



Indian Journal of Hill Farming

June 2021, Volume 34, Issue I, Page 71-74



Empowering women farmers for livelihood and nutritional security in village Surmoli of Tehsil Munsiri, Distt Pithoragarh, Uttarakhand

Vandna Pandey* . Harish Pandey . Ritesh Ranjan . Jyoti Rawal . Madhu Bala

Defence Institute of Bio Energy Research, Field Station, Pithoragarh, Uttarakhand

ARTICLE INFO

Article history:

Received : 29th July 2020

Revision: September, 2020

Accepted 5 November, 2020

Key words: Vegetables, CAGR,
Cabbage, Meghalaya

ABSTRACT

In Uttarakhand state there are 13 districts, namely, Chamoli, Pauri, Tehri, Uttarkashi, Dehradun, Haridwar and Rudraprayag in the Garhwal region and Nainital, Almora, Pithoragarh, Udham Singh Nagar, Champawat and Bageshwar in the Kumaon region. Pithoragarh district is within the Kumaon region of Uttarakhand. The Tibet pleatue is situated to the north and Nepal is to the east. The district is divided into six tehsils viz: Berinag, Dharchula, Didihat, Gangolihat, Munsiri and Pithoragarh. More than three-fourths of total population of Pithoragarh depends on agriculture for their livelihood and the economy is predominantly dependent on hill agriculture. For physical, geographical and environmental reasons, the scope for agricultural policies based on modern input-intensive agriculture is severely constrained in the hill regions. As a result, the majority of the rural population in the hills either survives on subsistence agriculture or migrates to other parts of the country for employment. Defence Institute of Bio Energy Research (DIBER), one of the establishments of DRDO, has carried out commendable work in high altitude agriculture. The institute has conceived a project SARHAD in 2016. One of the objectives of this project is the dissemination of vegetable production technologies developed by DIBER to the border villages of district Pithoragarh, with the view to promote livelihood and nutritional security to the villagers. In this regard an approach was made towards the women farmers of village Surmoli of tehsil Munsiri, distt Pithoragarh through dissemination of improved vegetable production technologies developed by the institute, by giving desired training on nursery raising, planting of material, organic farming, crop protection and development of demonstration trials of vegetable crops in their fields. So that availability of fresh vegetables can be made locally to fulfill the demand of local inhabitants of Munsiri and beyond. Through the dissemination of these vegetable production technologies, there is an increase in socio-economic conditions of women famers of this village and certainly it will generate more opportunities for self employment and entrepreneurship too. The efforts have also resulted in nutritional security of women farmers' family.

*Corresponding author: vpandeybeenu@rediffmail.com

Introduction

Vegetables are the integral part in all walks of society. They are the rich source of carbohydrates, proteins, vitamins, minerals, glucosinolates, antioxidants and fibres. They are known to play a key role in human health management particularly in lowering the risk of chronic human ailments such as cardiovascular diseases, cancer, AIDS, diabetes and other age related problems. With the increasing awareness among consumers, it is essential to increase vegetable production to meet the growing demands.

Ever since its inception, Defence Institute of Bio Energy Research (DIBER) has been engaged in evolving high yielding varieties of vegetables suitable for hilly areas and has successfully bred a number of varieties in different kind of vegetables which have found wide acceptance among locals. Institute has also standardized package of practices for green house technology for hills of Uttarakhand. One of the objectives of the SARHAD project is to disseminate the vegetable production technologies developed by DIBER to the border villages of district Pithoragarh, with the view to change the rural economy. So a study was conducted at village Surmoli of Tehsil Munsyari, Distt Pithoragarh. Ten women farmers were selected on the basis of their knowledge and experience towards vegetable production. These women farmers are also engaged in the production of other crops such as potato and rajma.

Pithoragarh is the easternmost himalayan district in the state of Uttarakhand. The district is within the Kumaon region surrounded by surrounded by two international boundaries (Fig1). The main farming activities are organic horticulture off-season vegetables & medicinal plants cultivation along with wool-based products and dairy farming. In hills, women play a very important

role in vegetable production and post production activities such as nursery management, intercultural operations such as manuring, hoeing, weeding, earthing, harvesting of crops, **Fig 1 Map of Distt Pithoragarh**



seed production and marketing. Besides this they are also involved in many other household activities. Due to migration of men from villages to cities, the role of women is increasing in agriculture since past twenty or twenty five years. To sustain the rural economy, women play a crucial role in family farming system. (Tripathi *et al.*, 2012). Village Surmoli is in tehsil Munsyari of distt Pithoragarh, Uttarakhand (Fig 2). Munsyari is situated at an altitude of 2200m above sea level and with latitude 30.0715° N and longitude 80.2373° E. The village is surrounded by dense forests with lovely view of Panchachuli peaks. This village is having home stays in which guests come and enjoy the pure organically produced vegetable



Fig2 Location map of study area

1. Material and Methods

In 2016, Malika Virdi came in contact with Defence Institute of Bio Energy Research (DIBER) Field Station, Pithoragarh and expressed her desire to start vegetable production at Sumoli village through the technologies developed by DIBER. The institute provided high yielding seeds and seedlings of summer, winter and european vegetables viz: tomato, capsicum, brinjal, cucumber, bittergourd, bottle gourd, bush squash, french bean, cabbage, cauliflower, broccoli, red cabbage, knol khol, pea, fenugreek, spinach and coriander to the women farmers of that village. All technical know-how of vegetable production and techniques were given to them through presentations and by making field visits in the village. Since 2016 they are associated with DIBER and getting very good remuneration of their vegetable produce. Guests from various parts of India are also enjoying these vegetables at the home stays.

2. Results and Discussion

Data of vegetable production of three consecutive years viz: 2017-18-19 was recorded. The production during the year 2016 was treated as farmers' traditional practices and average of three years production as demonstration practices. The economic feasibility of improved demonstration technology over farmers' traditional practices was calculated depending upon the prevailing prices of input and output costs. Data on farmers' practice was considered as check/control. Data were recorded on average vegetable production, gross cost, gross return and net return of demonstration and farmers' practice. Benefit Cost Ratio (BCR) was calculated.

It was revealed from the table 1 that percent increase over farmers' practice ranged from 24.11 to 66.0. Benefit Cost Ratio from demonstration technology ranged from 1.77 to 4.84 and from farmers' practice ranged from 1.60 to 3.90. Subhashini (1990) made contribution in studying role of farm women in hill vegetable farming. Pragaria (2012) studied role of Thar women in vegetable production. Bargali *et al.*, 2015 studied contribution of rural women in vegetable cultivation in home gardens of Nainital distt of Kumaon Himalayas, India. Bargali (2015) also studied role of rural women in agro forestry home gardens in Kumaon Himalayas, Uttrakhand. The efforts made by the institute resulted in sustainable livelihood and

nutritional security of these women farmers. Gogoi and Bhowmik (2003) studied role of Assamese women in vegetable production. Sen, M. *et al.*, 1993 made a case study on status of women in farm and non 0-farm activities in the coastal belts of west Bengal.

3. Conclusion

It is concluded from the study that livelihood security of women farmers in village Sumoli is increasing by adopting the technologies developed by DIBER. The efforts made by the institute showed a greater satisfaction on farmers' face due to significant increase in vegetable crop yield over traditional farmers' practice. Earlier women farmers were hardly getting sufficient vegetables but now they are getting ample quantity of quality vegetables in their diet thus improving nutritional security also.

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Table 1 Yield and economics of demonstration and farmers' practice

Farmer name	Area	Average Vegetable Production (kg)		% increase over farmers practices	Economics of demonstration (Rs/area)				Economics of check (Rs/area)			
		Demo	Check		Gross Cost	Gross Return	Net Return	BCR (R/C)	Gross Cost	Gross Return	Net Return	BCR (R/C)
Smt Mallika Viridi	400m ²	500	300	66.00	8000	24765	16765	2.09	5200	12600	7400	1.42
Smt Anusuya Tolia	800m ²	960	750	28.00	12500	34675	22175	1.77	10000	26053	16053	1.60
Smt Bina Nitwal	400m ²	650	479	35.69	6500	24460	17960	2.76	5000	15380	10380	2.07
Smt Rekha Rautela	300m ²	516	366	40.98	5000	23385	18385	3.67	3900	16500	12600	3.23
Smt Kamla Pandey	200m ²	323	219	47.48	3500	14370	10870	3.10	2100	8000	5900	2.80
Smt Kalawati	800m ²	1148	867	32.41	7500	38000	30500	4.06	6500	30000	23500	3.61
Smt Basanti Rawat	1100m ²	1442	1100	31.10	9500	62145	43645	4.84	7000	32000	25000	3.57
Smt Chandra Thakuni	600m ²	1100	737	49.25	8000	40500	32500	4.06	5500	27000	21500	3.90
Smt Hira Tolia	400m ²	750	544	37.86	6000	32800	26800	4.46	4800	23560	18760	3.90
Smt Saraswati Thakuni	800m ²	947	763	24.11	9000	36675	27675	3.08	7000	25620	18620	2.66