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Application of garret ranking technique in studying the problems of bamboo cultivation: A case study of Mokokchung district, Nagaland.

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ABSTRACT

This paper discussed about the problems faced by the farmers in Bamboo cultivation in Mokokchung District of Nagaland, India. Information regarding their problems is procured from the farmers. To find out the most significant factor which influences the respondent, Garrett's ranking technique is used. Garrett's Ranking Technique provides the change of orders of problems into numerical scores. The advantage of this technique is that the problems are arranged based on their severity from the point of view of respondents.

1. Introduction

In India, Bamboo grows in 15.69 million hectares of forest area, which constitutes about 12.8% of the total forest area of the country, reported the Forest Survey of India (FSI). India has one of the richest bamboo resources in the world, second only to China in Bamboo production. The country is said to have tapped only one tenth of its bamboo potential contributing only 4% share of the global market. The annual bamboo product in the country is estimated at 3.23 million tones. Of the total area under bamboo in the country, it is said that nearly 28 percent is in the North-Eastern States which is around 66 percent of bamboo resources of the country and 20 percent of the world are grown in the North-Eastern region (Rai and Chauhan, 1998).

Nagaland is known for its rich biodiversity and a home to many species of flora and fauna. Its geographical area of about 16579 sqkm has a forest cover of 12489 sqkm. The percentage of forest area is 75.33% according to the Forest Survey of India, 2017. The forest market is broadly categorized into two as that of Non-timber Forest Product (NTFPs) and Timber. NTFP also called 'minor' forest products are all forest products other than timber and fuel-wood. NTFPs provide a range of products which, when incorporated into the livelihood strategies of rural people aid in reducing their vulnerability to risks (Neumann & Hirsh, 2000). Rural people are vulnerable to risks in terms of profit from selling the forest produce and the investment involved in its cultivation. The forest produces in the rural set up are primarily used for food, and commercially contributes to industries for energy, shelter, medicines, tools and fiber. Apart from meeting the basic needs, the products are sold in local, regional and national markets to generate cash and, serve an important gap filling or safety-net function (Chopra, 1997; Khare et al., 2000; Shackleton et al., 2002; Angelsen & Wunder, 2003).

Bamboo is considered an important factor for economic development in the state of Nagaland. The state possess an immense resources of standing bamboo stock as well as widespread distribution of sophisticated craft skills of local people, one can see the possibility of a large decentralized industrial infrastructure growing in the state. However despite the available potential under the bamboo sector like availability of land, generation of income and employment, the sector has not gained the desired momentum in the state. Lack of awareness is one of the main challenges that stand in the way of bamboo based activities development. There are other reasons for the challenges faced by the state. This paper is an attempt to identify the problems and present them according to priorities and concerns accorded to it. As such Garrett's

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Ranking Technique is used to identify problems of growers in the cultivation of Bamboo in the district of Mokokchung in Nagaland.

2. Methodology

The study was carried out in Mokokchung district of Nagaland. Primary data were collected from the farmers particularly engaged in bamboo cultivation in the area. The study incorporated questionnaires as a tool to engage with the farmers. The questionnaires were used in the form of interview keeping in mind the literacy gap in the farmers. Information regarding the problems faced by the farmers in bamboo cultivation was procured. Farmers were asked to rank the problems faced by them based on their experiences. Quantitative approach to study the ranking was used as the methodology. Garrett's Ranking Technique was applied to study the preference, change of orders of constraints and advantages into numerical scores. The prime advantage of this technique over simple frequency distribution is that the constraints are arranged based on their severity from the point of view of respondents. Hence, the same number of respondents on two or more constraints may have given different rank. The field study was conducted in four villages of Mokukchung district; Kangtsung, Tuli, Merangkong, Longsa.

Application of the Garret's Ranking Technique

An attempt is made to recognize the problems faced by the growers in the cultivation of Bamboo. The identified problems of growers in the cultivation of Bamboo are ranked by making use of Garrett's Ranking Technique. The technique was used to rank the preference mentioned by the respondents on different factors and aspects of the cultivation process. It is used to find the most significant factor which had influenced the respondent in their practices. Founded on the Garret's Ranking technique, the study had the respondents rank different problems and outcome based on their impact thereby converting into score value and rank with the help of the following formula:

$$\text{Percent position} = \frac{100(Rij-0.5)}{Nj}$$

Where

Rij = Rank given for the i^{th} variable by j^{th} respondents

Nj = Number of variable ranked by j^{th} respondents

With the help of Garrett's Table, the percent position estimated is converted into scores by referring to the table given by Garret and Woodworth (1969). Then for each factor, the scores of each individual are added and then total value of scores and mean values of score is calculated. The factors having highest mean value is considered to be the most important factor. Below is the tabular representation of the problems faced by the Bamboo cultivating farmers in Mokokchung. The table is a random categorization of the problems found during personal interviewing and with the help of questionnaires. The table shows the preference and ranking of problems faced by cultivators engaged in Bamboo products.

Table 1: Problems faced by the Bamboo cultivating farmers (Mokokchung):

Problems of Bamboo cultivators	Ranks given by the Respondents							
	1st	2nd	3rd	4th	5th	6th	7th	8th
Inadequate farm credit	13	20	29	19	8	12	13	2
Lack of transportation facility	14	24	20	23	18	12	5	0
Poor machinery and inadequate tools	24	4	7	29	14	10	23	5
Marketing problems	15	33	23	16	14	10	4	1
Shortage of labour	29	25	14	12	9	15	8	4
Lack of good storage facility	12	6	10	5	36	22	18	7
Absence of grading	7	4	9	7	6	18	25	41
Lack of work culture	2	0	4	6	11	17	20	56

Source: Field survey 2017

The Percent Positions and Garret Values

The Garret ranks were calculated by using appropriate Garret Ranking formula. The based on the Garret ranks, the garret value was calculated. The Garret tables and scores of each problems in the above table, and multiplied to records scores in next table, finally by adding each row, the total Garret score were obtained.

$$\text{Percent position} = \frac{100(Rij-0.5)}{Nj}$$

The result is provided in the following table.

Calculation of Garret Value and Ranking

The calculation of Garret value and ranking of problems faced by bamboo farmers are shown below.

Table 2: Percent positions and Garret Values

Sl. No	100(Rij-0.5)/ Nj	Calculated Value	Garret Value
1	100(1-0.5)/ 8	6.25	80
2	100(2-0.5) /8	18.75	68
3	100(3-0.5) /8	31.25	60
4	100(4-0.5)/ 8	48.75	51
5	100(5-0.5) /8	56.25	47
6	100(6-0.5) /8	68.75	40
7	100(7-0.5) /8	81.25	32
8	100(8-0.5)/8	93.75	20

Table 3: The calculation

Description	Ranks given by the Respondents								Total	Average	Rank
	1st	2nd	3rd	4th	5th	6th	7th	8th			
Inadequate farm credit	1040	1360	1740	969	376	480	416	40	6421	55.35	IV
Lack of transportation facility	1120	1632	1200	1173	846	480	160		6611	56.99	III
Poor machinery and inadequate tools	1920	272	420	1479	658	400	736	100	5985	51.59	V
Marketing problems	1200	2244	1380	816	658	400	128	20	6846	59.02	I
Shortage of labour	2320	1700	840	612	423	600	256	80	6831	58.88	II
Lack of good storage facility	960	408	600	255	1692	880	576	140	5511	47.50	VI
Absence of grading	560	272	540	357	282	720	800	820	4351	37.50	VII
Lack of work culture	160	-	240	306	517	680	640	1120	3663	31.58	VIII

3. Result and discussion: understanding the problems in Bamboo cultivation

Bamboo has been traditionally raised; to a limited extend, in village commons and homestead gardens. There is a need for changing the 'forestry mindset' to the 'farming mind set' and creating awareness on the commercial viability and profitability of the species. Bamboo processing is a technical activity which requires a certain degree of technical proficiency. While Naga farmers are naturally trained at working with bamboo cultivation, yet their skills are limited to the requirements of the family and community. The commercial aspect is yet to take a front seat to meet market challenges. However the market challenges can only be met if problems of cultivation are identified and prioritized for further improvement. Based on the Garret's Ranking Technique it was revealed that 'Marketing problem' is the major problem with highest Garret score of 6846 and an average score of 59.02. Accordingly 'Shortage of labour' with average scores of 6831 and an average score of 58.88 is represented second. The calculation with an average score of 56.99 ranked 'Lack of transportation' facility third. 'Lack of work culture' with average score of 31.58 is the least. The average score and ranks

of different problems are shown in the figure above. On further in depth interviewing and use of ethnographic approach a lucid view of the problems were presented.

Marketing problems

According to the study, marketing problem is identified at the most important problems faced by the Bamboo cultivators. Despite good cultivation, finding appropriate market is an issue. The Bamboo produces do not reach the buyers leaving the farmers discouraged in taking it as a full time job. Due to topographical challenges reaching the right market becomes an issue. Exposure to other state and strengthening of inter-state market relation can address the issue. A common market for all the Bamboo cultivators of the state and region needs to be encouraged. Taking part in trade expo has helped some of the farmers to get connection with others in supplying its resources.

Shortage of Labour

People's preference for white collar job and wanting to stay in main town has lead to the difficulty in finding work force. Not many venture into the business that requires long term commitment unsure of the future market returns. Locals have limited the exploitation of bamboos for their personal use. For those who have taken up bamboo cultivation as serious business faces difficulty in getting the right number of labours. The investment and effort is a long term as such farmers are required for returns. Sustaining labours have also become a problem because of the inability of timely payment. Urban migration is another reason why cultivation that started during the forefather days has taken a back seat.

Lack of Transportation Facility

Poor road conditions and connectivity is one of the major hindrances to cultivators. They find it difficult to send the product to various places. Inclement weathers have also been disadvantageous to the business. The density of good roads in the state of Nagaland is weak and has been a drawback for entrepreneurs dealing with bamboo business. The mode of transportation is limited to trucks. Challenging topography and geography of the destinations have not been encouraging for transport business to collaborate much with the entrepreneurs dealing with bamboo business.

Inadequate Farm Credit

Poor financial assistance stands as an obstacle for promoting bamboo cultivation. Huge initial investment is needed to start the cultivation which the poor farmers cannot afford. There is also lack of awareness among the cultivators regarding various schemes or credit facilities offered by the centre and state. Bamboo, categorized as non timber produce is classified under Class D as per the Nagaland Forest Act. It has been noted that there is need of aggressive marketing policy for promoting bamboo resources in the form of products.

Poor machinery and inadequate tools

People still use the traditional method for cultivation and plantation of bamboos. They use machete (Dao), iron rods and spade for clearing jungles and planting bamboo saplings. The farmers use human labour and *dao* for the whole plantation process which consumes time and energy. Unlike many developed regions in the field of bamboo cultivation that use machine like electric motor, in the state of Nagaland the process is tiring. For instance, if the incense sticks making machine is available to the farmers than farmers can make use of the abundant raw bamboo resources instead of waiting for the people to buy bamboo pole. Absences of industrial tools have been a major setback for the cultivators.

Lack of good storage facility

Cultivators keep the cultivated bamboo in open spaces. This has lead to natural damages of the bamboos. There is no proper storage place and as such farmers directly sell the produce for the negotiable amount they get. In worst cases, the bamboos when degraded are used to set fires for cooking.

Absence of grading

There is no grading system practiced in Nagaland with regard to bamboo products. It solely depends on the market demand and supply. Prices vary from place to place and person to person. Appropriate grading can add market value to the produce. Grading system is also important to identify the quality of the produce and regularize the purchase.

Lack of work culture

Bamboo cultivation requires a lot of effort and the returns are not instant. The attitude and outlook of the people has also hampered the growth of bamboo production. Along with effort, Bamboo cultivation is time consuming and lack of commitment to the business has often resulted in the downfall of the cultivation trend and practice.

4. Conclusion

The Garret Ranking Technique in the case of Bamboo cultivation and problems associated to it deems fit. This is significantly because of the ranking method that puts up the highest mean value indicating it as an important factor in studying the problem. The respondents had given their preferential ordering of the unranked problems at the initial stage. The problems were outlined during the interviews with farmers. The ranking on preferential order indicate the primary concerns of the farmers. The study can be used by policy makers in enhancing the productivity of bamboo cultivation and the possibilities of adding commercial values to it to help the farmers.

5. References

Angelsen A, Wunder S (2003) Exploring the forest- poverty link: key concepts, issues and research implication. CIFOR Occasional Paper No. 40. Bogor, Indonesia, CIFOR. Viii, 58p.

Dhanavandan S (2016) Application of Garret Ranking Technique: Practical Approach.Internation Journal of Library and Information Studies, 6(3):135-140.

Forest Survey of India. (2019). India State of Forest Report, 2019. Published by the Ministry of Environment and Forests, GovernmentofIndia.http://www.fsi.org.in/sfr_2020; Accessed 12th October 2020 .

John Christy R (2014) Garrett's Ranking Analysis of Various Clinical Bovine Mastitis Control Constraints in Villupuram District of Tamil Nadu, IOSR Journal of Agriculture and Veterinary Science(IOSR-JAVS) 7(4):62-64

Meyers WC, Foley DP, Garrett WE, Lohnes JH, and Mandlebaum BR (2000) Management of severe lower abdominal or inguinal pain in high-performance athletes. The American journal of sports medicine, 28(1): 2-8.

Neumann RP and Hirsch E (2000) Commercialization of Non-Timber Forest Products: Review and Analysis of Research. Bogor: Center for International Forestry Research Rome: FAO.

Rai SN and Chauhan KVS (1998) Distribution and Growing Stock of Bamboos in India. Indian forester 124:89-98.

Sedaghat R (2011) Constraints in Production and marketing of Iran's Pistachio and the Policies Concerned: An Application of the Garret Ranking Technique. International Journal of Nuts and Related Sciences 2(1): 27-30.

Zalkuwi J, Singh R, Bhattarai M, Singh, OP, Rao D(2015) Analysis of Constraints Influencing Sorghum Farmers Using Garrett's Ranking Technique; A Comparative Study of India and Nigeria. International Journal of scientific research and management 3(3): 2435-2440.