

PRESENT STATUS AND CONSTRAINTS TO SHITALPATI HANDICRAFTS AND POLICY OPTIONS FOR IMPROVEMENT IN BANGLADESH

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Abstract

The study was conducted at the selected weaving areas of shitalpati or cooling mat handicrafts in Bangladesh during 2019-2021 to know the present situation of the handicrafts, existing constraints and formulate policy options for its improvement in the country. Although the traditional art of shitalpati weaving of Bangladesh was recognized as “Intangible Cultural Heritage” by the United Nations Educational, Scientific and Cultural Organization (UNESCO), but presently the glory of the cottage industry is in declining trend due to lack of research and development activities on "murta" plant (*Schumannianthus dichotomus* L.) cultivation (stem cane of this plant, which is used for shitalpati weaving). Quality murta cane production and processing, and unfair market price of the products, competing with plastic mats, lacking of diversification and value addition of handicrafts, lack of promotional activities of the stakeholders etc. are also responsible. It was observed that the murta plant has wide adaptability that can be cultivated easily in submerged or fallow lands. Murta plant can tolerate salinity and waterlogging environments and prevents soil erosion, which would be an adaptation option under changing climate in Bangladesh. Therefore, policy formulation and suitable action plan (short, medium and long term basis) should be done for recapturing the glory of shitalpati handicrafts in Bangladesh.

Keywords: Shitalpati handicrafts, intangible cultural heritage, constraints, policy options, craftsman livelihood.

Introduction

Shitalpati or cooling mat is a traditional handicraft of Bangladesh, which is highly valued in rural area of the country as it is soothing in hot weather condition. The herbaceous plant from which shitalpati is made is called "murta" plant (*Schumannianthus dichotomus* L.). The murta is a shrub and perennial plant under the family of Marantaceae. Depending on the growing region, the murta plant is also called as *paitra*, *mustaq*, *patibet*, *patipata*, *muktagach*, *patigacha*, *murtha*, *ratagacha*, *patijong*, *shitalpati* plant etc. The murta plant is considered as minor forest in Bangladesh that looks like a thin bamboo but is not as hard as a bamboo, grows into a bush. According to data obtained from Bangladesh Forest Research Institute, seedlings can be propagated through rhizomes, branch cutting, rooted cutting and seedling (Siddiqi *et al.*, 1998). The murta plant flowers in March-April

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and the fruit/seed matures in June-July (Merry *et al.*, 1997). Murta plant can grow up to 3-5 meters in length. The main part of this plant for making mat is the long stem without node which tends to get shorter as the plant grows older (Mia *et al.*, 2018). Once planted, good yields are obtained for about forty consecutive years (Chowdhury *et al.*, 2007). The murta cane is prepared by processing the outer covering or bark of the stem of “murta plant” in various natural ways. Shitalpati is also weaved with design of herbs, animals and different motifs. It has red, blue, green, black and purple colors (Banglapedia, 2014). The mat decorated with artwork or decoration is also called nakshi pati (Banu, 2012). At once, shitalpati was made with silver and ivory leaves. The person who makes shitalpati is called patikar, patiyal or pati industrial worker. Shitalpati is a traditional handicraft product that is about 350 years old. The greater Sylhet region is traditionally famous for making shitalpati. In addition, murta also grown in Tangail, Sirajganj, Jhalokati, Barishal, Cumilla, Noakhali, Chandpur and Feni and make shitalpati. Shitalpati are also used in making other handicraft products. The United Nations Educational, Scientific and Cultural Organization (UNESCO) has given recognition the traditional art of shitalpati weaving of Sylhet region of Bangladesh as world's most important “Intangible Cultural Heritage” in 2017 (Anon., 2017). The value of shitalpati is a little higher in rural Bengal as it is soothing in hot weather. In villages it is used instead of mats and in urban areas it is used as show-pieces. The shitalpati based handicrafts and the livelihoods of craftsman are facing many challenges due to lacking of proper management of cultivation, widespread expansion of plastic mats, limitations in making good quality shitalpati products and lacking of proper marketing and promotional activities. However, it is necessary to intensify research and development works on the production of murta plant, quality patibet (murta cane) and the manufacture of diversified shitalpati handicrafts in order to retaining the past heritage of the shitalpati based cottage industry. Therefore, the aims of this study was to explore the present status and existing constraints of shitalpati (cooling mat) handicrafts as well as formulating policy options towards sustainable development of the pre-glorious handicraft industry in Bangladesh.

Materials and Methods

Scientists of Bangladesh Agricultural Research Institute discussed and made interview with the shitalpati stakeholders like patikar, artisans, pati industrial workers, Shitalpati Shilpa Youth Foundation (Nalchiti, Jhalokati), Pati industrial workers cooperative Society Ltd. (Kalihati, Tangail) in different parts of the country regarding the current situation, problems and possible solutions of the shitalpati handicrafts in Bangladesh.

Study areas

The study was conducted in eight districts (10 upazilas) viz., Jhalokathi (Nalchiti sub-district), Sylhet (Goainghat and Golapganj), Moulvibazar (Rajnagar and

Barlekha), Tangail (Kalihati), Sirajganj (Kamarkhand), Cumilla (Barura), Chandpur (Shahrasti) and Feni (Feni Sadar), during 2019-2021 for gathering different information about the present situation of the handicrafts, existing constraints towards formulating policy options for its sustainable development in the country. Bangladesh Forest Research Institute (BFRI), Sholashahar, Chattrogram was also visited for collecting information about the previous and existing research activities on murta cultivation and weaving of shitalpati handicrafts in Bangladesh. The study areas along with the geographical coordinates of the sub-districts are given in Table 1.

Table 1. Study areas with geographical coordinates of upazila in Bangladesh

Division	Name of district	Name of upazila	Geographical coordinates
Barishal	Jhalokathi	Nalchiti	22°36'00" N & 90°17'06" E
Sylhet	Sylhet	Goainghat	25°04'18" N & 91°57'48" E
		Golapganj	24°51'20" N & 92°00'58" E
	Moulvibazar	Rajnagar	24°31'36" N & 91°51'20" E
		Barlekha	24°43'47" N & 92°09'35" E
Dhaka	Tangail	Kalihati	24°21'26" N & 89°56'03" E
Rajshahi	Sirajganj	Kamarkhand	24°22'31" N & 89°38'31" E
Chattogram	Cumilla	Barura	23°20'32" N & 91°02'44" E
	Chandpur	Shahrasti	23°13'41" N & 90°56'57" E
	Feni	Feni Sadar	22°59'09" N & 91°24'32" E

Selection of stakeholders

Different categories of shitalpati (cooling mat) stakeholders were selected randomly in the study areas like researchers, local entrepreneurs, craftsman/shitalpati worker/ patikar (men and women), murta growing farmers, handicrafts supplier, businessman, salesman, end users, local people etc. Shitalpati shilpa youth foundation and shitalpati industrial workers cooperative society were selected for taking interviews in the concerned study areas.

Data collection

Data collected consisted of both quantitative and qualitative information from the target stakeholders on murta cultivation, planting time, propagation methods, agronomic management, fertilizer management, insect-pest and disease management, stem harvesting and post-harvest processing, use of murta plant in weaving shitalpati handicrafts income and expenditure on murta cultivation, making and processing of murta cane (patibet), types and sizes of shitalpati,

income and cost of weaving of shitalpati handicrafts etc. Information were also collected about the current problem of shitalpati industry and possible ways to improve it. Primary data were collected through household survey as well as Participatory Rural Appraisal (PRA) tools like Focus Group Discussion (FGD) and Key Informant Interviews (KII). Besides, secondary information was also collected from different books, journals, booklets, factsheets, magazine, research reports, scientific articles, web pages, and so on to validate and support the primary information.

Collection of murta plant samples

During the study period, different samples of murta plant such as stem *peet* (upper green part of murta stem), *ati* (lower part of *peet*), *chhota* (lower layer of *ati*), *buka* (inner soft pith), whole plant (including *peet*, *ati*, *chhota* and *buka*) and leaf were collected randomly for laboratory analyses of their composition. It can be mentioned that stem of murta plant consisted of four layers viz., *peet*, *ati*, *chhota* and *buka*.

Laboratory analysis of murta plant leaf samples

The samples of murta leaf were analysed in the Laboratory of Animal Production Research Division of Bangladesh Livestock Research Institute (BLRI), Savar, Dhaka, Bangladesh for determining its chemical composition as livestock fodder and the results have been presented in Table 2.

Data processing and analysis

Data processing and analysis were done using computer based Microsoft Excel software. Economic analyses were also done of shitalpati handicrafts based on existing local market prices of inputs and products.

Results and discussion

Cultivation of murta plant

The murta plants are usually grown in the low-lying and wetland areas of Sylhet, Sunamganj, Moulvibazar, Habiganj, Chattogram, Noakhali, Feni, Lakshmipur, Chandpur, Cumilla, Brahmanbaria, Barishal, Jhalokati, Pirojpur, Jashore, Munshiganj, Narsingdi, Tangail, Mymensingh, Natore, Sirajganj districts of Bangladesh since hundreds of years ago. The murta plant is generally cultivated without any advanced care such as proper planting time, planting distance and method, weed cleaning, pruning or sharing, fertilizer management, pest and insect control, timely harvesting of stem/doga, etc. Murta plant grows well in waterlogged soils where silt accumulates. In some areas of Bangladesh, many

people grow new murta plants on the banks of canals or ponds to prevent soil erosion. No good quality land is required for cultivating murta plants. Murta can be easily grown on abandoned lands around houses, ditches, canal, beels or ponds which are always wet or low lands where the lands remain wet or damp (Alam, 2007). It is grown in Assam and West Bengal of India, the Malay Islands and the Philippines. Some people collect the stems (*doga*) of murta plants throughout the year. However, when the stems are collected during the rainy season, less number new shoots are produced ultimately reducing the yield. After planting the seedlings, it takes about 3 years to collect the doga/stems for making shitalpati. It was informed that one can make 5-6 number of shitalpati (1.52 m x 2.13 m size) by using the murta plants of one decimal of land in a year. Due to lack of knowledge or awareness about the diversified use of murta plant, lack of proper management and maintenance of murta plant, the murta garden is declining day by day. However, with better care, it is possible to increase the yield and quality of murta.

Establishment of Ratargul Swamp Forest in Bangladesh

In Bangladesh, the Ratargul Swamp Forest has been established in Gowainghat upazila of Sylhet district with an area of about 1346 hectares. In the local language of Sylhet, murta or patigach is known as "*Rata plant*". The name of this forest is Ratargul (Anon. 2016) after the name of that Rata plant. In addition, 204 hectares of forest land was declared as special biodiversity conservation area by the Forest Department of Bangladesh in 2015 (www.bforest.gov.bd). This forest has been conserved under the Forest Department of the Government of Bangladesh (Anon., 2011). There are murta mahals in Ratargul area covering an area of about 40.50 ha and murta garden covering an area of about 25 square km in south Sylhet range (BFRI, 1993). A new murta garden has been established on 25 hectares of land in 2018-19 at the initiative of Sylhet Forest Department. In addition, the Bangladesh Forest Department has adopted a plan to plant bamboo, cane and murta plants in 7171 hectares of land from 2017 to 2036 (Forestry Master Plan 2017-2036).

Chemical composition of murta leaf sample as livestock fodder

As nutritive value of livestock fodder, the leaf samples contained dry matter 26.23%, ash 11.76%, organic matter digestibility 88.24%, acid detergent fiber 56.02%, crude protein 13.84%, neutral detergent fiber 79.86%, ether extract 2.23%, lignin 29.57% and **gross energy** 17.46 kcl /kg. Results further indicated that murta leaves are very nutritious fodder for livestock particularly for cattle, goat and sheep (Table 2). Fasae *et al.* (2010) also reported that chemical composition of murta leaves were dry matter 20.50%, crude protein 25.43%, ether extract 6.60%, ash 12.61%, neutral detergent fibre 63.27%, acid detergent fibre 41.17% and acid detergent lignin 22.67%, which indicated that it is highly

digestible and their inherent nutrients are higher than the range recommended for maintenance in ruminant production. These fodders can be fed as supplements to low protein forage and can alleviate feed shortages experienced for ruminants in dry season.

Table 2 Chemical composition of murta leaf sample as fodder for livestock (2020-2021)

Sample name	Nutritive value status as livestock fodder								GE (kcl/kg)
	DM	Ash	OM	ADF	CP	NDF	EE	Lignin	
	%								
Murta leaf	26.23	11.76	88.24	56.02	13.84	79.86	2.23	29.57	17.46

Source: Bangladesh Livestock Research Institute, Savar, Dhaka, Bangladesh

Note: DM = Dry matter, OM = Organic Matter digestibility, ADF = Acid Detergent Fiber, CD = Crude Protein, NDF = Neutral Detergent Fiber, EE = Ether Extract, GE = Gross Energy

Use of different parts of murta plant for shitalpati handicrafts

Stem and branch of murta

Three types of stem and branches are available for making cane from murta plant. These are locally known as *doga* (long stem without knot), *dala* (top portion of *doga*) and *jhara* (short mature branch on the side of *doga*). Long and good quality *doga* (1.52-2.13 m in length) quality mat cane and large shitalpati (1.52 m x 2.13 m in size) can be made. It takes 100-120 long stems or *doga* to make a 1.52 m x 2.13 m size of mat (*pati*) which costs around Tk. 1200-1500. The market price of these carpets is much higher. However, a short and low-quality cane is made from *dala* and *jhara* stems or branches. It is said that the mat made of these canes is smaller and its market value is also lower at the local market. However, even if a large size shitalpati is made with joined short cane, its market value is reduced. The discarded parts of *dala* and *jhara* stem or branches can also be used as cooking fuel.

Layers of murta plant stem and making of *patibet* (murta cane)

Patibet (murta cane) is made from the bark of murta plant. The stem of murta plant consists of four layers, which are locally as *peet* (upper green part), *ati* or *auti* (lower part of *peet*), *chhota* (lower layer of *ati*) and *buka* or *feuta* (inner soft pith). Of the stem layers, only *peet* cane (*peet bet*) is used to make quality mat. *Patibet* is usually soaked and boiled with rice starch, hog plum leaves, cowa leaves, chukai or chukur leaves, etc. to make it durable, soft, whitening and increase luster and smoothness. *Patibet* is then dried well in the sun so that it can be stored for a long time. In order to making colored cane, the green part of the stem is painted with

different colored paints or the green part of the stem is scraped off with a knife and is boiled with different dye (red, pink, green, blue, yellow etc.) mixing water. The *ati* or *auti* bet (lower part of *peet*) is made colored by mixing dyes in hot water (1 teaspoon dye/10 liters of water) and heating it with cane for half an hour. The colored cane is used to make ornamental or design of the shitalpati.

Shitalpati weaving areas of Bangladesh

Primarily group discussions with *patikars* (shitalpati weavers), pati industrial workers and members of shitalpati industrial workers cooperative society related to weaving shitalpati in Bangladesh and reviewing information obtained from other secondary sources (reports, journals, bulletins, online papers, books, Banglapedia-database, articles, etc.) revealed that shitalpati are weaved traditionally in the districts of Sylhet, Moulvibazar, Habiganj, Jhalokati, Barishal, Pirojpur, Jashore, Faridpur, Sunamganj, Netrokona, Nilphamari, Kurigram, Tangail, Mymensingh, Narsingdi, Munshiganj, Sirajganj, Comilla, Chandpur, Feni, Lakshmipur and Noakhali (Table 3). However, Rajnagar, Balaganj, Baralekha and Molla Bazar of Sylhet region, Sonagazi, and Raipur of Noakhali, Swarupkathi and Nilgati of Barishal and Satche of Faridpur produced high quality of shitalpati (Banglapedia, 2014). However, shitalpati in Sylhet region is traditionally famous for its artistic and dexterity. Besides the Sylhet region, the patikars of Jhalokati district have also been famous for their shitalpati for hundred years.

Craftsman (patikar) involved in shitalpati weaving in Bangladesh

It is very difficult to determine the actual number of craftsman (locally known as *patikar*, *patial*, *paital*, *shitalpati shilpa sromic* etc.) in Bangladesh. Analyzing the data obtained from primary discussions with the members of shitalpati industrial workers' cooperative society and other secondary sources. It is learned that there are about 7916 craftsman families in the country who are directly or indirectly involved in this cottage industry and living in Sunamganj, Sylhet, Moulvibazar, Habiganj, Barishal, Jhalokathi, Pirojpur, Jashore, Mymensingh, Netrokona, Nilphamari, Kurigram, Tangail, Narsingdi, Munshiganj, Faridpur, Pabna, Sirajganj, Cumilla, Chandpur, Feni, Noakhali, Lakshmipur and Chattogram districts (Table 3). On the other hand, Forestry Master Plan (1992) showed that about eight thousand people in the country are involved in making shitalpati (GoB, 1992). Banglapedia (2014) reported that about fifteen thousand artisans are involved in making shitalpati in Bangladesh. However, in low-lying or submerged areas of the country, a large portion of the poor are directly or indirectly involved in the shitalpati handicrafts making for their livelihoods.

Table 3. Murta plant growing and shitalpati weaving areas, and number of craftsman (patikar) involved in shitalpati handicrafts of Bangladesh

Division	District	Murta plant growing and shitalpati weaving areas (Upazila)	No. of craftsman family
Sylhet	Sunamganj	Doarabazar, Jamalganj, Rajapur, Tahirpur	431
	Sylhet	Goainghat, Jaintapur, Companiganj, Golapganj, Fenchuganj, Balaganj, Beanibazar, Zakiganj	215
	Moulvibazar	Rajnagar, Barlekha, Srimangal, Kamalganj	120
	Habiganj	Baniachang, Chunarughat	80
Barishal	Barishal	Bakerganj	495
	Jhalokathi	Nalchiti, Rajapur, Jhalokati Sadar	570
	Pirojpur	Kaukhali, Nesarabad	175
Khulna	Jashore	Monirampur	25
Mymensingh	Mymensingh	Phulbaria, Gafargaon, Haluaghat, Muktagacha	220
	Netrokona	Mohanganj, Kendua	230
Rangpur	Nilphamari	Kishoreganj	150
	Kurigram	Bhurungamari	30
Dhaka	Tangail	Kalihati, Ghatail, Gopalpur, Delduar, Basail, Mirzapur, Nagarpur	2985
	Narsingdi	Manohardi	20
	Munshiganj	Sirajdikhan	60
	Faridpur	Boalmari	30
Rajshahi	Pabna	Atgharia	100
	Sirajganj	Sadar, Kamarkhand, Raiganj	370
Chattogram	Cumilla	Barura, Chandina, Burichang	140
	Chandpur	Shahrasti, Kachua, Hajiganj	410
	Feni	Sadar, Sonagazi	180
	Noakhali	Kabirhat, Sadar	650
	Lakshmipur	Raipur, Ramgati	180
	Chattogram	Anwara, Mirsarai	50
-	-	Total	7916

Sources: 1) Shitalpati Shilpa Youth Foundation, Nalchiti, Jhalokati; 2) Shitalpati industrial workers cooperative Society Ltd., Kalihati, Tangail; 3) Interview with patikar or pati industrial workers of the concerned district.

Types of shitalpati handicrafts in Bangladesh

Although the Shitalpati is made in different districts of Bangladesh, and there are many differences in their types, shapes, designs, artistic and dexterity. Again, there is a difference in the quality, size, shape, and design of shitalpati as many patikars do not have good idea or knowledge on making or processing of patibet, design of shitalpati, artistic and dexterity, and demand of the buyers. Observing the Shitalpati made in different areas, it was found that the quality, artistic, and dexterity of shitalpati of Sylhet region is relatively better than that of other parts of the country. However, if proper training or skill development programme is to be provided to the craftsmanship, it is possible to make quality shitalpati in other districts like Jhalokati, Tangail, Sirajganj, Cumilla, Chandpur, Feni, Noakhali, Lakshimpur etc. The following are the types of shitalpati (along with their key characteristics, size and price ranges) that are usually made and marketed by the patikars in different parts of Bangladesh are given below (Table 4).

Table 4. Types of shitalpati handicrafts, key characteristics, size and price

Sl. No.	Types of shitalpati	Key characteristics of shitalpati	Size (Length x Width)	Price range (Taka)
1) Based on the usage of different layers of stem of murta plant				
a)	Shitalpati (Cooling mat)	<ul style="list-style-type: none"> Made with <i>peet bet</i> (top layer of stem) Top surface of the mat is smooth and shiny Used for lying or sitting Export quality and high in price 	152cm × 213 cm	1200-1500
b)	<i>Ati pati / Chati / Chatai / Dao / Bukar pati</i>	<ul style="list-style-type: none"> Made with <i>ati or auti bet</i> (2nd layer of stem) Upper surface of the mat is rough or uneven Used for drying paddy or roof material for RCC Poor quality and price is cheaper 	152cm × 213 cm or bigger	500-700
c)	<i>Dala pati</i>	<ul style="list-style-type: none"> Made from short cane of dala stem Small in size and low in price 	91cm × 137cm	250-300
d)	Thick mat	<ul style="list-style-type: none"> Made with thick <i>peet or ati bet</i> Used for drying paddy or other crops Used for seating on it Large or small size and low in price 	152cm × 213 cm or bigger	500-700

Sl. No.	Types of shitalpati	Key characteristics of shitalpati	Size (Length x Width)	Price range (Taka)
2) Based on artistic, dexterity and design				
a)	<i>Nakshi Pati</i> (Chikan)	<ul style="list-style-type: none"> Made with thin or narrow <i>peet bet</i> Artistic and smooth Designed with animals, herbs and surroundings motifs Included in the list of World Intangible Cultural Heritage of the UNESCO Exportable in abroad and very high price 	152cm × 213 cm or any size	20000-25000
b)	<i>Nakshi pati</i> (General)	<ul style="list-style-type: none"> Artistic and smooth Made of white and colored <i>peet bet</i> Price is high 	152cm × 213 cm or any size	2000-2500
c)	White carpet (Chikan)	<ul style="list-style-type: none"> White, smooth and shiny Made of thin and white <i>peet bet</i> Price is high 	152cm × 213 cm	2000-2500
d)	White carpet (General)	<ul style="list-style-type: none"> White, smooth and shiny Made with some thick white <i>peet bet</i> Price is relatively low 	152cm × 213 cm	1200-1500
e)	Grameen check	<ul style="list-style-type: none"> Prepared in the form of Grameen check design Made of white and colored <i>peet bet</i> Smooth, shiny and high price 	152cm × 213 cm	1300-1500
f)	<i>Jamdani pati</i>	<ul style="list-style-type: none"> Made in the style of Jamdani saree design Made of white and colored <i>peet bet</i> Smooth, shiny and high price 	152cm × 213 cm	1200-1500
3) Based on the size and use of the mat				
a)	Bedding mat	<ul style="list-style-type: none"> Made with white or colored <i>peet bet</i> Smooth and shiny Used for sleeping on it Larger in size and more expensive 	152cm × 213 cm or bigger	1200-1500

Sl. No.	Types of shitalpati	Key characteristics of shitalpati	Size (Length x Width)	Price range (Taka)
b)	Prayer mat	<ul style="list-style-type: none"> Made with white or colored <i>peet bet</i> Smooth and shiny Used for religious prayers Small in size and low in price 	91cm × 137cm	300-400
c)	Seating mat	<ul style="list-style-type: none"> Made with <i>peet bet</i> Used to sit on the ground Small in size and low in price 	91cm × 137cm	250-300
d)	Table mat	<ul style="list-style-type: none"> Made with white or colored <i>peet bet</i> Smooth and shiny Used on table Small in size and low in price 	91cm × 137cm	300-400

Economic return of shitalpati weaving

Shitalpati artisans or patikar families usually make their own shitalpati or other handicrafts. In that case, from the cultivation of murta plant to the making and processing of patibet, dyeing of cane, design and weaving of shitalpati and its marketing all are almost done by themselves. As there is no alternative arrangement for employment, patikars are usually do shitalpati weaving during the rainy season. It was observed that to make a shitalpati of large size (152cm × 213cm) 6-7 man-days are required. But each of these ordinary sizes is sold at Tk. 1200-1500. It revealed that every artisan earned a wage of Tk. 170-180 per day (in 8 hours) for making the shitalpati (Table 5).

Table 5. Economic return from an ordinary quality of shitalpati (152cm × 213cm)

#	Input of shitalpati	Number	Making cost (Tk./unit)	Selling price (Tk/unit)	
				White mat	Colored mat
a)	Murta doga or stem	120	200	1200	1500
b)	Family labour (<i>patibet</i> making, processing, weaving of shitalpati etc.)	6-7 man-day (8 hrs. /day)	-		
c)	Painting of <i>Patibet</i>	-	100		
-	Total	-	300	-	-

Marketing place of shitalpati handicrafts

The patikar families (artisans) are usually selling shitalpati handicrafts at local warehouses, showrooms, fairs, to moneylenders, middlemen and by ferries. The moneylenders, foremen or middlemen also purchase the shitalpati products directly from the house of the patikars at a much lower price. Later it sells to users at a much higher price. This deprives the patikar family from fair price of shitalpati.

Economic importance of murta/shitalpati in Bangladesh

The only raw material for making shitalpati in Bangladesh is patibet made from the stem of murta. Murta plant play an important role in the economy of the country. The Bangladesh Forest Department receives a large amount of revenue from murta resources. It was reported that the average annual revenue of the Bangladesh government from the sale of murta is about five thousand United States Dollar (USD) during the period of 1981-91 (Banik, 2001). Most of shitalpati is used in the country and a small amount is exported abroad. In the country, 175 processing units of shitalpati products worth USD 0.10 million at a production cost of about USD 0.05 million (BSCIC, 1992). The shitalpati handicrafts has provided employment to the artisans or patikars involved in this profession. It was reported the annual value of murta and hogla plants in 1992 was about USD 0.11 million (Basit, 1995). In the country, about 15,000 artisans based in karupara or patikar produce shitalpati from murta with an annual value of around USD 0.59 million (Banglapedia, 2014).

Importance of murta cultivation in the agro-ecosystem of Bangladesh

Murta plant prevents soil erosion and the decaying leaves of the plant mix with the soil and add organic matter to increase the fertility of the soil. It is possible to increase the productivity of land by cultivating this plant on the side of the house, on the side of road, river or canal, in submerged or fallow lands. Murta plant can tolerate salinity and waterlogging. Due to its wide adaptability, the plant can be easily cultivated on any land up and down (Ahmed *et al.*, 2007). Abandoned stems or branches of the murta are used as fuel for cooking which reduces deforestation and protects the environment. The leaf sample contained dry matter 26.23%, ash 11.76%, organic matter 88.24%, acid detergent fiber 56.02%, crude protein 13.84%, neutral detergent fiber 79.86% and ether extract 2.23%. The leaves of murta can also be used as fodder for livestock through mixing it with rice straw. However, excess feeding of livestock with murta leaves may cause indigestion of the animal because it contains higher amount of crude protein. The murta plant protect the environment by creating green fences in wetlands. Therefore, it has huge potential to be cultivated in the coastal and low lying areas of the country.

Present status of shitalpati handicrafts in Bangladesh

Analyzing the data obtained from preliminary information, it was observed that in the low-lying areas of the country where the murta plant grows, the patikars (about eight thousand families across the country) are involved in this profession from their ancestors. Talking to the local patikars, it was known that the activities of this cottage industry have been going on for centuries. A huge number of shitalpati had been made before but many patikars have left the business due to low demand and the unfair market price of the shitalpati products. Many artisans make shitalpati products just to meet their needs. Again, if someone orders, they make the products according to the demand. Although the traditional art of shitalpati weaving of Bangladesh has been included by UNESCO in the list of important intangible cultural heritage of the world in 2017 but the shitalpati handicraft is on the verge of extinction due to lack of modern technology, lack of fair price of the products, proper recognition and lack of necessary cooperation in making the products. However, there is a huge demand for environmental friendly natural products (like shitalpati) as an alternative to the non-eco-friendly plastic products. Therefore, it is necessary to promote, export and use advanced technologies for the development of shitalpati based handicrafts in Bangladesh.

Research works so far conducted on shitalpati or murta plant in Bangladesh

Scientists of Regional Agricultural Research Station, Rahmatpur, Barishal of Bangladesh Agricultural Research Institute visited the Bangladesh Forest Research Institute (BFRI), Sholashahar, Chattogram to collect information about the research activities on murta plant by BFRI. According to BFRI, little research work had been conducted on the cultivation of murta plants in the 1980s and 1990s as a minor forest resource. However, research works are yet to be conducted by BFRI on the production of the quality stem of murta plants through improved management practices, management of insect-pests and diseases, making and processing of murta cane and weaving of good quality shitalpati products. As per the directives of Ministry of Agriculture, Bangladesh Agricultural Research Institute, Rahmatpur, Barishal has been executing some research programmes on collection and evaluation of murta germplasm, agronomic research for maximizing the yield and quality of murta plant, and processing (physical and chemical) of murta cane.

Constraints for promotion of shitalpati-based handicrafts in Bangladesh

- 1) Since there is no research or extension works for the development of shitalpati, the patikars cultivate murta plant and make shitalpati products following traditional practices which is not conducive to the development of shitalpati based cottage industry.
- 2) In the absence of modern agronomic technologies (in terms of planting of seedlings at the right time, plant spacing, method of planting, fertilizer

management, pruning or sharing, timely harvesting of stem/doga, etc.) the yield of murta plant is low and quality *patibet* (murta cane) is not satisfactory.

- 3) Murta plants are attacked by different insect-pests like leaf-rolling insects, stem-biting insects, rats, crabs, etc., resulting in reduced yield and quality. Moreover, diseases like stem and foot rot, leaf spots etc. are occurred, which reduce the quality and price of murta cane.
- 4) Many years old orchards of murta plant (50 years or more) are less productive and do not produce good yield and quality of shitalpati.
- 5) Due to lacking of modern technology for making and processing patibet, quality patibet is not produced. As a result, the quality of the shitalpati becomes poor and its market value is low.
- 6) Due to the proliferation of plastic mats in the market at present, the demand and price of shitalpati products are decreasing day by day.
- 7) The patikars suffer financially as they do not get a fair price for selling their products. That is why the patikars are leaving their original profession and moving to other professions.
- 8) Although shitalpati is included in the list of important intangible cultural heritage as declared by the UNSECO, but the product is not included in the list of exportable products of the country. That is why the workers involved in making handicrafts are deprived of a fair price and forced to sell at low prices in the country.
- 9) Absence of proper training, the quality of technique and craftsmanship of patibet production, processing and shitalpati weaving (e.g., weaving technique, design, and craftsmanship is not up to the mark.
- 10) Most of the patikars make only the shitalpati of traditional design from murta plant stem. However, the patikars do not get high prices for their product due to lacking versatility or diversification of shitalpati products.
- 11) The patikars usually borrow money (USD 235-588) from various local microfinance and Non- Government Organizations (NGOs) (e.g., Asha, Bangladesh Rural Advancement Committee-BRAC, Uddipan, Thengamara Mohila Sabuj Sangha-TMSS, etc.) at a high-interest rate (13-14%) for the production of shitalpati. Repaying loan installments in every week is very difficult for them.
- 12) As there is no suitable exhibition or sale center of shitalpati products in the country, local and foreign buyers or tourists are not attracted to buying shitalpati as a part of the world heritage. This hinders the

introduction and development of shitalpati handicrafts at home and abroad.

- 13) The shitalpati-based cottage industry is located in a very remote area of the country and communications are not well developed. This hinders the development of this industry.

Policy options for improving shitalpati in Bangladesh

- 1) Integrated research and development programmes should be undertaken on murta plant cultivation, processing, manufacturing, marketing, and promotion of shitalpati products in partnership with the concerned governmental and non-governmental organizations in Bangladesh.
- 2) Development and extension of suitable modern technologies (e.g., planting time, plant spacing, method of planting, pruning or pruning, fertilizer management, weed control, insect-pest and disease control, stem/doga cutting, cane/beti making, and processing, etc.) for the production of quality murta plant and shitalpati products.
- 3) The patikars usually weave shitalpati products by hand. It takes a lot of time and labour. Research can be done on mechanization to facilitate the work for making the products with minimum cost, time, and labour.
- 4) The patikars (workers engaged in making shitalpati) routinely soak and boil the patibet to make it durable and soft and to increase its brightness and smoothness. However, research is needed on the use of other natural or chemical products to make high-quality shitalpati products.
- 5) Collection, evaluation, and characterization of murta germplasm in different growing areas of the country to develop an improved variety of murta plants for making quality products.
- 6) Centennial or aged murta gardens are not very productive so they should be removed and new gardens should be established.
- 7) Instead of shitalpati weaving from murta plant, make versatility or diversification of shitalpati products such as prayer mats, toys, vanity bags, wallets, cushions, seats, wall mats, footwear, vases, pen holder, small boxes, photo frames, mirror frames, table lamps, hand fans, fancy shoes, girls bags, product packaging and so on for value addition of the products. The murta cane can also be used for decorating the walls of the house. This will increase the profitability and income generation of the patikars and other stakeholders involved in the shitalpati handicrafts making.
- 8) Of the four layers (*peet*, *ati*, *chhota* and *buka*) of murta plant stem, the *peet* and *atibet* can be used for making shitalpati products. The *chhota*

layer can be marketed as a rope for betel leaf garden, cottage shade, shika making and other tying purposes. On the other hand, the buka (pith) layer of murta stem can be used as a raw pulp material for making colorful paper that are used in cottage industries. This will ensure the efficient use of every part of murta plant and the patikars will be benefitted.

- 9) The murta plant is tolerant to waterlogging and salinity as well as protect soil erosion. Under the changing climatic conditions, the plant will be conducive to the socio-economic development of the poor people living in the low-lying and coastal areas of Bangladesh through the development and adoption of the shitalpati handicrafts. Besides, the cultivation of murta plant will ensure proper use of fallow land, prevent erosion and increase soil fertility.
- 10) As the production of fodder crops are limited in the waterlogged areas of Bangladesh, therefore murta leaves can be used for livestock fodder purpose.
- 11) Although the traditional handicrafts of shitalpati weaving have been included in the list of the important intangible cultural heritage of the world by UNESCO, the shitalpati products are not included in the list of export items of Bangladesh. Therefore, for the development of this cottage industry, shitalpati products should be included in the list of exportable items.
- 12) At present, due to the proliferation of plastic mats, the demand and market price of shitalpati are decreasing day by day. In this case, if people are made aware of the health hazards (allergies, skin diseases, etc.) caused by the use of plastic mat, people will be interested in using shitalpati products made from natural ingredients and the demand for these products will increase.
- 13) Provide proper training to the stakeholders (e.g. patikars, traders etc.) for enhancing their skills in relation to the production of quality murta cane, cane (*patibet*) making and processing, techniques (weaving, design, and craftsmanship) for making quality shitalpati and other diversified products from murta plant.
- 14) Infrastructure and road communications should be developed in the industrial areas (such as roads, bridges, culverts, construction of large houses for making cane from murta plants, etc.) for the development of shitalpati-based handicrafts in Bangladesh.
- 15) Group or association may be formed at local and regional levels with the participation of actual patikars and other stakeholders to supervise or coordinate the activities of the shitalpati-based cottage industry.

- 16) For the improvement of the shitalpati handicrafts, loans can be provided to the stakeholders (e.g., patikars, traders etc.) with easy terms and conditions or without interest from financial institutions (such as Small and Medium Industries Foundation-SME Foundation, Palli Karma Sahayak Foundation-PKSF, financial assistance from Bangladesh Bank, public-private banks, soft loans from World Bank funds, etc.).
- 17) For the development of shitalpati handicrafts, all types of products made from murta plants can be exempted from value-added tax (VAT) and income tax.
- 18) Shitalpati exhibitions or sales centers should be set up in different regions of the country to attract to buy shitalpati at reasonable prices. Besides, stalls of shitalpati products can be set up at the Dhaka International Trade Fair under the direct supervision of patikars and other stakeholders. This will introduce and develop shitalpati-based handicrafts in the country and abroad.
- 19) Ambassadors or missions of different countries located in Bangladesh can be introduced to the shitalpati handicrafts as the “Intangible Cultural Heritage” declared by UNESCO. This will increase the expansion and export of these natural handicrafts.

Conclusions

The diversification and improvement of the shitalpati handicrafts are essential for maintaining the glorious tradition of the cottage industry in Bangladesh ultimately better socio-economic condition of the shitalpati craftsman. For this, it is necessary to formulate and implement an appropriate action plan (short, medium, and long term) with necessary policies in partnership with various public-private and even international organizations.

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