The Effect of Crop Diversification on the Socio-Economic Conditions of Farmers- A Case of Rajasthan

Dr. Dipali Gupta^{1*}, Dr. Gajanand Modi²

¹*,²Professor-RNB Global University-Bikaner ²Associate Professor-RNB Global University-Bikaner

*Corresponding Author: Dr. Dipali Gupta *Professor-RNB Global University-Bikaner ²Associate Professor-RNB Global University-Bikaner

Abstract

The current research examining the impact of crop diversification was conducted in Himachal Pradesh, taking into account various factors such as the socio-economic conditions of farmers, changes in cultivation costs, income, and farmers' self-sufficiency. Both primary and secondary data were utilized for this study.

The findings revealed significant increases in vegetable cultivation areas, with a 232% increase in the rabi season and a 328% increase in the kharif season. Conversely, there were declines in the areas cultivated for paddy, wheat, maize, and barley, with decreases of 16.28%, 23.05%, 22.70%, and 76.89%, respectively. Following project implementation, the crop diversification index rose from 0.48 to 0.62.

Vegetable crop yields showed impressive performance, with increases ranging from 100% to 150% in both rabi and kharif seasons before and after project implementation. A significant proportion of respondents achieved selfsufficiency in vegetable (73.62%), milk (74.08%), and food grain (63.76%) production. Additionally, 77.06% of respondents reported increased annual income attributed to diversification.

Crop diversification demonstrates promising potential in enhancing yields, reducing cultivation costs, and ultimately increasing farmers' net income.

Agriculture has been the backbone of the Indian economy and it will continue to remain so for a long time. Agriculture is pivotal for socio-economic development of the country as it employs about 48 percent of total work force despite the fact that share of agriculture in India's GDP has declined from 48.7 per cent in 1950 to around 13 per cent in 2016 (GOI 2016). The growth in agriculture no doubt has helped in achieving self- sufficiency in food security but with changing socio- economic scenario, rise in per capita income and demand for high-value products, farmers are required to diversify their cropping pattern from food grains to high value crops such as fruits and vegetables. In the post green revolution period, the quest of achieving food security and the policy measures like support price programme have resulted in over focus of food crops, mainly rice and wheat combination, leading to mono-cropping, depletion of resources and host of diseases.

In the meantime, the high-value segment of agriculture offers considerable opportunities to farmers for improvement in their livelihood as the food basket is undergoing a significant change (Birthal *et al.* 2007). The consumption of food items is moving away from food grains and changing towards horticultural products like fruits and vegetables, food items of animal origin like milk, eggs, meat, fish, etc. This shift in consumption pattern to some extent resulted in diversification towards high value food and change in income and taste and preferences of consumers (Mittal 2007, Reddy 2004, Reddy 2009).

Under the present dispensation of demand for high value crops, addressing the constraints faced by small holders is vital for their inclusion in the development process of Indian agriculture and rural India. Hence, there is a need to diversify the cropping pattern from the traditional cereal crops to high value crops such as fruits and vegetables. In addition to production, improving the access of small holders to market is vital in improving their income realization

The state of Rajasthan enjoys the congenial conditions for diversification towards vegetables, cash crops and other high value crops from the present situation of mono-cropping. Further, there is immense scope for harnessing potential for cultivation of off-season vegetables through crop diversification programmes in the state. In line with the development policies of the State, conditions prevailing in the low hill areas of the state and with focus on increasing agricultural income, crop diversification is deemed to relevant option to be include in state agriculture policy by involving the various stakeholders.

One of such joint effort is the Rajasthan Crop Diversification Promotion Project, being implemented by Government of Rajasthan in collaboration with the Japan International Cooperation Agency- Official Development Assistance (JICAODA) during 2011-2021 (Anonymous 2016). The project aims at promoting crop diversification in the target area of five districts of Rajasthan namely, Bikaner through rehabilitation and development of infrastructure such as irrigation facilities, farm access roads, capacity building programme for farmers on vegetable cultivation, improving yield of food grains, post-harvest management, strengthening of extension services of Department of Agriculture and allied sectors. As

against this backdrop, an attempt has been made in the present study to analyze the Impact of Crop Diversification on Farm income due to intervention in the form of project funded by JICA.

MATERIALS AND METHODS

Table 1 Socio-economic conditions of the sample respondents (n=436)

	Particulars	Holding <1ha	Holding 1-2 ha	Holding >2 ha	Total
No. of respon	ndents	364	56 (12.84)	16 (3.67)	436 (100)
		(83.49)			
Sex	Male respondents	171	42 (9.63)	11.00	224.00
		(39.22)		(2.52)	(51.38)
	Female respondents	193	14 (3.21)	5.00 (1.15)	212.00
		(44.27)			(48.62)
occupation	Farming	335	50 (11.47)	12 (2.75)	397.00
		(76.83)			(91.06)
	Non-farm	24 (5.50)	4 (0.92)	3 (0.69)	31.00
					(7.11)
	Agriculture labour	5 (1.15)	2 (0.46)	1 (0.23)	8.00 (1.83)
Land holding	Land holding size		56	16 (3.67)	436 (100)
		(83.49)	(12.84)		
Head of the f	amily	232	44 (10.09)	14.00	290.00
		(53.21)		(3.21)	(66.51)
Marital status	S	351	55 (12.61)	16 (3.67)	422.00
		(80.50)			(96.79)
Average age	of the respondents (Years)	49.56	56	57.43	50.24
Average fam	ily size (No.)	5.23	5.94	5.75	5.34
Average edu	acation level of the respondents	7.72	8.35	9.81	7.88
(Years)	-				
Respondents	stay in the village	355	56 (12.84)	16 (3.67)	427 (97.94)
-	-	(81.42)			

RESULTS AND DISCUSSION

Socio-economic profile of the respondents

From (Table 1) it is revealed that, of the total 436 sample households, about 83.50 per cent of the respondents have land holding less than one ha, 12.84 per cent of the responders have 1-2 ha land holding and only 3.67 per cent of the respondents have land holding of more than 2 ha of the sample respondents, 51.38 per cent of them are male and remaining 48.62 per cent are female respondents. Major proportion of the respondents are farmers by profession (91.06), followed by non-agriculture (7.11%) and hardly two per cent of them are agricultural labour. Almost 96.79 per cent of the respondents were married and found to have attained middle age. Average age of the respondents was in the range of 49.56 to 57.43 yrs. This age group is an experienced section of the project beneficiaries and thus, are able to adopt new technologies and various other components of the intervention. Irrespective of the landholding size, average family size is 5-6 members per family and average education level is 7 to 10 years. Almost all the respondents i.e. 97.94 per cent are staying in village

Table 2 Cropping pattern in the study area prior to project implementation

Crops cultivated	Rabi (Ha)	Percent share	Kharif	Percent share in	Total	area Percent
		in total area	(Ha)	total area	(Ha)	share in total area
Paddy	0.00	0.00	56.25	32.87	56.25	16.14
Wheat	112.35	63.31	0.00	0.00	112.35	32.23
Maize	0.00	0.00	62.02	36.24	62.02	17.79
Barley	9.65	5.44	0.00	0.00	9.65	2.77
Pulses	1.34	0.76	2.44	1.43	3.78	1.08
Vegetables	30.76	17.33	17.77	10.38	48.53	13.92
Fruits	3.08	1.74	2.12	1.24	5.2	1.49
Grass/ fodder	18.20	10.26	26.47	15.47	44.62	12.81
Others	2.09	1.18	4.06	2.37	6.15	1.76
Total	177.47	100	171.13	100.00	348.60	100

Cropping pattern followed in the study area

A peep into the (Table 2) revealed that cereal based cropping pattern is predominantly noticed before the intervention of the HPCDP project. In rabi season, wheat crop constituted a major share in total cropped area (63.31%) followed by vegetable crops (17.33%) and grass/ folder crops (10.26%). Vegetables are mainly cultivated in rabi season, while, allocation of area in kharif season is less (10.38%) as compared to rabi season. Cultivation of pulses, fruits and barley was confined to very limited area in both the seasons. Maize and paddy constituted major share in total cultivated area in kharif season. The cereals based production on fragmented land holding is not economically viable due to low marketable surplus. Irrespective of the land holding size, cereals dominated the cropping pattern and same area was allowed to vegetable cultivation. In all, out of total cultivated area of 348.60 ha about 70.01 per cent of the area is under cereals based crops (Table 2). This cropping pattern clearly indicates that there was a wide scope for crop diversification i.e. shift from cereal based production to commercial crop (vegetables) production in the study area for enhancing the farmer's income.

Table 3 Shift in cropping pattern after HPCDP implementation

Crop	Before	th	e project	After the pr	oject implen	nentation Ch	nange in ar	ea (%)	
	implem	entation							
	Rabi	Kharif	Total	Rabi	Kharif	^r Total	Ra	bi	Kharif Total
Paddy	0	56.25	56.25	0.00	47.09	47.09		-16.28	-16.28
Wheat	112.35	0	112.35	86.45		86.45	-23.05		-23.05
Maize	0	62.02	62.02	0	47.94	47.94	0.00	-22.70	-22.70
Barley	9.65	0	9.65	2.23	0	2.23	-76.89	0.00	-76.89
Pulses	1.34	2.44	3.78	1.24	3.7	4.94	-7.46	51.64	30.69
Vegetables	30.76	17.77	48.53	102.19	76.13	178.32	232.22	328.42	267.44
Fruit crops	3.08	2.12	5.2	4.72	4.34	9.06	53.25	104.72	74.23
Grass/ fodder	18.2	26.47	44.67	18.03	22.83	40.86	-0.93	-13.75	-8.53
Others	2.09	4.06	6.15	4.41	3.72	8.13	111.00	-8.37	32.20
Total	177.47	171.13	348.60	219.27	205.75	425.02	23.55	20.23	21.92

Change in cropping pattern: Before and after implementation of the project From the (Table 3) it can be observed that prior to the implementation of the project, area under cereals was predominant both in kharif and rabi season. Whereas, after implementation of the project, area under vegetables has increased significantly. Area under paddy, wheat, maize and barley declined by 16.28%, 23.05%, 22.70% and 76.89 per cent, respectively after implementation of the project. While, it was noticed that area under pulse crops increased by 30.69 per cent mainly to meet the demand for self-consumption. There has been tremendous increase in the area under vegetables after the intervention of the project. The area under vegetables increased by as high as 267 per cent. Change in crop share in total cropped area It can be observed from the (Table 4) that the share of wheat and paddy in the total cropped area declined from 32.23 per cent and 16.14 to 20.36 per cent and 11.07 percent, respectively during the comparative period. Whereas, share of area under maize has declined from 17.79 per cent to 11.29 per cent and share of barley crop declined from 2.77 per cent to 0.53 per cent. Shift in the area allocated to pulses vis-a-vis other crops is not significant. While in the case of vegetable crops, significant shift in area is noticed before and after implementation of the project. The area under vegetable crops has drastically increased from 13.92 per cent before the project to 41.94 percent after the project period in the total cropped area. The share of area under fruits crops has marginally increased i.e. from 1.49 percent to 2.04 per cent.

Table 4 Share of the crops in total area cultivated before and after implementation of the project

	Absolute value		% share intotal area	% share in
Crops	(H	Ia)	(X_1) (Before)	total area (X_2)
	Before	After		(After)
Wheat	112.35	86.45	32.23	20.32
Paddy	56.25	47.09	16.14	11.07
Maize	62.02	47.94	17.79	11.27
Barley	9.65	2.36	2.77	0.55
Pulses	3.78	4.96	1.08	1.17
Vegetables	48.53	178.43	13.92	41.94
Fruits	5.2	9.06	1.49	2.13
Grass/fodder	44.67	40.88	12.81	9.61
Others	6.15	8.13	1.76	1.91
Total:		425.44	100.00	100.00

Index of crop diversification

Data in (Table 5) revealed that after the intervention of the project, the crop diversification index increased from 0.48 to 0. 62 on the scale, and thus indicated that the crop diversification has taken place by shifting the cultivated area from cereals based cropping system to vegetables and orchard crops. This finding is supported from the previous analysis of shift in the acreage allocation from cereal crops to vegetable crops.

Table 5 Crop group-wise diversification index

	% share into	tal% share in total	al					
	area	area	x12	x2 ²				
Crops	(X_1)	(X_2)						
	Before the	After the	Before the	After the				
	project	project	project	project				
Cereals	69.00	43.28	4760.53	1872.78				
Pulses	1.08	1.14	1.17	1.31				
Vegetables	13.90	41.98	193.12	1762.56				
Fruits	1.49	2.13	2.22	4.55				
Fodder	12.77	9.63	163.18	92.67				
others	1.76	1.91	3.10	3.67				
Total	100.00	100.08	5123.32	3737.54				
Changes in	Changes in the diversification index							
Particulars	В	efore the project	After the	project				
Sum of x1 ²		5123.32	3737.54	_				

ParticularsBefore the projectAfter the projectSum of $x1^2$ 5123.323737.54Sum of $(x1)^2$ 1000010015Index of crop0.4880.626diversification

Change in of yield performance of different crops before and after implementation of the project

From the (Table 6) it can be observed that wheat yield increased by 30.17 per cent, paddy (17.06%), maize (21.17%), barley (22%) and pulses (64%). Similarly, vegetable yields increased by 108% and fruit yields increased by 11.52%. Finally, fodder crops also registered positive growth in yields in both the seasons. On comparing yield across the different land holding sizes, in the case of wheat, the incremental yield was in the range of 18 to 30 per cent across the categories of farmers, while incremental yield in the case of paddy was in the range of 15 to 43 per cent. In the case of maize crop yield has increased in the range of 17 to 27% across the categories. Pulse crops in rabi have shown an impressive growth in yield (manifolds) after receiving the technical support and training from the officials/experts under crop diversification project. Among the entire crops cultivated in the study area, yield performances of vegetable crops has been impressive with 100 to 150% increase in both rabi and kharif seasons. Even in the case of fodder crops also yield improvement was noticed i.e. 37% growth as compared to yield before the project. Overall, the results of the study indicated it may be concluded that the interventions by the project not only have helped in crop diversification towards vegetables, but also have resulted in improvements in the yield of all the crops.

Table 6 Change in yield of different crops before and after the project
Land holding <1 ha

		Rabi	Kharif		Rabi	Kharif	
Crops cultivated	Prior	toAfter	Prior	toAfter	%	%	
	project	project	project	project	change	inchange	in
					yield	yield	
Paddy	-	-	19.93	22.98	-	15.304	
Wheat	17.28	22.16	-	-	28.24	=	
Maize	-	=	18.34	21.64	-	17.993	
Barley	16.34	19.97	0.00	-	22.22	-	
Pulses	1.32	5.14	5.87	6.49	289.39	10.562	
Vegetables	188.53	386.08	139	328.83	104.78	136.568	
Fruits	75	89	62.5	71.75	18.67	14.8	
Grass/fodder	46.78	77.1	58.8	78	64.81	32.653	
Others	52.31	82.5	82.5	70.1	57.71	-15.03	
Land holding 1-2 h	ıa						
Paddy	-	_	17.5	19.88	-	13.6	
Wheat	15.57	20.28	-	-	30.25	=	
Maize	-	_	16.7	21.21	-	27.01	
Barley	14.14	17.66	-	-	24.89	-	

Pulses Vegetables	1.64 147.09	3.34 344.03	5 170.86	10.03 378.88	103.66 133.89	100.6 121.75
Fruits	112.5	107.33	67.5	81.25	-4.6	20.37
Grass/fodder	46.92	71.5	65.07	61	52.39	-6.25
Others	78	87.5	40	73.33	12.18	83.33
Land holding >2 h	a					
Paddy	0.00	0.00	17.85	25.64	-	43.64
Wheat	14.87	18	0.00	0.00	21.05	0.00
Maize	-	-	18.43	22	-	19.37
Barley	17.5	19.97	-	-	14.11	-
Pulses	1.25	6	0	6	380.00	100
Vegetables	304.33	320.21	362.85	389.06	5.22	7.22
Fruits	40	50	45	82.5	25.00	83.33
Grass/fodder	57.25	99.85	63.66	137.85	74.41	116.54
Others	-	220	0	86	-	_

Change in farm income of sample respondents on intervention of HPCDP

It can be observed from the (Table 7) that, the average net annual crop income per household was in the range of ₹41, 786 to 1, 14054 and vegetables income ranging from ₹32, 728.52 to 82, 706.25 in the study area. In total average net crop income, the share of income earned from food grain crops is around 8-9 per cent, vegetables 72-80 per cent and non-food crops 12 to 18 per cent. This trend is more or less same irrespective of the landholding size. The average farm income including the livestock income aggregated to around ₹ 74131.20 to ₹ 137309.69 per household. In the study area majority of the sample respondents are engaged in agriculture and horticulture followed by livestock rearing for their livelihood. Farmers were able to earn higher income due to crop diversification for two reasons. Firstly, the cereals were not fetching more income and secondary vegetables cultivation fetched higher income as most of the vegetables are harvested in the off season more. The other reason is that there was a decline in cost of cultivation of crops due to intervention of this project.

Table 7 Annual income of the respondents

Particulars < 1 ha		1-2 ha	<2 ha	Grand total
Total food crops	3512.29 (8.41)	7920.92 (8.16)	10426.00 (9.14)	4383.48 (8.47)
Veg Total	32728.52 (78.32)	77373.21	82706.25	40296.75
		(79.74)	(72.51)	(77.83)
Non-food crops	n-food crops 5545.24 (13.27)		20922.22	7096.12
		(12.09)	(18.34)	(13.71)
Total crop income	41786.06 (100)	97029.85 (100)	114054.47	51776.35
			(100)	(100)
Milk/ Livestock	32345.14	40279.84	18700.00	33609.22
Total farm income	74131.20	137309.69	132754.47	85385.57

Table 8 Input wise average cost of cultivation of the crops cultivated in sample districts

Inputs cost	Baseline					After project implementation				
in agriculture		survey								
	Padd	Whea	Maiz	Vegetabl	Paddy	Wheat	Maize	Pulses	Vegetabl	
	У	t	e	e	(124)	(168)	(122)	(23)	e	
Seeds	2478	2564	1250	3600	1134.02	1168.35	800.25	928	3900	
Fertilizers	2337	3918	3801	3500	1594.76	1401.38	1176.76	1410	4500	
Organic	5630	4772	5000	3600	978.26	1650	1546.53	2850	5000	
Pesticides	NA	NA	NA	NA	1495.92	1077.62	1768.94	4812.5	6000	
Irrigation cost	2100	4200	2848	3500	322.12	1252.84	763.87	200	2500	
Cost on	2013	2929	2565	600	1539.86	1886.56	1415	654.55	800	
Labor costs	3041	2013	2865	5000	2037.8	2112.07	6049.39	325	8000	
Packing/Warehous	NA	NA	NA	NA		2379.17	2733.33	340	NA	
e										
Transport					4725					
Others					1270	2163.64	1846.19	500	1000	
Tota	1759	20396	1811	20000	15097.74	15091.18	18100.02	12020.96	31700	
1	9		1							

On comparing the cost of cultivation of the different crops between base line and after the project implementation period, considerable reduction in the cost of cultivation is noticed in the case of paddy and wheat crop. The decline in the cost of cultivation of paddy and wheat crop is attributed for the supply of inputs such as seed, fertilizers and irrigation at reasonable prices at community level (Table 8). These results are in line with (Birthal and Joshi 2007). Cost of production also declined in the case of vegetables, due to increased productivity on practice of the good package of practices and use of optimum level of quality seed and fertilizers. Cost of cultivation of vegetables in aggregate is giving a clear picture that after intervention of the project, there is a decline in the cost of cultivation

Table 9 Details of Self-Sufficiency and Marketable Surplus in Food Grains, Vegetables and Milk production

Products	only for th	of respondents Total eir self	having marketable	respondents having	of respondents not having self
С	consumption	surplus	self sufficiency	sufficie	ncy
Vegetables	50 (11.47)		271 (62.16)	321 (73.62)	115 (26.38)
Milk	74 (16.97)		249 (57.11)	323 (74.08)	113 (25.92)
	78 (17.89)		200 (45.87)	278 (63.76)	158 (36.24)

Self sufficiency

The self-sufficiency in agricultural produce is referred to the number of months for which the production of certain crops is sufficient to meet the household consumption. (Table 9) revealed that about 11.47 per cent of the respondents are producing the vegetable only to meet their consumption demand, whereas in milk and food grains also 16.97 per cent and 17.89 per cent of the respondents producing only for self-consumption, around 62.16 per cent of the respondents are able to have marketable surplus in vegetables, 57.11 per cent in milk and 45.87 per cent of respondents have surplus of food grains after implementation of the project in the study area. On the whole, 73.62 per cent, 74.08 per cent and 63.76 per cent of the respondents have attained self-sufficiency in production of vegetables, milk and food grain production in the study area. Out of total respondents, about 26.38 per cent, 25.92 per cent and 54.13 per cent of the respondents are not having sufficient production to meet the consumption demand, so they are dependent on local open markets to meet the consumption demand. The finding results suggest that, self- sufficiency and marketable surplus of vegetables, and food grains have considerably increased from the base line study period to after implementation of the project.

Impact of support received by the respondents under the HPCDP project From the (Table 10) it can be observed that around 80.56 per cent of respondents have participated in training programme and remaining 19.49 per cent respondents have not participated in training on technical issues of the crop production. About 29.35 per cent respondents received inputs for demonstration. Around15.13 per cent respondents received technical support in farm mechanization, post-harvest technology, organic farming etc. about 31.65 per cent respondents revealed various services provided in the project. The participation in the project also helped the respondents in acquiring assets, as 21.10 per cent respondents have acquired the assets on account of increase in the farm income. The proportion of beneficiaries was higher from the general category compared to the other social categories in the study area.

Table 10 Imp	Table 10 Impact of support received by the respondents under the HPCDP project								
Particulars			< 1ha	1-2 ha	>2ha	Total			
Participated	in	anyYes	290	49	12	351			
training									
programme			(79.70)	(87.50)	(75)	(80.50)			
		No	74	7	4	85			
			(20.30)	(12.50)	(25)	(19.49)			
Various	suj	pport							
received									
		Inputs for Demo	101	19	8	128			
			(27.70)	(33.90)	(50)	(29.35)			
		Equipment's	83	14	4	101			
			(22.80)	(25)	(25)	(23.16)			
		Training	290	49	12	351			
			(79.70)	(87.50)	(75)	(80.50)			
		Technical suppor		9	7	66			
			(13.70)	(16.10)	(43.80)	(15.13)			
		Others	109	25	4	138			
			(29.90)	(44.60)	(25)	(31.65)			

Assets acquired after Yes participating in the project	74	15	3	92
	(20.30)	(26.80)	(18.80)	(21.10)
No	290	41	13	344
	(79.70)	(73.20)	(81.30)	(78.89)

Opinions of the respondents on impact of crop diversification project on their socio-economic conditions

Peep into the (Table 11) revealed that around 56.19 per cent of the respondents opined that after implementation of the project, new crops have been introduced in the study area. About 77.06 per cent of the respondents opined that their annual income increased. About 22.94 percent of the respondents opined that cost of cultivation of the crop increased, whereas, 41.28 per cent of the members reported that there was a reduction in the cost of cultivation. Majority of the respondents opined that annual production of the crop has increased. About 88.99 per cent of the respondents opined that with the project intervention, the accessibility of the inputs has increased. Almost all i.e. 91.51 per cent of the respondents opined that vegetable production has increased in the study area after the intervention of the project. With regard to acquisition of assets, about 20.18 per cent of the respondents reported construction of new house, 14.68 per cent of the respondents purchased vehicles and about 63.07 per cent and 74.54 per cent of the respondents opined that they are able to provide education to their children and able to bear the family health expenses respectively due to increase in their income. The study concluded that after implementation of different components of the project the access to the irrigation facilities has increased considerably. In addition, facilitating the farmers with the other input services and capability building programme on various improved technologies motivated the farmers to shift from the cereals based cropping systems to vegetables and fruits based cropping system. These interventions surely made a great change in increasing the farmer's income which indirectly reflected in the change of their lifestyle and increase in economic status. The increase in income has helped them by educating their children, access to health services, construction of houses, purchase of vehicle and livestock. Many changes were also observed in crop cultivation methods and practices such as crop rotation, integrated farming, and introduction of organic practices which reduced the investments on inputs to some extent. The findings from the primary survey are in line with the observation made during the focus group discussion.

Crop Diversification on Farmers Socio-economic Conditions of the Farmers

Table 11 Opinions of the respondents on impact of crop diversification project on their socio-economic conditions

	Opinion		Figures indicate the % of the respondents		
Partic -					Tota
ulars		< 1ha	(n=56)	>2ha (n=16)	Tota
		(n=36	(II= 30)	(11–10)	(n=43
		(II=30 4)			6)
New crop introduced	Yes	56.	60.	37.	56.19
	103	32	71	50	30.17
	No	43.	39.	62.	43.81
		68	29	50	
Annual income	Increase	77.	82.	56.	77.06
	d	20	14	25	
	Decreas	0.0	1.7	0.0	0.23
	ed	0	9	0	
	No	22.	16.	43.	22.71
	change	80	07	75	
Cost of production	Increase	21.	28.	25.	22.94
	d	98	57	00	
	Decreas	43.	37.	12.	41.28
	ed	13	50	50	
	No	34.	33.	62.	35.78
	change	89	93	50	
Annual production	Increase	71.	75.	43.	70.87
	d	43	00	75	
	Decreas	2.4	1.7	0.0	2.29
	ed	7	9	0	
	No	26.	23.	56.	26.83
	change	10	21	25	
Accessibility to inputs easier	Yes	88.	94.	87.	88.99
and		19	64	50	

The Effect of Crop Diversification on the Socio-Economic Conditions of Farmers- A Case of Rajasthan

better	No	11.	5.3	12.	11.01
		81	6	50	
Vegetables produced for	Yes	92.	91.	75.	91.51
self-consumption		31	07	00	
_	No	7.6	8.9	25.	8.49
		9	3	00	
Constructed a House	Yes	17.	33.	25.	20.18
		86	93	00	
	No	82.	66.	75.	79.82
		14	07	00	
Purchased a Vehicle	Yes	13.	25.	6.2	14.68
		46	00	5	
	No	86.	75.	93.	85.32
		54	00	75	
Children are educated	Yes	62.	66.	62.	63.07
		64	07	50	
	No	37.	33.	37.	36.93
		36	93	50	
Able to meet family health	Yes	74.	78.	62.	74.54
expenses		45	57	50	
•	No	25.	21.	37.	25.46
		55	43	50	

References:

- 1. Anonymous. 2016. A Report on Status of Agriculture in India. Ministry of Agriculture and Farmers Welfare, Govt. of India.
- 2. Birthal P S and Joshi P K. 2007. Institutional innovations for improving smallholder participation in highvalue agriculture: A case of fruit and vegetable growers' associations. *Quarterly Journal of International Agriculture* 46(1): 49-68.
- 3. Mittal S. 2007. *Can Horticulture be a Success Story for India*?, Working Paper, No.197, Indian Council for Research on International Economic Relations (ICRIER), New Delhi.
- 4. Reddy A. 2004. Consumption pattern, trade and production potential of pulses. *Economic and Political Weekly* 39(44): 48544860.
- 5. Reddy A. 2009. Pulses production technology: Status and way forward. *Economic and Political Weekly* 44(52): 73-80.