

Analysis of Basic Infrastructure Facilities Available for Vegetable Production and Marketing

A Case of Nainital District of Uttarakhand

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Abstract— India is predominantly an Agrarian state with more than 50 percent of the population directly or indirectly dependent on agriculture and allied activities. This easily shows that agriculture is backbone of Indian economy and social fabric. Infrastructure plays an important role in the growth of any sector. The paper tries to list down all the basic infrastructural facilities that are required for proper carrying out of agriculture as a business. It also checks whether these facilities are available to the farmers of the region and how they affect the growth of agriculture sector in hilly state of India. The area chosen for the study is Nainital district of Uttarakhand. Questionnaire method was used for collecting the data for the research. The major finding of the research is that agriculture has lot of potential in hilly areas but the farmers of region are devoid of the basic infrastructural facilities required for the agricultural business.

Keywords-Farmers, Infrastructure, Irrigation, APMC, Supply chain, Transportation, Storage, Uttarakhand.

I. INTRODUCTION

Uttarakhand is a newly carved state out of Uttar Pradesh. The reason for creating a separate state out of the existing state was the fact that geographical and topographical factors of both the regions were quite different. Around 93 percent of the total area is hilly terrain having geographical features quite different from that of Uttar Pradesh. This change in geographical and topographical aspects associated with the hilly areas of Uttarakhand leads to change in the farming practices followed by the farmers of the region. Area under Agriculture and allied activities is 23.6% i.e. is around 13.37 lakh hectare. Being hilly terrain the farmers have an edge with respect to farmers of other areas in cultivation of vegetables. The seasonal vegetables grown in hilly areas have different sowing and harvesting time than that of plain (Tarai and Bhabar) areas. This creates a niche in the marketing scenario for the farmers of the region by marketing their produce as off-season vegetables. This can easily help farmers in attaining premium prices for the produce grown in the region. On one hand this hilly terrain has its benefit on another the farmers have to face a lot of problems because of the same. Proper Infrastructural

facilities are required for carrying out agricultural production and marketing in a profitable manner. Being hilly terrain it's always tough to have appropriate infrastructural facilities that is pre-requisite for any business. The paper tries to identify the basic infrastructural facilities that are available for the farmers of the region and its impact on production and marketing of vegetables

II. REVIEW OF LITERATURE

Sati V.P. (2006) in the study on Off-Season vegetable farming in the Pindar Basin reveals he identified that the region of Pindar valley is suitable for vegetable production. Potato and onion are the major crops grown in those areas that suitable in that climatic condition. Along with these two crops farmers of the region are cultivating spices and green vegetables. The cultivation of these vegetables is yielding good results to the farmers and enhancing their livelihood. But this activity has few constraints also. The availability of quality seed of improved varieties, other inputs like fertilizers, availability of transportation facility and warehouses were identified as few factors that act as constraint in this basin.

Arya Singh Prem (2000) has authored a book on, 'Off-Season Vegetables growing in hills.' The book deals with the different aspects of vegetable production in hills and their marketing and also provides an insight about the vegetable production in the Himanchal region. Besides this it explains the role of extension services, new technologies and various constraints in the vegetable production and few techniques of marketing. He in his study showed that extension services play an important role in the farmer's entrepreneurship.

Tamasese Edwin (December 2009) had responsibility to identify and evaluate few major shortcoming and lacunae in value chain of representative crop of papaya, breadfruit, cabbage and tomatoes in Samoa. This major aim of this exercise is to develop an implementable activity in support of Fruit and vegetable sector strategy. The technique of value chain mapping along with gross margin analysis was used to identify the impact these lacunas and constraints by

simply estimating the loss in present value chain because of these constraints

III. OBJECTIVES OF THE STUDY

- A. To identify different infrastuructual facilites avaiambe for the farmers of Uttarakhand.
- B. To study the impact of these infrastrucutral facilites on the production and marketing of the vegetables.

IV. METHODOLOGY

The developmental Blocks namely Bhimtal, Dhari, Okhalkanda and Ramgarh predominately the hilly belts of district Nainital were taken for the purpose of study. From these villages 190 families, giving equal representation to all the developmental blocks of the district has been sampled for the study.

Block wise Number of Off-Season Vegetables Growers families and the sampled Units selected for the study (shown in Table no. 1):

Block	Number of Sampled Units
Bhimtal	49
Dhari	46
Okhalkanda	49
Ramgarh	46
Total	190

Table No: 1

V. DATA ANALYSIS

The basic Infrastructural facilities that are desired by the farmers for production and marketing of vegetables in hilly areas of Uttarakhand are irrigation, availability of roads and transportation facilities, warehouses for storage, and proper marketing system suitable for selling the produce in the market and information regarding agricultural practices. Now in this portion we will try and discuss the condition of these infrastructural facilities available to the farmers of hilly areas.

Average distance of Agricultural land from Road Head

Table No.2 gives an idea about average distance of farmer's field from the road head.

DISTANCE	Bhimtal	Dhari	Okhalkanda	Ramgarh	Total
Road	3	3	4	4	14

Head					
%age	6.12	6.52	8.7	8.16	7.37
UPTO HALF Km.	17	15	18	7	57
%age	34.69	32.61	39.13	14.29	30
>.5 km to 1km	6	7	9	7	29
%age	12.24	15.22	19.57	14.29	15.26
More than 1 Km	23	21	15	31	90
%age	46.94	45.65	32.61	63.27	47.37
TOTAL	49	46	46	49	190

Table No: 2

The table shows that out of 190 respondent only 14 have land holding near to at road head. This is just 7.37 percent of the total number of respondent. More than 47.37 percent of respondent in the block have land holding more than 1km from road head. 30 percent respondents from all the blocks have land holding up-to half km away from the road head. In total, if we look, around 92 percent of the respondents have land holding away from road head. This is an important aspect. The farmers have to collect the produce from the field that are scattered and bring it to the road head via local transport. Major portion of land that is away from the road head is not connected to the main road via link road. This increases the problem of the farmers associated to agriculture production.

Transportation Cost: The land holdings in the hilly areas are scattered and the distance from the road head is pretty high. The transportation mainly comprises of two parts (a) local transport and (b) from road head to APMC. The local transportation is mainly done via two basic means one is use of labors and second is the use of horse cart. Few farmers also use their own source of transportation for the local transport. Table 3 gives the detail of different modes of local transportation in different blocks.

Horse cart	24	35	28	42
%age	48.97	76.086	60.87	85.71
Labor	14	1	8	2
%age	28.57	2.1739	17.39	4.0816
Own	11	10	10	5
%age	22.44	21.73	21.73	10.20
Total	49	46	46	49

The table clearly indicates that the transportation via horse cart is the most preferred form of transportation followed by own means of transportation (own labor, vehicle). A very less amount of respondents prefer the use of laborer for transportation purpose as it's an expensive and time consuming process. The local transport that the farmers undertake is a costly affair. A huge amount of money is involved in transporting the goods locally. Table 3 gives an idea about the cost of local transportation

BLOCK	AVERAGE RATES /TRIP
BHIMTAL	46.34
DHARI	40.85
RAMAGRH	39.4
OKHALKANDA	52.9

Table No: 3

The average rate charged by the local transporters (mainly the horse cart and human labor that are used by the farmers) are given in the table. The volume that they carry for the transportation varies from vegetable to vegetable. If we take on an average one Quintal is carried in every round than it is clear that per kg around 40 to 50 paisa is invested for the local transportation. More often it make around 45-50 percent of the total transportation cost. Now the distance travelled is pretty less in this case. Thus for a smaller distance farmers have to pay a huge price for the transportation of the vegetables. In such a long supply chain transportation cost, decreases the profitability of the farmers. For local transportation in few places there is provision of ropeways that can connect the farmer's field to the road head. This will reduce the distance travelled by the vegetable and also the cost and time. But out of two ropeways that were seen in Nainital, none was in a working condition forcing farmers to use the traditional methods of local transportation. The lack of commitment of local governing bodies and agricultural societies can be seen from this.

The transportation from road head to APMC is paid by the farmers. The sources that are available for the farmers for transportation are local pickups, small trucks and public transport facility for carrying goods from one place to other. The produce that is coming from one farmer's field is pretty small. Thus farmers appoint an agent that collects the produce from the whole village and carry it to APMC Haldwani.

Irrigation Facility

Availability of water for irrigation plays an important role in vegetable cultivation. Timely and sufficient quantity of water, if available, enhances the productivity of the crops. The source of irrigation involves tube wells, water harvesting tanks, canals etc. Table 4 gives an idea about whether land of the farmers has any source of irrigation facility or is it rain-fed in nature.

<i>Water Availability</i>	<i>No. of Respondent</i>
<i>Irrigated</i>	<i>84.00</i>
<i>%age</i>	<i>44.21</i>
<i>Rain fed</i>	<i>106.00</i>
<i>% age</i>	<i>55.79</i>

TABLE No. 4

The table indicates that the irrigated land that is just 44 percent and rain fed cultivation, that is dependent on rainfall is 55.79 percent. This shows that majority of the farmers in Nainital district rely on rainfall for providing water to the crops. Now this is a big problem of the region. Untimely rains are a common feature. The seeding and transplantation of the crop depends on the availability of the water for irrigation. The rainfall, if not timely, affects the sowing of the crops thus production and productivity of the same. Now with 56 percent of the respondent depending upon rainfall as a source of water there is a big percentage

of population that depends upon the uncertainties of climate and thus increasing the chance factor in the production of the vegetables

Destination of Selling Produce

The Haldwani APMC has a sub mandi in Bhowali region of Nainital District. This sub mandi is established to facilitate the farmers in selling produce in the nearby region. The other traditional mode of operation that the farmers can use is selling produce directly in the local market. Now table 5 gives detail of the different destination chosen by farmers in the traditional value chain.

BLOCK	Haldwani Mandi	Bhowali sub Mandi	Local Market
<i>Bhimtal</i>	<i>44</i>	<i>8</i>	<i>11</i>
<i>%age</i>	<i>89.80</i>	<i>16.33</i>	<i>22.45</i>
<i>Dhari</i>	<i>45</i>	<i>2</i>	<i>2</i>
<i>%age</i>	<i>97.83</i>	<i>4.35</i>	<i>4.35</i>
<i>Ramgarh</i>	<i>40</i>	<i>3</i>	<i>15</i>
<i>%age</i>	<i>86.96</i>	<i>6.52</i>	<i>32.61</i>
<i>Okhalkanda</i>	<i>47</i>	<i>0</i>	<i>2</i>
<i>%age</i>	<i>95.92</i>	<i>0.00</i>	<i>4.08</i>

TABLE No. 5

If we look, more than 85 percent farmers from all the blocks sell their produce to Haldwani mandi and a small portion of farmers sell the produce in the local market. The usage of Bhowali Sub-mandi is pretty less. The sub mandi was also visited and a detail study of it was done. It was identified that the mandi is very less functional. With only few traders present in the mandi, it's not considered as a viable option by the farmers of selling the produce. Now the distance of Bhowali Mandi is much less than that of

Haldwani APMC. If the farmers get proper facility in Bhowali sub-mandi than a huge crunch of the cost that invested by the farmers in the transportation can be saved.

Market Availability

One of the reasons that forces farmers to rely on the traditional value chain is the lack of market in the nearby areas. The government of Uttarakhand has now made it easier for the farmers for selling the produce outside APMC also. This can boost the chances of farmers in term of selling the produce directly to organized retail.

The produce that is grown in the hilly regions is plenty in quantity and the availability of the market in the near-by areas is a big problem. To cater to this problem the concept of "Apano Bazaar" was started in the region. The set-up was created near Garampani region of the district where place was provided for farmers, traders and consumers to come interact and enter into a business transaction. This due to a lot reasons was a big failure.

Lack of Extension Services/ Information Dissemination

There are a lot government institutes and NGOs working in the field of agriculture. The basic aim of these organizations is developing a formidable channel for providing information regarding cultivation practices, weather information, prices prevailing in the market and government schemes benefiting the farmers. The ground reality is totally different. A lot of respondent who participated in focus group interview pointed out that the basic information that is required by the growers in terms of cultivation practices and marketing of the produce are not available. The visit of the agriculture experts is not frequent. Few farmers also pointed out that many a times they were not provided the information when they contacted the institutes thus, have to rely on their own knowledge. The farmers also raised a finger on the working of extension institutes saying they never got any support from these agencies at time of need. The lacks of

knowledge of sources of finances have made farmers rely more on Arithiyas. A huge number of the respondents were not aware about different schemes of the government and other agencies that are beneficial for the farmers.

Storage Facility

The paradox of plenty is applicable in agricultural commodities. The higher production leads to higher supply leading to surplus quantity of produce reaching market yards thus decreasing the average mandi prices. This is a double edge sword for the farmers. In case everything goes fine and the production is in plenty than the prices in the mandi will fall drastically, leading to poor return to the farmers. In case the production is less due to some reason the per-unit cost of production and transportation will go high thus leading to more expenses and lesser return for the farmers. For coping with this paradox of plenty, proper storage facility is required where farmers can stock their produce after harvesting. The existence of cold storages for the farmers at village or block level will increase the time value of the vegetables and will give farmers a chance of selling the produce when the prices are better in market. But the farmers of Nainital district do not have access to the cold storage. The farmers because of it do not have a tendency of holding/ storing the produce. In case the farmers store the produce they do it in their own homes, where the basic prerequisites required for the storage are not available leading to loss of quality and quantity of the produce.

VI. FINDING AND CONCLUSION

Present study is conducted to identify the impact of different infrastructural facilities on the production and marketing of vegetables. Nainital district on one hand has edge with respect to growers from other part of the state in term of produce being off-season produce. But there are a lot of problems associated with the same. The hilly areas have a

scattered and small land holding that stops them for using the mechanized means of production. The distance of the land holding is pretty high from the road head. The connectivity of the land to the road head is also a big problem, thus the local transport, which the farmers undertake for this selling the produce, is a costly affair. A huge amount of money is involved in transporting the goods locally. Also it's a tedious task to carry these vegetables from the farmer's field to road head. In most of the cases the cost of local transport is more or less than equal to that of main transport. Now this is a huge amount of cost that the farmer has to bear and it's an added cost apart from cost of production. Steps must be taken for developing a strong link road system at village level. This will help in reducing the cost and time involved in local transport. But due to the hilly topography it's not an easy task to develop such a strong link road system. Another thing that can be done for enhancing the effectiveness of transportation is development of ropeway system in the hilly areas. This will reduce the time and distance that is involved in transporting vegetables from farm to road head. Proper management of sub mandi and their development will lead to reduction in the cost of transportation and will give farmers an opportunity for selling the produce in the nearby areas at a good price.

Huge dependence on the rainfall and lack of availability of irrigation facilities leads to decrease in the output of the produce. The untimely rain main affect the quality of the vegetables, thus decreasing the prices of the produce in the market. Government along with other agencies and NGO's should promote farmers in initiating rainwater harvesting at village level. This on one hand will reduce chances of landslide and erosion and on another will help in timely availability of water for irrigation purpose. Also steps should be taken to enrich the catchment areas of water in the hilly areas so that surplus water is available for irrigation.

The reduction in number of intermediaries can result in lowering the prices of the produce in the market for the customers and a higher percentage in terms of share for the farmers in the total value chain. Creation of warehouses at block level will provide a chance to the farmers for storing the vegetables at warehouse when demand is low and sell it when the demand is higher in market. This will help in dealing the paradox of plenty. Co-operative mode can be a way out for developing and maintaining warehouse at block/village level.

Infrastructure is an important aspect of vegetable production and marketing. The steps discussed above, if taken properly, can help in enhancing the infrastructural facilities that are required for production and marketing of the vegetables. This will help in making vegetable production a profitable business of the farmers.

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