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ORIGINAL ARTICLE

Employment Generation and Socio-Economic Change through Sericulture in Raigarh District, Chhattisgarh, India

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ABSTRACT

Sericulture is one of the primary occupations for livelihood of poor people in tribal area. Most of tribal are involved in Sericulture. Tasar, Eri are the main forest based cultivation adopted by the Tribal's and practiced in respective areas. India is the only country in the world to produce all the four varieties of silk namely Mulberry, Eri, Tasar and Muga. Out of the 6, 38,588 villages in India, sericulture are practiced in about 69000 villages providing employment to about 8.25 million people. Sericulture is providing livelihood for 9, 47,631 families. India continues to be the second largest producer of silk in the World.. As in 2015-16 the total raw silk production in the country is 28523 MT. Sericulture is an important labor intensive sector in the world and semi-urban population. Sericulture is a cash crop in the agriculture sector; it gives returns within 30 days, so these help to rural people for the socio-economic change. In sericulture, the entire range of activities generate a moderate flow of income and creates employment opportunities for a substantial section of low skilled marginal rural inhabitants who would otherwise remain unemployed or disguised employed in vast agricultural sector. These sectors are farm labor based and fall under the cottage and small scale sector. In silkworm seed sector, mulberry cultivation creates employment on farm. The silkworm rearing sector uses mulberry leaves as input and this creates large scale employment and income earning capacity for the family of mulberry growers. Sericulture with its unique features plays an important role in upgrading the socio-economic conditions of the rural folk and with employment opportunities to the educated rural youth and women. In view of the importance of sericulture enterprise, the paper tries to enlighten and discuss the significance of sericulture and strategies to be taken for the employment generation in Indian sericulture industry. Present paper explores the possible employment opportunities derived from problem analysis in the study area. The paper highlights the sericulture is a way for employment generation in Raigarh district, and needs as they act as a tool for socio-economic change for tribal. The study concludes with some suggestions to improve the feasibility of sericulture in long term.

Key words: *Employment, Sericulture, Tribal, Income, Socio-economic*

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INTRODUCTION

Indian economy reportedly suffers from high incidence of rural poverty, un-employment and under-employment. The reduction of rural poverty continues to be a paramount goal of the developing countries like India (Dewangan, *et al.*, 2011). Unemployment is today's basic socio-economic problem eroding national income and living standards, aggravating national development and poverty alleviatio (Narasaiah, 1996). Employment in agriculture is the predominant form of economic activity providing employment to 58% of the work force and contributing 18% of the gross domestic products in India (Tuteja 2007). Agricultural development alone cannot provide viable solution for alleviating

unemployment, poverty and out-migration for growing labour force in rural India (Chadha 1993). The farmers in these areas are very poor and their ability to take risk and invest necessary inputs for optimizing production is low (Sreedevi, *et. al.,* 2004). The livelihood among tribal communities in India is complex, dynamic and multidimensional phenomenon, the perception of which varies with geographic location, type of community, age, gender, education, fluctuations in resources (Kumar, *et. al.,* 2009). The word "Sericulture" has been derived from the word "Su" (Si) which means silk. Sericulture, the art and science of growing silkworm, food plants, rearing silkworms and production of silk is basically an agro-industry and an economically rewarding enterprise consisting of several sets of activities (Dewangan, *et. al.,* 2012). Silk is a functional term used to describe natural protein fibres' that are secreted by arthropods (Chowdhary 2006). Sericulture is divided in two sectors namely farm and industry. The farm sector involves growing silkworm's food plants, rearing silkworm to produce cocoons and eggs. Reeling, twisting, dyeing, printing, finishing, knitting form the industry sector (Srivastav, *et. al.* 2005) Silk production has the potential to make a significant contribution to the economy of many countries where there is surplus labour, low-cost of production and willingness to adopt new technologies (Hajare, *et. al.* 2007). Sericulture, the production of silk worms and thus ultimately of silk fibre (Ganga and Chetty 1991), has become a promising rural activity in India because of its minimum gestation period, minimal investment, maximum employment potential and quick turnover for investment (Kasi 2000, 2009a and 2009b). Out of 6.39 lakh villages in India, sericulture is practiced in about 69,000 villages (Central Silk Board 2002; Geetha and Indira 2011; Lakshmanan, *et. al.,* 2011). Sericulture activity brings regular income to the community without any bias of caste, creed, gender, or religion. A remarkable feature of this activity is its egalitarianism-sericulture farmers, rich and poor, earn the same income from it (Goyal 2007; Pillai & Shanta 2011; Thomas, Muradian, de Groot, & de Ruijter 2010; Vijayanthi 2002). Sericulture is an extremely labor intensive industry and occupies a pivotal position from the point of providing employment and additional income to weaker sections (Best & Maier 2007; Bhatta & Rao 2003). The tasar silk industry has acquired a big role in improving tribal socio-economic condition besides generating substantial rural employment (Suryanarayana & Srivastava 2005, Rao 2007, Reddy, *et al.,* 2010b). There are 258 well-recognized tribal communities, notified as scheduled tribes in India (Sinha 2003). There are more than 58 countries practicing sericulture in the world. India is the only Country in the world to produce all the four known varieties of silk including Mulberry, Eri, Tasar and Muga (Savithri, *et al.,* 2013). Sericulture in India is a fairly organized activity that is in the cottage industry segment and is largely rural based and labour intensive. Cultivation is spread Over 22 states. Covering 172000 hectares across 54000 villages operating 258000 handlooms and 29340 power looms (Dewangan, *et. al.,* 2011). India continues to the second largest producer of silk in the world. In 2012-13 the total raw silk production of 23679 MT and In 2013-14 the production increased up to 26480 MT and in 2015-16 it goes up to 28523 MT. The employment generation in the country is raised to 8.25 million persons in 2015-16 compared to 7.85 million persons in 2013-14 (Annual Report of Sericulture 2016). One hectare of sericulture land can create remunerative employment for 13 persons per year (Datta 1988). Even the small farmer with his meagre capital base, make rupees 14000 gross income from an acre of irrigated land (Balasubrsmanian 1986). A farmer can earn Rs. 19997 from one acre of irrigated land (Reddy 1985). The net returns in case of Mulberry sericulture(when a farmer has one acre of mulberry plantation using family labour) is estimated at about Rs. 48,000/- per annum which is substantially high compared to that of other tropical crops (Dandin, *et al.,* 2005). The creation of employment and income in silk reeling units is dealt with in (Radhakrishna, *et al.,* 2000) where they found that an acre of irrigated mulberry generates as much as one lakh rupees per year through transactions of cocoons and provide full employment to a minimum of 5 men throughout the year. Presently in

Chhattisgarh three types of silk viz., 'Mulberry', 'Tasar' and 'Eri' silk are producing. Tasar is realy named as Kosa. Sericulture is being practiced by the tribal of traditional Districts of Baster, Raigarh, Bilaspur and Surguja. Sericulture activities covered 43760 acres. The total number of Tasar center is 285(12551.93Acres), Tasar plantation under CGSP is 155 sites (10000 Acres), Tasar rearing in forest is 18827.9 Acres), Natural Raily Cocoons Area is 500 sq.kms and mulberry gardens are 117 (2380.5Acres). The total beneficiaries are 51310 in numbers out of them 32,429 are Scheduled Tribe (Dewangan, *et. al.,* 2010).

MATERIAL AND METHODS

The present investigation was carried out in 2 Blocks namely Dharamjaigarh and Gharghoda of Raigarh district, Chhattisgarh state, based on potentiality and production of tasar/mulberry cocoons, where both types of sericulture- mulberry and tasar are being practiced. Raigarh district is major tasar growing area where tribal are engaged in sericulture activity. Tasar silkworm rearing has been going on since 1956-57 and rearing of mulberry silkworm started in the year 1982-83. Sericulture activity covered 312042 acres. Dharamjaigarh and Gharghoda are rural populous blocks with total geographical area is 2006.69, square kilometres. According to census 2011 population are 207030 for Dharamjaigarh and 79425 for Gharghoda. Sex ratio is 1004 and1010 and population density is 135 and 169 per Sq km.

Initially the list of Sericultural villages and the names of beneficiaries were obtained from local Sericulture department of above 2 Blocks. The primary data was collected from the sampled respondents following the personal structured pre-tested interview schedule standardized by Nagaraja (1989) conducted during the months of July to December 2006, under very informal atmosphere. Each question was explained to the respondents with the assistance of local extension workers and their response was recorded with due care. In the above mention blocks four villages were selected with 25 beneficiaries in each village at random for collection of data. Thus, 100 beneficiaries were selected from each block. The farmers were post classified into main and additional based on the employment. The information sought from the respondents/beneficiaries consisted of three types. The First type pertained to general information. The Second type sought was related to Occupational Status, Employment days in a year, Total Monthly Income, Occupation before the Sericulture, Duration of Sericulture Work, Average Annual Income from the Old Occupation, Crops taken in a year, Cocoon produced and Profit in each crop. The Third type of information pertained to the Losses in Sericulture, Compensation by Government and Loan according to requirement, total labour period, Change in economic status, Change in Annual Income through Sericulture, Displacement by Sericulture. Primary and secondary data was analyzed using various statistical tools viz., mean, mode and median where the situation is the basis of vertically received.

RESULT AND DISCUSSION

On the basis of study, the analysis pertaining to employment, income, occupation, risks factor and social impact. In Dharamjaigarh & Gharghoda Blocks analysis of the first type of information related that the Kachha houses are 100%. On the other hand Pakka house are nil. Regarding ownership of house in study area, all the respondents have their own house.

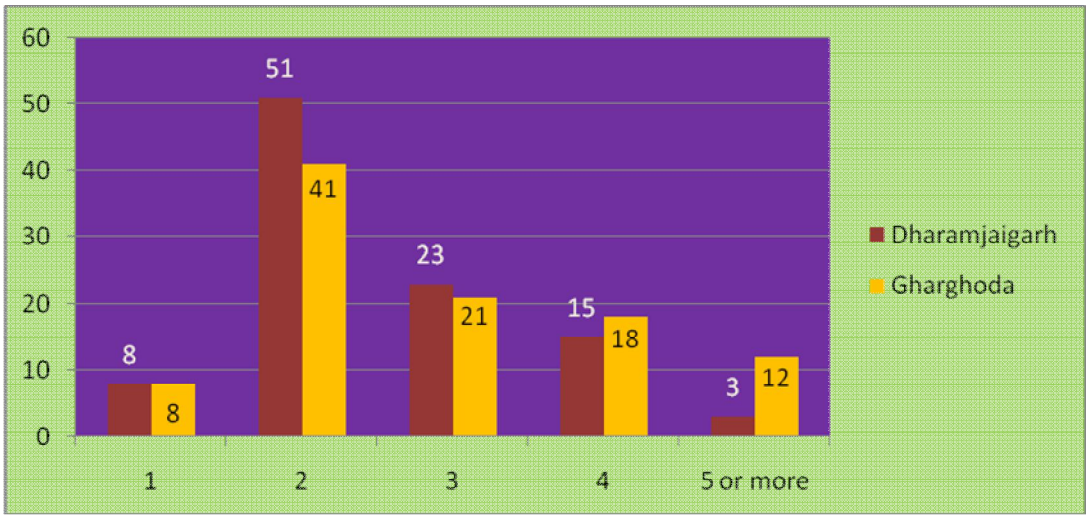
1. WORKING MEMBER IN FAMILY:

It is observed that in Dharamjaigarh block the number of working members in 8 families only 1 and the same way in 51 families 2, in 23 families 3, in 15 families 4 and in 3 families 5 members are working. whereas in Gharghoda block the number of working members in 8 families is only 01 and the same way in 41 families 02, in 21 families is 03, in 18 families 04 and in 12 families 5 members are working. It is clear through the analysis that 3 members are involved in the occupation from the average families. It means there is a

positive attitude of the members from each family. Sericulture was adopted as Secondary occupation by 100% beneficiaries from Dharamjaigarh and 99% from Gharghoda block. Only 1% beneficiaries from Gharghoda block adopted sericulture as Primary occupation.

M = (1/N) Σfx,
= (1/100) 262
= 2.62
Where N = Number of observation
F = Frequency (collected data)
x = Variable (as per situation)

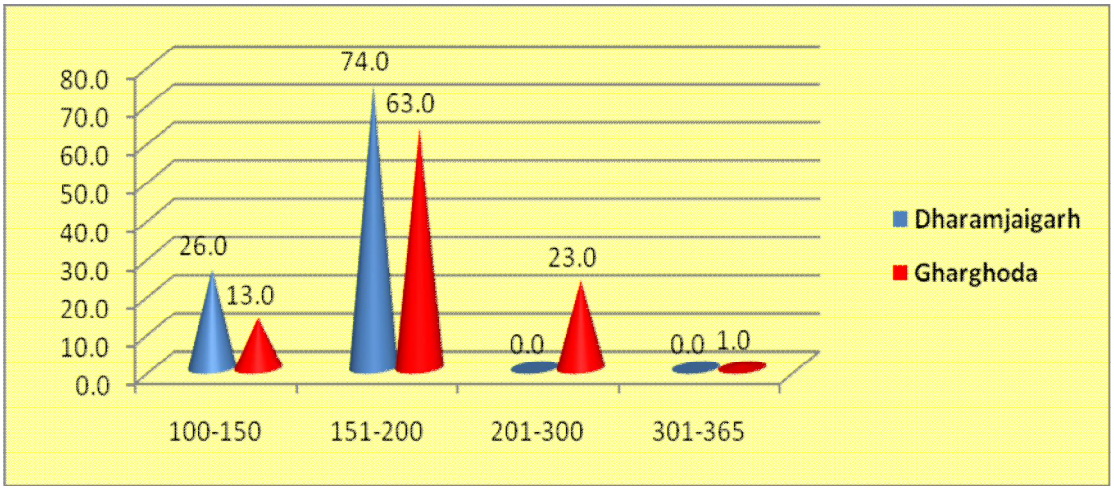
Graph 1: Status of working member in family in study area



2. EMPLOYMENT DAYS (MAN DAYS) FROM SERICULTURE:

In Dharamjaigarh block 26% respondents received employment for 100-150 days and 74% received 151-200 days. Whereas in Gharghoda block 13% respondents received employment for 100-150 days and 63% received 151-200 days. 201-300 days' employment received by 23% respondents and 301-365 days employment receiver's respondents is 1%. The employment site is situated their own village where they got employment from sericulture activity.

Graph 2: Man Days Generate from Sericulture in Study Area



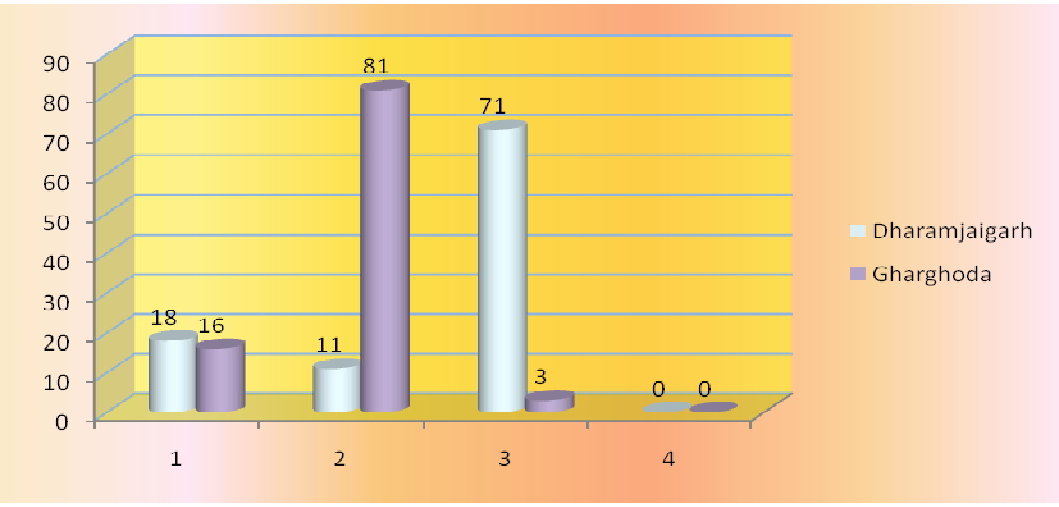
3. INCOME FROM SERICULTURE:

The data indicate that total average monthly income in Dharamjaigarh is only Rs. 3770/- and in 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 Dharamjaigarh Rs. 5350/-, and Gharghoda it is Rs. 5800/-.The average years of sericulture occupation in Dharamjaigarh is 12.25 and in Gharghoda. 10 year. DFLs were supplied from Sericulture centers and their demand of Dfls was easily fulfilled by the State sericulture department. The economic status in old occupation is normal for 82 and bad for 118 and very poor for NIL respondents.

4. COCOON PRODUCTION AND PROFIT:

It is observed in the study area that 18 respondents from Dharamjaigarh and 16 from Gharghoda take only one crop in a year while 11 from Dharamjaigarh and 81 respondents from Gharghoda take two crop in a year. In Same manner 71 respondents from Dharamjaigarh block and 03 from Gharghoda block take 3 crops in a year. The numbers of cocoon produced are 6350/crop/beneficieries in Dharamjaigarh and in Gharghoda it is 7500. The economic gain by the respondent of Dharamjaigarh is Rs.5160/-and in Gharghoda it is Rs.5960/-. The yearly production of cocoons by the respondent of Dharamjaigarh 18900 number and in Gharghoda 20400 number. Average annual income about Rs 16980/- for Dharamjaigarh and Rs 17820/- for Gharghoda.

Graph 3: Status of Cocoon Production in Study Area



5. SERICULTURE AND RISK FACTOR:

187 respondents had been bore a loss from Sericulture and 13 had not suffered. It indicates the hardship and risk involved in it. Almost all attributed the loss due to 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 200 respondents only 1% get Compensation from government where as 99% denied. All respondents are accorded full cooperation by the officers of sericulture department. Only 15 respondent get loan as per their requirement and 185 not get.

6. SERICULTURE AND SOCIAL IMPACT:

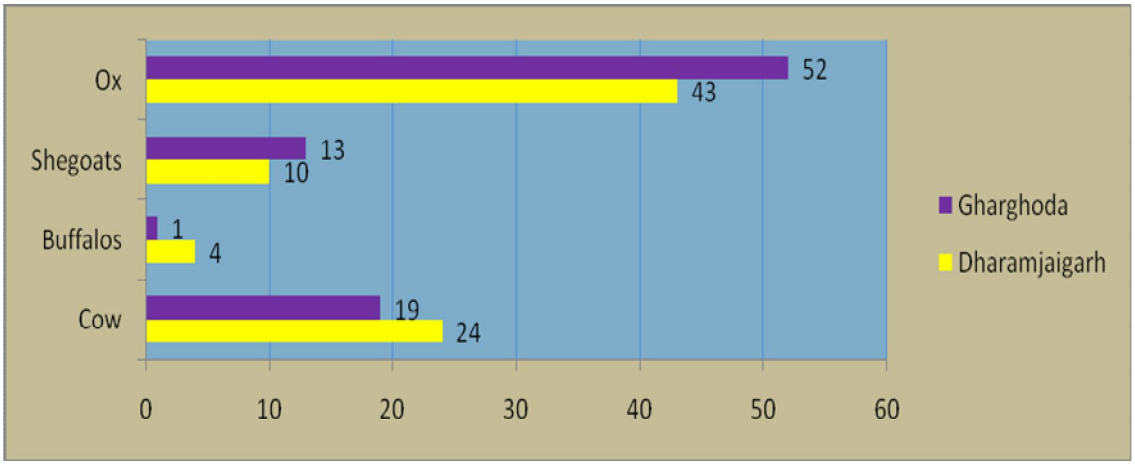
It is observed that all the respondents attributed the following impact by Sericulture-Conservation of environment, No cutting and felling of trees, Interstate migration is checked, Local employment is generated. It served as additional income generating source, Regular savings habit has been developed, 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. The total labour period has been estimated In Dharamjaigarh 8.08 hrs and in Gharghoda.7.38 hrs. All respondents agreed that their economic status has changed. It has been estimated that the annual income rose up to an average of Rs 20200/- of respondent in Dharamjaigarh and in Gharghoda block Rs. 18150/- The present findings confirm the earlier reports of Kumar 2009; Malathesh, *et al.* 2009; Shendage, *et al*.2009; Singh, *et al.* 2009; Thakur and Sharma 2009; Mitra and Verick 2013.

7. TYPES OF LIVESTOCK (MILCHING):

In the study area 24 respondents have cow in Dharamjaigarh block and 19 rspondents in Gharghoda whereas 04 respondents have Buffalos in Dharamjaigarh and 01 respondents in Gharghoda. 10 respondents have shegoats in Dharamjaigarh and 13 respondents in Gharghoda. As a live stock engaged in household burden in Dharamjaigarh block, Ox- by 43 respondents and in Gharghoda 52 respondents. In Dharamjaigarh block 14 respondents have poultry whereas in Gharghoda block it covers 30 respondents.

Graph 4: Types of Livestock in Study Area



8. DOMESTIC EXPENDITURE:

In the category of Liquor and Narcotics, 83 respondents from Dharamjaigarh block and 45 from Gharghoda block consume there expenditure in liquor. On Tobacco maximum expenditure is incurred by the respondents of Gharghoda block i.e. 74, followed by Dharamjaigarh block 69. Same as on Gudakhu 69 from Dharamjaigarh and 60 respondents from Gharghoda domestic expenditure has been incurred. In Dharamjaigarh block 05 respondents incurred expenditure on Gaanja whereas 01 respondents from Gharghoda block expenditure on the same.

9. DISPLACEMENT FOR SERICULTURE AS LIVELIHOOD:

It is observed that in the Gharghoda block 16 respondents have been displaced or migrated for livelihood and there is 04 respondents displaced from Dharamjaigarh block. 08 respondents from Dharamjaigarh feel that sericulture has affected their traditional business/occupation.

10. SUGGESTION FOR CHANGE:

It is observed in the study area that 67 respondents from Dharamjaigarh block and 41 from Gharghoda block suggest for change in field work area. 20 respondents from Dharamjaigarh and 03 from Gharghoda block suggest for change in rearing. 28

respondents from Dharamjaigarh block and 88 from Gharghoda suggest for change in training. 23 respondents from Dharamjaigarh block and 26 from Gharghoda suggest for change in facilitation.

Graph 5: Suggestion for change in study area

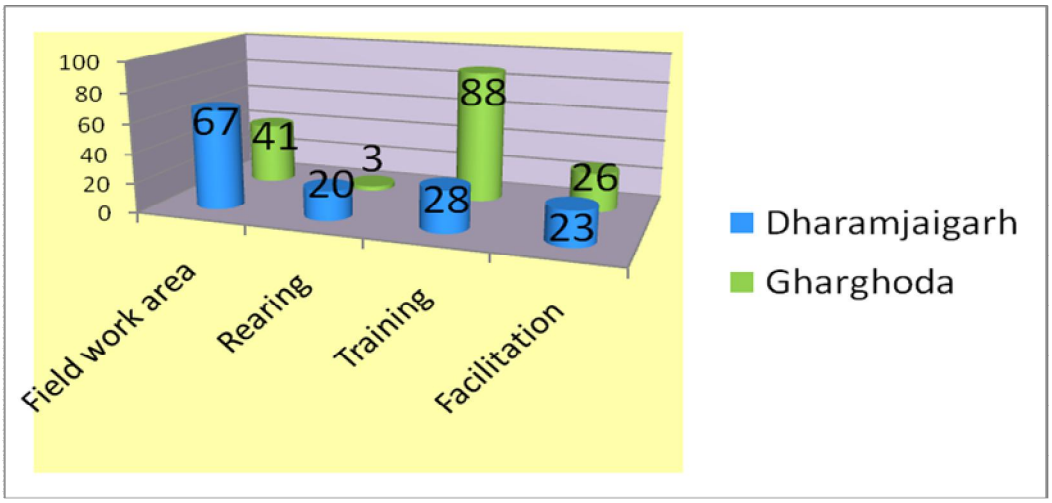


Table 1: Statistics of Sericulture in India

S.N	Year	Total Tasar Silk Production(Mt)	Total Raw Silk Production(Mt)	Employment Generation (Lakh)	Foreign Exchange Earning (Usd) Million
1	2005-06	308	17305	59.50	721.53
2	2006-07	350	18475	60.03	737.76
3	2007-08	428	18320	61.20	677.40
4	2008-09	603	18370	63.10	691.06
5	2009-10	803	19690	68.17	609.58
6	2010-11	1166	20410	72.50	628.57
7	2011-12	1590	23060	75.60	491.10
8	2012-13	1729	23679	76.53	423.37
9	2013-14	2619	26480	78.50	410.61
10	2014-15	2434	28708	80.30	471.00
11	2015-16	2819	28530	82.50	389.53

Source: DGCIS, Kolkata, 20163

Fig. 1: Tasar Silkworm Larva, Fifth Instar

Fig. 2: Mature Silkmoth

Fig. 3: Preparation of Field

Fig. 4: Reeled Silk Yarn

Source: District Sericulture Office, Raigarh

CONCLUSION

The opportunity lies with this sericulture sector is in its income effect associated with the large section of downtrodden artisans who could in turn generate a large spill over effect over the society as a whole. Low gestation period and quick turnover makes sericulture ideal for poor and marginal rural inhabitant. Poverty and income inequality can be harnessed if expansion of sericulture can be sustained in the rural sector. It has been observed that in sericulture 57% of its final value is flown back to the primary producers. This Sericulture sector is not only important for generating rural employment and preventing rural migration but also for protection and preservation of ecology, socio-economic change, 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 Act) population must receive 100 days employment in a year, whereas sericulture provides 151-200 days employment i.e., 54%. Due to these practices respondents earned around double income compared to their earlier income. 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 sericulture is that the practice can be adopted by the farmers without any difficulties and within 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. Respondent who had been once causing the depletion of forest resources are now interested in its protection involving them in evolving suitable measures through the Sericulture. They have come to an understanding that feeding of Tasar silkworm on the food plants in the forest is a part of the total ecosystem, and moved towards the conservation of forest resources through forest protection.

Income generation process of the silkworm rearers are threatened by some significant supply side constraints, which includes several types of inefficiency starting from technological inefficiency, cost inefficiency, labour inefficiency and market inefficiency. It is found in study that wild Tasar biodiversity is facing unparallel threat of extinction from their natural habitat due to environmental degradation and other related issues like deforestation, unsustainable fuel wood extraction, unplanned agricultural practices,

encroachment into forest land for agriculture and forest settlements, forest fire, over grazing, non adoption of adequate soil conservation measures. This would have direct impact on food plants of different wild silk moths. Reduction of human pressure on the forest has been observed through increased sericulture activities.

SUGGESTION

1. The government should give them compensations for the losses incurred in this occupation due to diseases and the negative impact of natural factors.
2. There should be enough loan facilities for the improvement of their occupation which is still more beneficial.
3. The government should be encouraging them to make clothes along with sericulture occupation.
4. Public Private Participation in the Post-cocoon sector and contract farming with NGOs and corporate participation.
5. Decrease in forest/timber cutting and diversion towards farm/nonfarm activities, saving of forest land from massive soil erosion through contour Bunding.
6. Covering of degraded lands with plantation of Tasar food plants are basic solution for bio-diversity conservation.
7. Diversity of Sericigenous moths needs to be conserved through well planned and sustainable measures. Conservation of forest bio-diversity requires community involvement, especially tribal's.

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DECLARATION OF CONFLICTING INTERESTS

The author declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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