

Research Article

A Sustainable Way of Life with Bamboo: The Assamese Experience

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ABSTRACT

This article delves into the viability of bamboo as a means of subsistence for a select group of recipients in the Assam region of Sivasagar. There are six main points in this article. First, a theoretical foundation for making a living is discussed. The second part is a literature review that is selective in nature. The third part of this analysis focuses on Assam, the “homeland of bamboo,” and the many bamboo-based goods that can be found there. In the following paragraphs, we’ll talk about the real winners: the residents of the Demow cluster in Assam’s Sivasagar district. The final section highlights the potential for bamboo development, drawing the attention of planners, activists, and academics alike to its importance in achieving sustainable livelihoods in Assam.

Keywords: Bamboo, Bamboo products, Demow cluster, Sustainable livelihood, Sivasagar district

LIVELIHOOD: A CONCEPTUAL FRAMEWORK

The International Labor Organization (ILO) defines livelihood as “the knowledge, resources, and pursuits necessary for a means of subsistence.” For the purposes of this project, livelihood services for adults and minors of working age include, but are not limited to, the following: Education and training services that equip recipients with the knowledge and skills necessary to access and succeed in more advanced forms of social, financial, and occupational support. Social capital-building services link individuals to like-minded communities with the aim of fostering long-term change. To combat poverty in novel ways, thinkers came up with the concept of Sustainable

Livelihood (SL) in 2001 (Krantz). These were deemed insufficient because they either ignored other key factors, such as vulnerability and social exclusion, or focused primarily on specific expressions of poverty, such as low income. More and more individuals are realizing that they need to pay more attention to the myriad of elements and procedures that either restrict or enable the ability of poor people to maintain themselves in a manner that is economically, environmentally, and socially sustainable.

Traditional poverty definitions and alleviation strategies, such as a focus on increasing people's disposable income, have been criticized for being overly limited. With its emphasis on the myriad elements and processes that either hinder or aid poor people's capacity to make a living in a way that is economically, environmentally, and socially sustainable, the SL idea provides a more cohesive and integrated approach to poverty. The concept was initially proposed during the 1992 United Nations Conference on Environment and Development and the Brundtland Commission on Environment and Development.

The composite concept of a sustainable rural living suggested by Robert Chambers and Gordon Conway in 1992 is most often used at the household level. Having a sustainable way of life means being able to bounce back quickly from setbacks, to keep or improve one's resources and abilities, and to leave such advantages to future generations. If a way of life can absorb and rebound from stressors and shocks, keep or improve its capabilities and assets, and not deplete its natural resource base, then it can be considered sustainable. The SL concept and methodology have been put into practice by the Institute of Development Studies (IDS) and the British Department of International Development (DFID). A revised definition of SL was proposed by the leading proponent Ian Scoones of IDS, who argued that a person's livelihood consists of their skills, assets (including material and social resources), and activities necessary for subsistence. If a way of life can absorb and rebound from stressors and shocks, keep or improve its capabilities and assets, and not deplete its natural resource base, then it can be considered sustainable.

The SL method places a premium on including people in the process of activity identification and, when possible, implementation. It's comparable to the traditional method of Integrated Rural Development, but it doesn't necessarily seek to improve every facet of the poor's daily lives. There are subtle differences in how SL is implemented by UNDP, CARE, and DFID. The United Nations Development Programme (UNDP) provides a programmatic framework for developing integrated support activities to increase the resilience of poor and vulnerable people's livelihoods, whereas the Center for American Progress (CARE) places an emphasis on empowerment as a central aspect of its strategy.

Mainstreaming the basic ideas that poverty-focused development action should be people-centered, responsive, participatory, multi-level, undertaken in partnership, sustainable, and dynamic, the SL method seeks to boost DFID's effectiveness in reducing poverty. The SL Framework is an integral part of DFID's strategy since it provides a holistic perspective on poverty and its effects on the lives of the poor. UNDP, CARE, and DFID all adopt a method called the Sustainable Livelihoods (SL) approach to combat poverty. Physical, ecological, social, and human capital are only a few of the many resources mentioned. By looking at a number of things from a variety of angles, this method sheds light on what drives people into poverty. It offers a practical framework for gauging both immediate and long-term impacts on people's standard of life. However, it does not deal with issues of poverty identification or community power dynamics. The SL method calls for a flexible planning situation, which is uncommon in regional growth agencies. It is necessary to include counterpart employees in the planning process and train them to adopt the technique, although it may be impractical for many local development administrations. Sida has taken the initiative to implement a program that will increase the poor's ability to provide for themselves and escape poverty.

From FAO, one may get a quick guide broken down into eight sections. The purpose of this Rapid Guide is to assist field missions in comprehending the consequences for the design, implementation, and evaluation of specific projects based on how local institutions affect the livelihoods of rural households, especially the poor. The FAO uses the following definitions for a family, a means of subsistence, and SL: The members of a household "eat from the same pot" and have a vested interest in maintaining and enhancing their family's socioeconomic level from one generation to the next. "You can't put food on the table without the skills, material, and social supports to make a living. To be sustainable, a way of life must be robust enough to endure pressures, recover from setbacks, and maintain its capabilities and resources into the future without depleting its natural resource foundation. The Sustainable Livelihoods Framework is a useful tool for understanding the complex relationship between household livelihood systems and the external environment, including both the natural environment and the policy and institutional context.

The SL idea is a more compelling and comprehensive strategy for reducing poverty. The Brundtland Commission on Environment and Development first proposed the idea of sustainable livelihoods, and the 1992 United Nations Conference on Environment and Development expanded on this idea by emphasizing its importance as a broad goal for reducing poverty. The following is a detailed description of a sustainable rural lifestyle that was proposed by Robert Chambers and Gordon Conway in 1992 (Krantz,

2001: 1); it is most often used at the household level. Skills, knowledge, possessions, rights, and labor are all components of a person's means of subsistence. When a way of life can absorb setbacks, bounce back stronger than before, keep or grow its capacity for earning a living, and pass those advantages on to future generations, we say that it is sustainable. Something is also considered sustainable if it has a positive impact on the lives of others, both now and in the future, on a local and global scale (Krantz, 2001: 6). To have a "livelihood" in the social sciences means that an individual, family, or community has access to a source of income and/or a pool of resources that may be bartered for or sold in order to meet basic subsistence requirements. Equipment, land, and other tangible resources can fall under this category as well as data, cultural understanding, social connections, and legal protections (Blaikie et. al., 2004:43). Human rights studies, sustainability studies, and subjects like political ecology all make use of the concept of livelihood. In light of this, the study makes an effort to investigate sustainable livelihoods in Assam using bamboo for various value-added products.

SELECTED LITERATURE REVIEW

According to Konwar (2020), the Multidimensional Poverty Index (MPI) is a tool used to measure poverty in the northeastern states of India. It utilizes the Alkire and Foster (AF) approach and encompasses three dimensions: health, education, and the standard of living, related to the Millennium Development Goals (MDGs). The MPI value was found to be higher in Assam and Meghalaya over the decade (2005-06 to 2015-16). Vulnerability to poverty was estimated to be lower in Mizoram over the decade compared to the all India levels. However, the severity of poverty was higher in two states, Assam and Meghalaya, compared to the all India estimate (8.8%) between 2005-06 and 2015-16.

Assam, as a gateway to Northeast India, remains multidimensionally poor compared to all states of Northeast India. Vulnerability and severity of poverty are higher in Assam over the decades among the Northeastern States. Therefore, it is recommended to implement pro-poor strategies for Assam in the areas of health, education, and standard of living to alleviate multidimensional poverty.

The study aims to analyze the development of MPI, its concept, dimensions, and indicators. The global MPI was created using the multidimensional measurement method developed by S. Alkire and J. E. Foster (AF). In the global MPI, a person is considered MPI poor or multidimensionally poor if they are deprived in at least one-third of the weighted MPI indicators or their weighted deprivation score is equal to or higher than the poverty cutoff of 33.33%.

The Sustainable Development Goals (SDGs) are a set of 17 global goals aimed at achieving a better and more sustainable future for all. The Global Multidimensional Poverty Index (MPI) is related to these goals and comprises three dimensions: Health, Education, and Living Standards. The MPI includes three indicators: Nutrition, Child mortality, Years of schooling, School attendance, and Living Standards.

In 2005-06, the MPI value was highest in Assam, followed by Meghalaya, and lowest in Mizoram. Inequality among the MPI poor is high in Meghalaya, followed by Arunachal Pradesh. If a person is deprived in 20-33% of the weighted indicators, they are considered “Vulnerable to Poverty,” and if they are deprived in 50% or more (i.e., $k=50\%$), they are identified as being in “Severe Poverty.”

Vulnerability to poverty was estimated to be higher in all North Eastern States of India except Arunachal Pradesh (15.3%), Meghalaya (15.4%), and Mizoram (16.0%). Severe poverty was higher in two states, such as Assam (12.2%), and Meghalaya (11.2%) compared to the all India estimate (8.8%).

The incidence of multidimensional poverty was nearly halved over the decade from 2005/06 to 2015/16, with the MPI value declining by 56.53%. The global Multidimensional Poverty Index (MPI) was halved for faster progress in health, education, and income among the poor. The incidence and intensity of poverty among the northeastern states decreased, leading to a reduction in the MPI value.

The Multidimensional Poverty Index (MPI) is a direct method of measuring poverty for international comparison. It replaced the Human Poverty Index (HPI) and showed higher values in Assam and Meghalaya over the decade (2005-06 to 2015-16). Vulnerability to poverty was lower in Mizoram over the decade compared to all India levels. However, the severity of poverty was higher in Assam and Meghalaya compared to the all India estimate (8.8%) between 2005-06 and 2015-16. Assam, a gateway to Northeast India, remains multidimensionally poor compared to all states of Northeast India. Vulnerability and severity of poverty are higher in Assam over the decades among the Northeast States. Therefore, it is recommended to implement a pro-poor strategy in health, education, and standard of living to overcome multidimensional poverty.

Khanikar (2020) asserts that North-East India is a highly potential area for bamboo cultivation, with 90 species recorded, 41 of which are endemic to the region. Assam, also known as the “Bamboo Queen of India,” is rich in forest tree resources, including various species of bamboo and cane. The most economically viable species under the genus *Bambusa* is *Bambusa balcooa*, which is used for construction, frameworks, agricultural installations, baskets, bridges, and paper making.

Bambusa balcooa is a densely tufted species, with culms measuring 15-25 meters in height and 8-16 cm in diameter. It is considered one of the best and strongest bamboos used for construction and building purposes, with immense potential for commercial cultivation. The morphology of *Bambusa balcooa* Roxb includes oblong-lanceolate leaves, scabrous-ciliate margins, and a membranous and broadly triangular inflorescence. The plant has multipurpose utility and is sometimes referred to as the “Female Bamboo.” The state’s forest area covers 34.21% of its geographical area, with bamboo-bearing forests covering 7,238 km². The study highlights the importance of commercial cultivation of this species for both industrial and domestic use. *Bambusa balcooa* Roxb is a bamboo species native to Assam, Bangladesh, India, Laos, Myanmar, Nepal, and Vietnam. It thrives in tropical to warm temperate climates and can be found at altitudes up to 600 meters. The plant grows well in well-drained sandy loam to clay loam soil with a pH of 4.5 to 6.0. During the rainy season, new shoots emerge and mature within 4 years. The species has a rare flowering cycle of 35-45 years.

Propagation of *Bambusa balcooa* can be done through seed or vegetative means, but seed availability is rare. Culms should be selected in their second year of growth, with strong central branches being the best. Cuttings should be taken during the spring season, with careful observation of buds. The nursery bed should provide proper shade, high moisture content, and good drainage facilities. Cuttings should be placed horizontally, covered with fine sand, and kept in moist conditions under partial shade. Fertilization and management of established clumps should include dry farmyard manure or vermicompost, and proper irrigation for the first two years.

Bambusa balcooa is a valuable component of rural landscapes, contributing to increased productivity and sustainability. It is well-suited for agroforestry, as it can be grown in various horticultural systems, including agri-silviculture, silvipastoral, and agri-silvipastoral. *Bambusa balcooa* is most common in home gardens in Assam, where it is grown alongside crops like banana, betel nut, coconut, neem, bael, citrus, and jackfruit. It is also economically viable for raising shade-tolerant crops like pineapple, ginger, and turmeric.

Culm age determination and harvesting are crucial, with young, tender shoots being harvested within 3 weeks after emergence. The culm sheath, bud initiation, branch initiation, color, ring, and hair should be observed for construction purposes. *Bambusa balcooa* has tremendous economic, commercial, and local importance, providing raw materials for construction, pillars, and walls. It is drought-resistant, making it suitable for low rainfall areas. *Bambusa balcooa* is also used in the production of bamboo-based products like charcoal, panels, flooring, pulp, and daily used articles.

Bambusa balcooa is a preferred non-wood forest fiber source due to its mechanical strength, high specific gravity, and long fibers. It is also used in traditional farm devices like Huja, Bang, and Ukon, which are used to carry rice bunches and reshuffle rice straw. The soft juvenile bamboo shoots are popular as food by all tribes and ethnic groups in the region, with medicinal properties preventing cardiovascular diseases, cancer, weight loss, and improving digestion.

The National Mission on Bamboo Application (NMBA) has identified *Bambusa balcooa* as a commercially important edible bamboo species. This species is crucial for household construction and agricultural tools, and is mainly cultivated in homestead gardens. Commercial cultivation of this species contributes to the economic growth of rural village people in Assam. The species is mainly cultivated in homestead gardens, and the focus on commercial cultivation is aimed at enhancing the quality of bamboo products. The species is also used in agroforestry systems, promoting economic growth in rural villages. The species is mainly cultivated in homestead gardens, and its cultivation is a significant contributor to the economic growth of rural village people in Assam.

Bhatta et. al. (2016) have pointed out that wetlands provide a diverse range of ecosystem services that support the livelihoods of many people. However, wetlands are continuously being degraded, and there is scant information on individual wetlands, people's dependency, and their exploitation at a local scale. A case study of the Maguri-Motapung Beel wetlands of Assam, India, assessed wetland ecosystem services, drivers of change, and impacts of those drivers on ecosystem services and people's dependency. The analyses showed a total of 29 ecosystem services, and high dependency on these, with five out of seven livelihood strategies sourced from ecosystem services. Over-exploitation of wetland resources and siltation were reported as major direct drivers of change, with impacts on both ecosystem services and people's livelihoods. Drastic decreases in thatch, fish stocks, fodder, and tourism were observed. This suggests an urgent need for a comprehensive participatory management plan. Actions are needed to maintain the Maguri-Motapung Beel wetlands and the flow of services to sustain people's livelihoods in the area. With an estimated 50% global loss of wetlands in the last century and the loss of 5,000 square kilometers a year in Asia alone, the loss of ecosystem services and livelihood impacts shown in this study may be typical of what is occurring in the region and perhaps globally. Wetlands in South Asia are increasingly important due to their diverse range of altitudes and their role in supporting high biodiversity. In India, the total area under wetlands is estimated to be 15.3 million ha, covering about 5% of the country and supporting 20% of its known biodiversity. These wetlands are also important centers of social, cultural, and

recreational activity, with large numbers of people dependent on their resources for their livelihoods. However, increasing concern has been expressed over the continuing degradation of India's wetlands due to anthropogenic activities such as urban development, agricultural expansion, industrial pollution, and threats such as global climate change.

Approximately 70% of the total area under wetlands in India is under paddy cultivation. Information on individual wetlands and their exploitation at the local level is very limited, and precise information about the values and drivers of changes is required for the conservation and sustainable use of wetlands. Knowledge on wetland ecosystem services, drivers of change, and subsequent impacts specific to regions or areas of concern is essential for ensuring wise use, conservation, and sustainable development. This study aims to identify and assess ecosystem services, drivers of change, and impacts of those changes on people's livelihoods using a case study of the Maguri-Motapung Beel wetland of Assam, India. The study aims to show the scale of changes to ecosystem services and livelihoods that wetlands in the region, and perhaps globally, may be experiencing and the potential consequences for local people. The study's wetland, located in the Indo-Burma global biodiversity hotspot, is characterized by swamp forests, semi-evergreen forests, deciduous forests, and patches of wet evergreen forests. It has an annual rainfall of 2,300 mm to 3,800 mm, with temperatures ranging from 7°C to 35°C. The area is ecologically important with 36 species of mammals, 500 species of birds, 105 species of butterflies, and 108 species of fish. The critically endangered Gangetic River Dolphin has been reported in the wetland when flooded. The area has been declared as an Important Bird Area and Endemic Bird Area, with rare and highly range-restricted species. The wetland is especially rich in fish species, supporting the livelihoods of people living nearby. A case study approach was adopted, and data were collected using both qualitative and quantitative methods. The initial assessment showed that about 40% of the total households depend directly on wetland resources. A total of 101 wetland-dependent households were surveyed, focusing on the ecosystem services used, people's dependency on them, drivers of change, and their impacts on ecosystem services.

The study conducted a series of focus group discussions, stakeholder workshops, and key informant interviews to understand the current state of the Maguri-Motapung wetland ecosystem. The focus group discussions were conducted at the community level in five villages, with an average of 8-10 participants. The participants were selected based on their livelihood strategy and dependency on the wetland Beel. The workshops aimed to understand local stakeholders' perceptions of the wetland's drivers of change and gather suggestions for sustainable conservation and management. Key informant

interviews were conducted with representatives from various organizations, focusing on livelihood strategies and drivers of change. The data was analyzed using SPSS 15.0 software to determine local people's dependency and the impacts of different drivers on the wetland ecosystem. The population of Maguri-Motapung wetland is dominated by ethnic minorities, with an average household size of 4.9 and a literacy rate of 62%. Livestock farming, agriculture, and fishing are the key livelihood options, with less than 10% of the population involved in government employment or private salaried positions. The Maguri-Motapung Beel is a significant ecosystem service in the region, providing various livelihoods to local communities. A total of 29 key ecosystem services were identified through household surveys, focus group discussions, and stakeholder interviews. These services include provisioning (15), regulating (7), supporting (5), and cultural services. Fish is the top-ranked service, followed by tourism, habitats for wild flora and fauna, livestock grazing, and fuel wood collection.

A total of eight livelihood strategies were revealed, with 84% of respondents involved in fishing and agriculture, while others were involved in teaching, business, and labor. Approximately 51% of households are dependent on fishing as their primary occupation. In 2012, 87 respondents collected 44,783 kilograms of fish, earning an average of 7,786,195 Indian Rupees (INR). During focus group discussions, an additional 117 fishermen belonging to 20 groups from surrounding villages were reported to depend on fishing, earning an average of 1000 INR per week per group in 2012. Agriculture, including horticulture and homestead tea cultivation, was found to be the second most important livelihood strategy. Locals were also found to cultivate seasonal crops during the dry season on exposed soil tracts of the wetland. Of seven identified livelihood strategies, five were directly linked to ecosystem services: fishing, agriculture, livestock grazing, tourism, and business such as hotels, guides, and boat services were completely dependent on services provided by the Beel. Tourism employment, such as guiding for bird watching and boat services, is an emerging alternative livelihood option among the young.

In conclusion, the Maguri-Motapung Beel provides numerous ecosystem services that contribute to the livelihoods of local communities. The Maguri-Motapung Beel Wetland in Assam faces eight direct and three indirect drivers of change in ecosystem services, both natural and human-induced. These drivers include the lack of a wetland management plan, population growth, market forces, invasive species, siltation, encroachment, unmanaged tourism, sewage, overexploitation, fish poisoning, and deforestation in surrounding areas. Indirect drivers include the lack of a management plan, population growth, invasive species, siltation due to high flash floods and river cutting, encroachment and illegal agriculture farming, unmanaged tourism, excessive

use of motor boats, sewage and water contamination, overexploitation, fish poisoning, and deforestation. Both direct and indirect drivers of change impact people's dependency on the ecosystems in the area. About 98% of household survey respondents reported a decrease in the availability of material for thatch/bamboo, while 89% reported a decrease in flood control. About 86% reported a decline in fish stocks, and a decrease in tourism and fodder. As ecosystem services are directly related to people's livelihood strategies, changes in ecosystem services showed impacts on people's dependency, especially in fishing and agriculture. Although only 13% reported a decrease in irrigation water, about 42% reported negative impacts on their agricultural outputs. The Maguri-Motapung Beel Wetland faces significant threats to its ecosystem services and people's dependency on them. Addressing these issues is crucial to ensure the long-term health and sustainability of the ecosystem. Over-exploitation is a major reason for a 57% decline in fish stock, 50% in tourism, and a 24% decrease in thatch/bamboo/rattan collection. Siltation negatively impacts flood control by 68%, fish production by 42%, fodder collection by 38%, and bamboo/thatch/rattan collection by 37%. Flooding is reported as a natural driver of change that negatively impacts people's livelihoods, causing a decrease in fodder by 40% and thatch/bamboo/rattan production and collection by 58%.

Both direct and indirect drivers of change impact ecosystem services and people's dependency on the ecosystems in the area. About 98% of household survey respondents reported a decrease in the availability of material for thatch/bamboo, while 89% reported a decrease in flood control. About 86% reported a decline in fish stocks, and a decrease in tourism of 75% and fodder of 66%. Changes in ecosystem services showed impacts on people's dependency, especially in fishing and agriculture. The vulnerability of wetland communities to rapid changes in the supply of key ecosystem services is of concern elsewhere. According to Chakraborty and Barman (2014), India, one of the fastest-growing economies in the world, faces a significant challenge in its rural hinterland. 69% of the population lives in rural areas, and most depend on agriculture for their livelihood. About 7 crore people are without employment, leading to continuous migration from rural to urban areas for better employment opportunities and living standards. The pace of rural industrialization in Assam has not been satisfactory, with the state heavily dependent on agriculture. A study conducted in the Sonitpur district of Assam based on data collected from 288 entrepreneurs through structured questionnaires found that entrepreneurs were primarily motivated by the need for self-employment, eagerness to make money, and the need for independence. The study also provided insights on the impact assessment of EDP on rural micro-entrepreneurs in the district.

Rural entrepreneurship is defined as self-employment programs exclusively meant for rural people, establishing industrial and business units in rural areas. It can take place in various fields such as business, industry, and agriculture and acts as a potent factor for economic development. Rural entrepreneurs can be broadly classified into Agricultural Entrepreneurs, Micro Entrepreneurs, Small Business entrepreneurs, and Rural Artists. The study of Ajit Kanitkar (1994) aims to understand the emergence of successful entrepreneurs and owners of micro-enterprises in rural India. Based on case studies of 86 village-based entrepreneurs, the article examines the socio-economic profile of the entrepreneurs, their motivation for shifting from an agriculture-based occupation to a non-farm activity, their approach to raising resources for their enterprises, and the factors that facilitate the entry of village-based entrepreneurs into business activities. Orhan and Scott (2001) surveyed 25 women entrepreneurs to explore the reasons that motivate them to enter into business. They found that motivating factors include the environment, push factors, and pull factors. In Greece, women were mostly motivated by pull factors like self-fulfillment, the need for creativity, and independence. Mishra and Bal (1997) conducted an empirical study on entrepreneurial motivation in seven districts of Orissa, finding that financial, institutional, cultural, political structure, overall socio-economic background, government policies, individuals' preferences, and willingness were responsible for entrepreneurial activities. Sarri and Trihopoulou (2005) examined personal characteristics and motivations of women entrepreneurs in Greece, finding that high education levels, marriage, having children, and a tendency to enter into business in old age were key motivating factors. Mishra and Bal (1997) found that financial, institutional, cultural, political structure, overall socio-economic background, government policies, individuals' preferences, and willingness were responsible for entrepreneurial activities in any country at any time. Kaippachery (2005) analyzed the impact of economic reforms on rural small-scale enterprises (RSSEs) in Kerala, finding that the reforms had a negligible impact on employment, earning capacity, and the availability of raw material. To support economically unsustainable RSSEs, the study suggested developing rural financial markets, trade fairs, advertisement, and displays to improve the marketing of rural industrial products, cost reduction, improvements in product quality, and the dissemination of market information to customers. Rural entrepreneurship development programs (REDPs) are an efficient instrument in creating income and employment opportunities for rural youth, especially women in rural and semi-urban areas. Jyoti Kumar and Lalhunthara (2012) found that education, experience, age, and family play an important role in shaping entrepreneurial ambition, with nearly one-fourth of entrepreneurs being females.

This study aims to examine the motivational factors of rural micro and small-scale entrepreneurs in the Sonitpur district of Assam. The research is based on a total

population of 1150, with 288 rural entrepreneurs selected through a simple random sampling method. The data was collected from primary and secondary sources, including interviews with selected rural entrepreneurs and published data in books, journals, magazines, and websites. The study found that 32.3% of rural entrepreneurs started their enterprises as self-employed, while 17.4% started their enterprise to make money, 14.2% to lead an independent life, 11.4% to continue the family business, 7.6% to be dissatisfied with their current job, 5.6% to earn social prestige from society, 4.9% to utilize technical and professional skills, and 3.1% to be inspired by success stories of other entrepreneurs. Motivators play a significant role in the establishment of any enterprise, as they provide ideas about how the business should be started. Motivators can be individuals, relatives, friends' parents, or spouses who motivate entrepreneurs to set up an enterprise. The analysis of various motivators shows that 37.8% of rural entrepreneurs were self-motivated, 19.8% were motivated by family members, 16.5% by their spouse, and 14.9% by friends.

The study concludes that entrepreneurship is the result of encouragement and active support from a spouse, friends, relatives, and family members, apart from individual initiative. The findings suggest that various entrepreneurial development programs and policies are inadequate in motivating rural entrepreneurs. The selection of a particular line of activity is a crucial decision for the ultimate success of an enterprise, as it requires expertise and the implementation of the right policies and planning. Micro and small industries contribute significantly to productivity and quality, with these sectors now providing 40% of the natural gross domestic product. A study was conducted to examine the reasons that influenced rural entrepreneurs in choosing a present line of economic activity. The main reasons for choosing an enterprise include ease to start a business, a higher margin of profit, less competition, easy marketability of products, previous experience, and workers easily available. However, selecting a present line of activity based on easy entry/start-up was not a sound one, as hesitation could lead to long-term consequences. The location of an enterprise is also a key factor, with 22.9% of rural entrepreneurs choosing the present location in the Sonitpur district of Assam. The factors considered included hometown, resources available at a lesser cost, availability of raw materials, non-existence of similar units, availability of labor, nearness to market availability of plots, and government incentives. Initial sources of finance to start the business are also important, with 44.8% of rural entrepreneurs raising finance support from family members, 40% from commercial banks, 8.4% from government agencies, and 6.9% from money lenders. Family support indicates confidence in the capabilities of the rural entrepreneur, profitability, preparedness to risk savings, and shaping the entrepreneur's new career.

The selection of a present line of activity by rural entrepreneurs is influenced by various factors, including ease to start a business, location, initial sources of finance, and motivational factors. The study aimed to understand the major expectations and fulfillment of rural entrepreneurs from Entrepreneurship Development Programmes (EDPs). The results showed that rural entrepreneurs in the Sonitpur district had more than one expectation from the programs. These expectations included knowledge about starting an enterprise, MSME, finance, assistance in selecting a project, marketing support, technical know-how, grant of subsidy, management, incentives, and project report. Out of 157 respondents, only 28% admitted that training helped them in setting up an enterprise, 45% satisfied to some extent, and 30% not satisfied at all. Out of 157 respondents, 42% admitted that training helped them in getting knowledge about MSME, 34% satisfied to some extent, and 24% not satisfied. In terms of project selection, only 17% gave credit to the training organization, 55% satisfied to some extent, and 48% not satisfied at all. Most respondents felt that the emphasis remained on imparting theoretical inputs and practical tips, leading to dissatisfaction. Out of 157 respondents, 54% were satisfied with knowledge about subsidy schemes, while 41% felt that training organizations were not able to provide information about various schemes. Out of 157 respondents, 25% admitted that training helped them acquire knowledge about management, and satisfaction was higher than those who felt training was insufficient for acquiring knowledge about incentives. In terms of project report preparation, only 25% of respondents were satisfied, and 41% did not know how to prepare it. Some respondents expressed language problems, which could affect their understanding of the lectures given by resource persons. Entrepreneurship is a result of interaction between individuals, environment, and socio-cultural factors. The government is making efforts to instill entrepreneurship among its people, as it is a key way to improve the socio-economic status of rural entrepreneurs. To protect and enhance demand potentiality, suggestions can be made for rural entrepreneurship, such as providing finance, knowledge, technical expertise, managerial advice, and marketing support. To foster an entrepreneurial environment in rural areas, organizations should organize camps and encourage continuous learning. Success stories of entrepreneurs can also facilitate entrepreneurship, and success stories should be introduced to those who have not completed high school. Training institutions like Institutes of Entrepreneurship Development (IEDS) and Centers for Entrepreneurship Development (CEDS) should be established to organize training programs in rural areas. Furthermore, the formation of village development councils at the village level should be established to discuss and advocate for development issues. Post-training services should be provided to trained entrepreneurs to ensure sustainable activities. The Rural Entrepreneurship Development Bank of India should also be formed to provide finance, knowledge, technical expertise, managerial advice, and marketing assistance.

The study by Parkash et. al. (2019) investigates the diversity and distribution of Endomycorrhizae and dark septate endophytes in economically important bamboo species in Assam, India. The genus *Bambusa* Schreb. is commonly found in the north-eastern region of India. Four bamboo species were found to be locally economically important, and rhizospheric soil and root samples were collected for screening of dark septate endophytes (DSE) and arbuscular mycorrhizal (AM) colonization. Quantitative analysis of root samples revealed the presence of all three types of endomycorrhizal root infection/colonization, namely hyphal, vesicular, and arbuscular. Dark septate endophytic infections were also observed in all bamboo species. The genus *Glomus* is the most dominant, with 17 species (61%), followed by *Acaulospora* with 7 species (25%), *Entrophospora* with 2 species (7%), *Scutellospora* with 3.5%, and *Gigaspora* with 1 species each. The distribution of AM fungi was highest in *B. bamboos* (67.7%), followed by *B. pallida* (19.4%), *B. tulda* (11.1%), and least in *B. nutans* (2.8%). Bamboo resources have been considerably declining due to exploitation, shifting cultivation, gregarious flowering, and extensive forest fires in the natural habitats. Further microbial-based applied research is needed to protect dwindling natural bamboo resources and consider AMF bioinoculants in future management practices to maintain diminishing ecosystems.

The study focuses on the isolation of arbuscular mycorrhizal (AM) spores from various plant species in Assam, North East India. The spores were collected using wet sieving and decanting techniques, and then transferred to Whatman filter paper. The spores were identified using conventional morphological characteristics and keys provided by Schenck and Perez, Morton, Benny, and Mukerji. Dark septate endophytes (DSE) are a group of root-inhabiting fungi that colonize living plant roots without causing negative effects. They have been reported in connection with 600 plant species, including non-mycorrhizal ones. In India, bamboo, a significant forest resource, plays a vital role in the rural financial system. Inoculations of different bamboo species with bio-fertilizers, including arbuscular mycorrhizal (AM) fungi, have been shown to significantly increase plant growth and yield under varying conditions. The study aims to enumerate the endomycorrhizal diversity associated with economically important bamboos in Assam, including *Bambusa bambos* (L.) Voss, *Bambusa tulda* Roxb., *Bambusa pallida* Munro, and *Bambusa nutans* Wall. ex. Munro. The plant species were collected from three sites in Jorhat district, Assam, and the study aims to understand the endomycorrhizal diversity associated with these economically important bamboos.

The study aims to provide insights into the endomycorrhizal diversity associated with various economically important bamboo species in Assam, North East India. The study analyzed root samples from four *Bambusa* species collected in three villages in Jorhat

district, Assam. The samples were screened for Dark Septate Endophytes (DSE) and Arbuscular mycorrhizal (AM) infection/colonization. Quantitative analysis revealed the presence of all three types of endomycorrhizal root infection, namely hyphal, vesicular, and arbuscular. Dark Septate Endophytic infections were also observed in all bamboo species. The root colonization percentage varied considerably among species, possibly due to the development of VAM in roots controlled by host nature and fungus-root symbiosis. The host's reaction to penetration and proliferation of the fungus in roots is influenced by the presence of intracellular haustoria, which leads to the development of the most specific modifications in host cells. The occurrence of heavy mycorrhizal infection could be attributed to nutrient stress and intense competition between surrounding plant species. The fibrous root systems of early colonizing herbaceous species that occupy the site may also have contributed to the high level of infection, allowing better contact between the roots of different plant species and thus helping to spread the infection. Qualitative analysis revealed that the endomycorrhizae found in the rhizospheric soil predominantly belong to five genera: *Glomus*, *Acaulospora*, *Gigaspora*, *Scutellospora*, and *Entrophospora*. *Glomus*, with 17 species (61%), is the most dominant genus, followed by *Acaulospora* with 7 species (25%), *Entrophospora* with 2 species (7%), and *B. tulda* (70%).

Bamboo species in North East India have been found to have a high distribution of mycorrhizal (AM) fungi, with the highest concentration found in *Bambusa* species (67.7%), followed by *Bambusa pallida* (19.4%), *Bambusa tulda* (11.1%), and *Bambusa nutans* (2.8%). About fifteen AM species were recorded and isolated from the rhizosphere of naturally growing populations of bamboos. Eight AM inoculants significantly increased shoot length in bamboos. In *Bambusa tulda*, four species belonging to three genera of AM were isolated, while in *Bambusa pallida*, eight species were isolated, two belonging to *Acaulospora* and the rest to *Glomus*. Only one species of AM fungi belonging to the genus *Glomus* was isolated from bamboo nutans. However, Jamaluddin et. al. (2001) reported a significant increase in growth and biomass of bamboo nutans after inoculation with AM inoculum obtained from the rhizosphere of field-grown plants of bamboo nutans. The diversity of AM spores and endophytes colonization in bamboo from North East India has been studied extensively, with various studies focusing on the metabolism of vesicular-arbuscular mycorrhizas and their potential for exploiting them in agriculture. The occurrence of mycorrhiza in crops is affected by soil fertility, and the occurrence of mycorrhiza in crops is affected by soil fertility. This study investigates the impact of various types of vesicular arbuscular mycorrhizal (VAM) inocula on the growth and biomass of bamboo species. The research found that better nutrient and water uptake leads to increased bamboo biomass. All bamboo species were infected by endomycorrhizae under natural

conditions, but their population and root infection varied considerably among species. Bamboo, being a fast-growing plant, requires more nutrients during the initial stage of seedling establishment, and the amphibian mycorrhizal (AM) fungal symbiosis might play a vital role by supplying nutrients to the host plant. The results showed that all target plant species are highly dependent on mycorrhizal associations for its survival, growth, and development. Therefore, the inoculation of VA mycorrhizal fungi at the time of plantation may be beneficial as the phosphorus requirement of bamboo can be optimized through AM inoculation. The study was supported by the Indian Council of Forestry Research and Education, Project No.: RFRI/2015- 16/SFM-1, and the authors are thankful to The Director, Rain Forest Research Institute (ICFRE) for providing all necessary facilities. References include Allen (1992); Bonfante-Fasolo (1984); Caldwell, Jumpponen et. al. (2000); Cruz and Husain (2008); Currah and Tsuneda (1993); *Phialocephala fortinii* (Hyphomycetes, Mycelium radialis atrovirens) in culture, Das and Kayang (2010), Arbuscular mycorrhizal fungi and dark septate endophytes - are they mycorrhizal? and Nemeček and Meredith (1981).

The study by Bordoloi et. al. (2020) explores the adoption of vermicompost technology for livelihood improvement among farmers in the Sivasagar District of Assam, India. Vermicompost is a highly nutritive and powerful plant growth promoter and protector, produced by using earthworms to eat and digest farm waste. The fine granular peat-like end product, vermicompost, contains elevated levels of nitrogen, phosphorus, potassium, micronutrients, microflora, and enzymes compared to traditional compost. The secretions of earthworms in vermicompost serve as plant growth stimulating factors. Awareness of vermicompost production was created among the rural population of Sivasagar district through Front Line Demonstration (FLD) programs. The study was conducted with 100 farmers, with female farmers being more interested in adopting vermicompost (78.4%) than male farmers (55.6%). Independent variables such as gender, age, education, caste, income, and landholding of farmers were important for the adoption of vermicompost technology. The study found that KVK, Sivasagar, was able to motivate middle-aged and middle school pass farmers to adopt the technology with the highest benefit-cost ratio (3.52). There is a need to popularize vermicompost technology among young farmers and SC and ST communities for greater upliftment of the farming community. The study found that the majority of respondents participated in the vermicompost Front Line Demonstration, with male farmers being the most motivated. However, after the demonstration, the majority of respondents adopted vermicompost, with female farmers being the most motivated. This contradicts Das et. al. (2016) results, where adoption was found to be maximum among male farmers. The majority of farmers aged 35 to 50 years participated in the FLD programs (49%) and adopted the technology (73.5%), followed by the age group 25 years to

35 years (70.4%). Financial burden may be the reason for adopting vermicompost among this age group. Middle school pass beneficiaries adopted the technology the most (70%), followed by the high school category (65.8%). The study also found that the highest participation was observed among the OBC category (42%) and SC category (63%), as Sivasagar district is dominated by OBC population. The economic benefit of low-cost vermicompost units was recorded in the form of the benefit-cost ratio (3.52). The study concluded that female farmers were more interested in adopting vermicompost than male farmers. Independent variables like gender, age, education, caste, income, and landholding of farmers were important for the adoption of vermicompost technology. The study suggests that there is a need to popularize vermicompost technology among young farmers and SC and ST communities for greater upliftment of farming communities. Earthworms play a crucial role in the breakdown of organic waste, transforming it into vermicomposts and animal feed protein. This technology has been adopted by various farmers, including those trained in the KVK system. Studies have shown that the use of earthworm cast on protein synthesis in *Agaricus bisporus* has positive effects on protein synthesis. Additionally, the use of turkey litter vermicompost has been shown to improve the growth and yield characteristics of paddy. Vermicompost has also been used as a substitute for peat in potting media, affecting germination, biomass allocation, yields, and fruit quality of tomato varieties.

ASSAM: HOME FOR BAMBOO

Assam is home to a wide variety of bamboo and cane species, and its forests are abundant in these sylvan resources. Assam's culture and economy heavily rely on bamboo, a raw material with remarkable adaptability. However, the forests in the districts of Mizo Hills, Cachar, Mikir and North Cachar Hills, Nowgong, and Lakhimpur deserve special recognition. When traveling through the hill districts, visitors may be surprised by the abundance of bamboo and cane fields they encounter. The Muli (*Melocanna bambusoides*), Dalu (*Teinostachyum dalloa*), Khang (*Dendrocalmus longispatus*), Kaligoda (*Oxytenanthera nigrociliata*), and Pecha (*Dendrocalmus Hamilton-ii*) are all economically valuable bamboo species. Both the Muli and the Dalu are extremely valuable commercially; the former is used for pulping, building, and fencing; the latter is used in the mat and basket trade. A significant number of artists around the state specialize in manufacturing bamboo and cane products, making it one of the most widespread forms of handicraft in the country. Since no machinery is required, it can be done at home. Products made from cane and bamboo are versatile and common in every household. This sector has established itself as one of the state's premier handicrafts. Farmers can earn extra money by making baskets and furniture

in their spare time, and a select group of highly skilled artists can make a living selling only the finest ornamental items.

BAMBOO: BACKGROUND AND ORIGINS

There are no documented sources that can pinpoint the exact age, history, or origin of this art form in Assam. However, it is reasonable to infer that the art has been in use since the early days of civilization. There is a prohibition on cutting bamboo on “auspicious days” because of its special significance in early Assam. It is commonly held that bamboo is religiously significant and possesses fortunate qualities. Even during the reign of Assam’s ruler, Bhaskara Varman (early 7th century A.D.), a passion for the state’s cane and bamboo goods can be gleaned from the following passage (Choudhury, 2015). In ancient texts, the colorfully adorned sital patis (cool mats) favored by the affluent are mentioned. Cane was the typical material for mats. Cane was plentiful in the Assam jungles, as attested in the works of classical authors. Canes were planted and used as bridges in the hills and marshes that Ptolemy says are to the east of Serica, which we have located to be Assam. The ‘Harshacharita’ also provides evidence that other cane products were manufactured, specifically cane stools. Bamboo’s cultivation and varied applications are common knowledge. Bana is further evidence of the sophistication of this art form. He claims that Bhaskara sent Harsha with “baskets of variously colored reeds,” “thick bamboo tubes,” and “bamboo cages” for a variety of birds. All of these things show that, like the craftspeople in other areas of India, Assamese society has a long history of practicing and developing a wide range of industrial arts. The plains districts of the state produce a wide range of goods, including bamboo mats, sital pati, baskets of varying sizes and shapes, winnowing trays, sieves, japi, or chatta, and a number of different types of fishing instruments. Split bamboo and fine flexible cane strips are used to create the various cane and bamboo goods used around the home.

Bamboo and Cane Products Manufactured for Domestic Purposes

A brief description of some cane and bamboo products manufactured for domestic purposes is given below:

Chalani (sieve): It is woven with fine bamboo slips in a criss-cross way, leaving open spaces between the different slips as required for various purposes. The “chalani” is a round-shaped disc-like object, and its diameter varies from 1½ ft to 3½ ft. It is used for sieving rice, paddy, tea leaves, etc., and also for washing fish.

Kula (winnowing fan): It is made from flat bamboo slips for winnowing purposes in different sizes and shapes. A twilled design is used for a “kula,” and the edge is

reinforced by fixing two sets of one-inch wide bamboo pieces wrapped in flexible cane strips.

Khorahi (small basket): Khorahi is made from fine bamboo splits for washing rice, vegetables, fish, etc. It is a small basket with provisions for allowing water and dirt to pass out. The Khorahi is woven in a plain and square form but is gradually bent into a round form during the final stitching with flexible cane slips.

Dukula / Tukuri (Big basket): The shape of a dukula is similar to that of the Khorahi, but the size and preparation process are slightly different. The desired shape of a “tukuri” is achieved by bending the bamboo splits that form the warp gradually while weaving with the weft. The edge is strengthened by attaching two or four flat bamboo strips. The size of a “dukula” or “tukuri” is much larger than that of the Khorahi and is used for carrying and storing paddy, rice, etc.

Dala (bamboo tray): Dala is made from flexible bamboo strips in a twilled design. The dala’s shape resembles a disc with various sizes for different purposes. The edge around the dala is stitched in the same way as that of the edge of a tukuri or dukula, but the bamboo rims used on the dala’s edge are about 1½ wide. The dala is especially used for rearing silkworms and for winnowing, among other domestic purposes.

Duli (Assamese) / Tali (Bengali) – Big Basket: The “duli” or “tali” is used for preserving paddy. The weaving process is almost the same as that of a tukuri, but the bamboo splits used are flatter and more flexible. The dulis are much larger than the tukuri, and their shape is slightly different.

Doon (Assamese) Kathi (Bengali) - Measure: It is prepared in an almost conical shape with fine bamboo strips for measuring rice or paddy. Its holding capacity varies from 2 seers to 3½ seers, depending on the location. A ring is attached at the bottom to allow it to stand on the ground.

Dhol (big measure): The process of preparing a “dhol” is similar to that of the doon. However, it is much larger in size and is used for measuring paddy only. In the Cachar district, it is known as “pura.” These are not generally bought or sold in the markets.

Fishing Implements: Various fishing contraptions are prepared from cane and bamboo in different parts of the state. Some of the commonly used fishing implements like Jakai, Khalai, Dori, Chepa, Paran, Jhuti, Hogra, etc., are briefly described below:

Polo: It resembles the shape of a dome with a short stem of about 63 in diameter, open at the top. The diameter at the bottom varies from 2 ft to 3½ ft, and even up to 4 ft, with a height ranging from 2 ft to 3 ft. Polo is prepared from small bamboo

strips fastened with fine and flexible cane slips. Polo is used for fishing in shallow water. The person using it holds it by the side of the stem, presses its rim into the mud, then pulls it back and lifts it above the water level. Again, they press it as before while moving through the water. When they catch a fish, they put their hand inside through the stem to retrieve it. Julki is a smaller version of the polo prepared in the same fashion.

Jakai: The “jakai” is a species of wickerwork shovel that is either dragged along the bottom or placed on the water bed to catch small fishes which take refuge in it when the weed is trampled. It is made with bamboo slips known locally as “dai,” and “jati” bamboo is specially used for making this particular implement.

Khalai: The “khalai” is also prepared with bamboo strips. The strips used for the weft are very long, while those for the warp are short. The “khalai” is woven in the shape of an earthen “kalasi” or pitcher. It is used for temporarily holding fishes during hand-net fishing.

Chepa: The Chepa is made from prepared bamboo rods of varying sizes. These rods are woven in a roundish fashion with jute string or soft cane slips. A bamboo-made valve, locally known as “par” (Bengali) and “kal” (Assamese), is fitted in the middle of the chepa to allow the fishes to enter with no means of escape.

Dori: Fishermen in the rural areas of the state manufacture various types of dories. A “dori” is generally rectangular and is made from small bamboo strips woven with flexible cane slips. A trap is fitted with a “dori” in such a way that a bamboo-made screen extends inwards from either side of the oval mouth, and the pointed splints on the two sides interlock together.

Parans: These are various cages or basket traps made from bamboo splits used for catching fishes. There are two kinds of “parans,” namely (i) “uba paran” (vertical cage) and (ii) “pora paran” (horizontal cage). They have one or two valves or trap doors through which fishes can be easily caught. All these implements mentioned above are generally used for catching fishes in shallow water. In addition to these contrivances, there are other implements made from bamboo and cane used for catching fishes in deep waters. These are locally known as gui, jhuti, dingaru, thupa, hogra, etc.

Plain Basket, Assam (Used by the Bodos to keep catch while fishing)

Bamboo Mats: Bamboo mats of various types are manufactured on a commercial basis in the districts of Nowgong, Darrang, and Cachar. Large-scale commercial production can be seen in the Karimganj sub-division of the Cachar district, where mats are locally known as ‘dhara,’ ‘jharria,’ or ‘darma,’ and thousands of people are engaged in this

craft. In the districts of Darrang and Nowgong, such mats are produced from the dried stalks of various kinds of marshy plants and weeds. In the district of Cachar, they are produced from bamboo slips.

An observation of the manufacturing process, as recorded here, is from a village in Cachar. The process begins by cutting long bamboos into several parts according to the desired length of the mats to be woven. Each part is then split into several thin pieces, with the breadth of these pieces being about 1/8" to 1/16". Splitting is generally done using a 'hatu dao' (small bill hook), which is fixed on a 'jak' ('V' shaped wooden frame). The soft portion of the bamboo split is then removed with a 'dao,' resulting in flat, flexible bamboo strips used for manufacturing mats.

Once the bamboo strips are ready, the artisans commence the weaving process. In weaving bamboo mats, a twilled pattern is typically followed, with three strips taken at a time and woven breadthwise one after another. The same process is repeated. After weaving is complete, all four sides of the mat are twisted slightly and tied up with a long bamboo strip to frame the outer edges, which keeps the woven strips compact.

This craft is carried out by all members of the artisan's family, with men preparing the bamboo strips, and women and children weaving the mats. Bamboo mats have a wide range of uses, including construction of temporary walls and sheds, large pandals, roofing for country boats, dwelling houses, and domestic purposes. Additionally, large mills and factories require mats for various purposes.

SIVASAGAR DISTRICT FOR BAMBOO PRODUCTS – SELECTED BENEFICIARIES

The production of bamboo products is primarily a rural industry seen in Sivasagar district, Assam. It is commonly pursued by agriculturists in their spare time as a subsidiary occupation. The heavy concentration of this industry in rural areas can be attributed to the availability of bamboo in villages and the high demand for various bamboo products, such as mats, baskets, fishing contraptions, in every rural household in Sivasagar. The essential equipment required for this industry, like dao and knife, is invariably found in every family. Manufacturing activities are generally carried out outdoors, and all members of the family, both male and female, take part in it. However, male members of the family predominate. Most of the products manufactured in these households are meant for domestic use, with only a small percentage sold in the markets. Professional artisans who follow this trade as a full-time occupation sell their products in the markets.

Cluster Demow

The potential for making bamboo and cane products on a commercial basis is quite significant in the District. There is a good demand for its products both within and outside the country from the Demow Cluster. ‘Sitalpati,’ a type of mat, is perhaps the most notable and popular product among the handicrafts in the Demow Cluster in Sivasagar District, Assam. Unlike other kinds of mats woven in Northeast India, Sitalpati is more expensive. The word ‘Sital-pati’ means cool mat. The makers are usually Kayasthas, not from a traditional craftspeople caste. The raw material used is the Murta cane (*Marantadichotomus*), which grows in marshy and water-logged areas and is found abundantly in choked-up tanks and damp hill slopes. The production of Sitalpati is purely a household industry, with men preparing the cane strips and women doing the weaving work. The highest concentration of artisans pursuing this craft is noticed in the district of Sivasagar.

Alina Momin a women of 38 years lives with her husband Jefar Sangma and her only child at Pachim Bosti, Hologuri, Sivasagar. She is a Graduate holder. She is presently a member of Hana SHG, since 2008. She has taken in training Bamboo Jewellery and Mat Based Product Waving and Product Making and now she is making and earning from the same, even though she is trained as a Mater trainer and now training other such artisans/women in different parts of the state.

She has been working in bamboo sector since 2020 and earning a monthly amount of 10000 to 15000. The “Sale of Articles of Rural Artisans Society” in short (SARAS) is a distinctive initiative which aim at providing the platform to the rural artisans, to showcase their skill & products, raise awareness amongst urban customers on rural livelihoods initiatives and also develop a market link. She had participated with her products and able to earn around 25000 in the overall SARAS Fair, 2022-23. She also adds, “From the exposure opportunities and trainings provided by ASRLM and TRIBAC, they have become very brave and confident about themselves and are able to brought this wave of change in their”. Now she not only earning for herself but also able to support her husband and educate her child for better future.

Rahana Begum, daughter of Tazul Hussain and Sorifon Begum, is a 36-year-old woman who lives with her husband, Afirudin Ali, and their two children in Bokota Borbam, Jututing Gaon, P.O. Nemuguri, Pin-78567. She has successfully completed her HSLC qualification. Rahana has been a member of Nandini SHG for the past 7 years.

She began working with bamboo in 2019 and believes that by adding a modern twist to their creations, she can contribute to better household income through these products. She has received training in Bamboo Jewelry making and now sustains her livelihood

by creating bamboo jewelry, earning an amount of 15,000-16,000 per month. The training she received, coupled with her persistent effort and dedication to her craft, has been the cornerstone of her success.

She shares, “Earlier, women from our community were very shy and hesitant to engage in conversations with outsiders. However, thanks to the exposure opportunities provided by ASRLM and TRIBAC, they have become more courageous and self-assured. Knowledge and awareness have ushered in this wave of change, not only in me but in several other women like me.”

Now, Rahana not only supports other women artisans but has also achieved financial independence. Her work also involves selflessly contributing to the betterment of the larger women’s community.

With great pride, she expresses, “Now, I am capable of single-handedly covering the education expenses of my son. I owe my current status to the training provided by ASRLM and TRIBAC, and I am profoundly grateful to them for instilling this confidence in me.” Today, Rahana Begum stands as a community leader in her village and serves as an example for numerous women like her.



Soroj Borgohain, daughter of the late Sunaram Phuka and late Suijo Phukan, resides with her husband, Mr. Biplab Borgohain, and their three children. She is a 37-year-old woman from the village of Gohain Gaon, Nemuguri, Sivasagar, Pin: 785674. She has completed her higher secondary education and has been a member of Surujmukhi SHG since 2011. Soroj has received training in Bamboo Mat-Based Products and is now capable of running her own business in mat-based products, as well as some sustainable and traditional items. She earns around 8,000 to 11,000 per month, depending on order demands.

She adds, “It took some time for me to transition from my old method of making household items to the new one. At first, it was surprising that a modern method like bamboo weaving worked better. It’s not to mention it’s easy and inexpensive, making

it accessible. I thank ASRLM and TRIBAC for providing me with training on innovative concepts of handicrafts, where I learned the selection and treatment process of bamboo, new ways to handle fungus and diseases, and the proper timing for each step in the process.”

She further shares, “I learned about various livelihood options for women through this project. Above all, I learned the right processes for bamboo-based products and their demand in the market. I used bamboo in traditional ways for household purposes, and most of the time, we used to burn it as waste.”



CONCLUSION - SCOPE FOR BAMBOO DEVELOPMENT

The primary raw materials for the industry, namely bamboo and various types of cane, are abundantly available throughout the state. This industry requires little to no investment and can be pursued by anyone as a supplementary occupation within a household. As such, the industry has significant potential for development, and new products tailored to modern preferences can be manufactured from bamboo and cane. Developing market intelligence is crucial to meet consumer market needs. The State Government Emporia are also working to promote a few artistic and decorative cane

Appendix-I: Glossary

Chalani	Sieve
Kula	Winnowing fan
Khorahi or dhusain	Small bamboo basket
Dukula or Tukuri	Big bamboo basket
Dala	Bamboo tray
Doon or kathi	Measure
Dhara, dharia or darma	Bamboo mat
Japi or chhata	Bamboo and leaf head-gear
Sital pati	Cool mat
Patikar	Cool mat maker

and bamboo products outside the state. To organize the unorganized and scattered handicraft artisans, the Government of Assam has launched a scheme for the registration of handicraft artisans and handicraft units.

Appendix-II: Photos

Soroj Borgohain:

Bamboo Mat based Boxex are Natural & Eco-friendly – Woven with bamboo sticks and cotton threads. Bamboo grows very fast, is bio-degradable and hence is a renewable material. A non-plastic option for storing your rings, *necklace*, *earrings*. These *boxes* can be used for storing a variety of things like *jewellery*, stationery.



Images of artisans working on various types of bamboo Mat Based Boxes.

REFERENCES

- Bhatta LD, Chaudhary S et. al., 2016. Ecosystem Service Changes and Livelihood Impacts in the Maguri-Motapung Wetlands of Assam, India, *Land*, Vol. 5, No. 2, pp. 15–15. doi:10.3390/land5020015
- Bordoloi A, Bora R et. al., 2020. Adoption of Vermicompost Technology for Livelihood Improvement of Farmers in Sivasagar District of Assam, India, *International Journal of Current Microbiology and Applied Sciences*, Vol. 9, No. 2, pp. 104–108. doi:10.20546/ijcmas.2020.902.013
- Chakraborty D and Barman R, 2014. A Study on Impact of Motivational Factors on the Growth of Rural Entrepreneurs of Assam, *Iosr Journal of Business and Management*, Vol. 16, No. 3, pp. 71–80. doi:10.9790/487x-16357180
- Choudhury PC, 2015. The History of Civilization of the People of Assam, 1959. Facsimile Publisher.
- Khanikar R, 2020. *Bambusa balcooa* Roxb: A farmer's species of choice in Assam, *International Journal of Advanced Scientific Research and Management*, Vol. 5, No. 9, p. 122. doi:10.36282/ijasrm/5.9.2020.1755
- Konwar P, 2020. The Multidimensional Poverty in the North Eastern States of India, *Epra International Journal of Research and Development*, pp. 89–92. doi:10.36713/epra4639
- Krantz L, 2001. The Sustainable Livelihood Approach to Poverty Reduction - An Introduction. SIDA: Swedish International Development Cooperation Agency.
- Lokho K and Narasimhan D, 2019. Bamboo - The 'Timber' of Mao-Naga Community, *Ethnobotany Research and Applications*, Vol. 18, pp. 1–10. doi:10.32859/era.18.27.1-10
- Parkash V, Handique L et. al., 2019. Diversity and Distribution of Endomycorrhizae and Dark Septate Endophytes of some Economically Important Bamboos of Assam, India, *Notulae Scientia Biologicae*, Vol. 11, No. 3, pp. 447–454. doi:10.15835/nsb11310343
- Sundriyal M and Sundriyal RC, 2011. Bamboo Trade and Future Prospects in the Central Himalaya: A case study of the traditional artisans of Uttarakhand, India, *Ethnobotany Research and Applications*, Vol. 9, p. 445. doi:10.17348/era.9.0.445-454

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