6	18	85.27	9.84
Madhya Pradesh	16	43.62	5.54	4	44	4.44
Himachal Pradesh	20	84.7	10.16	0	0	0
Gujarat	19	83.38	11.1	1	13	0.8

Note: (1) Zero deviation means no incidence of deviation. Where FHP-MSP = 0, it is taken as a positive deviation that indicates the success of MSP policy. (2) Mean deviation shows the positive (negative) deviation of FHP from MSP in terms of ₹ per quintal. (3) Degree of deviation implies the percentage of mean deviation with respect to average MSP.

Table 2:Agency-wise paddy procurement (%) in various states of India

States	Local Private	Mandis	Input Dealers	Cooperatives & Govt. Agencies	Processors	Others
Himachal Pradesh	12.3	29.8	3.9	0.0	51.7	2.3
Punjab	8.5	56.7	0.5	33.0	0.2	1.1
Haryana	9.5	75.4	1.0	6.1	7.5	0.4
Uttar Pradesh	40.0	26.3	21.4	3.5	0.4	8.4
Bihar	55.5	10.1	11.2	18.9	0.1	4.2
Assam	63.4	23.7	4.1	0.1	7.6	1.2
West Bengal	73.3	17.8	0.9	0.7	2.6	4.6
Jharkhand	56.5	24.4	11.6	4.9	1.0	1.5
Odisha	50.2	29.6	2.0	16.3	1.2	0.7
Madhya Pradesh	20.4	20.7	10.0	47.6	0.0	1.3
Gujarat	61.3	17.1	0.8	20.8	0.0	0.0
Maharashtra	39.9	32.6	9.3	12.0	5.9	0.3
Andhra Pradesh	74.7	2.4	12.4	7.2	2.1	1.2
Karnataka	59.8	35.4	2.7	1.0	0.3	0.9
Kerala	6.1	0.3	0.0	93.4	0.0	0.1
Tamil Nadu	62.4	13.1	7.5	16.0	0.4	0.6
India	38.7	32.2	7.3	17.2	2.1	2.5

Source: Authors' calculation from the 'Situational Assessment Survey of Agricultural Households' (SASAH) - 2013-14.

Table 3: Agency-wise paddy procurement (%) from marginal farmers in various states

States	Local Private	Mandis	Input Dealers	Cooperatives & Govt. Agencies	Processors	Others
Himachal Pradesh	44.1	40.1	13.9	0.0	0.0	1.9
Punjab	24.0	51.8	1.0	21.6	0.7	0.8
Haryana	4.7	75.9	1.6	7.0	10.2	0.5
Uttar Pradesh	43.9	33.1	20.3	1.7	0.6	0.6
Bihar	61.2	13.4	11.5	4.7	0.1	9.1
Assam	63.1	26.0	5.2	0.0	5.2	0.5
West Bengal	73.7	20.7	1.4	0.7	1.8	1.5
Jharkhand	64.7	21.8	5.5	5.2	0.7	2.1
Odisha	68.7	24.4	1.5	3.1	0.6	1.7
Madhya Pradesh	30.0	13.8	16.8	36.3	0.0	3.1
Gujarat	68.5	16.7	1.5	13.3	0.0	0.0
Maharashtra	59.2	32.3	2.4	3.3	2.2	0.6
Andhra Pradesh	86.6	1.4	11.4	0.0	0.3	0.4
Karnataka	62.4	22.1	10.1	2.8	0.8	1.8
Kerala	34.5	1.8	0.0	62.7	0.0	1.0
Tamil Nadu	70.0	14.2	0.0	13.9	1.0	0.9
India	55.1	24.0	9.4	7.4	1.8	2.2

Source: Authors' calculation from SASAH - 2013-14.

Table 4: Agency-wise paddy procurement (%) from Small farmers in various states

States	Local Private	Mandis	Input Dealers	Cooperatives & Govt. Agencies	Processors	Others
Himachal Pradesh	0.0	48.4	0.0	0.0	49.8	1.8
Punjab	12.7	58.2	0.9	27.5	0.5	0.2
Haryana	16.6	64.8	0.2	6.0	12.0	0.5
Uttar Pradesh	53.5	22.0	18.6	3.9	1.0	0.9
Bihar	67.8	7.9	12.8	6.6	0.4	4.5
Assam	58.3	29.5	5.0	0.0	5.6	1.7
West Bengal	79.5	13.7	1.2	0.4	1.5	3.9
Odisha	71.5	15.8	2.1	9.2	1.0	0.4
Madhya Pradesh	8.6	36.3	8.4	46.7	0.0	0.0
Gujarat	70.6	11.5	0.9	17.0	0.0	0.0
Maharashtra	38.2	50.3	6.0	2.8	2.7	0.0
Andhra Pradesh	76.2	0.4	20.7	0.0	1.8	0.9
Karnataka	62.0	33.2	2.8	1.4	0.5	0.1
Kerala	30.6	0.0	0.0	69.4	0.0	0.0
Tamil Nadu	61.3	18.9	0.0	17.9	0.0	1.9
India	52.4	25.1	8.1	10.4	2.4	1.6

Source: Authors' calculation from the SASAH - 2013-14.

Table 5: Agency-wise paddy procurement (%) from Semi-medium farmers in various states

States	Local Private	Mandis	Input Dealers	Cooperatives & Govt. Agencies	Processors	Others
Punjab	9.2	65.5	0.0	25.2	0.0	0.1
Haryana	8.1	73.7	2.2	8.7	7.2	0.1
Uttar Pradesh	40.5	33.9	15.3	3.3	0.0	7.0
Bihar	62.9	8.1	13.4	13.8	0.0	1.8
Assam	76.6	5.3	6.5	0.7	8.9	1.9
West Bengal	72.7	20.8	0.0	1.5	5.0	0.0
Jharkhand	37.0	34.7	11.2	17.2	0.0	0.0
Odisha	47.5	27.2	3.2	19.3	2.1	0.7
Madhya Pradesh	31.6	13.1	19.6	33.3	0.0	2.5
Gujarat	27.0	9.9	0.0	63.1	0.0	0.0
Maharashtra	39.1	39.3	1.2	14.9	5.2	0.4
Andhra Pradesh	79.3	0.0	16.0	0.0	3.1	1.6
Karnataka	71.4	27.9	0.0	0.0	0.0	0.8
Kerala	0.0	0.0	0.0	100.0	0.0	0.0
Tamil Nadu	76.5	8.8	5.1	9.6	0.0	0.0
India	40.9	32.9	6.6	15.5	2.4	1.7

Source: Authors' calculation from SASAH-2013-14.

Table 6: Agency-wise paddy procurement (%) from Medium farmers in various states

States	Local Private	Mandis	Input Dealers	Cooperatives & Govt. Agencies	Processors	Others
Punjab	9.5	50.3	1.8	35.7	0.0	2.7
Haryana	8.4	83.1	0.0	4.3	3.0	1.2
Uttar Pradesh	41.1	25.8	24.9	2.0	0.0	6.1
Bihar	59.5	10.8	5.8	23.9	0.0	0.0
Assam	18.6	81.4	0.0	0.0	0.0	0.0
West Bengal	82.1	5.3	0.0	0.0	9.5	3.1
Jharkhand	21.6	0.0	78.4	0.0	0.0	0.0
Odisha	50.2	23.8	0.0	25.7	0.0	0.2
Madhya Pradesh	11.0	6.6	0.0	82.5	0.0	0.0
Maharashtra	52.5	10.9	11.5	25.0	0.0	0.0
Andhra Pradesh	79.9	4.9	10.6	0.0	2.1	2.5
Karnataka	76.0	24.0	0.0	0.0	0.0	0.0
Kerala	0.0	0.1	0.0	99.9	0.0	0.0
Tamil Nadu	66.8	0.0	22.6	10.6	0.0	0.0
India	28.7	38.2	8.0	22.2	0.7	2.3

Source: Authors' calculation from the SASAH - 2013-14.

Table 7: Agency-Wise paddy procurement (%) from large farmers in various states

States	Local Private	Mandis	Input Dealers	Cooperatives & Govt. Agencies	Processors	Others
Punjab	0.0	54.7	6.7	38.6	0.0	0.0
Haryana	0.0	61.1	0.0	6.7	32.2	0.0
Uttar Pradesh	6.8	34.1	0.0	0.0	0.0	59.1
Bihar	100.0	0.0	0.0	0.0	0.0	0.0
Assam	0.0	100.0	0.0	0.0	0.0	0.0
Odisha	0.0	100.0	0.0	0.0	0.0	0.0
Madhya Pradesh	0.0	100.0	0.0	0.0	0.0	0.0
Maharashtra	55.6	0.0	0.0	0.0	44.4	0.0
Andhra Pradesh	53.9	0.0	17.3	28.8	0.0	0.0
Karnataka	0.0	100.0	0.0	0.0	0.0	0.0
Kerala	0.7	0.0	0.0	99.3	0.0	0.0
Tamil Nadu	100.0	0.0	0.0	0.0	0.0	0.0
India	15.5	41.1	5.5	28.5	5.2	4.2

Source: Authors' calculation from SASAH- 2013-14.

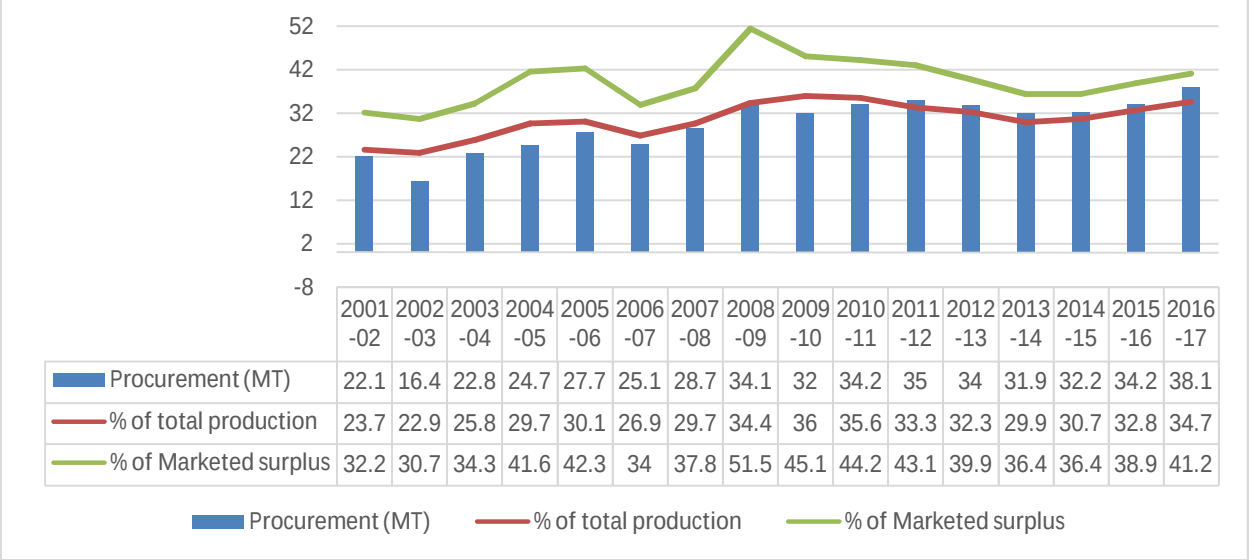
Table 8: State-wise costs and average gross returns of paddy cultivation during 2015-16

State	Cost A2 (₹/ha)	Cost A2+FL (₹/ha)	GVO (₹/ha)	Average gross returns over A2		Average gross returns over A2+FL	
				(col.4− col.2)	Per cent (col. 5/col.2*100)	(col.4 - col.3)	Per cent (col. 7/col.3*100)

				₹/ha		₹/ha	
Andhra Pradesh	42061	50661	84539	42478	100.99	33878	66.87
Assam	20360	35276	36138	15778	77.50	862	2.44
Bihar	20907	27416	37766	16859	80.64	10350	37.75
Gujarat	35352	40369	73113	37761	106.81	32744	81.11
Haryana	33942	44009	111456	77514	228.37	67447	153.26
Himachal Pradesh	9042	25733	40556	31514	348.53	14823	57.60
Jharkhand	17988	24047	33332	15344	85.30	9285	38.61
Kerala	50294	54128	93161	42867	85.23	39033	72.11
Karnataka	37153	46368	84854	47701	128.39	38486	83.00
Madhya Pradesh	20558	28534	41835	21277	103.50	13301	46.61
Maharashtra	41261	52320	54884	13623	33.02	2564	4.90
Odisha	25312	41144	42557	17245	68.13	1413	3.43
Punjab	34242	40152	103688	69446	202.81	63536	158.24
Tamil Nadu	46272	55570	77142	30870	66.71	21572	38.82
Uttar Pradesh	27757	37912	53131	25374	91.41	15219	40.14
West Bengal	35992	52415	59273	23281	64.68	6858	13.08
All- India	**30247**	**40716**	**59144**	**28897**	**95.54**	**18428**	**45.26**

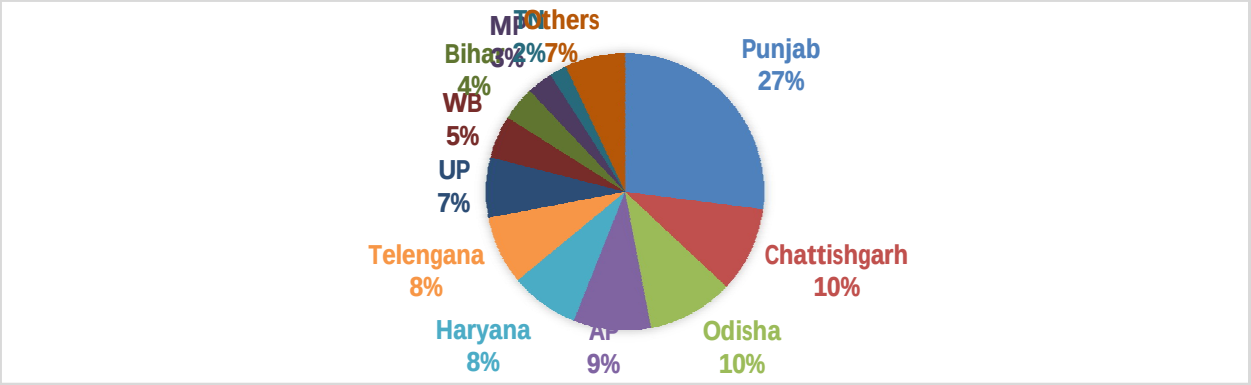
Source: Commission for Agricultural Cost and Prices, New Delhi.
Note: GVO- gross value of output (₹/ha).

Figure 1: Total paddy procurement as share of production and marketed surplus at national level



Source: Directorate of Economics and Statistics, New Delhi.

Figure 2: Contribution of major rice producing states in total rice procurement in 2016-17.



Source: DES, DAC&FW and FCI.

Table A1: Recent trends of changes in MSP for various crops in India

Crops	₹ per Quintal								% Change							CAGR
	2011	2012	2013	2014	2015	2016	2017	2018	2011 to 2012	2012 to 2013	2013 to 2014	2014 to 2015	2015 to 2016	2016 to 2017	2017 to 2018	2011 to 2018
Paddy (c)	1000	1250	1310	1360	1410	1470	1550	1750	25	4.8	3.8	3.7	4.3	5.4	12.9	7.89
Paddy (f)	1110	1280	1350	1400	1450	1510	1590	1770	15.3	5.5	3.7	3.6	4.1	5.3	11.3	5.46
Jowar	980	1500	1500	1530	1570	1625	1700	2430	53.1	0	2	2.6	3.5	4.6	42.9	12.23
Bajra	980	1175	1250	1250	1275	1330	1425	1950	19.9	6.4	0	2	4.3	7.1	36.8	10.34
Ragi	1050	1500	1500	1550	1650	1725	1900	2897	42.9	0	3.3	6.5	4.5	10.1	52.5	15.21
Maize	980	1175	1310	1310	1325	1365	1425	1700	19.9	11.5	0	1.1	3	4.4	19.3	7.89
Arhar	3200	3850	4300	4350	4625	5050	5450	5675	20.3	11.7	1.2	6.3	9.2	7.9	4.1	8.61
Moong	3500	4400	4500	4600	4850	5225	5575	6975	25.7	2.3	2.2	5.4	7.7	6.7	25.1	10.45
Urad	3300	4300	4300	4350	4625	5000	5400	5600	30.3	0	1.2	6.3	8.1	8	3.7	8.14
Groundnut	2700	3700	4000	4000	4030	4220	4450	4890	37	8.1	0	0.8	4.7	5.5	9.9	6.32
Soybean	1650	2200	2500	2500	-	2775	-	-	33.3	13.6	0	-	-	-	-	-
Wheat	1285	1350	1400	1450	1525	1625	1735	-	5.1	3.7	3.6	5.2	6.6	6.8	-	5.12[A]
Barley	980	980	1100	1150	1225	1325	1410	-	0	12.2	4.5	6.5	8.2	6.4	-	6.24
Gram	2800	3000	3100	3175	3425	4000	4400	-	7.1	3.3	2.4	7.9	16.8	10	-	7.51
Lentil	2800	2900	2950	3075	3325	3950	4250	-	3.6	1.7	4.2	8.1	18.8	7.6	-	6.54
Mustard	2500	3000	3050	3100	3350	3700	4100	-	20	1.7	1.6	8.1	10.4	10.8	-	8.45
Jute	2200	2300	2400	2700	3200	3500	3700	-	4.5	4.3	12.5	18.5	9.4	5.7	-	8.81
Sugarcane	170	210	220	230	230	255	-	-	23.5	4.8	4.5	0	10.9		-	8.74[B]
Copra	5100	5250	5250	5550	5950	6500	7500	-	2.9	0	5.7	7.2	9.2	15.4	-	5.54

Note: c and f stand for common and fine varieties, respectively. A-the period is 2011-17. B- the period is 2011-16, CAGR-compound annual growth rate.
Source: Commission for Agricultural Costs and Prices (CACP), New Delhi.