INTRODUCTION
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The word ‘Silk’ spells luxury and class. Ever since its discovery, 4 millennium ago, silk has been virtually ruling as “Queen of Textiles”, due to its sheen, lusters and elegance. It is the yarn of life, extruded by that unassuming caterpillar into a continuous filament. Silk has been linked and sought-after creations by the biggest names in haute couture. Yet, many admirers of spectacular garments are unaware of the modern origin of these illustrious textiles. The fact that the raw material comes from areas in developing countries and transition economies is in stark contrast to the affluent environment where elegant garments of famous fashion houses are presented to a selected few.

Sericulture in India:

In developing countries such as India, agriculture and agro-based industries play a vital role in the improvement of rural economy. The limited availability of land, the limited cash returns, and agriculture being confined to one or two seasons in the year, have made villages to look for supporting rural enterprises, such as sericulture. In India, over six million people are employed in various activities of sericulture. It is a cottage industry and provides the womenfolk in the rural areas with ample work in rearing silk worms, while the male members work in the fields. Recently the enforcing of new ideas by research institutions both in mulberry cultivation and silkworm handling among sericulturists, the industry is now practiced as main profession and a major cash crop, of the country in general and of southern states in particular.

Sericulture in India plays an important role in the economic life of the family. While silk spells luxury and wealth, its production means, a highly employment oriented, low capital intensive and remunerative activity ideally suited to the conditions of labour abundant economy of rural India. With unique distinction of sole producer of all the four kinds of commercially known natural silks like,
mulberry, tasar, eri and muga, India enjoys her position as the second largest raw silk producer in the world.

Sericulture is sought by the policy makers to be an ideal tool for poverty alleviation in rural India and thus Central and State Governments have orchestrated congruence of all planned efforts to harness the fruits of this ancient and traditional enterprise by making it flourish across the country. Recognizing the declining trend among the giant silk producing countries, India has been taking all measures, banking on this opportunity, to fill the void both in the domestic and world silk market.

Sericulture has attained a significant growth in the past five decades in India after independence. The mulberry area increased steadily from 83 thousand hectares in 1960-61 to 3418 thousand hectares in 1993-94, but there was decline in the mulberry area in the ensuing years and so reduced to 2314 thousand hectares during 2001-02. The raw silk yarn production was stagnant and was hovering around two thousand tonnes in sixties and seventies. But silk production increased considerably in the eighties and reached 11.49 thousand tonnes in 1990-91. The growth rate of raw silk production reduced in the later part of the last decade due to the reduction in mulberry area, but still there was improvement in the total raw silk production due to increased productivity and so the silk production reached 15.85 thousand tonnes in 2001-02.

Silk productivity in India between 1960 and 1970 was very low and ranged from 14 kg to 20 kg per hectare. However, a significant leap in productivity was observed in the eighties and nineties, when it reached to around 68.50 kg per hectare during 2000-02. The improvement in productivity was due to the replacement of age-old low yielding local mulberry varieties and pure local multivoltine silkworm breeds with high yielding mulberry varieties and cross breed and bivoltine silkworm races respectively along with adoption of improved practices for mulberry
cultivation and silkworm rearing in the field through the efforts of Central Silk Board and the State Sericulture Departments.

The export of silk goods steadily increased from a modest level of Rs.17 million in 1960-61 to a whopping Rs.22353 million during 2000-02. However, Indian exports are mostly in the low unit price category unlike that of Western Europe or China. The export of high value products from India is dependent on import of quality raw silk especially from China.

Sericulture in Karnataka

Tippu Sultan, undoubtedly fired by his need for low volume, high value commodities to trade with Europe, particularly France, for exchange of arms, introduced sericulture successfully in 1780s around Mysore. The royal patronage to sericulture continued by Mysore rulers and industry was flourished under the rule of Krishna Raja Wodeyar.

Mysore silk has been famous since 1832. Sir M. Vishweshwaraih, the then Dewan gave great impetus to the industry in 1912. During World War II, the need to increase silk production for manufacturing parachutes led to intensified official interest in sericulture and acreage under mulberry expanded considerably (Sanjay Sinha, 1992). The acreage under mulberry has increased nine folds from 15400 hectares to 149785 hectares between 1940-41 and 2000-01, while cocoon production has increased 13 times from 4614 tonnes to 66518 tonnes and raw silk production has grown almost 28 folds from 330 tonnes to 9494 tonnes. During 2000-01, the area under mulberry was 112557 hectares spread over 15860 villages providing gainful employment to about 2.633 lakh farming families.

Yield gap analysis

Though the production level has increased to a great extent in the recent past, there still exists a wide gap between the actual yield obtained in the farmers’ fields
and the potential of production level with the existing modern technology. Even in Karnataka, where sericulture is being practiced as a traditional industry, the average productivity level of the cocoon is 42.76 Kg/100 Dfls as against the laboratory yield of 61.09 Kg/100 Dfls in PM x NB4D2, which is also achieved by a few progressive farmers. This indicates that only 70 per cent of the existing potential yield level of PM x NB4D2 is being reared predominantly in the state.

The concept of ‘Yield gap’ provides the information in this regard. It could be observed that the reasons attributable to yield gap are (i) Natural-season and environment factor, (ii) Socio-economic factors which influence the adoption of technologies and usage of inputs, (iii) linkage efficiency between research stations and farmers through extension agencies (iv) Technology itself - inherent weakness in technologies and (v) Managerial efficiency of farmers - input use, risk taking behaviour, decision making etc.

Currently, the problem of concern to all is that even though the production level has increased, there is a gap between potential and actual yield. The general belief is that the farmers are not able to fully exploit their resources in order to achieve high yield due to various reasons. As a result, the production cost is increased, making Indian silk cost prohibitive. It is therefore, imperative to analyze the magnitude of the gaps in attainable yields and explore the possibilities of relaxing existing constraints in order to bridge the attainable yield gaps by proper assessment of problems.

Yield gap refers to the difference between the potential and actual farm yields. Potential yield refers to that yield which is obtained in the experimental station, with best available technologies in practice. Potential farm yield is the yield obtained in the demonstration plots in the farmers’ field while the actual yield refers to the yield actually realized by the farmers.

The difference between experimental station yield and potential farm (Demonstration plot yield) yield is known as Yield Gap-I and is hypothesized to be
caused by environmental differences and non-transferable technologies. Yield Gap-II corresponds to the difference between potential farm (Demonstration plot) yield and the actual farm yield and is hypothesized to be caused by various biological, physiological and socio-economic constraints.

The transformation of research station results in the form of demonstration yield or the highest sample farm yield representing at least 5 per cent of the total sample can be used as potential farm yield. While the potential yield is the same, actual yield at the farmers' level vary from place to place and farmer to farmer.

Numerous studies have been conducted to study the yield gaps in several agricultural crops including rice, maize, cotton, coconut etc. In these studies production constraints and their effects on the yield levels of the farmers were identified (Paciencia C, Manuel 1986). In sericulture also, many studies conducted in the recent past reveal the importance of production factors. However, the yield of silk cocoon/mulberry just like any other agricultural crops is influenced by the cultural, management practices, quantities of inputs applied, level of technology, agro-climate conditions and socio-economic factors.

In this context, the present research has been taken up to analyze the probable reasons for such yield gaps in mulberry as well as cross breed and bivoltine hybrid cocoon production in Mandya district of Karnataka and to suggest suitable solutions for bridging the same.
OBJECTIVES

The following specific objectives were considered:

1. To quantify the measurable yield gaps in mulberry and cocoon production.
2. To document input use pattern and adoption pattern of sericulture technologies by the farmers.
3. To identify the major constraints for narrowing down economically recoverable gaps.
4. To suggest suitable policy measures to shorten the yield gaps.