



Constraints faced by the farmers of Himachal Pradesh in production of different crops

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ABSTRACT

The farmers are confronted with numerous production, marketing and ecological constraints in production of different crops that hinders their income generation and increase in productivity of different crops. The present study has been conducted in all the four agro climatic zones of Himachal Pradesh with one representative district from each zone, to find out the constraints and its chronology that are being faced by the farmers. Three blocks from each district were selected on the basis of maximum area under cultivation and from each block four villages, further from each village three farmers were selected. Thus, a sample size of one hundred forty four farmers have been selected from all the four agro-climatic zones of Himachal Pradesh. Information about constraints from the farmers has been collected by using well structured schedule by personnel interview method. Garret ranking technique has been used to prioritize the imminent challenges/constraints. Some impending challenges those endanger the economic viability and ecological sustainability of different crops are lack of irrigation facilities, small land holding, fluctuating price, distant markets, wild animals menace, incidence of diseases and insect pests attack and irregular monsoon which are being ranked first and second in the different four major categories that are having highest Garret Mean Score. The high incidence of diseases has led to an excessive use of agrochemicals that has given rise to a vicious cycle of falling productivity-more use of chemicals-further fall in productivity, and so on. This has not only escalated the production cost but has also affected environment and bio-diversity adversely.

Key words: Garrett's Ranking, high value crops, production constraints, marketing constraints and ecological constraints

Received 29.01.2020

Revised 06.02.2020

Accepted 12.03.2020

INTRODUCTION

Himachal Pradesh is situated in the western Himalayas, offering a multi-textured display of lofty snow-clad mountains, deep gorges, thickly forested valleys, large lakes and terraced fields sub divided into four different agro climatic zones. The agriculture is considered the backbone of the state's economy as it is the main stake of livelihood for two third of rural population in the state. The economic growth in the State was predominantly governed by agriculture activities but the percentage contribution of agriculture in total State Domestic Product has declined from 57.9 percent in 1950-51 to 55.5 percent in- 1967-68, 26.5 percent in 1990-91 and to 8.4 percent in 2018-19. [1]. According to Agricultural Census of 2010-11, in Himachal Pradesh only 11 percent of the total geographical area is available for cultivation and more than 88 per cent of the holdings are small and marginal; owing less than two hectares of land.

Doubling the farmer's income by year 2022 is a prime vision of the government of India. To achieve the same in Himachal Pradesh, it becomes very imminent that firstly the constraints that are being perceived by the farmers in current scenario are highlighted so that a novel strategy and some change in the policy stance may be initiated at the earliest. It is imperative to mention that agricultural transformation in a mountainous state like Himachal Pradesh is circumscribed by mountain specificities, namely, inaccessibility, fragility, marginality, niche and human adaptation mechanism created by unique vertical

dimensions that distinguish them from plains [3]. There are several physical constraints to agriculture in the mountain areas of the Hindu Kush Himalayan region like remoteness and inaccessibility, marginality, and fragility in terms of moisture stress and poor soil conditions and a short growing season. Added to these are socioeconomic constraints such as small landholdings, poor productivity, poor production management, labour shortages, poor post production management, poor marketing and marketing networks, unirrigated land and lack of entrepreneurship. All these are leading to under utilization of the resource bases in the mountains and limited the generation of surpluses in the agricultural sector that could be used to invest in and support the growth of the mountain economy. Sharma [7] reported that the emerging challenges like rapid depletion of soil fertility, changing weather and climatic conditions, increasing erosion of comparative advantages, increasing competition from cheaper imports, inadequate infrastructural facilities and old age of crop bearing apple plantations pose a serious threat to the economic viability and ecological sustainability of crops. Therefore, improving the production and productivity of these tiny holdings and in the ultimate analysis, the level of living of marginal and small farmers is a major challenge for the planners and policy makers. The present study has been specifically taken to find out all these constraints and their severity at grassroot level.

MATERIAL AND METHODS

The Primary data for the present study was collected from the farmers of all the four agro-climatic zones of Himachal Pradesh for the agricultural year 2019-20. One district from each agro-climatic zone was selected purposively. Una (Shivalik Hill Zone), Solan (Mid Hill Zone), Shimla (High Hill Zone) and Kinnaur (Cold Dry Zone) districts was chosen for the present study. Three blocks from each selected district having maximum area under cultivation were purposively selected. From each block four villages were selected. Accordingly, three farmers were selected from each village. For the selection of sample, three stage stratified random sampling design was adopted; with development block as a primary unit, village as a secondary unit and sampled farmer as an ultimate unit. Accordingly, 12 households were selected from each block thus making total sample size of 144 from four agro-climatic zones of Himachal Pradesh. Well structured schedule was used to collect the information about constraints from the selected farmers. Garrett's Ranking Technique was used to prioritize the imminent challenges/constraints in the study area.

Garrett's Ranking Technique

Per cent Position = $100 (R_{ij} - 0.50) / N_{ij}$

Where, R_{ij} = Rank given to the i th item by the j th individual,

N_{ij} = Number of items ranked by the j th individual,

The per cent position of each rank was converted into scores using Garrett's table. For each constraint score of the individual respondent were added. Thus, mean score for each constraint was ranked by assigning higher rank (1) to highest value Garrett mean score.

RESULTS AND DISCUSSION

Constraints/ Challenges

The production of different crops are confronted with numerous constraints due to their highly perishable nature, high-tech requirements, costly planting material/seeds, inputs, etc. Thus, for encouraging the production and efficient marketing of these crops, various problems and constraints in their production and marketing with which they are confronted with, are needed to be identified. Mainly constraints have been categorized into four major categories i.e Production constraints, Marketing constraints, Ecological constraints and Other constraints. These major constraints were further divided into different subcategories which are being described as under in different tables.

i) Production constraints

Lack of irrigation facilities has been a major constraint in agriculture at national level. The same constraint has also risen as the major problem in the study area (Table-1). This was the major problem with highest rank in Zone-I (83.00), Zone-II (84.30) and Zone-III (81.13) as the study area lacked proper irrigation facilities. It was expected that the unreliable rainwater would impose severe limitations on the agricultural production. While in Zone-IV small land holding (78.00) was the major problem. It is also second most major constraint for increasing productivity at state level. There is a preponderance of small land holdings in Himachal Pradesh. According to Agricultural Census of Himachal Pradesh (2010-11), small and marginal farmers together constitute 88% of the total population of the state. The average size of holding was 1.0 hectares in 2010-11. Fluctuating production, unfertile holding and cash shortage when needed also contributed to production constraints. India lacks modernized infrastructure for promoting

the agriculture sector. Rudimentary policies, old fashioned equipment's and practices used by farmers in India are not sustainable, resulting in low productivity for many agricultural commodities [2].

ii) Marketing constraints

Price fluctuation is a multifaceted problem attributed by various factors which, when combined, culminate in dangerous consequences for the most vulnerable. Although high prices can technically be good news for farmers, price fluctuation is extremely dangerous, as farmers and other agents in the food chain risk losing their investments if prices fall. This severe marketing constraint was noticed during the survey in all the zones by scoring highest Garret Mean Score values of 77.40, 76.51, 78.20, 76.25 and 77.09 in zone-I zone-II, zone-III, zone-IV and at overall state level and is thus, ranked I (Table-2). Agri-commodity sector is still lacking in a well-developed, organized and integrated market for spot trading of commodities. Farmers quite often are faced with a risk of what to grow and when and where to sell. Any development in this front will directly facilitate the growth of the commodity futures markets also on those agri products. The agricultural product prices are highly volatile. A farmer is highly susceptible to price fluctuations both of farm produces and farm inputs [4, 6].

Distant markets (75.00) are playing their role in proving a constraint for production of high value crops and hence, ranked second. High transport charges and lack of all-weather roads, malpractices by traders at the time of auction and inadequate storage facilities were another constraints related to marketing which were ranked 3rd, 4th and 5th respectively at state level in the study area. Traditional harvesting and storage conditions of Indian farms and farmers result in large proportions of crop wastage. It has been estimated that crop wastage due to inefficient storage is 7 per cent of annual grain production per year in India. This percentage accounts for 21 million tonnes of wheat grain alone, as India lacks proper cold storage and cold chain transportation [8]. Bishnoi *et al.* [1], conducted a study in Kurukshetra and Panipat districts of eastern zone and Hisar district of western zone in the state of Haryana. These districts were selected on basis of acreage under summer mungbean. The analysis of constraints in cultivation of summer mungbean as opined by the sampled farmers recite that non-availability of suitable machine for harvesting, non-procurement of produce by Govt. agencies, harvest price less than MSP were recorded as the major constraints in the study area.

iii) Ecological Constraints

In India, the impact of climate change is severe on agricultural production. It leads to many adverse consequences in agricultural sector viz., crop failure, decline in agriculture production and productivity, deceleration in soil fertility, and fall in ground water level.

The farming community is facing several threats due to environmental changes and pollution. Crop damages due to climatic changes are putting a lot of pressure on the farmers. The cultivation of high value crops, especially horticultural crops, has started showing increasing symptoms of unsustainability due to, among other things, falling soil fertility, erratic weather conditions and the emergence of numerous insects, pests and diseases. The adoption of same cropping sequence year after year has caused the loss of micronutrients leading to deterioration in the overall soil health. Land use pattern in the state of Himachal Pradesh in the Indian Western Himalayas has been undergoing rapid modifications due to changing cropping patterns, rising anthropogenic pressure on forests and climate changes.

In the study area incidence of diseases and insect pests attack and irregular monsoon showed a deep impact in all the zones (Table-3). Pests and incidence of diseases pose a serious risk for farmers as they can impact on market access and agricultural production. The incidence of diseases and insect pests attack (76.73) was also found out to be a major constraint in study area and was ranked first at overall level. At the state level, problem of irregular monsoon (76.36) has thus been ranked second. Monsoon plays a crucial role in Indian agriculture. Most farmers rely on good crop produce during monsoon to earn their living and in order to overcome debts incurred. This further cements the importance of monsoon in an agrarian economy like India. Agriculture in Himachal too is largely dependent on monsoon and as such production of crops fluctuates year after year due to irregular monsoon. Loss of soil fertility, soil erosion, loss of water holding capacity were the other problems which were ranked 3rd, 4th and 5th respectively at overall level.

iv) Other challenges

As human and livestock population has increased immensely, forest encroachment has been effected, which paved a floor to grazing activities, cultivation of wastelands and deforestation. As human and livestock population has increased immensely, forest encroachment has been effected, which paved a floor to grazing activities, cultivation of wastelands and deforestation. As human and livestock population has increased immensely, forest encroachment has been effected, which paved a floor to grazing activities, cultivation of wastelands and deforestation. Due to such human disturbances and habitat loss the wild animals have been affected to a great extent, some became

endangered, some extinct, and those who survived, learnt to live in man designed habitat successfully. As human and livestock population has increased immensely, forest encroachment has been effected, which paved a floor to grazing activities, cultivation of wastelands and deforestation. Due to such human disturbances and habitat loss the wild animals have been affected to a great extent, some became endangered, some extinct, and those who survived, learnt to live in man designed habitat successfully.

Wild animals menace (78.66) was found as the major constraint at state level with the highest mean score (Table-4). The menace of wild and stray animals has emerged as one of the greatest challenges in the recent past. Damage to crops by wild and stray animals specially monkeys is being reported from many parts of the state. The issue has been highlighted even at the legislative assembly of the state many times. The farmers are facing the crop damage problems due to the crop raiding by wild animals. Costly inputs (78.12) was the second most important constraint affecting the farmers in the study area. A substantial increase in input costs of materials has led to a decline in crop income over the years. The farmers are finding it difficult to keep their margin of profit with growing input cost every year. Thirdly, there are no local processing facilities available in the study area. Consumption of processed products started since time immemorial. Large initial investment needed and lack of policy support were also major problems in the study area.

The transition towards high-value agriculture is not without constraints, especially for smallholders. If the high-value commodities are products that the farmers have not grown before, the farmers may lack necessary information on production methods, marketing opportunities and the probable distribution of net returns. This problem is particularly acute when the target consumers have very specific quality requirements and/or strict food safety requirements [5].

Table:1 Production constraints being faced by the farmers

Constraints	Zone-I		Zone-II		Zone-III		Zone-IV		Over all	
	GMS*	Rank	GMS*	Rank	GMS*	Rank	GMS*	Rank	GMS*	Rank
Small land holding	75.71	V	72.63	V	79.11	II	78.00	I	76.36	II
Cash shortage when needed	76.83	IV	75.12	III	66.65	VIII	68.14	VIII	71.69	VII
Fertilizer and Plant protection chemicals not available in time	65.52	VIII	65.40	VIII	68.63	VII	68.58	VII	67.03	VIII
Un-fertile holding	80.39	II	73.17	IV	69.77	VI	69.50	VI	73.21	V
Costly labour	73.40	VI	68.43	VII	73.32	V	77.88	II	73.26	IV
Non-availability of skilled labour at operation period	70.13	VII	70.45	VI	77.18	III	73.40	IV	72.79	VI
Fluctuating production	76.57	III	78.91	II	76.10	IV	66.75	IX	74.58	III
Lack of irrigation facilities	83.00	I	84.30	I	81.13	I	77.58	III	81.50	I
Non-availability of quality seed and planting material	64.30	IX	64.81	IX	65.13	IX	71.97	V	66.55	IX

*GMS-Garret mean score

Table:2 Marketing constraints being faced by the farmers

Constraints	Zone-I		Zone-II		Zone-III		Zone-IV		Over all	
	GMS*	Rank	GMS*	Rank	GMS*	Rank	GMS*	Rank	GMS*	Rank
Non-availability of institutional credit	64.68	VIII	59.63	VIII	69.12	VI	68.20	V	65.41	VI
High transport charges and lack of all-weather roads	68.73	III	70.73	III	74.37	III	69.24	IV	70.77	III
Distant markets	75.60	II	73.23	II	77.60	II	73.58	II	75.00	II
Lack of vehicles and non-availability in time	66.13	VII	62.63	VII	67.56	VII	55.92	VIII	63.06	VIII
Fluctuating price	77.40	I	76.51	I	78.20	I	76.25	I	77.09	I
Inadequate storage facilities	65.29	V	65.38	VI	69.20	V	71.37	III	67.81	V
Malpractices by traders at the time of auction	66.82	IV	68.25	IV	71.46	IV	67.23	VI	68.44	IV
Lack of market intelligence	63.63	VI	66.40	V	64.33	VIII	65.59	VII	64.99	VII

*GMS-Garret mean score

Table:3 Ecological challenges related to farming being faced by the sampled farmers

Constraints	Zone-I		Zone-II		Zone-III		Zone-IV		Over all	
	GMS*	Rank	GMS*	Rank	GMS*	Rank	GMS*	Rank	GMS*	Rank
Loss of soil fertility	72.26	III	72.92	III	70.47	VI	64.42	III	70.02	III
Soil erosion	68.72	IV	67.33	V	72.38	IV	64.03	V	68.12	IV
Loss of water holding capacity	66.51	V	61.52	VII	77.30	III	61.12	VII	66.61	VI
Loss of genetic diversity of planting material	62.82	VIII	64.45	VI	71.67	V	62.92	VI	65.47	VII
Soil contamination with chemical fertilizers, pesticides and others	65.77	VII	69.30	IV	69.52	VII	64.10	IV	67.17	V
Incidence of diseases and insect pests attack	76.80	II	79.61	I	79.90	II	70.62	I	76.73	I
Irregular monsoon	80.53	I	75.93	II	80.60	I	68.36	II	76.36	II
Irrigation water quality	59.48	IX	57.60	IX	61.63	IX	58.53	IX	59.31	IX
Loss of soil organisms/ predator	61.03	VI	59.05	VIII	65.79	VIII	60.35	VIII	61.56	VIII

GMS*- Garret Mean Score

Table:4. Other constraints related to farming being faced by the farmers in the study area

Constraints	Zone-I		Zone-II		Zone-III		Zone-IV		Over all	
	GMS*	Rank	GMS*	Rank	GMS*	Rank	GMS*	Rank	GMS*	Rank
Less experience in the field	61.13	VII	63.48	IX	68.20	VI	62.60	VI	63.85	VII
No local processing facilities	78.70	II	73.50	VI	76.00	III	75.50	II	75.93	III
Large initial investment needed	78.22	III	76.30	IV	73.33	IV	74.57	III	75.61	IV
Lack of policy support	71.72	VI	74.33	V	70.43	VI	68.92	V	71.35	V
Wild animals menace	80.90	I	81.62	I	78.60	I	73.51	IV	78.66	I
Lack of proper knowledge about the application of insecticides, pesticides and fertilizers	71.80	V	77.23	III	72.00	V	59.53	VII	70.14	VI
Costly inputs	74.13	IV	79.73	II	77.10	II	81.50	I	78.12	II

GMS*- Garret Mean Score

CONCLUSION

Agriculture can provide better choices and quality options for sustaining the livelihoods of hill farmers but what is necessary in this process is to develop a clear understanding of the ecologically and economically sustainable farming options. Lack of irrigation facility (81.50) and small land holding (76.36) were the most limiting constraint expressed by farmers in the production of high value crops. In the marketing of fruits and vegetables in Himachal Pradesh fluctuating price (77.09) and distant markets (75.00) were the constraints which were ranked 1st and 2nd at state level on the basis of maximum value of Garret Mean Score. Major ecological constraints were incidence of diseases and insect pests attack (76.73) and irregular monsoon (76.36). Other emerging challenges like wild animals menace (78.66), costly inputs (78.12), no local processing facilities (75.93) and large initial investment needed (75.61) pose a serious threat to the economic viability and ecological sustainability of the process of crop production in the state. The path of doubling farmers income can be cleared if the constraints as pointed out in the current study can be removed through effective planning at the highest level.

ACKNOWLEDGEMENT

I would like to express my thanks to Indian Council of Social Science Research, New Delhi (ICSSR) for providing me financial assistance to carry out this study.

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CITATION OF THIS ARTICLE

N Devi, K K Raina and R Sharma. Constraints faced by the farmers of Himachal Pradesh in production of different crops .Bull. Env. Pharmacol. Life Sci., Vol 9[4] March 2020 : 13-18