Ericulture as a Remedy of Rural Poverty in Assam: A Micro Level Study in Barpeta District

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Introduction

Ericulture i.e., rearing of eri cocoon and spinning as well as weaving of endi clothes has been an integral part of the rural economic activities especially of the rural women in Assam. Though both male and female folk of all sections of rural population have been engaged in different sericulture activities, tribal women have been predominant in the rearing and weaving of eri raw silk and endi textiles, who in addition to their daily household activities use their leisure time and with the help of their traditionally inherited knowledge produce useful but comparatively cheaper endi clothes. The activities not only help to increase their household income but also help many of them to come out of the acute poverty. Moreover, these women become economically and thus socially more empowered. In other words, ericulture here acts as an instrument of empowering rural women.

The agro and plantation based rural economy of Assam has been suffering from the slow growth, higher unemployment rate, grim industrialisation and higher incidence of poverty. Reduction in the size of operational holding per family to less than 0.05 hectare and rising cropping intensity to over 125 per cent (World Bank Report, 2000) in the absence of technological up-gradation led to very slow output growth in agriculture, rising unemployment and incidence of poverty. Percentage of unemployed labour force increased from 2.2 in 1983 to 4.6 in 1999-2000, which was the highest among all the North-Eastern states (as per *National Human Development Report*, 2001).

One of the important problems that the state of Assam has been facing is the problem of mass poverty. Around 36.09 per cent of its total population was living below the poverty line during 1999-2000[1]. In the year 2004-05, Assam ranked 17th in terms of incidence of poverty among all the 35 states and union territories of India. Though the Planning Commission Report (2007) shows a drastic fall in incidence of poverty (55.77 lakh i.e., 19.7 per cent) still now a large section of rural population of Assam is living under poverty (22.3 per cent) and there is no doubt that the incidence is

[1]Government of India (2001-02), *Economic Survey*.

more among the females. The situation of those people becomes acute at the time of flood that occurs frequently and inundates several areas to compound their hardship. Without much capital and other scope, ericulture provides ample scope for employment and income for the survival of those people. Being a labour intensive activity, ericulture has been acting as antidotes to the problem of unemployment and reduction in poverty in Assam for a long period of time without which the rural poverty in Assam would be more severe. Benchamin and Jolly (1987) also identified ericulture as an occupation of "low investment and high output" source of employment and income. Though it has been surviving for a long period of time it is not growing at a faster rate due to the lack of capital of the eri rearers and that of the common weavers that prohibits technological invention and innovation. Moreover, the profit rate is not sufficiently high due to lack of organisation of the rearers and weavers and hence their poor bargaining power. Nonetheless, it provides some income to those who cannot generate otherwise without much capital investment and a larger section of the rearers can come out of their acute poverty and sustain. Of course, relatively much more income may be generated if spinning and weaving can be adopted along with rearing activity and also through raising bargaining power with the formation of self-help group or cooperatives.

Ericulture generates employment for a large number of unemployed people especially of females partially or fully in its various stages of activities. The scope can be further increased if ericulture proper and endi textile industries are undertaken scientifically and commercially. Thousands of families in Assam have been engaged directly or indirectly in various ericulture activities like sowing of seeds; plantation of host plants; maintenance of plants; plucking of leaves from the planted and wildly grown trees; feeding and rearing of silkworm up to cocoon stage; spinning of yarn; weaving of fabrics; marketing of cocoons (intermediate product) and cloths (final product) etc (Das, 2006). Though the official statistics shows that only about 4.55 per cent of total main workers in Assam were engaged in ericulture during 1991 and that declined to about 3.94 per cent in 2001 (Government of Assam, 1997, 2005; Government of India, 1991, 2001) the actual figures are much more as those figures do not include the individuals involved in the spinning and weaving in addition to the rearing of eri cocoon.[2] Moreover, despite the significant rise in total number of families

[2] Here the number of families engaged in ericulture (obtained from the *Statistical handbooks* of Directorate of economics and Statistics, Government of Assam, 1997, 2005) is multiplied by the average number of persons of a family engaged in such activities (as observed from the primary data by the

engaged in ericulture during 1991 to 2005, its share to total workforce declined due to relatively faster growth of other (tertiary) sector of the economy (De and Das, 2007). Here spinning and weaving are taken place at home on a very small scale with simple traditional tools by a section of eri-cocoon rearers. All the cocoon rearers are not the weavers and large section owing to the ignorance and lack of finance, directly sell their reared cocoon to the middlemen traders that add comparatively low to their family income with respect to the eri-rearers and endi-entrepreneurs.

This paper thus tries to throw some light on the role of ericulture and endi-entrepreneurship in the generation of income, employment and removal of poverty in Assam.

After the introduction a brief review of earlier studies on sericulture and specifically on ericulture is provided. After that contribution of ericulture to the employment and family income in Barpeta district of Assam is analysed. It is followed by an assessment of the entire ericulture activities for the generation of income and employment for the sample families. Thereafter the role of ericulture in the alleviation of poverty is explained at micro level. The final section includes the conclusion and policy prescription.

Studies on Ericulture in Assam and Mode of Analysis

Till today we do not have any detailed study, covering all the aspects of the sericulture especially on ericulture of Assam. However, the Sericulture and Weaving Department of the state Government of Assam had conducted a survey during 1975-76 in 598 Gaon Panchayats of the plain districts of Assam to assess the position of the silk industry in terms of production, employment etc. The survey report revealed that the majority of population pursuing the silk culture as leisure time occupation[3]. It also revealed that the majority of population pursuing the silk culture in Assam belong to both General and Scheduled Tribes. A few studies are also there on different sericulture activities of Assam and other parts of India conducted by Dutta (1983, 1988), Choudhury (1984), Ratnala (1990), Das (2002) who tried to analyse the problems, prospects and economic conditions of sericulture sectors. However, most of them

authors), that is three in the present case to approximate the total number of persons engaged in ericulture and its share to total main workers in Assam).

[3] As there is disguised unemployment in agriculture, the rural people, especially the women folk have been engaged in such occupation. Also the male people during the lean agricultural season take part in such activities for raising a part of their family earning.

stressed much on mulberry, mugaculture and related cottage industries except Dookie (1984) who gave a special emphasis on the analysis of ericulture and eri-silk industry as a source of income and employment in India. These may be mentioned here.

Dutta (1983) conducted a study entitled "Economics of Silk Production in Assam", which provides a brief note about the silk production and its related aspects in Assam. He made an in depth assessment of the net income generated by a family of silkworm rearer with the help of primary data that may provide an indication of its prospects. But the sample used in his study was very inadequate. Later, Dutta (1988) also discussed the problems and future prospects of eri, muga and mulberry silk industry in Assam especially in the Sibsagar district through another study entitled "Problems and Prospects of Silk Production in Assam with Special Reference to Sibsagar District". The most important drawback of that study was that he did not take into account transport cost associated with the collection of wild leaves in case of eri and imputed labour cost in the estimation of income and profit while explaining the prospects of it. However, transport expenses forms an important part of the cost especially during the crisis of food leaves in the neighbouring area. Even if the collection of wild eri leaves is done by the family labourer (who might be unemployed otherwise) it involves some opportunity cost irrespective of its worth. Dookia (1984) tried to analyse the position of eri silk industry in Indian economy as a cottage industry and discussed its role in the creation of employment and income in the rural economy. Choudhury (1984) also attempted to assess the economic importance of each variety of silk by estimating gross and net returns per hectare of land under host plant and per family of silkworm rearers. This assessment seems to be based on experiment rather than field study.

Ratnala et al (1990) studied the employment of human labour in sericulture across different size of the farms especially of the mulberry farms in Andhra Pradesh. In their study, they found that utilisation of human labour was more in smaller farms where the attention on each activity was more than the bigger farms. They observed a significant positive relationship between hired labour use and the size of land holding. Also there was an inverse relation between the human labour use and the size of land under cultivation that means the bigger firms are more capital intensive than the smaller one. They concluded that the higher employment potentialities of sericulture were well suited to exploit the abundant human resources in rural India. The presence of disguised unemployment was more in case of smallholdings but the big holdings were generating

comparatively less employment in their sericulture farms. In order to engage the family labourer effectively and use the labour rationally, holding size of 1.01 to 1.5 acres was found to be optimum for the cultivation and rearing of silkworm (Ratnala, et al, 1990).

Thereafter "A Study of Mugaculture with Reference to Income and Employment Generation in Kamrup District" by Paresh Chandra Das in 2002 may be mentioned. Here, he discussed the problems of mugaculture in Kamrup district of Assam and means to revive the thousand-years-old industry. He also tried to find out the share of mugaculture in the generation of employment through the analysis of data collected from a sample of 736 families in Kamrup district during January 1999 to December 2002. Out of 736 families, 26.87 per cent of the respondent households were found to adopt mugaculture as a source of livelihood in his study. But, he did not estimate the capacity of mugaculture to generate employment per unit of output or area under the growth of host plant i.e., the efficiency of mugaculture in the generation of employment and income has not been checked.

Though there are a few studies on sericulture and particularly on ericulture in Assam and other parts of the country most of those described how people adopt these cultures and who are engaged in such activities. But none of them explained how the activity affects the economy of the rearing families at micro level and what its role in the poverty alleviation is. In this paper, though a small sample of 180 families are considered for the collection of information we could successfully show the impact of ericulture on the income and the alleviation of incidence of poverty at the family level.

The sample families have been chosen from the Barpeta district by multistage sampling procedure.[4] At the first stage, three Community Development Blocks out of total twelve blocks in the district are chosen purposively on the basis of the concentration of ericulture activities. Three villages have been chosen from each of the chosen blocks (total nine villages) also purposively depending upon the concentration of such activities. From the nine villages, total 180 sample families are selected (23, 10 and 17 from Gahia, Agdia and Garartari villages under Sarukhetry block; 14, 21 and 35 from Salbari, Hahchara and Bhuyapara villages under Jalah block and 18, 32 and 10 from Bashbaari, Nimua and Khurabari villages under Gobardhana block respectively)

[4] Though contribution to total ericulture output of the state and number of families engaged in ericulture is much larger in Karbi Anlong, North Lakhimpur and Dhimaji district, concentration of activities is much more in Barpeta, where over 16 per cent of the inhabited families are engaged in such activities. Moreover, the growth rate of output of eri cocoon per unit of eri food plantation during 1990-91 to 2004-05 is the highest in this district among all the districts of Assam (De and Das op. cit).

on the basis of the proportion of families of the three blocks engaged in such activities in the respective villages. From each village, the sample families are drawn by simple random sampling without replacement from all the families practising sericulture.

From each selected family, information regarding number of broods reared and production of cocoons and pupae in a year, number of people engaged in this occupation, working hours in rearing, spinning and weaving, cost of appliances of rearing, price of pupae and cocoons at which these are sold, production of yarn, labour hour required in spinning and shawl production, cost of handloom, price of yarn and endi-products, the problem faced by rearers, other occupations, total annual family income etc have been collected through a pre-tested questionnaire. The survey was conducted during the period June 2005 to July 2006. Information on the market price of eri cut cocoons was not available from the secondary sources, which was also collected from the respondent and verified with the field officers of Sericulture Department of Government of Assam.

Contribution of ericulture to income and employment in Barpeta district and of the sample households is analysed by tabular method. Also the contribution to income and employment generated due to the endi textile operations (spinning and weaving) is analysed by tabular method. The observations are given below.

Observations:

Employment of Families in Sericulture in Barpeta District

The position of unemployment and incidence of poverty in Barpeta district is not much different from that of the entire state of Assam. The number of unemployed persons as per registration in the district Employment Exchange was 80327 in 2004[5]. Out of 1.64 lakh population of the district (2001 Census Report), 31.40 per cent was in the working class, which was less than that of the state average (35.78)[6]. It was due to the slow pace of agricultural development and almost zero industrialisation on the one hand and on the other hand high growth rate of population that was 18.53 per cent during 1991 to 2001(2001 Census Report). Moreover, there is almost no employment in the state government sector in recent years. Therefore, people have to find out the scope of self-employment on the basis of their knowledge, skill and experience. Sericulture

[5]Directorate of Economics and Statistics, Government of Assam (2005), *Statistical Handbook,* Table-19.05, P-168

[6] Directorate of Economics and Statistics, Government of Assam (2005), *Statistical Handbook*, Table-1.10, P-28.

and particularly ericulture has provided employment to a large number of families belonging to all General Category, Scheduled Caste and Scheduled Tribes in Barpeta district. Here, especially the poor villagers have been practicing such activities from the traditional period, as it requires very simple tools and limited investment. Knowledge on such activities is inherited through generations. Changes in engagement of families in sericulture in the district during 1995-96 to 2005-06 are shown in table-1.

Table-1: Employment of Number of Families in Sericulture in Barpeta District

Silk variety	Eri	Muga	Mulberry	Sericulture Total	Percentage of Eri to Total Sericulture	Percentage of Muga to Total Sericulture	Percentage of Mulberry to Total Sericulture
1995-96	886	52	134	1072	82.65	4.85	12.50
1996-97	1798	9	253	2060	87.28	0.44	12.28
1997-98	1735	0	162	1897	91.46	0.00	8.54
1998-99	1400	200	378	1978	70.78	10.11	19.11
1999-00	2376	5	257	2638	90.07	0.19	9.74
2000-01	2433	85	279	2797	86.99	3.04	9.97
2001-02	3421	74	294	3789	90.29	1.95	7.76
2002-03	3421	115	323	3859	88.65	2.98	8.37
2003-04	3421	115	323	3859	88.65	2.98	8.37
2004-05	3421	115	323	3859	88.65	2.98	8.37
2005-06	3421	116	324	3861	88.60	3.00	8.39

Source: Directorate of Sericulture, Government of Assam, Guwahati, Assam.
Note: Tasar is not considered here, as it is not practised in Barpeta district. However, it is grown on a minor scale in some districts of Assam.

From table-1, it is noticed that the number of families engaged in sericulture in Barpeta district has increased by more than three times from 1072 in 1995-96 to 3861 in 2005-06. As alternative employment opportunities were not sufficient to cope up with increasing population in the district of Barpeta, increasing number of people has been engaged in sericulture for their livelihood. Among all the sericulture activities, ericulture occupies the prominent place in terms of generation of employment in the district[7]. During 1995-96 to 2005-06, number of families practising ericulture increased by more than four times (i.e. from 886 in 1995-96 to 3421 in 2005-06) which was more than that of sericulture total. During this period, although number of families engaged in mugaculture increased by more than three times, still now only 116 families are engaged in mugaculture in the district. The main reason for its deplorable condition was the scarcity of muga host plants. The number of families practicing mulberry culture

[7]Though ericulture is one of the important activities of the rural people of Barpeta district, Karbi Anglong occupies the 1st position in terms of generation of employment and output of ericulture in the state. But Barpeta is comparatively a smaller district in size and concentration of ericulture is much higher.

also increased from 134 in 1995-96 to 324 in 2005-06, which is also very less compared to that of ericulture. Though Directorate of Sericulture, Government of Assam set up a Sericulture Farm at Howly (within the district) to supply muga and mulberry seeds and to motivate people towards these cultures, it failed to fulfil its prime objective. With the rising pressure of increasing population more and more land was used for cultivation of food crops and for construction of dwelling houses, and hence the availability of muga host plants has not increased significantly. Also it is a costly and risky affair. Apart from that, as the rearers have to stay round the clock in *Somanies*, it is highly tedious for them. Most of them cannot hire labour also for their unhealthy economic condition. Therefore, they prefer to culture eri to muga, which is quite easy to carry on. Though the position of mulberry in the generation of employment opportunities has been relatively better than muga it has not been satisfactory in the district. In terms of percentage to total number of families engaged in sericulture, the proportion of eri has increased from 82.65 per cent in 1995-96 to 88.60 per cent in 2005-06. Where as, the percentage of muga and mulberry families has declined during that period.

Diagram -1

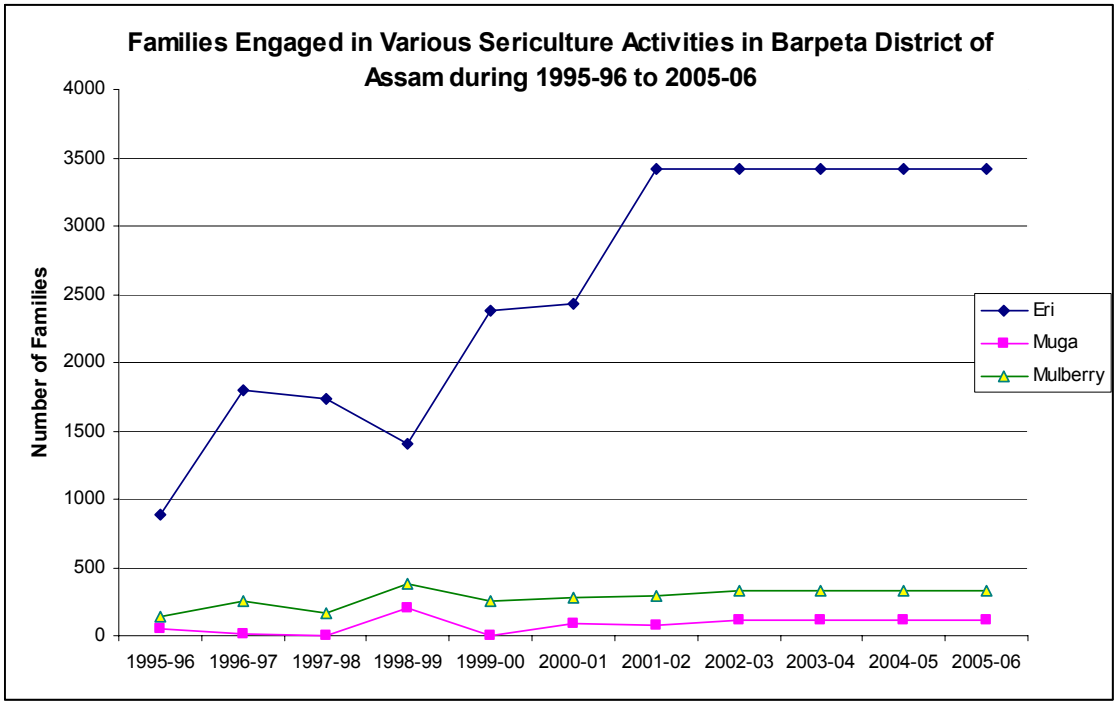

Diagram-1 also depicts the relative growth in number of families engaged in eri, muga and mulberry over time in the district of Barpeta. Number of families engaged in ericulture has recorded a significant rise from 1995-96 to 2001-02 and remain stagnant

thereafter. Also a short-term decline is observed from 1997-98 to the following year. However, a positive growth in number of families is observed in case of muga and mulberry during that particular year though there is no significant growth of families engaged in muga and mulberry activities throughout the whole period. The rise in number of families in muga and mulberry during 1997-98 to 1998-99 was because of the government incentives in the form of aid under Catalytic Development Project (CDP) in terms of cash and kind as well as training given to the growers for the promotion of muga and mulberry and that caused a drastic shift of eri rearers to muga and mulberry culture. In the following years when grants and aids were withdrawn, most of the rearers returned to ericulture again.

Contribution of Ericulture Proper to the Family Income

The rural poor people traditionally practise ericulture by traditional method. With small amount of investment they can generate a good amount income that helps improving their standard of living. Though the official figures of the Director (North-East), Central Silk Board, Guwahati, Assam show that ericulture has been contributing below one per cent (it varies between 0.03 and 0.06 per cent during 1980-81 to 2004-05) to the NSDP of Assam, it contributes much more to those families who practice ericulture. Moreover, the figures do not include the contribution of spinning and weaving part of the endi-entrepreneurs. Table-2 shows the contribution of ericulture proper to the family income of the sample households in the district of Barpeta.

Table-2: Contribution of Ericulture Proper (Rearing of Eri Cocoon) to the Income of Sample Households during 2005-06

Block	Village	Household (Number)	Income from Ericulture (Rs)	Total Family Income (Rs)	Income per family (Rs)	Percentage Contribution of Ericulture to Total Family Income
Sarukhetri	Gohia	23	49090	1193000	51869.56	4.11
	Agdia	10	19690	477000	47700.00	4.12
	Garartari	17	36446.75	872000	51294.11	4.17
	Sub-total	50	105226.75	2542000	50840.00	4.13
Gobardhana	Bashbari	18	29812.45	910000	50555.55	3.27
	Nimua	32	77245.5	1552000	48500.00	4.97
	Khusrabari	10	20537.5	508000	50800.00	4.04
	Sub-total	60	127594.95	2970000	49500.00	4.29
Jalah	Salbari	14	25695	2247000	160500.00	1.15
	Hahchara	21	41282.5	1113000	53000.00	3.70
	Bhuyapara	35	68266	1967000	56200.00	3.47
	Sub-total	70	135243.5	5327000	76100.00	2.53
Grand Total		180	368064.45	10839000	60216.66	3.39

Source: Compiled from Field Survey

From table-2, it is noticed that the average contribution of ericulture to the family income of the 180 sample households was only 3.39 per cent. Its share to family income was slightly higher (4.29 per cent) in Gobardhana CD block. It is because of the establishment of Eri Concentration Centres at Bajegaon Pathar and Nimua to grow and supply eri feed leaves to the rearers at free of cost that raises the scope of earning by those villagers of the block from ericulture activities. The villagers of Nimua also recorded the highest percentage of average family income generated from ericulture, that is about 5 per cent. Also, there is a weekly market (organised market) where the rearers can sell their bye product, pupae and raise their income. Share of ericulture to the family income is observed to be the lowest (2.53 per cent) in Jalah CD block. Within this block, it is the lowest (i.e. 1.15 per cent) in Salbari village, which is also the lowest among all the nine villages. As major portion of income of the sericulturist of Salbari village comes from mugaculture (not shown here), share of eri to the family income was negligible. Though in terms of percentage, ericulture proper (cocoon output) constitute very less in absolute amount it is not altogether negligible as it provides employment to the people especially the rural tribal women who have no scope of alternative more remunerative activity. Moreover, the weaving part of ericulture also constitutes to the weaving families (some of the ericulture families are also the weaver). Also it is noticed that average family income of the Salbari village within Jalah block is the highest (Rs.1.60 lakh) and on the other hand Agdia village within Sarukhetry block recorded the lowest average family income (Rs.47700). It indicates that the share of ericulture to family income is less in the richer areas than the poorer areas i.e., the riches put less stress on ericulture, which is also clear from the estimated regression equation $\text{Ln } Y = 13.154 - 1.086 \text{ Ln } X^*$; ……$R^2 = 0.946$

(0.098)

(Fig. in the bracket is standard error and t-value= -11.08)

Altogether these nine villages generated about Rs.3.68 lakhs from ericulture proper alone during that particular year and hence one can imagine what would be the total annual income generated by all the villages of the whole district from such activities.

Total Employment and Income Generated in the Whole Ericulture Activities

Since ericulture consists of ericulture proper and endi textile industry therefore, generation of employment and income is to be considered in ericulture total. Eri cut cocoons are produced by rearers. Along with income from eri cut cocoons, the rearers

earn income from bye-product, pupae. In the second stage of activity cocoons are converted into yarn by spinners and lastly, yarn is used in producing fabrics by weavers. Therefore, employment and income generation at each stage of production are summed up to get total income and employment generated in ericulture total. Employment and income generation in the production of eri cut cocoons and endi textile industry in the sample villages are estimated and presented in table-3.[8]

From table-3, it is observed that from the production of 1267.63 kilogram of eri cocoon by all the sample families together, 12480.5 equivalent man-days are generated in ericulture total. This production has generated revenue of Rs.1134053. Gross value addition in ericulture total is of Rs.966930.7. However, net value addition is of Rs.453884.2, which is less than half of gross value addition in ericulture total. In total ericulture, gross value addition and net value addition are found to be the highest in the village Nimua within Gobardhana block. Gross value addition is the lowest in Garartari while total net value addition is the lowest in Salbari village.

Generation of equivalent man-days in ericulture proper is 4451. The revenue generated in ericulture proper is Rs.499240.7. Gross value addition and net value addition in ericulture proper is of Rs.479293.7 and Rs.293701.2. Gross and net value addition in rearing of eri cocoon are found to be the highest in the village Nimua. On the other hand, gross value addition is the lowest in Khusrabari, while net value addition is the lowest in Agdia.

Out of total production of cocoon (1267.63 Kg), only 420 kilograms are used in spinning and weaving by the sample rearers. In spinning and weaving activity, altogether 8029.5 equivalent man-days are generated. Revenue generated in spinning and weaving activity is Rs.634812. Gross value addition in spinning and weaving of endi textile is of Rs.487637. But net value addition is very low of Rs. 160183. Net value addition in spinning and weaving is much lower than ericulture proper. It is because of high proportion of imputed labour cost. Gross value addition in spinning and weaving is the highest in Nimua village and lowest in Garartari. In case of net value addition it is the highest in Hahchara village and lowest in Garartari village. In the

[8] Employment generated in the rearing of eri cocoon is estimated by multiplying the number of broods reared by each family by the number of days required for the harvesting which is again multiplied by the number of hours required everyday for nurturing the broods. It is then divided by 8 (8 hours is equivalent to one man day) to get the equivalent man-days generated in the process. In the spinning and weaving also quantity of output and the total man-hours required is considered to estimate the employment generated.

village Garartari, net value addition is found to be negative. It is because of higher wage rate.

If the entire cocoons are used in spinning and weaving, a sum of Rs. 1471770 could have been generated by the sample households. Net gain in gross revenue in weaving would be of Rs. 984132.7. In terms of percentage, further around 101 per cent over actual income could have been generated if the entire cocoons would be processed in weaving.

Similarly, more man-days could have been generated with the processing of entire cocoon in weaving. Potentiality of generation of man-days equivalent in weaving is 23561.32. But potentiality of entire ericulture activities in the generation of man-days is 28012.32. It indicates that further 128.53 per cent of actual man-days can be generated. Thus, if the cocoon rearers provided basic facilities of weaving and they adopt such practice, then there would be significant gain in employment and income in the whole ericulture activities.

Table-3: Man-days Generated and Gross and Net Value Addition in Total Ericulture Activity

Block	Village	Households (Number)	Production of Cocoon (Kg)	Ericulture Proper					
				Man-days Equivalent Generated	Revenue Generated (Rs)	Cost of Capital (Rs)	Gross Value Added (Rs)	Labour Cost (Rs)	Net Value Addition (Rs)
Sarukhetry	Gahia	23	148	504.5	57720	2637	55083	22702.5	32380.5
	Agdia	10	79	328	30760	1630	29130	14760	14370
	Garartari	17	120.6	377	46821.75	1985	44836.75	16965	27871.75
	Sub-total	50	347.6	1209.5	135301.8	6252	129049.75	54427.5	74622.3
Gobardhana	Bashbari	18	106.73	362	41702.45	1495	40207.45	14480	25727.45
	Nimua	32	249.55	867	106155.5	4220	101935.5	34680	67255.5
	Khusrabari	10	76.45	249.5	28812.5	1010	27802.5	10479	17323.5
	Sub-total	60	432.73	1478.5	176670.5	6725	169945.45	59639	110306.5
Jalah	Salbari	14	93.5	399	37000	1635	35365	14238	21397
	Hahchara	21	150.5	533.5	59602.5	2100	57502.5	22407	35095.5
	Bhuyapara	35	243.3	830.5	90666	3505	87161	34881	52280
	Sub-total	70	487.3	1763	187268.5	6970	180298.5	71526	108772.5
Grand Total		180	1267.63	4451	499240.7	19947	479293.7	185592.5	293701.2

Source: Compiled from Field Survey

Table-3 (Continued)

Block	Village	Spinning and Weaving of Endi Textile							Ericulture Total			
		Spun Cocoon (Kg)	Man-days Equivalent Generated	Revenue Generated (Rs)	Cost of Capital (Rs)	Gross Value Addition (Rs)	Labour Cost (Rs)	Net Value Addition (Rs)	Man-days Equivalent Generated	Revenue Generated (Rs)	Gross Value Addition (Rs)	Net Value Addition (Rs)
Sarukhetry	Gahia	27	511	47912	10030	37882	22995	14887	1015.5	105632	92965	47267.5
	Agdia	35	686.5	60400	12070	48330	30892.5	17437.5	1014.5	91160	77460	31807.5
	Garartari	35	575.5	26600	11575	15025	15862.5	-837.5	952.5	73421.75	59861.75	27034.25
	Sub-total	97	1773	134912	33675	101237	69750	31487	2982.5	270213.8	230286.8	106109.3
Gobardhana	Bashbari	37	723.5	55700	13490	42210	28940	13270	1085.5	97402.45	82417.45	38997.45
	Nimua	92	1811	127550	31710	95840	72440	23400	2678	233705.5	197775.5	90655.5
	Khusrabari	28	543.5	44100	9075	35025	22827	12198	793	72912.5	62827.5	29521.5
	Sub-total	157	3078	227350	54275	173075	124207	48868	4556.5	404020.5	343020.5	159174.5
Jalah	Salbari	35	658	42200	13305	28895	27636	1259	1057	79200	64260	22656
	Hahchara	57	1108.5	112900	20320	92580	46557	46023	1642	172502.5	150082.5	81118.5
	Bhuyapara	74	1412	117450	25600	91850	59304	32546	2242.5	208116	179011	84826
	Sub-total	166	3178.5	272550	59225	213325	133497	79828	4941.5	459818.5	393623.5	188600.5
Grand Total		420	8029.5	634812	147175	487637	327454	160183	12480.5	1134053	966930.7	453884.2

Source: Compiled from Field Survey

Table-3 (Continued)

If All Produced Cocoons are Used in Weaving by the Rearers Themselves							
Potential Gross Value Added in Weaving (Rs)	Net Gain in Gross Revenue in Weaving (Rs)	Potential Gross Value Added in Ericulture Total (Rs)	Percentage Gain in Gross Value Added in Ericulture Total over Actual Value added	Potential Employment in Weaving (Number)	Net Gain in Employment in Weaving (Number)	Potential Total Employment in Ericulture Total (Number)	Percentage Gain in Total Employment in Ericulture Total over Actual Employment Generated
207649.5	169767.5	262732.5	182.61	2801.04	2290.04	3305.54	225.51
109087.7	60757.71	138217.7	78.44	1549.53	863.03	1877.53	85.07
51771.86	36746.86	96608.61	61.39	1214.61	862.11	1591.61	118.18
362783.3	261546.3	491833.1	113.57	5554.43	4004.43	6763.93	145.11
121758.7	79548.74	161966.2	96.52	2087.00	1363.50	2449.00	125.61
259966	164126	361901.5	82.99	4912.34	3101.34	5779.34	115.81
95630.76	60605.76	123433.3	96.46	1483.95	940.45	1733.45	118.59
477036.6	303961.6	646982	88.61	8483.71	5405.71	9962.21	118.64
77190.93	48295.93	112555.9	75.16	1757.80	1099.80	2156.80	104.05
244443.7	151863.7	301946.2	101.19	2926.83	1818.33	3460.33	110.74
301987.9	210137.9	389148.9	117.39	4642.43	3230.43	5472.93	144.05
626224.5	412899.5	806523	104.90	9330.62	6152.12	11093.62	124.50
1471770	984132.7	1951063	101.78	23561.32	15754.82	28012.32	128.53

Source: Compiled from Field Survey

Role of Ericulture in Eradicating Rural Poverty

Ericulture plays an important role in reducing the hardship by improving economic condition and standard of living of the rearing and weaving families. The activities require very small amount of investment in comparison to even the crop cultivation and hence is adopted largely by poor rural folk. Planning commission of India stipulated per capita income of Rs 387.64 per month as the benchmark (poverty line) for the rural areas of Assam to estimate incidence of poverty for the year 2004-05. Here, in this analysis after adjusting with the rising price index approximated Rs.433 monthly per capita income is considered as the benchmark for the calculation of the proportion of families living below and above poverty line during 2006 in the study area.

First of all, distribution of families among different income groups of the sample villages with per capita income including income from ericulture activities is enumerated and presented in table-4. Thereafter, the similar distribution is computed without incorporating the income from ericulture activities by the sample families, which is presented in table-5. Comparing these two tables we can observe the changes in number and percentage of families within different income groups with and without having ericultural income. It provides us an idea of how far ericulture in these villages have been successful in eradicating poverty or lifting people out of the clutches of poverty.

Table-4: Number of Families in Different Monthly per Capita Income Groups with Ericulture Income

Block	Village	Household (Number)	Less than Rs.250	Rs.251 to Rs.433	Rs.434 to Rs.600	Above Rs.600
Sarukhetri	Gohia	23	1	5	9	8
	Agdia	10	0	6	1	3
	Garartari	17	0	6	5	6
	Sub-total	50	1 (2.00)	17 (34)	15 (30)	17 (34)
Gobardhana	Bashbari	18	0	5	3	10
	Nimua	32	0	12	9	11
	Khusrabari	10	1	5	2	2
	Sub-total	60	1(1.67)	22 (36.67)	14 (23.33)	23 (38.33)
Jalah	Salbari	14	3	2	3	6
	Hahchara	21	4	8	2	7
	Bhuyapara	35	2	9	12	12
	Sub-total	70	9 (12.86)	19 (27.14)	17 (24.29)	25 (35.71)
Grand Total		180	11(6.11)	58 (32.2)	46 (25.55)	65 (36.11)

Source: Compiled from field Survey

Note: Figures in the parentheses represent percentage of corresponding figure to total

From table-4, it is observed that out of 180 eri rearing families; altogether 69 families (38.13) are living below poverty line. Among those 11 families (6.11 per cent) are very poor having monthly per capita income even less than Rs.250. Among the three blocks, percentage of families living below poverty line is the maximum in Jalah block (40 per cent of families in this block have monthly per capita income less than Rs.433). However, incidence of poverty is observed to be the maximum in the villages Agdia and Khusrabari with figure recorded at 60 per cent. But the percentage of families belong to the very poor category is higher in Salbari (21.43 per cent). Where as 55.56 per cent of total families in that village belong to the higher income group with monthly per capita income above Rs.600. Also it is observed that the average family income of this village is much higher than that of the other villages and those relatively better off families practice more mugaculture and weaving along with ericulture proper (De and Das, 2007). It indicates that the distribution of income in this village is skewed towards the relatively richer families.

Table-5: Number of Families in Different Monthly per Capita Income Groups without Ericultural Income

Block	Village	Household (Number)	Less than Rs.250	Rs.251 to Rs.433	Rs.434 to Rs.600	Above Rs.600
Sarukhetri	Gohia	23	3	4	8	8
	Agdia	10	4	2	1	3
	Garartari	17	2	4	6	5
	Sub-total	50	9 (18.00)	10 (20.00)	15 (30.00)	16 (32)
Gobardhana	Bashbari	18	3	3	2	10
	Nimua	32	6	9	7	10
	Khusrabari	10	3	4	0	3
	Sub-total	60	12 (20.00)	16 (26.67)	9 (15.00)	23 (38.33)
Jalah	Salbari	14	3	2	3	6
	Hahchara	21	7	5	2	7
	Bhuyapara	35	5	9	9	12
	Sub-total	70	15 (21.43)	16 (22.86)	14 (20.00)	25(35.71)
Grand Total		180	36 (20)	42 (23.33)	38 (21.11)	64 (35.56)

Source: Compiled from field Survey

Note: Figures in the parentheses represent percentage of corresponding figure to total

Table-5 shows if the income from ericulture is not taken into account, 78 families (i.e., 43.33 per cent) would belong to the poor category. It indicates that the ericulture activities have helped 09 families i.e., 5.2 per cent of the sample families to overcome poverty. Among the poorer 36 families (20 per cent) would be very poor with monthly per capita income less than Rs.250. But the figure was only 11 i.e., 6.11 per cent in earlier case (when ericultural income was incorporated). Moreover, 23.33

per cent of the families belong to the group of Rs.251 to Rs.433 monthly per capita income, which means about 14 per cent of the families have been able to improve their condition from very poor to moderate poor due to the ericulture activities.

Table-6: Percentage Change in Poverty due to Ericulture

Block	Village	House-hold (Number)	Number and Percentage of Households under Poverty		Percentage Decline in Poverty due to Ericulture Activity	Percentage of Families Practice Spinning and Weaving
			Without Income from Ericulture	With Income from Ericulture		
Sarukhetri	Gohia	23	7 (30.43)	6 (26.08)	14.29	26.09
	Agdia	10	6 (60.00)	6 (60.00)	0.00	50.00
	Garartari	17	6 (35.29)	6 (35.29)	0.00	35.29
	Sub-total	50	19 (38.00)	18 (36.00)	5.26	34.00
Gobardhana	Bashbari	18	6 (33.33)	5 (27.77)	16.68	44.44
	Nimua	32	15 (46.87)	12 (37.5)	19.99	43.75
	Khusrabari	10	7 (70.00)	6 (60.00)	14.28	40.00
	Sub-total	60	28 (46.66)	23 (38.33)	17.85	43.33
Jalah	Salbari	14	5 (35.71)	5 (35.71)	00	64.29
	Hahchara	21	12 (57.14)	12 (57.14)	00	47.62
	Bhuyapara	35	14 (40.00)	11 (31.42)	21.45	45.71
	Sub-total	70	31 (44.28)	28 (40.00)	9.66	50.00
Grand Total		180	69 (38.33)	78 (43.33)	11.54	43.33

Source: Compiled from tables-4 and 5.
Note: Figures in the parentheses represent percentage of families below poverty line

Table-6 depicts that there is an over all 11.54 per cent decline in poverty because of the adoption of ericulture activities by the sample villagers. However the impact is more in the village where relatively fewer number of families practice spinning and weaving along with the production of cocoon. This is observed from the correlation between percentage reduction in poverty and percentage of ericulturist families engaged in weaving across the sample villages, which is found to be negative (–0.362). Though the correlation coefficient is not very high it indicates that the relatively well off families (who were already above poverty line) practice weaving along with ericulture proper and hence the impact in terms of poverty alleviation is appeared to be insignificant. But the areas or villages where less percentage of ericulture families practice weaving, the incidence of poverty is more and thus they cannot adopt weaving without any external financial support. Most of them earn a few amounts from ericulture proper (from the sale of cocoon and pupae), which are not very high in absolute amount, but has very high significance for those families and they can just meet their daily subsistence requirements, i.e. it helps them to come out of acute poverty. It is also clear from the correlation between the average total family earning from all ericulture activities across the villages with the percentage of ericulturist

families practicing spinning and weaving (along with ericulture proper) which is positive and the value is 0.35. The indication is that those who adopt spinning and weaving along with the rearing activity can generate substantially more income than those who do not. Though the weavers are relatively well off than those who do not adopt weaving they are in fact not rich and they are also benefitted significantly from the eri rearing as well as weaving activities in the absence of any other better opportunity within their limited skill and financial capability.

Conclusion:

Though the contribution of ericulture to NSDP at market price is not very significant the rural poor people earns a reasonable amount that fairly supplements their family income and especially the tribal women are benefited in a significant way. Moreover, considering the net revenue generated and the production of eri cocoon by the sample households, it is noticed that about Rs.1411.25 is generated from each kilogram of cocoon. Therefore, if (as observed from the sample) one third of the produced cocoon is processed total revenue generated by the rearers and weavers' families of the state of Assam would be about Rs.24.79 crores, which is not very insignificant at all. Though ericulture has not been growing at a very faster rate due to low profitability, it is still surviving and growing at a slower rate as it is still providing something to the rural poor where people lack in its alternatives.

It contributes more to the family income of those who adopt weaving in addition to rearing of raw silk. Therefore endi-entrepreneurship is very important from the point of employment and income generation, which increase the contribution of ericulture substantially. Nonetheless the poorer, those who even cannot take up weaving activities alongside rearing are also benefited and in spite of comparatively low absolute earning from ericulture, percentage of family income earned from ericulture is much more compared to those who have been involved in weaving. Many of the extreme poorer section can meet their subsistence. Of course it is clear that if they could be made more enterprising through the adoption of weaving activities they would be highly benefited.

Finally, ericulture total is completely managed by rural women folk. The rural tribal women can help the family by contributing income as well as by supplying protein full pupae to their children and other family members. Contribution to family

income makes the women to be more empowered and independent in the family as well as in the society. Hence, if they are brought under cooperative or self-help group, then they can adopt weaving on a larger scale and can diversify their output through the arrangement of proper training and that will definitely have diverse impact on the condition of the rural poor masses.

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