



Status of organic farming and economics of organic vegetable cultivation in Himachal Pradesh under *Paramparagat Krishi Vikas Yojana* (PKVY)

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ABSTRACT

This paper was an attempt to analyze the present status of organic farming in Himachal Pradesh and economics of organic vegetable cultivation in Chamba district of Himachal Pradesh. There were 39,780 registered organic farmers in the state with total area under organic crops in the state was about 21,743 hectares. In 2017-18, there was 7,263 clusters were present at national level out of which 110 clusters were formed at state level (H.P.) under *Paramparagat Krishi Vikas Yojana* (PKVY). The analysis of cropping pattern revealed that main organic crops are maize, paddy and rajmash in *kharif* season and wheat, barley, pea and potato in *rabi* season. Productivity of organic vegetable crops was highest in potato (about 106 q/ha) followed by peas (about 92 q/ha). Gross returns and net returns over variable cost was highest in potato (Rs. 84,761/ha and Rs. 42,572/ha) and followed by peas (Rs. 64,087/ha and Rs. 42,388/ha) on overall farm situation, respectively. Benefit cost ratio was highest in peas (1.59) followed by potato (1.39). The study highlighted that organic pea and potato crops were profitable endeavour.

1. Introduction

India is bestowed with a lot of potentials to produce varieties of organic products due to its varying agro-climatic conditions (Charyula and Dwivedi 2010). In several parts of the country, the inherited tradition of organic farming is an added advantage i.e., Himachal Pradesh (Devi *et al.*, 2020). The economy of the state (H.P.) is primarily agrarian and provides sustenance to about 69 per cent of the total population (Economic Survey of Himachal Pradesh 2019-20). In general, farming systems are mixed and subsistence in nature. The extent of use of chemical inputs in agriculture is low as compared to neighbouring states like Punjab and Haryana. There is scanty use of agro chemicals (pesticides, insecticides, and herbicides) was about 158g per ha in the state in comparison to the country it was 381g per ha (IBEF 2017). In recent years, organic farming as a cultivation process is gaining increasing popularity (Dangour *et al.*, 2010). Presently, farming and farmers of Himachal Pradesh are passing through a transitional phase, comprising of

several factors and processes, which include both constraints and opportunities. The ongoing diversification drive has conclusively proved that the economic prosperity of hill farmers lies in growing off-season vegetables and the production of fruits. This opportunity, however, is constrained by increasing input costs and impoverished soils. Decreasing trend in crop yield growth has been observed due to injudicious/overuse of inputs like synthetic fertilisers and pesticides (Lal 2009; Pingali 2012). Farmers are looking for alternatives given the ever-increasing cost of synthetic inputs and poor input-output ratio (Chadha *et al.*, 2012). The vegetable and fruit business of farmers of Himachal Pradesh can transform drastically by adopting organic farming. It is in these areas and for those commodities that get certified organic tag or Himachal Pradesh organic brand will be an important alternative option. This could be a sustainable option for maintaining the productivity of farmlands also. The farmers in hilly regions have the opportunity to patronize organic farming by default due to agro-climatic advantage

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over plains (Wani *et al.*, 2013). Organic farming is growing rapidly among Indian farmers and entrepreneurs, especially in low productivity areas, rain-fed zones, hilly areas and the northeastern states where fertilizer consumption is less than 25 kg/ha/year (Mitra and Devi 2016). An integrated farming system is the strength of hill farming. Agriculture-Animal husbandry is complementary and supplementary enterprises that provide a livelihood to the agrarian population on one hand and reduce dependence on synthetic external inputs on the other. Thus, better management of animals, grasslands, farmyard manure hold promise for the promotion of organic farming in the state. A large part of the area of Himachal Pradesh is under pastures, forests, wasteland, and support land which are largely used by local farming communities as grazing land, source of fodder, and wild harvest (Partap 2011). Himachal Pradesh is one of the states in India, where over the past few years' farmers, Government and non-government agencies have made significant contributions to the state-wide process of organic farming promotion and sustainable development. Low consumption of fertilizers and pesticides can further facilitate large scale adoption of organic farming with relative ease by the farmers in niche areas.

The State Department of Agriculture in Himachal Pradesh is promoting organic farming in different parts of the state under *Paramparagat Krishi Vikas Yojana* (PKVY). The National Missions on sustainable agriculture and horticulture development emphasize the promotion of good agriculture practices as necessary components of the agriculture development approaches for which organic farming is the best-known tool. Organic cultivation has an immense prospect of income generation too (Bhardwaj and Dhiman, 2019). Organically grown vegetables have better quality, get better prices (premium prices in case of certified organic). Experience shows that the production of organic farmers even if uncertified, sells on priority and receives better prices. Thus, it is imperative to check the status of organic farming in the state and examine the input use pattern and economics of major organically produced vegetables (Pea and Potato) in the study area.

2. Methodology

The secondary data was collected from various published sources and institutes like Ministry of Agriculture and Farmers Welfare, Government of India, Directorate of Agriculture, Shimla, Department of Agriculture, Chamba and

Chaudhary Sarwan Kumar Himachal Pradesh Krishi Vishvavidyalaya (CSK HPKV), Palampur. Primary data were collected through specifically well-designed survey schedules by personal interview method during the period of March 2019 to April 2019 in Chamba district of Himachal Pradesh, India. The district was purposively selected as large number of farmers in the district is engaged in organic cultivation by default. Further, three stage random sampling design was employed for the selection of organic farmers. At the first stage of sampling two blocks viz., Mehla and Chamba were selected randomly. At the second stage of sampling, three clusters were selected randomly from each block. These organic clusters were formed by Department of Agriculture, Chamba under guidelines of *Paramparagat Krishi Vikas Yojana* (PKVY) according to which in each cluster, a minimum of 65 % of the farmers should belong to small and marginal categories, respectively (Anonymous 2017). In the third stage, 10 farmers from each cluster were selected randomly thus constituting a sample of 60 organic farmers out of which 44 were marginal farmers (≤ 1 ha) and 16 were small farmers (>1 ha). The economics of organic vegetables cultivation in Himachal Pradesh has been worked out on the basis of primary data collected from 60 farmers representing different farm size categories. The results regarding various cultivation practices being followed by the sample farmers, along with returns and costs involved in cultivation were calculated.

3. Results and discussion

Status of organic farming in Himachal Pradesh

State strives for adoption of organic farming practices and has brought policy changes in agriculture development scenario in order to provide sustainable livelihoods to the farming community through organic farming approaches. It is being promoted in the state by organic farmers associations, NGO's and govt. agencies, as an appropriate farming approach for farmers, producing for themselves or for the local/national markets. The schemes for the promotion of organic farming were and the achievement of the schemes may be assessed from the statistics of the farmers registered and the acreage of crops under the organic farming in the state. The district-wise details of the registered organic farmers and area under organic farming is given in Table 2 & 3.

Table 1. Distribution of sample amongst different categories of farmers

Category	Size of holding (ha)	Number of farmers	Percentage of farmers
Marginal	<1	44	73.33
Small	>1	16	26.67
Total		60	100.00

Registered organic farmers

Activities for the promotion of organic farming were taken in all the district of the state. Districts wise detail of registered organic farmers in the state is present in Table 2. It can be seen from the table that there were 39,780 registered organic farmers in the state. Among the different district of the state, the highest number of registered organic farmers were in district Shimla (12,644) which accounted about 32 % of the total organic farmers in the state. Next to the Sirmaur (4,829 farmers) has highest number of organic farmers followed by district Solan (4,162 farmers), respectively. The number of organic farmers in Kinnaur and Lahaul & Spiti district were quite low accounting for 0.65 and 1.64 % of the total organic farmers in the state, respectively. It was mainly due to the fact that the total number of farmers was quite low in these districts, hence the number of organic farmers is also low compared to the other district. The number of organic farmers in Chamba where the present study is conducted were 1,889 accounting for about 5 % of total organic farmers in the state.

Area under organic farming

District wise area under organic farming in Himachal Pradesh has been presented in Table 3. The table reveals that the total area under organic crops in the state was about 21,743 hectares. Among the different district of the state, district Shimla was at top position with 30 % of the total area under organic farming in the state. In Shimla, area under organic farming was 6,541 hectares which 10 % district net sown area. The table further indicate that the area under organic farming in Solan district was also good compared to other district i.e., it occupied 17 % of the total area under organic farming in the state followed by Sirmaour (8.70 %), Mandi (8.40 %). The estimation of per farmer area under organic farming indicates it was 0.55 ha for the state as whole. It is interesting to know that it was found to be highest in case Kinnaur (1.18 ha) followed by Lahaul & Spiti (0.98 ha) and Solan district (0.87 ha). It was found to be lowest in case of Kangra and Sirmaur district of state i.e., 0.35 and 0.39 ha.

Table 2. District wise organic farmers in Himachal Pradesh during 2018-19

District	No. of registered farmers	%
Shimla	12644	31.78
Sirmaur	4829	12.14
Solan	4162	10.46
Kangra	3715	9.34
Mandi	3562	8.95
Hamirpur	2173	5.46
Kullu	2087	5.25
Bilaspur	2039	5.12
Chamba	1889	4.75
Una	1778	4.47
Lahaul & Spiti	652	1.64
Kinnaur	260	0.65
Total	39780	100.00

Source: Directorate of Agriculture, Shimla.

Table 3. District wise Area under organic farmers in Himachal Pradesh during 2018-19

District	Registered Area (ha)	%	Area/farmer (ha)
Shimla	6540.97	30.00	0.52
Solan	3620.59	17.00	0.87
Sirmour	1892.10	8.70	0.39
Mandi	1822.13	8.40	0.51
Kullu	1316.70	6.10	0.63
Kangra	1294.36	6.00	0.35
Bilaspur	1226.94	5.60	0.60

Chamba	1195.76	5.50	0.63
Hamirpur	1054.42	4.90	0.49
Una	833.25	3.80	0.47
Lahaul & Spiti	639.70	2.90	0.98
Kinnaur	306.40	1.40	1.18
Total	21743.30	100.00	0.55

Source: Directorate of Agriculture, Shimla.

Paramparagat Krishi Vikas Yojana (PKVY)

This scheme launched in 2015, is a sub-component of Soil Health Management (SHM) scheme under National Mission of Sustainable Agriculture (NMSA) aim at development of sustainable models of organic farming through a mix of traditional wisdom and modern science to long term soil fertility build up, resource conservation and helps in climate change adaptation and mitigation. It primarily aims to increase soil fertility and thereby helps in production of healthy food through organic practices without the use of agro chemicals.

The scheme promotes Participatory Guarantee System (PGS) for India. PGS-India form of organic certification that is built on mutual trust, locally relevant and mandates the involvement of producers and consumers in the process of certification. PGS-India operates outside the framework of third-party certification.

Funding pattern under the scheme is in the ratio of 60:40 by the Central and State Governments respectively. In case of North-eastern and Himalayan States, Central Assistance is provided in the ratio of 90:10 (Centre: State) and for Union Territories, the assistance is 100 %.

Selection of areas/ Farmers' groups under PKVY:

1. Organic farming under PKVY will be promoted preferably in hilly, tribal and rain-fed areas.
2. Local group formation will be focus on farmers/villages of a particular locality having an area of 20 hectares and approximately 50 farmers rather than emphasizing on individual farmers.
3. 25-30 such local groups covering 500 ha area in hilly regions and 1000 ha area in plain regions shall constitute one "cluster".
4. Cluster chosen shall be in contiguous patch, as far as possible, may be extending over few adjacent villages (but not over large areas in sparsely distributed villages).

5. Formation of Gram Panchayat based Farmer Producer Organizations will be encouraged or already existing FPOs will be promoted under the scheme.
6. In a cluster, there should be maximum number of small and marginal farmers. Women farmers/ SHGs should be given preference.
7. Success in marketing shall be one of the key components taken up for outcome evaluation along with other indicators such as soil health improvement, reduction in cost of cultivation etc.

Organic clusters formed under PKVY

It can be seen from the Table 4 that under PKVY 7,263 clusters upto 2017-18 have been formed in the country, out of which 110 clusters were from Himachal Pradesh. The number of organic farmers cluster in Chamba district increase from 10 cluster in 2015-16 to 27 in 2017-18. Under the PKVY the farmers were organized into clusters. Table 3 shows that number of clusters under PKVY in Chamba district, Himachal Pradesh as well as in India.

Capacity building done by CSK HPKV, Palampur

The capacity buildings of the various stakeholders of organic farming viz. student, faculty, farmers and others were initiated from onwards 2012 (Table 5). The table reveal that during a period of nine years, 12,557 participants were trained by the university. Among the total participants trained, the proportion of farmers was highest (76.06 %) followed by students and others accounting for 16.72 and 5.83 % of total participants. The pattern of year-wise achievements in training revealed that highest number of trainees during 2017 followed by 2016 accounting for about 23.63 % and 22.15 % of the total trained participants, respectively.

Table 4. No. of clusters under *Paramparagat Krishi Vikas Yojana* (PKVY)

Year	Chamba district	Himachal Pradesh	India
2015-16	10	110	7263
2016-17	17	110	7263
2017-18	27	110	7263

Source: Ministry of Agriculture and Farmers Welfare; Department of Agriculture, Chamba.

Table 5. Capacity building done by CSK HPKV, Palampur from 2012-20

Years	No. of trainings	Number of participants in %				Grand Total
		Faculty	Students	Farmers	Others	
2012	3	-	3.24	0.84	-	1.18
2013	5	-	-	1.57	-	1.19
2014	5	-	2.86	1.57	-	1.67
2015	42	17.71	24.06	17.84	9.97	18.42
2016	54	37.14	14.29	21.57	48.63	22.15
2017	70	15.43	23.25	24.06	21.04	23.63
2018	42	6.29	8.62	7.21	2.73	7.18
2019	65	19.43	19.15	18.58	17.08	18.60
2020	27	4.00	4.53	6.75	0.55	5.98
Total	313	175	2099	9551	603	12428
% with respect to different categories		1.39	16.72	76.06	5.83	100.00

Note: data for year 2020 is available up to 13 March, 2020.

Source: CSK HPKV, Palampur.

Table 6. Cropping pattern on sample farms (ha/farm)

Particular	Marginal		Small		Overall	
	Area	%	Area	%	Area	Percent
<i>Kharif</i>	0.3628	51.52	1.1612	50.77	0.5757	51.11
Maize	0.1772	25.16	0.5855	25.60	0.2861	25.40
Paddy	0.0286	4.06	0.0865	3.78	0.0440	3.91
Rajmash	0.0204	2.90	0.0665	2.91	0.0327	2.90
Other crops	0.1366	19.40	0.4227	18.48	0.2129	18.90
<i>Rabi</i>	0.3414	48.48	1.1259	49.23	0.5506	48.89
Wheat	0.1633	23.19	0.5643	24.67	0.2702	23.99
Barley	0.0283	4.02	0.0708	3.10	0.0396	3.52
Pea	0.0208	2.95	0.0640	2.80	0.0323	2.87
Potato	0.0316	4.49	0.0960	4.20	0.0488	4.33
Other crops	0.0974	13.83	0.3308	14.46	0.1597	14.18
Total cropped area	0.7042		2.2871		1.1263	
Net cultivated area	0.4010		1.3545		0.6553	
Cropping intensity (%)	175.64		168.85		173.83	

Cropping pattern

The broad picture of cropping pattern followed by sample farms in the study area has been examined and is depicted in Table 6. The net cultivated and total cropped area on an overall farm situation was estimated to be 0.6553 and 1.1263 ha, respectively. The cropping intensity was found to be about 176 %, 169 % and 174 % on the marginal, small, and overall farm categories, respectively.

In the *kharif* season, on overall farm situation, maize occupied the highest area (25.40 %) followed by paddy (3.91 %), rajmash (2.90 %). During the *rabi* season, among the different organic crops, the area under wheat (23.99 %) followed by potato (4.33 %), barley (3.52%) and pea (2.87 %). Maize, paddy, black gram and rajmash are major organic crops which are grown by respondents during the *kharif* season. Among the different organic crops, the highest area

was allocated for production of maize, followed by paddy and rajmash having acreage of 0.2861, .0440 and 0.0327 hectares, respectively. It was found that maize in *kharif* season and wheat in *rabi* season occupied an important place among the different organic crops in the study area. The area allocated to each crop depends upon the productivity, home consumption and market prices.

Input use pattern of organic vegetables

The input use of organic peas and potato has been analysed and represented in Table 7. It was discovered that the different organic inputs are prepared by farmers from household, farm and locally available materials like cow dung, cow urine, jiggery, cow milk etc. and are used in crop

production in the study area. The concentration of these organic inputs was differing from place to place and farm to farm.

a) *Seed*

It can be observed that the quantity of seed used was found to be highest in potato (about 2225 kg/ha) followed by peas (134.13 kg/ha) on overall farm situation. Across the different farm situations, the quantity of seed rate used in various organic crops was relatively higher on small farms.

b) *Farm yard manure*

In the study area, the quantity of FYM used in potato was found to be highest i.e., about 25 q/ha followed by peas (about 19 q/ha) on overall farm situation.

c) *Vermi-compost*

The use of vermi-compost was found to be higher on marginal farms as compared to small farm situation in potato. The use of vermi-compost in potato and peas was 4.15 and 2.03 q/ha on overall farm situations, respectively. Farmers usually preferred more quantity of FYM instead of vermi-compost. Among the farmers, quantity of vermi-compost was comparatively less as compared to recommended quantity of vermi-compost. This is mainly due to low capacity of vermi-compost unit, installed at farm level.

d) *Liquid organic inputs*

Liquid organic inputs like *jivamrit*, *vermiwash* and *matkakhad* are being recently promoted under organic agriculture schemes like *Paramparagat Krishi Vikas Yojana* (PKVY) and *Subhash Palekar Natural Farming* (SPNF) in the state other than FYM/Vermi-compost.

The Table revealed that the application of *jivamrit*, *matkakhad* and *vermiwash* in peas was estimated at about

87.62, 83.17 and 55.37 litre/ha, respectively on overall farm situation. In case of potato utilization of *jivamrit*, *matkakhad* and *vermiwash* was about 80.25, 86.44 and 60.22 litre/ha, respectively.

e) *Biopesticides inputs*

It is the general perception among the sample farmers that the crops which are grown by using organic inputs are resistant to many insect pest and diseases, but the incidence of disease is low. However, in order to manage insect pest & diseases of crops the farmers were using *beejamrit* and *fermented butter milk*. The use of biopesticides inputs for the management of insect-pest and diseases in the organic vegetables was analysed and the usage of *beejamrit* was highest in potato (about 15 litre/ha) followed by peas (about 11 litre/ha). The utilization of *fermented butter milk* was about 86 litre/ha in case of potato followed by 75 litre/ha in case of peas on overall farm situations, respectively.

Economics analysis of organic vegetables

The information regarding cost returns aspects of organic vegetables has been presented in Table 8. As far as pea was concerned, the total cost of cultivation was estimated at Rs. 40,387/ha on overall farm situation, whereas it was found to be relatively lower on marginal farms (Rs. 40,175/ha) than small farms (Rs. 40,905/ha). The share of human labour in total cost of cultivation in peas was found to be highest i.e., about 69 % of total cost of cultivation followed by FYM (about 13 %) and plant protection measures (about 8 %) on overall farm situation. The proportion of total fixed and total variable cost to the total cost of cultivation in pea was estimated at about 46 % and 54 %, respectively, on overall farm situation.

Table 7. Input use pattern in major *rabi* season crops on sample farms (per ha)

Particulars	Pea			Potato		
	Marginal	Small	Overall	Marginal	Small	Overall
Seed (kg)	132.91	137.5	67.26	22.32	23.56	22.65
FYM (q)	17.35	21.80	23.16	24.11	22.42	23.66
Vermi-compost (q)	1.92	2.32	1.46	1.20	1.68	1.33
<i>Jivamrit</i> (l)	88.25	85.89	56.07	36.40	32.68	35.41
<i>Matka khad</i> (l)	84.28	80.12	40.03	24.70	27.74	25.51
Vermiwash (l)	53.50	60.50	22.72	22.00	26.75	23.27
<i>Beejamrit</i> (l)	11.02	10.49	6.34	1.40	1.57	1.45
Fermented butter milk (l)	77.86	67.73	27.93	18.19	18.87	18.37

Note: Units was represented in Kg is kilogram, q is quantal, l is litre, respectively.

Table 8. Cost of cultivation of organic vegetables crops on sample farms (Rs./ha)

S.No.	Particulars	Pea			Potato		
		Marginal	Small	Overall	Marginal	Small	Overall
A	Fixed cost						
i	Interest on total fixed investment	2339 (12.41)	2243 (12.28)	2313 (12.38)	2339 (12.41)	2243 (12.28)	2313 (12.38)
ii	Depreciation	3003	2520	2875	3003	2520	2875

		(15.94)	(13.80)	(15.38)	(15.94)	(13.80)	(15.38)
iii	Land rent	13500	13500	13500	13500	13500	13500
		(71.65)	(73.92)	(72.24)	(71.65)	(73.92)	(72.24)
	Total fixed cost	18842	18263	18688	18842	18263	18688
		(46.90)	(44.65)	(46.27)	(31.06)	(29.76)	(30.70)
B	Variable cost						
i	Seed	930	963	939	17504	18616	17801
		(4.36)	(4.25)	(4.33)	(41.85)	(43.19)	(42.19)
ii	Manures and fertilizer						
a	FYM	2585	3270	2762	3873	3296	3713
		(12.12)	(14.44)	(12.73)	(9.26)	(7.65)	(8.80)
b	Vermi-compost	324	441	353	737	680	722
		(1.52)	(1.95)	(1.63)	(1.76)	(1.58)	(1.71)
c	Liquid manures	828	850	836	843	862	851
		(3.88)	(3.75)	(3.85)	(2.02)	(2.00)	(2.02)
iii	Plant protection measures	1764	1594	1742	1906	2141	1993
		(8.27)	(7.04)	(8.03)	(4.56)	(4.97)	(4.72)
iv	Labour cost	14757	15353	14916	16436	16950	16573
		(69.18)	(67.81)	(68.74)	(39.29)	(39.32)	(39.28)
v	Interest on working capital	144	172	152	529	558	537
		(0.67)	(0.76)	(0.70)	(1.26)	(1.30)	(1.27)
	Total variable cost	21333	22642	21699	41828	43103	42189
		(53.10)	(55.35)	(53.73)	(68.94)	(70.24)	(69.30)
C	Total cost (A+B)	40175	40905	40387	60670	61366	60877
D	Gross returns	64681	62454	64087	83806	87388	84761
E	Net returns over variable cost	43349	39812	42388	41979	44285	42572
F	Productivity (q/ha)	92.40	89.22	91.55	104.76	109.24	105.95
H	Cost of production (Rs./q)	435	458	441	579	562	575
I	Benefit cost ratio	1.61	1.53	1.59	1.38	1.42	1.39

Note: Figures in parentheses indicate percentages to the total in each category.

In potato, the total cost of cultivation was found to be Rs. 60,670, 61,336 and 60,877/ha on marginal, small and overall farm situation, respectively. The share of total fixed and total variable costs in total cost of cultivation was about 31 % and 69 % on overall farm situation, respectively. The proportion of variable cost in the total cost was found to be higher on small farms (70 %) compared to marginal farms (69 %) in potato. Among the different constituents of variable cost, seed was the major component accounting for about 42 % of the total cost in potato on overall farm situation. The expenditure on labour, FYM and plant protection measures were estimated at Rs. 16,573, 3,713 and 1,993/ha, respectively in potato in the overall farm situation. The proportion of these costs was about 39 %, 9 % and 5 % to the total cost of cultivation in potato.

The analysis of data reveals that the net returns over variable cost from of organic vegetables were found to be positive. These was found to be highest in case of potato (Rs. 42,572/ha) followed by peas (Rs. 42,388/ha) on overall farm situation. Productivity of organic vegetable crops was

found to be highest in case of potato (about 106 q/ha) followed by peas, which was relatively higher on marginal farms (92.40 q/ha) than small farms categories (89.22 q/ha). Benefit cost ratio was highest in peas (1.59) followed by potato (1.39).

4. Conclusion

In Himachal Pradesh, there are some pockets, especially in Chamba, Shimla, Solan, Kinnaur, Lahaul & Spiti, where farmers have not yet shifted to inorganic farming and are by default practicing organic practices in crop production. The study revealed that there are a substantial number of certified organic farmers in the state, as well as an area under organic farming that has been steadily rising over time. Under the *Paramparagat Krishi Vikas Yojana* (PKVY), it is noticed that the number of clusters keeps increasing in the Chamba district, from 10 clusters in 2015-16 to 27 clusters in 2017-18, which indicates that the scheme is widely adopted in the study area. To promote organic

farming in the state, the capacity building of the various stakeholders in organic farming, viz. students, faculty, farmers, and others, was done by CSK HPKV, Palampur. There were 313 trainings that were organised from 2012 to 2020, which trained 12428 participants. The proportion of farmers was highest (76.06 %), followed by students (16.72 %) of the total participants. The study reported that the organic farmers grow maize, paddy, and rajmash as major *Kharif* season crops, and wheat, barley, peas, and potato as *rabi* season crops. It is also noticed that organic farmers adopt diversification farming to generate employment throughout the year and enhance their income. The study revealed that the net return over variable cost was Rs. 42,572/ha in potato and Rs. 42,388/ha in peas, respectively, on the overall farm situation. The benefit-cost ratio was highest in peas (1.59) followed by potato (1.39). The study highlighted that organic pea and potato were profitable venture. The share of the total fixed cost in the total cost was 46.27 % and 30.70 % in pea and potato, respectively, on overall farms which is quite high due to the share of profit being reduced. To counter this problem, farmers should be motivated to make collective use of mechanical power and fixed resources to bring down the fixed costs. Specific policy intervention is needed to deal with significant promotional and extension activities so that farmers can follow organic practices on their farms to achieve higher productivity of crops. In the study area, there is absence of standardization of methods/practices for vegetable crops (except cauliflower, tomato, pea, coriander, and garlic) under organic farming. So, there is an immediate need to formulate an appropriate package of practices for other vegetable crops.

5. Conflict of interest

The authors declare that they have no conflict of interest.

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