EMPLOYMENT GENERATION WITH SUSTAINABLE DEVELOPMENT AND BIO-DIVERSITY THROUGH SERICULTURE: A STUDY OF THREE TRIBE BLOCKS OF RAIGARH, INDIA

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ABSTRACT

Sericulture is an eco-friendly agro-based labor intensive rural cottage industry subsidiary employment and supplementing the income of rural farmers especially the economically weaker section of the society. Sericulture occupies the place of pride in the rural economy. Sericulture can be practiced even with very low land holding. Low gestation, high returns make sericulture an ideal programme for weaker section of the society. 60 lakh persons are engaged in various sericulture activities in India. Tropical Tasar culture is an agro forestry of growing wild silk insect for unique Vanya silk, which provides livelihood and employment to 2.5 lakh rural aboriginal families of the country. The involvement of landless rural people get involved in Tasar culture is because they understood its potential for rural and tribal upliftment. In order to preserve the natural biodiversity present among these populations, the systematic attempts are required to conserve the wild Seri biodiversity for ecological balance and for sustainable economic viability. The economic values, employment potential and global demand in general and bio-diversity conservation in particular have motivated the conservation of Tasar insect wildlife which found rapidly depleting and getting endangered. This article demonstrates that certain developmental initiatives have been playing an important role in the socio-economic progress of tribal masses in Raigarh, (C.G.). This article explains the increased returns from sericulture as a result of development programmes. The article concludes with some suggestions to improve the long term feasibility of sericulture.

Key Words: Employment, Development, Diversity, Sericulture, Tribal, Tasar, Income

INTRODUCTION

Sustainable development is a pattern of resource use that aims to meet human needs while preserving the environment so that needs can be met not only in the present, but in the indefinite future, is the need of hour Value addition to biodiversity by building capacity of local communities. In the Harda forests of Central India where JFM is relatively successful, the revenue generated by the village level forest protection committee from the sale of grass was calculated to be Rs.1,00,000/ year. Seri-biodiversity refers the variability in silk producing insects and their host plants. Fairly good numbers of references are on record about Seri-biodiversity and their potential as a source of natural silk in Indian subcontinent. The wild Silk moths play an important role in the conservation and utilization of biodiversity as reported by Frankel, Peigler and Kioka, Thangavelu, Alam et.al., Narsimhana, Akai, Satpathy and rao, Mohan rao et.al., Kirsur and Krishna rao, Shankar rao et.al., Rout et.al., Mitra and Moon. Asia is the top producer of silk in the world contributing 95% of the total global output. There are 40 countries on the world map of silk, bulk of it is produced in China and India, followed by Japan, Brazil and Korea India has a forest and tree cover of 23.68% of its geographical area. Out of 0.6 million villages in India, around 0.2 million villages with a population of about 350 million are dependent for sustenance directly or indirectly in the forests. Sericulture play very effective role in the utilization of the natural resources in a most
effective manner for socio-economic upliftment with livelihood and employment and income generation.\(^5\) In India, agriculture and agro-based industries play a vital role in the improvement of the rural economy. Limited availability of land, limited cash returns and agriculture\(^6,7\) being confined to one or two seasons in the year have made villages to look for supporting rural industries such as sericulture.\(^8\) Sericulture broadly comprises inter-linked activities such as food plant cultivation, maintenance to feed the silkworms, silkworm rearing to produce the silk cocoons, reeling the cocoons for unwinding the silk filament, yarn making, weaving and processing of fabric.\(^9\) Sericulture is a potential sector of the agriculture to raise economic status of the farming community and also earning foreign revenue. Sericulture in India is a fairly organized cottage industry, largely rural based and labour intensive. Cultivation is spread over 22 states, covering 172000 hectares. Sericulture provides employment to more than 6 million people across 54000 villages, which operate 258000 handlooms and 29340 Power looms, producing 5 million square meters of silk fabric per annum.\(^10\) Silk constitutes world’s 3% textile trade and India’s share in the world’s silk trade is about 9% and which is growing in recent years. Globally India is the second largest producer of silk and contributes about 15.5% to the total world raw silk production.\(^11\) Sericulture is an integral part of tribal life, practiced by about 1.5 lakh tribal populace in the states of Jharkhand, Chhattisgarh, Orissa, Madhya Pradesh, Uttar Pradesh, West Bengal, Bihar, Maharashtra and Andhra Pradesh.\(^12\) There are 258 well-recognized tribal communities, notified as scheduled tribes in India.\(^13\) This culture is able to generate quite remunerative and meaningful employment\(^14,15\) Tasar sericulture is a labour intensive industry in all its phase. It can generate employment up to 11 persons for every kg.of raw silk produced.\(^16\) Tropical Tasar culture is the rearing of wild silkworms A. mylitta D. for production of Tasar silk and it provides livelihood to rural tribal’s in India.\(^17\) The 44 ecoraces of insects feeds majorly on nature grown food plants available over Jharkhand, Orissa, Chhattisgarh, Bihar, Madhya Pradesh, Andhra Pradesh, West Bengal and Maharashtra states.\(^18,19\) In Chhattisgarh tropical Tasar and mulberry are reared on commercial scale.\(^20\) Tasar is really named as Kosa. Sericulture is being practiced by the tribal of traditional districts of Baster, Raigarh, Bilaspur and Surguja.\(^21\) Sericulture activities covered 43760 acres. The total number of Tasar center is 285 and mulberry gardens are 117. The total beneficiaries are 51310 in numbers out of them 32429 are Scheduled Tribe(SC).\(^22\) The polyphagous nature of the Tasar silkworm is a boon to its rural tribal’s rearers as their livelihood linked with the collection and sale of nature grown Tasar wild cocoons.\(^23-25\) Tasar culture is a cottage, agro-forestry and forestry based industry that provides sustainable livelihood to several rural communities and country to earn foreign exchange.\(^26\) The global production of raw silk is approximately 70,000 tones per year\(^27\) Silk industry has lot of socio-cultural and traditional linkages in India and plays a vital role on rural economy and hence, the aboriginals are practicing Tasar culture simultaneously with agriculture for base livelihood\(^28,29\) Tasar food plants and silkworm exhibit extensive biodiversity.\(^30\) Tasar culture is an important co-discipline of applied forest biology, needs special understanding and addressing towards breeding prospective to promote the sustainable utilization of this precious natural resource.\(^31,32\)

**METHODOLOGY**

The present investigation was carried out in 3 blocks namely Gharghoda, Lailunga and Tamnar of Raigarh district, Chhattisgarh, India was purposely selected for the study, and based on potentiality and production of Tasar/mulberry cocoons, where both types of sericulture – mulberry and Tasar are being practiced. Mulberry (domestic) the silkworm is *Bombax mori*, larvae feed on leaf of morus species. Tropical Tasar (wild) the silkworm is *Antheraea mylitta Drury*, larvae feed on leaves of *Terminalia arjuna, Terminalia tomentosa* and *Shorea robusta*. Raigarh district is major Tasar growing area where tribal are engaged in sericulture activities. Tasar silkworm rearing has been going on since 1956-57 and rearing of mulberry silkworm started in the year 1982-83. Since sericulture activities covered 312042 acres, therefore the total beneficiaries are 5739 out of them 3347 are scheduled tribe. Gharghoda, Lailunga and Tamnar is a rural populous block in

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\(^{17}\) Lailunga and Tamnar is a rural populous block in terminalia arjuna.\(^{19}\) J. Environ. Res. Develop. Vol. 8 No. 1, July-September 2013
Raigarh, India. The total geographical area of these 3 books is 469,600,433 square kilometers and population is 70021, 113531, 78882 out of which schedule tribe is 42061, 72149, and 41596(60.07%, 63.55%, and 52.70%). Sex ratio is 1016, 1000,998 and population density is 149,189,182 Sqkm.

Initially the list of Sericultural villages and the names of beneficiaries were obtained from local Sericulture department of above 3 blocks, The primary data was collected from the sampled respondents following the personal interview method using structured interview schedule standardized by Nagaraja. From these three blocks four villages were selected randomly and in each villages 25 beneficiaries were selected to collect data. Total 100 beneficiaries were collected from each block. The farmers were post classified into main and additional based on the engagement of employment.

The information sought from the respondents/beneficiaries involved in sericulture activities consisted of three types. The first type pertain to general information. The second type sought was related to occupational status, employment days in a year, total monthly income, total expenditure, occupation before the sericulture, duration of sericulture work, main occupation related to sericulture, average annual income from the old occupation, crops take in a year, cocoon produced in each crop, Profit from each crop, yearly production of cocoons, average annual income. the third type of information pertained to the losses in sericulture, compensation by government, loan according to requirement, attachment with sericulture, sericulture is favorable or not, traditional business is affected or not, total labor period, change in economic status, change in annual income through sericulture, displacement by sericulture, impact of sericulture in life style and economics of silk production.

Primary and secondary data was analyzed using various statistical tools viz., mean, mode and median.

**RESULTS AND DISCUSSION**

In Lailunga and Tamnar blocks, analysis of first information i.e Kachha houses are 97% and 99% where Gharghoda all respondents have 100% kachha houses. On the other hand pakka houses are 03% and 01% in Lailunga and Tamnar but in Gharghoda all the respondents do not have Pakka houses. Regarding ownership of house 99% and 94% in Lailunga and Tamnar respectively where is in Gharghoda all the respondents have their own house. Similarly in Lailunga and Tamnar the status of the ownership of house belongs to government have 01% and 01% respectively and in Gharghoda there is no government house. We have observed that in Lailunga and Tamnar block the status of the occupation is 2.49 and in Gharghoda 2.85 person is engaged in sericulture. Sericulture was adopted as a primary occupation by 1%, 2% and 18% in Gharghoda, Tamnar and Lailunga block but 99%, 98% and 82% beneficiaries were adopted this occupation as a Secondary. In Gharghoda 13% respondents received employment about 100-150 days and 63% received 151-200 days. 201-300 days employment received by 23% respondents and 301-365 days receiver’s respondents is 1%. Similarly in Lailunga 32% respondents received employment for 100-150 days and 65% received 151-200 days. 201-300 days employment received by 3% respondents and 301-365 days employment receiver’s respondents are nil. Also in Tamnar 73% respondents received employment for 100-150 days and 25% received 151-200 days.201-300 days’ employment received by 1% and 301-365 days employment receiver’s respondents are 1%.

**Income from sericulture**

The data indicates that the total average monthly income of people from sericulture in Tamnar is only Rs. 3,540/- and in Lailunga, Rs. 3,840/- while as Gharghoda Rs. 3670/- at their village itself. Whereas from the forest minor produce collection and disposal (once in a year) the average income of the respondents has been estimated for Tamnar, Rs. 6,550/-, Gharghoda Rs. 5,800/-and Lailunga it is Rs. 5950/- respectively. The average years of sericulture occupation is in Gharghoda 10.3, Lailunga 12.51, Tamnar 9.80 year. The economic status from the old occupation is normal for 160 and bad for 119 and very poor for 21 respondents. We have observed that 37 respondents take only 1 crop in a year while 180 take 2 crops, 80 take 3 crops/
and 03 respondents take 5 crops. DFLs were supplied from sericulture centers and their demand of DFLs was easily fulfilled by the State sericulture department. Out of 300 sample 99 from Gharghoda, 92 from Lailunga, 89 from Tamnar block rear on Terminalia arjuna. 206 respondents stated that host plants are affected by Matamari (leaf gall infection) and 206 respondents replied that the plants are affected by stem borer where as 142 for leaf spot and 12 for Root rot.

**Cocoon production and profit**

The number of cocoons produced in Gharghoda is 7,500/crop/beneficiaries in Lailunga 5,900, in Tamnar 7,750. The economic gain by the respondent of Gharghoda is Rs 5,960/crop. In Lailunga 5,720/- in Tamnar 5,760/-. The yearly production of cocoons by the respondent of Gharghoda is 20400, in Lailunga 18300, in Tamnar 19800 number.

**Sericulture and risk factor**

284 respondents had by suffered loss due to Sericulture and 16 had not suffered. It indicates that the hardship and risk involved. Almost all respondents attributed fluctuation of atmospheric and adverse weather conditions viz. heavy rains, high humidity and high temperature cause disease which leads to a complete failure of their crops. Out of 300 respondents only 2% get compensation from government where as 98% denied. All respondents get full cooperation accorded by the officers of sericulture department. Only 45 get loan as per their requirement and 255 do not get.

**Sericulture and social impact**

It observed that all the respondents attributed the following impacts by Sericulture –Conservation of environment, no cutting and felling of trees, inter state migration is checked, local employment is generated. It is served as an additional income generating source, regular savings habit has been developed, want to attach continue with the sericulture. It is suited to our lifestyle. The work is simple and can be done without any cost. Can serve better for the additional income generation and pave the way for the local employment generation.

Most respondents have adopted sericulture by knowing from other companions already engaged in this field, others have been duly advised by the state Govt. employee/ Field workers regarding the benefit of the sericulture. It is observed that only one respondent feel that sericulture has affected their traditional business/occupation and 299 of the view that it has not affected.

The total labour period has been estimated In Gharghoda 7.38 hrs, in Lailunga 7.53 hrs and in Tamnar 8.09 hrs. Those 295 respondents (98%) supported that their economic status is changed and only 5 respondents (2%) not finding any change. It has been estimated that the annual income raised up to an average of Rs 18,150/- respondent, in Gharghoda and in Lailunga 19,800/- in Tamnar block Rs. 23,650/- . 33 respondents have been displaced or migrated and 267 respondents denied for any migration. All the respondents are feeling good reasons being as follow –sericulture can be done without investing any capital thus they need not go to the money lenders or any middle man. As the income status has become high their self respect has also gone up. They have been recognized socially. They have been called upon by the Panchayat Meetings. They are released from their debt. They have been able to fulfill their household and medical need. India. (Table 1 to Table 5)

**Table 1 : Tasar cocoon production and productivity in Chhattisgarh**

<table>
<thead>
<tr>
<th>Year</th>
<th>Effective plantation [Hac.]</th>
<th>Used dfl [No.]</th>
<th>Cocoon production [Lakh]</th>
<th>Beneficiary [No.]</th>
<th>Per Ha. cocoon production [Nag]</th>
<th>Per dfl cocoon production</th>
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Table 2: Tasar cocoon production and productivity in Raigarh district, India

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Sources: Directorate of Rural Industries [Sericulture sector] CG

Table 3: Cocoon production and income generation in Tasar center of tamnar

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Table 5: Cocoon production and income generation in Tasar center of Lailunga and Katakliya

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<th>Payment (Rs.)</th>
<th>Beneficiary (No.)</th>
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CONCLUSION

Tasar silk sector eminently qualifies as one of the most appropriate agro-based cottage industry for rural development, environment protection and rejuvenation. This sector is not only important for generating rural employment and preventing rural migration but also for role in protection and preservation of ecology, heritage and socio-cultural values. Sericulture provides more than 50% employment to the respondent in a year thus stops the inter-state migration. According to the MNREGA (Mahatma Gandhi National Rural Employment Guaranty Programme) population must receive 100 days employment in a year whereas sericulture provides 151-200 days employment i.e., 64%. Due to this practices respondent were earned around double income than earlier income. The total monthly income obtained from all sources to the families involved in sericulture occupation is average 3840/-. Tasar culture is helpful for saving 3190 host plant by each respondent i.e., tribal were very much eco-friendly. It is noteworthy that adopting the Sericulture by tribal they conserve the environment by non-cutting and felling of trees because sericulture is now their way of life. Interstate migration is checked because sericulture provides additional income at their door level. Regular savings habit has been developed by sericulture practices among the tribes because they earn much more than their standard of living. It is remarkable that sericulture is suited the life style of tribe because practice of sericulture is simple and can be done without any cost and skill. The advantage of Tasar sericulture is that the practice can be adopted by the farmers without any difficulties and with in shortest possible time. It can engage members of the whole family and the work can be managed in addition to their day to day activities. Initiating sericulture by a farmer invariably leads is generation of further downstream employment in reeling and weaving either in house hold or organized sectors. In present day world when manmade fiber manufacturing units are invariably polluting the environment, there is no doubt that sericulture should prosper as a eco-friendly culture to meet the requirement of exclusive fabrics of the people. As a matter of fact, greater thrust is
required to expand this culture further to increase the volume of production for mankind. The total forest cover of India as per state of Forest Report 2003 plays a significant role in biodiversity protection, global environment conservation, landside prevention and soil preservation, headwater conservation, health, recreational and cultural. Material production, these huge forest bio-resources may effectively be utilized for conservation and economic exploration of Sericigenous insects available in the country for sustainable rural livelihood and poverty alleviation which is the major issue of developing country including India. India is considered as hot spot of Seri-biodiversity particularly in case of vanya silk sector which play a significant role in sustainable rural livelihood and poverty alleviation in the country.

REFERENCES


