

Impact of Commercialisation on Tribal Culture and Forest Ecosystem Sustainability

* Dr. B.P. Chandramohan, ** Mr.T.K.S. Villalan, *** Mr.J. Munirathanam

Commercial opportunities for tribal communities as a result of decentralisation and democratisation have a deeper impact on tribal culture. The current initiatives of development and the subsequent commercialisation affect biodiversity and environmental values of forest and eventually disappears valuable forest ecosystem. The market pressure linked with cultural aspects of tribal people and ultimately the strength of the ecosystem. The present study is based on the Malayali Tribe of the Jawadhu Hills of the Eastern Ghats located at the Tamil Nadu state of South India.

The aim of the paper is to improve our understanding on the issues relevant to the commercialisation influencing the tribal culture and the forest eco-system of the Jawadhu Hills. In order to achieve this objective the paper has the following research questions.

1. What are the interactions between commercialisation and community and household welfare?
2. What are the interactions between commercialisation and forest eco-systems?

Malayali Tribe

There is no unique opinion about the origin of the Malayali tribe. Evidences regarding the movement of Malayali tribal to the Jawadhu Hills were from Kanchipuram during the Pallava period. The myths connected to the migration of Malayali tribe into Jawadhu Hills have been described by Thurston (1909). Actually these were the descriptions of some of the hereditary leaders like '*Pattakaran*' *Sathi Koundan*, and *Kangani*. According to Thurston the word Malayali means the inhabitants of hills.

The history of Jawadhu Hills reveals that inhabitants were dated back to the period of late Stone Age. The excavated records and the archaeological evidences by the archaeological survey of India described that some of the tribal caves belonged to the Neolithic period estimated to be 4000 years old. It clearly shows that Jawadhu Hills had the history of tribal life while witnessing the polished stones, the axes and other hunting materials. Iron Age seems to be the beginning of tribal agriculture of shifting cultivation type. It gradually shrunk the availability of forest land in the valleys of Jawadhu Hills.

* Reader, Department of Economics, Presidency College (Autonomous), Chennai – 5, (India).

** Selection Grade Lecturer, Department of Economics, Pachaiyappa's College (Autonomous), Chennai -30 (India).

*** Selection Grade Lecturer, Department of Commerce, Presidency College (Autonomous), Chennai -5, (India).



Tribal Cave in Neolithic Period

Thurston does not treat Malayalis as tribes like *Thodas* of Nilagiris. This is because of the fact that Malayalis are Tamil speaking tribe unlike *Thodas* and *Badugas*. Moreover many of the Tribal qualities were absent in Malayalis. They call themselves as people of hills (Malaivazhum Makkal) and not as original people (Pazhangudi Makkal). The government of India recognised Malayalis as Scheduled Tribes due to their socio-economic backwardness.

Prior to Malayalis, hunters were the predominant groups in Jawadhu Hills. The period prior to Malayalis could have been pristine eco-systems in which the hunters were essentially the primitive group of hunter-gatherers. The Malayali tribe invaded the areas of hunters and settled in Jawadhu Hills which started changing the eco-systems of the forest. The possession of the forest land by the tribal households differs. It ranges from less than 1 acre to the maximum of 10 acres (one acre = 100 cents).

Jawadhu Hills

Jawadhu Hills is located in the Thiruvannamalai District of Tamil Nadu state. Jawadhu Hills have a length of 45 kms and a maximum width of about 40 kms. It is a part of the Eastern Ghats of India. The centre and south of Jawadhu Hills consist of extensive undulating plateau with large valleys ranging between 500 mtrs and 800 mtrs. *Kambhangudi Malai* is the highest peak in Jawadhu Hills having more than 3500 feet height. Jawadhu Hills consists of steep rocky and precipitate soils. The climate is favourable to the growth of sandalwood trees. The total population of Jawadhu hills is over 45000 as per the 2001 census of India. The marketable produces of the Jawadhu Hills are sandalwood, Bamboos, firewood, Tanbark, Gallnut and Tamarind. Tamarind is the important Non Timber Forest Products (NTFP).

The inaccessibility of the Jawadhu Hills is prevented by better transportation facilities. The forest roots are linked with the tribal locations by long foot paths ranging upto 15 km. At the foot hills and in the valleys, the vegetative cover is very poor due to the frequent intervention of the local

population. There were Bamboos in the east and west slopes. It was observed that Malayalis were regularly travelling between their dwelling and *Jamunamaruthur and Alangayam* in Tiruvannamalai District. The selling of forest produces take place in the *Jamnamaruthur* weekly market. They regularly visit temples in the plains. Malayalis worship sacred groves and their beliefs have helped to protect good tree cover. Rituals on big scale are conducted periodically to the gods. The important deities are Kali, Murugan and Amman.



Religious Procession of Malayali Tribe

The studies of Ehrenfels (1943) describe the food habits of Malayalis tribe. The food habits of them since subsistence economy reflect their agricultural pattern. Minor millets, raagi, maize and corn are the important varieties of grains to the people of Jawadhu Hills for their food. At present the consumption pattern of the Malayalis has been gradually shifted to include rice and wheat. There has been a sharp reduction in the cultivation and consumption of traditional food items. The influence of modern agriculture and cash crops has been brought to compromise the consumption pattern in favour of high yielding food crops.

Basically Malayali tribe is an agricultural community which gradually shifted from the subsistence agriculture to commercial agriculture. The transition represents the change in eco-system. It is justified by the reduction of the forest area in the total geographical area. The elder Malayali household members indicated that a movement towards outside forests was more complex and they never went outside the forest for buying food items. But the people admit that they go down to sell their produces and to buy vital items to the market in every Monday. They added that increasing population pressure forced them to find food grains from the market.

Non-timber Forest Products

A NTFP literally means every natural resource from the forest except timber. The hunter gathering tribes and the settled agriculture tribes totally depend on the forest for their livelihood and their way of life is no way harm the sustainability of the forest. However, their property rights, harvesting

practices and management strategies largely decide the sustainability of forest eco-system.

Forests feature predominantly in tribal development because they depend on a wide variety of plants, animals for their own use and for sale. Forest products have commercial markets and generate substantial revenues. In the search for development, forests provide a flow of valuable products. If people's life is to be improved in an environment friendly way, it should be without being subject to the destructive way of harvesting. Commercialisation culture of tribal helps to understand the relationship between forest products, poverty reduction and sustainable forests.

The degree of relationship between the contributions of forest products to the household economy measured in terms of the ratio of total cash and in-kind income and the degree to which tribal households are integrated into the cash economy. In subsistence oriented tribal households, more than half of the cash income comes from selling forest products. They tend to be located in relatively remote areas with abundant forests and limited transportation infrastructure. The land which they cultivate is licensed land; ensure the rights of sales only to a tribal and access to other forest resources is open. They supplement their agricultural income with gathering or extracting NTFPs. Off-farm activities help make ends meet the return often find insufficient to lift tribal households out of poverty. In the Jawadhu Hills range, these tribal households tend to invest very little effort in cultivation and rely on NTFPs which has been declining as a result of overexploitation, inefficient management and loss of habitat.

Important non-timber forest product of Jawadhu Hills

Local Name	Botanical Name
Tamarind	Tamarindus indica
Nellikai	Phyllanthus emblica
Yettikottai	Strychnos mix-vomica
Avaram bark	Cassia auriculata
Konnai bark	Cassia siamea
Kadukkai	Terminali chebula
Pungan	Pongamia glabra
Tagarai	Cassia siamia
Mani Pungan	Sapindus emarginata
Seekai	Acacia sinuta
Woodapple	Feronia elephantum
Elandai	Zizyphus maurtiana
Kilakkai	Carissa carandas
Setha	Anona squamosa
Thuringimaramn	Alibizzia amara
Alingimaram	Alangium lamarckii
Arasamaram	Ficus religiosa
Veppalaimaram	Wrightia tomentasa
Kattu elumichai	Atalantia monophylla
Sundakai	Solanum trilobatum

Malayali tribe generally extract NTFPs in times of the year in which income from cultivation or from other sources is low. The labour requirements

for extracting for NTFPs is relatively high when compared to agriculture or off-farm labour. They do the job when labour requirements for agriculture are low. NTFPs are more important to the low income tribal people. But poverty alleviation requires increased trade of NTFPs results in an increase in income. Change in the tribal culture induced by commercialisation cause resource depletion. Tenure security need not necessarily lead to sustainable harvest of NTFPs but it may change the attitude for conservation. Moreover, people do not necessarily prioritise long-term availability of resource for their future economic security.

The plight of the tribal people to a large extent depends on the historical resources and tenure claims for their survival. The livelihood of the tribal depends in different degrees upon on access to forest resources. Much of their uses are to meet the subsistence needs but the cultural survival of the tribal depends on the production and marketing of NTFPs.

Tribal Agriculture

The best among the *patta* land of Malayali Tribe is used for paddy cultivation. The rotten leaves and branches brought from forest areas act as manure. In order to protect the crops from cattle, they made up fence of poles and dried wood. The paddy cultivation lost its significance due to the availability of ration rice from the public distribution system. Earlier paddy cultivation is meant for the domestic requirements. Paddy cultivation is not a good commercial proposition due to the high transportation cost of taking the paddy to the market. The important commercial crops of Malayalis are Ragi, Bajra and Maize. Jawadhu Hills receive less amount of rainfall when compared to the Western Ghats hence; these less water intensive items are cultivated. It is also noticed that some of the fields of the tribal are connected to electric pumpsets for irrigation.



Electrified Pumpset in a Tribal Habitate

The introduction of tar roads, public transportation system and state sponsored public distribution system has a major impact in the agricultural

pattern. It is surprised to note that almost all the tribal households in Jawadhu Hills are connected to electricity.

Tribal Women

The common feature is that tribal women are the NTFP processors, using rudimentary technology and returns to labour are significantly low. The processing work is often carried out near their residence. In Jawadhu Hills the extraction of various medicinal nuts and tamarind processing is labour intensive and conducted by women. Women do the processing work at home which does not disturb other domestic activities. Malayali Tribe take wage employment opportunities within and outside the forest. Various social and cultural constraints prevent women from travelling to the town and taking employment. Generally women collect firewood, leaves, nuts and seeds, besides rearing cattle's. Another important feature is that women often do not have control over the income generated. Men have full control over the proceeds from forests. Evidences from the commercialisation of NTFPs, the socio-economic and political conditions of women harmed.



Processing of Tamarind

Commercialisation

Commercialisation of forest flora and fauna is a recent phenomenon. Owing to the market demand many Malayali Tribe in Jawadhu Hills harvest non-timber forest products of commercial values. The involvement of middlemen, traders and contractors from plains has further accelerated the commercialisation process of forest resources. This has led to the introduction of cash economics in the life of Malayalis and it is gradually substituting traditional self-sufficient subsistence pattern of the tribal household economy.

The modern tribal people get more than 50 per cent of their cash income from off-farm activities. Owing to modernization and the thirst of consumerism modern tribal people make relatively large trade in mature markets yield higher income. The size of tribal household income depends on property rights, size of land, accessibility to markets and the opportunity costs of labour. Modern tribal enjoy better transportation facilities and other physical infrastructure such as communication and electricity. There is a tendency

among them to overexploit forest products. In this situation forestry is generally the default option.

The areas located nearer to the market, definite tenure rights for land, less requirement of labour for cultivation and by using labour readily available at low periods in the agricultural cycle tended to have higher incomes. Trade in many of the NTFPs has developed only recently. It has proportionately increased with the availability of new products in the market. The gathering of the forest products from the wild is associated with subsistence oriented livelihood strategies. Gathering from wild does not always mean gathering from an undisturbed natural forest. Sustainable forests naturally regenerate resources in order to improve the quality of life of the tribal people.

Commercialisation is an effort of tribal households for socio-economic and political empowerment. The question of ownership of land and control of access to NTFPs determine the extent of poverty and wealth distribution among them. The issues of ownership and control of resources form the central to socio-political studies of commercialisation. Women play an important role in the harvesting, processing of the NTFPs, while men do the job of marketing. The examination of land tenure reflects commercialisation.

What the tribal feel a block in their economic empowerment is the difficulties of getting their goods to the market and to receive fair prices for their products. In Jawadhu Hills, Malayali Tribe has two forms of access rights. They enjoy the benefits of both private property resources where they cultivate and being the member of the village forest council they enjoy the benefits of non-timber forest products. Individual tribal households have private rights to specific land surrounding their dwellings. The NTFPs on forest land are common property which are protected and harvested jointly by the tribal households.

The areas of Malayali Tribe have cultural and economic values. Recent developments of hill road construction upto Jamunamarudhur from Polur, Thiruppathur, Vaniyambadi and Ambur have increased the commercial importance of Jawadhu Hills.

Medicinal Plants

The tribal knowledge of medicinal use of plants is still an unexploited area. In the 1780s an employee of the British East India Company convinced botanists in England to establish a network of naturalists in India reporting to the Kew Garden (British Imperial Institute), (Grove 1995).

A majority of NTFPs in Jawadhu Hills is for medicinal use. The genesis of Indian native medicines of Ayurveda and Sidha can be traced to what called ethno medicines is practiced by the tribal communities. It is observed that the tribal knowledge of medicine is either on the verge of extinction or being destroyed. At present tribal depend more on trained doctors of town which give them immediate relief from pain. It is reported that forest herbs and leaves are the best medicines for immunity, fertility, abortion, asthma etc.

Market

Tribes are considered to be the most economically impoverished community of India. The net income contributed by Malayali Tribe showed an inverse relationship between percentage of income derived from NTFPs and total household income. The poor tribal households of interior forest relatively depend on economic support from NTFPs collection. The poor tribal

households engage in NTFPs extraction in the absence of alternative income sources. The poor households with surplus labour and low opportunity cost accept less paid wage employment. Some of the tribal households undertake intensive forest agriculture. The output per unit of land is higher than non-forest agriculture but the income per hectare of land in forest is lower than that in non-forest areas depending on the distance of the land from the market. Some of the tribal households in Jawadhu Hills hire ass to transport their agricultural produces to the market. The transportation cost accounts for a substantial portion of the revenue from the sales.

Most of the people interviewed highlighted a fixed life based on agriculture. They engage in extractivism in cases of urgent financial necessity such as basic necessity of food was the reason for financial necessity. But at present in the list of necessities many more items are included. The number of items included in the consumption basket persuades them to find alternative income earning sources. Some of the tribal households sell their labour outside the forest even at a long distance. It indicates that tribal no longer depend forest for improving their livelihood but search for opportunities that give better opportunity cost. It indicates that the dependence of tribal on the forest decreases with the percentage of educated members in the family and income from other vocations. The interviews highlighted the preference of the tribal for vocations rather than the forest dependence. The tribal people who have greater dependence on the forest did not improve their living standards significantly. In a situation of rising commercial values, the tribal people can be subject to exploitation. There are some tribal households complained that some of them were the victims of theft cases even if they are innocent.

In the areas where communication and transportation facilities are poor, the costs of transportation to the market are high. The trading of NTFPs reflects the prevailing social, economic and geographical considerations of tribal people. In some households producers themselves act as traders and in other cases middlemen visit their dwellings to procure the NTFPs produced by the tribal households. But in majority of the cases, middlemen are accused of exploiting producers and their excessive profit share leaving the producers a paltry sum. Certainly the middleman or traders have the advantage of the weak bargaining power of the producers. The tribal people sell the same NTFPs of the same quality at different prices in different locations of the forest.

The tribal households are exploited while selling their forest produces and labour. They sell their agricultural produces to the Jamunamaruthur market on every Monday. The traders come to the market from outside who act uniquely to procure these products at a lesser price. For some of the NTFPs, the price difference between the local forest market and the main market is more than 10 times. The tribal population sells their labour for various construction activities in the forest areas. The contractors get full wages from the forest department but pay them only a fraction. This results in entering a relationship between money lenders and poor people. This has implications for commercialisation because once the produces consumed by the tribal households sold in the market in order to pay the debts. The role of middleman is blamed an important reason for the poverty of tribal in Jawadhu Hills.

It is noted that the profit margins of the middlemen can be over emphasised because of the reasons that they bear high transportation costs, financial risks and unpredictable market. The middlemen therefore try to shift the burden on the tribe who are ignorant about the outward market. The tribal also face uncertain market for their NTFP because local trader come to the market only when the agricultural produces of the tribal are very cheap when compared to the other markets. The monopoly control of the traders acting under a cartel makes producers powerless to capture good returns for their producers.

The village forest council is a step towards reducing the control of the middlemen in order to get a greater share of benefit to the tribal households. But it is reported that the tribal people receive a little as 10 to 40 percentages of the sale price as a return to the forest council which will be circulated among the tribal households (village forest council members).

Village Forest Council

In Jawadhu Hills, Village Forest council is the popular strategy to harvest NTFPs from State Forest reserves. The very objective of the council is to integrate local tribal community NTFPs. Jawadhu Hills witness participatory forest management with focus on NTFPs. The village forest council is an alternative management strategy to solve the problems of degradation of forests and growing conflict between forest dependent tribal communities and the forest staff. Many of the villages of tribal households in Jawadhu Hills come under the control of the Panchayat administration. Despite the situation where official management of forest use lay outside village control, they did create the village forest council to manage and protect their legally designated Panchayat forest. Through management in the village forest council, the tribal households participate in forest protection in return for NTFPs, employment and net cash benefits from rotation of sales. It is noted that some tribal households are not members of village forest council, because they don't have time to participate in the council at the cost of their agriculture. Therefore relatively rich and interior tribal households are found less as members in village forest council.

Tenure system provides the rules and regulations to harvest forest resources, including ownership and corresponding rights. The defining characteristic of extractive reserves is a specialised tenure arrangement between the state and the tribal. Extractive reserves are forest areas inhabited by tribal population granted long term rights to forest resources which they collectively manage (Joint Forest Council). The extractive reserves are state owned where the rights of forest are allocated only to the tribal people. This arrangement is viewed attractive because it appears socially just form of forest land use for promoting socio-economic development of tribal and environmental conservation. The basic principle of this exercise is the sustained extraction of renewable commercial forest products by traditional resident population or indigenous or tribal population. There is socio-economic and conservation implications of tenure arrangement.

Tribal Culture

Perceptions of modern lifestyle make forest based activities less attractive. Regional development changes the culture of tribal people. New roads alternative sources of wage income, government policies protecting the interests of tribal make forests less attractive. The Malayali Tribe fast shift

from natural resources based activities of forestry to wage employment in the secondary and tertiary sectors. Perceptions of modernity make such possibilities highly attractive especially for younger generations. The introduction of 35 kgs of free rice per tribal household per month, 1 per cent reservation of educational and job opportunities in government sector and the efforts of tribal welfare societies in Jawadhu Hills transform agriculture and harvesting of NTFPs less remunerative. Moreover, the younger and educated tribal people consider these productions as backwards. The Malayali Tribe of Jawadhu Hills shows mass migration of younger people in different metropolitan cities such as Bangalore, Chennai and Poona. They look forward new ways to make a living comparable to their brethrens in other parts of the country. This change made ageing labour force in tribal agriculture in forests.

The younger generation of the Malayali is in the transitional stage of tribal culture while the old generation feels a mysterious bond between man and other animals and a symbiotic relationship with the cattle. The tribal ethics of forest sprang among the fundamental facts of their existence. The tribal dependent on the fertility of the forest areas are basically to meet their agricultural needs. They use the edibles among the wild fruits, leaves and roots besides honey. Majority of the forest depending tribal in Jawadhu Hills build their houses with bamboos, forest leaves and hay. Majority of these are substituted by concrete houses at present.



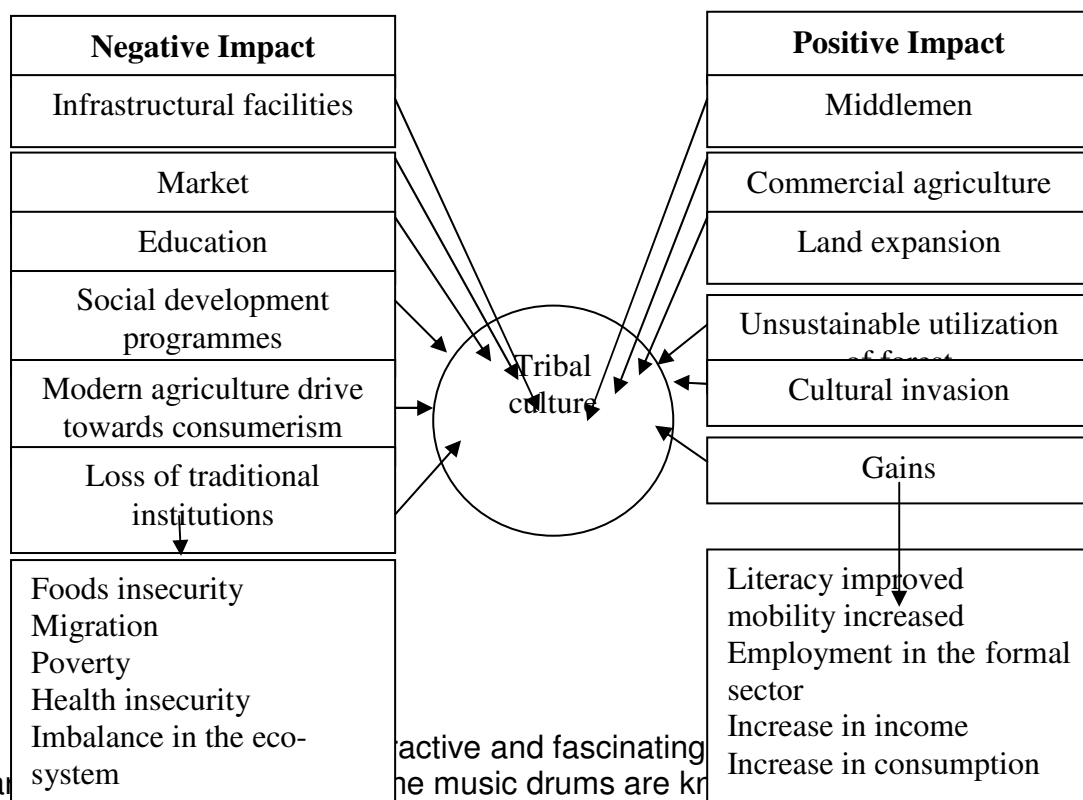
Kiln for Constructing Modern House

Expansion of agricultural activities, grazing activities and the social activities like worshipping deities into the tribal habitats have forced Malayali tribal into the interior forest. Intensive commercialisation forced many of the male members to work as manual labourers in the agricultural fields of the plains, wage labourers in the forest department and the migrant labourers outside the forest. The degradation of forest further accelerated the push factors and the extension of activities such as commercial gathering and fuel collection.

The younger generation of Malayali Tribal of Jawadhu hills has been forced to discard the traditional way of life and they started adapting to the changing situations. The important consequence of the high degree of commercialisation leads to ultimate destruction of tribal life and their culture. With a disappearance of the important tribal culture, practical understanding of ecological relationship between the society and the environment is disturbed. The loss of ecological knowledge among these ecosystem people of the Jawadhu Hills area is one of the serious issues of concern.

The tribal superstitions like worshipping live trees for happy life could enforce or atleast support ecological considerations through without full realisation of the significance. It is superior to the value system compared to what we see in the present times. The sacred groves have the philosophy of appearing the nature that survive today even in Jawadhu Hills. The unsustainable harvesting of forest was considered as a taboo for fear of antagonising the rules of deities represented by various aspects of nature.

The Malayali tribal practice settled agriculture; permits intensive cropping by the use chemical fertilizers is an adaptation of the human society to meet the modern amenities of life. The process of cultural change has become complex under the gradually increase interaction with the more developed caste society. Better transportation facilities between forest market and the outer towns change the culture of the younger generation.



at
metame ornaments are important for their deities. It is a paradox that the modern society has to learn many things from tribal, the tribal living in forest to copy the lifestyles of urban which are not basically conservation oriented. To a tribal, forest is the source of all good things. In the traditional tribal culture, the community leader decides the pattern of cropping, time of sowing, hunting and other social and economic activities.

With the commercialisation of the tribal culture these largely dictated by the market. The emergency of government institutions, politics and associations helped the younger generations to enter into the formal sector using the positive discrimination allowed for the Scheduled Tribe by the government of India.

Ecosystem Sustainability

The link between forest ecology and commercialisation can be viewed with special reference to market, institutional and ecological concern was the creation of new markets and expansion of existing market in the forest area. Jammunamarudhur and Alankayam are the two growing markets within the forest area of Jawadhu Hills. It accelerates over harvesting and resource depletion. These NTFPs are coming to the market and an increasing speed. It is observed that there is a poor overall regeneration while extraction is higher. The NTFPs species face greater deficit because regeneration is affected by collection of seeds and fruits from NTRP species.

The problem of overharvesting, especially firewood occurs with rapidly rising commercial value. There is no mechanism to give incentives for tribal to conserve these resources for long-term use. The weakness of institutions customary or government is another factor causing adverse effects of commercial extraction induce tribal households to lax their customary rules and less concerned with the long –run sustainability rather than short-run benefit. Conditions of open access often prevail. The hunting and trapping often exceeds sustainable forest rates. Hunting is often not meant for domestic consumption but for commercial exploitation. Some senior tribal people accepted a drastic disappearance of many animals in the Jawadhu Hills in the past ten years.



Deforestation in a Tribal Village

Development activities instead of assimilating have alienated tribal communities. Development of road facilities in Jawadhu Hills accelerated commercialisation and the dependence of Malayalis outside the forest for income generation disrupted the traditional tribal production techniques and

they have been deprived of the forest and forest produce. The assimilation and integration of tribal communities with the rest of the society does not take place due to the feelings of insecurity and absence of freedom, quality and mutual respects.

In Jawadhu Hills the species richness of tropical forest eco-system is in the brink of extinction and the forest eco-system is warned of the perils of deforestation. Jamunamarudhur, an important location in the Jawadhu Hills, is known for the precious sandalwood which spread fragrance is one of the fast vanishing species due to the effects of human activities on the functioning of eco-system. The linked threats of modernisation on deforestation and species extinction became primary concerns.

Some argued that the extraction of non-timber forest resources by the tribal may lead to biotic impoverishment (Nepstad, D.C., Brown, I.F., Luz, L., Alechandre, A and Viana, V. 1992). It may be due to over harvesting, reduced populations of dispersal agents through hunting, low germination rates, dependence on large openings and burning beneath adult trees. But it is felt that extractors are the beneficiaries of forest resources hence they have in incentive to maintain the resources. The biotic impoverishment will continue within extractive reserves as long as cattle are viewed as the main investment of surplus income. But the extractive model based on village forest council is appreciated because of its economic viability, environmental conservation and social equity.

The Jawadhu Hills also face the problem of significant amount of timber and non-timber forest products illegal commercial extraction. Tribal claims that illegal extraction often coincides with a breakdown of authorities without replacing them with effective authorities. The survivals of effective and honest foresters have to face problems from co-workers and illegal fellers. In India under state ownership, the conditions of the forests deteriorated and tribal communities and other forest dwellers had no interest in conservation without management rights or ownership (Pachauri, R. 1990).

The growing market demand for certain forest products can lead to an increase in natural resource crime and associated phenomena of violence and corruption. Sandalwood is the costly timber used for the manufacture of medicine, cosmetic products and costly furniture which often subject to the category of natural resource crime leading to negative ecological and economic outcomes.

In Jawadhu Hills, the high price of super quality sandal wood was the prime reason for the change of the resource base over time. Rising prices do lead to increase in harvesting through illegal sandalwood harvesting. If the returns from the extraction are lesser than the marginal cost of illegal harvesting, this precludes botanical extinction. It is reported that till 2000 there were superior quality sandalwood in the Jammunamarthur area of Jawadhu Hills and at present the species is almost in the stage of extinction. It is the best example of rising prices leading to increased extraction for a particular species and rapid depletion in spite of the complexity of ecological changes. The rarity of sandalwood related to the low population number of this finest variety could lead to depletion or extinction and therefore lower biodiversity. Results of the study oppose to the view of Edwards (1996) that rising prices will not lead to increased harvesting and possibility of exhaustion.

Forest management is essential to promote economic development by maintaining and even increasing production while maintaining or improving ecological conditions. The way of life of Malayali Tribe is customary management of forest. The practices are founded on acquiring flora and fauna sustainably for generations living in forest.

Conclusion

The results of the present study reveal the ecological effects of commercialisation of forest products and the constraints of sustainable extraction due to the change in the tribal culture. Research findings indicate that the biological properties of many tropical species face the stage of extinction. The transaction of tribal culture from substance agriculture to commercial exploitation has higher risk on forest ecosystem sustainability. High biodiversity forest inhibits commercial exploitation if tribal culture remains static. The change in tribal culture with limited biodiversity, high population densities and clustered distribution of tribal dwellings make commercial exploitation of forest simple. No longer has the younger tribal population depended on forest for their livelihood but they tasted opportunities outside the forest. It is difficult to objectively measure the degree of commercialisation on tribal culture and ecosystem sustainability, because of the complex linkage between commercialisation and change in tribal culture and ecosystem sustainability.

REFERENCES

- Edwards, D.M. 1996, Non-timber Forest Products from Nepal: Aspects of the Trade in Medicinal and Automatic Plants, FORESC Monograph 1/96. Ministry of Forest and survey Centre, Babar Mahal, Kathmandu, Nepal.
- Ehrenfels O.R.B. 1943, Traces of a Matricuchial cwilization among the killi Malayalis, Journal of the Royal Asiatic society of Bengal, Vol. IX, 29-82.
- Grove, R. 1995, Green Imperialism: Colonial Expansion, Tropical Island Edens and the Origins of Environmentalism, 1600-1860, Cambridge University Press, Cambridge.
- Nepstad, D.C., Brown, I.F., Luz, L., Alechandre, A and Viana, V. 1992, 'Biotic Impoverishment of Amazonian Forest by Rubber Tappers, Loggers and Cattle Ranchers, In: Nepstad, D.C and Schwartzman, S. (eds.), Non-timber Products from Tropical Forest: Evaluation of Conservation and Development Strategy, 1-14. The New York Botanical Garden, Bronx, New York.
- Pachauri, R. 1990, Sal Plate Processing and Marketing in West Bengal, Sustainable management, Working Paper, 12, Ford Foundation, New Delhi, India.
- Thurston E 1909, Caste and Tribes of South Indian, Vol.IV, Government Press, Madras.