Journal of Agricultural Development and Policy
Volume 25 No. 2 (2015): 36-45

# A Constraint Analysis in Crop Production in Sub-Mountainous Zone of Punjab

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***ABSTRACT***

*Agriculture in the Sub-Mountainous Zone of Punjab occurs in the form of mixed farming system. This involves several sub-sectors like crops, agroforestry, agro horticulture and livestock, which is used in a mutually reinforcing manner. The Sub Mountainous Zone encounters several constraints on account of climatic, edaphic, and social factors, but the major effect is encountered in crop farming. The present study highlights different constraints perceived by farmers of the zone in crop cultivation. The primary data collected from 240 respondents proportionately distributed over three land holding categories namely small (<5 acre), medium (5-10 acres) and large (>10 acres), from 6 blocks of Hoshiarpur and Roopnagar district representing the zone, represents the basis of study. The constraints divided into four main categories i.e. biotic, operational, infrastructural and marketing, were got ranked by the respondents into low, moderate and high according to perceived intensity. These were assigned values from one to three and depending upon the responses mean score was calculated so as to provide ranks to these constraints. Low yields, poor quality seeds, animal menace, inadequate irrigation facilities, fragmented land, poor extension services, non-availability of processing units and poor connectivity to the market were found to be the major constraints in the crop production by the farmers of the Sub-Mountainous Zone of the state. The findings of the study call for concerted policy action for the redressal of these constraints.*

**Key words:** Sub-mountainous zone, Constraint analysis, Crop production
**JEL Classification:** Q1,Q22,Q16

## INTRODUCTION

The Sub-Mountainous Zone of Punjab state lies in the N-E part in the form of a 10 to 20 km wide strip and covers approximately nine per cent geographical area of the state. It covers part of the districts of Pathankot, Hoshiarpur, Shaheed Bhagat Singh Nagar, Roopnagar and Mohali. This part of the state has always been under privileged as regards the available resources like assured irrigation. Crop production in the Sub Mountainous Zone is a critical component of mixed farming system. This system involves several sub-sectors like crops, agroforestry, agro horticulture and livestock, which are used in

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a mutually reinforcing manner. The interactions of these components are synergistic, and result in greater total effect than the sum of their individual effects (Edwards *et al,* 1988). More specifically, the benefits often result in ecological and economic sustainability by creating risk bearing capacity within the system. The Sub-Mountainous Zone encounters several constraints on account of climatic, edaphic, and social factors, but the major effect is encountered in crop farming due to its shorter life cycle as compared to the other components of the integrated production system, like trees and livestock. The integration of crop and livestock serves the purpose of minimizing risk apart from recycling of resources. The purpose of integration is to earn additional income and impart economic stability to the farming system. There is a strong complementarity in resource use, with outputs from one component being supplied as inputs to the other, for example manure from livestock is used to enhance crop production, whilst crop residues and by-products feed the animals. The productivity levels of these areas have remained lower across years because of frequent droughts occurring due to high variability in the quantum and distribution of rainfall, imbalanced fertilization, small farm size and poor mechanization, poor socio-economic conditions and low risk-bearing capacity, low credit availability and infrastructural constraints (Sharma *et al,* 2009). Consequently, farmers are distracted from agriculture and tend to migrate to cities to look for alternative jobs. It is against this backdrop, the present study has been envisaged to carry out the constraint analysis in crop production in the Sub-Mountainous Zone of Punjab, so as to facilitate the strategic planning machinery of the state to gear up the support system to address the constraints on priority.

## METHODOLOGY

The present study, conducted in the Sub Mountainous Zone of Punjab, is based on the primary data collected from 240 respondents proportionately distributed over three land holding categories namely small (<5 acre), medium (5-10 acres) and large (>10 acres), from six blocks of Hoshiarpur and Roopnagar district representing the zone. The respondents were selected from clusters comprising of four to five villages, in such a way so as to ensure due representation of semi hilly and plain areas. Since there are large number of constraints all these were arranged into four sub categories namely biotic, operational, infrastructural and marketing constraints. For the purpose of simplification, the respondents were asked to categorise the given factors that were limiting crop cultivation according to their prevalence and intensity into three categories namely: low, moderate and high. These categories were assigned values from one to three and depending upon the responses mean score was calculated for all the constraints so as to rank order them.

## RESULTS AND DISCUSSION

Punjab state is agriculturally quite advanced, productivity levels are one of the highest for most of the crops in the country and it is often referred as the grain bowl but the sub mountainous area is still under developed and the productivity of most of the

crops is very less. In this zone, there is integration of crop and livestock production in a synergistic manner, with recycling allowing maximum use of available resources. Crop farming has been the primary occupation of the people, but it is losing importance with the farmers of the region, due to large number of constraints which results in crop failures may be due to erratic weather, menace of animals or poor quality of seeds. The constraints experienced by farmers varied according to their socio economic conditions. The cultivable land constituted about 70 per cent of the total land holdings on small (4.28 acres) and medium farms (9.93 acres) with respective cropping intensity of 174 and 158 per cent (Table 1). On large farms, the cultivable land constituted 90 per cent of the total (21.58 acres) with cropping intensity of only 122 per cent. Forest and waste land constituted about one-third of the total land on small and medium farms, whereas it was one tenth on the large farms. Out of the total cultivable land about 69 per cent was under irrigation and remaining 31 per cent was rainfed on irrespective of the land holding category. The constraints as identified for crop farming in the sub mountainous zone have been categorized into four different groups: biotic, operational, infrastructural and marketing constraints. The detailed discussion on these is presented under different sub heads.

**Biotic Problems**

In the Sub-Mountainous Zone, drier conditions with respect to moisture usually results in the attack of termites. Termites destroy the seed and can affect the crop from germination till its harvesting stage. This problem equally affected all the categories of farmers and ranked one with a high mean score of 2.37 on overall basis (Table 2). The

**TABLE 1: AVERAGE SIZE OF LAND HOLDINGS IN THE SUB-MOUNTAINOUS ZONE, PUNJAB**

(Acres)

| Particulars | Small | | Medium | | Large | | Overall | |
|---|---|---|---|---|---|---|---|---|
| | Area | Percent | Area | Percent | Area | Percent | Area | Percent |
| Total Land | 4.28 | 100 | 9.93 | 100 | 21.58 | 100 | 8.86 | 100 |
| Forest & waste land | 1.28 | 29.9 | 2.95 | 29.7 | 2.2 | 10.2 | 2.09 | 2.36 |
| Cultivable Land | 3 | 70.1 | 6.98 | 70.3 | 19.38 | 89.8 | 6.77 | 76.4 |
| Irrigated | 2.06 | 48.1 | 4.59 | 46.2 | 13.99 | 64.8 | 4.68 | 52.8 |
| Un-Irrigated | 0.94 | 22 | 2.39 | 24.1 | 5.4 | 25 | 2.09 | 23.6 |
| Leased-in | 0.19 | 6.2 | 0.9 | 11.5 | 3.54 | 15.7 | 0.92 | 12.1 |
| Irrigated | 0.18 | 5.8 | 0.68 | 8.7 | 3.26 | 14.5 | 0.8 | 10.6 |
| Un-Irrigated | 0.01 | 0.3 | 0.22 | 2.8 | 0.28 | 1.2 | 0.12 | 1.6 |
| Leased-out | 0.11 | 3.6 | 0.054 | 0.7 | 0.37 | 1.6 | 0.12 | 1.5 |
| Irrigated | 0.11 | 3.6 | 0.004 | 0.1 | 0.37 | 1.6 | 0.1 | 1.3 |
| Un-Irrigated | - | - | 0.05 | 0.6 | - | - | 0.01 | 0.1 |
| Total operational land | 3.08 | 100 | 7.83 | 100 | 22.56 | 100 | 7.58 | 100 |
| Irrigated | 2.13 | 69.2 | 5.27 | 67.3 | 16.88 | 74.8 | 5.38 | 71 |
| Un-Irrigated | 0.95 | 30.8 | 2.56 | 32.7 | 5.68 | 25.2 | 2.2 | 29 |
| Cropping Intensity (%) | 174 | | 158 | | 122 | | 145 | |

**TABLE 2: RANKING OF BIOTIC CONSTRAINTS IN CROP PRODUCTION, SUB-MOUNTAINOUS ZONE, PUNJAB**

| Particulars | Small | | Medium | | Large | | Overall | |
|---|---|---|---|---|---|---|---|---|
| | Mean score | Rank | Mean score | Rank | Mean score | Rank | Mean score | Rank |
| Lack of good quality seeds | 1.88 | 5 | 1.54 | 6 | 1.43 | 6 | 1.7 | 5 |
| Lack of sustainable new varieties of crops for rain-fed areas | 1.95 | 4 | 1.77 | 4 | 1.49 | 5 | 1.82 | 4 |
| High incidences of diseases | 1.83 | 6 | 1.55 | 5 | 1.63 | 4 | 1.7 | 5 |
| Low yield | 2.22 | 2 | 1.9 | 3 | 1.71 | 3 | 2.04 | 2 |
| High incidence of termites | 2.44 | 1 | 2.31 | 1 | 2.26 | 1 | 2.37 | 1 |
| High incidence of insects/pests | 1.97 | 3 | 1.94 | 2 | 1.97 | 2 | 1.96 | 3 |

respondents revealed that termites attacked crop due to moisture stress. Adoption level of seed treatment practice with chloropyrephos before sowing was poor. Low yield of crops was another major problem reported by the respondents in the study area and as per mean score of 2.04, it was ranked second on overall basis. It was ranked second by small and third by medium and large farmers, probably due to higher level adoption of improved cultivars on these farms. Besides this, there were large number of other reasons for the low yield of crops, one of them was higher incidence of insect pest attack, followed by lack of sustainable varieties of rain-fed crops, since it was a known fact that the high yielding varieties respond with application of irrigation and use of chemical fertilizer, it was observed that respondents were using these high yielding varieties under rainfed condition where advantage of higher yield could not be obtained, as a result the yields were low.

Higher incidence of insect pest attack was ranked third on overall basis with a mean score of 1.96 on overall farm. It was reported that insect pest attack was negligible about ten years back, may be due to large biotic diversity and was controlled naturally. The respondents highlighted that at present most of the wheat was affected by jassid (*tela*) attack which reduced yields by 10-15 per cent.

Lack of sustainable new varieties of crops for rainfed area was ranked as fourth constraint with a mean score of 1.82 on overall basis. High incidence of diseases and lack of good quality seeds were the other problems reported by the respondents on fifth rank with a common mean score of 1.70 on overall basis. All these constraints had created disinterest of respondents in crop farming and they had become more inclined towards tree farming, which often acts as security against crop failures and one cannot be wrong to say that crop cultivation had become a secondary occupation in some parts of this agro climatic zone. The three categories of farmers were observed to be in agreement as regards the rank ordering of these constraints was concerned.

**Operational Constraints**

There were some inherent problems due to the geographical location of the study area,

**TABLE 3: RANKING OF OPERATIONAL CONSTRAINTS IN CROP PRODUCTION, SUB-MOUNTAINOUS ZONE, PUNJAB**

| Particulars | Small | | Medium | | Large | | Overall | |
|---|---|---|---|---|---|---|---|---|
| | Mean score | Rank | Mean score | Rank | Mean score | Rank | Mean score | Rank |
| Damage by wild animals Kharif | 2.87 | 2 | 2.94 | 1 | 2.89 | 1 | 2.9 | 1 |
| Damage by wild animals Rabi | 2.19 | 4 | 2.35 | 4 | 2.37 | 4 | 2.27 | 3 |
| Damage by stray animal Kharif | 2.16 | 5 | 2.02 | 6 | 1.97 | 7 | 2.08 | 5 |
| Damage by stray animal Rabi | 2.88 | 1 | 2.9 | 2 | 2.8 | 3 | 2.88 | 2 |
| Lack of agricultural labour in peak season | 1.78 | 12 | 2.55 | 3 | 2.8 | 2 | 2.2 | 4 |
| Lack of technical know-how | 2.02 | 8 | 1.77 | 9 | 1.77 | 8 | 1.9 | 9 |
| Inadequate irrigation facilities | 2.29 | 3 | 1.87 | 8 | 1.63 | 9 | 2.05 | 7 |
| High cost of irrigation | 2 | 10 | 1.51 | 12 | 1.43 | 11 | 1.75 | 11 |
| Land degradation | 2.07 | 6 | 1.92 | 7 | 2 | 6 | 2.01 | 8 |
| Undulating /small size of plots | 1.93 | 11 | 1.58 | 11 | 1.4 | 12 | 1.73 | 12 |
| Infestation of Lantana and Parthenium weeds | 2 | 9 | 1.75 | 10 | 1.57 | 10 | 1.85 | 10 |
| Fragmented land | 2.06 | 7 | 2.02 | 5 | 2.11 | 5 | 2.05 | 6 |

undulating topography and menace of wild and stray animals, which created operational problems in crop farming. The different operational problems and the corresponding ranks assigned to them have been presented in Table 3.

Menace of wild and stray animals create many problems in crop cultivation and it was perceived to be the most serious constraint. The frequency intensity and type of damage by wild and stray animals had been got ranked for *kharif* and *rabi* seasons separately. At times the damage was so severe that some of the farmers had reported abandoning crop cultivation. On overall basis menace of wild animals in the *kharif* season was the most serious problem reported and ranked one with a mean score of 2.90. The damage by wild animals in *kharif* season was reported to be especially on maize crop. The respondents revealed that wild animals attacked the maize crop during nights only. Though watch and ward was a regular practice but negligence of a single night could damage the entire crop.

Menace of stray animals during *rabi* season was the second ranked problem with an overall mean score of 2.88, but it was ranked differently by different categories of farm house holds. It was ranked first by small, second by medium and third by large farm size category. Stray animals are the ones which have become unproductive and are abandoned in the forest areas. Their number has grown in alarming proportions. Once they enter any field they can damage the entire field within no time. The respondents revealed that some of the unproductive animals became productive in the natural environment, this has posed a challenge for better management of these animals at farm level. During *rabi* season, there was absence

of any vegetation in the forest area and to feed themselves, the stray animals enter the cultivated area and damage the standing crops. Menace of wild animals during *rabi* was the third ranked problem with an overall mean score of 2.27. Since during *rabi* season the degraded forests or the pasture lands were unable to meet the demand of fodder of these animals and they were also reported to attack the cropped area for meeting their fodder requirement thus posing a serious threat to crop farming in the Sub-Mountainous Zone.

Another problem related to animal menace was menace of stray animals in *kharif* season which was comparatively less due to easy fodder availability in the forest areas. This problem was ranked fifth on overall basis, though medium and large farmers ranked it at sixth and seventh spot. Thus, it can be concluded that menace of animals, they may be wild or stray, was the most important constraint which need to be tackled at priority, so that crop farming does not become a secondary occupation of the household living in the area. The forest needs to be rejuvenated in such a way that habitat is created for these animals and they do not encroach upon the cultivated lands. Most of the farmers were actively engaged in watch and ward and they consider it to be a regular operation in crop cultivation, which certainly adds up to a higher cost of cultivation. It was reported that stray cattle could damage crops at any time, but the wild animals damaged crops during nights only. The farmers had to tame dogs, burdening them further with additional cost which remains unaccounted for.

Availability of agricultural labour during peak season was an important constraint reported by medium and large households with respective mean score of 2.55 and 2.80 and ranked second and third respectively. It was given twelfth rank by small farmer category, indicating sufficiency of labour on account of small area under crop cultivation. On overall basis, it was ranked fourth with a mean score of 2.20 (Table 3).

Fragmented land holding was another serious problem faced by the natives of this region, which had created disinterest in agriculture. Singh *et al.* (2009) also reported this in irrigated farming systems of western Uttar Pradesh, as big operational difficulty due to which some farmers had abandoned crop cultivation.During sowing season, sowing commences from the far end, and the field which are left in between stay vacant, for the entire season, or they could be sown only with the help of bullocks. This problem was ranked sixth on overall basis with a varied ranking pattern by small, medium and large farm households.

Inadequate irrigation facilities was a third ranked constraint, reported by small farmers with mean score of 2.29, indicating higher dependence on government tubewells for irrigation, which were reported to be insufficient on per unit area basis. Normally one tubewell was installed in a village which could provide life saving irrigation. The medium and large farm households owned the tubewells and hence were not constrained on this account. On overall basis this constraint was ranked seventh with a mean score of 2.05.

Undulating topography, poor vegetation

and damage to natural water course had created problem of land degradation, in the Sub-Mountainous Zone, which occured due to heavy run off. It was reported to be a serious threat to crop cultivation in the zone. Similar results were indicated in the study by Grewal (1996) wherein it has been reported that poor vegetation in the high altitude areas leads to less seepage and more run off which develop gullies in the agricultural fields. Reclamation of such lands is must for crop cultivation and the affected farmers have to spend heavily for bringing this land back for crop cultivation. This problem ranked eighth on overall basis with a high mean score of 2.01. This was a moderate magnitude problem but reported by a higher number of respondents from all the categories of farmers.

Lack of technical knowhow, infestation of land by lantana and parthenium weeds, high cost of irrigation and undulating and small size of plots were other subsequent ranked constraints posing serious threat to crop cultivation in the sub mountainous zone of Punjab. The area was heavily infested by lantana and parthenium weeds and was comparatively more where land was left without cultivation, as in the upper region. These weeds grew gregariously and inhibits the growth of other species of economic importance in the village common land and forests.They cover large areas if not eradicated within a span of 2-3 years. Most of the forest area of the Shiwaliks was dominated by these species. Besides this undulating and small size of plots was a major hurdle for mechanised operations (Yadav *et al,* 2014). Private tube wells charged more than ₹50 per hour for irrigation and it took about 8 to 12 hours depending on the soil type and discharge.

**Infrastructural Problems**

The infrastructure available in the Sub-Mountainous Zone was inadequate when compared with the rest of Punjab state, which is considered as one of the most developed from agricultural point of view in the entire country. As reported, less number of seed shops were available in the area as a result

**TABLE 4: RANKING OF INFRASTRUCTURAL CONSTRAINTS IN CROP PRODUCTION, SUB-MOUNTAINOUS ZONE, PUNJAB**

| Particulars | Small | | Medium | | Large | | Overall | |
|---|---|---|---|---|---|---|---|---|
| | Mean score | Rank | Mean score | Rank | Mean score | Rank | Mean score | Rank |
| Lack of inputs | 1.47 | 7 | 1.11 | 7 | 1.09 | 6 | 1.29 | 7 |
| Lack of extension services | 2.61 | 2 | 2.35 | 2 | 2.23 | 2 | 2.46 | 2 |
| High prices of quality seeds | 2.97 | 1 | 2.93 | 1 | 2.69 | 1 | 2.91 | 1 |
| High prices of inputs due to improper markets | 2.31 | 3 | 2.05 | 4 | 1.91 | 4 | 2.16 | 4 |
| Poor quality of inputs in market | 2.24 | 4 | 2.24 | 3 | 2.17 | 3 | 2.23 | 3 |
| Lack of capital resources | 1.5 | 6 | 1.11 | 6 | 1 | 8 | 1.29 | 6 |
| Lack of institutional credit | 1.42 | 8 | 1.07 | 8 | 1 | 7 | 1.24 | 8 |
| Poor maintenance of Government tube wells | 1.94 | 5 | 1.45 | 5 | 1.37 | 5 | 1.69 | 5 |

less competitive prices of quality seeds was the most serious problem. The large number of risk factors often discouraged the farmers from purchasing these highly priced seeds. High price of quality seeds was the most important infrastructural constraint reported by all the categories of respondents and on overall basis it ranked one with a high mean score of 2.91 (Table 4).

Lack of extension services was the second ranked problem, which affected dissemination of improved technology and development schemes by the government becoming an important constraint in the crop production. Remote location and limited means of transportation often discouraged the visit of field functionaries of development agencies, with the result the region remained backward as far as dissemination of technology was concerned. As reported by the respondents, technologies available were all due to their personal efforts. On overall basis, it was ranked second with a mean score of 2.46.

Due to improper markets, the farmers often became victim of the monopoly of seed shop owner. As reported, most of the varieties of crops were available without proper packing cover, identity of this could not be ascertained. Insecticide and pesticides of reputed companies were not available on these shops. Moreover, the price was high due to remote location. Consequently, these constraints ranked third and fourth on overall basis with mean scores of 2.23 and 2.16 respectively.

Tube wells installed by the state government were not maintained properly and this problem got the fifth rank by all the categories of farms with an overall mean score of 1.69. Other infrastructural problems were like lack of capital resources, lack of inputs and lack of credit, and these were reported as low magnitude problems by all the categories of farms. They were ranked sixth, seventh and eighth respectively. The farmers in the area were known for their risk averter act, therefore development was minimal.

**Marketing Problems**

The sub-mountainous region covers approximately nine per cent area of the state. This area is tagged as a potential area for organic production of crops due to low use of chemicals and fertilizers. The area can be exploited for good quality of crop products, but the region lacks any such processing initiatives. Therefore, lack of processing facilities was the most serious problem and ranked one by all the farm size

**TABLE 5: RANKING OF MARKETING CONSTRAINTS IN CROP PRODUCTION, SUB MOUNTAINOUS ZONE, PUNJAB**

| Particulars | Small | | Medium | | Large | | Overall | |
|---|---|---|---|---|---|---|---|---|
| | Mean score | Rank | Mean score | Rank | Mean score | Rank | Mean score | Rank |
| Poor connectivity to the market | 2.48 | 2 | 2.33 | 2 | 1.94 | 3 | 2.35 | 2 |
| Low price of farm produce | 2.38 | 3 | 2.33 | 2 | 2.17 | 2 | 2.33 | 3 |
| Lack of cheap and efficient transport | 2.21 | 4 | 1.65 | 4 | 1.26 | 4 | 1.88 | 4 |
| Non-availability of processing units | 2.91 | 1 | 2.9 | 1 | 2.97 | 1 | 2.92 | 1 |

categories with a high mean score of 2.91, 2.90 and 2.97 by small, medium and large farm holders respectively (Table 5).

Availability of processing facilities at local level can promote processing of available products and farmers can get remunerative prices of their produce, which would in turn lead to more interest in crop production. Large number of fruit trees are available naturally like Mango, *Amla*, *Dhau*, *Dela*, *Karonda* etc. If processing facilities are made available, these can be commercially exploited by growing high yielding grafted plants in the forests. Curry leaves known for culinary and therapeutic value, are abundantly available in the region, which is used widely for garnishing in food industry, but due to lack of awareness it could not be exploited.

When the yields are low it is not viable to transport produce for sale in the market which is distantly located. Poor connectivity to the market forced the farmer to sell their meagre surplus to petty traders at their door steps on their price. For example local maize fetches higher price in the market but it was purchased at much lower price locally. The constraint of poor connectivity to the market was ranked second by respondents from all the farm size categories and it attained a mean score of 2.35 on overall farm. Low price of farm produce was an important constraint and was ranked second on medium and large farms because they were affected more due to a larger marketed surplus. Small farmers ranked it at third place and on overall farm basis it was ranked third with a mean score of 2.33.

Lack of cheap and efficient means of transport was reported as a serious problem by all the categories of farm holders but the mean score was the highest (2.21) on small farms followed by medium (1.65) and large farms (1.26) and with a mean score of 1.88 on overall farm, it was ranked fourth. It was reported as a high magnitude problem by small farmers, while it was a low priority problem

**TABLE 6 : SEVERITY OF CONSTRAINTS IN CROP PRODUCTION IN SUB-MOUNTAINOUS ZONE, PUNJAB**

| Category | Severity Percent | Problems | | | | |
|---|---|---|---|---|---|---|
| | | Biotic | Operational | Infrastructural | Marketing | All |
| Small | 25-50 | 11.6* | 2.5 | 3.3 | 0 | 0.8 |
| | 50-75 | 52.1 | 44.6 | 61.2 | 18.2 | 50.4 |
| | >75 | 36.4 | 52.9 | 35.5 | 81.8 | 48.8 |
| Medium | 25-50 | 15.5 | 2.4 | 2.4 | 1.2 | 1.2 |
| | 50-75 | 70.2 | 59.5 | 95.2 | 29.8 | 78.6 |
| | >75 | 14.3 | 38.1 | 2.4 | 69 | 20.2 |
| Large | 25-50 | 11.4 | 5.7 | 20 | 0 | 2.9 |
| | 50-75 | 82.9 | 68.6 | 80 | 60 | 82.9 |
| | >75 | 5.7 | 25.7 | 0 | 40 | 14.3 |
| Overall | 25-50 | 12.9 | 2.9 | 5.4 | 0.4 | 1.3 |
| | 50-75 | 62.9 | 53.3 | 75.8 | 28.3 | 65 |
| | >75 | 24.2 | 43.8 | 18.8 | 71.3 | 33.8 |

**Per cent of respondents.*

for medium and large farmers.

**Severity of Constraints**

The proportion of respondents enunciating level of severity at the aggregate level for different categories of constraints, has been summarised in Table 7. The severity had been estimated on the basis of attained score as a percentage of maximum attainable score for each category of constraints. The perusal of the table clearly indicates that majority of the respondents from all the farm size categories reported most of these problems with severity falling in the range of 50-75 per cent. Maximum 48.8 per cent respondents from small farm size category reported these constraints with a severity of more than 75 per cent, followed by 20.2 per cent medium and 14.3 per cent large farmers.

## CONCLUSION

It can be concluded that animal menace, low yields, poor quality seeds, inadequate irrigation facilities, fragmented land, poor extension services, non-availability of processing units and poor connectivity to the market were the major constraints in the crop production reported by the respondents of the Sub-Mountainous Zone of the state. Most of the biotic and infrastructural constraints can be solved by providing agricultural extension facilities in the villages. Issues pertaining to marketing can be addressed by suitable policy interventions, which can go a long way in creating better economic opportunities for the inhabitants of this neglected area of the state.

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Received: September 22, 2015
Accepted: November 4, 2015