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REVIEW ARTICLE

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UNDERTAKING NEVER-ENDING CYCLE:
EVALUATION WITH REGARD TO SERICULTURE
IN MAIN CAFFEINE**

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Progress Setting Up and Also Undertaking Never-Ending Cycle: Evaluation With Regard To Sericulture in Main Caffeine

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INTRODUCTION

Making a livelihood is part of man's existence. Poverty in a most general sense means that one does not make out as well as others or as well as one would have liked to. There may be many underlying reasons for poverty. Poverty probably has always existed as a real phenomenon. But it was the international agreements drawn up at Bretton Woods towards the end of World War II that spelt out for the first time that poverty was a world-wide concern (World Bank Reports, various years). The term "underdeveloped" world was introduced, later replaced by the more optimistic – but not necessarily more realistic – term "developing countries".

Developing countries, self-defined and declared as such in the United Nations, are poor countries. Poverty may be measured by per-caput-income, purchasing power parity, human development indicators or by other means, and is in the first instance a relative term (e.g. Hemmer, 2002). They all mean that people are less well off than one would hope for in comparison.

Poverty exists, and it does not matter very much which historical or ideological reasons we attach to it. The more useful way to look at it is that there are many examples where relative poverty, even absolute poverty threatening people's lives (starvation) can be overcome. Examples from the so called industrialized countries are the Alpine regions, the poverty-stricken regions of southern Germany, the Mezzogiorno of Italy, and many regions of Ireland.

In India, Sericulture is mostly a village-based industry providing employment opportunities to a large section of the population. Although Sericulture is considered as a subsidiary occupation, technological innovation has made it possible to take it up on an intensive scale capable of generating adequate income. It is also capable of providing continuous income to farmers.

India is the second largest producer of silk in the world with an annual silk production of more than 21,000 M. Tons in 2010-11(provisional). Although, all the known varieties of silk, viz. Mulberry, Eri, Muga and Tasar are produced in India, Mulberry silk is the most popular variety. Mulberry silk alone contributes more than 80% of the Country's silk production. Silk and silk goods are very good foreign exchange earners. Export potential of this sector is promising as silk production in Japan is declining and that of China, the largest silk producer the World, it is stagnant. The present global scenario clearly indicates the enormous opportunities for the Indian Silk Industry.

Sericulture plays a vital role in rural development in Karnataka, as it integrates well with the farming systems and has the potential to generate attractive income throughout the year. Karnataka produced 8196 tons of raw silk during 2001-02, which accounted for about 51 per cent of the country's total silk production of 15,848 tones. As mulberry is highly versatile in nature, it is cultivated in a variety of soil types, a wide range of agro-climatic conditions and in both rain fed and irrigated areas. Out of 1,20,119 ha of mulberry area in Karnataka, rain fed mulberry occupies 24,985 ha, accounting for 20.80 per cent of the total mulberry area. The rain fed sericulture is distinct from the irrigated sericulture. As the rain fed farming is generally characterized by uncertainty and fluctuations in rainfall and other climatic conditions, there are wide spatio-temporal variations in the productivity levels in the rain fed sericulture. Quality mulberry leaf, separate rearing house with the required rearing appliances and proper rearing management, which are essential for the production of quality cocoons are lacking with the rain fed Sericulturists. In this context, the study has been taken up to analyze the resource-use pattern and profitability of dry land sericultural operations with the following specific objectives: (i) To study the resource-use efficiency and productivity in sericulture farms; (ii) To assess the profitability of sericulture operations under

rainfed conditions; (iii) To analyze the extent of adoption of recommended technologies by the farmers; and (iv) To identify the problems faced by the rainfed sericulturists.

Eri culture can generate employment for a large number of unemployed people especially females partially or fully in its various stages of activities. The scope is increased further when proper eri culture and endi textile industries are undertaken on scientific and commercial lines. Thousands of families in Assam have been engaged directly or indirectly in various eri culture activities like sowing of seeds, plantation of host plants, maintenance of plants, plucking of leaves from the planted and wildy grown trees, feeding and rearing of silkworm upto cocoon stage, spinning of yarn, weaving of fabrics, marketing of cocoons and cloth etc. During the rearing period of eri and mulberry worms, constant watch is not necessary. The family members engage themselves in works connected with rearing, e.g., collection of leaves, cleaning of leaves and rearing trays, which require 2 to 4 hours everyday. But in case of muga culture, continuous and careful watch is necessary from the time of keeping tiny worms on the feeding plants soon after breeding till maturity stage. Therefore, the members of the rearing families have to stay in the 'Somanies' throughout day and night. Sometimes, hired labourers are also employed for the purpose.

HISTORICAL PAST

Though the Chinese sources say that Fo-xi, the first emperor of China as the first person to introduce mulberry cultivation, silkworm rearing, it is Si-ling-chi, the wife of the emperor Hoang-ti who has been considered as the Lady of the Silkworms. The great prince, Hoang-ti, directed his wife, Si-ling-chi, to examine the silkworm and test the practicability of using the thread. Thereafter, Si-ling-chi discovered not only the means of raising silkworms, but also the manner of reeling the silk, and of employing it to make garments. Si-ling-chi was later deified for her work and honored with the name Seine-Than, or "The Goddess of Silkworms". Sericulture during the following centuries spread through China and silk became a precious commodity highly sought by other countries. The reign of the emperor Hoang-ti dates back to 2677 – 2597 BC and it is observed that sericulture was already a long-established profession. According to Chinese records, the discovery of silk production from *Bombyx mori* occurred about 2700 B.C.

It is well known that silk was first discovered in China in the year 2852 B. C., by Shi Lin Chi, wife of the first Chinese emperor, who also in-vented the hand loom for its use. From that time up to the beginning of the Christian era, China was the world's only producer of silk. Even in that country, only the imperial family and nobility were allowed to use it. But after a period of nearly 29(X) years, the sericulture industry gradually extended to other countries. It was introduced into Japan in 199 A. D. by a Chinese, Koma-O, and into

Rome about the middle of the sixth century by two Persian monks returning from China. The movement continued to spread until by the twelfth century, nearly all of Asia, and the European countries bordering on the Medi-terranean were engaged in sericulture.

TECHNOLOGICAL INNOVATION

The technology of sericulture and silk production is well-known. In brief, various aspects involved in it are as follows:

Mulberry Cultivation: Silkworms feed on mulberry leaves. Hence the rearing of silkworms involves cultivation of mulberry trees, which provide a regular supply of leaves. Worms are introduced through DFLs (Disease Free Layings, i.e. eggs) procured from a quality centre (called grainage). In India, the bulk of mulberry cultivation is done by small farmers (< 4 acres land), usually in clusters of 300-400.

Rearing: The silkworms are actually larvae of the silkworm. They are reared in specially made trays in rooms with controlled temperature and humidity and regularly fed mulberry leaves. At a certain stage they convert themselves into cocoons. These cocoons are made from a single filament of material secreted by the pupa and wrapped around itself for protection. These filaments upon hardening constitute silk. On an average, 1 acre of plantation would yield 240 kg of cocoons in an year, starting from 100 DFLs. Depending upon whether it is dryland or irrigated mulberry, farmers can harvest the cocoons 4 to 8 times in an year.

Reeling: The removal of silk yarn from the cocoons is called reeling. This is done by first cooking them in water to remove the gum, which holds it together, and then unwinding the filaments (reeling). Usually 8-10 cocoons are reeled together. There are three methods for reeling: the charkha, the slightly more advanced cottage basin and the costly automatic machines.

Raw silk is of two kinds, viz., mulberry and non-mulberry. The distinction arises from the rearing of silk worms either upon mulberry leaves or on other plants. Mulberry silk is produced mainly in Karnataka, West Bengal, Jammu & Kashmir, Tamil Nadu and Andhra Pradesh although some other States have made some progress in this direction under their development plans. Vanya (Non-mulberry) silk comprising Tasar, Eri and Muga are produced in Jharkhand, Chhattisgarh, Madhya Pradesh, Orissa, Bihar, West Bengal, Assam, Meghalaya, Manipur and Nagaland. The different types of Vanya silk and spun silk and noil yarn are further defined as follows:

Tasar Silk – It is silk reeled from cocoons of silkworms belonging to saturniidae family, which are fed on leaves of Oak, Asan and Arjuna trees. Tasar silk is mainly produced in Jharkhand, Bihar,

Chhattisgarh, Madhya Pradesh, Orissa and West Bengal & Andhra Pradesh.

Eri Silk – It is spun from cocoons of silkworms belonging to saturniidae family, which are fed on castor leaves. Eri yarn is produced in Assam, Bihar, Manipur, Meghalaya, Nagaland and West Bengal. Unlike other kind of silk, this cannot be reeled and hence it is only spun. It has natural copperish colour.

Muga Silk - It is silk produced only in Assam from cocoons of silk worms belonging to saturniidae family, which are fed on Som and Soalu leaves. It has a rich golden colour. Spun Silk Yarn - Yarn composed of silk filaments of lengths ranging from 1 to 8 inches produced by bleaching, dressing and spinning the silk waste which is the by-product of the raw silk reeling industry.

Noil Yarn - It is short-staple residue obtained during dressing operations in silk spinning from silk waste. It is a by-product of spun silk industry. This can be spun into Noil yarn of coarse counts.

DEVELOPMENT PROCESS

Since the project has started in 1998 with experimental project until 2002 in the nucleus phase, the project was still on schedule. All these phases from experimental to industry phase have been completed. However, the project results were lower than expected.

As indicated, for development of sericulture and silk industry, the Central Silk Board(CSB) supports different activities of the State under the CADP. Financial assistance is provided for planting high yield mulberry varieties, installation of drip irrigation systems, construction of separate rearing houses, procurement of improved rearing equipments, establishing chawki rearing centres and supply of quality disinfectants. The matching share will be provided by the CSB as a subsidy.

Further support mechanisms are provided:

Assistance for health insurance to women sericulturists and workers, establishment of a Seri-Poly-Clinic, setting up of bio-control agents, support for establishment of multi-end reeling units, establishment of automatic reeling units, support for purchase of hot air driers, assistance for loom upgrading, establishment of nodal handlooms, insurance for silkworm crop and assets, assistance for dyeing and fabric processing, as well as general training in silkworm rearing

Sericulture is a livelihood activity that goes round the year & provides remunerative income to the farmers. About 15,000 traditional families involving one lakh

people actively practise sericulture in Orissa. It provides indirect employment to equal number of reelers, spinners & weavers. Out of the 4 types of silks viz. Mulberry, Tasar, Eri and Muga cultivated in India, three types namely Mulberry, Tasar and Eri culture is practiced in Orissa. These 4 types of silk differ in their food plant, duration of life cycle, quality of cocoon and yarn viz. size, weight, texture, colour, strength etc. At present with Govt, support tribals & few non-tribals under the BPL category are practicing sericulture & producing silk cocoons.

India exports considerable quantity of silk goods and the value of these silk goods is more than 15 per cent of the total raw silk production. India's export includes Dress Materials, Readymade Garments, Saris and Made-up articles for interior decoration. India's export has adequately progressed during the study period with both quantity and value of export showing high and significant growth. This increased growth is also accompanied by higher volatility. India exports mainly to 10 countries viz., USA, UK, Hong Kong, German People Republic, Italy, France, Spain, Saudi Arabia, UAE and Singapore. The share of total Indian exports to these 10 countries constitutes 80 per cent.

Sericulture, the production of silk worms and thus ultimately of silk fibre (see Ganga and Chetty, 1991), has become a promising rural activity in India because of its mini-mum gestation period, minimal investment, maximum employment potential and quick turnover for investment (Kasi, 2000, 2009a and 2009d). Out of 6.29 lakh villages in India, sericulture is practised in about 69,000 villages (Central Silk Board, 2002: 4; Geetha and Indira, 2011; Lakshmanan et al., 2011). Sericulture generates direct and indirect employment in various ways. First, mulberry cultivation creates employment on farms. Second, cocoon production, which uses mulberry leaves as an input, creates large-scale employment for family members of the mulberry growers. There are even instances of non-mulberry growers taking up cocoon production alone as a full-time occupation. They buy leaves from mulberry growers and then use them as raw material for cocoon production. Further, the reeling activity is also done locally, either in the rural areas or in semi-urban areas. Employment generated by this activity certainly helps to reduce rural unemployment.

CONCLUSION

The production function analysis has indicated that bullock power, human labour, quantum of feed and disinfectants are the important inputs which significantly influence the cocoon production. As regards the allocative efficiency of resource-use, bullock power is used efficiently. Leaf, fertilizer and disinfectants are used at sub-optimal levels. Hence, there is a scope of increasing the use of these inputs

to the optimum level in order to achieve the efficient use. The allocation efficiency is higher than unity for labour, which implies that the labour is being used uneconomically. The surplus family labour could be utilized for off-farm activities for rational use of manpower.

The economic analysis has indicated that the surplus income generated in cocoon production activities under rainfed conditions could be just enough to meet the wages of family labour, as with the inclusion of wages for family labour in the cost, the cocoon production activity becomes non-profitable. The research conducted on rainfed sericulture is only limited compared to that on irrigated sericulture. Hence, cost-saving technologies with high-yielding mulberry varieties and silkworm hybrids suitable for rainfed conditions should be evolved and popularized in order to reduce the cost of production and improve the profitability in rainfed sericulture.

a) For encouraging the rearers and to provide necessary information. Seri demonstrators should be engaged by the state government, who can play important role in providing necessary assistance and disseminating relevant information to the rearers.

b) Sufficient Eri concentration centres should be opened. The state government should provide food leaves to eri rearers through these centres.

c) The activities of the middleman, traders of cocoon should be controlled, as they exploit the innocent rearers and deprive them from getting a reasonable return on their investment.

d) Traditional weavers should be motivated and trained to embrace the new technology on silk fabric production. For the overall development of the silk weaving sector and as a part of modernization of the looms, the government of Assam should take necessary measures and initiative short term courses of advanced training facilities for dyeing, designing, printing, weaving etc. to the traditional weavers.

e) Attempts should be taken to capture foreign markets on the basis of information provided by Indian Silk Export Promotion Council, Mumbai. Moreover, fairs and exhibitions of quality products should be held at national and international level. This process will definitely raise the income of the weavers and exporters of silk.

To overcome these problems and to make this developmental enterprise still more attractive, several suggestions can be made (see also Toomey, 2011). First, there is a need to introduce new varieties of mulberry, which have been found viable with regard to the quality and quantity of leaf by the research institutes. Seri culturists must be encouraged to rear the beltline variety of silkworm rather than multivoltine silk worms to obtain better incomes. More farmers may also be motivated to take up sericulture on a

larger scale through cooperative farming. Irrigation facilities have to be enhanced by encouraging farmers to adopt drip irrigation. To meet the growing demand for DFLs, more grain ages should be opened and care must be taken to supply good quality laying

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