

# **SUSTAINABILITY OF TASAR CULTURE IN RESPECT OF CLIMATE CHANGE**

**By**

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**ABSTRACT**

Tasar host plant *Terminalia arjuna*, *Terminalia tomentosa*, *Shorea robusta* were widely found in the tropical and temperate zone specially Bihar, Jharkhand, Odisha, Chhattisgarh, West Bengal and Andhra Pradesh. There were four varieties of tasar silk moth viz; *Antheraea mylitta*, *A. pernyi*, *A. proylei* and *A. roylei*. In this study all three varieties of host plant and four varieties of silk moth species of *Antheraea* were selected to study the impact of climate change. Climate change influence the wide number of deterioration of tasar culture host plant of all varieties of Arjuna. In this investigation reported shows change of temperature, humidity and rainfall combination is not in proper manner. Due to those climatic factors nature of duration of reproduction of the tasar silk moth becomes either more or less. Hence, the conservation of naturally grown tropical tasar food plants along with silk insect will contributes for the bio-diversity maintenance besides their sustainable utilization by forest dwelling aboriginals. It is complete fact due to the deforestation and climate change fast loss of species of terminalia and other host plants in the entire region as per my survey.

Key words: Termanalia, tasar, climate, aboriginal, temperate zone, tropical zone.

## INTRODUCTION

Tasar culture is a forest based industry uniquely suited to the economy and social structure of the developing countries because of its minimum investment requirement and high employment potential for tribal and rural people. So, In the present review an attempt was made to present the various aspects involved in tasar culture for forest development and the government schemes for the sustainable development of tribal people through tasar rearing. Plantation of tasar host plants and rearing of tasar silkworms should be considered as forestry activities since tasar silk is one of the important non-timber forest produce, which not only provides sustenance to the tribal population and aboriginals through generation of employment and income but also facilitates

Rearing of Tropical tasar silk worm, *A. mylitta* is practiced in the central and southern plateau region in the humid dense forest area covering the states of Bihar, Jharkand, Chhattisgarh, Madhya Pradesh, Orissa, West Bengal extending to Uttar Pradesh, Andhra Pradesh and Maharashtra. It is estimated that 11.16 million hectares of forest trees constitute the primary and secondary food plants of tasar silk worm. 80% of the tasar flora is covered by *Shorea robusta* and the rest is covered by *Terminalia* species and other host trees. Only 5% of the tasar food plants in India are put to use for tasar rearing (Singh and Mishra, 2003).

The wild tasar-biodiversity of India is facing unparallel threat of extinction from their natural habitat due to environmental degradation, climate change and other related issues. The alarming decline in various ecoraces natural multiplication is attributed due to rampant collection, rapid deforestation and industrialization of their natural habitats (Sinha and Sinha, 1994; Nayak et al., 2000; Hansda et al., 2008). Further, the conservation focus and timely attention has not been given to smaller species like wild insects of high commercial importance (Wilson, 1987) which led to rapid dwindling of natural population even in their core habitats.

In the present era, the very survival of mankind on earth is challenged by the fast depletion of forest, which cause ecological imbalance, global warming, drought, flood and green house effect and it is a matter of great concern for the whole world. As such biodiversity conservation including that of the endangered flora and fauna is the need of the hour. Plantation of tasar host trees and rearing of tasar silkworms should be considered as forestry activities since tasar silk is one of the important non-timber forest produce, which not only provides sustenance to the tribal population and aboriginals through generation of employment and income but also facilitates sustainable utilization of forest resources. Tasar culture is the main source of income for many tribal communities in India. Around 3,000 tasar rearers, mostly tribals, are dependent on the industry.

The North Eastern region of India comprising of seven states viz., Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura constitutes nearly one fourth of the country's forest resources as a whole. Introduction of a sericigenous insect, *A. proylei* on Oak specially on the leaves of *Quercus serrata* in the Eastern Himalayan wet and temperate forest has added a new dimensions in the development of an agro based industry in the country in general, and in the North Eastern and North Western states, in particular. It has given a new vista in moulding the economy of the weaker section of the society (Jolly et al., 1970; Singh, 2003).

The tasar culture provides livelihood and employment for 1.5 lakh tribals from Jharkhand, Chhattisgarh, Orissa, Madhya Pradesh, Uttar Pradesh, West Bengal, Bihar, Maharashtra and Andhra Pradesh states. The practice involves chain of activities like collection of cocoons from nature or rearing of silkworm on nature grown host plants or on economic plantations to rise

cocoons, which are utilized by reelers and weavers to produce yarn and fabrics. The silk industry has lot of socio-cultural and traditional linkages in India and plays a vital role on rural economy and hence, the aboriginals are practicing tasarculture simultaneously with agriculture (Thangavelu, 2002; Reddy, 2009).

The tasar wild insect needs conservation both under short and long term measures and on and off their habitat for the sustainable utility and socio-economic up-liftment of rural tribals (Srivastava *et al.*, 2009). The economic values, employment potential and global demand in general and bio-diversity conservation in particular (Mahapatra, 2009) have motivated the conservation of tasar insect wildlife which found rapidly depleting and getting endangered with the following methods.

Although, India's stands second largest silk producer in the World after China, it accounts for only 5% of silk market and the production potential of tasar silk can be enhanced, which is unique of the country and grow very little in rest of the wild.

## **MATERIAL AND METHODOLOGY**

The study were conducted at wildy tasar zone of district Chaibasa at Jharkhand. There was one species of *Antheraea* selected viz: *A. mylitta* and three different host plant *Terminalia tomentosa*, *Terminalia arjuna* and *Shorea robusta* in two consecutive year 2011-13. During the research we investigated the no. of egg laying of 100 healthy male cocoons and 100 healthy female cocoons of Daba eco-races of species of *A. mylitta* on different host plants collected from the Central Tasar Research and Training Institute, Ranchi stored as a seed crop. Entire investigation carried out in complete rearing season during the year 2011-13 on optimum standard physico-chemical parameter viz: 70-80% RH, 8-10hrs Photoperiod and 22-26° c temperature under five cropping season viz: Sept- Oct, Oct-Nov, Nov-Dec, Dec-Jan and Jan-Feb, so that clear impact of climate change were identified.

## **RESULT & DISCUSSION**

During the investigation period of two years 2011-13, on the basis of different parameter like Relative humidity, Photoperiod, temperature; we observed the number of egg laying of Daba ecoraces of *Antheraea mylitta* in different rearing season (Sept- Oct, Oct-Nov, Nov-Dec, Dec-Jan and Jan-Feb ) on different host plants *Terminalia arjuna*, *Terminalia tomentosa* and *Shorea robusta*. We observed no. of egg laying is higher on host plant *Shorea robusta* in rearing season Nov-Dec, Dec-Jan. *Shorea robusta* is widely distributed all over the area but there is a decline in other host plant due to the drastic change in environment and climate condition, which also affect the tasar culture. Kar et al., 2000 reported that the voltinism (uni/bi/tri) in *A. mylitta* is regulated by environmental factors like temperature, relative humidity, day length and rainfall. Some have reported that voltinism pattern is found to be stable for a particular zone can change in different environmental conditions. Mahapatra (2009) studied the tropical tasar silkworm, *Antheraea mylitta* feeds primarily on sal (*Shorea robusta*), asan (*Terminalia tomentosa*) and arjun (*Terminalia arjuna*). Hence, the conservation of naturally grown tropical tasar food plants along with silk insect will contributes for the bio-diversity maintenance besides their sustainable utilization by forest dwelling aboriginals. It is complete fact due to the deforestation and climate

change fast loss of terminalia and other host plants in the entire region as per our study. The number of egg laying during the Sep-oct and Oct-Nov are maximum on all host plants but on the species of the host plants Terminalia are lesser than the *Shorea robusta*. It is due to unavailability of the medium leaves of the Terminalia host plant are less and for the survival of the optimum nutritional leaf of egg laying moth having lacking during the rearing period.

**Table showing Number of Egg laying in different cropping period on different host plant during 2011-12 & 2012-13.**

Rearing season	No. of Egg laying (2011-12)			No. of Egg laying (2012-13)		
	<i>Terminalia arjuna</i> (100X100 moth)	<i>Terminalia tomentosa</i> (100X100 moth)	<i>Shorea robusta</i> (100X100 moth)	<i>Terminalia arjuna</i> (100X100 moth)	<i>Terminalia tomentosa</i> (100X100 moth)	<i>Shorea robusta</i> (100X100 moth)
<b>Sept- Oct</b>	301	291	305	331	305	395
<b>Oct-Nov</b>	250	235	258	243	229	253
<b>Nov-Dec</b>	309	295	330	327	336	348
<b>Dec-Jan</b>	312	305	340	295	309	331
<b>Jan-Feb</b>	246	237	251	234	245	257

## CONCLUSION

Tasar culture is a forest-based industry, which remained as an integral part of tribal economy in many states of India, employing lakhs of poor/ tribal people who have no other vocation. They are associated with it either in collection of nature grown cocoons or rearing of silkworm on forest trees. Tribes have strong spiritual, cultural and socio economic affinity to the forest and to the wild silk moth farming. The natural forest is well protected where wild silk moth farming is practiced. The pruned branches of the host plants are used as firewood, which suppress the need for illegal felling of trees for fire wood purpose, a practice common in the country sides.

The destruction of natural habitats, over exploitation, induction of alien species, control of related pests and predators, pollution besides, deforestation are the main reasons for the diminution of tasar insect wild life. On realization, that the erosion of biodiversity may threaten the very existence of life, has awakened man to take steps to safeguard it. The promotion of Indian tropical tasar (vanya) silk as green occupied a unique market status and a source of cash income for many rural tribal communities. Also, the wild tasar ecoraces are very important for evolution and breeding of new silkworm strains with desired economic characters.

## ACKNOWLEDGEMENT

I am highly thankful to P.G.Department of Zoology, A.N.College, Patna for providing laboratory facilities to execute this research work successfully.

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