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TASAR SERICULTURE - A POTENTIAL AGRO BASED ENTERPRISE FOR SUSTAINABLE SOCIO- ECONOMIC DEVELOPMENT

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ABSTRACT

Sericulture is an ancient and important rural agro-based industry and has uplifted the social and economic livelihoods of people and is the key in plummeting unemployment in developing countries. India's economy is largely depends on the success of agriculture and associated farm activities, as more than 70 percent of the people's livelihood is depending on these sectors. Tasar Sericulture with its rural based on-farm and off-farm activities and enormous employment generation potential has been recognized as one of the most appropriate avenues for socio-economic development. It not only directly employs people in tasar nursery production, seed production, silk worm rearing, silk reeling, spinning, weaving and silk waste processing but also indirectly as traders of silk products. Tasar sericulture has improved rural economy, by creating income generating entrepreneurial opportunities. In view of the significance of tasar industry for the economy of the country, the script enlightened the future viable entrepreneurial opportunities for the sustainable socio- economic development in tasar sericulture.

Keywords: Tasar Sericulture, Agro-based, Enterprise, Socio-Economic.

Introduction

Silk is a natural and amongst the earliest fibers discovered by man with others being wool, hemp, linen and cotton. Silk has several natural properties that make it distinct from all other fibers both natural and manmade. It has a natural luster, and inbuilt affinity to rich colors, high absorbance, light weight yet stronger than a comparable filament of steel, poor heat conduction that makes it warm in the winter and cool in summer, flexibility and an excellent drape. Sericulture is a comprehensive agro-based cottage industry, which aims at uplifting the socio-economic standards of people who are engaged with it. As a dynamic small-scale industry the employment potentiality of the silk industry is extensive. The major activities of sericulture comprises of establishment of host plant, cocoon production, raw silk and fabric production.

India is the second largest producer of silk in the world. Among the four varieties of silk produced in 2022-23, Mulberry accounted for 75.59% (27,654 MT), Tasar, 3.60% (1,318 MT), Eri 20.09% (7,349 MT) and Muga 0.71% (261MT) of the total raw silk production of 36,582 MT. (Source: CSB reports).

Silk cocoon production is valued as the main product of sericulture that boosts farmers' income. Apart from cocoons as the primary product of silk production, there are a lot of valuable secondary products for example silkworm proteins, moths and wastes which can be processed to meet different purposes such as animal feeds. Sericulture industry being a cottage, agro and forestry based industry has been seen to enhance sustainable livelihood of rural communities in different countries, socio-cultural and traditional linkages, enhanced rural economies. With all the mentioned attributes of the silk industry, it is appropriate to call sericulture an ideal industry for a sustainable future.

This industry with a broad agricultural base is an excellent avenue for providing employment with various entrepreneurial opportunities for the rural development. The cultivation of host plants and rearing of silkworm are agro based, while the post cocoon activities are industrial. The various entrepreneurial opportunities in sericulture industry are raising of

nurseries, preparation and supply of silkworm eggs/seed (DFLs), silkworm rearing, cocoon production, silk reeling, silk yarn and silk weaving, silk fabric finishing and cocoon and silk based handicrafts etc., Sericulture and silk production have an enormous potential in our country provided it is made available to rural people, especially women, and its marketing is organized independently. It can serve as an excellent mode for employment generation and augmentation of income.

Strengths of Indian tasar industry

- Employment generation
- Reduction in Rural migration
- Women-empowerment
- Poverty elimination
- Self-employment
- Environment friendly

The tasar silk industry has acquired a big role in improving tribal socioeconomic condition besides generating substantial rural employment (Suryanarayana & Srivastava, 2005; Rao, 2007). This silkworm is reared in the jungles of central and north-eastern parts of India. In India, tasar silk is mainly produced in the states of Jharkhand, Chhattisgarh and Orissa, besides Maharashtra, West Bengal and Andhra Pradesh. Tasar culture is the main source of income for many tribal communities in India. Around 3.5 lakh tasar rearers, mostly tribals, are dependent on the industry. It is mainly used for furnishings, dress materials and saris. The porous texture and thermal properties makes these silks user friendly and healthy. The large number of women engaged in the activity, cultivation taking place in tribal and economically under developed regions, conservation of naturally grown food plants for the silkworms contributing to the bio-diversity conservation are some of the other features that gives it an unique identity. In view of the significance of sericulture industry, hereunder the entrepreneurial opportunities of tasar sericulture are furnished:

- Plantation
- Rearing
- Cocoon production
- Reeling
- Spinning
- Silk Fabric
- Silkworm By-products and their applications

Entrepreneurial opportunities: Scope of earning in various activities of Tasar silk industry

Entrepreneurship plays a critical role in promoting the economic growth and development in a country. Growth of entrepreneurship in any sector not only improves production systems and thereby productivity, but also strengthens the basic foundation of the industry by generating opportunities and employment. The pursuit of sericulture offers gainful employment not only the rural masses but also for the educated youth in semi-urban and urban areas. Sericulture growth will certainly lead to vibrant rural by creating income generating entrepreneurial opportunities enabling poverty reduction and arresting rural to urban migration of the rural poor. Some of the primary thrust areas capable for entrepreneurial opportunities across tasar silk value chain are discussed in Table 1.

Table 1: Income Generation across Tasar Silk Value Chain

Activity	Stakeholder	Period	Tentative Period	Returns (Rs.)/ cycle
Raising of seedlings	Kisan Nursery Entrepreneur	4 months	Apr -Aug	40000
Plantation farmer/ Silkworm rearing				
Seed Rearing	Seed Rearer	35-50	Aug-Sept	25000
Nucleus Seed Rearing	Adopted Seed Rearer	50-70	Sep-Nov/ Dec	35000
Commercial Rearing	Commercial Rearer	50-70		30000
Silkworm Seed Production				
Basic Seed	Tasar Viksas Samity/ Society	200-220	Dec-Jul	100000
Commercial Seed	Commercial Rearer	20-25	Aug-Sep	30000
Reeling	Reeler	8 months	Dec -Jan onwards	30000
Spinning	Spinner	9 months		22000

Entrepreneurial opportunities: Silkworm by-products and their applicationsThe primary product obtained from silkworm is the silk fiber used as a raw material for the textile and silk fabric industry to manufacture silk garments like shirts, sweaters, clothes as well as weaving. On top of the primary goal of attaining silk, what makes sericulture a more viable venture are the secondary products that serve different purposes which are medicinal, human food, animal feeds and so many others. Many researchers have documented the importance of these secondary products but much attention has been drawn to silk pupae, litter, sericin and fibroin (Table 2).

Table 2: Silkworm by-products and their applications

S. No	Products and waste products	Application	Reference
1.	Silk sericin	Oxidation resistance UV rays resistance	Gulrajani, 2006 Senhal, 2008
2.	Silk biopolymer	Tissue regeneration Wound healing	Kumaresan *et al.,* 2007 Federico *et al.,* 2007
3.	Silk fibroin peptides	Cosmetic making	Kumaresan *et al.,* 2007 Federico *et al.,* 2007
4.	Silk proteins	Specialty diet for cardiac and diabetic patients	Ramesh *et al.,* 2005 Reddy, 2008
5.	Dried cocoon palade powder	Poultry and fish feed	Iyengar, 2002
6.	Serratio peptidate (Serrapeptase intestinal enzyme)	Anti-inflammatory Anti-tumefacient Enhance blood circulation Treat arterial plaque	Ramesh *et al.,* 2005 Reddy, 2008, Feng, 2004
7.	Silk fibroin	Dressing material Veterinary medication	Gulrajani, 2006 Kumaresan *et al.,* 2007 Sehnal, 2008
8.	Silk fiber	Surgical sutures Teeth reconstruction	Gulrajani, 2006 Wang *et al.,* 2006
9.	Silk fibroin nerve guidance conduit	Peripheral nerve regeneration Collagenisation	Yan *et al.,* 2009
10.	Silk fibre and polypropylene	House construction	Shigetaka and Teruo, 2002, Zultifli *et al*., 2008
11.	Silk based paper	Art craft	Reddy *et al*., 2008
12.	Silkworm pupae and excreta	Animal/poultry feed Silkworm pupal cakes Medicinal wine Treat osteoarthritis Preparing amino acids and flavoured products	Qadri *et al*., 2015 Datta *et al*., 2007
13.	Silkworm powder	Lowering blood-glucose levels.	Ryu *et al*., 1997
14.	Silkworm extract	Treat prostate hyperplasia and erectile dysfunction	Qian, 1997
15.	silkworm moth oil	Textile dyes Superior soaps	Gui and Zhuang, 2000
16.	Silkworm Litter	Organic manure Biogas	Sharma and Madan, 1992

Silkworm rearing profile across sericulture sector in India:

Table 3 provides Information on silkworm rearing profile, costs incurred and returns realized form cocoon production across sericulture crops, share of expenditure incurred on major inputs in the total cost of production of respective cocoon. Tropical Tasar area dominated with host plants of Arjun & Asan and observed in forest region. Tasar silkworm rearing conducted with daba eco races & CTR-14 on an average of two crops in a year.

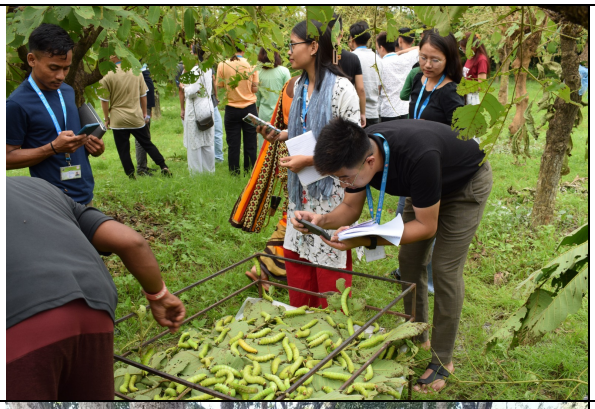
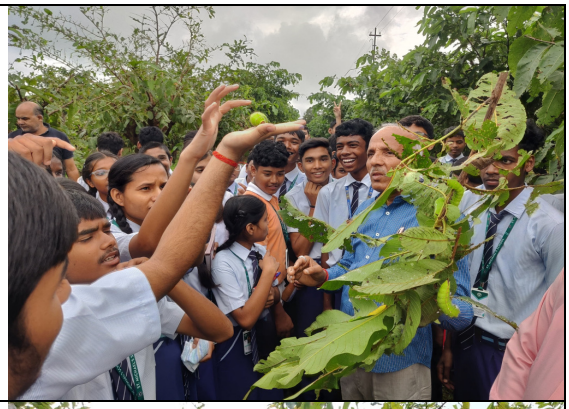
Table 3: Silkworm Rearing Profile across Sericulture sector in India

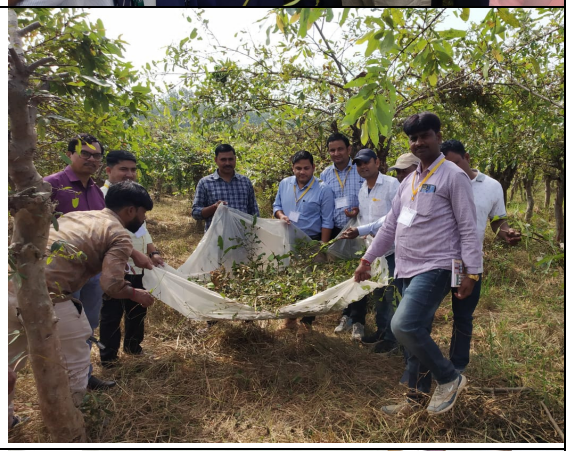
Particulars	Mulberry	Eri	Muga	Tasar
Raw Silk Proportion (36, 582 MT, 2022-23)	75.59%	20.09%	0.71%	3.60%
Major Location	Southern India, WB and J&K	North East India	North East India	Central & East India
Avg. Plantation Area (Acre)	1.7 (0.4-2.5)	0.8 (0.5-1.24)	1.2 (0.6-2.1)	5.16 (0.8 – 6.95)
Plantation Type	Bush & Tree	Road-side (53%), Systematic & forest	Block (69%) & Forest	Forest (71%) followed by block plantation
Plant Varieties	V1 (60%), S-1635 & S-1	Castor (39%) & Kesseru	Som (85%) & Soalu	Arjun & Asan (50-68%)
Avg. No. of Crops	Five (1-10)	Two (1-5)	Two (1-3)	Two (1-3)
Silkworm hybrid/breed	FC1xFC2, SK6xSk7 & ICBs	Eco race & C-2	Domesticated race & CMR series	Daba, Eco race & CTR-14
Avg. Dfls reared/crop	616 (200-1200)	50-100	120-300	338 (90-500)
Dfls Source	CSB, DoS & private grainages including chawki supply	DoS & CSB	DoS & CSB	CSB & DoS
Rearing Type	Shoot (70%) & Tray	Bunch & Tray	Tree	Tree
Mountage type	Plastic, Chandrike & Rotary	Jali	Jali	--
Avg. Cocoon Yield	70 kg/100 dfls (35-120)	8.92 kg cut cocoons/100dfls (44kg Pupae)	47 cocoons/dfl	39 cocoons/dfl
Avg. Cocoon Price (Rs.)	350-800/kg	600-1200/kg (Pupa: 300-400/kg)	3-4/cocoon	4-5/cocoon
Silk Yarn Price (Rs.)	4000-5000	2500-3500	25000-32000	4000-5000

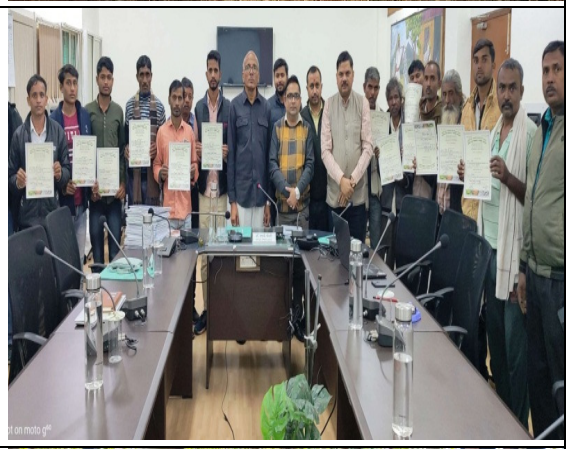
TASAR : SWOC Analysis

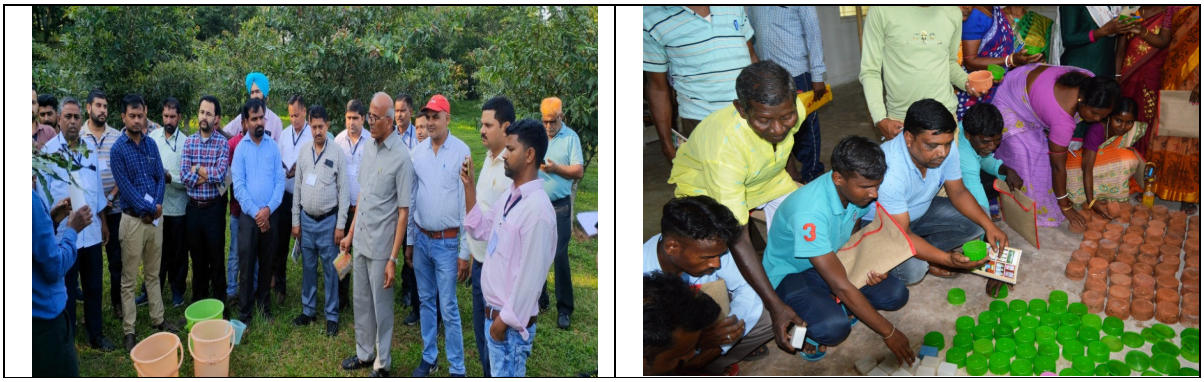
SWOC analysis is a strategic planning method used to research external and internal factors which affect success and growth in the various stages of the value chain. Here are some strengths, weaknesses, opportunities and challenges of tasar. SWOC analysis is presented by the Table.

Strength	Weakness	Opportunity	Challenges
Wide production base	Out door rearing	Social benefit due to Tribal and women employment	Depletion of forest areas
Rural / Tribal employment	Production fluctuations	Export potential	Industrialization in and around forest
Eco Friendly nature of production process	Poor transfer of technology to remote areas	Traditional handloom designs	Limited season bound crops
High Market demand	Diverse range of practices leading to low productivity	Special market niche for vanya silks	Decrease in the population of wild silk moths in natural habitat







Conclusion and future prospective

Back in the days Sericulture industry only focused at the utilization of silk fibre for textile industry but recent research and developments in the industry have proved it is a viable multi-purpose agro-based industry that has provided various insights in the socio-economic development of different countries through employment opportunities, food security, income generation, women empowerment, environmental safety, agriculture integration and infrastructure development. Research and Development has further extended sericulture applications to new areas of great importance such as human and livestock feeding, cosmetic making, pharmaceutical, biomedical and bioengineering, automobile, house building and art craft. Therefore, Sericulture industry exceedingly qualifies as one of the best agro-based investment due to the multipurpose functions it furnishes mainly the socio-economic development. Attention given to facts stated by different studies of sericulture it's wise to conclude that sericulture can be considered as the most suitable and beneficial agro-based industry for socio-economic present and future development.

Recommendations to improve tasar sericulture industry:

- Scientific research and development must be designed to exploit all the areas in the industry that have not been fully utilized like the handling of secondary products of silkworm but this is possible through government support and funding.
- Universities and agriculture institutions should develop curriculum that exhaustively train professionals in sericulture related fields in order to enhance knowledge and skills based training for students at all levels.
- Strengthening sericulture industry linkages between government and Research institutes, Universities, private company, NGO's and professionals.
- Government should create office of sericulture extension workers at different levels in order to create awareness and extend intended services to farmers through trainings and demonstrations.
- Studying and documenting sericulture practices so as to aid education, dissemination and sensitization of sericulture farmers and out growers and all stakeholders.
- Develop a proper farming system that integrates sericulture activity with other agriculture enterprises namely fish farming, poultry and vegetable production.
- Government to create a reserve fund in form of bank loan/credit for all stakeholders in sericulture industry at a low interest rate in order to facilitate sericulture activities as well as encourage farmers to engage in the industry.
- Infrastructure development like installing silk processing factories in different parts of the country as this will provide employment opportunities to people in the area as well as ready market for the silk products produced farmers.

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