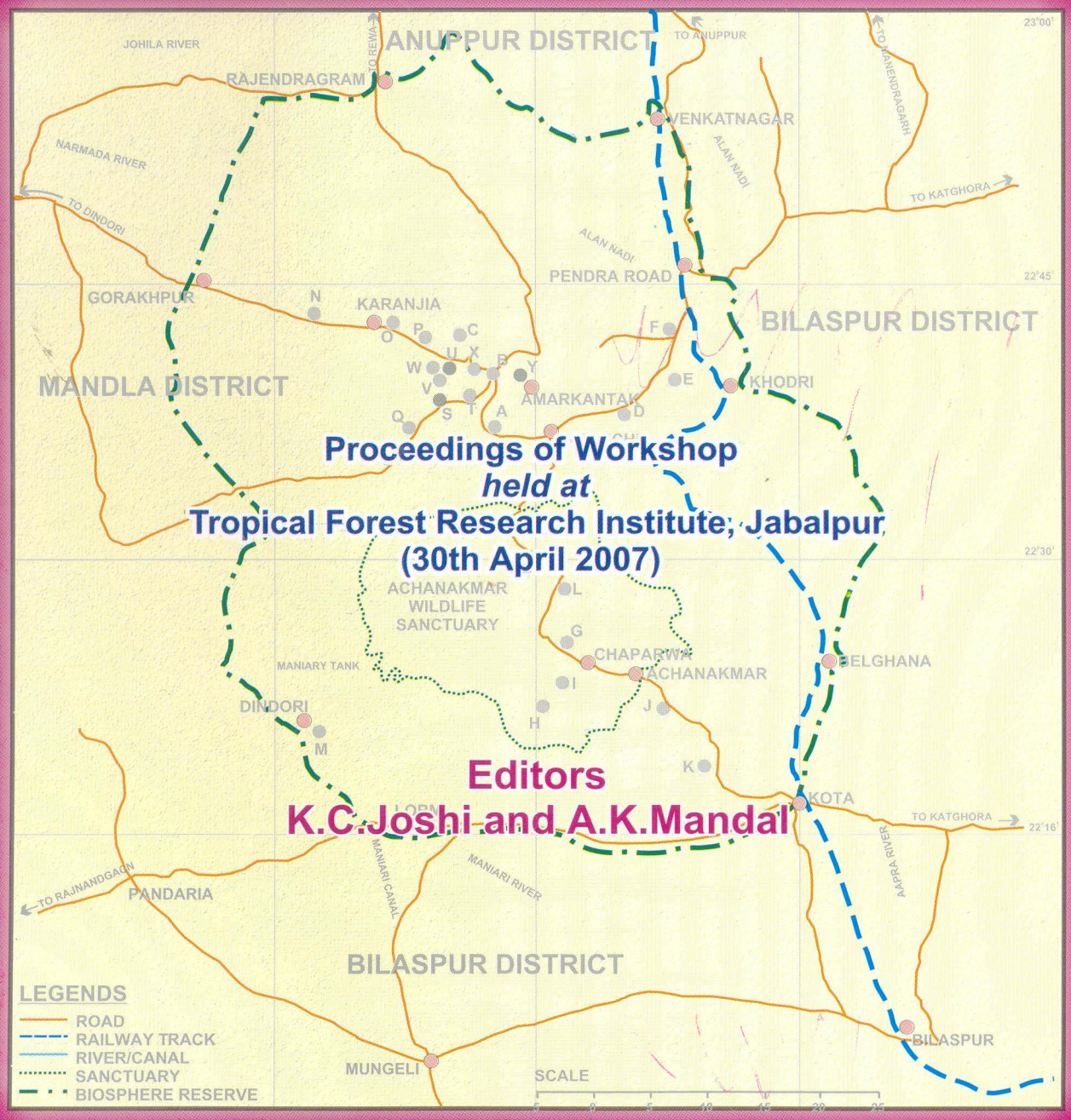
RESEARCH NEEDS FOR ACHANAKMAR-AMARKANTAK BIOSPHERE RESERVE



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Tasar Culture - An approach of social upliftment of forest dwellers of Achanakmar-Amarakantak Biosphere Reserve

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ABSTRACT

Tassar culture is one of the oldest occupation of the tribes particularly living in and around the forest in central and eastern India (Chakravorty, 1982). Since time immemorial the forest dweller practice tassar culture offers vast potential for employment generation especially for women and older people. Due to inherent characterstics like low investments, prevention of migration, high output a doorstep, protection of environment, afforestation, etc. tassar culture has attracted the attention of planners as tool for development of rural sectors.

The tropical tassar silkworm *Antheraea mylitta* D. is a lepidopterean insect. Larvae feeds on leaves of *Terminalia arjuna, T. tomentosa* (Fam: Combretaceae), *Shorea robusta* (Fam: Dipterocarpaceae) which are abundantly available in the tropical forests in India. After attaining the maturity the larvae spin cocoon and metamorphose into pupae. The pupae later emerge as moth, the female lays eggs after mating and the life cycle continues. The cocoons are commercially used for extraction of raw tassar silk yarn.

Achanakmar- Amarkantak Biosphere Reserve (AABR) was notified by the government of India on 30th March, 2005 covering total 3,835.51 sq.km., of which 1,224.95sq.km. falls in the state of Madhya Pradesh and 2,610.53 sq.km. in Chhattisgarh. The core zone (551.55sq.km.) of Achanakmar Sanctuary falls entirely in the state of Chhattisgarh. 3,283.96 sq.km. surrounding the core zone forms the buffer zone. In Chhattisgarh, a part of Bilaspur district falls under AABR. A sizeable number of primary food plants of tropical tassar mainly *arjun, saja* and *sal* found in the buffer zone, mostly as tall tree or coppice.

The present paper deals with the economic upliftment of forest dwellers inhabiting the villages Bansajhal and Tendua in buffer zone in AABR of Bilaspur district Chhattisgarh. These villagers, who are among the poorest of the poor and identified to live below poverty line, were motivated to take up tassar culture during the years 2005-06 and 2006-07. The results revealed that the earning per person increased substantially during the year 2006-07 as compared to the initial year 2005-06. Besides providing livelihood, there was also improvement in the living standard.

Due to regular activities of tasar rearing and awareness developed among the farmers for protection of the trees. There were environmental benefits as well like control of cuttings and felling of trees. The activities of *samiti* (groups) were revitalized preventing migration of the villagers. The results indicate that such activities when propagated among the villagers in buffer zone will enhance the socioeconomic status and at the same time will provide protection and conservation of flora and fauna in biosphere reserve area and help to maintain ecological balance. There is an urgent need of intervention by scientists, environmentalists, state and central government organizations, forest departments, NGO's for opening income avenues for the forest dwellers to protect and conserve the forest wealth.

Introduction:

Tasar culture is one of the oldest occupation and important source of livelihood for the tribes particularly living in and around the forests in central and eastern India (Chakraborty, 1982). This culture is able to generate quite remunerative and meaningful employment (Jolly, 1964, Narshimhanna 1979).

Since time immemorial, the forest dwellers practice tasar culture and it is an integral part of the forest ecosystem. Tasar culture offers vast potential for employment generation especially for women and older people. Due to inherent characteristics like low investment, prevention of migration, high out put at door step, protection of environment and forests, tasar culture has attracted the attention of planners as tool for development of rural sectors.

The tropical tasar silk worm *Antheraea mylitta* Drury is a lepidopteran insect. Larvae feed on leaves of *Terminalia arjuna*, *T. tomentosa* (Family – Combretaceae) and *Shorea robusta* (Family – Dipterocarpaceae) which are abundantly available in the tropical forests in India. After attaining maturity the larvae spin cocoon and metamorphose into pupae. The pupae later emerge as moths, the female lays eggs after mating and the life cycle continues. The cocoons are commercially used for extraction of raw tasar silk yarn.

Achanakmar - Amarkantak Biosphere Reserve (AABR) is spread in an area of 3,835.51 sq. km. The core zone (551.55 sq. km.) of BR, which was earlier known as Achanakmar sanctuary falls entirely in Chhattisgarh. It is surrounded by a buffer and transition zone. Madhya Pradesh has an area of 1224.95 sq. km. as buffer and transition zone while Chhattisgarh has an area 2058 sq. km. as buffer zone. The buffer and transition zones in Bilaspur district has a sizeable number of primary food plants of tropical tasar mainly *arjun, asan* & *sal* as tall trees, established seedlings and coppice shoots.

The present paper deals with the economic upliftment of forest dwellers inhabiting the villages Bansajhal & Tendua in the buffer zone of AABR of district Bilaspur, Chhatisgarh, who were identified to live below poverty line and actually among the poorest of the poor. They were encouraged to take up tasar culture during the year 2005-06 and 2006-07 and the results are summarized herewith.

Material and Methods:

Two villages namely Bansajhal and Tendua in the transitional/buffer zones of AABR having abundant distribution of naturally occurring *Terminalia arjuna* and *T. tomentosa* were selected. There are more than fifty families in these villages within the Lormi forest range which have active forest protection groups (*Van Suraksha Samiti*- VSS). A total ten members belonging to the scheduled tribe community of Bansajhal and five members of Tendua belonging to OBC community were considered as tasar silkworm rearing group. The group were trained on basic technique of rearing the silkworm (Jolly, 1972, Mathur, *et al.* 1996) on natural host plant bushes and trees. The Basic Seed Multiplication & Training Centre (BSM&TC), Central Silk Board, Bilaspur imparted training to the selected VSS members which followed community approach activities such as group discussion, motivation, working pattern, base line survey of economic status of each member. Daba bivoltine disease free layings (dfls) eggs were supplied to the selected VSS members of the village Bansajhal & Tendua during the year 2005-2006, 2006-2007 in both first & second crops.

Tasar silkworm rearing: This activity was a new experience for the VSS members and they attended the rearing from morning to evening for the entire rearing period. Even night watch was maintained from make shift watch tower at the rearing sites. During 2005-06 the silkworm rearing and cocoons harvesting were carried out by the VSS members under close supervision of BSM&TC staff as per recommended package of practices (Jolly, 1972 & Sinha, 2000). Chaki rearings (up to 2nd molt out) were conducted on comparatively low bush plants or coppices under nylon net (40ft. x 30ft. x 10ft.) to protect young worms from pest, predators and natural calamities. However, during the year 2006-07 rearings were conducted in similar way but without the involvement or day to day guidance of BSM&TC staff. During the course of rearing the beneficiaries were trained regarding various rearing practices *viz.,* brushing, protection and transferring worms and cocoons harvesting.

The larval period in days and mature larval weights were recorded and after completion of rearing, the mature cocoons were harvested. Initially individual cocoons were sorted visually in to two group *viz.,* i. seed cocoons: well built having good shell, and ii. non - seed cocoons: cocoon shell weak. Subsequently the seed cocoons were sorted and procured on the basis of cocoon weight into following grades and corresponding rates:

Grade	Shell weight	Rate per thousand
A	1.8 gm and above	Rs. 1015.00
B	1.50 gm to 1.79 gm	Rs. 910.00
C	1.20 gm to 1.49 gm	Rs. 765.00
D*	0.90 gm to 1.19 gm	Rs. 605.00

*Not considered as seed cocoons

Result and Discussion:

Tasar silkworm rearing: The performance of rearing for 2005-06 and 2006-07 are presented in table 1 which reveals that the productivity of cocoons per dfl is slightly higher in first crop in both the villages during 2005-06. However, in 2006-07, the yield is more particularly in village Bansajhal in the second crop as well as compared to 2005-06 second crop. The dfls consumption increased per beneficiary during the second year in both the villages. The rearing period recorded in both the villages is nearly same in both years. The improvement in yield in the second year (2006-07) can be attributed to the experience gained as well as the involvement of the beneficiaries in the activity. The yield in the first crop which is taken during July-August is generally lower than the second crop during October-November, which is due to the effect of abiotic factors prevailing during monsoon (Sen and Jolly, 1967, Chatterjee *et al.* 2007). This is the first successful achievement introducing tasar culture in the Biosphere Reserve. Earlier, the tasar culture has been reported in Simlipal Biosphere Reserve (Nayak, 1999).

Table 1. Tasar silkworm rearing in AABR

Year	Village	Crop	No./ beneficiaries	No./dfls brushed	No./ days involved	No./ cocoons per dfls
2005-06	Bansajhal	1st	10	1500	37	42
		2nd	10	1500	42	41
	Tendua	1st	05	500	37	43
2006-07	Bansajhal	1st	10	1500	36	38
		2nd	10	2000	43	84
	Tendua	1st	05	1000	36	45

Cocoon production and income generation through tasar culture:

Perusal of the table 2 reveals that during 2005-06 the cocoon production in first crop in both the villages was 63530 at Bansajhal and 21250 at Tendua. Accordingly, the income earned was Rs. 46059.00 at Bansajhal and Rs.15375.00 at Tendua. In the corresponding crop in 2006-07, the production at Bansajhal was 56300 and in Tendua, it was 45153. The income earned was Rs. 41380.00 at Bansajhal and Rs. 33029.00 at Tendua.

The second crop was carried out only in Bansajhal in both 2005-06 and 2006-07. The cocoon production in 2005-06 was 61,475 whereas it was 1,68,400 in 2006-07. Correspondingly the income earned was Rs. 46,215.00 in 2005-06 and Rs. 1,38,166.00 in 2006-07. The profitability and sustainability of tasar culture in the villages Bansajhal and Tendua is higher than previously estimated by Naik (1999) and Singh & Sinha (2000).

Table 2. Tasar cocoon production and income at AABR

Year	Village	Crop	No. cocoon produced		Cost of cocoon (Rs.)		Total (Rs.)	No of Cocoon in Grade (%)			
			Seed	Non seed	Seed	Non seed		A	B	C	D
2005-06	Bansajhal	1st	60000	3530	45600.00	1059.00	46059.00	-	-	60000 (100)	3530
		2nd	56750	4725	44794.00	1417.00	46215.00	4650 (8.19)	1500 (2.64)	50600 (89.16)	4725
	Tendua	1st	20000	1250	15200.00	375.00	15375.00	-	-	20000 (100)	1250
2006-07	Bansajhal	1st	51000	5300	39790.00	1590.00	41380.00	1400 (2.74)	3000 (5.88)	46600 (91.3)	5300
		2nd	159400	8600	135586.00	2580.00	138166.00	30000 (18.82)	60000 (37.64)	69400 (43.53)	8600
	Tendua	1st	40653	4500	31709.00	1320.00	33029.00	1000 (2.45)	1709 (4.20)	38000 (93.30)	4400

Table 3. Income generation per beneficiary at AABR

Year	Village	Crop	Income per beneficiary (Rs.)	Income per day (Rs.)
2005-06	Bansajhal	1st	4665.90	126.10
		2nd	4621.50	110.00
	Tendua	1st	3115.00	84.18
2006-07	Bansajhal	1st	4138.00	115.00
		2nd	13816.60	321.30
	Tendua	1st	6605.80	188.49

Income per beneficiary during first crop was Rs. 3115.00 to Rs. 4665.90 in the 2005-06 and Rs. 4138.00 to Rs. 6606.00 in 2006-07(Table 3). Whereas, in the second crop it was Rs. 4621.00 during 2005-06 and Rs.13816.60 during 2006-07. Earning improved in 2006-07 over 2005-06 which can be attributed to better quality of cocoons produced. More cocoons were placed under Grade A & B during second crop 2006-07 compared to 2005-06.

Impact on containing rural migration:

Table 3 indicated that the average per day per beneficiary income from tasar silkworm rearing ranged between Rs. 84.18 to Rs. 321.30 depending upon the season, consumption of tasar seed, increased rearing efficiency and capacity. This may be considered quite remunerative as compared to average return from other activities in these areas. Due to lack of enough agriculture work the peasants mostly remain idle and migrate in search of work. This base line study has indicated that migration of landless families living in the buffer zone of AABR is a serious problem especially during January to March and again August to October. Tasar culture proved effective to minimize migration of rural people by providing them employment opportunity during stress periods.

Therefore, tasar culture provides livelihood in biosphere reserve as an economic development model and checks rural migration. Singh *et al.* (2007) suggested that tasar culture is best suited for poor landless families as compared to other activities. It is estimated that tasar culture can provide about 110 days employment especially during the stress period.

Positive impact of tasar culture on Achanakmar – Amarkantak biosphere reserve:

1) No migration of adopted landless beneficiaries during 2005-06 and 2006-07. As a consequence of economic development exploitation by money lenders and middlemen also reduced.
2) Apart from checking felling of trees the activity also helped to enrich the forest as a consequence of man and nature interaction.
3) Cutting branches and leaves of *T. tomentosa* stopped in these adopted villages.

4) Encouraged by the success achieved by the adopted beneficiaries more than 20 other families enrolled for tasar culture activities in coming years.

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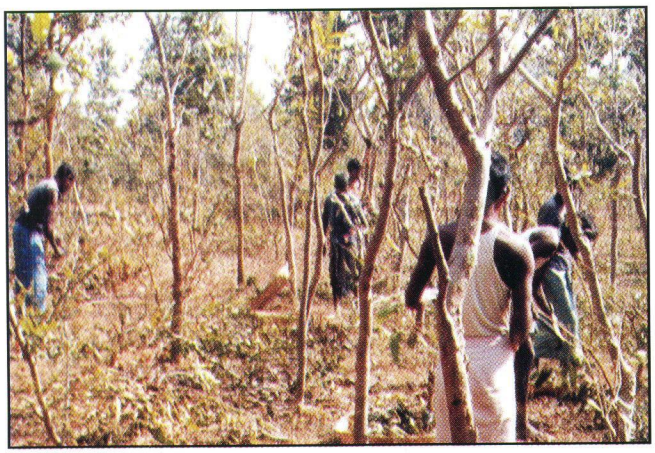
(1)

(2)

(3)

Photographs No. 1, 2, 3 showing Tasar Silkworm (5th stage larvae) Rearing & No. 4 showing cocoon formation



4. Photographs showing cocoon harvesting activities of forest dweller of Achanakmar - Amarkantak biosphere reserve