

## RESEARCH ARTICLE

## Understanding the Perception, Constraints and Reasons for the Adoption of Organic Farming

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## ABSTRACT

*The present study analyzed the perception, constraints, and reasons for adopting organic farming in Himachal Pradesh, India. A sample of 60 organic crop growers was selected using a three-stage random sampling design in the year 2018-19. These farmers had adopted organic farming under Parampragat Krishi Vikas Yojana (PKVY). Findings revealed that the cost of cultivation is increasing continuously with the increasing use of inorganic inputs was the major reason for shifting farmers to organic farming. During the survey, 43.33 per cent of respondents reported that the Dept. of Agriculture is playing a significant role in changing the perception of farmers toward the adoption of organic farming. The major reason reported by respondents for practicing organic farming was the low cost of cultivation as no inputs were purchased from the market (21.67%). The low productivity of organically cultivated crops and difficulty in the disposal of organic produce due to a lack of specialized agencies were reported to be the major production and marketing constraints. The difficulty in certification of produce was the major institutional constraint, whereas, crop loss due to birds and stray animals were the emerging problems in the study area. Thus, policymakers have to pay proper attention critically to the constraints faced by the farmers to increase the productivity of organic farming in a sustainable manner.*

**Key words:** Constraints; Perception; Organic farming; Marginal and Small farmers.

The Indian economy has always been based on agriculture. Currently, more than half of the population of the country makes a living from agriculture and related services (Tripathi et al. 2018). The Indian agriculture sector has undergone significant improvement during the past few decades. Since the introduction of "Green Revolution" technologies, India's agriculture has transitioned from subsistence to commercial production. The input-intensive "Green Revolution" has concealed significant externalities in recent decades that have a negative impact on natural resources, human health, and agriculture itself, despite its success. Neoliberal economic policies also have an additional impact. The Indian peasantry has suffered as a result of the reduction or elimination of input subsidies as well as the privatization and marketization of economic activity (Goswami et al. 2017). In addition, the "Green Revolution" and the neo-

liberalization of the Indian economy have contributed to a horrible agrarian catastrophe (Mishra, 2008; Lerche, 2011). The most exposed group has historically been smallholders. Higher production costs, high credit interest rates, uncertain agricultural market prices, growing costs of diesel inputs, and privatized seeds are characteristics of India's current agricultural sector (Badwal et al. 2019). Indian farmers as a result, especially smallholder farmers, are increasingly caught in a never-ending cycle of debt (Siddiqui, 2015). Over the past two decades, over 500,000 farmers in India have attempted suicide (Parvathamma, 2016). These issues can be combated with sustainable agriculture as it is ecologically sound, economically suitable, and socially acceptable as it helps farmers to achieve self-sufficiency, and self-reliance (Singh and Thakur, 2022). Although, the farmers who practice sustainable agriculture also face various difficulties. To get beyond

these limitations, appropriate remedies are needed (Devi et al. 2020). To decide on an appropriate approach and for the evolution of an appropriate policy, such difficulties and constraints require thorough analysis. The goal of the current study was to analyze the perception, constraints, and reasons for the adoption of organic farming in Himachal Pradesh, India.

## METHODOLOGY

The present investigation was carried out in the Chamba district of Himachal Pradesh mainly since it is one of the backward districts of the state. In general, the farming systems in the State are mixed and are subsistence in nature. But State government and the Department of Agriculture (HP) made efforts to promote organic farming in different parts of the state under Paramparagat Krishi Vikas Yojna (PKVY), which stipulates that a minimum of 65 per cent of farmers in each cluster belong to the small and marginal categories, respectively (GoI, 2017). The information was gathered using well-designed survey schedules and the personal interview approach in the Chamba district of Himachal Pradesh, India, during March and April 2019. Three stage random sampling design was employed for the selection of growers from the study area. At the first stage of sampling, from seven developmental blocks of the district, two blocks namely, Chamba and Mehla were selected randomly. In the second stage of sampling, the list of clusters formed by the Department of Agriculture where organic crops are commonly grown. From the list so prepared, a sample of 6 clusters (3 from each block) was selected randomly. In the third stage of sampling, the list of 150 organic farmers was prepared with the help of ADO/AEOs and Panchayat representatives. Finally, a sample of 60 organic crop growers was selected randomly by selecting 10 farmers from each selected cluster. These 60 farmers fully adopted organic farming under PKVY. Out of which 44 were marginal farmers (<1 ha), and 16 were small farmers (>1 ha.).

## RESULTS AND DISCUSSION

*Correlation between socio-personal variable with the adoption of organic farming* : The relation between the adoption of organic farming with socio-personal variables was statistically analyzed and presented in Table 1. The variable viz., age, education, type of family, and training were significantly and positively correlated with the adoption of organic farming at

5 per cent level of confidence. While the size of the family was significant and negatively correlated with the adoption of organic farming. On the other hand, variables such as gender, total land, cultivated land, and member of society were non-significant at 5 per cent level of significance. Subrahmanyeswari and Chander (2022) reported that training of farmers was significantly associated with the adoption of organic farming whereas Naik et al. (2009), Jaganathan et al. (2012) and Bhattacharjee et al. (2021) highlighted that education was also significantly associated with the adoption of organic farming.

**Table 1. Correlation between socio-personal variable with adoption of organic farming**

Variable	'r' value
Age	0.067*
Gender	-0.211 <sup>NS</sup>
Size of family	-0.071*
Education	0.061*
Type of family	0.051*
Total land	0.137 <sup>NS</sup>
Cultivated land	0.139 <sup>NS</sup>
Training	0.174*
Member of society	-0.001 <sup>NS</sup>

\*Significant at 5% level of significance; NS=non-significant

**Table 2. Type of farming practice before the formation of clusters under PKVY (%)**

Farming practice	Marginal	Small	Overall
Organic	72.73	62.50	70.00
Inorganic	13.64	6.25	11.67
Mixed	13.64	31.25	18.33
Organic	72.73	62.50	70.00

*Type of farming practice and shifting to organic farming* : Farming is an inherited activity as the major source of livelihood for the majority of the rural population (Singh et al. 2021). The type of farming practices adopted by the respondents on their sample farms before the formation of clusters under the PKVY scheme in the study area is presented in Table 2. Out of 60 sample households, 42 cultivated their crops through organic farm practice followed by mixed farming and inorganic farm practices. In mixed farm practices, the farmer adopts both practices (organic and inorganic). Respondents reported that they apply inorganic fertilizers and follow other farm operations such as organic farming. While the inorganic farm follows all practices related to the inorganic farming

type. In the study area, there were only 18 farmers who have non-organic farms which were about 30 per cent. Out of which 11.67 per cent have inorganic farm types and 18.33 per cent were mixed farm types (Table 2). Thus, the information regarding the shifting of inorganic farmers to organic farming is presented in Table 3. The results showed that organic farming was practiced default in the state as well as in the Chamba district but the practicing of organic farming on scientific lines was relatively new in the study area (Singh and Thakur, 2022). The proportion of respondents having an experience of 1-3 years was the highest (44.44% of the total non-organic farms) in the overall farming situation. The proportion of respondents having an experience of 3-4 years and >5 years was 22.22 per cent, respectively, on the overall farm situation. A similar pattern was followed in the marginal and small farm situations.

**Table 3. Shifting of inorganic farmers to organic farming before the formation of clusters under PKVY (%)**

Years	Marginal	Small	Overall
<1	16.67	-	11.11
1-3	41.67	50.00	44.44
3-4	25.00	16.67	22.22
>5	16.67	33.33	22.22
Total	100.00	100.00	100.00

**Table 4. Reasons for adoption of organic farming (%)**

Particulars	Marginal	Small	Overall
The soil health is deteriorating due to the use of inorganic inputs	16.67	16.67	16.67
The price of organic produce is expected to increase	8.33	16.67	11.11
Incentives from the govt. for organic farming	25.00	33.33	27.78
Non-availability of fertilizers and chemicals in a remote area	8.33	-	5.56
The cost of cultivation is increasing continuously with increasing use of inorganic inputs	41.67	33.33	38.89
Total	100.00	100.00	100.00

*Reasons for the adoption of organic farming* : A perusal of the data presented in Table 4 indicates that the cost of cultivation is increasing continuously with the increasing use of inorganic inputs was the major reason for the adoption of organic farming over inorganic farming and about 38.9 per cent of farmers agreed with this reason followed by incentives received from the government for organic farming

(27.78%), the soil health is deteriorating due to the use of inorganic inputs (16.67%) and the price of organic produce is expected to increase (11.11%) on the overall farm situation. The non-availability of fertilizers and chemicals in the remote area was the least reported reason (5.56%) for the shift to organic farming from conventional farming. A similar study revealed that improvement in the health of the soil, lower production cost, sustained farmer livelihood system, and minimal negative environmental effects were the major reason for practicing organic farming (Jaganathan et al. 2022). Ahmed et al. (2019) also reported that the majority of farmers adopting organic farming due to organic products fetching better prices for farmers and reducing the cost of production.

**Table 5. Perception of farmers regarding adoption of organic farming**

Particulars	Marginal	Small	Overall
Inputs like FYM, etc. are available in plenty	18.18	12.50	16.67
Soil fertility is improving with organic farming	15.91	12.50	15.00
Organic product enhances quality of produce	6.82	6.25	6.67
Productivity is quite good in the prevailing climatic conditions	4.55	12.50	6.67
Produce is sold at premium prices	9.09	6.25	8.33
Cost of cultivation is quite low as no inputs are purchased from the market	22.73	18.75	21.67
Incidences of insect pest and diseases are very low	13.64	18.75	15.00
Suitable for mixed cropping practices	9.09	12.50	10.00
Total	100.00	100.00	100.00

*Perception of farmers regarding the adoption of organic farming* : Table 5 shows the perception of farmers regarding the adoption of organic farming. Respondents reported that the cost of cultivation is quite low in organic farming as no inputs are purchased from the market (21.67%) were the major reason for the practicing the organic farming by the farmers followed by inputs like FYM, cow urine, biomass, waste of house, etc. are available in plenty to prepare the biofertilizers, manures and biopesticides were the second major reason (16.67%). About 15 per cent of farmers reported that the soil fertility was improved with the continuous practice of organic farming and

incidences of insect pests and diseases were reduced in the study area. Whereas suitable for mixed cropping practices and produce of organic farming is sold at premium prices were reported by 10 per cent and 8.33 per cent of farmers, respectively. On the other hand, organic products enhance the quality of produce and productivity is quite good in the prevailing climatic conditions were reported by 6.67 per cent in both reasons. Similar results were reported in marginal and small farm situations.

**Table 6. Motivation source for adoption of organic farming**

Particulars	Marginal	Small	Overall
Self	27.27	18.75	25.00
Neighbours	6.82	6.25	6.67
Relatives	4.55	-	3.33
KVKs	22.73	18.75	21.67
Dept. of Agriculture	38.64	56.25	43.33
Total	100.00	100.00	100.00

*Motivation Source for adoption of organic farming* : India is a country endowed with indigenous knowledge and the potential for organic agriculture (Bera et al. 2022). Even though India lags in the adoption of organic farming for a variety of reasons (Das et al. 2020). The source-wise motivation for adoption of organic farming by the respondents is presented in Table 6. The results revealed that out of the total respondents, majority were inspired either by Dept. of agriculture, self and KVK, accounting for 43.33 per cent, 25.00 per cent, and 21.67 per cent, respectively, on the overall farm situation. However, 6.67 per cent and 3.33 per cent of the respondents were inspired by neighbour and relatives, respectively. In the case of marginal and small farm situations, most inspired by the Dept. of agriculture for organic farming, i.e., 38.64 per cent and 56.25 per cent, respectively.

*Constraints in organic farming* : Organic farming is relatively risky compared to traditional farming. In organic farming, synthetic chemicals are not used for plant nutrients and to measure the insect-pest attack and weeds. During the survey, it was reported by the majority of respondents that they are confronted with a large number of problems associated with organic farming. The problems associated with organic farming have been categorized into four categories; related to production, marketing, institutional and miscellaneous aspects.

*Production problems* : The problems associated with organic production were grouped into three groups i.e., related to agricultural inputs, labour and machinery, and technology.

It can be seen from Table 7 that, among the problems related to inputs, the majority of the farmers were facing the problem of low productivity level of organically grown crops followed by lack of irrigation facilities, followed by the drought at critical stages of plant growth and non-availability of quality seeds followed by preparation of organic inputs is labour intensive and costly on overall farm situation, respectively. Several constraints are impeding small farm holders in India from adopting organic farming. The results similar with the findings of Devi et al. (2020) and Chiphang et al., (2022) also reported the decline in crop productivity and increase in pest and disease incidence as major issues in the research area. As per Saxena and Singh (2000), the non-availability of high-quality bio-fertilizers, followed by a lack of knowledge and skill, improved composting methods, bio-fertilizer application methods, and the non-availability of vermicompost in sufficient quantities, are the other issues faced by organic growers. The lack of a sufficient supply of organic supplements, bio-fertilizers, and a local market for organic produce are major sources of concern (Pandey and Singh, 2012, Samantaray, et al. 2009). While Mohanty et al. (2013) reported that the lack of regular soil testing, followed by lack of mechanization in agriculture, poor knowledge of IPM, lack of innovativeness, lack of entrepreneurial ability, lack of low responsiveness, lack of storage facilities, post-harvest technologies, and lack of effective supervision and monitoring by extension workers, were also reported as major constraints in organic farming.

Problems related to labour and farm machinery like the problem of high wages & labour was faced by the majority of the respondents, followed by bullock/tractor/power tiller charges were high followed by non-availability of human labour was followed by non-availability of bullock/tractor/power tiller at the proper time on overall farm situations, respectively (Table 7). Organic farming requires over 15 per cent more labour than traditional farming (Pimentel et al. 2005). Thimmarreddy (2001) and SunilKumar (2004) also highlighted the problem of labour shortage, power shortage, and high wages in their respective studies.

**Table 7. Problem/constraints related to production problems in organic farming on sample farms (%)**

Particulars	Marginal	Small	Overall
<i>Related to inputs</i>			
Non-availability of organic biomass for preparing compost	45.45	31.25	41.67
Non-availability of urine/dung of local /indigenous cow	52.27	43.75	50.00
Preparation of organic inputs is labour intensive and costly	65.91	68.75	66.67
Non-availability of organic inputs in the market	56.82	56.25	56.67
Management of weeds, insect-pest & diseases is difficult	61.36	37.50	55.00
Scarcity of bio-fertilizers and manures	59.09	56.25	58.33
Non-availability of quality seeds	65.91	75.00	68.33
Cost of seed is high	68.18	56.25	65.00
Poor germination of seeds	31.82	37.50	33.33
Lack of irrigation facilities	75.00	62.50	71.67
Drought at critical stages of plant growth	70.45	62.50	68.33
The low productivity level of organically grown crops.	79.55	75.00	78.33
<i>Related to labour and machinery</i>			
Non-availability of human labour	40.91	50.00	43.33
High wages & labour	65.91	62.50	65.00
Non- availability of bullock/tractor/power tiller at proper time	29.55	43.75	33.33
Bullock/tractor/power tiller charges are high	52.27	31.25	46.67
<i>Related to technology</i>			
Lack of knowledge about insect/pest control in organic farming	36.36	43.75	38.33
Lack of knowledge about weed management practices in organic farming	38.64	25.00	35.00
Lack of proper guidance regarding preparation of Organic inputs	59.09	62.50	60.00
Lack of knowledge about the use of liquid organic fertilizers	75.00	62.50	71.67
Non-availability of a package of practices on organic farming	77.27	56.25	71.67
Insufficient demonstration units for FYM/compost/Liquid manure preparation	54.55	50.00	53.33
Lack of soil & water testing facilities	70.45	68.75	70.00

In case of problems related to technology (Table 7), lack of knowledge on the use of liquid organic fertilizers and the unavailability of a package of practices for organic farming ranked first which accounted for 72 per cent followed by lack of soil & water testing facilities followed by lack of proper guidance regarding preparation of organic inputs and insufficient demonstration units for FYM/compost/liquid manure preparation on overall farm situation, respectively.

*Marketing, Institutional and Miscellaneous aspects* : Among the problems related to marketing (Table 8), a low level of marketable surplus was found as the major constraint in the study area. On the overall farm situation, about 77 per cent of the total respondents agreed that the low level of marketable surplus followed by disposal of products is difficult due to lack of specialized agencies followed by low prices of products and high transportation charges. The results were similar to the findings of Azam *et al.* (2021), who reported that the difficulties in marketing

organic goods have hampered its expansion in the country. Organic farming is a low-cost crop-growing technology; however, marketing organically grown crops has proven difficult, particularly for some farmers. The lack of actual marketing infrastructure is a major issue for growers (Prabu, 2008). India does not have adequate cold storage or cold chain transportation (Suprem *et al.* 2013). However, according to Bishnoi *et al.* (2020), the key restrictions in the research area were non-procurement of output by government agencies and harvest prices were less than that of MSP. Devi *et al.* (2020) reported that the lack of minimum support price for organic products was another problem in the study area.

In case of institutional problems (Table 8), difficulty in fulfilling certification norms/rules, conversion period from inorganic to organic is longer, certification is difficult and time-consuming, and certification agencies are less and located at distant places are the major problems in organic farming as reported by the majority of the respondents. The

**Table 8. Problems/constraints related to marketing, institutional and miscellaneous aspect in organic farming (%)**

Particulars	Marginal	Small	Overall
<i>Marketing aspect</i>			
Disposal of produce is difficult due to lack of specialized agencies	77.27	68.75	75.00
Low level of marketable surplus	84.09	56.25	76.67
Purchase agencies at longer distances	65.91	75.00	68.33
High transportation charges	68.18	81.25	71.67
Lack of marketing information	70.45	50.00	65.00
Lack of storage facilities	68.18	75.00	70.00
Low prices of produce	75.00	68.75	73.33
<i>Institutional aspect</i>			
Certification is difficult and time-consuming	79.55	87.50	81.67
The certification fee is high	77.27	68.75	75.00
The conversion period from inorganic to organic is longer	86.36	81.25	85.00
Difficulty in fulfilling certification norms/rules	90.91	75.00	86.67
Certification agencies are less and located at distant places	86.36	68.75	81.67
Lack of timely and appropriate transfer of technology measures by extension organization/Agri. Dept./private agencies.	65.91	43.75	60.00
Insufficient extension staff	52.27	68.75	56.67
Lack of supply of printed material in Hindi regarding various practices of organic farming	72.73	75.00	73.33
<i>Miscellaneous aspect</i>			
Stray animals	59.09	56.25	58.33
Birds	61.36	62.50	61.67
Monkeys	36.36	31.25	35.00

proportion of respondents reporting these problems was found to be highest in case of difficulty in fulfilling certification norms/rules followed by conversion period from inorganic to organic is longer followed by certification is difficult and time-consuming, and certification agencies are less and located at distant places (both 82%) on overall farm situation. Small farmers in developing countries, such as India, are discouraged by a lack of knowledge, rational capital, and access to certification (Pandey and Singh, 2012). As per the findings of SunilKumar (2004), the majority of respondents had difficulty with technical knowledge. Shashidhara (2006) observed that technical guidance and organizing training on eco-friendly practices help resolve the problems of organic farmers. Muttalageri and Mokshapathy (2015) reported that there is a paucity of literature or a package of practices on organic vegetable production, as well as support from government agencies and other relevant departments in the form of subsidies and monetary incentives. There is also a dilemma with the lack of a minimum support price for organically produced vegetables, as well as a lack of a market

exclusively for organic produce.

The other miscellaneous problems (Table 8), like birds, stray animals, and monkeys, were to be of great concern. All the inputs and efforts put into organic farming are useless if birds, stray animals, and monkeys damage the crop. The majority of the respondents reported the problem of birds and stray animals. The proportion of respondents was found to be highest in the case of birds followed by stray animals followed by monkeys in overall farm categories, respectively. Devi et al. (2020) also reported that the wild animal menace was the major constraint in the Himachal Pradesh state. *Association of land holding with problems* : The association of problems faced by the farmers in organic farming with land holding was studied using the chi-square test, and the results are presented in Table 9. Production and institutional problems were non-significant and showed no differential incidence of the problems on marginal, small, and overall farms except in overall farms problems related to technology. The calculated chi-square value was significant, showing the differential incidence of production problems related to technology by overall

**Table 9. Association of land holding with problems in organic farming**

Particulars	Marginal	Small	Overall
Production problems			
Related to inputs	04.65	05.14	09.79
Related to labour and machinery	04.50	04.53	09.03**
Related to technology	02.86	03.20	06.06
Marketing problems	68.97*	33.26*	102.23*
Institutional problems	04.15	04.46	08.61
Miscellaneous problems	31.20*	10.93**	42.13*

\*and\*\*significant at 1 and 5% level of significance, respectively.

farms. Calculated chi-square was non-significant at a 1 per cent significance level in marketing problems on marketing problems in all farm situations. The calculated chi-square was significant at a 1 per cent level of significance, showing the differential incidence of the problems on marginal, small, and overall farms in miscellaneous problems.

## CONCLUSION

It can be concluded that farmers are adopting organic farming due to the increased cost in conventional farming and incentives received from the government under various schemes. Further, they perceive that input cost in inorganic farming is quite low and these inputs are available in plenty with the farmers. The study showed that the move to organic farming is not without challenges, particularly for marginal and small landowners. As a result, several challenges in their production, institutional, and marketing aspects with which they are challenged have been recognized to stimulate organic crop production and efficient marketing. The major constraints were low crop productivity in organic farming, high wages & labour, lack of understanding of the utilization of liquid organic fertilizers and paucity of a package of organic farming methods, low level of marketable surplus, and difficulty in fulfilling certification norms/rules. Organic farming is hampered by several problems and new difficulties are also arising. Thus, efficient planning and execution at the ground level to remove these constraints can be fruitful both for the farmers and the economy as a whole. The policymakers have to pay proper attention critically to the constraints faced by the farmers to increase the productivity of the organic farmers in a sustainable manner.

## CONFLICTS OF INTEREST

The authors have no conflicts of interest.

## REFERENCES

- Ahmed, T.; Raghuprasad. and Shivamurthy, M. (2019). Ecological, economic and social sustainability of organic farming. *Indian J. Ext. Edu.*, **55** (1): 8-93.
- Azam, M.S.; Tiwari, S.C. and Pathak, H.R. (2021). Do financial constraints matter in accessing agricultural loan? organic vs. conventional farmers. *IUP J. Account. Res. Audit Practices*, **20** (4): 205-223.
- Badwal, D.P.S.; Kumar, M.; Simran, S.H. and Kaur, S. (2019). Zero Budget Natural Farming in India- A review. *Int. J. Curr. Micro biol. Appl. Sci.*, **8** (12): 869-873.
- Bera, S.; Acharaya S.K.; Kumar, P.; Chatterjee, R.; Mondal, K. and Haque M. (2022). Organic manure in conservation agriculture: perception, reality and interpretation. *Indian J. Ext. Edu.*, **58** (2): 53-57.
- Bhattacharjee, U.; Shah, A.; Tiwari, P.K.; Dhakre, D.S. and Gupta, R.K. (2021). Achievement motivation of organic farmers of birbhum district of West Bengal. *Indian J. Ext. Edu.*, **57** (1): 38-42.
- Bishnoi, D.K.; Malik. D.P.; Pawar, N.; Kumar. N. and Sumit. (2020). Resource use efficiency and constraint analysis of summer mungbean cultivation in rice-wheat cropping system. *Econ. Aff.*, **65** (1): 117-122.
- Chiphang, S.; Singh, R. and Feroze, S. M. (2022). Is organic rice bean (*vigna umbellata*) farmers economically better off?. An empirical analysis. *Indian J. Ext. Edu.*, **58** (1): 17-20.
- Das, S.; Chatterjee, A. and Pal, T.K. (2020). Organic farming in India: a vision towards a healthy nation. *Food Qual. Saf.*, **4** (2): 69-76.
- Devi, N.; Raina, K.K. and Sharma, R. (2020). Constraints perceived by the farmers of Himachal Pradesh in organic farming. *Econ. Aff.*, **65** (2): 213-218.
- GoI [Government of India] (2017). Paramparagat Krishi Vikas Yojana (PKVY) Manual for district- level functionaries, Department of Agriculture Cooperation and Farmers Welfare, Government of India. Available: <https://darpg.gov.in/sites/default/files/Paramparagat%20Krishi%20Vikas%20Yojana.pdf> [March.23, 2021].
- Goswami, B.; Bezbaruah, M.P. and Mandal, R. (2017). Indian agriculture after the Green revolution: Changes and challenges. Routledge. Retrieved from: <https://doi.org/10.4324/9781315268538>
- Jaganathan, D.; Bahal, R. and Padaria, R.N. (2022). Reasons for practicing and not practicing organic farming as perceived by farmers. *Indian J. Ext. Edu.*, **46** (3&4) : 1-6.

- Jaganathan, D.; Bahal, R.; Burman, R.R. and Lenin, V. (2012). Knowledge level of farmers on organic farming in Tamil Nadu. *Indian Res. J. Ext. Edu.*, **12** (3): 70-73.
- Lerche, J. (2011). Agrarian crisis and agrarian questions in India. *J. Agrar. Chang.*, **11** (1): 104-118.
- Mishra, S. (2008). Risks, farmers' suicides and agrarian crisis in India: Is there a way out? *Indian J. Agric. Econ.*, **63** (1): 38-54.
- Mohanty, A.K.; Lepcha, B. and Kumar, A. (2013). Constraints analysis in adoption of vegetable production technologies for livelihood perspective of tribal farmers in North Sikkim. *Indian Res. J. Ext. Edu.*, **13** (2): 51-56.
- Muttalageri, M. and Mokshapathy, S. (2015). Constraints in production and marketing of organic vegetable growers in Belagavi district of Karnataka. *Asian J. Manag. Res.*, **5** (4): 558-565.
- Naik, M.H.; Srivastava, S.R.; Godara, A.K. and Yadav, V.P.S. (2009). Knowledge level about organic farming in Haryana. *Indian Res. J. Ext. Edu.*, **9** (1): 50-53.
- Pandey, J. and Singh, A. (2012). opportunities and constraints in organic farming: an Indian perspective. *J. Sci. Res. Banaras Hindu Univ.*, **56**: 47-72.
- Parvathamma, G.L. (2016). Farmers suicide and response of the government in India – an analysis. *IOSR J. Econ. Finance*, **7** (3): 1-6.
- Pimentel, D.; Hepperly, P.; Hanson, J.; Douds, D. and Seidel, R. (2005). Environmental, energetic, and economic comparisons of organic and conventional farming systems. *Bio-Science*, **55**: 573-582.
- Prabu, M.J. (2008, March 6). Only market driven strategies can boost organic farming. *The Hindu*.
- Samantaray, S.K.; Prusty, S. and Raj, R.K. (2009). Constraints in vegetable production-experiences of tribal vegetable growers. *Indian Res. J. Ext. Edu.*, **9** (3): 32-34.
- Saxena, K.K. and Singh, R.L. (2000). Adoption of organic farming practices by farmers of Malwa region. *Maharashtra J. Ext. Edu.*, **19**: 53-58.
- Shashidhara, K.K. (2006). A study on management of eco-friendly practices by vegetable growers of North Karnataka. Doctoral dissertation, University of Agricultural Sciences, Dharwad, India.
- Siddiqui, K. (2015). Agrarian crisis and transformation in India. *J. Econ. Pol. Econ.*, **2** (1): 3-22.
- Singh, A. and Thakur, R.K. (2022). Economic assessment and labour utilization of organic kidney beans and black gram. *Indian Res. J. Ext. Edu.*, **22** (2): 44-50.
- Singh, A. and Thakur, R.K. (2022). Profitability, resource use efficiency and technical efficiency of organic crops in Himachal Pradesh of India. *Int. J. Environ. Stud.*, DOI: 10.1080/000207233.2022.2037337.
- Singh, P.; Thakur, R.K. and Singh, A. (2021). Changing dynamics of cropping pattern and constraints perceived by the vegetable growers in Himachal Pradesh. *Indian J. Econ. Dev.*, **17** (4): 810-820.
- Subrahmanyeswari, B. and Chander, M. (2022). Diffusion of agricultural innovations: the case of organic farming in Uttarakhand state of India. *Indian J. Ext. Edu.*, **58** (2): 181-185.
- Sunilkumar, G.M. (2004). Study on knowledge and adoption of production and post-harvest technology in tomato crop of Belgaum district in Karnataka. M.Sc. Thesis, UAS, Dharwad, India.
- Suprem, A.N.; Mahalik and Kim, K. (2013). A review on application of technology systems, standards and interfaces for agriculture and food sector. *Comput. Stand. Interfaces*, **35**: 355-364.
- Thimmareddy, K.S. (2001). Case studies on organic farming. M.Sc. Thesis, UAS, Dharwad, India.
- Tripathi, S.; Shahidi, T.; Nagbhusan, S. and Gupta, N. (2018). Zero Budget Natural Farming for the Sustainable Development Goals (Council on Energy, Environment and Water, 2nd edition). Council on Energy, Environment and Water.

