

Sustainable Women Entrepreneurship: A Study on Muga Silk Entrepreneurs in Sualkuchi Village of Assam

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Abstract :

To achieve inclusive development, the sustainability of the women entrepreneurship has become a necessity which is related to the needs of the environment, the economic resources, and the community; and their association with the present and the future. In India, 'gender disparity' plays a spoilsport in the realm of inclusive economic development as it constricts the women to take economic decisions, to have economic ownership, to avail equal opportunities for economic growth, and above all the economic independence and sustainability. The present paper has studied the sustainability of the women entrepreneurs, engaged in the *muga* silk production in Sualkuchi Village of Assam, through the marketability, profitability and value chain analysis. It also studies its impact on environment, livelihood and study of attitude of the entrepreneurs and their succeeding generations.

Keywords : *Sustainability, Muga Silk, Entrepreneurship, Women*

Introduction

As per Census 2011, Indian workforce includes about 48.5 percent women population. Thus, a proper and effective augmentation of women in the workforce can contribute towards an inclusive economic growth of the country. For a realistic growth of women in the society, the sustainability of their livelihood is crucial and important. Similarly, out of total population in Assam, 48.92 percent constitute female as per Census 2011. The work participation rate of men is 57.1 per cent and that of women is 12.7 per cent which signifies an unembellished gender disparity (Census, 2011). It is clearly evidenced that

participation of women in workforce and entrepreneurship as an option of livelihood can boost the inclusive economic growth by reducing unemployment and societal vulnerability of the women (Thomas & Hedrick-Wong, 2019). Entrepreneurship is considered as a key to enhance economic growth, productivity and employment opportunities with the help of creativity and competitiveness. Economic growth with sustainability and entrepreneurship has a strong positive relationship. Many researches are also indicative of the fact that by introducing woman as an entrepreneur, the inclusive growth can be achieved sans gender discrimination at a sustainable rate (Özyol, 2020; World Bank, 2018; UNESCO, 2018, UNGC, 2018). The Indian women entrepreneurs have an edge over their male in creating employment opportunities and increasing productivity, thus playing a significant role in poverty reduction, human development and health and education (Dutta & Gailey, 2012; World bank, 2012). Women entrepreneurship, which is still in its nascent stages, is the most appropriate and viable solution to improve female work participation (Dayal et.al, 1993). Women enterprises account for only 7.36% of the total enterprises (MSME Census 2006-07 published in 2011-12) reflecting the scope for their growth. Studies reveal that though a larger number of women are starting business ventures as a means of self-employment and financial empowerment, the size of their business remains small. To sustain and grow in business, the ventures should be viable enough to ensure commercial sustainability (Yadav & Unni, 2016; Gupta et.al., 2009).

Background of the study

The development of women is a holistic concept, stretching across economic, social and cultural fields (Mehta & Sethi, 1997; Ahl, 2006). Participation of women in economic development is possible if they engage in entrepreneurial activities (Akehurst et.al., 2012) by excavating their hidden entrepreneurial capabilities, skills, knowledge, adoptability, and sensitizing them towards socio-economic status in the society (Langowitz & Minniti, 2007; Jennings & Brush, 2013; Bruni et.al, 2004; Kabeer & Subrahmanian, 1996; Kelley et.al, 2013). In India women entrepreneurs are found as garment manufactures, farm owners, business women with many commodities, establishing firms like tiffin centres, milk centres, petty shops, vegetable vendor owner, food stall owner, sericulture farmers, weavers, textile designers etc. (York & Venkataraman, 2010; OCED, 2012; Buvinic et.al., 1996). Sustainability of women entrepreneurship can be achieved by augmenting the formation of capital through micro credit and indigenous skill development (Brush & Cooper, 2012; World Bank, 2012).

India enjoys a distinct position in the world silk map producing all four varieties of silk viz. eri, *muga*, tassar and mulberry. It is the second largest producer in the global silk market. Assam has a global monopoly in the production of *muga* silk. *Muga* silk is organic

and natural and has the tough natural fibre with durability. With golden lustre rises it with ages and flexibility of using any type of embroidery and colour dying, it becomes one of the costliest silks in the world (Paul & Jena, 2017). Spinning and weaving of silk in Assam has traditionally been a women-oriented occupation which was done at home. This weaving skills of Assamese women is a sustainable source of earning livelihood. Thus, the sustainability of women entrepreneurship in the area of *Muga* silk production and its marketing has placed an important position for contributing towards the economic growth of the state of Assam.

Literature Review

Sustainability is a concept with three dimensions: environment, economic and social, associated with long term goals without negative impact on them as discussed in the United Nations Conference on Trade and Development held at Geneva (UNCTAD, 2015²⁵). Entrepreneurship is a tool to achieve sustainable development goals (SDGs) by creating values and sustainable source of earning and to address the problems of unemployment and poverty (York & Venkataraman, 2010). Sustainable entrepreneurship involves creation of business policies, initiatives and strategies without harming economy society and environment with value creation and sustainable future as discussed by Hall et.al in their article on Journal of Business Venturing (Hall et.al., 2010; Shepherd & Patzelt, 2011; Choudhary, 2018).

Women entrepreneurship which creates employment, reduces poverty, betters the standard of living by providing health and education support to the households (HHs) and the society as stated in the International Entrepreneurship management Journal (Noguera et.al., 2013; Kelley et.al., 2017; Hechevarría et.al., 2019; Cardella et al., 2020), faces an array of gender discriminations, work-family conflict, poor access to resources, lack of HRD and personality differences. This leads to an inferior mindset and isolation in entrepreneurial concourses with lack of self-confidence and insecurity (Hechevarría et.al., 2019). Some studies revealed that self-confidence, the provision of assistance and institutional support and the ability to access the credit service and social networks are factors that stimulate female entrepreneurs (Mishra, 2015; Alamet.al., 2011). Women lead with assertive, persuasive mindset, willing to take risks to survive and have succeeded during competition with their hard work, diligence and perseverance (Saraswat&Lathabhavan, 2020; Amrita et.al., 2018). Women's environment friendly behaviour in various spheres are more likely to take sustainable decisions for their households and businesses. Gender comparison shows that the way of living, lifestyle and the consumption pattern of women are much less resource intensive and sustainable than that of men (Smith, 2010; Sumathiet.al., 2014; Latham, 2006; Bhatia & Jain, 2013).

Thus, sustainability is the key issues for a women entrepreneur which can be attained by achieving profitability with a stable market and protection of environment.

Objectives

The objective of the present paper is to analyse the sustainability of the women entrepreneur, engaged in the *Muga* silk production in Sualkuchi village of the state of Assam.

Methodology

For the purpose of present study, the Sualkuchi Village of Kamrup District of Assam is selected. Women who are engaged in *Muga* Silk weaving and production with the entrepreneurial ownership are the target group. Primary data were collected from 35 randomly selected women entrepreneurs out of the universe consisting of 76 entrepreneurs who are directly engaged in the production of *Muga* Silk and its marketing, for a minimum period of 10 years. In this study seven domains have been included as presented in the figure 1.

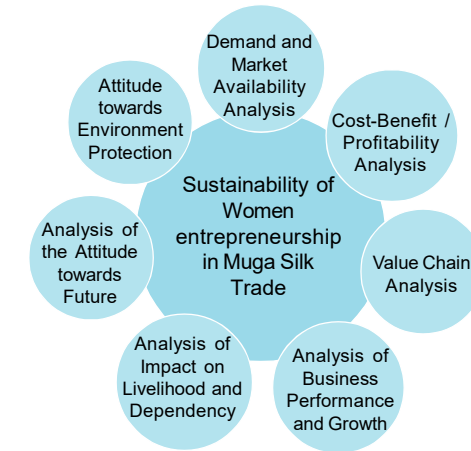


Figure-1: Sustainability of Women entrepreneurship in Muga Silk Industry

Analysis of demand and market availability has indicated the presence of market, supply, and demand for the *mugasilk* products at present and in the future, along with the growth in the supply factors and customers' demand and presence of market infrastructure. The marketing chain includes various players at various level. Sustained involvement of each player depends on the value addition at each level which gives rise to profit, which has been analysed through value chain analysis. The analysis of business performance and growth has studied the sustained and consistent growth of the business with respect to the volumes of

working capital, average sales volume, the profit earned, utilisation of capacity in terms of number of looms owned and used, and number of workers engaged over a period of time. The analysis of impact on livelihood and dependency has analysed the trade sustainability through the dependency of the entrepreneur on the business for her livelihood which has been emulated through a steady rise in the expenditures over a period of time. The analysis of the attitude towards future and the analysis of attitude towards environment protection have judged the future of the trade as the propriety, which can be extended, if the future generation accepts the trade to continue with a sustainable physical environment.

Analysis

The muga silk plays vital role in the socio cultural life of Assamese people mostly in marriages and different festival. The muga silkworm are semi wild in nature. One more variety of silk worm the oak tassar (muga silkworm) is found in Dima Hasao and Karbi Anglong districts which is completely wild in nature. The silk worms feed on leaf of the *som*, and oak plants. After harvesting the cocoons, the weavers prepare the threads and put them in looms to produce various garments and clothes. The weavers either markets the produces directly through their outlets or through middlemen. The sustainability of the *muga* silk trade can be analysed through the following analyses, based on the primary data collected from the responding women entrepreneurs and from the secondary statistical data collected from various sources.

Demand and Market Availability Analysis

The Indian sericulture market in 2017 was worth INR 205 billion and the market is projected to reach INR 535 billion by 2023, approximately 18% between 2018 and 2023 (IMRC Group, 2021). Currently, India is the world's second-largest producer of raw silk and the largest consumer of raw silk and silk fabrics. This is divided into Mulberry and Vanya, based on market segmentation. The Vanya segment of silk market was further subdivided into Tasar, Eri, and *Muga*. Though India is the second largest silk producer, the domestic demand for silk exceeds the supply and the gap is being met by imports. Based on the demands, the market is again divided into natural silk yarns, fabrics and made-ups; readymade garments; silk carpets; and others. Silk yarns, fabrics and made-ups have the largest areas of demand. In India, Karnataka is the leading producer of mulberry silk whereas Assam is the largest producer of Vanya silk. Assam produced 587.47 metric tonne of *Muga* silk and 106.82 metric tonne of pat mulberry silk during 2011-16. The following table shows a constant rise in the production of muga silk in India. As the gap between demand and supply is quite high, the marketable opportunities for the silk-producers are also high.

Table 1: Production of Muga Silk in last Five years in India

Years	Production of Muga Silk (in MT)	Change in %	Years	Production of Muga Silk (in MT)	Change in %	CAGR 2011-12 to 2020-21
2011-12	114.56	-	2016-17	166	30.97	7.721%
2012-13	104.12	-9.11	2017-18	170	2.41	
2013-14	118.04	13.37	2018-19	192	12.94	
2014-15	124.00	5.05	2019-20	233	21.35	
2015-16	126.75	2.22	2020-21	241	3.43	

Source: Statistics presented in Business standard and www.statista.com.

The weavers/entrepreneurs engaged with silk production in Sualkuchi exports few of their products to national (18.56%) and international market (12.11%), and at present, their production is mainly for the purpose of the domestic (local) market. In addition, the weavers take orders from different tribes of north-east region for weaving traditional garments with pat-*muga* silk. The silk market of Sualkuchi is a direct market i.e., *consumer to producers*. The producers with retailing stores directly take orders from the customers during the season of marriage and festivity and produce ready-made garments based on recent customer choices and fashion-trends. Recently, online shopping process, with a sales volume of 4.12%, has initiated and given a wider scope. The cheap machine made and duplicate silk garments present in the market from Assam possess a threat for the *muga* silk market. Thus, innovation in designs and fashion, patenting and geo-tagging the products with an incentivisation for production of pat-*muga* silk and garments are the need of the hour for its development and growth.

Cost-Benefit / Profitability Analysis

A silk producer (seri cultivator) needs at least one acre of land to cultivate about 400 grams of Muga silk in one time. In addition, a single piece of Muga *mekhelasador* requires at least 1000 grams of Muga silk. 1000 cocoons can generate about 125 grams of silk. From rearing the silkworm to obtaining a finished product in terms of a piece of Muga *MekhelaSador*, it takes almost two months. In order to determine the cost-benefit of one set of muga *mekhela-sador* and one piece of muga-silk saree, five factors are considered, which is presented in the table 2. The cost benefit or profitability analysis shows a profit of 14.39% for the producer for making a *Mekhela Sador* and 14.92% for producing a muga-

silk saree. So also, a profit of 15.38% and 16.36% has been earned by the wholesalers for a *MekhelaSador* and a muga-silk saree whereas the retailer earned a profit of 16.67% and 17.19% respectively. The cost-benefit analysis has been made with a presumption that the time lag between production or purchase and sale of the product is 15 days, and the carrying cost and holding cost is very negligible.

Table 2: Profitability / Cost-Benefit Analysis of one set of MugaMekhelaSador and one piece of Muga-silk Saree (Amounts in INR)

Particulars	Rupees (Quantity Wise/ Labour Cost)	Unit/ Quantity required for a Set of <i>Mekhela Sador</i>	Per Set of <i>Mekhela Sador</i>	Unit/ Quantity required per Saree	Per Saree in INR
DighSuta/Warp thread (Length Wise)*	Rs.28000 per kg	300 g	8,400	250g	7,000
BaaniSuta/Weft thread (Breadth Wise)**	Rs.26000 per kg	350g	9,100	450g	11,700
For Design					
i. Guna (Suta)	Rs.500 per kg	500g	250	500g	250
ii. Mina (Suta)	Rs.200/kg	500g	100	500g	100
BobinBota Price	Rs.30/250g	1500g	180	1500g	180
Bati Karha Price	Rs.700/ Wrap Rs.600/ Weft	-	1,300	-	1,300

Particulars	Rupees (Quantity Wise/ Labour Cost)	Unit/ Quantity required for a Set of <i>Mekhela Sador</i>	Per Set of <i>Mekhela Sador</i>	Unit/ Quantity required per Saree	Per Saree in INR
Labour cost (BobinGhura, Cost MohuraFurua, Per Day Cost, Boo Cost, Loom charge)	Rs. (2000 + 1400) per set	-	3400	-	3,400
Total Cost of Production			22,730		23,930
Estimated Selling Price (by the producer)			26,000		27,500
Profit % of the Producer			14.39%		14.92%
Estimated selling price (by the wholesaler)			30,000		32,000
Profit % of the wholesaler			15.38%		16.36%
Estimated Market Price			35,000		37,500
Profit % of the Retailer			16.67%		17.19%

Source: Field Survey data 2022

*The vertical arrangement (length) of Muga silk to make any cloth is called 'Wrap' (DighSuta); **The horizontal arrangement (breadth) of Muga Silk to make any cloth is called 'Weft' (BaaniSuta)

Value Chain Analysis

The value chain analysis has been undertaken by averaging the expenditure incurred and revenue earned at each level of activities (rearers, reelers and dyers, weavers, workers engaged in bleaching, design and dyeing; textile producers, wholesalers and retailers) to produce a set of *Mekhela-sador* and a muga-silk saree. The value chain and the value added at each chain-player is prepared and presented in table-3. The value addition throughout the supply-chain up-to the point of selling shows that each player has added some values to the produces and in that way earn their livelihood. But the weavers/producers control the pre-weaving

value addition (39.50% in case of a *mekhelasador* and 38.01% in case of a muga-silk saree) whereas the middlemen control the post-weaving value addition (around 15 to 17% of the value). Further other chain actors spinning workers, dyers, knitting workers, design workers contribute in the value chain on the basis of 'work per meter square' but earn comparatively at a lower proportion. The main players in this industry are the weavers, producers (owners), wholesalers, retailers and middlemen. They are the ultimate value addition players who can decide the selling price of a set of muga-silk saree and a set of *mekhelasador*.

Table 3: Values across the Value Chain for Muga Silk (in Rs.)

Chain Actors	Value	Added Value	% of Value added	Value	Added Value	% of Value added
	<i>Mekhela-sador</i>			Muga-silk saree		
Producers of Silk Fibre	11,336	255	2.25%	12,225	275.063	2.25%
Spinning Workers	11,543	208	1.80%	12,449	224.084	1.80%
Silkworm boiler dyers	11,716	172	1.47%	12,635	185.732	1.47%
Knitting (<i>Bobin-Bota</i>) Workers	11,894	178	1.50%	12,827	192.409	1.50%
Weavers / producers	19,660	7766	39.50%	20,692	7865.21	38.01%
Bleaching	20,061	401	2.00%	21,115	422.295	2.00%
Dying	20,575	514	2.50%	21,656	541.404	2.50%
Design and Finishing	20,995	420	2.00%	22,098	441.963	2.00%
Textile Producers	24,680	3685	14.93%	25,973	3875	14.92%
Wholesaler / Middlemen	29,166	4486	15.38%	31,054	5080	16.36%
Retailers (Sales Price)	35,000	5835	16.67%	37500	6446	17.19%

Source: Field Survey data 2022 (based on approx. value)

Analysis of Business Performance and Growth

One of the aspects to study the sustainability of the entrepreneurship is to analyse the growth of the business in terms of uses of working capital and the profit earned. The table -4 indicated a rise in the working capital investment by the women entrepreneurs

engaged in muga-silk production. The growth in the working capital investment has been experienced till early 2020 but shows a decline during the first-phase of COVID pandemic. Though the amount of investment in working capital varies among the individual entrepreneurs but similar trend of growth and decline has been indicated while analysing the books of the respondents. The net profit also shows a rising trend during the pre-COVID period but again declined during the pandemic. Analysing the working capital to net profit ratio, it is found that it is highest during the pandemic period as the entrepreneurs had tried to earn the most of the profit (% of profit to sales is 17.83% in FY 2020-21) though the sales declines to the extent of 20.05% than the previous financial year. Due to covid lockdown there is an unexpected price hike on muga silk thread and weaver's charge due to which they have discontinued their part of work until they can recover a good amount of revenue. To sustain the business, the entrepreneurs have adjusted their profit percentage and expenditure with respect to the working capital, which is a sign of sustainability.

Table 4: Average Sales, Working Capital invested and Profit Earned during the last five FYs (in Rs.) and the change (in %) from the Previous FY

Particulars	2016-17	2017-18	2018-19	2019-20	2020-21
Average Sales	11,81,220.65	13,78,271.23	15,69,106.70	16,59,211.04	13,26,542.64
Change	-	16.68%	13.85%	5.74%	-20.05%
Average WC	7,95,434.78	9,21,304.30	10,80,652	11,25,652	9,27,652.20
Change	-	15.82%	17.30%	4.16%	-17.59%
Average Net Profit	1,84,506.67	2,35,960.03	2,64,080.66	2,74,267.58	2,36,522.55
Change	-	27.89%	11.92%	3.86%	-13.76%
WC to NP Ratio	4.31	3.90	4.09	4.10	3.92
NP to Sales	15.62%	17.12%	16.83%	16.53%	17.83%

Source: Field Survey data 2022 (based on approx. value)

Analysing the capacity utilisation, in terms of average number of looms used, it is found from the table – 5 that the entrepreneurs have also reduced or increased the uses of

the looms on the basis of the demand and investment. The capacity utilisation has been declined during the pandemic period. Otherwise, the average capacity utilisation rate is within 76% to 89% which is very good for a small-scale women entrepreneur. Higher price of raw material and labour cost are the reason behind decrease in the number of weavers and looms in this industry.

Table 5: Number of looms owned and used by the Respondents over the last five years

FYs	Average Number of looms owned	Average Number of looms used	Used Capacity in %
2016-17	6.8	5.2	76.47%
2017-18	7.2	6.4	88.89%
2018-19	8.7	7.1	81.61%
2019-20	9.0	7.5	83.33%
2020-21	9.0	5.6	62.22%

Source: Field Survey data 2022

Post-lockdown period has experienced a steady growth in the average number of workers per month and the average number of man-hours per month, for the responding women entrepreneurs. However, during the pandemic it has reduced drastically. In pre-pandemic period the percentage of non-wage workers (members from the family) constituted around 38.02% to 39.67% but the ratio changed during the pandemic to 56.03% to manage the cost. Except three entrepreneurs in all other cases the number of hired weavers are decreasing because of high price of muga silk thread, high charge by weavers and sometime 'run off' by the weavers after advance charge by the them. The growth in the manpower employment and the rise in the number of man-hour used have indicated the steady growth in the business.

Table 6: Number of Workers engaged during the last five years

FYs	Average Number of workers used per month	Average Number of Man-hours per month	Average Number of family members worked per month	Average Number of Man-hours per month done by the family members	% of work done by Family workers
2016-17	15.43	2701.09	5.87	1026.95	38.02%
2017-18	16.96	2967.39	6.71	1174.20	39.57%
2018-19	20.09	3515.22	7.96	1392.73	39.62%
2019-20	21.39	3743.48	8.49	1485.04	39.67%
2020-21	14.35	2510.87	8.04	1056.83	56.03%

Source: Field Survey data 2022

Analysis of Impact on Livelihood and Dependency

The business is said to be sustainable if the entrepreneur has dependency on it for his livelihood and due to the business, the income as well as his expenditures have been steadily increased over a period of time. In this regard, the responses were collected from the responding entrepreneurs engaged in the muga-silk production, which has been summed up and presented in the table 7. The average share of income from the muga-silk business to the total HH income (68.32%) indicates a low-level livelihood-diversification among the respondents and thus, the dependency on the muga-business is high. The respondents also opined that their income has been increased and so as the HH expenditures along with acquisition of HH assets, education for the children, medical and sanitation at an increased rate whereas the expenditure for food and clothing, and housing has been increased at a lower rate. They also used an average of 44.88% of the business return for the working capital and reinvestment. The use of 10.22% of the return for general savings and 19.56% for acquisition of HH assets is the indicative of their future-orientations. An average income of 4.89 percent has only been utilised for development of skill purposes though the venture needs a high degree of innovation, skill acquisition and specialisation. According to them, the traditional looming does not require additional skill and expertise as they have possessed the expertise in their work due to the presence of the traditional knowledge and skill.

Table 7: HH Income and Uses of Return/Income from the Muga-Silk Business

Purposes	% of the Revenue	Purposes	% of the Revenue
Composition of Household Income (in %)			
Muga Silk	68.32%	Other Businesses	12.34%
Agriculture & allied	14.43%	Any other sources	4.91%
Increase in the HH Income		Increase in the HH Expenditure	
0 – 20% Increase	21.74%	0 – 20% Increase	13.04%
20 – 40% Increase	52.17%	20 – 40% Increase	60.87%
40 – 60% Increase	13.04%	40 – 60% Increase	17.39%
More than 60% Increase	8.70%	More than 60% Increase	4.35%
Use of Return/Income from the Muga-Silk Business (in %)			
HH Consumption	20.45	Working capital Uses	23.12
Purchase of HH Assets	19.56	Re-investment in business	21.76
Savings and investment	10.22	Other purposes (Training etc.)	4.89

Source: Field Survey data 2022

Analysis of the Attitude towards Future

A five-scale questionnaire, based on Likert Scale, were administered on the respondents to analyse the attitude of the women entrepreneurs, who are engaged in weaving and marketing of muga silk. The descriptive statistical analysis has indicated that they can face future eventualities with confidence, can transact with suppliers and traders from the state of Assam and other states easily, and also transact and negotiate with government officials (Table 8). They also take necessary measures for the future as they save and spend for children’s education but adapt low level of preventive health measures. Putting to test the views for the test of Ch-square, it is found that the difference between the views of the respondents are not varied, which is also been confirmed due to a low score of standard deviation for all statements.

Table 8: Confidence to face the Future: Descriptive Statistics

Statements I plan for	Mean	SD	χ ²	Sig.
face any eventualities in future	4.11	.793	72.199	.000
preventive health measures	2.96	.825	64.547	.004
children education	3.89	.656	63.331	.000
savings/investment	4.13	.815	69.429	.000
I can transact with supplier/traders	3.98	.850	93.650	.000
I can transact with govt. officials	3.61	.988	73.681	.000

Source: Field Survey data 2022 (based on approx. value)

With respect to the attitudes of the women entrepreneurs, as responded under a 5-scale response, from Sualkuchi silk village, the respondents had opined equivocally to continue their muga-silk business at a higher scale in the future and also opined to opt for some diversification of business, as a secondary option, along with a step up in present muga-business. They denied to continue the business with lower volume in future with a change and diversification of business or continue with the same scale or to discontinue the muga-business fully. The low standard deviation score and the chi-square test have confirmed the no variance of opinion among the respondents.

Table 9: Attitude towards Muga Silk Production and selling in future

Statements Continue muga silk activities	Mean	SD	χ ²	Sig.
as it is	1.89	.340	57.894	.000
with larger volume	4.26	.137	54.693	.004
with larger volume and to diversify to other business	4.17	.188	49.892	.000
with lower volume and to diversify to other business at a higher scale	2.14	.445	69.211	.000
Discontinue muga activities fully	1.04	.825	57.513	.004

Source: Field Survey data 2022 (based on approx. value)

Analysis of Attitude towards Environment Protection

Respondents under the present study, responding to a five scale questions about with respect to their views on the environment protection and the attitude of the future generations, which revealed that their use of traditional skills and knowledge in the cultivation of silkworm and the *som* trees, handling the handlooms for weaving, materials they used, and production of textiles are always environment friendly. Therefore, they want to adopt this traditional skill which do not have any harmful impact on environment and also helps in maintaining the forest ecosystem. Hence, they are aware about that there is no any harmful side from cultivation culture and weaving culture of Muga Silk (Table 10). With respect to the continuation of the trade through next generations, a divided opinion is formed among the respondents. Some of the respondents are highly agreed that their business should continue but a divided in their views with respect to involvement of their next generation or upsprings. The divided of opinion, as indicated through the test of Chi-square, about the introduction of innovative modules in muga production with respect to the designs, colour, fibre-mixing, motifs, upgradation of their looms etc.

Table 10: Attitude towards environment protection and their succeeding generation

Statements I am aware about	Mean	SD	χ^2	Sig.
environmental degradation and its protection	4.17	.576	56.192	.000
the measures to retain the forest cover for silk moth rearing and the cultivation of <i>som</i> trees	4.65	.832	58.001	.000
the uses of non-chemical raw materials	4.13	.694	52.579	.000
the teaching to other weavers about environment protection	3.08	1.087	43.091	.004
I want my children must continue the same business	4.13	.339	51.004	.000
I want the traditional knowledge and skill should continue to next generation	4.06	.381	52.785	.000
My children want to continue the same business	2.89	.429	1.005	.711
I want that the muga business should not stop in future	4.44	.189	57.892	.004
I want the innovation in muga silk production	2.09	1.691	1.792	.672

Source: Field Survey data 2022

Findings

The findings of the above analysis indicated the presence of a gap between the demand and supply of *mugasilk* with a well-developed market-infrastructure. There is opportunity for the growth and sustainability of the trade, which has been demonstrated through the analysis of business performance and growth. The present trade has not only provided an acceptable degree of profitability to the producers but also indicated the presence of value addition in each stage of the value chain. The dependency on the *mugasilk* trade for the livelihood by the women entrepreneurs has increased. The *Muga*-silk business has not only empowered the women entrepreneurs in terms of economic happiness as the business is flourishing and growing during the pre-pandemic period and provide a substituted means of livelihood by the use of indigenous knowledge and skill, raw materials, and machinery and tools. The agrarian economy successfully satisfies hungry stomachs of the deprived lots in the state of Assam. They are not only successful in carrying their business for years together but also negotiated the tough periods of COVID pandemic which affects the whole of handloom sector in India. They manage through their limited entrepreneurial capabilities, the challenges of tough competitions in the garment market, higher cost of silk thread and other raw materials, higher labour cost and scarcity of indigenous labour etc. With a futuristic resiliency, the women-led *muga*-silk business proves to be sustainable.

- The concerning fact of sustainability of this trade is due to the following reasons:
- Lack of interest of the next generation to adopt the current *muga*-trade,
 - A feeling of alienation towards innovation in *muga* silk production and adaptation of new and sophisticated technology by the indigenous weavers,
 - Lack of upgradation of indigenous knowledge, skill and technology among the weavers as the localised R & D on the indigenous knowledge is absent completely,
 - Adaptation and flexibility of the entrepreneurs to handle the future abrupt eventualities like the recent COVID pandemic.

Conclusion

The sustainability of women entrepreneurs engaged in *muga*-silk production in the Sualkuchi Village of Assam is present but is very much localised. It can be globally achievable as the perpetual demand for the seri-products in a healthy and organic lifestyle augments the pace of the progress in an optimistic course. The lone way for attainment is a scientific assortment of the indigenous knowledge and skill with contemporary marketing innovations and augmentation of human resources.

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