

## ***Pinus gerardiana*: A boon for livelihood security in Jammu and Kashmir**

**Manzar Masood, P. S. Slathia, S.K. Gupta\*, R. Peshin and Rakesh Kumar**

*Division of Agricultural Extension Education, SKUAST, Jammu.*

*\*Division of Agroforestry, SKUAST, Jammu – 180 009.*

*\*Corresponding author's Email: sushilgupta67@rediffmail.com*

---

**ABSTRACT:** *Pinus gerardiana* Wall. (Chilgoza) is an edible pine nut of North-Western Himalayas. The species is of great importance in the dry temperate zone due to its pivotal role in the economy of the tribal. The present study was conducted in Paddar block of Kishtwar district in Jammu and Kashmir in 2012-13. Out of 32 villages were randomly selected having the dominance of chilgoza plantations in Paddar block and 10 respondents per village were interviewed through pre-structured schedule. The investigation was carried out to study the socio-economic profile of the study area and the percent contribution of chilgoza nut collection, extraction and marketing to the family income. Data depicted that maximum (64.88 percent) income was obtained from chilgoza nut collection in Affani village than crops and labour wages per household. On average basis of the selected villages chilgoza nut collection contributed 43.56 percent in total household economy of the Padder Valley. Unscientific storage of nuts was the major constraint reported by 86.25 percent of the sampled farmers and 66.25 per cent of the respondents also reported that local unskilled manpower engaged for nut extraction damage the nuts due to lack of proper scientific knowledge there by lowering its quality. Since, chilgoza (*Pinus gerardiana*) play a vital role in the livelihood of rural people, it is necessary to provide the technical know-how to address to the scientific storage and nut extraction so that net returns increase further thereby improving the socio-economic status of the farmers.

**Key words:** Chilgoza, livelihood, Paddar Valley and *Pinus gerardiana*.

---

Received on: 07.11.2016

Accepted on: 24.12.2016

---

### **1. INTRODUCTION**

Trees have been associated with man since ages. People use tree resources for almost everything including food, energy, medicine, fodder, construction, furniture, baskets, mats, dyes, agricultural implements and utensils. These resources provide not only products but also ecological services which are relevant to the livelihoods of the people, viz., soil protection, soil fertility, water regulation, micro-climate and carbon sequestration besides mitigating global warming. Farmers make use of these available natural resources which provide sustainability to farming system and act as sources for their livelihood. The annual income to local people from the multiple uses of trees contributes in a big way for the livelihood security of millions of poor people all across the world. *Pinus gerardiana* Wall. (Chilgoza) is an edible pine nut of North-Western Himalayas among the forest tree species. In India, its natural plantations are found in inner Himalayan zone comprising Kinnaur and Pangri in Himachal Pradesh and Kishtwar and Astur area of Jammu and Kashmir at an altitudinal range from 1600-3300 (Dogra, 1964; Singh

*et al.*, 1973; Dewan *et al.*, 1992). Ecologically, this species is of great importance in the region as it occupies niche in the dry temperate zone and also contributes towards the tribal economy (Rajan and Thakur, 2007). The seeds are locally called *Feta* in Paddar valley of Kishtwar district of Jammu and Kashmir and marketed as 'Chilgoza' or 'Neoza'. It is one of the prized cash crop which fetches a price of Rs. 500 to Rs. 600 per kg in the local market and higher in national and international markets. Chilgoza nuts have 7.5% moisture, 16% protein, 50% fatty material which is mixture of palmitic, stearic, oleic, linoleic and fatty acids. It also contains about 22% carbohydrates, 2% fiber and about 3% minerals chiefly calcium, phosphorus and iron (Kumar and Sharma, 2009). Apart from agriculture, some of the farmers in the village who don't possess agriculture land are involved in this venture and their livelihood solely depends on collection, extraction and marketing of chilgoza. Their earnings on account of this activity on an average have been estimated to be Rs 18,000-40,000 annually (Pandey, 1997; Ved and Goraya, 2008; Kashyap *et al.*, 2014; Singh and Reija, 2014; Thakur *et*

al., 2014). Therefore, the present study was conducted with the objective to assess the chilgoza nut collection role in the livelihood security of the local inhabitants in the Paddar valley of district Kishtwar, Jammu & Kashmir.

## 2. MATERIALS AND METHODS

The study was conducted in Paddar block of district Kishtwar, Jammu and Kashmir. Paddar block was selected purposively for carrying out the study. This block comprised of 32 villages. Out of 32 villages, 17 villages were having the dominance of *P. gerardiana*. Further, out of these 17 villages, 8 villages were randomly selected for carrying out the study. A list of the farmers who were involved in the collection of *P. gerardiana* cones in eight selected villages was prepared with the help of village committee head, and panchayat, members and from that list 10 farmers were selected randomly from each sampled village thereby making a total sample size of 80 respondents for the purpose of study which comprised about 22 percent of the total prepared list of farmers engaged in chilgoza nut collection. The sample size was considered adequate in term of depth and accuracy required and in term of the time and resources available for the study and also the study area had undulating topography and sampled villages were far located from each other. The data were collected by visiting the selected villages through pre-structured questionnaire by adopting the interview mode with the head of households. Age of the respondent farmer has been categorized on the basis of Singh's cumulative cube root method of categorization (Singh, 1975) as given below.

$$S_i = L_i + \frac{I^{n/3} - C_{i-1}}{3\sqrt{f_i}} \cdot h_i$$

Where  $I_i$  = indicate category number (  $i = I, II, III$  )

$S_i$  = Segment (e.g. I, II, III)

$L_i$  = Lower limit of the  $i^{\text{th}}$  class

$C_{i-1}$  = Cumulative  $3/f$  of the class proceeding to the  $i^{\text{th}}$  class

$h$  = width of the  $i^{\text{th}}$  class

$N$  = total cumulative

## 3. RESULTS AND DISCUSSION

Analysis of the data presented in Table 1 reveal that majority of the respondents (57.5%) were in the age group of 37-41 years, followed by 25 per cent in the age group of 30 to 37 years and the least (17.5%) were in the age group of 41 years and above respectively. Regarding other socio-economic and socio-personal variables, the results depicted that 61.25 per cent of respondents were illiterate. 78.7 per cent of the respondents had nuclear and 21.3 per cent had joint family systems, respectively. Majority (85%) of respondents were engaged in agriculture, chilgoza nut collection and labour activities. This was followed by agriculture and chilgoza nut collection practice and accounts to be 12.5 per cent of the total respondents. The least (2.5%) had their own business along with agriculture and chilgoza nut extraction. Thus, it can be concluded from the study that main source of livelihood of *P. gerardiana* nut extractors was farming, labour and chilgoza nut collection over the rest of the income generating activities. Regarding land holding, 72.5% of respondents have less than 0.25 ha of land, 20% of farmers have 0.25-0.5 ha of land and only 7.5% of farmers have more than 0.5 ha of land respectively. Majority (72.50 percent) of the respondents were not associated with any social organization. About 13.7 percent of the respondents are the members of Panchayat, 11.3 percent are members of Forest Village Committee, 2.5 % of the respondents were Namberdar. About 15 percent of the respondents had no exposure to mass media. 61.25 percent of them had no extension contacts. Junior Agriculture Assistant (JAA) of State Department of Agriculture was contacted only by 21.5% of respondents occasionally in the last one year and 17.5 percent of the respondents had extension contact with Forest Village Committee members including its head occasionally in the last one year. Hilly terrain of the study area including inaccessibility, is presumed to be the main reason for the less visits of extension functionaries in the study area. Less exposure to technological advances and poor socio-personnel background of the inhabitants could be the reason for assuring the livelihood and good returns.

On marketing network front, it is revealed that 45% of respondents sold their produce to the consumers

Table 1. Socio economic and personal characteristics of the people associated with chilgoza nut collection

n = 80

Characteristics	Category	Frequency	Percentage
Age	a) 30-37years	20	25.00
	b) 37-41years	46	57.50
	c) 41years and above	14	17.50
Education	a) Illiterate	49	61.20
	b) Primary	09	11.20
	c) Middle	12	15.00
	d) High	09	11.20
	e) Higher secondary & above	01	1.20
Family Size	a) Joint family	63	78.80
	b) Nuclear family	17	21.20
Occupation	a) Chilgoza nut collection.& Farming	10	12.50
	b) Chilgoza nut collection, Farming & labour	68	85.00
	c) Chilgoza nut collection, Farming & business	02	2.50
Size of holding	Marginal land holding(< 1 ha )		
	a) Up to 0.25 ha	58	72.50
	b) 0.25 to 0.5 ha	16	20.00
	c) More than 0.5 ha	06	7.50
Social participation	a) Forest Village Committee head	01	1.20
	b) Forest Village Committee member	08	10.00
	c) Lamberdar	02	2.50
	d) Panchayat member	11	13.70
	e) No participation	58	72.50
Mass media exposure	a) Radio	44	55.00
	b) Television	09	11.50
	c) Newspaper	08	10.00
	d) Farm literature	07	8.70
Extension contact	a) Junior Agriculture Assistant (J.A.A)	17	21.50
	b) Forest Village Committee	14	17.50
	c) Non Governmental Organization	09	26.20
	d) No extension contact	40	50.00

directly, 36% of respondents to the local market in the nearby villages and 19% to the contractors. Thus, it is evident that marketing facilities for chilgoza nuts are inadequate in the area of production which compel the farmers to sell their hard earned produce in the local markets at the throw away prices.

The data related to the economic gains from different activities of the people in the Paddar block (Table 2) reveal that chilgoza extraction contributed to the extent

Table 2. Economic gains from chilgoza nut collection (%age)

Villages	Crop	Labour	Chilgoza nut collection
Atholi	35	26	39
Affani	13	22	65
Jar Karthai	34	25	41
Tayari	33	26	41
Thumb-Ishtiyar	29	30	41
Lower-Shawas	35	27	38
Upper-Shawas	32	27	40
Ishtiyari	27	34	39
Overall average	29	27	44

Year of study= 2012-13

of 65 per cent to the total household income in village Affani, followed by 41.0 per cent in the Jar Karthai, Tayari, Thumb Ishtiyari villages, respectively. The lowest contribution to the total household income was found in Lower Shawas village. It is evident from the Table 3 that chilgoza extraction activity contributed to the extent of 44 per cent to the total household income in the selected villages of the Paddar valley of Kishtwar district of Jammu and Kashmir state.

Regression coefficients were worked out between the economics of different crops and the chilgoza nut extraction in the Paddar Valley (Table 3). Analysis of data revealed that independent variable occupation and mass media exposure had highly significant impact on economics of chilgoza nut collection and marketing.

From the foregoing results, it is concluded that this venture of chilgoza nut collection is a major source of livelihood of the tribals in the Padder valley. Scientific storage and nut extraction technique is the major constraint in obtaining the remunerative returns from

Table 3. Regression coefficient of different independent variables with the economics of different crops and Chilgoza in Paddar Valley

Different variables X/Y	Kodra ( <i>Paspalum scrobiculatum</i> )	Potato ( <i>Solanum tuberosum</i> )	Maize ( <i>Zea mays</i> )	Rajmash ( <i>Vigna aconitifolia</i> )	Chilgoza ( <i>Pinus gerardiana</i> )
Age	-12.64	6.88	-292.56	-24.98	150.01
Family type	-21.96	22.94	37.34	60.82	661.14
Education	27.47*	25.09	-59.66	-15.16	976.14
Occupation	9.06	1.40	-72.28	-28.89	1776.88*
Land Holding	-3.55	-4.04	-10.73	17.61*	-637.83**
Social participation	-10.20**	1.83	-17.10	-0.74	348.51
Mass Media exposure	20.10	83.04	81.35	15.46	5823.67*

\*Significant at 5 percent, \*\*Significant at 1 percent

chilgoza so technical know-how about scientific storage and nut extraction should be provided by field functionaries to the farmers of Padder Valley in order to remove this bottleneck. Horticultural produce and marketing board of the state should establish marketing centres in the area for procurement of chilgoza nuts for providing remunerative prices to the farmers and also this will save farmers from clutches of local traders.

## REFERENCES

- Dewan, M.L., Nautiyal M.C. and Sah V.K. 1992. Nut Fruits for the Himalayas. Concept Publication Co., New Delhi, India. p. 182.
- Dogra, P.D. 1964. Gymnosperms of India: II Chilgoza pine (*Pinus gerardiana* Wall). *National Botanical Garden Lucknow Bulletin*, 109: 1-47.
- Kumar, G and Sharma, N. 2009. Little known dry fruit nut Chilgoza. *Ayurveda for Holistic Health*, 1(13): 16-19.
- Pandey, Gopa. 1997. Joint forest management: perception of new incumbents in Indian Forest Services. *Indian Forester*, 123(6): 527-535.
- Rajan, B. and Thakur, C.L. 2007. Standardization of grafting techniques for neoza pine (*Pinus gerardiana* Wall). *Indian Journal of Forestry*, 30(2): 205-210.
- Singh, R.V., Khanduri, D.C. and Kashmiri Lal. 1973. Chilgoza pine (*Pinus gerardiana* Wall) regeneration in Himachal Pradesh. *Indian Forester*, 99(3): 126-133.
- Singh, R. 1975. An alternative method of stratification on the auxiliary variable. *Sankhya*, 37: 100-108.
- Thakur, N. S., Sharma, S., Gupta, R. and Gupta, A. 2014. Studies on drying and storage of chilgoza (*Pinus gerardiana*) nuts. *J. Food Sci. Technol.*, 51(9): 2092-2098.
- Kashyap, S.D., Dagar, J.C., Pant, K.S. and Yewale, A.G. 2014. Soil Conservation and Ecosystem Stability: Natural Resource Management through Agroforestry in Northwestern Himalayan Region. In: *Agroforestry Systems in India: Livelihood Security & Ecosystem Services* (eds. J.C. Dagar et al.). Springer, India. pp. 21-55.
- Singh, R.B., Hietala, Reija. 2014. Livelihood Security in Northwestern Himalaya: Case Studies from Changing Socio-economic Environments in Himachal Pradesh, India. Springer, Japan. pp. 258.
- Ved, D.K. and Goraya, G.S. 2008. Non-timber forest produce as livelihood options for rural communities of mid Himalayas of Himachal. Foundation for Revitalisation of Local Health Traditions, Bangalore.