



ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor: 8.4
IJAR 2022; 8(12): 318-324
www.allresearchjournal.com
Received: 20-10-2022
Accepted: 28-11-2022

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Diversification of agricultural activities (A case study of Sonipat district of Haryana)

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Abstract

The present study focused on the nature and extent of diversification of small farmers owning land below two hectares. For the present study, district Sonipat of Haryana state was purposively selected. Further, for the empirical analysis; three villages were selected for conducting household survey of farmer. All data pertaining to study like area, production, input use and user perception were analyzed to identify the constraints and potential of small farmers while producing HVC¹ like fruits, vegetables, dairy and poultry product etc. The extent of diversification was assessed using “Herfindahl Index Method”. The study revealed that the extent of diversification amongst small farmers is high as compared to larger farmers. It is found that Small farmers have abundant family labour and they tend to put more area under HVC crops of their total land availability. However, Farmers owning land between 2 to 4 acres are more flexible & access to required facility like credit, formal agricultural training etc. Which shows their positive impact on diversification.

Keywords: Constraints, diversification, high value commodities, small farmer, survey

Introduction

Diversification is an important part of the changing economy. In developing countries like India, maximum people are engaged in primarily activities for their survival which is not enough to fulfill even their basic needs. So they used to engage in more than one activity to sustain in a changing economy system. But with the changing pattern of our economy and growing urbanization create new growth opportunity in the agricultural sector by means of diversification toward HVCs. Before 1990, the nature of agricultural diversification was known as a coping mechanism against risk. But after 1990s with the trade liberalization policy new market opportunity were discovered and at the same time the pace of urbanization was also very strong in the developing countries which help in generating demand for these HVCs. In India diversification is a demand driven approach which means rising per capita income, growing urbanization are the main factors which promote diversification.

Objective of the study

- To examine the nature and extent of agricultural diversification of farmers with more emphasis on the small farmers
- To analyze the constraints and potential of agricultural diversification
- To give appropriate suggestion for the sustainable growth of smallholders.

Conceptual Methodology

For the following research a preliminarily study has been carried for understanding the topic and to find out the research problems. After the research problems identification a detailed outline was prepared for conducting research. As study is based on field investigation; Haryana state was purposively selected. Further, one district was selected based on the criteria of small land holdings and maximum area under vegetables at district level. After district selection, one block and three villages were purposively selected based on the intervention regarding agricultural diversification with the consultation of district and block

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¹ High value commodities are those groups of commodities which has high market value like fruits, vegetables, milk, meat, egg and fish.

level horticulture officers. All data as per study requirement were collected from the field. Secondary data at district, block and village level were collected from departments/offices like District Agriculture and Horticulture, Block Development Office (BDO) and patwari office at village level. Other important data were collected from various publications like reports on horticultural sector by national and state government and Statistical Abstract Book of Haryana 2006-07, 2009-10 year and others online publication. The primary data were obtained by conducting household survey of selected farmers with major proportionate from the small farmers.

Household surveys were conducted in three villages namely Aterna, Pabsra and Manoli in Rai block of Sonipat district. Sample households were selected through the process of stratified random sampling technique based on the list of farmers obtained from the village patwari. Further farmers were categorized into different sub-categories as marginal farmers (less than one hectares), small (between 1-2 hectares), medium (2-4 hectares) and larger (above 4 hectares).

Then out of the list, total size of 90 samples which includes 30 samples in each village was taken. Further, as the study is being carried out in the context of small and marginal farmers; maximum proportion of the total samples was held by these group of farmers.

After that all gathered data were compiled and analyzed with certain method to arrive at a conclusion. These methods are following:

i. Herfindahl Index Method²

- Perception based method To analyze the very first objective of the study a method called “Herfindahl Index Method” has been used to measure the horizontal extent of diversification or diversification of crops. The main characteristic of this method is there value which is bounded by zero to one. If the value is one, it denotes the perfect concentration and if it is zero then there is perfect Diversification.

$$HI = \sum_{i=1}^N P_i^2$$

- Where N is the total number of crops and P_i represents area proportion of the i^{th} crop in total cropped area.
- For the second objective a perception based method was adopted to analyze the constraints of the farmers during their diversified nature. For this purpose some parameters were selected based on the data collected through primary survey. After that a score matrix was prepared of the selected parameters and the different results were obtained through some values to visualize the data in a more understanding way.

Study Area

The studied villages namely Aterna, Pabsra and Manoli are the part of Rai Block which is located on the south east of the district. The villages are well connected with National Highway-1 and very close to Delhi with huge market opportunity.

The above table shows the cropping pattern of the selected

farmer’s household of three villages namely Aterna, Pabsra and Manoli. In Aterna village farmers are more diversified toward baby corn crop with an area of 22.67 hectares whereas in Pabsra and Manoli village farmers are diversified towards the production of vegetables crops mainly for daily uses. The main advantage of these crops is their cultivation in both Rabi and Kharif season with maximum profit gain than wheat and rice.

The table above shows the socio-economic characteristics of surveyed household’s in Aterna, Pabsra and Manoli village. It is found that the farmers owning land above 2 acres are more access to formal training and update information related to agricultural activity which might have direct impact on their area under HVCs. Further, the farmers who are more literate are more access to formal credit, agricultural training programmes and update information. However, in Manoli Village where the average age of diversified farmers is low as compared to Pabsra and Aterna which indicates that young farmer are more diversified toward HVCs as compared to other category of farmers.

Results and Discussion

Horizontal Extent of Diversification

The Horizontal extent of diversification or diversification within crops was gauged with the help of “Herfindahl Index Method” across different categories of farmers. This method consist a value which is bounded with zero to one. It means if the value is one that would show complete concentration and if it is zero that would show perfect diversification. However, it may or may not be one of the good tools for measuring the extent of diversification but it is useful to know the horizontal diversification or diversification within the cropping pattern. In this regard the figure 1 (attached in Annexure) shows that the farmers who owned land between 2 to 4 acres are more diversified and grow two or more than two HVCs crops; whereas, the farmers below two acre of land are less diversified with only one HVCs crop.

The figure 2 indicates that in all three selected villages, the farmers who owned land below two acres put maximum percent of their gross cropped area (GCA) under HVCs, but their horizontal extent of diversification is not so high because they put maximum percent of their GCA under only one commercial crop. The main reason for that is their small land holding size and if they put more area under more than one or two commercial crops then the total surplus would be very less and they would be deprived from the market chain. Whereas in case of farmers who owned land above two acres generally grow more than one or two high value commodities crops because they are more flexible in terms of the size of their land holding. However there percent of GCA under HVCs are less in comparison to farmers below two acres of land in all the selected villages.

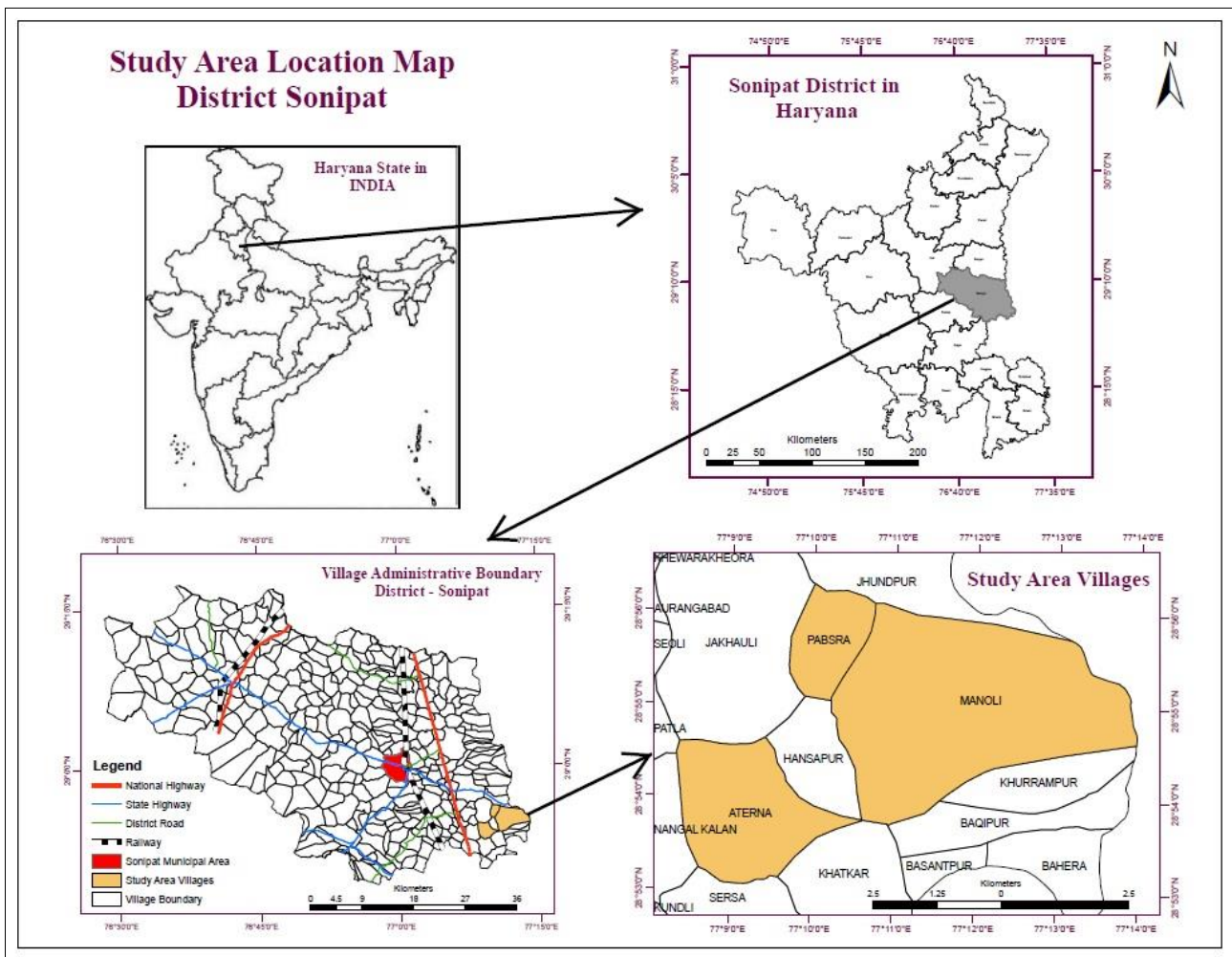
The figure 3 indicates that the average family labour per household is highest amongst farmers who owned land below two acres and put more portion of their land under HVCs crops. So, this indicates the positive relationship between area under HVCs crops and family labour availability.

The figure 4 shows the intensity of benefit variation under different crops. The graph indicates that the proportion of income from HVCs like baby corn, bhindi and sweet corn are very high amongst the smallholders owning land below 4 acres as compared to larger farmers where the high proportion of income comes from wheat and paddy crops. Moreover, the farmers owning land between 2 to 4 acres are

² Pal, Kar, & Bengal, 2012

getting higher proportion of their total income at farm level from HVCs which vary from 70 percent in Aterna (from baby corn crop), about 44 percent in Pabsra (from crops like

Bhindi, Bakla and Sem) and around 70 percent in Manoli village (from crops like sweet corn, Bhindi).



Map 1: Study Area Location Map

Table 1: Cropping Pattern of Sample Households

Cropping Pattern	Unit	Village Name		
		Aterna	Pabsra	Manoli
No. of Farm Household Selected	Number	30	30	30
Total Cultivated Area	ha	34.01	36.48	52.59
Total Gross Cropped Area	ha	69.30	72.06	104.37
Area Under Different Crops				
Wheat	ha	22.11	27.73	46.03
Paddy	ha	22.15	21.58	30.97
Baby Corn	ha	22.67	0.00	0.00
Sweet Corn	ha	0.00	0.00	14.17
Vegetables	ha	1.00	21.94	12.55
Fodder Crops (Jowar)	ha	1.38	0.81	0.65

Source: Primary Data

Table 2: Socio-economic Characteristics of Sample Households

Socio-Economic Variables	Aterna			Pabsra			Manoli		
	Below 2	2 to 4	4 & Above	Below 2	2 to 4	4 & Above	Below 2	2 to 4	4 & Above
Land Holding (in Acre)									
Age	53	48	53.4	52.28	55.27	48.2	45.61	44.44	49.62
Education	8	12	9	9	10	11	10	10	9
Family Size	6	5	5	6	6	5	5	5	6
Access to formal Credit (in %)	21.43	18.18	20	21.43	54.55	60	30.77	77.78	62.5
Formal Training on Agricultural Practice (in %)	21.43	36.36	40	14.29	18.18	40	15.38	55.56	25
Update Information of Agriculture Practice (in %)	28.57	45.45	40	35.71	54.55	60	38.46	22.22	87.5

Source: Primary Data

Diversification & Possible Constraints

Though in all these three villages farmers are being diversified and try to harvest more benefit but these farmers also faced some constraints during the whole process of diversification which start from the cultivation of HVCs till their arrival at the market. In all three villages some of the constraints have been identified through direct conversation with the farmers who are practicing the cultivation of these HVCs and a score matrix were generated on the bases of the farmer's responses.

Village wise descriptions of all possible constraints across different categories of farmers were analyzed in the paper. The main constraints observed from the figure 5 are mainly high market risk, lack of quality input availability and expensive labour which are mostly face by the farmers owning land between 2 to 4 acres and above the 4 acres of land. Mostly the larger farmer's faces the risk associated with the market price fluctuation and that's why they restrict their land to put in the cultivation of HVCs and follow the wheat and paddy cultivation pattern which is more secure in nature. However the farmer owning land between 2 to 4 acres also faces the market risk but the main constraints faces by them are associated with the lack of quality input like hybrid seed and the expensive labour which is required all time during the cultivation of HVCs. Whereas the marginal farmers owning land below 2 acres mostly faces the constraints of being marginal in term of their land holding which may restrict their further growth.

The figure 6 shows those in Pabsra villages the cultivation of HVCs are mainly practices by smallholders. It may be one of the reasons behind that most of the constraints are faced by farmers below 4 acres of land. Moreover, the constraints associated with the small land holding, high cost of cultivation and high market risk are the most frequent amongst these group of farmers. The biggest constraints face by the marginal farmers (owning land below 2 acres) is their tiny pieces of land which restrict them to put more area under HVCs. However the marginal farmers don't afraid of the cost of cultivation because they have abundant family labour availability as compared to larger farmers. Whereas the farmers owning land between 2 to 4 acres observed high cost of cultivation and the risk associated with market are their biggest constraints. However, lack of quality input availability is also one of the major constraints observed in all the three villages.

The figure 7 indicates that in Manoli village the constraints associated with small farmers are mainly high cost of cultivation and small land holding. Whereas the farmers owning land between 2 to 4 acres and above four acres are mainly afraid of the risk of fluctuating market price which sometimes cause a massive fall in price and the net benefit is below the cost of cultivation. However, the larger farmers mostly suffer from the risk of expensive labour on hired basis which sometimes exceed the benefit out of these HVCs.

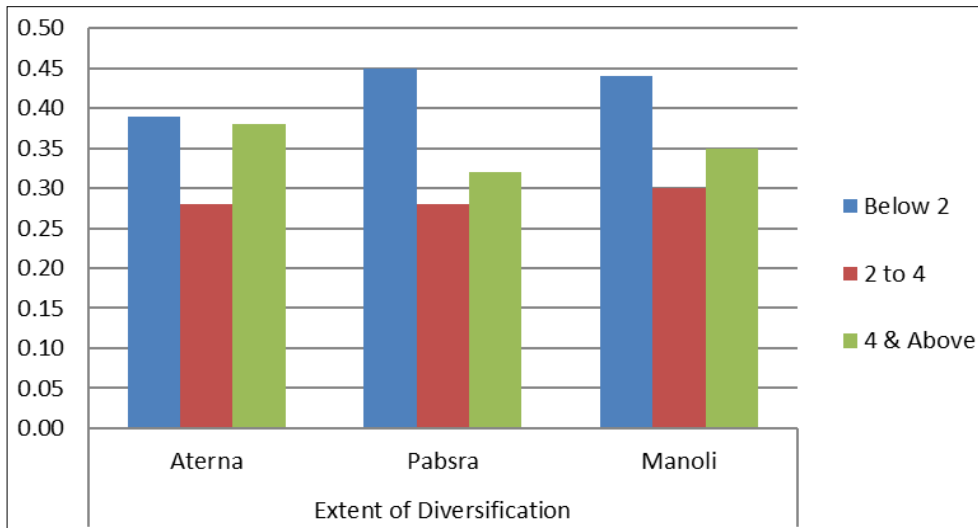
Conclusion and Recommendation

It is found that the nature of diversification in the studied villages are more in a generalized way as most of the farmers are either diversified or in the process of being diversified. However, there is neither complete diversification nor complete concentration. Whereas, the farmers owning land between two to four acres are more

access to facilities like formal credit, agricultural training programme and showing more horizontal extent of diversification which means that these kind of facilities have their crucial role in the process of diversification. Moreover, it can be observed that the net income per household at farm level is much better of diversified farmers than that of non-diversified farmers. The high relative profitability may be one of the reasons for being diversify their cropping pattern. However, the farmers who owned land between two to four acres are more flexible across different categories of farmers in using their land for commercial crops because of the size of land holding and the choice regarding the crop selection. The larger farmers don't take risk and follow the traditional cultivation pattern because they lack man power and the hired labour are more expensive which sometimes exceeded the benefit out of the cultivation of these HVCs. On the other hand, small farmers have the crop choice but they don't have abundant land to make their choice fulfil. And small amount of surplus may be one of the reason of being deprived either by direct elimination from the market chain or by indirect way like unsatisfied price for their small produce in the market. But the small farmers possess one of the required strength like abundant labour which helps them in reducing the cost of cultivation in term of labour requirement and in putting maximum proportion of their area under commercial crops. Although in all those three villages all farmers either small or large who are practicing the cultivation of various commercial crops faces many constraints which may restrict their growth in the whole process of diversification. The most frequent constraints observed are mainly associated with high market risk of price fluctuation, high cost of cultivation and lack of quality input availability. However, the biggest constraints observed by the small farmers is their small land holding which put restriction on them for putting maximum area under commercial crops.

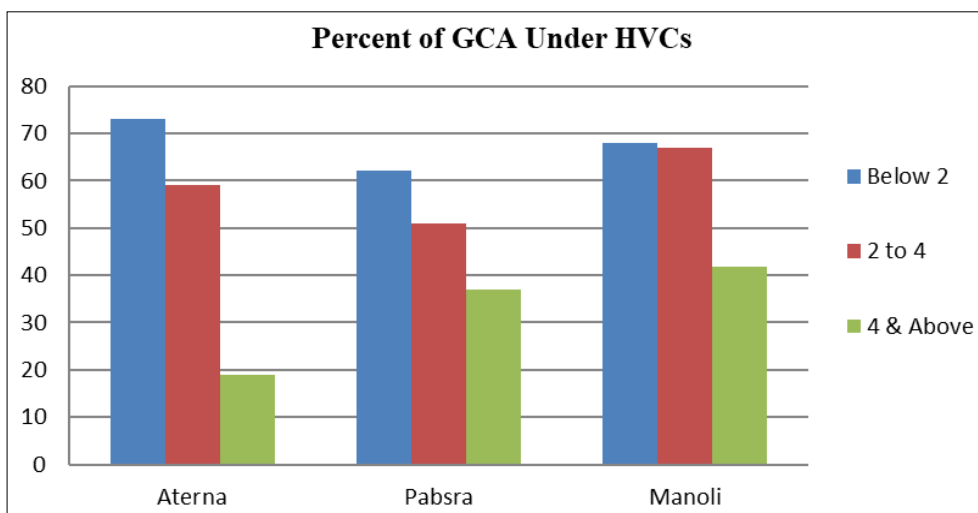
Recommendation

- There is a need to motivate farmers through regular "Kisan Mela" with the support of local agricultural institution where farmers should be trained or advice for practicing the cultivation of HVCs.
- There is a need to stabilize the market price to make farmer's decision in favour of putting more areas under HVCs because in case of HVCs
- Technological development in terms of providing low cost good quality of hybrid seeds which can restrains the risk of weeds and other disease in case of HVCs like baby corn, bhindi, and other vegetables etc.
- There is a need to establish linkages between the producer and the end consumer via establishment of agro-processing unit. For this purposes government need to support the public private partnership (PPP) with some compensation to attract the private players.
- Small farmers own very small amount of land which restrict their horizontal diversification so they are needed to diversify their economy by vertical diversification which includes poultry & dairy farming, fishing etc.
- There is a need to replicate some successful models of agri-business like the concept of producer company and framer market centre like Rythu Bazaar in Andhra Pradesh.



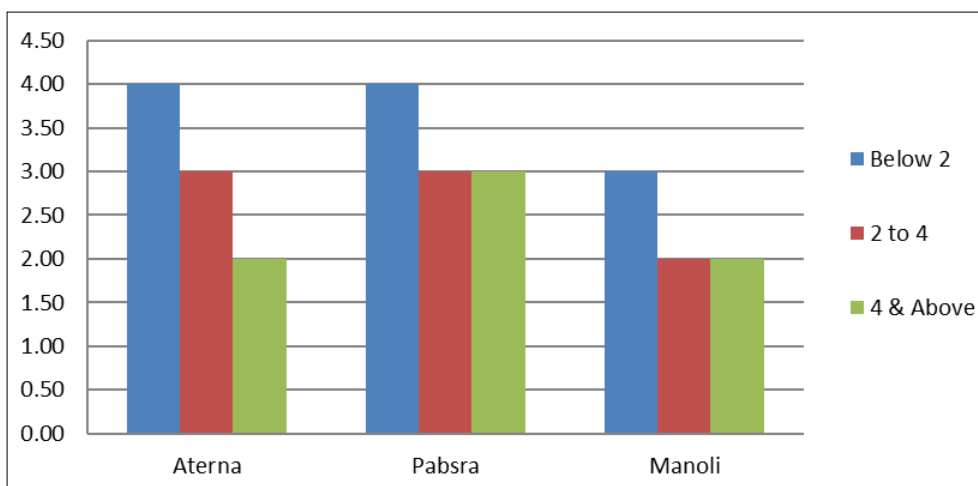
Source: Primary Data

Fig 1: Horizontal Extent of Diversification



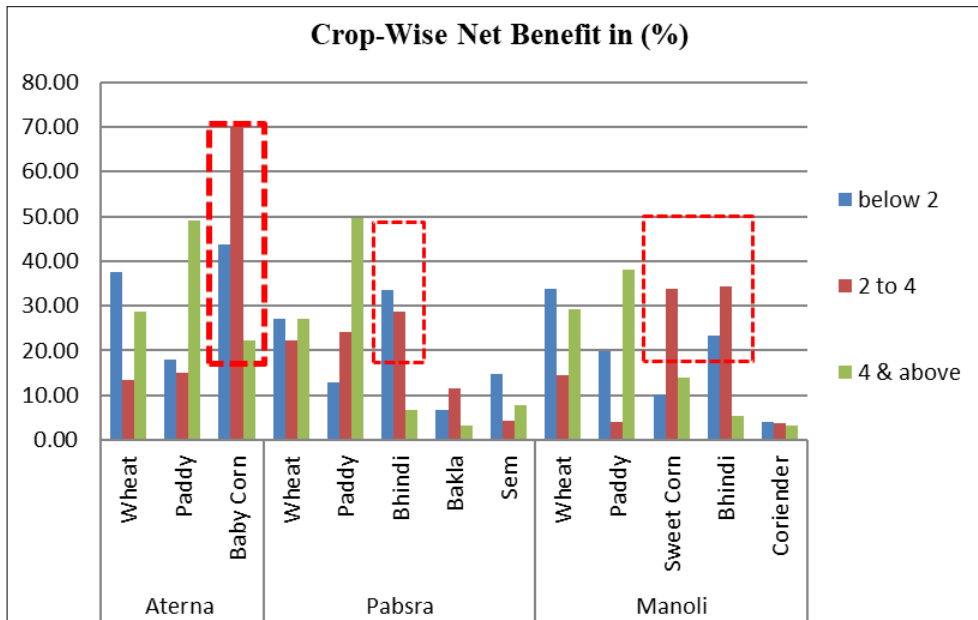
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Fig 2: Extent of Diversification by Proportion of Area under HVC Crops



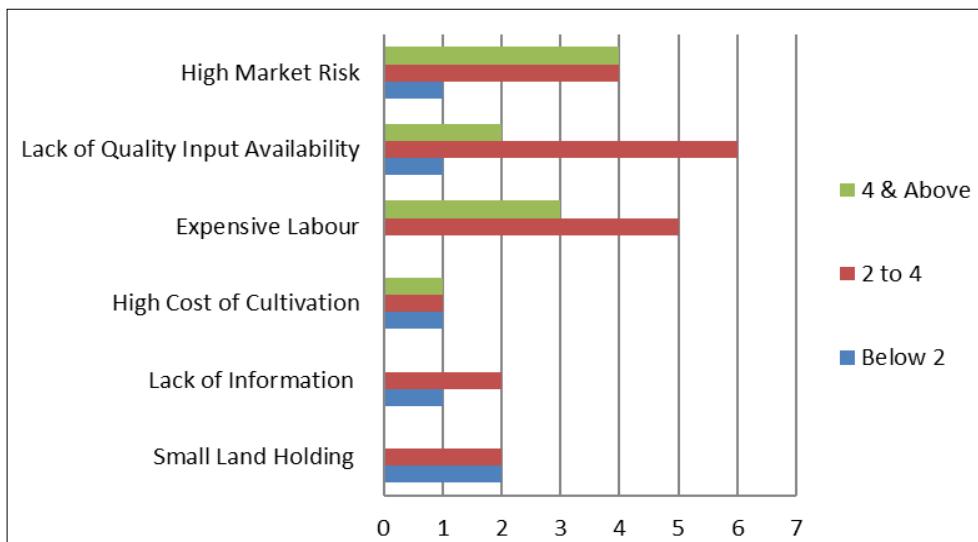
Source: Primary Data

Fig 3: Family Labour Availability at Farm Level



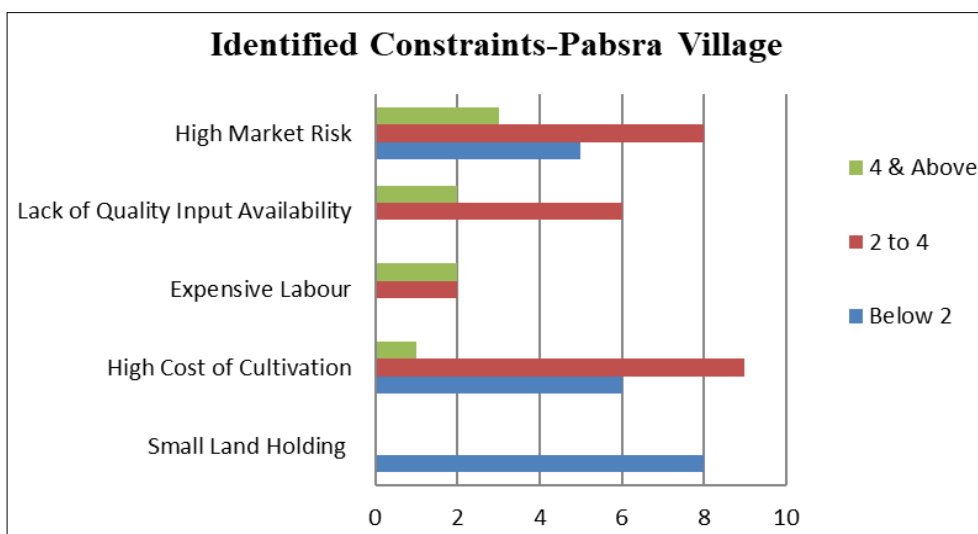
Source: Primary Data

Fig 4: Percent Share of Different crops in Total Income



Source: Primary Data

Fig 5: Identified Constraints - Aterna Village



Source: Primary Data

Fig 6: Identified Constraints - Pabsra Village

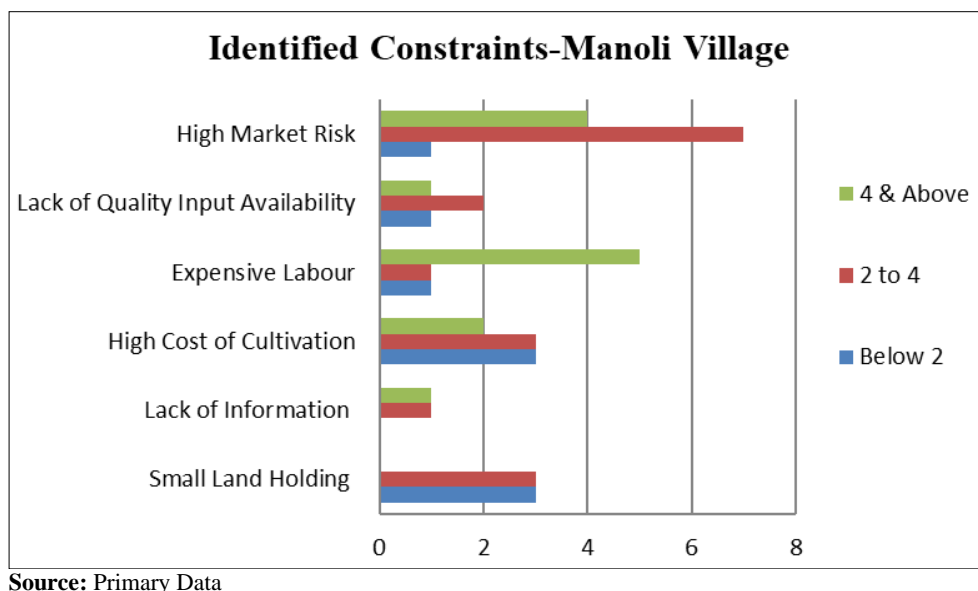


Fig 7: Identified Constraints - Manoli Village

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