Socioeconomic Status of Bamboo-Based Handicrafts Producers: A Case Study in Handessa Grama Niladhari Division, Kandy, Sri Lanka

Dananji Amarasinghe, Ministry of Finance, Economic Stabilization and National Policies, Sri Lanka

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Abstract

In Sri Lanka, the production of bamboo crafts and utensils largely relies on local knowledge specific to the regions where bamboo plantations are situated. The bamboo-based handicraft industry in Sri Lanka comprises semi-skilled, unorganized, disintegrated, and economically disadvantaged workers who face notable social discrimination. However, the industry has the potential to improve the socioeconomic status of underprivileged individuals in Sri Lanka. This study aimed to investigate the current social background and economic potential of bamboo-based handicraft producers to improve their social and economic well-being and identify opportunities to overcome socio-economic challenges. The data collection process involved a household questionnaire survey, key informant discussions, and focus-group discussions. Fifty handicraft makers were selected from the Handessa Grama Niladhari division using the stratified random sampling method. Most secondary data were obtained from the resource profile of the Udunuwara divisional secretariat. The findings revealed that most workers were over 60 years old and had only completed primary education. Furthermore, the lack of product diversification has been considered a major constraint on expanding market opportunities. critical challenges faced by craftsmen including the decline in skilled artisans, inadequate education, poor financial management practices etc. While addressing these issues, it is important to revitalize the industry and empower future generations to engage in and appreciate this traditional craft industry to ensure its sustainability.

Keywords: Bamboo Crafts, Socioeconomic Potential, Local Knowledge, Underprivileged Communities



Introduction

Background

Bamboo is one of the important non-timber forest products cultivated worldwide. According to the Forest Cover Assessment Survey of 2015, published in 2020 by the Department of Forest Conservation, the estimated total forest cover of the country was 1,865,671 hectares representing 28.4 per cent of the land in Sri Lanka (CBSL, 2020). The forest cover of Sri Lanka is declining due to rapid population growth, leading to land fragmentation, land scarcity, and increasing level of poverty. Considering the total land extension, 2500 ha of bamboo plantations exist in Sri Lanka (UNIDO, 2020). Bamboo is mainly used locally as fuel and low-quality construction material. Approximately 40% of bamboo is used for fuelwood and charcoal globally. Nevertheless, a significant amount is also used for construction, flooring, fodder, and food worldwide. In Sri Lanka, the Bamboo crafts and utensils industry mainly depends on traditional knowledge in some scattered areas with the availability of raw materials. Besides, in countries such as India, and Indonesia bamboo is utilized for various purposes depending upon its properties. It plays an integral role in the daily life of people. Particularly, bamboo craft is one of the oldest traditional cottage industries in India. In addition, bamboo plays a very important role in the socio-economic and cultural lives of Indonesian people as there are bamboo resources available throughout the country in natural as well as plantation forests. There is a potential to develop the bamboo-based craft industry in Sri Lanka. According to that, the United Nations Industrial Development Organization (UNIDO) has granted USD 600,000 to uplift the industrial bamboo sector in Sri Lanka. In the traditional context, bamboo-based handicraft workers are considered semiskilled, unorganized, disintegrated, and socio-economically backward groups. As a result, handicraft workers are experiencing some notable social discrimination. Therefore, there is a necessity to overcome the limitations of the bamboo-based handicraft industry to upgrade their economic and social values of them. As an account, the bamboo-based handicraft industry can be recognized as one of the key instruments to uplift the socio-economic status of poor and underprivileged people in Sri Lanka.

Research Problem

The majority of rural householders of the Handessa Grama Niladhari (GN) division in Udunuwara Divisional Secretariat Divison (DSD) mainly sustain their livelihood through the bamboo-based handicraft industry. Though they are backward in socio-economic status than the expected level due to lack of government support, inflexible policies, limited innovative skills of producers, unorganized market system, difficulties in accessing the technology, transport issues of raw materials, issues of the supply chain of raw materials, lack of value addition, dissatisfaction of young generation due to low level of reputation for the industry have tended to retard income generation through this industry. Concurrently, these factors lead to demote the living standards of bamboo artisans. This study is conducted to identify the socio-economic status of bamboo-based handicraft producers to overcome issues in developing their livelihood.

Research Objectives

The study was implemented to identify the current social and economic potential of bamboobased craft makers in the Handessa Grama Niladhari division. Further, it was required to provide recommendations to empower them socio-economically.

Justification

Bamboo is a versatile grass which considered a poor man's timber in the past. Thus, with the drastic changes, it is well known as green gold, merely found in Asia and Africa regions. According to the study, throughout 60 years bamboo-based handicrafts have been produced in Handessa GN division. At present, the manufacturing of winnowing fans is the major production. In addition, craft producers supply sticks for the production of fragrance sticks as an intermediary. Considering the bamboo-based handicraft producers in the Handessa GN division majority of craft producers manufacture around 50 winnowing fans per month solely while a few of them manufacture around 300 winnowing fans per month by using workers on a daily rental basis. Thus, as raw material, bamboo wood has to be transported from Nuwara Eliya district and the cost of transportation is comparatively high. Customarily, Producers have to spend around a thousand rupees per bamboo tree as the cost of transportation and there is an issue of getting permits for transportation. Currently, due to the shortage of raw material availability has merely affected the bamboo-based handicraft industry because it is essential to have at least a one-foot internodal length for manufacturing winnowing fans. Thus, it is hard to find raw materials in Udunuwara DSD to fulfil the above requirements. Therefore, it has become a severe issue for them. As well as the cost of utensils utilized for manufacturing bamboo-based handicrafts is unbearable for producers. Apart from that, issues related to selling bamboo-based handicraft products such as exploitation of producers due to the low farm gate price also adversely affect the industry and socio-economic well-being of them. In addition, due to the lack of reputation, the young generation of most bamboo-based handicraft manufacturing families would not like to sustain their livelihood engaging this industry. Therefore, this study is important for the identification of the contemporary socioeconomic status of bamboo-based craft producers to overcome issues for the development of their living standards.

Literature Review

Bamboo is a versatile gift of nature (Jha & Yadava, 2015) and it is one of the vital non-timber forest products (NTFPs) cultivated widely in the world (FAO, 1978). According to Bajracharya et al., n.d., it has intimately been associated with human beings since time unknown. Bamboo is utilized for various purposes depending on its properties (Effah et al., 2014; Selvam, 2016). It has combined with the ordinary lifestyle of people, including activities such as house construction, agricultural tools and implements, food material and weaponry, a convenient source of cellulose for paper manufacturing and rayon etc. (Selvam, 2016).

Sri Lankan Situation of Bamboo-Based Handicraft Industry

Various development strategies have been tested to develop Sri Lanka based on the growth and expansion of industries. However, as a developing country, it is a contemporary requirement to revive the economy by focusing on small-scale industries. Along with that, there is a possibility to empower bamboo-based handicraft production as a small-scale industry to contribute to economic development (Masakorala, 2005).

Bamboo trees occur naturally in all three of its major climatic zones named as wet zone, intermediate zone and dry zone in Sri Lanka (Kariyawasam, 1998). Thus, considering the extent, only 2500 ha of bamboo plantations exist in Sri Lanka and the bamboo is merely used locally as fuel and in low-quality construction (UNIDO, 2020). Sri Lanka has established a

wood plantation and wood processing industry, which can acquire benefits through a bulk supply of raw materials. According to UNIDO, there is a potential for developing the bamboo supply chain and related product industry in Sri Lanka.

The Worldwide Situation of the Bamboo-Based Handicraft Industry

The bamboo craft industry is one of India's oldest traditional cottage industries (Kasemi, 2013; Selvam, 2016). The origin of this rural craft has been traced from the beginning of civilisation. Further, people started making baskets, mats and many other household products using bamboo which was abundantly available in nearby forests. Later, tribal and rural people identified it as a means of livelihood. Therefore, the bamboo craft is spread in all rural areas of India and it feeds millions of traditional workers (Sreekumar, 2009). In addition, bamboo can be found naturally and cultivated with twelve genera and more than fifty-three species in almost all its parts in Nepal (Stapleton, 1994; Karki et al., 1998; Das, 1999; Das, 2004). Therefore, bamboo is an integral part of forestry and the mainstay of the rural culture of Nepal (Das, 2002). Along with this, bamboo cultivation is a vital component of the rural farming system and plays a critical role in supporting the rural economy to sustain the livelihoods of many rural households including socially and economically underprivileged groups (Karki et al., 1998; Das, 1999; Kasemi, 2013). As a result, bamboo has become one of the important renewable natural resources that can uplift people above the poverty line if it is grown and managed on a sustainable basis (Das, 2002; Poudyal & Das, 2002). It is well recognized in the rural economy of Nepal in terms of livelihood upgrade even though the importance of bamboo is predominant in the agricultural economy (Storey, 1990; Karki & Karki, 1996; Karki et al., 1998; Das, 2001; Bista, 2004). Bamboo has a huge demand among rural people for construction purposes and bamboo artisans in rural and urban enterprises make various bamboo products except weaving. For instance, the weaving of bamboo strips is most widespread because 70% of the farmers grow bamboo on their farms and around the homesteads in terms of utilization (Karki, et al., 1998). Bamboo-based craft makers design various bamboo architectures with the assistance of simple basic tools prepared locally under bamboo-based entrepreneurship (Bajracharya et al., n.d.). Besides, it has a direct linkage with the socio-economic and cultural conditions of the Nepalese people (Jha & Yadava, 2015). Around 3.3 million farming families have involved in the bamboo sub-sector either as producers or as users of bamboo-based products in Nepal (Pant, 2006). Further, it can contribute to the regional and national economy (Bajracharya et al., n.d.).

According to Latif, 2008, the Bangladesh Small and Cottage Industries Corporation (BSCIC) estimated that there are about 45,000 registered small-scale cottage enterprises located throughout Bangladesh that consume about 46 million bamboo culms annually and about 300,000 people are employed in bamboo cutting and collecting from forests. It emphasizes the way of providing indirect benefits by generating employment opportunities related to the small-scale bamboo-based cottage industries. Employment generation and livelihood upgrading characteristics of the bamboo-based enterprise are vital to the continuing development of the country's economy, specifically in the rural sector (Alamgir et al., 2005, 2007).

Socio-Economic Benefits of Bamboo-Based Handicraft Industry

According to Selvam, 2016, Socioeconomic status means the accessibility, affordability, acceptability and actual utilization of various available common facilities of the people. It elaborates on economic conditions such as the condition of the living house, proprietorship of

house, irrigated land facilities, income, work availability, savings and loans and the social conditions such as legal identity, memberships, participation in public contests, celebrations, accessibility, discrimination, health problems and their habits. In light of socioeconomic status, bamboo-based handicraft workers are still unorganized, noncohesive, socioeconomically backward and semi-skilled. As a result, they have been unable to engage in the bamboo-based handicraft industry as regular employment, hard to get meaningful wages and handicraft producers still experience some distinguished social discrimination. Development and encouragement of cottage industries based on bamboo have a very high potential to provide sufficient cash income to locals and contribute to their household economy (Poudyal, 1992; Karki et al., 1995; Sherchan et al., 1996). Bamboo-based enterprises are vital sources of employment generation for both the rural as well as the urban workforce (Jha & Yadava, 2015). Though, the potential of generating employment opportunities has not been utilized yet. For instance, the bamboo-based economy contributes only 1-2% to the national GDP in Nepal due to the lack of conducive policy and support of the government, disorganized market, and limited skills (Karki et al., 1998). Most Farmers grow bamboo in their private farmlands (Das, 2002). Besides, most producers are poor and have less encouragement for commercial production and marketing. For example, some ethnic communities still utilize bamboo for their subsistence. Though, most marginalized ethnic communities in Rautahat District, Nepal involve in the bamboo-based craft industry by making different types of bamboo woven products, handicrafts, and furniture for their income. These locally-produced bamboo products are readily marketable in the local market. Nevertheless, its trade is not satisfactory in the national market due to the lack of transportation channels and a wellestablished marketing structure (Adhikari, 2008). Marketing of bamboo and bamboo crafts is one of the important sources of income for particularly people who are socially and economically underprivileged (Das, 2002; MDBRPP/DFRS, 2010). However, the majority of bamboo-based traditionally processed products have to face huge competition with substitutes and other international products considering the international market (MDBRPP/DFRS, 2011). There are several factors such as age, education, size and household income as well as knowledge of the uses which affect the socio-economic impact on forest products including bamboo and rattan (Lacuna-Richman, 2007). Several social factors affect the commercialization of non-timber forest products including improvement of social justice, community organizations and the culture of the local community. As well as, production, collection, processing, storage, market and sales affect the process of commercialization of non-timber forest products. Among the above-mentioned factors, marketing and sales are remarkable for the successful commercialization of non-timber forest products (Marshall et al., 2003).

Challenges Faced by the Bamboo-Based Handicraft Industry

In the Sri Lankan context, the bamboo-based handicraft industry is in a primitive stage when compared with other handicraft industries. There are some challenges related to the bamboobased handicraft industry that affect the industry's growth and expansion. As per the previous studies, major challenging areas have been identified. The scarcity and depletion of natural stocks of raw materials, the timely availability of raw materials and finance, the discontinuity of craft skills, poor social recognition of handicrafts, poor income, migration to other jobs, reluctance to use new technology, inability to afford to buy new technology, competition of imported substitute, high cost of production, the bureaucracy and the lack of extension programs of the institutions and the challenges of middlemen are most important. In addition, lack of marketing information is one of the major problems faced by rural producers in the commercialization of bamboo-based products. Producers do not have sufficient information about their product prices in the local market or input for processing the desired product demandable in the market, the extent of competition, and the quality of the desired product. This may occur due to insufficient raw materials which leads to a small range of products. High transportation costs and less infrastructure such as roads and public transport services reduce the ability of manufacturers to compete in the market particularly in rural areas (FAO 1987; Datta et al., 2016; Kebede, 2018).

Considering the current nature and the complications of the handicraft industry, in some aspects, it can be a solution to the present development problem nevertheless not a perfect solution. Most of the youths are moving away from the traditional bamboo-based handicraft industry due to the lack of recognition and low reputation as craft workers (Rana, et al., 2009). Therefore, the handicraft industry may not be a solution for the unemployment in rural areas. The handicraft industry can be developed parallel to the growth of the tourist industry. Government intervention is needed to promote the local handicraft market. Some potentials can be utilized to improve the handicraft industry.

Conclusion

Key Findings

This study mainly encompasses the analysis of the current social background and economic potential of bamboo-based craftsmen in Handessa Grama Niladhari Division, Kandy, Sri Lanka. Accordingly, key findings can be illustrated as follows;

Social Background of Bamboo-Based Handicraft Producers

Age Distribution

Considering the age distribution of the bamboo-based handicraft producers, the majority of workers are above 60 years old and the involvement in the industry was less in the young generation particularly those below 40 years old because most young people don't prefer to engage in the craft-producing industry because of the less recognition and reputation. Therefore, it has been confined to the most of the elderly people. According to the prevailing situation, transferring knowledge from generation to generation was a serious issue. As a result, talented craftsmen were rare among the present generation due to the lack of preference for this industry (Figure 1).



Gender-Wise Participation

Both males and females have engaged in the craft-producing industry. The majority of them are males compared with females. However, female labour force participation is in a satisfactory position (Figure 2).



Figure 2: Gender-Wise Participation

Civil Status

70% of the bamboo-based handicraft producers are married and 12% of females are widows. It indicates that widows have engaged in the handicraft industry for their subsistence to sustain their livelihood and the role of this industry as a critical livelihood source in maleheaded households (Figure 3).



Type of Bamboo-Based Production

The majority of handicraft producers manufacture winnowing fans as they have already created market channels to sell them. However, they have a lack of preference for product diversification and a few handicraft artisans produce ornamentals while manufacturing winnowing fans (Figure 4).



Figure 4: Type of Bamboo-Based Production

Level of Education

The majority of handicraft producers have only primary education (up to grade 05) and most of them have dropped out of school after primary education. Parents rarely encouraged their children to obtain well-organized education due to the lack of financial management, less social mobility inside the community etc. (Figure 5).



Figure 5: Level of Education

Relationship Between the Involvement of the Number of Family Members and Number of Dependents of the Family

It indicates a significant relationship between the involvement of the number of family members and the number of dependents (F value (0.00028) < 0.05) (Figure 6).



Figure 6: Relationship Between the Involvement of the Number of Family Members and the Number of Dependents

The current landscape of this industry highlights significant challenges and shifts in participation among the younger generation. Many young individuals are reluctant to engage in craft production due to the industry's lack of recognition and reputation, which results in a generational gap where knowledge transfers from older craftsmen to the youth has become increasingly problematic. This has led to a scarcity of skilled artisans, as young individuals are more inclined to pursue careers in public and private sectors.

Economic Potential of Bamboo-Based Handcraft Producers

Relationship Between Monthly Income and Monthly Savings Distribution

It illustrates a significant relationship between monthly income and monthly savings (F value (0.0000) < 0.05) (Figure 7). The bamboo-based handicraft producers are incompetent in managing their savings. For instance, the daily production is around 50 winnowing fans and the selling price of a winnowing fan is around Sri Lankan Rupees (Rs.)150.00. Although, poor financial management practices, coupled with cultural factors such as addiction to alcohol and gambling, hinder their ability to save and invest effectively (Figure 8 and Figure 9).



Figure 7: Relationship Between Monthly Income and Monthly Savings Distribution



Figure 8: Monthly Income (Rs.)



Figure 9: Monthly Savings (Rs.)

Challenges Faced by Bamboo-Based Handicraft Producers

It has become a current requirement to examine opportunities to overcome socioeconomic challenges faced by bamboo-based artisans. Through this study, some challenges have been identified including difficulties in obtaining permits for the transportation of bamboo trees, less requirement for using winnowing fans due to modern technological equipment, lack of social recognition for handicraft producers, less bamboo-based product diversification, lack of knowledge for financial management etc.

In the above context, the bamboo-based handicraft industry faces critical challenges, including a decline in skilled artisans, inadequate education, poor financial practices etc. While addressing these issues, it is important to revitalize the industry and empower future generations to engage in and appreciate this traditional craft industry to ensure its sustainability.

Limitations

Several limitations such as travel restrictions, and imposing contemporary lockdowns to prevent the community spread of the coronavirus due to the covid 19 pandemic situation directly affected primary data collection. Usage of online platforms is also unrealistic in light of the targeted group which had been selected for sampling since they had a lack of knowledge regarding online methods and primary data depended on respondents. Instead of that time limitations for collecting primary data were affected to confine the scope of the study. The secondary data for this study was limited to the resource profile of the Udunuwara divisional secretariat due to the lack of previous studies.

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References

- Adhikari, N. (2008). Economic potential of bamboo in Nepal for the traditional bamboo users in the modern economy.
- Alamgir, M., Jashimuddin, M., & Bhuiyan, M. (2005). Employment generation and economics of cane based furniture enterprises of Chittagong, Bangladesh. *iii*(4), 279-292.
- Bajracharya, M., Rajbhandary, S., & Das, A. (n.d.). Socio-economic impacts of bamboo enterprises in the Mid-hills of Nepal: A case study on Pahari community at Badikhel Village, Lalitpur. *Banko Janakar*, 19-25.
- Bista, D. (2004). People of Nepal. Ratna Pustak.
- CBSL. (2020). Annual Report 2020. Colombo, Sri Lanka: Central Bank of Sri Lanka.
- Das, A. (1999). Socioeconomics of Bamboos in Eastern Nepal. *PhD Thesis, University of Aberdeen, UK.*
- Das, A. (2001). Bamboo: Species for economic prosperity, environmental conservation and rural development in Nepal. In *Nepal Bamboo Update* (pp. 3-4).
- Das, A. (2002). Bamboo growing and its market development potential for sustaining rural livelihood and poverty reduction in Eastern Nepal. *Banko Janakari, I*(12), 8-19.
- Das, A. (2004). Manual on Bamboos of Nepal Community Forestry Component. *Tree Improvement and Silviculture, Ministry of Forest and Soil Conservation, Kathmandu, Nepal.*
- Datta, J., Das, J., Debnath, A., Ram, A., & Haldar, S. (2016). Entrepreneurial Behaviour of Rural Women on Bamboo Handicrafts in Tripura, North-East India. *Economic Affairs*, 61(4), 653-658. doi:10.5958/0976-4666.2016.00080.2
- Effah, B., Boampong, E., Asibey, O., Pongo, N., & Nkrumah, A. (2014). Small and Medium Bamboo and Rattan Enterprises in Economic Empowerment in Kumasi: Perspectives of Producers. *Journal of Social Economics*, *1*(1), 11-21.
- FAO. (1978). *Bamboo forest news for Asia and the Pacific*. Bangkok, Thailand: Food and Agricultural Organizations.
- Jha, R., & Yadava, J. (2015). Economic potential and marketing trend of bamboo in Nepal: A case study from Rautahat District. *Banko Janakari*. doi:10.3126/banko.v25i1.13476
- Kariyawasam, D. (1998). Bamboo resources and utilization in Sri Lanka. *Proceedings of training course cum workshop*. Yunnan, China: IPGRI.

- Karki, J., & Karki, M. (1996). Bamboo production, use and trade in Eastern Nepal: A Case Study. In The Role of Bamboo, Rattan Medicinal Plants in Mountain Development. *Proceedings of a workshop held at the Institute of Forestry* (pp. 144-155). Pokhara, Nepal: INBAR Technical Report No. 15.
- Karki, M., & Karki, J. (1995). National Bamboo and Rattan Information Database Nepal, Tribhuvan University, Institute of Forestry. Pokhara, Nepal.
- Karki, M., Sherchan, G., & Karki, J. (1998). Extensive Bamboo Production and Consumption in Eastern Nepal: a case study. *INBAR*.
- Kasemi, N. (2013). INFLUENCE OF SOCIO-ECONOMIC FACTORS ON THE PRODUCTIVITY OF HOUSEHOLD INDUSTRY: A CASE STUDY OF BAMBOO-WORK INDUSTRY IN JALPAIGURI DISTRICT, WEST BENGAL. *Geo-Analyst*, 42-49.
- Kebede, A. (2018). Opportunities and Challenges to Highland Bamboo-Based Traditional Handicraft Production, Marketing and Utilization in Awi Zone, Northwestern Ethiopia. *International Journal of History and Cultural Studies (IJHCS), IV*(IV), 57-67. doi: http://dx.doi.org/10.20431/2454-7654.0404005
- Lacuna-Richman, C. (2007). Improving Commercial Possibilities of Non-wood Forest Products from Leyte the Philippines. Faculty of Forestry University of Joensuu Finland.
- Latif, M. (2008). Bamboo species, their distribution, habitat, rehabilitation and uses in Bangladesh. *Document no -1 ,market development of bamboo and rattan products with potentials,Bangladesh Forest Research Institute, Chittagong.*
- Marshall, E., Schreckenberg, K., & Newton, A. (2003). Commercialization of non-timber forest products: First steps in analyzing the factors influencing success. Int Fores Rev.
- Masakorala, P. (2005). The Nature, Problems and Challenges of Handicraft Industry in Sri Lanka. *Proceedings of the 10th International Conference on Sri Lanka Studies*, 129. Retrieved from http://www.slageconr.net/slsnet/10thicsls/10thicslsabsfull.pdf
- MDBRPP/DFRS. (2010). *Review of Developed Western Markets for Bamboo and Rattan Commodities of Nepal*. Kathmandu, Nepal: Market Development of Bamboo and Rattan Products with Potental (MDBRPP) Project, Department of Forest Research and Survey.
- MDBRPP/DFRS. (2011). Review of Traditional Designs and Technologies of Bamboo and Rattan Products in Nepal. Kathmandu, Nepal: Market Development of Bamboo and Rattan Products with Potential (MDBRPP) Project Department of Forest Research and Survey.

Pant, A. (2006). Accessing Competitiveness of Bamboo Sub Sector. GTZ PSP/RUFIN.

- Poudyal, P. (1992). Bamboos- Field Manual for Community and Private Forestry in Nepal.Part II Field Document No 20, HMG/FAO/UNDP, Community Forestry Development Project (Phase II). Kathmandu, Nepal.
- Rana, M., Mukul, S., Sohel, M., Chowdhury, M., Akhter, S., Chowdhury, M., & Koike, M. (2009). Economics and Employment Generation of Bamboo-Based Enterprises: A Case Study from Eastern Bangladesh. *Small-scale Forestry*, 9, 41-51. doi: 10.1007/s11842-009-9100-8
- Selvam, T. (2016). SOCIO ECONOMIC STATUS OF BAMBOO HANDICRAFT WORKERS. Indo – Asian Journal of Multidisciplinary Research (IAJMR), 2(5), 770-774. doi: 10.21276.iajmr.2016.2.5.8
- Sherchan, G., Karki, M., & Karki, J. (1996). Case Study in Extensive Collection, Production, Utilization and Marketing of Bamboo in Eastern Nepal. Beijing, China.: INBAR/IDRC.

Sreekumar, T. (2009). Kalpetta Bamboo Cluster. Uravu-Kerala .

Stapleton, C. (1994). Bamboos of Nepal: An Illustrated Guide.

Storey, P. (1990). Bamboo: A Valuable Crop for the Hills.

UNIDO. (2020). Bamboo processing for Sri Lanka. UNIDO.

UNIDO. (2020). *Bamboo processing for Sri Lanka*. UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION.