Original Article

Awareness about Minimum Support Price and Its Impact on Diversification Decision of Farmers in India

K.S. Aditya, S.P. Subash, K.V. Praveen, M.L. Nithyashree, N. Bhuvana and Akriti Sharma*

Abstract

In this article, we have analysed farmers’ awareness about Minimum Support Price (MSP) and its impact on diversification of crops grown in India. We used nationally representative data collected by National Sample Survey Office, 70th round data. The data revealed that only 23.72 and 20.04 per cent of farmers in the rural agricultural households in India are aware of MSP of crops grown by them in kharif and rabi season, respectively. From the results of probit model, it is inferred that MSP needs to be backed up by effective procurement coupled with awareness creation by extension system to enable more number of farmers to take benefit of this safety net. We have also explored the relationship between farmers’ awareness about MSP and decision to go for crop specialization using Heckman selection model. The study shows that farmers’ knowledge of MSP had not lead to specialization.

Key words: agricultural policy, crop diversification, Minimum Support Price, crop specialization

1. Introduction

Minimum Support Price (MSP) is an integral component of Agriculture Price Policy of India. It targets to ensure support price to farmers and affordable price to consumers through public distribution system (PDS) (Parikh & Singh 2007). The price support system was conceptualized during pre-green revolution period as an institutional mechanism for incentivizing farmers to adapt new technologies (Planning Commission 2005; Deshpande 2008). Later, Agriculture Price Commission was established in the year 1965, based on Jha committee recommendations to suggest support prices for crops after considering the cost of cultivation to account (Kadasiddappa et al. 2013). Broad objectives of the commission are to ensure remunerative prices to farmers and reasonable prices to consumers and promote sustainable use of resources towards socially desirable crop mix (Parikh & Singh 2007).

Price incentives in the form of support prices helped India to increase food production during green revolution period. MSP also aims at procuring food grains from food surplus states for distribution through PDS and maintaining buffer stock and thus bridge the demand supply gap (Jha & Srinivasan 2006; Chand 2008). Price incentives in form of MSP are credited for the increase in area under rice and wheat in the green revolution states like Punjab and Haryana.

Agricultural situation in India has undergone sea change after the green revolution
period, but the agriculture price policy has more or less remained same (Chand 2003). Food surplus is available in many states and not just Haryana, Punjab and Andhra Pradesh; however, the procurement has largely confined to these regions (Planning Commission 2005). MSP is viewed as a safety net to ensure price security for a long-term investment decision to farmers.

There have been many concerns off late regarding operation and effectiveness of MSP. Many studies have pointed out that MSP is leading to regional imparity in incomes as it is effective only in few states where it is backed by procurement (Ali et al. 2012; Tripathi 2013; Schiff et al. 1992). MSP is also said to have favoured crop specialization in with rice and wheat at the cost of pulses and oil seeds (Chand 2003; Jha & Srinivasan 2006; Jha 2009; Mittal & Hariharan 2016).

With demand–supply situation undergoing sea change over the last couple of decades or so, the agriculture price policy needs a relook. Treating MSP as a safety net, in this study, we explore the farmers’ awareness of MSP of crops grown by them, across crops and states, with the hypothesis that awareness is the bare minimum requirement for policy interventions to have any impact. We also explore the reasons for the apathy of farmers to sell their produce to procurement agencies. The correlates of awareness about MSP have also been examined. The study also tries to reconnoitre the possible relationship between knowledge of MSP and farmers’ choice of crop specialization/diversification. The key objectives of the study are to understand the status of farmers’ awareness of MSP of crops grown by them and its correlates and to explore the nature of the relationship between farmers’ awareness of MSP and decision to diversify the crops.

2. Theoretical Framework

When viewed from a safety net perspective, MSP helps farmers by setting floor price if procurement agency purchases the product at MSP when the open market price falls below the floor price. In absence of procurement, a farmer can refuse to settle for a price below MSP if he is aware of the support price for the crops. If he is not even aware of MSP of crops, traders and middlemen can turn exploitative and offer price less than MSP (Economic Survey 2016). So, in this study, awareness about MSP is considered as a proxy for the impact of support prices.

The underlying theoretical framework for the relationship between crop diversification and MSP awareness is drawn from livelihood diversification theory. Livelihood diversification is defined as the process by which rural families construct a diverse portfolio of activities and social support capabilities in their struggle for survival in order to improve their standards of living (Ellis 1998). The theory states that farmers respond to policy, environmental and resource constraints with measures like changing crop choices. This study is based on the assumption that if there is no MSP, the farmers would rationally diversify his cropping pattern. In India, a significant amount of area under coarse cereal crop has been replaced by fine cereals like rice and wheat, which clearly suggest the biasness of MSP towards the later mentioned crops. Farmers who are aware of MSP will be inclined to allocate major area share to that crop as there is little price risk involved. This assumption is valid in our case as most of the farmers who were aware of MSP of crops are either rice or wheat growers. Our aim here is to see whether knowledge of MSP makes them to allocate more area to that crop leading to crop specialization (or less or no diversification) or not.

3. Data and Methods

We have used the data from ‘Situational Assessment Survey of Farmers’ (National Sample Survey Office 70th round). The sample consists of data regarding 35,200 rural agricultural households spread across 4,529 villages of India collected using stratified multistage random sampling (NSSO 2015). The data were collected for kharif and rabi (the two major agricultural seasons of India) in two separate visits and pertain to the year 2012–13. Only the households that grow at least one crop for
which MSPs are announced were considered for analysis as MSP is announced only for 24 crops at present (Table A1). A household, which is aware of MSP of at least one crop, is treated as being ‘aware’ about MSP and vice versa.

We have also used agro-climatic region dummies at the district level to account for the difference in agro-climatic parameters that affects the crop diversification. Theoretically, amongst the climatic variables, rainfall plays an important role in farmers’ choice of crop diversification. Hence, district-wise rainfall data for the corresponding year was collected from Indian Meteorological Department and used explicitly in the regression equation.

3.1. Simpson Diversity Index for Measuring Crop Specialization

There are different methods to measure crop diversity. Diversity indices are a common measure for assessing plant diversity (Magurran 2004). Simpson index is more responsive to dominant species (Aguilar et al. 2015). Crop diversification was quantified using Simpson index in this study. The index is based on the share of the rth crop in gross cropped area for the season (Mittal & Hariharan 2016). The value of the index depends on a number of crops grown and their share in gross cropped area. Assuming all the crops grown have the same share of gross cropped area, as the number of crops grown approaches infinity, the value of index approach unity. Theoretically, Simpson index ranges between zero and one, zero being the case of complete specialization.

\[
SI = 1 - \sum_{i=1}^{n} P_i^2
\]

where \(P_i\) represents the share of area under each crop to gross cropped area.

3.2. Heckman Model

Heckman selection model could be used to access whether there is an underlying regression relationship between awareness about MSP (regression equation) and cropping diversity (selection equation). The underlying assumption is that awareness about MSP is non-random contingent upon a set of observed and unobserved characteristics. Generally, estimated impact of MSP awareness may be biased and inconsistent because of ‘selection biases’. Source of this bias is endogeneity of ‘awareness’ variable (correlated with the error term consequential upon non-randomness). We need to account for unobservable factors affecting both probability of being aware of MSP and choice of crop diversification.

The first step in our model is the selection equation that captures the factors that affect probability of farmer being aware of MSP of crops that he grows. Then we estimate ‘inverse lambda’ to account for selection bias and include it as an explanatory variable in the outcome equation that establishes the relationship between crop diversification and MSP awareness (following Briggs 2004). As suggested by Heckman, this approach will account for the unobserved selection bias and produce efficient estimates. And also, the first equation helps us to identify the drivers of awareness about MSP awareness.

Regression equation used in the study is expressed mathematically as outcome equation:

\[
Y_j = X_j\beta + u_{1j}
\]

where \(Y_j\) is the Simpson index of diversification and \(X_j\) is the vector of independent variables.

The corresponding selection equation is

\[
M = z_j\gamma + \mu_{2j} \quad \text{and observed only if } z_j\gamma + \mu_{2j} > 0
\]

where \(M\) is equal to awareness about MSP of crops

\[
\mu_1 \sim N(0, \sigma)
\]

\[
\mu_2 \sim N(0, \sigma)
\]

\[
\text{corr}(u_1, u_2) = \rho
\]
When $\rho \neq 0$, standard regression techniques applied to the first equation yield biased results. Heckman provides consistent, asymptotically efficient estimates for all the parameters in such models. The variables used in the model are given in Table 1.

3.3. Limitations

Farmers’ choice of crop diversification also depends on the scope for diversification in the region and socio-economic criteria. We have tried to account for most of these factors within the constraints imposed by the availability of data and methods. We admit that research question can be better addressed with panel data.

4. Results and Discussion

Minimum Support Prices are an important component of agriculture price policy in India. The scheme provides the floor price for farm produce and also makes food grains available for buffer stock and PDS. It provides security for long-term investment decisions of the farmers. Another important objective of MSP is to incentivize the farmer to allocate resources in socially desired cropping patterns. MSP is expected to provide a sense of price security to the farmer and motivate them to diversify the crops. MSP as an incentive for diversification is superior to other incentives (Planning Commission 2005).

Policy decisions by the Government in terms of MSP for the past 14 years are 

| Name | Type |
|------|------|
| Outcome equation: Dependent variable is Simpson index of diversification | |
| Aware about MSP of crops | Dummy = 1 if aware and 0 otherwise |
| Inverse mills | Variable to account for selection bias |
| Annual rain | Mean annual rainfall of the district (for 2012–13) |
| Annual drought | Dummy = 1 if actual rainfall is deficient by more than 20% |
| SC | Dummy = 1 if belongs to scheduled caste and 0 otherwise |
| ST | Dummy = 1 if belongs to scheduled tribe and 0 otherwise |
| OBC | Dummy = 1 if belongs to other backward caste and 0 otherwise |
| Age | Age of the head of the household |
| Age$^2$ | Squared term of age of head of household |
| Household size | Number of members is family |
| Literate | Dummy = 1 if literate and 0 otherwise |
| Received training in agriculture | Dummy = 1 if received training in agriculture and 0 otherwise |
| Public extension contact | Dummy = 1 if accessed public extension service and 0 otherwise |
| Progressive farmer contact | Dummy = 1 if accessed progressive farmer as source of information and 0 otherwise |
| Mass media contact | Dummy = 1 if accessed progressive farmer as source of information and 0 otherwise |
| Agriculture as primary income source | Dummy = 1 if agriculture is the main source of income and 0 otherwise |
| Marginal farmer | Dummy = 1 if size of operational holding is less than 1 ha and 0 otherwise |
| Small farmer | Dummy = 1 if size of operational holding is between 1 and 2 ha and 0 otherwise |
| Semi-medium farmer | Dummy = 1 if size of operational holding is between 2 and 5 ha and 0 otherwise |
| Medium farmer | Dummy = 1 if size of operational holding is between 5 and 10 ha and 0 otherwise |
| BPL | Dummy = 1 if farmer belongs to below poverty line category |
| AEZ_dummy | Dummies for 14 different ACZ, =1 if the farmer belongs to that particular ACZ. |
| Selection equation: Dependent variable $n =$ awareness about MSP—Dummy = 1 if farmer is aware | |
| Male headed | Farm household where head of the family is male |
| Effective states | Dummy = 1 if the farmer belongs to states where there is the active procurement of food grains, that is, Haryana or Punjab or Chhattisgarh or Andhra Pradesh or Karnataka and 0 otherwise (classification based on literature survey) |

Notes: Squared term of age is used to improve the fit of the model as the reviewed literature suggests that the variable follows quadratic form. ACZ, agro-climatic zones; MSP, Minimum Support Price.
presented in Figure 1. MSP for all crops is continuously rising and conscious effort by the policy to favour pulses, oilseeds and minor cereals can be seen particularly after 2007–08. During this period, MSP for major pulses was raised by Rs. 526 (Tur), 955 (each for Moong and Urad), 624 (Groundnut) and 156 (Gram) over the previous years when compared with Rs. 240, 367 and 240 hikes in MSP for Jowar, Ragi and Bajra respectively in real terms. Further, in 2011–12, MSP for these was hiked by Rs. 615 (Tur), 860 (Moong), 961 (Urad), 967 (Groundnut), 588 (Gram), 506 (Jowar), 436 (Ragi) and 184 (Bajra) over the previous years in real terms. But is this a sufficient incentive for the farmer to diversify the crops with the inclusion of pulses and other minor crops? Does the announcement of MSP instil a sense of price security in a farmer?

For MSP to function as safety net, there must be a system of procurement, which should buy the produce at MSP whenever market prices fall below support price for the crop, and farmer must be aware of the MSP for the crops grown by him so that he can refuse to sell his produce at price below MSP. Table 2 presents the percentage of farmers who are aware of MSP of crops grown by them. At crop level (each farmer may be growing more than one crop), the awareness stands at around 17 per cent for both kharif and rabi. But MSP is announced only for selected crops in each season and calculating the share to a total number of crops may be erroneous. We have considered subsample of farmers who grow at least one crop for which MSP is announced, and data of such farmers are used in the analysis (except summary statistics). Any household having knowledge of MSP for at least one crop is considered as aware, and the share of such households is 28.30 and 23.13 per cent in rabi and kharif, respectively (Table 2). We can draw inference for India as

Table 2 Share of Farmers’ Awareness of MSP of Crops Grown by Them (%)

| Awareness of MSP                   | Rabi | Kharif |
|-----------------------------------|------|--------|
| Awareness at crop level           | 17.51| 17.16  |
| Awareness at household level      | 28.30| 23.13  |
| Awareness at household level with sampling weight | 23.72 | 20.04  |

Note: MSP, Minimum Support Price.
Source: NSSO data.

Figure 1 Trends in Minimum Support Price for Major Pulses, Oilseeds and Cereal Crops (in Rs. at 2011–12 Prices)
a whole only after accounting for sampling weights. So we can say that only 23.72 and 20.04 per cent of Indian households are aware of MSP of crops grown by them (Figure 2).

Even after more than 40 years after its implementation, less than 25 per cent of farmers knows the MSP of crops they grow. Although MSP is announced for the whole of India, the operation is limited only to few states where the designated government agencies procure the produce from farmers. Statewise figures on farmers’ knowledge of MSP of crops support our proposition. In states where procurement of food grains through designated agencies is more active, like Punjab, Haryana, Chhattisgarh, Uttar Pradesh and Telangana, the awareness of MSP is also high (Table 3).

Further, 27.83 and 30.48 per cent of farmers are reported of being unaware about the agency that procures the food grains at MSP (Table 4). There is a need for creating a good network of procurement agencies and also for awareness amongst farmers about the operation of MSP. Except for crops like rice and wheat, quantity procured is very limited leading low level of awareness. Even for rice and wheat, procurement takes place only in few states, and more farmers are aware of MSP in those states (Figure 3).

Minimum Support Price of rice and wheat is known to the majority of the farmers in

| States          | Rabi (%) | Kharif (%) |
|-----------------|----------|------------|
| Punjab          | 52.94    | 48.93      |
| Chhattisgarh    | 37.09    | 47.20      |
| Delhi           | 64.29    | 41.18      |
| Odisha          | 9.85     | 36.23      |
| Haryana         | 32.10    | 27.80      |
| Uttar Pradesh   | 22.43    | 27.59      |
| Bihar           | 22.84    | 27.49      |
| West Bengal     | 19.29    | 26.23      |
| Telangana       | 30.82    | 25.32      |
| Kerala          | 19.47    | 22.09      |
| Rajasthan       | 20.90    | 15.06      |
| Andhra Pradesh  | 14.35    | 14.60      |
| Karnataka       | 14.61    | 13.97      |
| Jharkhand       | 4.96     | 13.25      |
| Himachal        | 10.24    | 13.24      |
| Madhya Pradesh  | 30.47    | 12.19      |
| Gujarat         | 9.97     | 12.02      |
| Uttarakhand     | 9.14     | 9.81       |
| Jammu and K     | 6.03     | 8.21       |
| Maharashtra     | 8.00     | 8.19       |
| Tamil Nadu      | 15.12    | 7.71       |
| Arunachal       | 7.39     | 6.49       |
| Tripura         | 21.50    | 5.99       |
| Mizoram         | 0.30     | 4.24       |
| Assam           | 3.88     | 4.09       |
| Nagaland        | 1.96     | 3.87       |
| Chandigarh      | 6.67     | 3.13       |
| Meghalaya       | 12.52    | 1.33       |
| Manipur         | 0.14     | 0.48       |
| Sikkim          | 0.00     | 0.00       |

Note: MSP, Minimum Support Price.
Source: NSSO data.
Haryana, Punjab and Chhattisgarh; major states from where food grains are procured for buffer stock or PDS. Knowledge of MSP of rice and wheat is less in other growing regions like Andhra Pradesh, Telangana, Karnataka, Uttar Pradesh and Bihar. For important pulse crops like Tur and Gram, the share of farmers knowing MSP of crops is very less across all states. Less than 10 per cent awareness for most the pulses is another cause of concern (Tables 5, 6). With India trying to increase the pulse production, support prices can act as an incentive if the government starts procurement through a good network of channels. Then only the benefit of support prices will reach farmers and be able to provide price security that it intends to.

Out of meagre proportion of farmers who were aware of MSP, 75.09 and 75.58 per cent of farmers (in rabi and kharif, respectively) have not sold the produce to procurement agencies. The reasons for not selling to procurement agency are given in Table 7. The role of MSP is to set the floor price, and if farmers have received a better price than MSP, it is fine. Only 7.97 and 8.77 per cent of farmers reported that they did not sell to procurement agency as they received a better price in the market. But nearly 25 per cent of farmers reported that there is no procurement agency/local purchaser available to procure the produce at MSP. Ideally speaking, the benefit of MSP should reach all farmers across all states and for which a good network of procurement agencies with required infrastructure is also must. But from a practical point of view, this may not be feasible. Government agencies are already facing difficulty in storage and maintenance

| Table 4 Farmers Awareness of Procurement Agencies (%) |
|------------------------------------------------------|
| Procurement agency | Rabi | Kharif |          |
|---------------------|------|-------|----------|
| Food Corporation of India | 18.80 | 19.02 |          |
| Jute Corporation of India | 1.02 | 1.35 |          |
| Cotton Corporation of India | 0.62 | 2.13 |          |
| National Agricultural Cooperative Marketing Federation of India Ltd | 5.24 | 3.30 |          |
| State Food Corporation | 17.74 | 13.23 |          |
| State Civil Supplies | 7.73 | 9.13 |          |
| Others | 21.03 | 21.36 |          |
| Did not know | 27.83 | 30.48 |          |
| Total | 100 | 100 |          |

Source: NSSO data.

| Table 5 Farmers Awareness about MSP by Crop Groups (%) |
|--------------------------------------------------------|
| Crop group | Rabi | Kharif |          |
|------------|------|-------|----------|
| Cereals | 29.02 | 22.04 |          |
| Pulses | 10.1 | 8.67 |          |
| Oilseeds | 17.67 | 15.88 |          |
| Sugarcane, cotton and jute | 24.24 | 21.04 |          |
| Total | 17.51 | 17.16 |          |

Note: MSP, Minimum Support Price.
Source: NSSO data.

Figure 3 Cropwise and Statewise Awareness of Farmers about Minimum Support Price of Crops
of food grains procured. The infrastructure available may not allow us to expand procurement to the whole country. Instead, MSP can be backed by the method of ‘deficiency payments’ as suggested by many earlier studies and reports. If the market prices fall below MSP, 50 per cent of the difference between price and MSP will be paid to a farmer under this system. MSP needs to be backed by either effective procurement or system of deficiency payment if it were to help the farmer by setting floor prices.

Another thing to note is 66.68 and 63.22 per cent of farmers in rabi and kharif reported that they have not sold to procurement agency because of other reasons. The other reason might include a delay in payments of money by procurement agencies. A study by (Deshpande 2008) reported lag of nearly 1 month between procurement and payment. The method of payment using checks rather than cash might also add to farmers’ indifferent attitude to procurement agencies.

We have used a probit model to identify the correlates of farmers’ knowledge of MSP of crops grown by them. The same model is used as selection equation (first step) in Heckman two-step selection model. Household’s awareness of MSP is the dependent variable for the regression. State dummies were used to nullify the effect of unobserved heterogeneity across the states. Standard errors were clustered at the region to enhance the precision. The results indicate that literacy and extension contact (both public extension and progressive farmer contact) are positively associated with awareness about MSP. Marginal farmers have less probability of knowing MSP of crops compared with their counterparts. Households below the poverty line1 were also found to have lesser awareness about MSP (Table 8).

If farm household belongs to states where MSP is coupled with active procurement

Table 6 Farmers’ Knowledge of MSP by Crops

| Crop    | Rabi |                  | Kharif |                  |
|---------|------|------------------|--------|------------------|
|         | Aware | Not aware        | Aware  | Not aware        |
|         | Number | Percentage | Number | Percentage | Number | Percentage | Number | Percentage |
| Paddy  | 1,183  | 28.15  | 3,020  | 71.85  | 4,987  | 27.43  | 13,192 | 72.57  |
| Jowar   | 46    | 8.65   | 486    | 91.35  | 128    | 7.8    | 1,514  | 92.2   |
| Bajra   | 7     | 5.22   | 127    | 94.78  | 320    | 16.15  | 1,661  | 83.85  |
| Maize   | 200   | 15.55  | 1,086  | 84.45  | 466    | 11.29  | 3,663  | 88.71  |
| Wheat   | 3,621 | 33.2   | 7,285  | 66.8   | 2      | 11.11  | 16     | 88.89  |
| Gram    | 256   | 11.67  | 1,937  | 88.33  | 7      | 5.38   | 123    | 94.62  |
| Tur     | 38    | 7.72   | 454    | 92.28  | 97     | 7.87   | 1,135  | 92.13  |
| Urad    | 48    | 13.83  | 299    | 86.17  | 121    | 10.07  | 1,080  | 89.93  |
| Sugarcane | 458  | 55.18  | 372    | 44.82  | 702    | 46.34  | 813    | 53.66  |
| Groundnut | 37   | 9.44   | 355    | 90.56  | 67     | 7.88   | 783    | 92.12  |
| Cotton  | 111   | 24.24  | 347    | 75.76  | 491    | 21.04  | 1,843  | 78.96  |

Note: MSP, Minimum Support Price.  
Source: NSSO data.

Table 7 Reasons quoted by farmers for not selling to procurement agency

| Reason for not selling to procurement agencies | Rabi | Kharif |
|-----------------------------------------------|------|--------|
| Procurement agency not available              | 16.53| 17.53  |
| No local purchaser                            | 6.63 | 6.94   |
| Poor quality of crop                          | 1.25 | 2.31   |
| Crop pre-pledged                              | 0.75 | 1.20   |
| Received better prices                        | 7.97 | 8.77   |
| Other                                         | 66.88| 63.26  |
| Total                                         | 100.00| 100.00 |

Source: NSSO data.

1. In this study, the poverty line is measured using possession of below poverty line cards. These cards are distributed amongst rural households that make them eligible under PDS.
variable-effective states), the probability of such household knowing MSP of the crop is high. But, probit coefficients cannot be compared based on magnitude. So, we calculated marginal effect of each variable that signifies magnitude of increase in the probability

| Variables                  | Coefficient | P > |z| | Coefficient | P > |z| |
|----------------------------|-------------|-----|---|-------------|-----|---|
| Male headed                | 0.144       | 0.004 |   | 0.158       | 0.246 |
| Literate                   | 0.266       | 0.000 |   | 0.261       | 0.000 |
| Received training in agriculture | 0.153 | 0.030 |   | 0.085       | 0.553 |
| Household size             | 0.007       | 0.079 |   | 0.015       | 0.042 |
| ST                         | −0.157      | 0.059 |   | −0.128      | 0.274 |
| SC                         | −0.118      | 0.023 |   | −0.014      | 0.863 |
| OBC                        | −0.068      | 0.061 |   | 0.009       | 0.917 |
| Age                        | 0.011       | 0.010 |   | 0.008       | 0.572 |
| Age²                       | 0.000       | 0.116 |   | 0.000       | 0.726 |
| Marginal farmer            | −0.566      | 0.000 |   | −0.637      | 0.002 |
| Small farmer               | −0.280      | 0.011 |   | −0.286      | 0.149 |
| Semi-medium farmer         | −0.146      | 0.163 |   | −0.236      | 0.194 |
| Medium farmer              | −0.026      | 0.802 |   | −0.255      | 0.109 |
| BPL                        | −0.152      | 0.000 |   | −0.145      | 0.059 |
| Land leased in             | 0.035       | 0.099 |   | 0.039       | 0.224 |
| Agriculture as primary income source | −0.040 | 0.304 |   | −0.068      | 0.162 |
| Public extension contact   | 0.347       | 0.000 |   | 0.336       | 0.000 |
| Progressive farmer contact | 0.386       | 0.000 |   | 0.412       | 0.000 |
| Mass media contact         | 0.089       | 0.137 |   | 0.090       | 0.202 |
| Effective states           | 1.169       | 0.000 |   | 1.156       | 0.001 |
| Constant                   | −1.763      | 0.000 |   | −1.918      | 0.000 |

Notes: Dependent variable: Aware about MSP. Log pseudolikelihood = −30,483,404, number of observations = 27,715, pseudo-$R^2 = 0.1699$, standard error adjusted for 84 clusters in region and state dummies were also used (for kharif). Log pseudolikelihood = −26,819,397, number of observations = 20,816, pseudo-$R^2 = 0.1453$, standard error adjusted for 85 clusters in region and state dummies were also used (for rabi). BPL, below poverty line; MSP, Minimum Support Price; OBC, other backward caste; SC, scheduled caste; ST, scheduled tribe.

Figure 4 Marginal Effects of Variables on Probability of Farmer Being Aware about Minimum Support Price. BPL, Below Poverty Line; OBC, Other Backward Caste; SC, Scheduled Caste; ST, Scheduled Tribe
of being aware of MSP for a unit increase in a respective variable. The result is depicted in Figure 4. Most important variables that increase the awareness about MSP are active procurement, awareness creation (public extension contact and progressive farmer contact) and literacy. This reinstates that announcing of MSP does not work in isolation unless coupled with procurement. Recent hikes in MSP of pulses and oilseeds to increase in production may not work unless it is backed by procurement or deficiency payment.

In the next step, using Heckman selection model, we tried to establish the relationship between farmers’ decision to diversify (or to specialize) and MSP awareness (Table 9). For kharif season, variable for awareness was statistically insignificant, and for rabi, it was positive as well significant. So we do not accept the null hypothesis that awareness about

Table 9  Relationship between Knowledge of MSP and Crop Diversification: Result of Heckman Outcome Equation

| Simpson index | Kharif Coefficient | P > |t| | Rabi Coefficient | P > |t| |
|---------------|--------------------|-----|-----|----------------|-----|-----|
| Aware about MSP of crops | -0.007 | 0.379 | 0.023 | 0.009 |
| Inverse mills | -0.055 | 0.305 | -0.045 | 0.603 |
| Annual rain | 0.000 | 0.047 | 0.000 | 0.944 |
| Annual drought | -0.010 | 0.515 | 0.000 | 0.976 |
| SC | 0.006 | 0.676 | -0.022 | 0.085 |
| ST | 0.059 | 0.001 | 0.014 | 0.356 |
| OBC | 0.004 | 0.699 | 0.006 | 0.457 |
| Age | -0.001 | 0.490 | 0.002 | 0.048 |
| Age² | 0.000 | 0.575 | 0.000 | 0.077 |
| Household size | 0.003 | 0.000 | 0.003 | 0.000 |
| literate | -0.023 | 0.166 | 0.015 | 0.458 |
| Received training in Agriculture | 0.014 | 0.274 | 0.008 | 0.559 |
| Public extension contact | 0.017 | 0.190 | 0.019 | 0.427 |
| Progressive farmer contact | 0.008 | 0.322 | 0.012 | 0.274 |
| Mass media contact | 0.019 | 0.014 | 0.020 | 0.034 |
| Agriculture as primary income source | -0.070 | 0.125 | -0.074 | 0.122 |
| Marginal farmer | -0.029 | 0.437 | -0.017 | 0.608 |
| Small farmer | 0.004 | 0.912 | 0.005 | 0.845 |
| Semi-medium farmer | 0.019 | 0.442 | 0.003 | 0.873 |
| Medium farmer | -0.008 | 0.611 | 0.008 | 0.749 |
| BPL | 0.003 | 0.784 | 0.000 | 0.974 |
| AEZ15_dummy | 0.060 | 0.187 | 0.113 | 0.024 |
| AEZ2_dummy | 0.051 | 0.172 | 0.015 | 0.822 |
| AEZ3_dummy | -0.016 | 0.743 | 0.101 | 0.402 |
| AEZ4_dummy | -0.009 | 0.922 | 0.005 | 0.970 |
| AEZ5_dummy | 0.058 | 0.542 | 0.017 | 0.891 |
| AEZ6_dummy | -0.059 | 0.151 | 0.000 | -0.000 |
| AEZ7_dummy | -0.135 | 0.001 | -0.052 | 0.665 |
| AEZ8_dummy | 0.025 | 0.761 | 0.059 | 0.606 |
| AEZ9_dummy | 0.051 | 0.522 | -0.036 | 0.750 |
| AEZ10_dummy | -0.061 | 0.270 | -0.097 | 0.314 |
| AEZ11_dummy | -0.121 | 0.000 | -0.055 | 0.607 |
| AEZ12_dummy | -0.011 | 0.865 | -0.044 | 0.694 |
| AEZ13_dummy | -0.014 | 0.813 | -0.003 | 0.950 |
| AEZ14_dummy | 0.036 | 0.706 | 0.053 | 0.653 |
| Constant | 0.444 | 0.000 | 0.207 | 0.298 |

Notes: Number of observations = 26,330, R² = 0.1700, standard error adjusted for 84 clusters in the region and state dummies were also used in kharif season. Number of observations = 19,901, R² = 0.1350, standard error adjusted for 83 clusters in the region and state dummies were also used in rabi season. BPL, below poverty line; MSP, Minimum Support Price; OBC, other backward caste; SC, scheduled caste; ST, scheduled tribe.

© 2017 The Authors. Asia and the Pacific Policy Studies published by John Wiley & Sons Australia, Ltd and Crawford School of Public Policy at The Australian National University
MSP leads to crop specialization. Although the sign of awareness variable is positive, the magnitude of the coefficient is very small indicating the weak relationship it has with crop diversification. Most of the variability is absorbed by state dummies, indicating a decision to diversify mostly depends on the potential of the region more than the other factors (Figure 5).

5. Concluding Remarks

Minimum Support Prices are considered as an important pillar of Indian Agricultural price policy rolled out with an intention of providing price security to farmers. Theoretically, the support prices are to benefit farmers of most of the crops in the entire nation. In this article, we tried to analyse the level of awareness of farmers about MSP of crops they grow and its correlating factors using a comprehensive dataset of National Sample Survey Office, 70th round. We found that more than 75 per cent of Indian households is not aware of MSP of crops grown by them. Awareness was high only in case of rice and wheat that too only in few states like Punjab, Haryana and Chhattisgarh, from where food grains are heavily procured by designated agencies for maintaining buffer stock or PDS. Awareness of MSP of pulse crops was even less (<10 per cent for most of the crops), which is a cause of concern. If the farmers are aware of the MSP of crops, they can bargain price and refuse to settle for less. Their ignorance would make it easy for middlemen and other traders to exploit the farmers by quoting less price.

Out of few who were aware of MSP, nearly 25 per cent of farmers reported not selling the produce to procurement agencies. Unavailability of procurement agencies and local purchasers were reported as the major reason. From probit regression, we conclude that to make more farmers aware about MSP of crops and to enable them to take benefit of it, better network of procurement agencies should be developed. Decentralized procurement agencies with local presence coupled with increased storage capacity or system of deficiency payments to bypass the need for procurement can extend the benefits of support prices to a larger segment of the farming community. Public extension machinery will also play a vital role. We found no empirical evidence to prove that awareness of MSP leads to crop specialization as procurement is biased towards rice and wheat.

References

Aguilar J, Gramig GG, Hendrickson JR, Archer DW, Forcella F, Liebig MA (2015)
Crop Species Diversity Changes in the United States: 1978–2012. *Plos One* 10(8), 1–4.

Ali SZ, Sidhu RS, Vatta K (2012) The Effectiveness of Minimum Support Price Policy for Paddy in India with a Case Study of Punjab. *Agricultural Economics Research Review* 25(2), 231–42.

Briggs DC (2004) Causal Inference and the Heckman Model. *Journal of Educational and Behavioral Statistics* 29(4), 397–420.

Chand R (2003) Government Intervention in Foodgrain Markets in the New Context. Policy paper 19.2003. ICAR-National Institute for Agricultural Economics and Policy Research. Erstwhile National Centre for Agricultural Economics and Policy Research. New Delhi.

Chand R (2008) MSP and Other Interventions in Wheat Market: Are They Contributing to the Buffer Stock Cycles and Market Destabilization? http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.620.3112&rep=rep1&type=pdf

Deshpande RS (Ed) (2008) Impact of Minimum Support Prices on the Agricultural Economy. In Glimpses of Indian Agriculture. Ministry of Agriculture & Academic Foundation, Government of India. New Delhi.

Economic Survey (2016) Agriculture: More from Less. http://indiabudget.nic.in/es2015-16/echapvol1-04.pdf

Ellis F (1998) Household Strategies and Rural Livelihood Diversification. *Journal of Development Studies* 35(1), 1–38. http://doi.org/10.1080/00220389808422553.

Jha, Brajesh (2009) Drivers of Agricultural Diversification in India, Haryana, and the Greenbelt Farms of India. Working Paper Series No. 303. Institute of Economic Growth. New Delhi.

Jha S, Srinivasan PV (2006) India—Reforming Farm Support Policies for Grains Report Prepared for IGIDR—ERS/USDA Project: Indian Agricultural Markets and Policy. Mumbai.

Kadasiddappa M, Soumya B, Prashanth P, Sachin HM (2013) A Historical Prospective for Minimum Support Price of Agricultural Crops. *Kisan World* 40(12).

Magurran AE (2004) *Measuring Biological Diversity*. Blackwell publication, UK.

Mittal S, Hariharan VK (2016) Crop Diversification by Agro-climatic Zones of India—Trends and Drivers. *Indian Journal of Economics and Development* 12(1), 123–32.

NSSO (National Sample Survey Office) (2015) Situation Assessment Survey of Agricultural Households: January–December 2013. NSS 70th Round (unit level data). Ministry of Statistics and Programme Implementation (MOSPI). Government of India.

Parikh J, Singh C (2007) Extension of MSP: Fiscal and Welfare Implications. http://planningcommission.nic.in/reports/sereport/set/ser_msp.pdf.

Planning Commission (2005) Report of the Inter-ministry Task Group on Comprehensive Medium-Term Strategy for Food and Nutrition Security. http://planningcommission.nic.in/aboutus/taskforce/inter/inter_nutrn.pdf

Schiff MW, Alberto V, Anne OK (eds) (1992) *The Political Economy of Agricultural Pricing Policy: A Synthesis of the Political Economy in Developing Countries*. John Hopkins, Baltimore, MD, USA.

Tripathi AK (2013) Agricultural Price Policy, Output, and Farm Profitability—Examining Linkages during Post-reform Period in India. *Asian Journal of Agriculture and Development* 10(1), 91–111.
## Appendix A

### Table A1  List of Crops for Which MSP Is Declared

| Serial number | Crop     | Common/other name | Type/variety          |
|---------------|----------|-------------------|-----------------------|
|               |          |                   |                       |
| **Kharif crops** |          |                   |                       |
| 1             | Paddy   |                   | Common/grade ‘A’      |
| 2             | Sorgum   | Jowar             | Hybrid/maldandi       |
| 3             | Pearl millet | Bajra       |                       |
| 4             | Maize    | Corn              |                       |
| 5             | Finger millet | Ragi            |                       |
| 6             | Pigeon pea | Arhar (Tur)    |                       |
| 7             | Green gram | Moong         |                       |
| 8             | Black gram | Urad           |                       |
| 9             | Cotton   |                   | Medium staple/long staple |
| 10            | Groundnut |                   | In shell              |
| 11            | Sunflower |                   | Seed                  |
| 12            | Soyabean  |                   | Yellow and black      |
| 13            | Sesamum   |                   | –                     |
| 14            | Niger     |                   | Seed                  |
| **Rabi crops** |          |                   |                       |
| 15            | Wheat     |                   |                       |
| 16            | Barley    |                   |                       |
| 17            | Gram      |                   |                       |
| 18            | Lentil    | Masur             |                       |
| 19            | Rapeseed/mustard |           |                       |
| 20            | Safflower |                   |                       |
| **Other crops** |          |                   |                       |
| 21            | Copra     |                   | Milling/ball          |
| 22            | De-husked coconut |           |                       |
| 23            | Raw jute  |                   |                       |
| 24            | Sugarcane |                   |                       |

**Notes:** MSP of the crops are declared by the government based on recommendations of CACP. CACP is under Ministry of Agriculture and Farmers Welfare, Government of India. They provide price policy reports to government for crops grown in kharif and rabi and for other crops such as sugarcane, raw jute and copra. Although cost of production is a key factor in determination of MSP, other factors such as demand and supply, price trends (domestic and international), intercrop price parity, terms of trade between agriculture and non-agriculture and implication of MSP on consumers are considered. For more details on MSP, see CACP website http://cacp.dacnet.nic.in/. CACP, Commission for Agricultural Costs and Prices; MSP, Minimum Support Price.