



Value chain analysis of traditional bamboo products in Meghalaya

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ABSTRACT

The study was conducted in the state of Meghalaya comprising of 100 respondents to analyse the value chain of traditional bamboo products of the state. The existing marketing channels and the compliance cost involved at each stakeholder level in every channel was analysed. The results showed that there were two marketing channels present for trading of polo and khoh in the study area and maximum quantity was marketed through channel-II. The highest value addition was observed at wholesaler-cum-retailer level in both the districts. The traditional products were sold at the local markets have high potential to be marketed in the global market with the help from different stakeholders engaged in bamboo business. Farmer producer organizations formation at the village level would provide opportunity for direct marketing and artisans could get more income and thereby improving the livelihood.

Key words: Bamboo product, Meghalaya, traditional, value chain

INTRODUCTION

Bamboo is one of the world's most valued non-timber forest products (INBAR, 2019) and bamboo enterprises are the primary source of livelihood and a source of economic upliftment for poor and underprivileged people (Lobovikov et al., 2009; Partey et al., 2017). On account of its diversified uses, the bamboo is now also known as 'the plant with thousand faces', 'green gold of forests', and 'poor man's timber' (Goyal and Brahma, 2014). It is used for house construction, bamboo ply, agricultural implements, handicraft, irrigation, brooms, medicine, food, fuel, fodder, paper and pulp and as a perfect substitute for some wood-based products (Sharma et al., 2018). Bamboo craft has been practiced by the NEH regions of India for centuries as their prime livelihood and income source. Currently bamboo sector in India provides 432 million work days per annum employing rural poor, especially women (Dhurga, 2017). A significant part of a tribal population

(50% of 68 million) depends on exploitation of non-timber forest products like bamboo for their livelihood (Jamatia, 2014). Trading in value-added products of bamboo has the potential to make positive contribution to the global environment and economy. Asian countries continue to dominate the international markets for bamboo and rattan product trade (INBAR, 2019). India and China were the major producer of bamboo in Asia and together account approximately 70 per cent of the bamboo in Asia (Mera and Xu, 2014). During 2019, the total global bamboo exports was USD 3.054 billion where India stands at seventh position in world export by exporting 67 USD million (2% of world exports) (INBAR, 2021). Total 12 numbers of bamboo-based products traded in global market. The major export destinations of bamboo products from India were Bhutan, Bangladesh, USA, UAE and Nepal. Bhutan and Bangladesh had stable market for bamboo poles and bamboo charcoal, Nepal for bamboo plywood and UAE for bamboo paper-based products (Gogoi

et al., 2020). Realizing Bamboo's full potential as a driver of environmental sustainability and inclusive economic growth requires a fundamental shift in the present way the system operates in India (INBAR, 2019). There is urgent need for streamlining the production and marketing infrastructure for finished products that fetch lucrative prices, as well as for finding more prospective markets (INBAR, 1998). With this background the study was carried out to study the value chain of traditional bamboo products in Meghalaya.

MATERIALS AND METHODS

The study was conducted in two districts i.e., East Khasi Hills and Ri Bhoi of Meghalaya based on the maximum number of stakeholders engaged in the bamboo business among all the districts. In the East Khasi Hills district, Shela Bholaganj and Khatarshnong Laitkroh blocks were selected based on the concentration of the stakeholders and from each block one village viz., Kshiyad and Nongpriang was selected randomly for the study. Similarly in Ri-Bhoi district, Umsning block was selected based on the concentration of the stakeholders and two villages viz., Umran and Sonidan from the block were selected randomly. A total of 47 respondents from Ri-Bhoi district and 53 from East Khasi Hills district were selected randomly making it a total of 100 respondents.

Both primary and secondary data were used for the study. Primary data were collected from the sample respondents during 2019 to 2021 through a well-structured pre-tested schedule) comprising parameters like variable cost, fixed cost, investment and gross return involved in preparing different products of bamboo products. The secondary data were collected from journals, research papers, reports, publications of ministry of environment forest and climate change, Government of India and different related websites.

The data on value chain intermediaries were recorded by taking into consideration the various bamboo products prepared at each level of marketing (Kohls and Uhls, 1967). The formula to work out value addition by each stakeholder was worked out as:

Value addition = Selling price of the product - cost of the total input

The major channels involved in the marketing of bamboo and bamboo products were identified and following methods were used:

Compliance cost

The total cost incurred on marketing either in cash or kind by the producer seller and by the various intermediaries involved in the sale and purchase of commodities till the commodities reaches the ultimate consumer, (Acharya and Agarwal, 2011) was computed as:

$$C = CF + Cm_1 + Cm_2 + Cm_3 + \dots + Cm_i$$

$$C = CF + \sum Cm_i$$

where,

C = total cost of marketing of the commodity

CF = cost paid by the producer at the time the produce leaves the farm till he sells it

Cm_i = cost incurred by the i th middlemen in the process of buying and selling the product

Marketing margin of middlemen

It is the difference between the total payments (cost + purchase price) and receipts (sale price) of the middlemen (i th agency) (Acharya and Agarwal, 2011). It is expressed as:

$$Am_i = Pr_i - (Pp_i + Cm_i)$$

where

Am_i = absolute marketing margin of i th middlemen

Pr_i = total value of receipts per unit (sale price)

Pp_i = purchased value of goods per unit (purchase price)

Cm_i = cost incurred on marketing per unit

Price spread

Price spread is the difference between the price paid by the consumer and the price received by the producer for an equivalent quantity of the produce. It was calculated using the following formula

Price spread= $P_c - P_r$

where,

P_c = Price paid by the consumer

P_r = Price received by the producer

Producer's share

The producer's share in consumer's rupee was worked out as under (Acharya and Agarwal, 2011).

$$P_s = P_F / P_c \times 100$$

where,

P_s = Producer's share in consumer's rupee

P_F = Price of the produce received by the producer

P_c = Price of the produce paid by the consumer

RESULTS AND DISCUSSION

Value chain of bamboo products

Bamboo was widely used to make traditional bamboo products by the experienced artisans. Polo (traditional multipurpose bamboo basket of Meghalaya) and Khoh (cone shaped traditional bamboo basket of Meghalaya) was prepared using the bamboo species of *Bambusa jaintiana* (Skhen). The market price of these products ranged from Rs.100-200 based on the sizes. Nongkynrihet al. (2019) also reported similar uses of bamboo in Meghalaya. Bamboo products (Khoh and Polo) made from bamboo poles were marketed through two channels viz., channel-I such as artisans→ village merchant→ wholesaler-cum-retailer→ consumer (90.39%), and a very less quantity through channel-ii such as artisans→ consumer (9.61%) (Table 1). The marketing of the polo and khoh were confined to only the local markets of Meghalaya.

Table 1. Major marketing channels of bamboo products (Polo and Khoh) in Meghalaya

Channels	Actors	Quantity (%)
Channel I	Artisans→Village merchant→ Wholesaler-cum-Retailer→Consumer	90.39
Channel-II	Artisans→ Consumer	9.61
Total		100

Source: Field survey, 2022

The bamboo products made by the expert and skilled artisans of the RiBhoi and East Khasi Hills were disposed-off through these two marketing channels. In channel-I: artisans→ village merchant→ wholesaler-cum-retailer→ consumer a larger quantity (89.33%) of products were disposed-off while through channel-ii: artisans→ consumer, the product was delivered directly to the consumers at a very smaller quantity (10.67%) in East Khasi Hills. In Ri-Bhoi, 90.70 per cent was disposed-off through channel-II (Table 2).

Table 2. Channels identified for disposed-off bamboo (number of culms) in Meghalaya for making bamboo products

Particulars	Ri Bhoi	East Khasi Hills	Overall
Channel-I	16 (9.30)	167.5 (89.33)	16.85 (9.61)
Channel-II	156 (90.70)	20 (10.67)	158.42 (90.39)
Total	172 (100)	187.5 (100)	175.27 (100)

Note: Figures in the parentheses indicate percentage to total, Source: Field survey, 2022

Marketing cost and margin of bamboo

Through the channel-I: artisans→ village merchant→ wholesaler-cum-retailer→ consumer, a large quantity of polo and khoh was disposed-off in both the markets of Meghalaya, the polo and khoh made by the artisans were purchased directly by the village merchant from the artisans at the rate of Rs.150 per unit in both Ri-Bhoi and East Khasi Hills market. Similar to the other products marketing channels, loading and unloading cost was highest due to more labour requirement and higher wage rate (Rs.350 per day). The selling price of the village merchant was Rs.170 per unit and Rs.175 per unit in Ri- Bhoi and East Khasi Hills respectively. The marketing cost was estimated of Rs.1.56 per unit and Rs.1.70 per unit with a margin of Rs.18.44 per unit and Rs.23.30 per unit in Ri- Bhoi and East Khasi Hills, respectively. The product was then passed to the wholesaler-cum-retailer and the cost incurred by the wholesaler-cum-retailer was higher in the East Khasi Hills than in Ri-Bhoi.

Table 3. Marketing cost and margin of Polo and Khoh (Rs./unit)

Particulars	Ri-Bhoi		East Khasi Hills	
	Channel-I	Channel-II	Channel-I	Channel-II
Selling price of artisans	150	180	150	180
Cost incurred by the artisans				
i) Transportation	1.32 (46.81)	1.55 (40.79)	1.75 (52.24)	1.25 (35.71)
ii) Loading unloading	0.75 (26.60)	1 (26.32)	0.75 (22.39)	1 (28.57)
iii) Storage and other costs	0.75 (26.60)	1.25 (32.89)	0.85 (25.37)	1.25 (35.71)
Total (i to iii)	2.82 (100)	3.80 (100)	3.35 (100)	3.50 (100)
Net price received by the artisans	147.18	176.20	146.65	176.50
Cost incurred by the village merchant				
i) Transportation	0.56 (35.90)		0.70 (41.18)	
ii) Loading unloading	0.75 (48.08)		0.75 (44.12)	
iii) Storage	0.25 (6.03)		0.25 (14.71)	
Total (i to iii)	1.56 (100)		1.70 (100)	
Price paid by the wholesaler cum retailer	170		175	
Village merchant's margin	18.44 (9.22)		23.3 (11.65)	
Cost incurred by wholesaler-cum-retailer				
i) Transportation	2.58 (39.21)		3.25 (43.62)	
ii) Loading unloading	0.75 (11.40)		0.75 (10.07)	
iii) Storage	0.25 (3.80)		0.45 (6.04)	
iv) Market fee	3 (45.59)		3 (40.27)	
Total (i to iv)	6.58 (100)		7.45 (100)	
Price paid by the consumers	200	180	200	180
Wholesaler-cum-retailer's margin	23.42 (11.71)		17.55 (8.77)	

Note: Figures in the parentheses indicate percentage to total

Source: Field survey, 2019-21

The selling price of the wholesaler-cum-retailer was observed to be similar for both markets and estimated of Rs.200 per unit. The margin earned by the wholesaler-cum-retailer was found higher at Ri-Bhoi Rs.23.42 per unit than East Khasi Hills market. The market fee contributed highest to the marketing cost followed by the transportation cost of the Wholesaler-cum-Retailer. The channel-II was direct channel from artisans to the consumer with a less quantity of produce disposed-off. The total cost incurred by the artisans was estimated of Rs.3.80 per unit in the market of Ri-Bhoi and Rs.3.50 per unit in the market East Khasi Hills of which higher cost was on transportation. The selling price was Rs.180 per unit in both the markets. The margin was higher in the market of East Khasi Hills (Rs.176.50/unit) (Table 3). Lynseret al. (2014) also reported that, from bamboo mat making in Meghalaya, the average net income per household per year was found to be to Rs. 3841 and it contributed around Rs.28 lakhs to the annual income of the villagers.

The traditional bamboo products would remain inevitable in the region as it was used from ancient times. Hence, there is need for creating awareness among the artisans and other stakeholders to form farmer producer organizations (FPOs) to increase their profit to double by making new products having high demand in the domestic and global market and exploring new market opportunities.

Price spread or value addition of bamboo products

Polo and Khoh were marketed in Ri-Bhoi market through two channels only, of which net price received by the farmer was estimated to be of Rs.147.18 per unit and Rs.176.20 per unit in channel-I and channel-II, respectively. The marketing cost was higher in channel-I of Rs.10.96 per unit than channel-II of Rs.3.80 per unit. Marketing margin on the other hand was estimated at Rs.41.86 per unit in channel-I. The price paid by the consumer as of Rs.200 per unit and Rs.180 per unit in channel-I and channel-II, respectively. Therefore, the price spread was found to be higher in channel-I (Rs.52.82/unit) compared to channel-II (Rs.3.80/unit). In channel-II, producer's share in consumer rupee was higher (97.89%) as it was directly marketed by the artisans to the consume Rs. Similarly, in East Khasi Hills, the net price received by the farmer was found to be of Rs.146.65 per unit and Rs.176.50 per unit in channel-I and channel-II, respectively. The marketing cost was estimated of Rs.12.50 per unit and Rs.3.50 per unit in channel-I and channel-II, respectively. In channel-I, marketing margin was estimated of Rs.40.85 per unit. The price paid by the consumer was Rs.200 per unit in channel-I and Rs.180 per unit in channel-II. Hence, the price spread was found to be higher in channel-I (Rs.53.35/unit) than channel-II (Rs.3.50/unit). Therefore, the producer's share in consumer rupee was estimated and found to be higher in channel-II, 98.06 per cent compared to channel-I (73.34%) as stated in Table 4.

Table 4. Price spread or value addition of polo and khoh in Meghalaya (in Rs. per unit)

Particulars	Channels	Net price received by producer	Marketing cost	Marketing margin	Consumer's price	Price spread	Producer's share in consumer's rupee
Ri-Bhoi district	Channel-I	147.18	10.96	41.86	200	52.82	73.59
	Channel-II	176.2	3.80	-	180	3.80	97.89
East Khasi Hills district	Channel-I	146.65	12.5	40.85	200	53.35	73.33
	Channel-II	176.5	3.50	-	180	3.50	98.06
Overall	Channel-I	146.92	11.73	41.36	200.00	53.09	73.46
	Channel-II	176.35	3.65	-	180.00	3.65	97.97

Source: Field survey, 2022

CONCLUSION

In both the districts of Meghalaya under study, price spread was higher in Channel-I. Highest quantity of products in Meghalaya (90.70%) was sold through Channel-I (artisans→ village merchant→ wholesaler-cum-retailer→ consumer). Maximum marketing margin was obtained by the wholesaler-cum-retailer. The marketing channels end users were only from the domestic market which could be expanded to global market with restructured value chain and bamboo FPO formation at cluster level. This would help the artisans to link with the market directly providing higher income for improved livelihood.

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REFERENCES

- Acharya, S.S. and Agarwal, N.L. 2011. *Agricultural marketing in India*, 5th edn. Oxford and IBH publishing Co. Pvt. Ltd., New Delhi. p. 48.
- Dhurga, S. 2017. Problems and prospects of bamboo market in India. *Aayvagam* 5(2): 86-90.
- Gogoi, J., Kumar, P. N., Singh, R., Tyngkan, H. and Nongbri, B. 2020. Export performance of bamboo products in India: a markov chain analysis approach. *Indian J. Econ. Dev.* 8(2): 107-116.
- Goyal, A.K. and Brahma, B.K. 2014. Antioxidant and nutraceutical potential of bamboo: an overview. *Intl. J. Fund. Appl. Sci.* 3(1): 2-10.
- INBAR. 1998. Natural forest-based bamboo production-to-consumption system: a case study from central. INBAR Working Paper No. 20. International trade of bamboo and rattan. International Bamboo and Rattan Organisation, Beijing, China.
- INBAR. 2019. Eradicating poverty with bamboo. International Bamboo and Rattan Organisation. <https://www.inbar.int/eradicating-poverty-with-bamboo/>. Accessed 20 August 2019.
- INBAR. 2021. *Trade overview 2019: bamboo and rattan commodities in the international market*. International Bamboo and Rattan Organisation. <https://www.inbar.int/wp-content/uploads/2021/04/Trade-Overview-2019-China-final-1.pdf>. Accessed 23 December 2021.
- Jamatia, S. 2014. Bamboo regulation in India: the need for reforms. Centre for civil society. <https://ccs.in/sites/default/files/publications/viewpoint12.pdf>. Accessed 7 August 2020.
- Kohls, R.L. and Uhls, J.N. 1967. *Marketing of agricultural products*. Macmillan Publishing Company, New York.
- Lobovikov, M., Paudel, S., Ball, L., Piazza, M., Guardia, M., Ren, H. and Wu, J. 2007. World bamboo resources: A thematic study prepared in the framework of the global forest resources assessment. Food and Agriculture Organization. <https://www.fao.org/3/a1243e/a1243e00.htm>. Accessed 15 June 2020.
- Lynser, B.M., Tiwari, B., Nongbri, B. and Kharlyngdoh, E. 2014. Bamboo mat making and its contribution to the rural livelihood of women in South Meghalaya, India. *Bamboo Sci. Culture- J. Americ. Bamboo Soc.* 28(1): 1-9.
- Mera, F.A.T. and Xu, C. 2014. Plantation management and bamboo resource economics in China. *Ciencia y Tecnología* 7(1): 1-12.
- Nongkynrih, C., Kumar, Y. and Mipun, P. 2019. Bamboos: diversity and its utilization in Meghalaya, Northeast India. *Plant Arch.* 19(2): 3106-3311.
- Partey, S.T., Sarfo, D.A., Frith, O., Kwaku, M. and Thevathasan, N. V. 2017. Potentials of bamboo-based agroforestry for sustainable development in Sub-Saharan Africa: a review. *Agric. Res.* 6(1): 22-32.
- Sharma, R., Wahono, J. and Baral, H. 2018. Bamboo as an alternative bioenergy crop and powerful ally for land restoration in Indonesia. *Sustainability* 10(12): 4367.