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Income and employment generation through sericulture in Dharamjaigarh block, Chhattisgarh, India

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Abstract
Sericulture is an important labour intensive agro-based industry. It is the only cash crop that provides attractive incomes to the farming community in general, small and marginal farmers in particular. Sericulture is the art of silk production, which includes area under mulberry cultivation, silk worm rearing, both pre and post cocoon activities. Sericulture improves the standard of living and life style of the people in rural area by providing sufficient employment and income opportunities for rural people. Sericulture Industry in India has classified the employment generation pattern of the industry into two major types: Direct Employment – (a) Mulberry Cultivation; (b) Leaf Harvesting; (c) Silk Worm Rearing; Indirect Employment – (a) Reeling; (b) Twisting; (c) Weaving; (d) Printing & Dyeing; (e) Finishing; (f) Silk Waste Processing. Sericulture is one of the prominent enterprises, which provided full time employment to the entire family, offering high income and better standard of living. This agro based cottage industry is so labour intensive and employment creating and income generating this is rightly called the 'Kalpavriksha' or the 'Kamadhenu' of the poor and downtrodden. Total raw silk production in India was 26480 MT, out of which mulberry raw silk production was 19476 MT (73.55%) during 2013-2014 and it goes up to 30265 MT in 2016-17. Employment generation is 8.51 million in the same year. 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 study concludes with some suggestions to improve the feasibility of sericulture in long term.

Keywords: sericulture, tribal, employment, income, cocoon

1. Introduction

Sericulture is an important labour intensive agro-based industry. It is the only cash crop that provides attractive incomes to the farming community in general, small and marginal farmers in particular. It requires a meager capital of Rs. 500 to create one job as against rupees 10,000 or more per job in organized industrial sector (J. Acharya, 1993) [17]. Sericulture is the only cash crop, which provides frequent and attractive returns in the tropical states of the country through year. The average annual income per hectare was around Rs. 40,000 (Jagannath, N. 1995) [18]. The term "Sericulture" generally refers to the processes involved in the production of silk. In Latin language 'Seri' means silk, silk is a natural filament created by silk work, therefore, sericulture refers to the process of rearing of silk worms by feeding them with mulberry leaves for the purpose of producing silk. (Raya, Y. S. Hanumantha, 1996) [26]. Sericulture is the art of silk production, which includes area under mulberry cultivation, silk worm rearing, both pre and post cocoon activities. Sericulture improves the standard of living and life style of the people in rural area by providing sufficient employment and income opportunities for rural people, it is also one of the instrument for controlling the migration of people from rural areas to urban areas in search of jobs. (Marella, S. (2013) [20]. This agro based cottage industry is so labour intensive and employment creating and income generating this is rightly called the 'Kalpavriksha' or the 'Kamadhenu' of the poor and downtrodden (Muniraju, 1988) [22].

Gangopadhyay (2008) [14], in his review of Sericulture Industry in India has classified the employment generation pattern of the industry into two major types: Direct Employment – (a) Mulberry Cultivation; (b) Leaf Harvesting; (c) Silk Worm Rearing; Indirect Employment – (a) Reeling; (b) Twisting; (c) Weaving; (d) Printing & Dyeing; (e) Finishing; (f) Silk Waste Processing. Ali (2010) [1] revealed that 26.66 per cent respondents had annual income between 50,000/- to 1, 00,000/- followed by 1, 00,000/- to 1, 50,000/- of 20 per cent respondents, respectively. While, there is similar type of annual income from other group. Dewangan *et al*. (2012) [13] revealed that the total monthly income obtained from all sources to the families involved in sericulture occupation is average 3840/-. The total monthly expenditure is about 2380/-. The respondent tribe of study area collects forest minor products and thus they earn income about 5950/- 29 once in year which is a satisfactory amount for poor families. Balakrishanappa and Rajan (2010) [5] have observed that sericulture is one of the prominent enterprises, which provided full time employment to the entire family, offering high income and better standard of living. Usha Rani (2007) [28] has shown that 96.36 man days of employment are generated from the establishment of one acre of mulberry garden for rearing 300 dfls (disease free layings) of silkworms in two months.

Socio-economic condition of the tasar rearers / reelers/ weavers in Korba district (Chhattisgarh), Were majority of the rearers (44%) fall in the income group of Rs. 5000-10000 from tasar silkworm rearing, which formed about 19% of the

total income Rs. 47631.58 (Brahmachari, B.N.; *et.al.* 2006) [9]. In Surguja, the tribal women engaged in this activity were living below the poverty line (BPL), having an annual family income of Rs. 11,850.00 or less (Bhatia, N.K., *et.al.* 2009). Banerjee (1990) [6] also justified the reason of female dominance in sericulture by stating that silkworm rearing calls for intensive attention as well as mother's care, especially during the later stage of larva. Identification of mature silkworms for putting in spinning trays requires a great deal of expertise, skill and intensive labour. These beget problems of getting hired labour and, accordingly, dependence on family labour increases. These are the reasons why female dominance in sericulture is so much prevalent in sericulture. Women's participation was high in rearing sector than mulberry cultivation. A great deal of variation exists in their participation across different sericultural regions and socio economic groups and also across their age, status in the household and educational levels (Gayathri Devi, 1994) [15]. Participation of family labour was 56% out of the total manpower involved in sericultural activities under rain fed conditions of Chamarajanagar (Rajesh, 1995) [25].

Lakshmanan and Geetha Devi (2007a) [19] reported that one acre of mulberry sericulture had generated 532 mandays in various activities in Gobichettipalayam and Udumalpet taluks of Tamil Nadu. Of this, 319.20 man days were from own family source and 212.80 man days were hired.

Pushpa and Netaji (1999) [24] conducted a study on income and employment pattern of farmers in various integrated farming systems in Rasipuram and Namakkal taluks of Salem district in Tamil Nadu and found that maximum additional employment generated (515 man days) was in sericulture compared to poultry (160 man days) and dairy (170 man days). Bisen *et al*. (2005) [8] studied the economics of cocoon production in Balaghat district of Madhya Pradesh and concluded that approximately 51% of the cost was spent for human labour. Chandrasekar (1985) [10] found that sericulture provides two times more employment i.e 538 man days /ac/yr than other alternate crops in Dharmapuri district of Tamil Nadu. Hanumappa (1986) [16] found that cultivation of one hectare mulberry required 371 man days per year. It was also estimated that the employment generation was about 400 man days per annum per acre (Nagaraj *et al*., 1986b) [23]. India is the second largest producer of silk in the world next only to China. Karnataka is the leading sericulture state which contributes around 50 per cent of the total silk production in India. It is estimated that the indirect effect of sericulture to the farm income is about 25 per cent (Mattigatti and Iyengar, 1995) [21]. India is one of the highest consumer and importer of raw silk in the world, and unable to meet the increasing demand for raw silk by the domestic industry, due to low productivity and low quality, high-grade quality mulberry–raw silk is not being produced in the country and also most of the hand loom weavers prefer Bivoltine silk, hence the import of raw silk is more in the India (Tikku, M.K. 1999) [27]. In India, Several socio-economic studies have affirmed that the benefit-cost ratio in sericulture is more among comparable agricultural crops. Currently the domestic demand for silk of all varieties is nearly 25,000 MTs, of which only around 16322 MTs (2009-10) was produced in the country and the rest being imported mainly from china (Anitha, R. (2011) [2]. India is the only Country in the world to produce all the four known varieties of silk including Mulberry, Eri, Tasar and Muga. Sericulture in India is a fairly organized activity that is in the cottage industry segment and is largely rural based and labor intensive. Cultivation is spread Over 22 states, Covering 172000 hectares across 54000 villages operating 258000 handlooms and 29340 power looms. (Dewangan, S. K. *et al*., 2011) [12]. Sericulture enterprise in its totality is a long chain industry from mulberry cultivation to fabric making. India stands second in silk production; next to China. Total raw silk production in India was 26.5 MT, out of which mulberry raw silk production was 19.5 MT (73.55%) during 2013-2014 and it goes up to 30265 MT in 2016-17 (Annual report, CSB, 2016-2017) [4].

In Chhattisgarh Tasar and mulberry are reared on commercial scale by the tribal of traditional Districts of Bastar, Raigarh, Bilaspur and Surguja. In the time of establishment of Chhattisgarh state i.e. 2000-01 Total number of 12269 hectare plantation (Departmental tasar+Project+Natural forest block) are available whereas in 2014-15 near about 20590 hectare for Tasar food plantation and 11797 hectare are identified for rearing and cocoon production. For Natural Tasar development 34737 hectare of sal and other food plants are available out of which 9844 hectare are used for Natural seed multiplication camp. In 2014-15 Total Tasar center are 381 and Mulberry center are 74 in number. Total 12,89,44,930 number of Tasar cocoon are produced and same year 66278 kg. Mulberry cocoon are produced. Employment generation are recorded as 481 families for Tasar and 990 families for Mulberry sector. In overall 30792 people are benefitted with Tasar sector in collection and sell of cocoon. In 2016-17 Total Tasar cocoon production are registered as 19, 84, 16,184 number and in Mulberry 60502 kg are achieved. In Tasar sector Total 55422 people and in Mulberry sector 908 families are benefitted. In the same year Total 266 natural multiplication camp are organized. 28.29 lakh numbers of Dfls are supplied to rearers. In the state Total 183 women self help group are working in Reeling sector and 2520 motorized Reeling and spinning machine are working (DOS, Sericulture, Chhattisgarh). Raigarh district stand first in area under plantation of host plant for silkworm rearing. Raigarh district has total area of 2022.6 ha Daba tasar farming under with production of 15,93,7,216 lakh cocoons 63, 6375 beneficiaries (Anonymous, 2012) [3].

2. Material and Methodology

The present investigation was carried out in Dharamjaigarh Block of Raigarh district, Chhattisgarh state, 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. For the study in area Sericultural villages and the names of respondents were selected with 25 beneficiaries in each village at random for collection of data. Thus, 100 respondent's beneficiaries were selected from block. The primary data was collected from the respondents following the personal interview method. 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 in each crop, Profit from each crop. The third type of information pertained to the Losses in Sericulture, Compensation by Government, and Loan according to requirement, Traditional Business is affected or not, total labour 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. The farmers were post classified into main and additional based on the engagement of employment. The information sought from the respondents involved in sericulture activities consisted of three types.

3. Result and Discussion

3.1 Type of house

On the basis of study, the analysis pertaining to employment, income, occupation, risks factor and social impact, Domestic Expenditure, Type of live stocks, Cocoon production, Duration of rearing of silkworm, Basic preparation for sericulture, Occupation before sericulture, Displacement for sericulture, Suggestion for change in Dharamjaigarh block. 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, it covered all respondents.

3.2 Status of working member in family

It is observed in Dharamjaigarh block that the number of working members in 08 families is one, in 51 families two, in 23 families three, in 15 families four and in 03 families five or more members are working. It is clear through the analysis that at least 3 members are involved in the occupation from the average families. It means there is a positive attitude of the members from each family.

M = (1/N) Σfx, where, N = Number of observation
M = (1/100) 254, F = Frequency (collected data)
M = 2.54 x = Variable (as per situation)

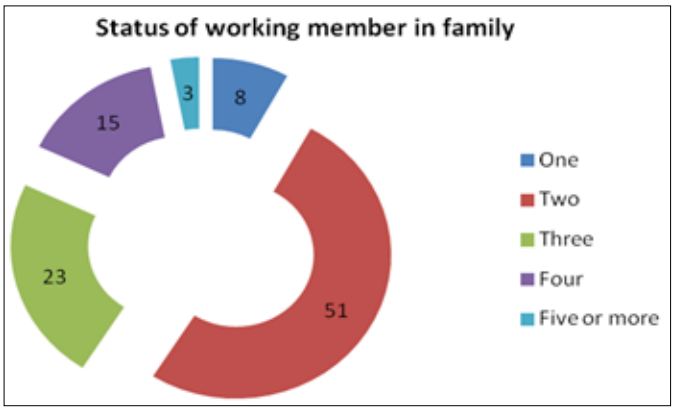

Fig 1

3.3 Employment Days (Man Days) from Sericulture

In Dharamjaigarh block 26% respondents received employment for 100-150 days and 74% received 151-200 days. 201-300 days' employment and 301-365 days employment receiver's respondents are nil.

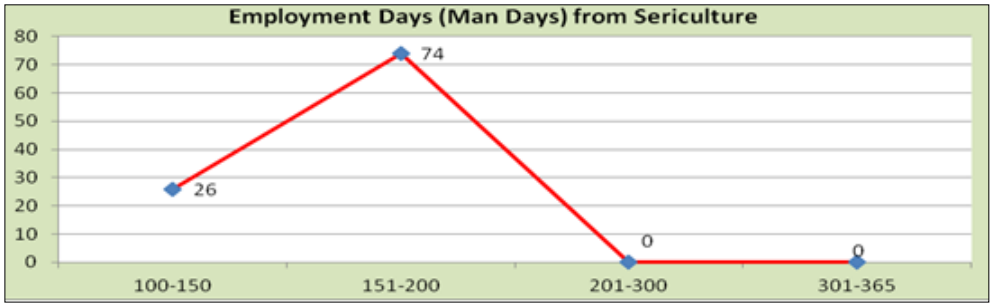

Fig 2

3.4 Income from Sericulture

The data indicate that total average monthly income in Dharamjaigarh is only Rs. 3770/- 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 Rs. 5350/- The economic status in old occupation is normal for 82 and bad for 18 respondents. The total monthly expenditure of the family from all sources are Rs.2210/-. The average annual income from the old occupation was Rs. 20950/-.

3.5 Cocoon Production and Profit

It is observed in the study area that 18 respondents take only one crop in a year while 11 take two crops in a year. In Same

manner 71 respondents take 3 crops in a year. The numbers of cocoon produced are 6350/crop/beneficiaries. The economic gain by the respondent is Rs.5160/-. The yearly production of cocoons by the respondent is 18900 numbers.

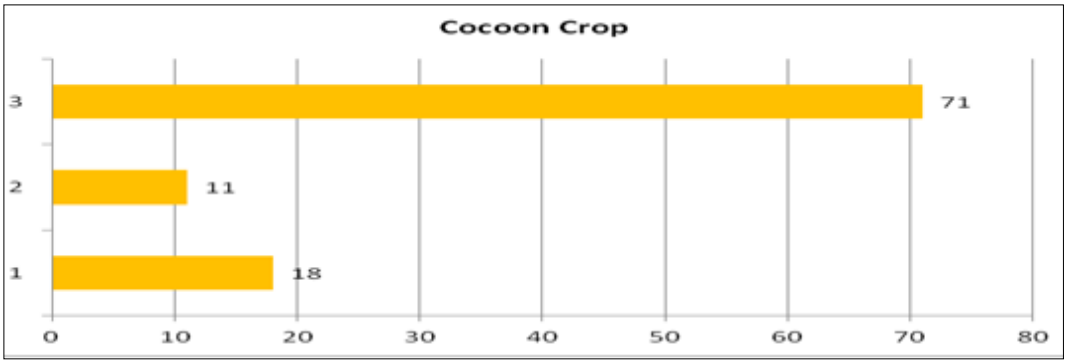

Fig 3

3.6 Types of livestock (Milching)

In the study area 24 respondents have cow, 04 respondents have buffalos. 10 respondents have she goats. As a live stock engaged in household burden, Ox- by 43 respondents and 14 have poultry.

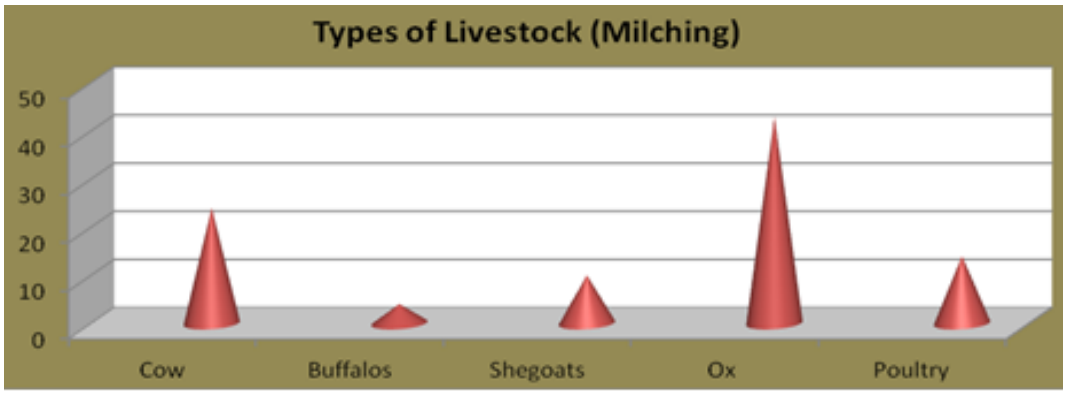

Fig 4

3.7 Domestic expenditure

In the category of Liquor and Narcotics, 83 respondents consume there expenditure in liquor. On Tobacco expenditure is incurred by the respondents i.e. 69, same as on Gudakhu 69 respondents domestic expenditure has been incurred. In study area 5 respondents incurred expenditure on Gaanja.

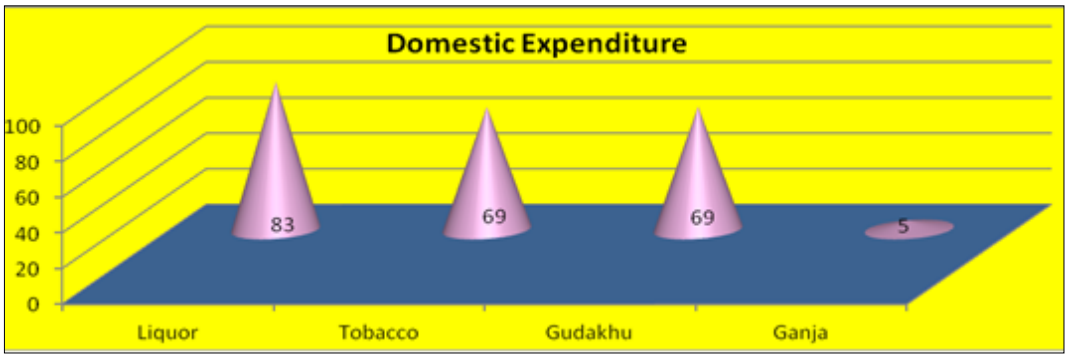

Fig 5

3.8 Basic preparation for sericulture

It is observed in the study area that 98 respondents emphasized that they preferably do the Plant Maintenance work on priority basis followed by collection of leaf by 28 Respondents, Maintenance of hygienic conditions of rearing room by 22 respondents, So as concerned with arrangement of equipment 28 respondents, prefer the work for basic preparation.

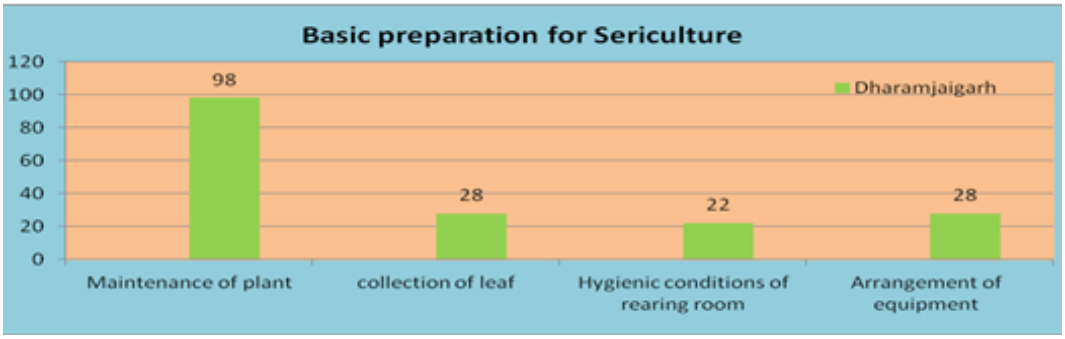

Fig 6

3.9 Duration of rearing of silkworm

In the study area parameter namely rearing of silkworm, it comes under observation that 02 respondents duration of rearing is only two years whereas 03 respondents do that since three years. Again for four years work as silkworm rearing 5 respondents covered. For 5 or more than five years it's counted as 90 respondents.

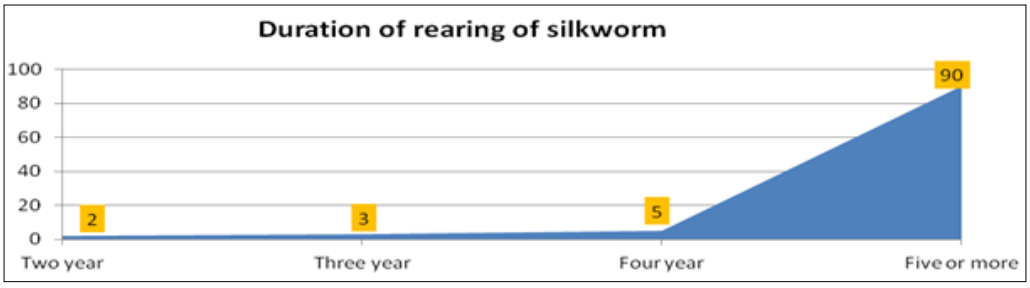

Fig 7

3.10 Displacement for sericulture as livelihood

It is observed that displaced or migrated for livelihood, there is 04 respondents displaced from study area. 08 respondents feel that sericulture has affected their traditional business/occupation.

3.11 Occupation before adopting sericulture

Out of 100 respondents from study area, the main occupation before adoption of sericulture was Agriculture for 71, whereas 07 respondents do as agriculture labor. Only 02 respondents are busy with sericulture and agriculture with sericulture are done by 20 respondent in Dharamjaigarh block. Primary host plant for silkworm rearing is in the priority of *T. arjuna*, *T.tomentosa*, *M. alba* & *S. robusta* with *Z. zuzuba* and that is about 3400 for each respondent. All respondents are accepted that the work of sericulture is comparatively better than other work.

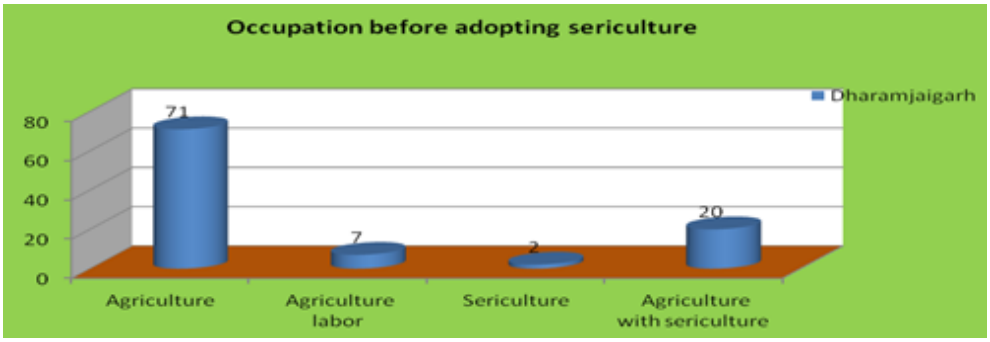

Fig 8

3.12 Sericulture and Risk Factor

All respondents had been bore a loss from Sericulture. It indicates the hardship and risk involved in it. The loss to fluctuation of atmospheric and adverse weather conditions viz heavy rains (82 Respondents), high temperature (31 respondents), pollution (02), and storm (02 respondents) cause disease (92) which lead to a complete failure of their crops. Out of 100 respondents no one get compensation from government. All respondents are accorded full cooperation by the officers of sericulture department. Only 8 respondent get

loan as per their requirement and 92 not get. This occupation is not new to the tribes in the study area because they are practicing sericulture since average of 12.25 year. DFLs were supplied from Sericulture centers and their demand of dfls was easily fulfilled by the State Sericulture department.

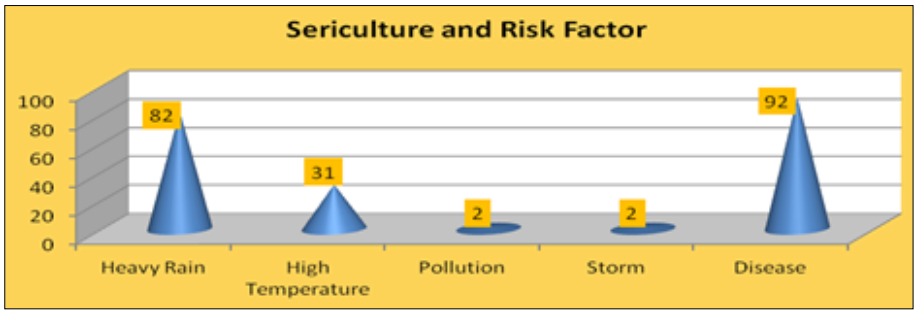

Fig 9

3.13 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 their 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. All respondents agreed that their economic status has changed.

3.14 Suggestion for change

It is observed in the study area that 67 respondents suggest for change in field work area. 20 respondents suggest for change in rearing. 28 respondents suggest for change in training. 23 respondents suggest for change in facilitation. Suggestion for change is also observed for Marketing 03 respondents and style of collection of cocoon by 01 respondent.

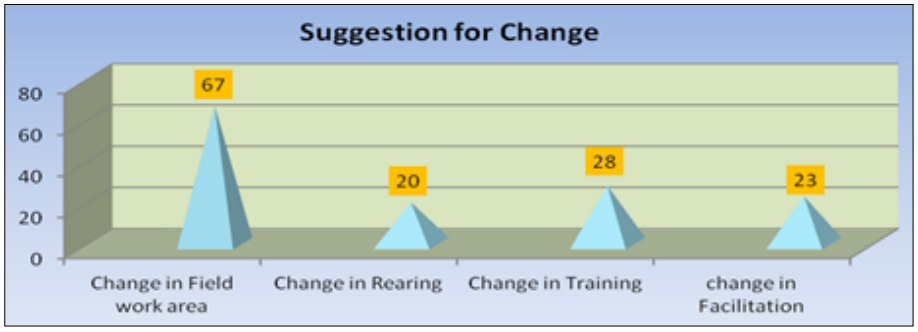

Fig 10

4. Conclusion

The demand for silk is growing in the national & international market day by day because of its qualities. Due to awareness in education in rural areas, literate farmers are willing to accept latest technological knowhow. It holds promise as an employment generating industry, especially in rural and semi-urban areas are recorded. Majority of farmers have low land holding capacity, the cost of the land is very high. It is clear through the analysis that 3 members are involved in the occupation from the average families. 74% respondents received 151-200 days employment from sericulture. 71 respondents take 3 cocoon crops in a year. The yearly production of cocoons by the respondent is 18900 numbers which converts equal amount of money. As on Gudakhu 69 and in liquor 83 respondent's domestic expenditure has been incurred. Respondents have proper livestock. 98 respondents preferably do the Plant Maintenance work on priority basis. Year for rearing of silkworm as observed is 5 or more than five years it's counted as 90 respondents from block. 08 respondents feel that sericulture has affected their traditional business/occupation. The main occupation before adoption of sericulture was Agriculture for 71 respondents. All respondents had been bore a loss from Sericulture. Only 08 respondent get loan as per their requirement and 92 not get. DFLs were supplied from Sericulture centers and their demand of dfls was easily fulfilled by the State sericulture department. 67 respondents suggest for change in training pattern. The rearers have small land holding for rearing. There is lake of competitive marketing network are counted as weakness of sericulture in study area. Some Opportunities like sericulture sector includes active involvement of rural women.

5. Suggestion

- The government should give them compensations for the losses incurred in this occupation due to diseases and the negative impact of natural factors.
- There should be enough loan facilities for the improvement of their occupation which is still more beneficial.
- The government should be encouraging them to make

clothes along with sericulture occupation.
- Public Private Participation in the Post-cocoon sector and contract farming with NGOs and corporate participation.
- Decrease in forest/timber cutting and diversion towards farm/nonfarm activities, saving of forest land from massive soil erosion through contour Bunding.

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