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Drawbacks, Necessary Development and Future Prospect of Silk in Bangladesh

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Abstract- Bangladesh is an underdeveloped and agro-based country. Silk industry has a long and glorious past history but the growth and market share is not satisfactory of this industry to the national and global context. It is an urgent need to mark the existing problem and future expectations of silk industry in Bangladesh. So, it is essential to make effective plan and proper execution of that plan to get back the glorious position of our silk industry as well as to help the economical development of our country.

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I. INTRODUCTION

Silk production is a very complicated process. Silk is made by silkworm, the caterpillar of the flightless silk moth, whose only food is fresh mulberry leaf. Silkworms are hatched from eggs and end their existence by encasing themselves in cocoons from which they emerge as silk moths. Several steps are required for silk filament manufacturing.

The production of cocoons for their filament is called sericulture. Experiments have proved that the cocoon of the *Bombyx mori*, a species of moth, produces the finest quality of raw silk.

The silk-moths cannot fly because their bodies are too heavy in relation to their wings. Male's silk-moths die soon after mating while one single female silk-moth lies from 300 to 500 tiny eggs before she dies. Silk moths lay eggs on specially prepared paper by using paper card method. After hatching, larva (caterpillar) comes out.

These caterpillars are very delicate and require the utmost care. When first born, they are dark green in color and have a voracious appetite.

The larva is fed mulberry leaves which are taken from the mulberry trees. At the 1st stage, the larva is fed

tender mulberry leaves and this stage lasts for two days. At 2nd stage, the larva is fed mulberry leaves which are taken from the middle part of the trees and are more matured than tender leaves. This stage lasts for 2.5-3 days. At 3rd stage, the larva is fed mulberry leaves which are taken from the lower middle part of the mulberry trees. This stage lasts for 2.5-3 days. At 4th stage, the larva is fed more matured mulberry leaves which are taken from the lower part of the trees. This stage lasts for 3-3.5 days. After 3.5-4 days, the silkworms stop having leaves and their skin turns into yellowish color from white color and secrete saliva which is a Protein based substance.

The liquid silk is contained in two glands inside the silkworm. From these glands it flows in two channels to a common exit tube, called the spinneret, in the silkworm's head. As it emerges, the liquid silk hardens into very fine filaments and these are coated and stuck together by a gummy substance called sericin which comes from two other glands nearby.

The silkworms are transferred to Chandraki as they start spinning cocoon around themselves and they are kept 6-7 days. The formation of cocoon needs 6-7 days and the Worm inside it is called Pupa.

The purpose of sericulture is to harvest the cocoons and collect the raw silk from these cocoons. Therefore, before it becomes a moth and tears out the cocoon to come out, the chrysalis is killed by exposing it to a temperature of 70-80 °C for 7-8 hours.

The silk fiber, as it is spun by the silkworm, consists of two triangular filaments of fibroin, stuck together with a gum called sericin.

The silk farmers heat the cocoons to kill them, leaving some to metamorphose into moths to breed the next generation of caterpillars. Harvested cocoons are then soaked in boiling water to soften the sericin holding the silk fibers together in a cocoon shape. The fibers are then unwound to produce a continuous thread. Since a single thread is too fine and fragile for commercial use, anywhere from three to ten strands are spun together to form a single thread of silk.

Most of the silk gum is not removed to give protection of the delicate filament. Cocoons are boiled into hot water until yarn comes out of cocoons and when the yarn comes out it is transferred to the reel by some manual and mechanical process. Transferring the

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yarn from reel to hank is known as re reeling which is done to overcome the reeling defects like yarn breakage, uneven Winding etc. Then the yarn is prepared for fabric production.

II. MATERIALS AND METHODS

In our study we find out some problems of silk industry in Bangladesh like old technology, poor advertising, limited showroom, shortage of raw materials, inadequate capital, insufficient governmental facilities etc. We also find out some prospects of this industry like growth of sales and market share, low cost of labor, increasing demand, good geographical location, employment opportunity etc.

a) *Present Status of Mulberry Trees in Bangladesh*

In our study we find out some problems of silk industry in Bangladesh like old technology, poor advertising, limited showroom, shortage of raw materials, inadequate capital, insufficient governmental facilities etc. We also find out some prospects of this industry like growth of sales and market share, low cost of labor, increasing demand, good geographical location, employment opportunity etc.

Cultivation of mulberry plants is referred to as moriculture. Mulberry is a perennial plant and, once established in the field, continues to produce in full form for at least 15 years.

Mulberry leaf is the food on which the silkworm lives on. So production of raw silk directly depends on the production of this leaf. *Bombyx mori* which produces the silk cocoons therefore research on conservation of genetic stock of mulberry, development of high yielding mulberry varieties, appropriate technology of mulberry cultivation and control of diseases and pests of mulberry are being conducted.

Improvement of crop productivity primarily depends on the level of conservation of genetic material. BSRTI is maintaining 60 mulberry varieties in its germplasm bank out of which 36 are indigenous and 24 are exotic in origin. Among the 24 exotic varieties, 17 Indian, 4 Chinese and 3 Japanese. Recently 4 exotic varieties have been collected.

BSRTI has developed 9 high yielding mulberry varieties (BM-1 to BM-9). The leaf yield of the developed varieties is 30-40 metric ton/hectare/year as against 12-18 metric ton/hectare/year. Among the developed BM-1, BM-3, BM-4, BM-5, BM-6 and BM-8 has been transferred to the field for commercial leaf production. The rest are in the pipeline for exploitation to the field level. CPH-91 and CPH-167 these two varieties are in the multiplication stage. The varieties were selected on the basis of biometrical, biochemical and bioassay studies, diseases

etc. The varieties BM-4 and BM-3 are found to be resistant to drought and water logging conditions respectively. The variety BM-4 is recommended for practice in water stress conditions and BM-3 water logging conditions. BM-8 and CPH 167 are found to be tolerant to drought and disease specially Tukra and Leaf curl.

b) *Present status of sericulture in Bangladesh*

BSRTI has fabricated low cost moutage made of straw and bamboo, which has the facilities for both side mounting. This type of moutages helps to produce quality cocoons at cheaper rate. The collection and maintenance of silkworm breeds of tropical and temperate regions are important for development of high yielding breeds and hybrids of silkworm. 85 multivoltine and bivoltine silkworm strains are being maintained in the institute. This include indigenous multivoltine, Indian multivoltine, Chinese multivoltine, Chinese bivoltine, Korean bivoltine etc.

The institute has formulated package of practices required for Chawki silk worm (young age) as well as late age silkworm rearing in tropical and subtropical condition. This include handling of silkworm eggs maintenance of proper temperature (23-28°C) and relative humidity (70-90 %) providing adequate spacing for silk worm (400-600 sqft for 50,000 larvae in 5th stage), maintenance of leaf freshness to preserve moisture and nutrient content, careful handling of worms in moults and spinning.

Silkworm genes could be altered to increase their tolerance of hot climates, allowing more widespread global cultivation.

Bangladesh is growing mainly BSRTI mulberry varieties for bush and tree plantations; silkworm races are both bivoltine hybrids (BSRTI series) and hybrids of poly-voltine breeds evolved through crossbreed of Nistari, a traditional Bangla strain and the hardy other races.

Table 1: Newly invented silkworm breed by BSRTI

SL No.	Code Name of Race	Full Name	Year of Development
1	F.T.B	Field Trial-B	2004
2	H.T.H.R.B-3	High Temp. High Humidity Resistant Breed-3	2004
3	95/14(P)	Improve multivoltine(Plain)	2004
4	95/14(M)	Improve multivoltine(Mark)	2004
5	ISK.	Indian Silkworm, Karnataka	2002
6	N(I)K(P)	Nistari(India) Karnataka(Plain)	2003
7	BN(P)	Brac Nistari(Plain)	2004
8	(P)	Nistaari B-2(Plain)	2005
9	(M)	Nistaari B-2(Mark)	2005
10	BN(M)M	Brac Nistari(Mark)	2004
11	BB	Bangladesh Bivoltine	2004

III. RESULTS AND DISCUSSION

a) Present Status of Mulberry Trees in Bangladesh

In 1993 our Finance Minister M. Saifur Rahman accepted the World Bank 1990 open market policy which is the main reason for the destruction of our silk industry. In open market policy people did not have to pay tax on the import of silk yarn .so people of our country started to import of silk yarn from china which was economically & in quality better than ours. Bangladesh became the transit point for the import of silk yarn which not only affected Bangladesh but also India and Vietnam. Many people in Indian boarder started seasonal business of silk product which came to our country cheaply & hampered our farmers & industrialist. As a result the Mulberry tree farmers and silkworm producers can't make profit by selling their products. So People are reluctant to cultivate Mulberry trees now days because there is no guarantee that if anyone has a Mulberry tree, he can sell its leaves to the market.

Another reason is there are hybrid crops from which they can earn much more than selling leaves of Mulberry trees. Now days, people can get crops all over the year from the hybrid crops & the crops amount is much more than previous period. For this reason there is acute shortage of Mulberry trees and silkworm. As a result many of our silk industries have been shut down so the number of Mulberry trees is decreasing day by day. The weather of country is changing day by day so the suitable environment for the cultivation of silk worm is reducing day by day. Many people have diverted their occupation to other sector from this sector and our rural areas people forgot about the cultivation of silk worm which is another reason for the destruction of this sector.

[11] Silk is a very fine, regular, translucent filament. It may be up to 600m long, but averages about

300m in length. Depending upon the health, diet and state under which the silk larvae extruded the silk filaments, their diameter may vary from 12 μm to 30 μm .

Our silk worm lays egg from which we can get only 400-500 yarn which is much lesser in comparison with china where from a silk worm egg they can get 1400-1600 m yarn. As long as our silk yarn is not so good as compared with China, we can't compete with them in international market. Our local market is now reluctant about silk product. People are now buying Indian synthetic product which are cheaper & don't have any crease or wrinkle after washing. So, people are refusing silk products eg. saree, salwar kameez etc.

In 2001 China created embargo to the export of silk yarn because they found producing fabric & garment more profitable than selling silk yarn. Recently china is reluctant to export silk yarn to other countries. Our sericulture research board & institute are corrupted & there is acute shortage of skilled & trained manpower. People working here very few of them have knowledge about sericulture. Lack of govt. subsidy & attention is another reason for the destruction of our silk industries.

b) Future prospect of silk weaving in Bangladesh

The present situation of silk weaving sector in Bangladesh is not very much congenial. If the current situation continues, our silk industries will be demolished in the near future. If our silk research board & institute work together & give appointment the skilled people here then we may hope a bright prospect in this sector. We need better silk worm & tooth tree in respective to our weather. If we can do so, we may certainly hope a better prospect in our silk sector. If the Government patronize to this sector & give incentive to the people of this sector then we can hope a bright prospect of this sector. People of our country should be getting acknowledged of this sector & new investment will certainly help to boost this sector. The farmers of our

country should be trained how to cultivate silk worm & tooth trees & if this happened we can certainly hope a better prospect of this sector.

c) *Way to restore our previous glory of silk product*

First reopening of the mills is needed. People can't overcome loss without subsidies from the govt. Govt. should create awareness to the farmers about Mulberry tree cultivation & the leaves should be bought by the govt. of its own care so that the farmers don't have any fear about loss. Embargo should be given on the import of silk yarn. Local market of silk product should be regenerated by creating awareness among people.

Our silk worm egg is not necessarily so big that can give 1400-1600 m yarn to compete with China. So, it is the research institute's duty to invent highly developed silk worm which can give 1400-1600 m yarn from its egg. Necessary developments of Mulberry tree should be done so that it can grow everywhere such as low lying land & in the front of free land of home.

IV. CONCLUSION

Bangladesh is a developing and small country. Silk industry plays a vital role in our national economy. It has a remarkable goodwill but the growth and market share is not satisfactory of this industry to the national and global context. Many people get employment opportunity from this industry and Govt. is getting huge income tax from the silk mills. In the present study we find out some problems of silk industry in Bangladesh like old technology, poor advertising, limited showroom, shortage of raw materials, inadequate capital, insufficient governmental facilities etc. Besides this we also mark some prospects like growth of sales and market share, low cost of labor, increasing demand, good geographical location, employment opportunity etc. So, it is essential to make effective plan and proper execution of that plan to get back the glorious position of our silk industry as well as to help the economical development of our country. For this purpose some recommendations have been proposed for silk industry of Bangladesh in the study. We believe that if the industry follows that recommendation, it will be benefited and able to gain more profit and overcome all of its obstacles.

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