

Successful Cultivation of Cash Crops—A Step towards Diversification in Agriculture in Chamba District of Himachal Pradesh

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Abstract—The focus of agriculture in the Himalayan region is slowly shifting from traditional cereal crops to high-value cash crops farming such as vegetables, fruits and medicinal plants. Vegetable, fruits, and flower crops normally give 4 to 8 times higher profits than other crops. The cultivation of niche based high value cash crops viz. tomato, capsicum, French bean, cucumber, okra, peas, cabbage, onion and garlic for getting additional farm income was successfully introduced and made popular amongst the farmers of Chamba district (All the three clusters). Climatic conditions in many parts of Himalayan Region are suitable for cultivation of crops like tomato, peas, beans, cabbage and capsicum in summer season (April to October) when these crops are not grown in the plains. Within horticulture, diversification through off-season vegetables seems to possess great potential in most of the areas in both temperate and non-temperate belts of Himalayan Region. With the successful cultivation of these vegetable crops, the farmers of the area are earning net profit of Rs. 8000-9000 per kanal (400 m² area) as compared to the cereal crops. There are many small pockets throughout the Himalayan Region which have attained economic progress by diversification through off season vegetables cultivation. With the introduction of vegetable crops in the area, a substantial decrease in cereal based cropping systems acreage has been noticed in the operational areas. Now more farmers are shifting toward cash crop production. This transformation from subsistence systems to commercial agriculture poses new challenges for improving and maintaining productivity and quality of the produce.

1. INTRODUCTION

Agriculture is the basis of the livelihood of over 80 percent of the rural population in the countries of the Hindu Kush-Himalayan (HKH) region. However, more than 90 percent of the farmers in the hill and mountain areas are marginal or small land-holding families, cultivating less than one hectare of land each [1,2,5&6]. In Himachal Pradesh, nearly 96.8 per cent of the total cropped area (10.24 lakh hectares), is under food crops — mainly wheat and maize. The remaining 3.2 per cent is under non-food crops, which also include fruits and vegetables. Chamba is bounded on north-west by Jammu and Kashmir, on the north-east and east by Ladakh area of Jammu and Kashmir state and Lahaul and Bara-Bangal area of Himachal Pradesh, on the south-east and south by the District

Kangra of Himachal Pradesh and Gurdaspur District of the Punjab [3]. Chamba is the north-western district of Himachal Pradesh. It is situated between north latitude 32° 11' 30" to 33° 13' 06", and east longitude 75° 49' 00" to 77° 03' 30" with an estimated area of 6,528 km². The territory is wholly mountainous with altitude ranging from 600 to 6,400 m. G [7] Chamba District is divided into six sub-divisions, seven Tehsils and three sub-Tehsils. From the view point of rural development, the district is divided into six development blocks. The district has 270 Gram Panchayats. Three development blocks namely Mehla, Salooni and Tissa have been declared backward, while 11 Gram Panchayats and 17 Gram Panchayats of Chamba and Bhattiayt block respectively have been declared as dispersed backward panchayats. Bharmaur and Pangi are tribal blocks. District covers an estimated area of 6528 sq km and is surrounded on all sides by lofty hill ranges. The territory is wholly mountainous with altitude ranging from 2,000 to 21,000 feet. Total population of the District is 460,499 according to Census 2001. The climate ranges from semi-tropical to semi-arctic. The district has a population density of 80 inhabitants per square kilometre (210 /sq mi). Its population growth rate over the decade 2001–2011 was 12.58 %. Chamba has a sex ratio of 989 females for every 1000 males, and a literacy rate of 73.19 %. [3]. The majority of mountain households operate mixed farming systems. The hill and mountains regions have a great potential for small-scale, specialized farming activities with high payoffs. Proper harnessing of niche-based farming can secure livelihood through direct use of products or trade in high-value products. However this livelihood security can only be achieved through well conceived agricultural development plans harnessing the uniqueness of varied agro-ecological conditions, niche areas suitable for cultivation of off-season vegetables, high value crops and adoption of improved integrated farming systems. A **cash crop** is an agricultural crop which is grown for sale to return a profit. It is typically purchased by parties separate from a farm. The focus of agriculture in the Himalayan region is slowly shifting from traditional cereal crops to high-value cash crops farming such as fruits, vegetables and medicinal

plants. Diversification with high value cash crops viz., tomato, okra, cucumber, capsicum, French bean, for income generation is introduced and made popular amongst the farmers. This transformation from subsistence systems to commercial agriculture poses new challenges for improving and maintaining productivity and quality of the produce. Fruits, vegetable and flower crops normally give 4 to 8 times higher profits than other crops. Within horticulture, diversification through off-season vegetables seems to possess great potential in most of the areas in both temperate and non-temperate belts of Himalayan Region. This region has an easy access to vast and ever growing consumer markets. Climatic conditions in many parts of Himalayan Region (Chamba) are suitable for cultivation of crops like tomato, peas, beans, cabbage and capsicum in summer season (April to October) when these crops are not grown in the plains. The price advantage makes it worthwhile to incur high production cost and transport off-season vegetables to distant consumer markets. There are many small pockets throughout the Himalayan Region which have attained economic progress by diversification through off season vegetables cultivation.

This, however, cannot be done by emphasizing the cultivation of cereal crops alone. If the poor mountain farmers are going to compete favourably in the modern world, they must be given options and alternatives that are not already captured by the competition. Development efforts tend to focus on exploring farming approaches to increase the productivity and carrying capacity of farms [4&6]. Cash crops farming – fruit and vegetable crops suitable to specific agro-climatic conditions – is one comparative advantage that can be exploited by these farmers. For example, in uplands of the Himalayan region, off-season vegetables and fruits provide the comparative advantage to the farmers.

2. MATERIAL AND METHODS

The cultivation of niche based high value cash crops (vegetable crops) viz. tomato, capsicum, French bean, cucumber, okra, peas, cabbage, onion and garlic for getting additional farm income was successfully introduced and made popular amongst the farmers of Chamba district during 2007 to 2013 i.e. for six years. Fifteen cash crops were taken for six years named as Cluster I (A group of villages in Bhatiyat/Sihunta Sub Division), Cluster II (A group of Villages in Chamba Sub Division) and Cluster III (A group of Villages in Bharmour Sub Division) with the crops having same or different varieties as available easily to the farmers for the three clusters. The fifteen crops taken are: Chilli Frnchbean, Okra, Cucumber, Tomato, capsicum, brinjal, peas, onion, garlic, palak, radish, Chinese cabbage, cabbage, broccoli. The basket of technologies for whole of the Chamba district will contain individual and community based technological interventions; however these will further be grouped and prioritized according to the climatic conditions of a particular location. For maximization of income for farming households, differential allocation of individual intervention /

component of the IFSM over the space and time will be done after carrying out the base line survey of the district and the surplus labour-hours, if any will be got engaged / encashed through other agro-entrepreneurial activities. After production, assistance will be given to the farmers/ group of farmers / SHGs/ Women Interested Groups (WIGs) in the fields of post harvest processing, grading, packaging and marketing, which would develop overall confidence in the farming groups thereby raising their level of income. The input required for obtaining the maximum yields were provided free of cost to the selected farmers. These inputs include Seeds, Fertilizers, Pesticides etc Map of Chamba District is given in Fig. 1.

3. OBJECTIVES:

1. Crop diversification from existing cereals based crops to vegetable crops
2. To increase income of the Rural farmers and generate employment.



Fig. 1. Map of Chamba District

4. RESULTS

With the successful cultivation of these vegetable crops, the farmers of the area are earning net profit of Rs. 8000-9000 per kanal (400 m² area) as compared to the cereal crops. With the introduction of vegetable crops in the area, a substantial decrease in cereal based cropping systems acreage has been noticed in the operational areas and with the introduction of new vegetable crops for the first time in many villages and high yielding varieties of few crops grown earlier in the villages, the yields of vegetable crops were increased manyfolds as compare to the traditional one. So the farmers were benifet and their livelihood was increased. According to Partap and Partap [6] it was found that the focus of mountain agriculture is shifting from traditional cereal crops farming to high value cash crops and the cultivation of such crops as apples, almonds, pear, peaches, plums and cherries and off-

season vegetables, both for local and export markets is increasing. The revival of chilli cultivation was also achieved with the successful introduction of bacterial wilt resistant variety Surajmukhi. The three cluster of fifteen crops with different varieties enlisted in the table with seed take and area covered, average yield and % increase in yield of six years (2007-2013) data were shown in Table 1.

5. HIGHLIGHTS OF THE TECHNOLOGY

The cultivation of niche based high value cash crops viz. tomato, capsicum, French bean, cucumber, okra, peas, cabbage, onion and garlic for getting additional farm income was successfully introduced and made popular amongst the farmers of Chamba district (All the three clusters).

Table 1: Details of demonstrations of vegetable crops conducted from 2007 to 2013

Cluster	Crop	Variety	Seed (Kg)	Area covered (ha)	Average yield (q/ha)	% increase in yield
Cluster I	Chilli	Surajmukhi	13.15	13.15	59.92	16.04
	Frenchbean	SVM-1	34.5	1.15	111.09	60.80
		ii) Luxmi	2.00	0.06	124.50	38.33
	Okra	i) Pusa Sawani	1.75	0.17	95.39	19.23
		ii) F ₁ Cross-5	6.00	0.80	115.08	43.85
		P-8	66.00	4.40	89.85	42.88
	Tomato	Tulsi	53.50	7.76	113.76	57.17
		F1 Amrit	0.46	0.92	140.30	27.54
		F1 243	0.08	0.16	136.80	22.14
		Malini	0.10	0.20	129.40	15.53
		KIAN	200 seeds	0.02	128.20	14.46
		Yash	0.13	0.87	330.81	32.32
	Capsicum	F1 7711	0.03	0.20	318.60	27.44
		Natasha	1000 seeds	0.03	190.35	New
		New Ace	0.02	0.08	182.50	New
Brinjal	Arka kesav	1.50	3.00	140.20	16.83	
Peas	AP-1	176.00	2.34	92.35	28.16	
	Palam Priya	120.00	1.60	87.51	38.34	
Onion	N-53	16.70	1.67	105.50	24.11	
	Palam Lohit	9.00	0.90	118.40	57.87	
Garlic	Agrifound Parvati	962.00	1.93	134.15	11.78	
Palak	Pusa Harit	36.00	1.44	116.52	43.16	
Radish	Japanese white	10.00	2.00	170.80	13.87	
Chinese cabbage	Palampur green	1.00	2.00	260.30	New	

	Cabbage	Varun	0.20	0.80	315.80	26.32
	Broccoli	Palam Samridhi	0.70	1.40	127.60	New
		Total	1510.82 + 1200 seeds	49.05	-	-
Cluster II	Chilli	Surajmukhi	14.50	15.5	73.92	41.09
	Frenchbean	Kentucky Wonder	6.00	0.19	110.25	22.50
		SVM-1	30.00	1.00	95.80	45.26
		Luxmi	52.00	1.70	82.63	25.29
	Phalguni	8.00	0.11	73.20	43.56	
Okra	F1 Cross-5	P-8	6.00	0.80	118.00	31.11
		P-8	56.00	3.60	86.87	33.09
		Tulsi (F1)	50.50	6.84	119.73	60.30
	Umang	16.00	2.10	124.60	66.13	
Tomato	F1 Yash	7711	0.48	3.20	330.31	32.12
		7711	0.03	0.20	320.50	28.20
Cucumber	F1 Amrit	F1 Amrit	1.23	2.46	185.90	69.00
		F1 243	0.15	0.30	141.30	28.45
		Malini	0.30	0.60	134.60	22.36
	KIAN	100 seeds	0.01	128.40	16.72	
	Cabbage	Varun	0.10	0.40	315.90	26.36
Capsicum	Natasha	1000 seeds	0.03	184.60	42.00	
		Indian	0.01	0.04	178.20	New
		New Ace	0.03	0.12	185.40	New
Brinjal	Arka kesav	1.00	2.00	144.30	31.18	
Peas	AP-1	Lincoln	200.50	2.67	86.58	37.41
		Lincoln	58.00	0.77	86.40	32.92
	Palam Priya	143.00	1.91	92.73	42.65	
	Punjab-89	80.00	1.06	92.40	42.15	
Onion	N-53	N-53	11.65	1.16	119.08	32.31
		Patna Red	2.00	0.20	116.20	54.93
	Garlic	Agrifound Parvati	1190.00	2.38	170.59	45.41
Palak	Pusa Harit	84.00	3.36	122.23	50.55	
	Radish	Japanese white	17.00	3.40	188.30	25.53
	Chinese cabbage	Palampur green	2.00	4.00	281.30	New
	Cabbage	Varun	0.23	0.92	310.70	24.28
Broccoli	Palam Kanchan	Palam Kanchan	1.00	2.00	190.30	New
		Palam Samridhi	0.70	1.40	131.20	0.00
	Total	2032.41 + 1100 seeds	66.43	-	-	
Cluster III	Chilli	Surajmukhi	17.05	19.40	66.71	25.64
	Frenchbean	i) Luxmi	10.00	0.32	114.50	20.52
		ii) Kentucky Wonder	6.50	0.21	105.00	10.52

		iii) SVM-1	19.50	0.65	81.31	11.91
		i) P-8	2.00	0.20	101.05	26.31
		ii) Pusa Sawani	1.25	0.13	85.50	6.87
		iii) F1 Cross-5	9.00	1.20	95.50	19.37
	Okra	F1 Tulsi	6.00	0.93	95.37	27.15
		Umang	4.00	0.53	92.50	23.33
		Indernil	5.00	0.67	85.30	13.73
	Cucumber	F1 Amrit	0.31	0.62	120.75	9.77
		F1 243	0.07	0.14	138.50	25.90
	Tomato	Yash	0.10	0.67	268.60	49.22
	Cabbage	Varun	0.19	0.76	292.80	39.42
	Peas	Palam Priya	230.00	3.09	70.66	4.87
		AP-1	223.50	2.98	63.43	30.17
		Punjab-89	75.00	1.00	74.20	18.82
	Onion	N-53	11.65	1.16	60.50	26.50
	Garlic	Agrifound Parvati	144.00	0.29	115.30	35.64
	Cabbage	Varun	0.07	0.28	312.60	25.04
	Broccoli	Palam Samridhi	0.60	1.20	112.30	New
		Total	765.79	36.43	-	-

6. CONCLUSION

Horizontal transfer of the technology made an impact among the stake holders. Farmers of all the clusters of Chamba District were growing traditional cereal crops. But now with the introduction of vegetables and improved plant varieties of horticultural and medicinal plants have resulted in higher profit per unit area. Now more farmers are shifting toward cash crop production. Within horticulture, diversification through off-season vegetables seems to possess great potential in most of the areas in both temperate and non-temperate belts of Himalayan Region. This region has an easy access to vast and ever growing consumer markets. Climatic conditions in

many parts of Himalayan Region are suitable for cultivation of crops like tomato, peas, beans, cabbage and capsicum in summer season (April to October) when these crops are not grown in the plains. The price advantage makes it worthwhile to incur high production cost and transport off-season vegetables to distant consumer markets. There are many small pockets throughout the Himalayan Region which have attained economic progress by diversification through off season vegetables cultivation.

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