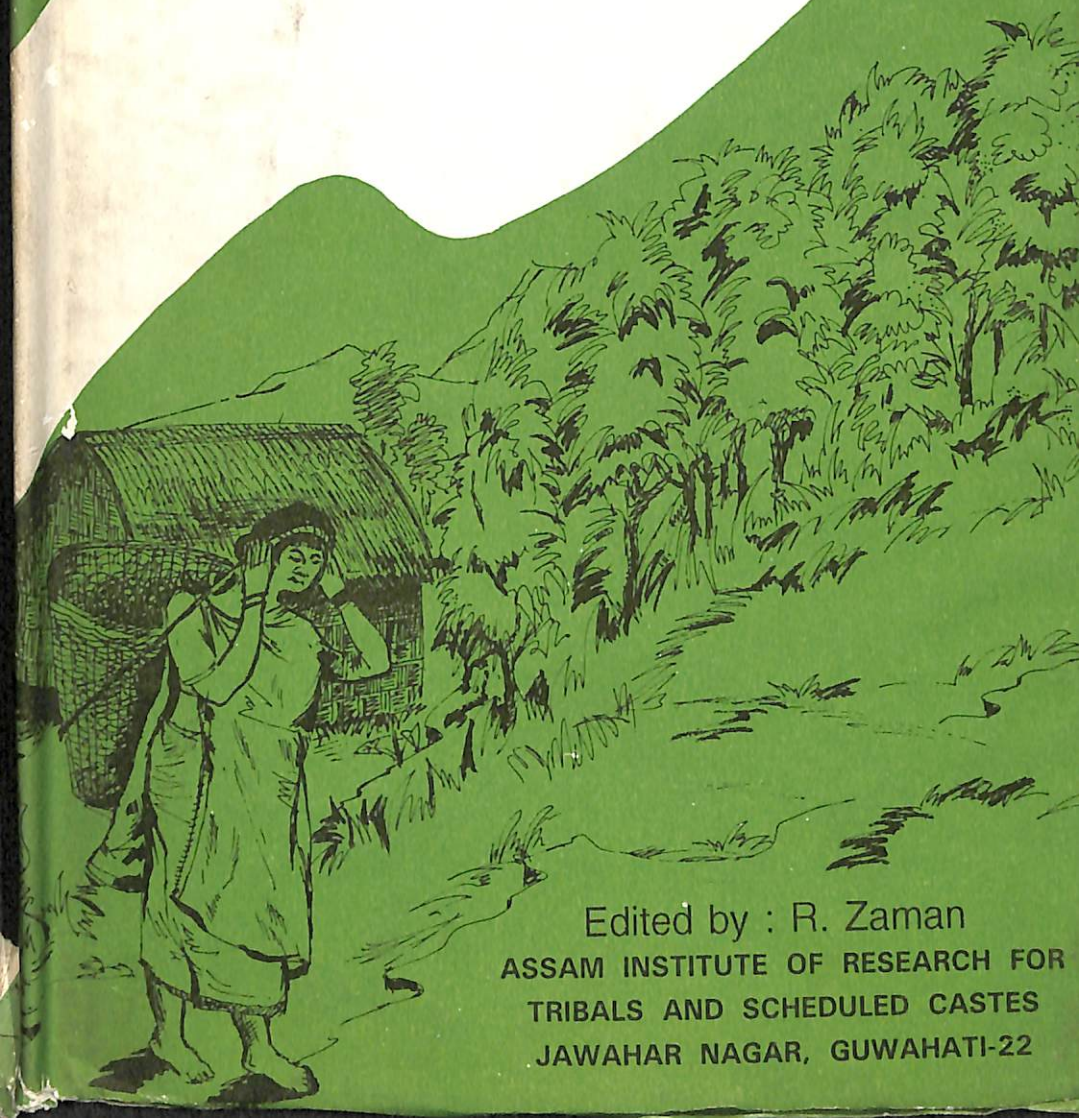


**FOREST RESOURCES-  
IN HILL DISTRICTS OF  
ASSAM- CONSTRAINTS  
FOR DEVELOPMENT.**



Edited by : R. Zaman  
ASSAM INSTITUTE OF RESEARCH FOR  
TRIBALS AND SCHEDULED CASTES  
JAWAHAR NAGAR, GUWAHATI-22

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## PREFACE

The Assam Institute of Research for Tribals and Scheduled Castes, Guwahati, had organised one seminar on "Forest Resources of Hill Districts of Assam- Constraints for Development" on 12th & 13th December, 1996 in the Institute campus. Altogether seven papers were presented. The first paper was presented by Shri Promod Goswami on "Forest Management in some foreign countries and learning points for India". Sri Goswami had been working Food and Agricultural Organisation for nearly 15 years. His experience was widely appreciated in the seminar. The second paper was presented by Dr. G.C. Sharma Thakur on "Forest Human Interface and understanding common property resource use". Dr. Sharma Thakur is the retired Director of this Institute. Dr. Sharma Thakur conducted many studies while he was in service. The paper was also appreciated in the seminar. The third paper on "An outline of a work plan for people oriented management of nature and natural resources in the two hill districts of Assam" was presented by Shri D.P. Neog, Retd. Principal Conservator of Forests who has wide experience in the Forest Department. His paper was welcomed by the participants. The next paper was presented by R. Zaman on "Gender Issues in Forestry". The topic is highly interesting and since it was gender related, it evoked lot of interest in the seminar. The last three papers were presented by research scientists from ICAR, Shillong. Shri S.N. Goswami from ICAR presented the paper on "Levels of Income under shifting Cultivation and its effect on natural resources". Shri K.A. Singh, R.N. Prasad and U. Sharma jointly presented a paper on "Watershed Based Farming Systems for North Eastern Hills Region". The last paper was presented by Shri S.K. Dhyani on "Work plan for Organising Forest Resources in Hill Districts of Assam- an out-



line". These technical papers were very nicely presented by the research scientists of ICAR.

The seminar was attended by many people including Professors from Gauhati University. In order to finalise the recommendations of the seminar, a Committee was constituted under the Chairmanship of P. C. Goswami. The other members were :

1. Prof. B.M. Das, Retd. Professor, Gauhati University,
2. Mr. K.A. Singh, Sr. Scientist, ICAR,
3. Mr. D.P. Neog, Retd. Principal Chief Conservator of Forests

The recommendations have been finalised and the same has been incorporated in the book now printed out for wide circulation.

I hope this book will be received by the readers with great pleasure. We are looking forward for comments and suggestions in this regard.

I am thankful to the faculty members and staff of the Institute and also to the participants in the seminar. Special thanks are also offered to the scholars who presented papers in the seminar. I also thank M/S. Bohniman Printers, Guwahati for their help and co-operation in bringing out the book.

**Dated : 2-1-98**

**R. Zaman**

Director

Assam Institute of Research for  
Tribals & Scheduled Castes,  
Guwahati-22

## FOREST MANAGEMENT IN SOME FOREIGN COUNTRIES

### LEARNING FROM INDIA

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# FOREST MANAGEMENT IN SOME FOREIGN COUNTRIES AND LEARNING POINTS FOR INDIA

Pramod Goswami

## INTRODUCTION :

Towards the end of the second world war, the then government of India launched a scheme for restoring the ravages caused to the country's forestry due to overexploitation for meeting the needs of the war. In fact, the government undertook the task of all-round accelerated development of the country-industrialisation, higher technical education, public health, scientific research etc. under this scheme, known as the post-war Reconstruction Scheme, highly qualified young men were sent to the United Kingdom and the United States for higher education or specialised training. I was selected under this scheme to study Advanced Forestry in the Edinburgh University which gave the highest forestry degree in U.K. on completion of a 3 years course. For practical training the Final Year students were taken to France and Belgium-visits to Germany being still restricted-as the forests of these countries were under scientific management for about 150 years by then. After obtaining my degree from the Edinburgh University I secured a Fellowship from the United State Government, for specializing in Soil Conservation and Watershed Management under its In-service Training Scheme for Foreign students. This specialization period of about four and half years in U.K. and U.S.A., gave me opportunity to acquaint myself intimately with forest management practices in highly developed countries of the west.

My experience in forestry in the developing countries, besides several states of India, was gathered during the years of my service with the B.A.O. of the United Nations for about 11 years in Indonesia, Bangladesh (Asia) Nigeria, Sierra Lonr, Ghana (West Africa), Jamaica, Trinidad and Tobago and Grenada (West Indies). The people of these countries were different and so also the forestry and land-use issues. Some major learning points for



India from these countries both Developed and Developing are mentioned here.

Points from Developed Countries.

Percentage of Forest Areas. The total forest areas in terms of the total land area of some selected industrialised countries are as below terms of Percentage of the total land area of some selected industrialised countries are as follows.

United Kingdom	6.1
France	19.9
Germany	26.8
Netherlands	7.7
Finland	70.9
Canada	37.8
USA (excluding Alaska)	32.8

All these countries are highly industrialised and their economics are the most advanced giving the population in the highest living standard in today's world. None of these countries have any set goal as to how much of land area what percentage of the total land area of the countries should remain under forests. The percentage of land under forests in these countries is the result of total population level of industrialization on suitability of land for profitable agriculture on sustained basis and many other interacting and complex factors. While the quantum of the need of the population for forest produce is of importance, it is not a criterion or determinant of the area under forest cover. These countries fulfil their needs for timber and other forest produce by import and manufactured substitutes. The policy in these countries is to preserve and maintain whatever forest land exists in scientific manner for their economic benefits and impact on environment. The Indian Forest policy on the otherhand lays down that also the total land area of the country should be under forest cover. There is no scientific or economic basis for this target. Regetation of this target year after year ignoring the fact that it is well high impossible to attain it -an increase of nearly 10%-merely less the urgency of the important need of maintaining the existing forest areas without causing degradation and over-exploitation. Individuals priority and policy emphasis should be not to allow further diversion of forest land to other purpose and manage the existing forests on scientific principles keeping the need of the vicinity population

in view.

II. Functional classifications of forests and management authority.

The Forest policy of India classifies the forests of country according to their primary functions etc. (a) Catchment Forests for maintenance of watersheds for prevailing soil erosion and maintaining stream flow, (b) Production forests for meeting needs of timbers and other forest produce for the population of the nation and industries, defence, communications etc. (c) Village forests for meeting the requirements of the village communities in the vicinities of forests. Although forestry is a concurrent subject, all forests are under the control and management of state Governments. Private ownerships of forests have been abolished in India after independence. In the developed countries of the west there are large areas of forests under private ownerships these are excellently managed on scientific lines taking advice from Govt. agencies. In the U.S.A. ownership and management authority of all state forests lie with both the Federal Government and the state Governments the forests of national importance both for maintenance of ecology and meeting needs of forest produce for the nation being maintained by the Federal Govt. and the rest by the state Governments. The private ownerships are confined to industrial forests such as paper and pulp making companies and forest estates of private citizens.

Forestry in India is a concurrent subject under the Constitution control and management of forests lie with the Central Govt. and the State Govt. jointly. However, Central Govt. does not do anything in the matter either in financial terms or in management spheres. Forests will be better preserved and the functions of the various types of forests will be better fulfilled if the following types of control and management are evolved and adopted.

1. Catchment forests to be controlled and managed directly by the Central Govt. No commercial exploitation of such forests are to be undertaken, nor clear felling ever to be permitted; only natural regeneration is to be undertaken.
- (ii) Commercial forests to be managed by the State Government following management plans jointly prepared by the Central and the State Government.
- (iii) Village forests and unclassified state forests to be managed



by Panchayats and District Councils taking technical assistance from the State Government.

Permission from the Ministry of Forests and Environment of the Government of India is required if more than ten hectares of Reserved Forests are to be diverted for other purpose such as construction of roads, railways hydro-electric projects, industrial enterprises etc. It is because of this very desirable regulatory measures that want on diversion of forest lands for other purpose has been discouraged even though sometimes inordinate delay in development project implementations does take place.

In this context the transfer of the Reserved Forests to the District Councils for management and exploitation is a retrograde step in the national interest. From the time of creation of the Reserved Forests the local people, tribal or non-tribal have not been bestowed with any rights in these forests; if earlier any community or individual had any right, those were abolished after giving due compensation either in cash or allowing such rights to be exercised on adjoining lands.

A year and half ago, when at the Arunachal Assam border forest check-gate, a gang of poachers were detected carrying a large number of musk-deer pods, some 20 in numbers brought from Arunachal forests killing this almost extinct species of deer found only in very high altitude in Arunachal Pradesh, Sikkim and Kashmir in India and in Nepal in small numbers. It comes down to lower altitudes to graze during winter. It is a fully protected species under the Indian Wildlife Protection Act. A group of tribal leaders represented to the Union Minister for forests and environment who was then in Itanagar Representing against this seizure of the musk pods stating that tribals always enjoyed unrestricted hunting in the forests. It is correct that the tribals had un-restricted rights of hunting in the forests but not with modern weapons, but only with bow and arrows which posed no danger of extinction of any species. It also needs to be unstilled in every citizen of the country that some traditional rights have to be regulated or surrendered for the good of the Nation. No citizen is allowed in any country to do whatever he likes, some individual or community rights have to be regulated for the sake of the country and society as a whole.

(iii) Industrial Forests :

Ambitious plans have been prepared since last one decade or so for afforestation of the waste lands, the degraded marginal lands and barren areas within demarcated forests under which several million hectares were to be planted with trees. This has not materialised. Funds spent on afforestation of large hectare also have been wasted as the works were carried out per functionally with an eye for fulfilling targets and often without following attending operations.

The country is facing shortage of industrial woods for pulp, plywood, and timbers for cabinet works. If industrial houses, paper mills etc. are encouraged to improve degraded forests or afforestation waste-lands with suitable soils the country can kill two birds with one stone-meet the requirement of industrial/wood and restore ecological balance. At the time of leasing the land for afforestation, the most important conditions to be imposed is non-alienation of the land for any other purpose and to any other person or bodies. Financial Institutions should be partners in this endeavour by providing easy loans. In the Northern States of U.S.A., where along with the Western States, most of the forests are, about 50% of the forests are owned privately-mostly by large companies, though the role of small owners including professionally trained foresters is also significant. These forests are so well managed that forestry employment has doubled in only two decades and forestry officers of these companies now are invariably taken in Boards of the Companies so that they can guide the companies in managing the forests on sustained yield basis. One third of the all sawn timber of the United States come from the two States Washington and Oregon where however nearly 40% of the forest ownership is in private hands. These company forests are exceedingly well managed employing professional foresters-their industrial enterprizes make more profits.

### LESSONS FOR INDIA FROM DEVELOPING COUNTRIES

The people, their culture, the land-use patterns literacy and public health levels and in many other respects the developing countries differ vastly from one another or one regional group of countries from another such group elsewhere. In agriculture, forestry, watershed management, soil conservation, agro-forestry and other allied discipline, India is considered as the leading Nation amongst the Third World countries. The Food and Agriculture



Organisation of the United Nations employs a considerable number of experts from India to run development projects and transfer technology all over the developing world while this is so, it is also true that we generally find some approaches to forestry, agriculture, land-use, extension activities etc. which have relevance to India and offer learning points for U.S.

Indonesia is very fantastic country-geographically, culturally, religiously and in many other respects. It consists of 3000 islands and many more which are uninhabited and too small to include in standard maps. The country extends from latitude 95 East just below to our Nicobar Island to Australia and New Guinea in the east at longitude 132 East. Obviously its population and climatic diversity is very great. It is the second largest Muslim country but it is not an Islamic country, as we were told by officials assisting US in our project activities. Government offices do not close on Fridays but do so on Sundays. Hinduism was the religion on the country in ancient times. The important island of Bali is still largely Hinduism. All ancient monuments depicting Hindu deities are carefully maintained and proudly exhibited. The famous dance dramas of Bali portrays the Ramayana secularism in Indonesia is not an ideal but a living reality. This is certainly important learning point for India.

There are many active volcanoes in Indonesia soils in many islands are derived from recent lava and new alluvium and hence very fertile. Major crops are rice, on terraces on slopes-maize, black-pepper, coffee, oil palm, tobacco tea rubber and sugar cane. Since we are training to introduce terrace cultivation and plantation crops in our hill districts, we have many things to learn from the Indonesian farmers and the plantation states who are industrious and unlike here, not dependent on government subsidy so heavily.

The hardworking nature of the Bangladeshi cultivators is well known in Assam. But what appeared amazing even to an Assamese expert when working in Bangladesh in an Asian Development Bank team, is the fact that large tracts of paddy field where paddy ready for harvesting stood, were in mere three days time replanted most successfully making field bonds and excess water-out lets etc. with latest IRI varieties of high yielding short duration rice. The Bangladeshi cultivators do not keena square meter of land follow even for a day. Bangladesh have freed itself from colonial and

later Pakistani domination through rebellion, have readily discarded the colonial rules and producers framing new ones in conformity with the objective of achieving rapid development of the country. Status and Salary of all the civil services of the country are now at par; when any delegation goes abroad, the senior most officer, whether he is a doctor, a forester, an agriculturist, an engineer or an administrative officer, becomes the leader of the delegation of the team. In India it is always a generalist who is the boss of the Department. Thus views of technical personnel are often stifled, resulting in mis-conception and mismanagement of many development projects in our country.

The Caribbean countries, the island nations of Central America, though tiny in size each have different problems because of their colonial history under the British or the French or the Spanish. Jamaica is the largest of English speaking islands and closest to the U.S. It grows the world best coffee, the Blue Mountain Coffee in large estates and small family gardens. But as the Jamaicans can and do easily migrate to Canada or USA to work in factories and in household jobs, the plantation are neglected for want of labour. The Jamaicans of course do return to their country when old, because of sentiments to die in their motherland. A package of agro-forestry practices were successfully tried by the UNDP project in the 80's to keep the population in the country by providing year round and remunerative employment based on agro-forestry principles. This was found to halt the migration of the youth to America in search of livelihood. The coffee grow in N.C. Hills, Mahur in particular, have been certified by the India Coffee Board to be of very high quantity. Caution is necessary in expanding a monocultural activity to avoid only part time employment. The agro-forestry approach, which created what is known as food forestry in the West Indies, has not yet been tried extensively in our remote hilly regions like N.C. Hills of Mizoram.

Grenada is a small island of volcanic origin. Its soil is very suitable for cultivation of nutmeg and clover it is known as the spice-island of the world. These two crops are able to offer handsome income as co-operatives deliver inputs fertilisers, pesticides, small implements at the farm gate in time and purchases the produce all round the year without creating hussels. This enables



even small farmers having only a few nutmeg trees in the compound, to earn handsome income to supplement earnings from other activities.

Trinidad and Tobago, the twin-island country is now a very prosperous nation offer the discovery of oil in the sixties. The population is roughly 45% of Indian origin 45% of African origin and rest of mixed French and Spanish origin. Earlier its economy dependent on coffee and cocoa estates where the African-origin people were employed and sugarcane plantations where people of Indian origin, the descendents of Indian indentured labour, earned their living. Alteration to agriculture and plantation crops have again been revived because of very low oil price. Now the Indian origin people have taken to vegetable, fruits and sugarcane cultivation whereas the Negroes working plantations owned by the wealthy planters. Because of great care and attention to given to all aspects of operations, both the plantation crops and the fruits and vegetable crops have again become lucrative. Fertilizers, and pesticides, used are un-adulterated, imported from Europe and USA, inputs are timely available. Agricultural implements both small and large are of superior quality imported mostly from U.K.- thus requiring less time and energy than what is used in India. Transport facilities both for inputs and marketing are excellent, produce are usually taken from farm-gate. Because of high income from the petroleum industry, prices of farm produce are high and attractive.

In our country, specially in the North-East, it has become difficult to obtain un-adulterated pesticides or fertilisers. Spread of malaria once again is believed mainly due to adulterated insecticide rather than emergence of insecticide resistant mosouitoes. In 1995, farmers all over the country were unable to get any Urea, because as it has now been revealed, the entire 330 crore rupees paid in advance by the then Govt. to some dubious foreign company without getting a grain of urea, was allegedly mis-appropriated by the family of the then P.M. of India. The new Prime Minister has been lecturing to the country that poverty alleviation and improving the lot of these below the poverty are priorities of his Govt. With such rampant corruption in India today, neither adoption of improved technologies from abroad or sathering of "Learning Points", will alleviate poverty or improve the lot of farmers; such as uterances and assertions will remain mere talking points only.

## FOREST HUMAN INTERFACE AND UNDERSTANDING COMMON PROPERTY RESOURCE USE

Dr. G.C. Sharma Thakur

The symbiotic relation between forest and human beings has its origin from man's existance in this world in million years ago. From the hunting and food gathering stage to the present hi-fi sophisticated human civilisation forests have played a significant role although mode of utilisation of forest resources has undergone vast changes over the centuries. Human civilisation originated in forests and forest products including animals living in the forests sustained the people throughout the ages. Without forests, green pastures, animals which are part and parcel of forests, there will be no human race. Forest (firewood) is essential in the three vital phases (Janma-i.e., birth, Mrityu-death, and Bibah i.e. marriage) of the Hindu social life. The new born baby needs fire to warm up, marriage without Homa ceremony is incomplete and at the end of life's journey firewood plays the ultimate role. Considering these intrinsic value of fire, men are protecting and preserving the forests for their interests. Environmentalists preserve forests for ecobalance. Thus men and forests have maintained a mutul dependence and co-existence.

What is a forest ? The laymen's definition can be summarised in a word jungle ('Janghal, Habi, Bananchal' in Assamese) which means a large uninhabited area of land with wild trees, shrubs, marshy land and wild animals. Any vegetation under a systematic management is defined, as forest. Prof. P.K. Bhowmik, quoted Sareiya's definition of forest as " an area set aside for the production or maintain under woody vegetation for certain indirect benefits which it provides e.g., climatic or protective.

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Rtd. Director, Assam Institute of Research for Tribals and Scheduled castes, presently Member, Assam Backward Classes Commission and project Consultant, Assam Institute of Research for Tribals and Scheduled Castes, Guwahati-22.



Forests provide both direct and indirect benefits to mankind. In appreciation of the benevolent role of the forests, there appear good many verses in the Hindu religious texts such as the Puranas which bear significance even in this late twentieth century. The Matshya Purana comments: "Dahotaa Kunwaa Khandaa Etaa Pukhuri Khandaar Samaan, Dahota Pukhuri Khandaa Etaa Sarobar Khandaar Samaan, Dahotaa Sarobar Khandaa Ejana Dharmik PutraJanma Diyaar Samaan, Kintu Dahotaa Dharmik Putra Janma Daa Jane, Punyar Katha, Ejopaa Gas Roa Tene Punyar Katha.

(Meaning-Digging of ten wells is equivalent to digging of one tank, digging of ten tank is equivalent to digging of one lake, digging of ten lake is equal to giving birth to a pious son but giving birth to ten pious is equal to planting a tree.)

There are other Sanskrit Verses which also praise the role of forests. A 'sloka' in the Hitopodesha states as follows:

'Tyagah EK Gunah Slaaghyah

Kim Anya Gunah Raashivih;

Tyaagat Jagati Pujjyante

Pasu, Paasnah, Paadapaa'

(Meaning-One Supreme quality i.e., sacrifice surpasses all other qualities. People all over the world offer oblations to animals, stones and trees because of the sacrifice they have made for welfare of human beings).

The interdependence of forests and men has suffered a great deal when men started senseless cutting of trees for their immediate gains. Modern science based culture, industrial expansion, population explosion and change of mode of living put heavy pressure on the forests and thousand hectares of forests land have been indiscriminately cut to meet requirements of men. In India during the last decade 91710 sq. km. i.e., 2.79% of the forests have been cut. That is per minute destruction of forests comes to 2500 hectares. Forests occupy an area of 74.87 million hectares which is about 22.77% of the total geographical area of the country. As early as 1952 the National Forest Policy laid down that the area under forests should be 33 1/2 percent of the total area. This destruction of forests has led to acute power shortage not only in India but also in other parts of the world. Forests have contributed large quantity of timbers for various uses in the nation building process but of late this items are in short supply because of shrinkage of the forests. The Report submitted by the National

Agricultural Commission 2 indicates the shortage of timbers the other forest products during the period 1980 to 2000. Following table shows the production, demand and shortage of timbers and other forest product from 1980 to 2000.

**TABLE -1**

Year	Production	Demand	Shortage
1980	10.24 m.c.m.	26.89 m.c.m.	19.65 m.c.m.
1985	10.64 m.c.m.	35.18 m.c.m.	24.54 m.c.m.
2000	11.82 m.c.m.	64.45 m.c.m.	52.63 m.c.m.

The serious shortage of forest produce has affected the people, particularly the rural and tribal people who use firewood for their cooking. The National Commission on Agriculture has highlighted this position in its reports. It was found that the demand for firewood in 1980 was 184.00 m.c.m. which increased to 202.00 m.c.m. in 1985 and the same will be further increased to 225.m.c.m. in 2000. While demand for firewood increases along the growth of population, the production decreases as more and more encroachment on forest land takes place. The report also points out that due to non availability of adequate firewood many tribal families and rural people in various parts of India are resorting to use of cowdung as fuel and every year an estimated 20 million tons of cowdung is burnt for day to day cooking. As a result, the people are using less cowdung in the agricultural fields and naturally output becomes less.

The increased pressure on forests has adverse effect on the ecological balance. A very alarming situation may arise if the balance is further escalated. The animal world will be badly affected. Already some species of animals and birds are on the verge of extinction in some parts of eastern India.

The depletion of forests has socio-cultural implication. History is replete with examples as to how social values, norms, traditional beliefs and practices have undergone metamorphic changes due to change of life pattern from food gathering/hunting stage to agricultural economy. Some of the tribal communities are still resorting to shifting cultivation which is considered as a wasteful method. The hill tribes of North East including those of Assam hill districts practise shifting cultivation. It is prevalent in other states of the Indian Union. In Orissa



it is called Podu, Dali, Koman, in Madhya Pradesh it is called Deppa. The Marias of M.P. call this type of cultivation as penda or Bewar. Prof. Bhowmik has opined, "It has been estimated that about 26 lakhs of people practise shifting cultivation in various states and union territories like Arunachal Pradesh, Andhra Pradesh, Tamilnadu, Maharashtra, Karnataka and Kerala comprising an area of 14 lakh acres with varying crop pattern."<sup>3</sup>

Forests and tribals are inseparable identities. Forests not only provide shelter to the tribes but these are the sources of various food items like herbs, roots, creepers, honey, birds and animals, heyand fodder for cattle, house building materials etc. Forests keep the climate congenial for human beings and protects soil erosion. Certain trees are considered as totemic objects and those are taboo to that society. A good number of clan names are associated with trees. Again some of the forests are earmarked as burial or cremation ground which are considered as sacred places. The Oraons and the Mundas consider the 'Sarna' as the sacred grove. The Rabhas and the Tiwas construct the 'Than Ghars' (community worshipping centre) in deep jungles. Even in non tribal rural areas of Assam we very often come across a Pippal tree, the stem in the lower part of which is wrapped with deep red cloth. The Pippal tree is believed to be the abode of malevolent spirits. Marriage with tree (plantain tree/betelnut tree) is in vogue among some tribal and non tribal population of Assam, particularly on the occasion of first puberty ceremony of a girl. The Bihu Husori party requires a big tree inside a forest to give formal farewell to the Husori dance that was performed for seven days beginning first Bohag (14th April).

The socio-religious beliefs, folk ways, myths and legends of the tribal people are closely interlaced with the forests. The involvement of the tribal people with the forests is so deep and intimate that detachment of forests may cause serious adjustment situation leading to social unrest. The Lodhas of Bengal, a peace loving forest tribe turned into criminal tribe because of the territorial displacement from forest moorings. The Government acquisitioned their lands in the forest without proper rehabilitation programmes. The food gathering tribal people could not bear the shock and their latent criminal propensity got upperhand. Shifting cultivation has been practised by the hill tribes of the two hill districts of Assam since centuries back. The forefathers of the Karbis, Dimasas, Zemi Nagas, Kukis and other hill tribes could hardly think that there will be crisis of forests in the hills and their

progenies will be compelled to switch over to wet paddy cultivation where they donot possess any expertise. The District Councils in those districts therefore have not passed blanket rules to stop shifting cultivation. Tradition modern continuum policy has been adopted. The District Councils have allotted lands suitable for wet paddy cultivation but the people take resort to leasing the lands to non tribal immigrant settlers. The pile dwelling houses over the hill tops surrounded by forests have sentimental attachment and the people do not like to abandon the traditional style of living.

The Forest Policy of 1894 is one such piece of legal rule which went against forest tribal inter relationship. This had affected the forest management adversely. The Forest Policy of 1952 could not do much better, rather this Policy put more restrictions to the forest produce users. The Policy inter alia stated "village communities in the neighbourhood of a forest will naturally make greater use of its products for the satisfaction of their domestic and agricultural needs. Such use, however, should in no event be permitted, at the cost of the national interest."<sup>4</sup> Thus the 1952, Policy document contained certain antitribal rules. The Forest Policy of 1894 provided some relief to the tribal people but the new Policy of Independent India withdrew the permission to cultivate forest land hitherto practised by the tribal people. The tribals collect forest produce for their day to day consumption and collection provided much needed relief to the subsistence economy. Besides, this permission to use forest produce encouraged the tribal people to consider the forests as their saviour and naturally they adopted a very co-operative attitude towards the forest management. The 1952 Policy put restrictions even in this vital sphere of tribal economy. A gap was created between the forest officials and the forest labourers. The introduction of village forest scheme as envisaged in the new policy could hardly mitigate the need of poor tribals. Some tribal families maintained private forests and the old Policy kept these private forests outside the purview of the Policy. The new Policy brought these forests within its framework. Other restrictions were also imposed and as a result the forest dwellers could not rear cattle without paying some fee for the grass. Jhum system of cultivation was disfavoured as the system involves destruction of forests thereby disturbing the ecological balance. The shifting cultivators were to be motivated to switch over to wet paddy cultivation. Thus many rights and privileges enjoyed by the tribal people were converted into rights and concessions



Dr. B.D. Sharma has opined, "The enforcement of the Forest Conservation Act 1980 has created an unenviable situation. The tribal is deemed to be a trespasser and sought to be evicted summarily without even listening to what he has to say. Not only his pleas about a hapless situation he is finding himself in are ignored, even the rights which should have been deserved to accrue to him even in terms of the law, which is basically against his interests, remain uncared for and un-noticed."<sup>5</sup>

The Forest Policy of 1988,<sup>6</sup> however could, be called as a people's policy as the Policy laid down certain benevolent measures for tribal people. The role of the forest dwellers has been recognised as they are treated as protectors as well as beneficiaries of the forest produce. There was large scale encroachment without let and hindrance. The latest Policy decided to clear all encroachments from the reserved forests. The forest villagers have been deprived of their legitimate rights although it was due to their hard labour the reserved forests are flourishing as good revenue earners since 1904-05. The Assam Institute of Research for Tribals and Scheduled Castes had conducted an, indepth study on the socio-economic condition of the forest villagers of Assam in 1989.<sup>7</sup> The study covered 24 tribal forest villages out of 233 in 14 Forest Divisions. At present there are 524 forest villages within the jurisdiction of the reserved forests. Slightly more than 3% of the area under the reserved forests are in occupation of the forest villagers. The total population of the forest villages is 1,60,179 comprising of 20,694 families. Out of the total population, 47,11% belong to Scheduled tribe. These forest villages are governed under the rules for establishment of forest villages and overall provision of the Assam Forest Regulation, 1891. Because of this peculiar position, the forest villagers do not come under the purview of the Panchayat Raj Act or the Tribal Sub-Plan. They enjoy only usufructuary rights over their lands allotted under forest lease. The right of transfer and sale is not given although the authorities have agreed to the mutual transfer of originally allotted land to the sons after the death of the allottee. The Report stated that 4.26% of the families do not possess home stead lands and about 74% of the tribal families have been found to be below the poverty line and 11.7% of the families earn their livelihood by serving as day labourers.

The forest villages were established as early as 1901-02 and each villager was allotted 5 Bighas of land including home stead land.

Besides, each working member living in the household was entitled to receive 10 Bighas of land. The ceiling, however, was fixed at 35 Bighas per household on payment of nominal land revenue. In lieu of the facilities provided by the Forest Department, the forest villagers required to render 5 days free labour and 20 mandays paid labour in a year at the prevailing rate of wages. The villagers enjoyed other facilities in kind such as free grazing of cattle, 10 Nos. of cartload of firewood annually, house building materials like thatch, bamboo, Ikara, etc. free of royalty.

The forest villagers today do not have good terms with the Forest Department as they have been prohibited to collect forest produce at their sweet will. The villagers are required to apply to the concerned D.F.O., Range Forest Officer for their minimum needs. The Forest Department, on the other hand cannot be blamed for such action as the population of forest villagers increased manifold where as reserved forest areas are remaining static or diminishing due to encroachment which has posed a serious problems to the Forest Department. In most cases it is found that the land per family as shown in the official record, was allotted to a member of a household in decades back but the same lands are further divided among the sons. Besides, the yield per bigha is low due to various factors like flood, depredation by wild animals, old method of cultivation etc.

Development of the forest villagers was the sole responsibility of the Forest Department. At the initial stage i.e., till Independence, there was not much provision in the forest management. But when the Planning Process started the forest villagers felt neglected as the amount utilised for development of forest villagers was negligible. The villagers have been deprived of the Tribal Sub-Plan benefits. Only in 1984-85 a Forest Village Development Scheme was initiated only to be abandoned in the midway. But since 1990-91 annual plan provision has been made to provide infra-structural facilities to the forest villages. The allocation under T.S.P. (F. V.) during 1992-93 to 1995-96 amounts to Rs.2400.00 lakhs. The year-wise break-up is shown below:-

<u>Year</u>	<u>Allocation</u> (Rs. in lakh)
1992-93	55.00
1993-94	55.00
1994-95	60.00
1995-96	70.00



The forest Policy of Assam, 1988, can be considered as a landmark for the forest villagers, particularly tribal forest villagers because the Policy has announced certain facilities to the villagers hitherto refused by the previous policies. It has been decided to re-organise the lawful settlers with a view to giving allotment certificates akin to revenue pattas, conferring all rights excepting the right of alienation to the forest villagers which will the right of alienation to the forest villagers which will help them to obtain bank loan and other financial assistance. All effective measures will be taken to ensure that new encroachment in reserve forest land takes place and illegal felling of trees stopped. Rule 12 provides active participation of District Councils in all matters of forestry in the hill areas and also in matters of elimination of Jhum system in phases.

Issue of new licenses and lease to industries will be duly regulated so that the locals, particularly the tribal people are mostly benefitted.

In order to minimise the pressure on reserved forest Rule 18 provides for mini forests in community lands, scattered wastelands and institutional lands, so that the villagers become selfsufficient in fuel, fodders, thatch, grass, bamboos, medicinal plants etc.'

The new policy decision will therefore go a long way to remove the strained relation between the forest villagers and the forest authorities, thereby improving the forest human inter relationship which is the sine-quantum for successful management of the forests.

#### SUGGESTIONS :

1. The forest villagers should be brought under various development schemes under the T.S.P. so that more funds are available for integrated development. Necessary changes should be made in the Forest Manual and the Forest Reservation Act.
2. The lands of the forest villagers should be accepted for sanctioning loans from banks and other financial institutions.
3. Encroachment of reserved forest land is a big problem not only for the Forest Department but also for the original forest villagers. Encroachment should be stopped at all cost for the greater interest of the nation and human beings.
4. Illegal felling of trees should be checked. The forest villagers and the people of neighbouring villages should be taken into confidence in this regard.

5. Training should be imparted to the village youths so that they can function as second line of defence not only in checking illegal felling of trees encroachment of forest land and poaching, but also keeping a vigil in the activities of forest officials.
6. Government may consider formally adopting a policy decision accepting unequivocally the forest villagers as partners in the management and development of forestry resources, so that desired changes can be effected in the perceptions of the administration and of the people about forestry. In this way the conflict between the administration and the tribal people over the command over and access to the forest resources will be eliminated.

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## An Outline of a work plan for people Oriented Management of Nature and Natural Resources in the two Hills District of Assam.

**Sri D.P. Neog**, IFS (Retd)

Former Principal CCF  
Assam.

The Karbi Anglong Hills (10330 sq.km.) and the North Cachar Hills (4890 sq. km.) Districts of Assam together covers an area of 15,220 sq. km. and is bounded by the Hills of Nagaland and Manipur to the East, the Meghalaya Hills on the west, the Barak Valley on the South and the Brahmaputra Valley in the North. The only railway link and major road links passing through these two districts not only connects both the valleys of the State but also the North Eastern states of Nagaland, Manipur, Meghalaya, Mizoram and Tripura. These arterial links are very vital and formed the only internal communication links to the various parts of the districts till the sixties after which only the districts have been opened up by establishing road communications to cater the needs of the Hydel projects, H.P.C paper Mills, Cement Factories, and extraction of Coal etc.

The State of Assam itself being landlocked and connected to the main land through a fragile railway and road link, remained handicapped and industrially backward till now, The century old tea Oil Coal and Forest based industries had confronted with chronic problems in procurement of raw materials and marketing of finished products. The transport and other subsidy have not been of much relief. The two Hills Districts being inaccessible due to their geographical location and physiographical condition remained very much undeveloped industrially. The two Districts enjoy the same hot humid climate, rainfall and soil fertility as has been found in the plain District of the States. These have brought in profuse vegetation growth and its Forests were the treasure trove of nature with varied type of forests and precious Wildlife.

Conservation of ecology, soil and water in these two Hills

Districts are very vital as they form the water sheds of the North and South bound rivers to the valleys which are the major Catchment areas of many fast flowing, cascading rivulets and feeder tributaries of the great rivers Barhmaputra in the North and the Barak in the south, These rivers namely Kaliani, Nambor, Kalain, Jamuna, Dikharu, Kapili, Killing, Barpani, Deyang, Kalain, Jatinga, Jiri etc. are known for their destructive capabilities of heavy situation and flush flooding. Conservation and protection of their catchments, microcatchments of their feeders are very important not only to protect the limited crop fields and wet cultivation lands in the plateaus and slopes but also the plain Districts below. It is also an absolute necessity for the interest of the hydel projects taken up and to be taken up in future.

As per statistical Hand Book published by the Govt. of Assam there are 10,380 sq.km. in Karbi Anglong and 4050 sq.km., in N.C. Hills which are not included in the Reserved and proposed Reserved Forests and not the land used for cultivation, village establishment, and urban conglomerates. However as per records these are 6457 sq. km. of Reserved and proposed Reserved Forests, 1470 sq.km., of netcrop area leaving aside the 1930 numbers of inhabited villages (1450 in K.A. and 480 in N.C. Hills) and 6 Nos of small towns including the District H.Q. in Diphu and two Subdivisional HQ in Bokojan and Hamren in K.A. and 3 Nos of towns in N.C. Hills ( including the District HQ in Haflong and Subdivisional HQ in Maibong.) In addition there are considerable areas occupied and in use for infrastructural net work. Considering all these, it could be safely assumed that at least an area of 6500 sq. km. remains under the control of the communities as unclassified free land for the purpose of jhumming ( slash and burn method of cultivation ) and other community needs.

The Reserved and proposed R.F. which are land permanently dedicated to Forestry ( 6,457 sq. km., ) constitutes 42.4% of the total geographical area of 15,220 sq.km., As per National Forest Policy, it is necessary to have 60% of the Geographical area under forests in the Hills for meeting the needs for conservation as also of the Forest products in demand. Considering the physiography of the terrain, immature geography, rock and soil of the area, prevailing Jhumming practice in these Hills which also forms the catchment of numerous Hill streams and rivers and also being an



area of sensitive seismic activities the area under Forest here, should be much more than 60% In addition the spatial distribution of the Reserved and proposed R.F. are also not where they are most needed from the point of soil and water conservation. This has been due to the fact that forest Reserves were demarcated and constituted away from the habitation covering areas practically free from encumbrances arising out of century old privilege which transformed it in to an inalienable right. The people in the Hills have settled along the river banks for facility of communication and their water needs. All the villages in these two Hills districts have been classified as problem villages by the Government for drinking water supply. With increase in population the critical catchment areas are being gradually cleared for expanding the earlier settlements. For the purpose of effective conservation of environment soil and water it is necessary to protect the catchments, and micro-catchments by complete preservation of its natural vegetation, afforestation/ reforestation or any other suitable measure.

The population of the two Hills districts as per 1991 census, is 8,13,524 (K.A. 6.62, 723 and N.C. Hills 1,50,801 ) with a density of population per sq.km. at 64 Nos in K.A. Hills and 31 Nos N.C. Hills. The Urban population of Karbi Anglong is found to be only 70,466 ( 10.6% ) and of N.C. Hills is 34, 486 (22.9%) with the balance living in rural villages, 59,257 Nos in Karbi Anglong (89.4%) and 1,16,315 Nos ( 77.1% ) in N.C. Hills Both the Districts being flanked by the two valleys, the Brahmaputra valley ( population 1,91,1 Lakhs with density 339 person per sq.km.) in the North and Barak valley (population 24,91 Lakhs and density 360 per sq.km.) in the South, there has been an onrush of people to these hitherto inaccessible hills particularly from 1961 onward. The density of population during 1971 and 1991 census shows an increase by 68.28% and 74.72% in Karbi Anglong District and by 40% and 98.3% in N.C. Hills respectively. The movement of people to these hills are likely to accelerate further due to the fact that the two Valleys have become oversaturated. Beyond the bearing capacity for the agrarian economy of the Valleys with population density in some of the adjoining districts as high as 460 in Kamrup, 457 in Karimganji District against the average population density of the state at 286 per sq.km.

A mop-up assessment estimated that out of the 4.5 Lakhs

Jhumias families in the North East India, there are 58,000 such families in the State of Assam, almost all of them are inhabitants of these two districts. The Jhumming practice in the past and pre-independent days was not so destructive due to fewer population 9131 (33000 in 133000 in 1941, 165,000 in 1951 ) and the vastness of the areas available for Jhumming. The Jhumming cycle then was around 20 years which had given a respite to the nature and brought in the beautiful bamboo forests, a secondary climax, in the abandoned Jhum area. The Forest Department had introduced Taongya cultivation method to afforest the Jhumland which brought in some beautiful Teak and other valuable plantations in these Hills, an ecofriendly measure, in the abandoned Jhumland, with increase in population the cycle has been reduced today even to 3/4 years in certain accessible easy slopes near habitation. The bamboo which requires at least 10 years to stabilise and to rejuvenate again had been almost completely wiped out in many areas as a result of repeated clear cutting in juvenile present stage giving rise to coarse and thorny, grasses and shrubs which are of no economic value. This is found to be a major cause of eradication of bamboos from many areas which coupled with destructive harvesting of bamboos by the bamboo collectors engaged by the H.P.C. at rate contract on bamboo delivered in mill site (who have cleared felled the bamboo forests in accessible locations for earning more profit) made the destruction all prevailing. These have deprived the bamboo resource to the detriment of ecology and have pushed both the public sector giant mills of the H.P.C. in Jagiroad and Badarpur, established on the basis of 1960-65 estimates of availability of bamboos mainly in these two hills districts, to the threshold of serious shortage of raw material.

The other natural resources found in these two Hill Districts are the lime stones, in Delai and Umrangso areas, basing on which the Cement factories at Bokajan and Umrangso area were established. The extraction of lime stones during 1993 was 2.84 Lakh M.T. The Coal found in an around Umrangso in the N.C. Hills have been under extraction since a few years past. Coal is also found in small quantity in the Karbi Anglong District where from it is being extracted at present. The production of coal in Assam during 1993 was 12 49,000 M.T. of which little over 2.33 lakh tones were from the Hill Districts. All these industries are being



handicapped due to the poor communication link and remoteness.

The two Hills Districts have very high potential for eneration of Hydro electric power but only a small beginning has been made for harvesting the same by taking up the Kopili and Karbi Lungpi projects. The Sukanjuri Micro project dried up due to clearance of catchment. Micro Hydel projects could be taken up in killing Deyang, Kaliani, Amring Utjanini, etc.

The forest based industries like saw mills were established since early fifties to use the selected species of timber in the forest in demand. The areas being most inaccessible only a couple of entrepreneur came forward to work out the Forest and established mills in Langting in North Cachar and Nailalung and Diphu in Karbi Anglong with areas leases to them for a long period. The timbers harvested with great difficulties were mostly sent out to Calcutta and other this consumption Centres as also for supply to the Central Govt. Defence establishments, Railways etc. through the State Govt. and D.G.S.& D. The working of forests in the Hills Districts, led to the discovery of one good species Padam (*Mansenia deenikai*) known outside as Assam Teak to be one of the species, much in demand. In same areas another important species, Bela (*Sweetenia macrophylla*) was also discovered. With searcity of timber in the country particulary in the advance states and metropolition cities the demand of finished timber went up, making the timber trade a very profitable one. The Railways established the Treatment plant in Naharkatia where in Railway sleepers convertes from many over green species, which are naturally not durable, were treated for use in the Railways. This is has also given a boost to the timber trade. This has lead to a higher demand of timber from the North East in general and these two Hills Districts in particular and all the Forest outside the reserved Forests were leased out to timber traders who harvested and despatched timbers against Govt. supply and private demand establishing the Depots at Calcutta, Mumbai, Delhi etc. Numbers of saw mills rise to the present level of 13 mills in Karbi Anglong and 9 Nos. in N.C. Hills. The plywood industry, which made a dint in the Upper Assam districts starting from 1924, have suffered for scarcity of plywood timber in the zone and these led to establishment of one full fledged plywood Mill by the Birla group in Diphu. This was followed by many vennering unit coming up

near to Forest which are supply in their veneers to standard plywood factories producing commercial plywood and other panel products.

The extraction of timber from the forestst under lease by private parties, same of which have been continuing their work for several decades without rest, have the deprived the forests at its valuable species in the leased area. The leases as stated earlier were confiend to the unclassified forests area but of late, leases have also been granted by the District Coucil in the Reserved Forests as the management of the R.F. was also transferred to the council by the State. The provision of probhibition of granting long term lease to private traders under the Forest conservation Act, 1980, has been by passed by granting leases for short period and renewal there after. Thus the unclassified forests area in particular have faced the increasing onslaught of the land saw and the ecology is being destroyed incresingly by very heavy exploitation, movement of timber trucks with construction to unscientific feeder and extraction paths in the Hills.

The authority to manage and deal with all the areas exceit the Reserved Forests are vested on the District Councils constituted under the Sixth schedule of the Constitution of India. Even the State Govt. is not competent to divert any area recorded as Forest for non-Forestry purposes without the prior permission from the Govt. of India. But the District councils by virtue of jurisdiction for activities other than Forestry as land not reserved/recorded as Forests. The shifting of Forests and Wildlife from the State list (List-II) to that of Concurrent list (List-III) under the seventh Scheduled of the Constitution under the 42nd Amendment. Act, 1976 had no effect in the unclassified Forest landlaw which were not constitution in to R.F. as because there was no Corresponding amendment inthe District Council Act wherein the authority and jurisdiction over specific subjects were prescribed. The situation is further aggravated by transfer of the subject Forests to the District Councils and its implimentation by the State unless the areas bearing forests (including abondoned Jhum land with nearly vegetation or barren for the time being) particularly in the critical catchment areas are reserved to give it the legal status for practising the same from squatting encroachment settlement and Jhuming by the people from within and outside.



The jhuming practices though destructive cannot altogether be stopped at once unless the people could be provided with some viable alternative like cash crop cultivation and could be assured of their basic minimum needs of staple food and other items at all time and season. While the conservation cover off soil by clothing the catchment with vegetative cover is very important, the provision for a good and sustained living for its almost 80% tribal population cannot be overlooked.

Planning for resource management with the available natural resources-land, river, forest, wildlife minerals has become very important at this stage. Development without destruction should be the guiding principle to derive maximum benefit to a maximum number of people in planning for resource management one has to take into account the followings:-

- (a) Quality and quantity of manpower available in the area and their traditions, customs and skills.
- (b) Availability of Natural resources-land, river forests, Wildlife mines and mineral etc.
- (c) Suitable land use and production pattern dependent on physiography, soil, climate etc.
- (d) Availability of market communication and other infrastructures.
- (e) Market demand and prices of products.

In order to utilise the land under community which is assessed to be to the extent of atleast 6500 sq. K.M. in these districts, it is necessary to give top priority to provide lucrative alternatives to Jhumming to the 58,000 Jhumia families inhabiting these Hills. The Forests Deptt. in Assam initiated cultivation of cash crop like cashew nut, Block pepar, Rubber Coffee etc in these Hills in the fifties which was later on taken up by the Soil conservation Deptt. after its separation from the Forest Deptt. in the year 1963. In order to give a boost to such efforts, the Assam plantation crop Development corporation was established by the soil conservation department as a commercial corporation engaged in Welfare to the Hill dwellers. The corporation had taken up extensive plantation of rubber in particular by introducing high yielding strains from 1974-75 and now have over 10,000 Hect, of Rubber plantation in these Hills. The other cash crop namely cashewnut, medicinal plants, Coffee, were not much

expanded as the soil, climate, temperature & Humidity etc have made it less remunerative than rubber. The plantation Crop Development Corporation have also taken up plantation of the forest growing species of economic importance like teak in the unclassified areas in these Hills with the consent and approval of the local community for purpose of soil conservation. The Forest Deptt. also has continued its effort to improve the quality and quantity of the growing stocks in the R.F. by taking up massive plantation of teak and other species of economic importance and has also established two Afforestation Divisions to cover these two Hills Districts one Division covering area lower altitudes and the other covering areas of higher attitudes taking up plantation of teak, and other economic species at lower altitude and planting of pine and other high altitude species in higher catchment in land taken over from the community with their consent. The plantation regeneration taken up by the Forest Deptt. in the R.F. and unclassified areas including social Forestry plantation in non traditional areas there at present are to the extent of more or less 20,000 Hectare per year.

These fruitful endeavours by the Forests Deptt. and the A.P.C.D.C. could have clothed the Hills within some reasonable time but the programmes are being greatly handicapped by the unwillingness of the local people to spare the land in their control being apprehensive that they would have no land for their Jhumming and other Development needs in future.

That the Jhumia could be rehabilitated by taking up Cash Crop cultivation has been proved by the Tripura Forest Development Corporation. Established the first large scale Rubber plantation in 1978 taking up 1000 Hect plantations and permanently rehabilitating 100 Nos. of Jhumia families as workers in this plantation. To give permanency to the settlement and impart the sense of participation, each family was allotted one Hect of Rubber plantation raised by the Corporation free of Cost. After its success a separate Rehabilitation Plantation Corporation also established which has been taking up cultivation of Rubber and rehabilitating the Jhumia families. Tripura is now the second Rubber producing state in India after Kerala.

The Rubber Board of India have assessed that there are about 4.5 Lakh Hectares of land suitable for Rubber plantation in the



North East of which 2 lakhs Hect. are a in Assam. No doubt the major chunk of these area in Assam are located in these two Hills District and particularly in K.A. Hills district. The RubberBoards encouragement has placed India in the 4th position in Rubber production after Thailand, Indonesia and Malaysia, with export value rising to Rs. 915 Crore.in 1994-95 which is estimated to reach 1280 Crore in 1996-97. The Rubber Board estimated the annual transactions in rubber to be of the order of Rs. 75,000 Crores fetching a revenue of Rs. 2000 Crores to the Govt. The Board provides incentive subsidiee for rubber plantation in the North-East,which is a non-traditional area and offers various help upto Rs. 4000% per hectare as fencing subsidy and Rs. 2500/-for irrigation Rs.1000/- per set of Rubber sheeting Roller Rs. 3000/- for construction of smoke house, supply of highyielding budded stump in poly bag, maintainence cost of Rs. 2/- to Rs. 4/- per plant established in polybag and Rs. 8000/- per Hect, Cultivation and maintainance grant in installments. In addition the Boards provides free Advisory and Extension service. The Board estimates that the net income before Tax could be Rs. 34000/- per Hectare with an average yield of 12000 kg. dry Rubber per Hectars per year. The cost of plantation (420 to 480 plants per Hectare) with its maitaned cost upto the end of 7th year when it is first tapped for production comes to Rs. 43000/- . The Board has established Regional office in Diphu, Silchar in addition to Guwahati, Jorhat for facility of the Hill District.

From above it is clear that rubber plantation could provide an alternative to Jhumming and it could be grown in small holding and even in and around the pertphary of the homested in groups or in single now in the vicinity of a processing factory. However the experience and facts reveals that the heavy rainfall, no. of rainy days, the high cost of collection and carriage of rawmaterial and chemicals, the incidence of disease pests, the high cost of laying and maintainence of extraction roads and pathes in the Hills with immature soil, and heavy rainfall, high humidity etc. creates considerable difference in yield and cost in rubber plantation in these Hills then that of Tripura and Kerala. In addition the required investment of Rs. 43000/- per Hectare remaining blocked for seven years and the period of its economic productivity at 25 years only appears to have made it less competative than Tea cultivation.

Further for taking over the free community land for Rubber would haecessitate payment of acquisition cost atleast at the rate of Rs. 4000/- per Hectare. The Maghalaya Govt. acquired the land under Balpkhram Biosphere Reserve in the past from the Nokmas by paying about Rs. 6.00 Crores. This cost of Rs. 4000/- per Hectare would constitute nearly 10% of the cost of creation which when added to the cost of creation of Rs. 43000/- would raise the investment further and become another hindrance unless the plantations are done by the people themselves in their own land.

Cultivation of Tea from the experiments of its cultivation for over one an half century in Assam (first Tea Co. established in 1839) and the affort of the Tea board has made it possible to take up Tea planation in these two Hills in some select areas as compact Tea gardens as also small scale planting by private in dividuuals even in an area less then 10 bighas (1.33 Ha) as a much profitable venture.

Even though the cost of planting and maintenance upto 4th year of one Hectare of Tea comes to Rs. 1.45 Lakh for Hills and Rs. 1.25 Lakhs in the planing it comes into production from the 3rd year gradually increasing upto the 9th year and remaining productive upto the age of 40 years. The cost of acquisition of land at the rate of say Rs. 4000/- per Hact would be within 3-4% of the cost of creation which therefore could be absorbed by the industry easily. The Board has offered a subsidy of Rs. 37900/- per Hectare in two equal instalment and Rs. 63000/- as loan at 15% rate of interst into to the small growers. The production of green Tea leaf from one Hectare grown under personal care of the small grower may even starts with producing 1250 kg grant of in the 2nd year rising to 12500 kg per Hact in the 9th year and there after. The present price of green Tea leaf offered by the established Tea factories in the adjacent gardens varies from Rs. 7/-to Rs. 9/-per kg depending on quality and quantity of supply. At this rate the earning from one Hectare of Tea grown by a small grower could be as high as Rs. 55000/- to Rs. 65000/- per year.

The Tea industry is a capital intensive industry fully established in Assam and therefore it could easily meet the cost of acquisition of the land and maintainence of communication to and for atleast in part. Big Tea gardens hae been located around these two Hills districts which to name a few are Gopal krishna,



Amsoi, Chapanala, kandali, Segunbari, Selna, Burapahar Kuthori, Hatikhnti, Methoni, Bokakhat, Borchapori, Behoras, Numaligarh, Bakial, Ranagera, Murphulani, Silanijan, Madhura, Kumbhigram, kalain etc. which conclusively shown that establishment of Tea gardens in these Hills, in select places, are a district possibility. These Tea gardans could also help the people around to take up small Tea planting providing market and technic help.

Assam has 2200 sq. km. of Tea and is supporting a population of over 50 Lakhs and have employed 6 Lakhs people as worker including 70,000 Nos of workers in the Factories. On this consideration if an area of 200 sq. km. i.e. 20,000Ha, could be taken up in suitable sites by acquiring the community right for establishment of say 50 Nos of standard tea gardens the would of the population in the two Hills districts could be settled in and provided with available alternative to Jhum cultivation. Some of these gardence could be established in areas were people have settled already in places around Bragaon, Amtereng, Tumpreng Kandali, Chapanala, Borjuri, Daigurung, Dolamora Delai, silanijan, Amring, Bathalagsu, Jating a valley which then could provide additional working and earning facilities to the people engaging them as non-resident workers without uproting them the heart and homes.

Displacament of Tribal population from existing sattlement should not be encouraged except those who volunteers to settle permanently in the plantation colonies to be established as model villages with minimum needs for ther health, education, drinking water, market and communication etc to be built up therein. The model villages within the plantation colonies or even outside in sutable locations could be established with the money to be paid as acquisition cost of community land and right. The present experience of complete shifting of the interior Forest villages in these Hills districts to convenient places outside the Reserved Forests shows that there would be considerable number of people who would like to shift to such model villages when such are established with the requred ammenities.

A People who have owned sufficient land in their village and who are not willing to shift may be given incentive to take up private planting of small areas with tea which would gave them a much better earning.

In places where marketing of green leaf tea present difficulty and where Rubber processing factories exist or could economilally established such area could be brought under Rubber plantation individually or by forming users Cooperatives to be subsidised from the found to be derived as acquisition cost of community land and rights.

Once the population is provided with the alternative by establishing organised Tea gardens and by inducing small private gardens of Tea and Rubber, the rest areas under unclassified community land particulary in critical catchment areas could be taken up for ressrvation and afforestation that will protect the soil ecology, environment and enrich the Natural resourees forests and wildlife.

Steps are also necessary for augmenting the sutable horticulture species which are found to be well suited in the Hills such as orange, pine apple and Banana etc. by establishing a few more fruit preservation factories like the KANCH Factory in Haflong. Plantation of Coffee, Cardamom, Tarmeric, Ginger, Palama-rose Oil and other spices, Medicinal- Plants, Day stuffs could also be taken up in the places it has proved successfull and where it is considered to be well suited.

The Karbi Anglong Hills in particular as per preliminary survey by the Assam Mines & Minerals Development corporation has a huge stock of quality granite in demend which are at present imported from Karnataka, Rajasthan etc. to the State. Quarrying of granite could be taken up by a establidhing processing factories in the K.A. district to avaiod waste of these valuable meterals by taking up quarring for export of blocks along. This would also, provide much employment to the people and improve the economy.

The two districts presents a paneroma that could rarely be seen. The Borpong area to the North of Singhassan Hill (1356meter) is full of waterfall and sulphure springs which extends in a more or less concentreted way for over 10sq.km. Development of these area could attract lot of tourist including indigenous foreign. The hot springs in Garampani within Number R.F. in K.A. Hills with the roamind elephants has already become well known to the tourists. The phenomen "Birds suicide" in Jatinga is now known world over. The lakes in the Hydel project at Umrangsu with its picturesque scenerio could be utilised for tourist attraction providing



water sports there in. The place Umrangso would attract tourists if a Helicopter service could be run regularly for which there is a Helipad. Umpanai and habeng meadows would be able to attract the tourists if regular communication could be established.

The Kaziranga National park in Golaghat Nagaon District has compulsory remained a seasonal place of visit for the world tourists which could be made an all season visiting place if the same National park is extended to cover the adjacent high lands and Hilly areas forming a complementary (satelite) park in K.A. with a common joint management and benefit with the District council. This would open a new visita, for the visitors to see Kaziranga in its worst affected heavy and devastating flood season alongwith the rare views of the famous one hore Rhinos and their associates. The elephants in Kaziranga are visitores from the K.A. Hills during the off flood seasons. The elephant balt above Kaziranga extends up to the Namber R.F. wherein the small sanctuary of 4 sq. km. in extent namely Garampani wild Life Sanctuary was established during the pre Independence days to preserve the wayside water spring along National High way 39. The small sancturary is totally indaquate and in significant for the purpose of preservation of wildlife particularly the elephants which requires a big territory. With the Opening up of unclassified forests in the Hills Districts the elephants have been compelled to use this small area as their "sanctum sanctoram" and move around in search of food causing the depredation and road blockads etc. A wildlife park of the status of a National park mainly for elephant protection could be established in the Karbi Anglong Hills covering Nambor, Daigurung, Kaliani, Mikir Hills Reserved Forests together. A proposal for constituting such a sanctuary/park for elephants in particular is lying unattended since 1992. This could be taken up under the Govt. of India's Project Elephants. The Jatinga Valley Forests with the towering Borail Hills near Haflong the areas around Umrangso and the Amring Reserved Forest areas could be constituted into sanctuaryses for protecting the Birds, Elephants and other wildlife which will also attract tourists.

Adventue tourism could also be developed to utilise the high potential the hill districts are bestowed with by nature wilderness trails, rafting and other water sports, mountaineering, perasailing hanggliding etc could be developed to use the beautiful hills and

dales, fast flowing rivers, hot springs and the general panaroma of the winding road, cascading water falls and the multiplicity of ethnic cast and tribes and their colourful dress, tradition and customs.

The area around Nelie, Baithalangu were particularly known for its production of shellac. The jhummiars reared Lac in their jhum land using leea, palas, Bagri as host. Assam produced one fourth of Indian production of Lac in the fitees for which the shellac factory in Chaparmukh was established.

A considerable population even now engage themselves in sericulture, weaving in cottage scale. Eri, Muga are the known products which could be augmented. There is immense scope for establishment of Diary Farming, Piggery and even fisheries including seasonal fisheries. Cultivation of sunflower and other oil seeds of better value could also be taken up.

The hill districts were a good source of varieties of cane which have almost been wiped out and planting of cane, patidoi and some select varieties of bamboos required for handicrafts in cottage scale could be taken up.

In order to protect and conserve the forests from wanton destruction by profit mongering contractors and traders, people oriented managing and working should be introduced removing the lessees. The local community should be allotted the bamboo areas for a long time, organising them to from trading cooperative and offering term loan as seed money for acquiring the infrastructure like implements trucks to harvest the bamboos and supply the same in the hillyard. They would work out the bamboo forests as per scientific workplan year after year and could be induced to take up planting of bamboos annually in the areas they clear fell for jhumming by that way considerable areas could be improved to have quality bamboo with higher yield per unit area.

Similarly a good number of commercial sized veneering units could be insitalle in areas close to the forests and this could be run by local youths forming trading cooperative. In place of allowing long lease of forests to private plywood millers for getting their plywood logs these veneer mills would be made to supply the venner produced (value added product) to the mills for assembly and panel board production at prefixed economic rate.



## GENDER ISSUES IN FORESTRY

**R. ZAMAN,**  
**DIRECTOR,**

*Assam Institute of Research for  
Tribals and Scheduled Castes, (AIRTSC).*

There are many facets of forest management for the purpose of preservation, conservation and scientific exploitation of forest resources. In the process, it is necessary to see the interest of various groups who are involved. The interest of the State comes predominantly at the top of the agenda. During the British days and even after independence, the interest of the State was the main criteria while deciding any forest policy for management of Indian Forest. In those days, there were vast forest resources and the need of the State and the people was comparatively low. The denudation of forest was not alarming at all. However, with increasing population and also necessity of the State, commercial exploitation of the forest has taken a sharp upward trend. The result is more unscientific felling of trees. The interest of the tribals living within the forest was almost neglected for more than a century till the drafting of the National Forest Policy, 1988 (NFP'88). A specific section 4.6 on tribal people was incorporated in NFP, 1988. The policy, however, stated clearly for protection of customary rights and concessions of the tribals. The domestic need of fuel, fodder and minor forest produce, construction timbers of tribals was considered to be the first charge on forest.

With the passage of time, denudation of forest has drawn the attention of the environmentalists as environmental degradation effects all human lives. Different studies have revealed that the direct impact of denudation on women has been very deep rooted. The tribal people living in the forest depend heavily on forest for their survival. The dependency is greater among women than men. The women take much more active role in collecting fuel-wood, food, medicines and fodder from the forest. The study by Dr. Walter Farnandes and Geeta Manon in a particular area of Bhawanipatna region shows that women are involved more in different activities than men.

Table is reproduced below :

### Average annual Human days as per women and in various activities in areas where shifting cultivation is prevalent.

Sl. No.	Activity	Female	Male
1.	Settled Cultivation	79.67	27.14
2.	Shifting Cultivation	105.40	59.11
3.	Wage labour	26.14	112.63
4.	Fire-wood	99.39	66.57
5.	Others	10.20	42.60
Total:-		329.80	308.85

**Source:- Tribal Women and Forest Economy, By-Dr. Walter Farnandes and publisher Geeta Manon, Page-78.**

From this, we have seen that women are engaged more than men in many activities except in case of wage labour. Although women are associate more with different activities relating to the forest for their livelihood, they are not taken into consideration at any stage of forest management. Of course, it is true that the tribals as a whole were left out from any association in forest management. Only after N.F.P., 1988, some states have started Joint Forest Management (JFM) for better conservation and preservation of forest.

The employment in forest activities also shows the gender bias unfavourable to the women. The All India figures from 1980 indicates that majority of women employment comes from Non-Wood Forest Products (NWFP).

Operation/ product	Men	Women	Total	%Total	%Women
Round wood/pulp	56	6	62	6	9
Firewood	81	40	121	11	33
N W F P	573	304	877	79	38
Plantation	31	16	47	4	33



(Source :- M.M. Pant, 1980)

In a study by Debal Deb, Ecologist, IPRAD on the issue of the gender role in Non-Timber Forest Produce (NTFP). The distribution of male and female was found as under:-

Classified item on NTFP	Female gatherer	Male gatherer
Food	37	7
Fodder for goats	3	3
Fuel	38	6
Structural	2	2
Religious	4	1
Ornamental	2	0
Medicinal	5	14 (all medical men)
Minor household articles, for mats, sal plates	3	0

Source :- Reflections on Gender Issues in Joint Forest Management, By-Mitali Chatterjee & S.P. Roy, Page-87.

The following chart will illustrate how women are more involved in various activities on Non-Timber Forest Produce (NTFP)

N.T.F.P.	Parts used	Collected by whom	(F=Female M=Male)
Fuel	Dry leaves, twig etc	F	
Fodder	Tender leaves	M,F	
Fruits	Fruits	F	
Mushroom	Whole parts	F	
Root tuber	Root tuber	M	
Leaves	Leaves	F	
Medicine	Fruit, root, bark, seed, sap.	M,F	

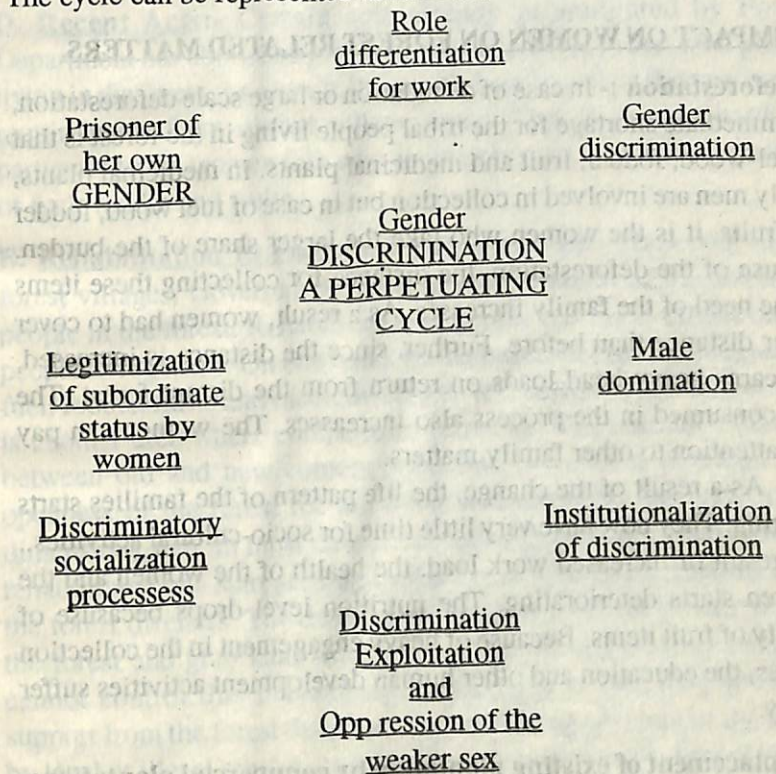
In activities relating to the forest, particularly in non-timber sector, women involvement is definitely more than their counter-part men. Women are also engaged as wage earners in forest related activities particularly in nursery work and plantation. The importance of the gender involvement in forest management has been realised both by

the Government and also by different sociologists. There are different acts which are supposed to put both men and women on equal footing. Some of the acts are:-

1. The Minimum Wages Act, 1948,
2. The Equal Remuneration Act, 1976,

There are some acts which provide special consideration for women. They are (1) The plantation Labour Act, 1951, (2) The Beedi and Cigar Workers (conditions of the Employment Act, 1976). (3) The Factories Act, 1948. (4) The Maternity Benefit Act 1961.

In spite of existence of different acts for the welfare of the women and children, the gender discrimination revolves in a perpetuating cycle. The cycle can be represented as follows:



Source :- Social Change, Vol. No. 25, page, 106

There is a growing pressure from all quarters to involve women



in various activities and also to eliminate gender discrimination wherever it exist. The voice was heard most prominently in the Beijing Conference for the women in 1995. Of the many resolutions, there was one relating to environmental degradation. It is acknowledged that environmental degradation that affects all human lives often has a most direct impact on women. Large scale deforestation, desertification, drought, depletion of soil and other resoureas gave rise to high incidence of environmentally related health problems resulting in even death among women and children. Those most affected are rural and indigenous women whose livelihood and daily subsistence depends directly on sustainable ecosystem.

Different activities of forest result in some direct impact on women as well as men. Since the women are more actived with non-timber forest produces, the impact is more on women than on men.

### IMPACT ON WOMEN ON FOREST RELATED MATTERS.

**A. Deforestation :-** In case of denudation or large scale deforestation, the immediate shortage for the tribal people living in the forest is that of fuel-wood, fodder, fruit and medicinal plants. In medicinal plants, mostly men are involved in collection but in case of fuel wood, fodder and fruits, it is the women who take the larger share of the burden. Because of the deforestation, the distance for collecting these items for the need of the family increases. As a result, women had to cover longer distance than before. Further, since the distance is increased, they carry heavy head loads on return from the distant forest. The time consumed in the process also increasses. The women can pay least attention to other family matters.

As a result of the change, the life pattern of the families starts changing. They now have very little time for socio-cultural activities,. As a result of increased work load, the health of the women and the children starts deteriorating. The nutrition level drops becasue of scarcity of fruit items. Because of heavy engagement in the collection process, the education and other human development activities suffer greatly.

**B. Replacement of existing plantation by commercial plantation:-**

The immediate impact of the process of replacing existing plantation by commercial plantation is a shortage of fuel, fodder, fruits

and medicinal plants. A part from the effect illustrated in deforestation their activity of the Forest Department generates very little employment for the local people. Normally, outside labourers are engaged by industrialists for commercial plantation.

### C. Classification of forest and biosphere:-

As per the Forest Regulations, from time to time, forests are classified as reserved, Protected and Village Forest. And in some cases, particular areas are declared as biosphere. It is very important to see that while declaring reserved, protected forest and then biosphere, the interest of the tribal people living in the forest is kept in mind otherwise, the same process will lead to shortage of fuel-wood, fodder, fruits and medicinal plants for the tribal people. The impact of this is same as that in case of deforestation since area demarcated exclusively for State control is unlikely to provide any benefit to the people.

**D. Recent Acts:-** Certain acts already promulgated by Forest Department has abolished poviding free fuel-wood to the tribal people living in the forest. As a result, the people have to collect their necessary requirements form distant village forest. This is causing hardship particurly to the women folk who are mainly responsible for collection of fuel, fodder and fruits.

**E. Rehabilitation in Forest :-** Apart from thepeople living in the forest villages, Government resort to rehabilitation of the displaced people in the forest. Rehabilitation of people has many effects on the people living there. On one hand, the resource on the forest regarding fuel, fodder, furits and medicinal plants increases. Occupation of land is another area where competition increases. The cultural exchange between old and new comers sometime becomes a problem. The openness of the forest for the rehabilitated people has some other dimensions also. In most cases, it is found that people other than the rehabilitated one start settling in the forest with active support form the forest dwellers. The dwellers invite their relatives to encroach in the forest and grab land wherever possible. The Forest Department cannot control this phenomenon effectively unless they get solid support from the forest dwellers. The increasing pressure of the forest by legal or illegal rehabilitation ultimately brings more discomfort to the women folk who all to link after the needs of the family.

**F. Mega Projects :-** By installation of Mega Projects in various parts of the country, Government want to take resources for the benefits of



large section of the people. In most Mega Projects, forests are normally affected. Creation of large dams for irrigation and harnessing Hydro Electric Energy is a common mega project. While the resources are redistributed particularly from the rural to the urban, the people inhabiting in the area of the projects are affected to a great extent. Immediately, fuel, fodder, fruits disappear from the vicinity of the people living in the project area. In order to ameliorate the conditions of the people, Govt. resort to large scale rehabilitation by providing land and money to the displaced persons. The displaced persons are to create a new society in a different environment. The displacement leads to lot of social changes for which they are to adopt and adjust in a challenging situation. The process of rehabilitation is not a simple one and in most cases, it take a very complicated turn. The family structures start breaking down because of the displacement and it is the women and children who suffer most. The lure of land and money sometimes prompts the families to get young children married at a comparatively tender age so as to enable themselves to claim for rehabilitation grant. The dimension has been found in the Sardar Sarover Narmada Project in Gujarat. Very young girls get married to very young boys below the age of 18 years. This process leads to early pregnancy of girl child. The education of the children are also effected. This is a great gender injustice in the rehabilitation process.

There is another dimension of Mega Project. It causes lot of disturbance to the soil of the area. The situation increases to a great extent. The nearby streams become shallow causing floods during monsoon. This causes lot of sufferings to the people living in the area. It is again the women who had to toil hard in such a situation.

### EXPECTATION

There are some basic reasons why women are preferred now for more active participation in the forest management. In any degraded activities of the forest, it is the women who suffer most. So the general feeling is that the women will take more interest than men provided an opportunity is given to them. It is also found that the priorities of the women are much more realistic. The need of the women is primarily the basic need of the family. While men by nature develop a commercial outlook in any activity, the women are much more pragmatic and less commercial. Further, it is found that women can be much more

organised group and more participatory in any activity.

Against this background, Govt. desires that there should be effective participation of women for proper management of the forest. It is expected that women will take active part in Joint Forest Management envisaged in the National Forest Policy, 1988 (NFP). The Sociologists took forward for the gender justice in all activities relating to forest. The tribal groups want to assert tribal authority in the tribal forest villages. Since the tribal forest villagers have been depressed for long since the days of the Britishers, they like to breathe fresh air in the new environment. They want to project the cause of the women. The anti-poverty groups want better education, health and nutrition for the people living in the forest. Since education, health and nutrition of the women are most effected because of various factors, this group wants for outside intervention for development in this sector. The Environmentalists believe that women and children take much more active part in plantation programmes launched by various groups. It is also believed that women can be better watch dog for illegal felling as the same leads to more misery in their lives.

### WOMEN MOVEMENTS

Against the background of high expectation from the women for effective forest management, we can illustrate few women movements which have been found to be a very successful. Bhagavatulla Charitable Trust (BCT) in Vishakapatnam district in Andhra Pradesh had converted 100 acres of waste land into ecologically sound plantation area. Although men were engaged, it is the women who took initiative. Another organisation of women called successful plantation programme in Bhansuada district of Rajasthan. The plantations were healthy and 90% of the sapplings were chosen by the women according to their needs. Women also ensured the survival of the plantation. Similarly, Banabharati in Koraput in Orissa, PREM and Gram Vikash in Ganjan district took up the successful plantation programmes where the main initiative was taken by the women. Right from nursery to actual plantation and survival, women were actively involved. Species were selected by them according to their necessity.

CHIPKO, the silent Valley Agitation, the Save Western Ghat March, APPICO are the most prominent movements for safeguarding the forest. These movements were peaceful and not violent. One



prominent feature of these movements is extra ordinary participation by women. Various women groups guarded the forest and also engaged themselves in plantation activities.

The success of such women movements in various parts of the country gives some hope of safeguarding forest which has not been possible merely by participation or say non-participation by it is better to know the status of the forest villages and the condition of the people living there.

### GLIMPSE OF A STUDY

The Assam Institute of Research for Tribals and Scheduled Castes, Guwahati conducted a study in 1991 of 24 forest villages spread over 14 No. of Forest Divisions in 11 districts of Assam. The districts are Sibsagar, Dibrugarh, Sonitpur, Kamrup, Tinsukia, Kokrajhar, Dhubri, Nagaon, Cachar, Karbi Anglong and Lakhimpur. The total number of households surveyed was 955. Out of that, 951 were tribal households. The broad features of the study are as follows :-

#### Parameters

#### Salient Points

- 1. Governance:-** Tribal forest villages donot come under the purview of the Panchayati Raj Act or Tribal subplan. Because of different forest rules and regulations the benefites of Integrated Tribal Development Project (ITDP) are not extended to these villages. The forest development schemes initiated in 1984-85 was abandoned in mid way.
- 2. Communications :-** A good number of villages donot have easy communication facilities.
- 3. Health Care**  
**Facilities :-** Health care facilities are far from adequate. Villagers are to cover more than 6 kilometers to receive medical facilities.
- 4. Veterinary**  
**Facilities :-** 50% of villages surveyed donot receive any veterinary service from the nearest Veterinary Centres.
- 5. Educational**

#### **Facilities :-**

Out of 24 number of villages, primary schools are available only in 5 number of villages. Most of the tribal forest villagers cannot afford educational expenses of their sons and daughters. The drop out figure is considerably high.

#### **6. Employment :-**

Only 129 persons were found to be getting job in 3rd and 4th grade. The percentage is quite low. Persons holding occupations other than forest employment are very few.

#### **7. Drinking water**

##### **Facilities :-**

The effort made by the Forest Department for providing drinking water to the forest villages is not satisfactory.

#### **8. Marketing**

##### **Facilities :-**

Only 3 villages are covered by Fair price shop. Here also, the stock position of the commodities is not satisfactory. The weekly huts are very far from the villages.

#### **9. Co-operative**

##### **Societies :-**

Not a single Co-operative Society was found in these villages.

#### **10. Small Scale Cottage**

##### **Industries :-**

Every tribal household possesses a loom and women weave clothes for domestic needs.

#### **11. Land :-**

The forest villages enjoy only usufructuary rights over their land allotted under forest lease, Right of transfer and sale is not available, although mutual transfer to son is allowed. Encroachment of forest land is a big problem for the authorities as well as to the orginal forest villagers. Other families surveyed, 63% possess less than 2 Bighas of homestead land each. About 4% families donot possess homestead leand. These families were found to be without any cultivable land.

#### **12. Income and**

##### **Expenditure :-**

Abot 74% families were below the poverty line. More than 88% families depend fully on agriculture. The rest 12% earn their



livelihood by serving as day labourers. Very small amount is spent on health care. Major source of expenditure is on observance of festivals including socio- religious ones. There is hardly any saving habit among the people.

### 13. Housing :-

The villagers can collect building materials for housing only on prior permission from the Forest Department.

The study reveals that most important felt need is cultivable land. The villagers are eager to get the facilities provided under Tribal Sub-plan and allied welfare schemes. The villagers also want restoration of some of the concessions like fuel-wood, to be granted to them by the Forest Department. Villages so that they can get loan offered by various Financial Institutions.

The study clearly reveals that the forest villages had a host of problems which need to be addressed before expecting high degree of participation for preservation and conservation of the forest. The result of the study will be found to be applicable in any other forest village also with few exceptions. The women had to share a lot of burden because of poor infrastructure in the villages. Unless their conditions are upgraded to a certain level the high expectation of gender participation may be a futile exercise. In order to empower the women the first thing needed is to upgrade the level of education. At the same time, they must be given sufficient knowledge about forest environment and various other issues relating to forest. The women should learn how to organise as a group and work for the betterment of the villages. They must get sufficient scope to work in various economic activities.

The women participation can be achieved either by Voluntary Organisation or by Institutionalisation. In Institutional participation through co-operatives, women club and even Panchayati Raj, it will not fetch the participation from lower echelons of the society. The upper echelons primarily the core groups takes the lion share in participation, thereby causing injustice to may in the lower strata. In most cases of participation, it is found that the leadership comes from the outside and only the insiders participation is taken to feomouflage the activity as people's movement. This, however, indicates helplessness of the poor women living in the poverty stricken villages. In such cases, the level of commitment is not up to desired level and women

participate for the sake of earning money only.

For successful participation of women in forest management, the women must understand the value of the environment. They should understand that the forest not only provide them with basic needs of fuel, fodder, fruit but they are also responsible for soil, water and pure air. Unless ecology is protected there cannot be any permanent economic development in the villages. In order to understand the value of the forest, these powerless women must be empowered by sufficient knowledge at the beginning. The capability of the women for protecting the environment must be upgraded. In the process the leadership for doing the same will emanate from the women themselves. Only such actions may provide a permanent solution for redressing gender injustice in forest management.

The main question that lies is who will start the process can the process be started by the Forest Department although may in the forest is still believe that participatory management is a threat to their authority. Can the process be started by enacting laws will provide some protective arrangement only but cannot generate a people movement.

Probably the whole process of women movement may be started by some core group members who took up the cause of the women with a Missionary spirit. It is a difficult task because in most cases, women donot believe that there has been gender injustice all along; inspite of fact they suffered most in any forest degraded activities.

The involvement of women may not be restricted only for plantation activities. There are host of activities where women can be successfully involved by different interested groups for effective forest management. Some of the areas for involvement of women are illustrated below:-

**1. Plantation:-** In plantation activities, women may identify the area for plantation. They may select species. Women may do all the nursery works and also plantation works. They can also ensure survival of the sapling after plantation. The plantation programme may be designed by Govt. authority or by any NGO and even by the women groups themselves.

**2. Watershed Development:-** It is necessary for the women to understand the concept of watershed development for better soil, water and air. Their knowledge may be upgraded



for identification of proper watershed areas. Women may identify the different schemes for the development. They may actively participate in implementation stages. Watershed development requires huge amount of fund and as such, such programme must be initiated by Government funding or by a strong N.G.O.

### 3. Protection of Flora :-

Women can participate like in CHIPKO, APPICO in guarding forest. They can also participate in collection of seeds for further propagation. Apart from the forest protection, force, women can organise their own voluntary force like the V.D.P. (Village Defence Party) and work with active support of the Forest Department.

### 4. Protection of Fauna :-

It is necessary for the women to know why fauna has to be protected for posterity. They can prepare a list of endangered species in the area and decide the course of action for protection of animals. They can participate even in rearing of some animals apart from guarding fauna of the forest. Another common factor is the drying of streams resulting in shortage of fish. It is necessary to identify the streams running in the forest and even try for augmentation of forest resources by spreading fish seedling.

### 5. Rehabilitation Programme :-

It is a very difficult area where women will have to organise to stop illegal intruders. They should stop encouraging their own relatives to come to the forest to complicate the problems for them. In order to cater the needs of the new comers, certain economic activities will have to be generated with support from government and N.G.O.

### 6. Management of Forest :-

While the activities illustrated above is a part of

management of forest, it is essential to take certain steps for effective participation of the women for better management of forest. Women should organise groups to interact the forest officials. They should upgrade their own knowledge about forest and whatever knowledge they acquire, it must be cascaded to other women in the villages. The women can themselves organise awareness programmes regarding education, health, economic problems, etc. The women may train voluntary force for various activities. Women should be ready also to take part in many male dominated activities.

The agenda for the Gender Issues is definitely long and unless a wholehearted integrated approach involving forest, Sociologists, Environmentalists, Anthropologists, Economists, Research Groups etc. is taken, it is unlikely to achieve the objective for gender justice and effective forest management.



# LEVELS OF INCOME UNDER SHIFTING CULTIVATION AND ITS EFFECT ON NATURAL RESOURCES

S.N. Goswami

ICAR Research Complex for NEH

Region, Barapani-793 103

Shifting cultivation locally known as jhum is the major land use practice in the hills of North Eastern Region of India. It covers about 50 to 70 percent of the total area of North Eastern Region and the jhum area cultivated varies from 0.5 to 2.5 ha. per household. The fertility of the soil and the pressure from weeds are the major determinants of farmers' decisions on when to shift, generally after one to three years of cultivations. Then they leave the fields to lie fallow long enough to regain fertility and begin the cycle in new fields. But the present rapid population growth (57% from 1981 to 1991 in some states of the North Eastern Region) has led to a shorten fallow period, 4-8 years in many areas instead of the 20-30 years typical in previous decades. This is not the sufficient time to restore the soil fertility and as a result yield has successively declined overtime.

## The practices under shifting cultivation :

Shifting cultivation is practised in hilly terrain, where the gentle slope of the land, high rainfall, moderate temperature and good soil favour the quick growth of plants. There is no permanent field for cultivation, a plot of land is cleared and cropped once or twice and then abandoned under forest fallow. In November or early December, land is selected by the entire village on the basis of the rotation of fields. During the dry winter months, from December to February, the forest on the selected path are cut jointly or severally and left to dry. Before the onset of monsoon in early part of April, the dry debris are burnt. After a shower or two ash settles down and the field become ready for sowing. The entire area is divided among the stick or sharp knives. A large variety of crops are grown in the same fields. Weeding is a continuous process. Harvesting starts from the third month and continues upto December next. Thus, a complete cycle of activities is completed for

the first year field. A new plot is selected for cultivation for the next year and same process is repeated.

## Levels of income and production in shifting cultivation

The jhum cultivation was once a complete economic system with several subsidiary occupation and its adjuncts. Each village was more or less, self sufficient in respect of food, cloths, implements and housing materials. But such isolation was possible only during the period when such villages were ruled by independent chiefs. Even now the economic life of jhum villages revolves round the system of jhum cultivation. Traditionally hunting, fishing, and gathering from Nature's stock are important subsidiary sources of food. Moreover, collection of timber, canes and bamboos for house building and making household tools and implements remains an important source of income, though income cannot be accurately calculated. Besides these each jhumia household possesses a few domesticated animals, cows or mithuns, pigs and poultry birds. Almost all hill tribes practising jhum do not drink milk and as such cattle breedings and dairy do not have much place in the economy. Weaving is an important female occupation supplying almost all the consumption requirement of dress, but it has lost much of its grounds to mill made clothes.

Jhuming and its associated activities though remain the chief source of income of certain hill tribe in North East India, these no longer able to provide even the bare subsistence. This is why some non-traditional occupations are finding favour with the jhumias. The most important non-traditional occupation is the employment as wage labour. Under the pure jhum economy, nobody offers labour for hire but there are indication from village survey reports that the jhumias have been adopting some non-traditional occupations. The emerging pattern of income from the different sources in hill villages in North East India can be had from data given in Table which presents data on the percentage contribution of different occupations in the village income of some hill villages. It will be found from the Table that there is a wide range of variations in respect of contribution of jhuming to the total village income of different hill villages. It contribute more than 50% of total village income in all surveyed villages except Mawtnum (Khasi Hills) and Bansidue (Garo Hills). Kanther Terang, a Karbi village near Diphu has all its characteristics of a jhum economy. Mawtnum, a Khasi village located in the Bhoi area beside the Shillong-Guwahati Road and Benshidua, a Garo village near Phulbari, a growing



urban centre in Garo Hills are no longer dependent on jhuming and its associated occupations. Settled farming and horticulture contribute bulk of the income in these villages. In Mawnum, animal husbandry and dairying contribute substantial income. Comparatively, the economy of Hmunpui in Mizoram, Agalgri in Garo Hills (Meghalaya), Pakam and Khonsa in Arunachal Pradesh is dominated by jhuming aided by some non-traditional occupations. Pakam, a Gallong village in Arunachal Pradesh has of course, a good source of income from settled farming.

**TABLE - 1**

Percentage Distribution of the Contribution made by Different occupations in the Village income of several Hill villages of North East India.

Source of income	Kanther Terang (Karbi)	Mawnum (Khasi)	Hmunpui (Mizo)	Banshidue (Garo)	Agalgri (Garo)	Pakem (Gellong)	Khonsa (Noote Naga)
1. Jhuming	71.2	5.4	58.6	22.4	57.5	50.8	56.3
2. Settled farming	-	21.5	-	28.9	0.9	21.4	3.5
3. Horticulture	-	28.2	4.6	14.9	0.7	5.3	NA
4. Agricultural wages	-	0.2	0.7	-	-	-	-
5. Animal husbandry	5.2	14.2	11.3	2.5	1.3	2.1	0.6
6. Sub-total Agriculture	76.4	69.5	75.2	68.7	60.4	79.5	60.4
7. Extraction from forest	8.4	5.8	NA	5.1	NA	NA	13.6
8. Arts and crafts	-	-	0.1	1.3	0.3	2.0	NA
9. Trade and Transport	-	-	0.1	6.9	-	-	-
10. Non-Agricultural wages	3.6	4.5	10.6	5.6	30.4	13.7	5.4
11. Salary and Remittance	9.1	17.6	8.0	8.4	8.9	4.8	11.8
12. Miscellaneous	-	1.1	-	4.0	-	-	8.8
Sub-Total :							
Non-Agriculture	23.6	30.5	24.8	31.5	39.6	20.5	39.9
	100.0	200.00	100.00	100.00	100.00	100.00	100.00

Source: Village Surveys, A.E.R Centre, Jorhat

From Table 2, we can find the gross value product under, jhum in different villages. Data on the total inputs of man-days per hectere are available for Kanther Terang, Hmunpui and Agalari. In jhuming land is free and capital investement is insignificant. Seeds, the main capital are all home produced. Keeping these fact in mind, the return per manday (8 hours a day) of labour can be calculated. In Table 3 are

given data on inputs of mandays and gross value products per hectere and returns per manday in Kanther Terang, Hounpui and Angalgri from jhuming.

**Effect of shifting cultivation on natural resources :**

There are many evil effect of jhuming of natural resources. Due to the practices of jhuming there is heavy loss of fertile top soil due to erosion. This has caused great loss of soil nutrients available in the soil. According to the experimental findings of ICAR Resesrch Complex at Barapani, the average soil loss is estimated at 41 tonnes per hectare annually. This works out about 10.25 million tonnes of soil in the jhum cycle of five years. Similarly, the same experiment has shown that along with the soil loss, there is also corresponding loss of soil nutrients at an estimated 175.75 tonnes of organic carbon, 26.5 tonnes of P<sub>2</sub>O<sub>5</sub> and 1750 tonnes of K<sub>2</sub>O in the same period.

**TABLE - 2**

Estimated Production of crops (in mixture) per hectore of jhum cultivation in certain villages of North East India (In quintal)

Crops	Kanther Terang (Karbi)	Banshidue (Garo hills)	Hmunpui (Mizoram)	Khonsa (Tirap, AP)	Pakem (Siang, AP)
Paddy	8.85	8.94	8.06	4.08	8.32
Maize	1.70	0.64	1.12	-	0.30
Milletts	-	0.55	-	4.82	0.87
Cotton (Raw)	1.47	1.10	0.05	-	-
Castor seed	0.47	-	-	-	-
Sesamum	-	-	-	-	0.49
Mustard seed	Na	0.08	-	-	-
Turmeric (dry)	-	0.31	Ng	-	-
Ginger	0.01	Ng	0.02	0.12	0.05
Taro	0.28	0.14	-	1.88	-
Yam	0.50	0.18	-	0.12	-
Black gram	Na	-	-	-	-
Chillies (dry)	0.04	0.18	0.40	0.17	0.06
Tabacco	-	-	0.07	-	-
Cassave	-	0.57	-	0.60	-

Source : Village Surveys, A E R Centre, Jorhat, Ng-Negligible

Gross Value of products (is)\* 8090.00 7852.00 5854.00 7930.00 6803.00 Adjusted at current prices.



**TABLE - 3**

Inputs of Labour and Value products per Hectare per Mandays in Hill Villages

Village	Mandays per hectare ( Annual)	Gross value products per Hectare	Return per Manday
Kanther Terang	219	8090. 00	36.94
munpui	276	5854.00	21.20
Agalgri	257	5633.00	21.92

Source: AER centre, Jorhat-Village survey.

The practice also causes destruction of animal, birds and favourable insects together with habitats. Loss of forest cover due to jhuming in different states are given in Table 4. It could be seen from the Table that the loss of forest cover in North east due to the practice of shifting cultivation is 702 sq kms. Among all the seven states Mizoram lost the highest forest cover of 256 sq km. Out of the total loss of 983 sq. km. of forest cover in North Eastern states 702 sq km. loss was due to the practice of shifting cultivation. Therefore the major loss in forest cover was attributed to the practice of shifting cultivation. Regeneration of forest due to afforestation measures taken by the Government and other organisation was to the tune of 348 sq km. Therefore there is a net loss of 635 sq.km. in forest cover in North Eastern states. If this loss is measured in economic terms. the loss may be of several thousand crores. Another direct physical loss caused by jhuming is in terms of good number of first class timber is destroyed. If by losing one tree one loses 2.5 cu.m. in one jhum cycle for five years, the state of Meghalaya loses about 625,000 cu.m. of firstclass timbers, excluding obcourse, other valuable forest produce like fibre bamboo, cane,thatch and a host of others that get reduced to complete ash. As per the estimate made by the Forest Department of Meghalaya the average annual loss per hectare in case of timber, bamboo and broomstick due to jhuming is to the tune of 20 cu.m, 6mt and 6kg respectively. If we were to convert the above physical destruction and loss into monetary or financial terms, perhaps the figures will be stupendous -- it may come to hundreds or thousands of crores of rupees.

This is indeed a colossal loss to the people and the region.

Against this background, the yield obtained from the jhum fields is only a pittance and can sustain a family for only about three to four months in a year. This is indeed a picture of definite unequal companison in terms of economic development and loss of vital resources of nature.

**TABLE - 4**

Loss of Forest Cover due to shifting cultivation and gain to Afforestation Measures

State	Loss due to			Gain due to			Net. (+) gain (-) loss
	shifting cultivation	other reasons	Total loss	Regeneration in abandoned shifting cultivation areas	Other reasons	Total gain	
Arunachal Pradesh	70	26	96	-	-	-	-96
Assam	165	190	355	104	8	112	-243
Manipur	28	36	64	-	-	-	-64
Meghalaya	110	2	112	6	-	6	-106
Mizoram	256	-	256	100	-	100	-156
Nagaland	63	-	63	90	-	90	+27
Tripura	10	27	37	15	25	40	+3
<b>Total</b>	<b>702</b>	<b>281</b>	<b>903</b>	<b>315</b>	<b>33</b>	<b>348</b>	<b>-635</b>

Therefore net loss in forest cover in the NE sates = (983-348) = 635 sq.km.  
 Source : Govt. of India, Forest Survey of India  
 Basic statistics, 1995, NEC, Shillong.

**Conclusion**

From the above analysis it is seen that the major portion of the income of jhum practisingvillages comes from jhum. The level of income and production from jhuming appears to be very low compared to prevailing wage rate. The practice of jhuming has created an alarming situation in terms of loss of natural resources. Thus there is an urgent need to have an insight into the practice of jhuming. There are two approaches to make this practice sustainable and ecofriendly. The first



one is improvement approach and the second one is replacement approach. In the improvement approach the moto is to increase the productivity of jhuming by introuducing better varieties of crops and planting of such crops which can reduce the soil erosion to a considerable extent.

In this regard the example of "Nagaland Environment protection and Economic Development through people Action (NEPED)" Project, may be cited. In this project the jhum farmers are asked to plant local cimber tree varities along with paddy in the land acquired after slashing and burning the green cover. The plan, that may very well be named sustainable jhum, envisages that unlike before when the land was left barren after two or three crops, now these tree will continue to grow after a plot is left by a farmer, thereby preserving the strength of the land and also rejuvenating it. It is not directly aimed at elemination of jhum but at helping the farmers to shift attention from annuals to perennials, and is based on the realization that they have an intimate knowledge of the biodiversity of the land. This project is funded by the Canadian International Development Agency (CIDA) through India-Canada Environment Facility (ICEF). In the replacement approach the emphasis is given to the introduction of sustainable and ecofriendly alternative farming systems. From the past experience it is seen that this approach has not given the desired result as it has an abrupt effect on socio cultural life of the tribal. It has been seen that there are good number of indiginous ecofriendly and sustainable agricultural systems practised by the tribal farmers of the North East. Emphasis should be laid on expanding these system to the jhum areas. Since these system are already in practice. therefore these will be easily acceptable to the jhumias. Acceptance of these systems will help in increasing income alongwith the conservation of natural resources. However whole hearted efforts of extension agencies are needed for its success.

## WATERSHED BASED FARMING SYSTEMS FOR NORTH-EASTERN HILLS REGION

**K.A. Singh, R. N. Prasad and U. C. Sharma**  
*ICAR Research complex for NEH Region, Barapani,  
Meghalaya - 793103.*

### SUMMARY

Existing agricultural system in the north-eastern hills region have accelerated land degradation and depletion of other natural resources. Watershed as a base for developing different farming systems ensured adequate protection of land against soil erosion on steep hill slopes at ICAR Research Complex, Barapani. Model land use (Agri-horti-silvipasture), dairy based farming and food crops with subsidiary dairy cow (mixed farming) proved their econimoc viability. Forestry, Agroforestry and Horticultural crops based farming systems revealed their biological potential by showing good plant growth in last 5-6 years. An increased understanding of watershed management by a broad range of people, policy makers to land users, playing different roles in the design and implementation of watershed based farming, is needed.

### INTRODUCTION :

North-eastern hills region comprising of seven states namely, Arunachal Pradesh, Assam, Manipur, Mizoram, Meghalaya, Nagaland and Tripura is characterised by large diversity in topography, climate and soil conditions. The region consists of mountain ranges and narrow valleys except Assam plains and Imphal valley. Primitive agriculture systems and indiscriminate use of natural resources adversely affect enviornment and agricultural productivity. High rainfall and steep hill topography are always associated with problem of severe soil erosion. Food production



systems predominantly shifting cultivation with short cycles, bun cultivation and growing pineapple along the hill slopes, have accelerated soil erosion (Table 1). Other development activities viz., construction of roads and hydel projects etc. have also affected land resources adversely at various places. Shifting cultivation, which is being practiced over 13515 sq. km. at one time or other, is most important cause for this situation. In this talk, I will discuss some of the approaches and research experience based on watersheds as the alternatives to shifting cultivation.

Table 1. Soil erosion hazards associated with various land use practices

Land use system/practices	Soil loss (t/ha/year)	Experimental plot size
Shifting cultivation	30.2-170.2	Small
Tuber crops on raised bed (bun)	5.1-83.3	field
Pineapple cultivation along the slope (first 2 years)	40.0-50.0	Medium
Homestead areas	24.0-62.6	Small
Mixed crop of maize and rice	16.8	Field
Rice crop on slope	19.7-21.0	Small
Bare fallow	32.9-45.0	Small
Cropping systems	83.3	Small
Grass cover (planted)	51.0-83.8	Medium
Natural bamboo forest	10.8	Medium
	0.04-0.52	Field

Small - 2-5 m<sup>2</sup>, Medium - 16-40 m<sup>2</sup>, Field - 69,000 m<sup>2</sup>

Source : Parasad et al. 1986

### Watershed-above for developing appropriate farming systems: What is watershed ?

A watershed is the total area of land above some point on a stream or river that drains to that point; it can be as small as few hectares for a small stream/ drainage or as large as thousand hectares in a river basin. Watershed area in the hills are generally small in size and easy to demarcate.

### Watershed Management :

It is the process of guiding and organising land and other resource use a watershed to provide needed goods and services without adversely affecting soil, water and other natural resources.

### What is sustainable development?

Development involving changes in the production and/or distribution of good and services which result for a given target population in an increase in welfare that can be sustained time.

(Gregerson and Lundren, 1989)

Sustainable development can occur only when the needs of people and the capacity of the natural resource base to meet those needs are balanced over time. Watershed management provides a convenient framework to use in moving toward this balance. The on the growth implementation of watershed management relies on many biophysical practices (e. g. soil erosion control, reforestration and institutional mechanisms viz., market and nonmarket incentives and regulations) within a framework that attempts to balance demands on resources with the supplies of goods and services they can produce on a sustainable basis. For steep hill slopes, the following consideration may form the base while planning for effecient land use systems on a watershed basis.

- i) Ensuring adequate protection of land against soil erosion with the use of local resources based conservation measures.
- ii) Maximum retension of rainfall within the area without affecting the crop(s).
- iii) Storage of runoff, its use for psciculture and irrigation if feasible and management of eroded silt, needs to be considered as an essential part of rain water management.

In a watershed management farmework various structural and non-structural practices are undertaken to achieve above mentioned objectives. The point about the with and without principle is important to keep in mind. some watershed management practices do not stop or reverse a physical process but they do slow the rate of enviornmental damage and thus create benefits. Although the short term effects of such practices may not be readily observed



by people, their cumulative long term effect can contribute directly to the success and sustainability. Generally, agricultural, forestry and other land use and engineering practices are combined to accomplish watershed management objectives.

### Watershed Management Training Needs :

An increased understanding of watershed management and therefore, increased training activity is needed by a broad range of people playing different roles in the design and implementation of sustainable land use systems based on a watershed (Table 2). The basic strategy emphasises local or regional involvement which accomplishes two major purposes :

- i) Training materials and methods are developed that are locally relevant.
- ii) Local capability to continue training activities is enhanced.

### Farming Systems :

**Farm forestry :** Forestry can play an important role in developing sustainable agricultural systems. Social forestry differentiated to production forestry, refers to farm or community forestry or forestry for local community development. It has important connection with environmental protection, agricultural productivity, the fuel crisis and the generation of employment opportunities (Fig. 1)

**Agro-forestry :** Sustainable production alternatives such as agroforestry practices after require accepting at least a short term sacrifice in agricultural output and usually require additional inputs such as tree seedlings and planting tools. Agroforestry techniques will need to be promoted among rural farmers by demonstrating the benefits of various options. A complete package would include technology options and a set of government policies that encourage agroforestry systems and would provide services in the form of seed, seedling and credits or some other form of financial assistance.

**Mixed farming :** Production of food crops with subsidiary livestock component in a mixed farming systems may improve the nutritional status of farm families with close organic recycling of by-products contributing towards sustainable agricultural

Table 2. Who needs to know about watershed management

Information and knowledge types

#### Background information on :

Actors or Users	Benefits and Linkages	Needs	Constraints	Technology & resource requirements	Techniques of watershed management planning	Design evaluation & appraisal methods	Technical Options	Management & organisation	Field techniques
Policy makers & sector planners	A	A	A	A	A	-	-	-	-
Project level planners & Managers	LS	LS	LS	LS	S	LS	S	LS	LS
Field-level staff	LS	LS	LS	LS	-	-	LS	LA	LS
Local leaders and NGOs	LA	LA	LA	LA	-	LS	LS	LS	LS
Farmers & other land users	LS	LS	LS	LS	-	LS	LS	-	LS
& Teachers of teachers'	S	S	S	S	S	S	S	S	S

A = General appreciation, S = Specific knowledge, LS = Local specific knowledge, LA = Local general appreciation

Adapted from Gregersen, H.S. Draper and D. Elz (eds.), Forthcoming, People and Trees : The Role of Social Forestry in Sustainable Development. The World Bank : Washington, D.C. 369 pp.



development. Growing crops on the terrace and forage grasses on terrace risers are the ideal approach to develop mixed farming systems on hill slopes. Under high rainfall situation, grasses on terrace risers, acting as live lysimeter, arrest nutrients in runoff water and produce forage without nutrient input and extra land.

**Horticulture based farming :** Growing fruits and vegetables near a market place/city may be rewarding option. Perennial cover of fruit trees on upside and vegetables on downside rich soil on a hill slope may prove sustainable production systems.

**Model land use :** In remote places, integrating livestock, horticultural and field crops to develop a model land use systems, will meet the requirement of balanced diets for the farm families with some cash income.

**Research experience gained in watershed based farming systems at ICAR Research Complex, Barapani :** The details of experimental watersheds at Barapani have been depicted in Table 3. All the farming systems based on microwatersheds were able to retain 90/95% rain water and reduce soil loss to a acceptable level. Thus, they were effective in protecting the hill slopes from land degradation. Agri-horti-silvipasture, dairy based farming system and mixed farming proved their economic viability. Other farming systems also showed their biological potential during last 5-6 years of study.

Table 3. Details experimental micro-watersheds, land use systems and soil conservation measures

Land use	Average Slope (%)	soil. & water conservation measures	Crops/livestock
Levstock based Farming (FSW-1) Area - 0.94 ha,	32	Contour trench, bunds & grassed water wages	Annual & Perennial Forage crops, fodder trees for two unit of dairy cows & their followers.
Forest for fuel wood (FSW-2) Area - 0.84 ha.	38	-	Alder, Australian a babool etc.

Forest for timber (FSW-8) Area-0.50 ha	41	-	Tila chap
Agroforestry (FSW-3) Area - 0.90 ha.	32	-	Exhucklandia, Chary, wattle, pine, Gauva, Pineapple etc. with 10 goats
Food production with one dairy cow (FSW-4)	32	Contour bunds, bench terrace & gassed water wages	Rice, Maize, Pulses, Radish, ginger etc. on terrace and guinea grass on risers with one cow & followers.
Model land use Agri-hortisilvipasture (FSW-5) Area - 1.03 ha.	42	Bench terrace & half moon terrace	Orange, lemon, pineapple in middle, maize sweet potato, ricebean with 10 goats on silvipasture and 10 pigs.
Fruits & vegetables production (FSW-6) Area - 0.96 ha.	53	-Do-	Orange, lemon, pineapple & vegetables.
Natural fallow (FSW-7)	46	-	Natural regeneration of pine makari sal with grasses

Land cap ability - VII, Soil - Clay loam.

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## Work Plan for Organising Forest Resources in Hill Districts of Assam an outline

**S. K. Dhyani**

ICAR Research Complex for N.E.H. Region  
Barapani, Meghalaya 793, India

### **Abstract**

In the two hill districts of Assam viz. North Cachar and Karbi Anglong, though the forest cover is higher than the national as well as state average, but is getting reduced at an alarming rate due to continuance of shifting cultivation, deforestation and other reasons. As a result adverse effects like frequent floods in low lands; severe soil erosion; reduced water yields; decreased productivity and reduced harvests from forests are quite prominent. To halt further degradation of forests, scientific land management with people's participation is need of the hour. Involvement of people and tribal farmers in organising forest resources will help in translating the technology into field action.

### **INTRODUCTION**

In the entire north-east region, mountainous, terrains coupled with high precipitation form the unique natural resource, and about 70% of the total geographical area of the region comprised of hill slopes. Forest resources are the critical ecological elements in the vulnerable hill ecosystem. The diverse forest flora have been central in maintaining water and soil stability under high rainfall conditions. They have also provided the most significant input for sustainable agriculture and animal husbandry in this region. In North Cachar and Karbi Anglong districts, about 39.4% of the geographical area is covered by forests as compared to 31.5% forest cover in Assam (Table-1). However, the forest cover in the two districts is getting reduced at an alarming rate due to continuance of shifting cultivation, deforestation and other reasons. As a result adverse effects like frequent floods in



low lands; severe soil erosion; reduced water yields; decreases productivity and reduced harvests from forests are quite prominent. In North Cachar, Karbi Anglong and Mikir Hills, about 58,000 tribal families are involved in shifting cultivation and the area affected by the practice annually is 696 sq. km. and the minimum area at one time or other is about 1392 sq. km. This corresponds to 2.26% and 4.53% of the forest area respectively.

**Table 1. Forest cover assessment of the two hill districts of Assam.**

	Geographical area (sq.km.)	Forest Dense	Cover Open	(%)-1991 Total
NorthCachar	4,888	24.72	14.64	39.4
Karbi Anglong	10,434			
Assam	78,438	20.19	11.36	31.5

State of Forest Report, 1991.

Forest figures are combined for the two districts.

**Table 2. Population and growth rate of the two hill districts of Assam.**

	Population (Persons)-1991			% Growth rate 1981-91		
	Rural	urban	Total	Rural	Urban	Total
North cachar	116,315	34,486	150,801	62.51	589.08	96.31
Karbi Anglong	592,257	70,466	662,723	58.52	558.19	72.79
Assam	19926527	2487795	22414322	48.65	91.66	52.44

As the 1981 census could not be held in Assam the growth rates related to the period 1971-91.

Source: Basic Statistics of NER- 1995, NEC, Shillong.

#### Approach

Resource conservation vis-a-vis forest restoration through integrated watershed management and community participation approach is the only answer to bring back the degraded forest ecosystems. Amelioration of wastelands through integrated watershed management strategies is a sustainable resource conservation

endeavour. A suitable mix of erosion control structures (half moon terraces, contour bunds, grassed water ways, gully plugging and bench terraces) and low cost vegetative technologies deploying local skills, materials, man power and indigenous practices, appears to be an appropriate work plan for organising forest resources in the two hill districts. Development of economically viable, socially acceptable and environmentally sound technologies with peoples participation is to be kept the underlying principle for ensuring protection and production on sustainable basis. It is a basic feature of decentralized micro-level planning. Community participation at conceiving, planning, designing and implementation of watershed development and subsequent management systems and operations is a key issue of the recently enacted Panchayati Raj System Act of 1994. The few examples of successfully implemented projects of this nature are at village Sukhomajri, Bunga (Haryana) and Reimajra (Punjab) in Shiwaliks, Nalotanala and Sahastradhara (Dehradun district) and Fakot in Tehri Garhwal (Uttar Pradesh).

#### CONSTRAINTS

For organising forest resources people's participation should be the central thrust. Before outlining the work plan constraint analysis should be undertaken. Some of the major constraints in the two hill districts and elsewhere are enumerated here,

#### A. **BIOLOGICAL CONSTRAINTS INCLUDING LAND RESOURCES:**

Land ownership, land use and socio-economic aspects are the principal factors which lead to land degradation. Shifting cultivation being a part and parcel of socio-cultural life of the tribal people, in spite of its adverse effects on the eco-system and productivity, is still in practice as a necessary evil. The rationale behind its persistency lies in its compatability with the physico-social environment, community land tenure system, undulating and steep topography and lack of communication leading to physio-graphical remoteness and isolation. "Community land" i.e. land other than agricultural land, is considered as free resource by the population, hence, over exploited which lead to degradation. Rehabilitation of such areas through alternative, sustainable biomass production should be undertaken on priority. Major emphasis could also be placed on introduction of high value industrial and forage grasses such as broom grass. Besides,



low lands; severe soil erosion; reduced water yields; decreases productivity and reduced harvests from forests are quite prominent. In North Cachar, Karbi Anglong and Mikir Hills, about 58,000 tribal families are involved in shifting cultivation and the area affected by the practice annually is 696 sq. km. and the minimum area at one time or other is about 1392 sq. km. This corresponds to 2.26% and 4.53% of the forest area respectively.

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Source: Basic Statistics of NER- 1995, NEC, Shillong.

#### Approach

Resource conservation vis-a-vis forest restoration through integrated watershed management and community participation approach is the only answer to bring back the degraded forest ecosystems. Amelioration of wastelands through integrated watershed management strategies is a sustainable resource conservation

endeavour. A suitable mix of erosion control structures (half moon terraces, contour bunds, grassed water ways, gully plugging and bench terraces) and low cost vegetative technologies deploying local skills, materials, man power and indigenous practices, appears to be an appropriate work plan for organising forest resources in the two hill districts. Development of economically viable, socially acceptable and environmentally sound technologies with peoples participation is to be kept the underlying principle for ensuring protection and production on sustainable basis. It is a basic feature of decentralized micro-level planning. Community participation at conceiving, planning, designing and implementation of watershed development and subsequent management systems and operations is a key issue of the recently enacted Panchayati Raj System Act of 1994. The few examples of successfully implemented projects of this nature are at village Sukhomajri, Bunga (Haryana) and Reimajra (Punjab) in Shiwaliks, Nalotanala and Sahastradhara (Dehradun district) and Fakot in Tehri Garhwal (Uttar Pradesh).

#### CONSTRAINTS

For organising forest resources people's participation should be the central thrust. Before outlining the work plan constraint analysis should be undertaken. Some of the major constraints in the two hill districts and elsewhere are enumerated here,

#### A. **BIOLOGICAL CONSTRAINTS INCLUDING LAND RESOURCES:**

Land ownership, land use and socio-economic aspects are the principal factors which lead to land degradation. Shifting cultivation being a part and parcel of socio-cultural life of the tribal people, in spite of its adverse effects on the eco-system and productivity, is still in practice as a necessary evil. The rationale behind its persistency lies in its compatibility with the physico-social environment, community land tenure system, undulating and steep topography and lack of communication leading to physio-graphical remoteness and isolation. "Community land" i.e. land other than agricultural land, is considered as free resource by the population, hence, over exploited which lead to degradation. Rehabilitation of such areas through alternative, sustainable biomass production should be undertaken on priority. Major emphasis could also be placed on introduction of high value industrial and forage grasses such as broom grass. Besides,



development of such areas is expected to reduce pressure on the neighbouring forest areas by producing goods and services from these waste lands. In the community lands different alternative land use systems such as agroforestry systems could be evolved based on site conditions. ICAR Research Complex in its significant achievement identified 'agri-horti-silvipastoral' model as alternative to shifting cultivation. Further notable successes have been achieved in integrated management of soil and water resources through watershed planning and management. The systems as outlined here are based on judicious combination of agriculture, horticulture, livestock, forestry and agroforestry. The agroforestry systems strengthened with subsidiary sources of income such as animal husbandry, fishery, apiculture or sericulture, provide opportunities for optimum realization of potentials through recycling of wastes of the system for converting them into economic products.

1. Hill tops Pure silviculture, mixture of tree species, silvipastoral.
2. Mid hills Silvi-horticulture, agri-silviculture, Sericulture with fruit plants and grasses.
3. Foot hills Agri-horticulture, sericulture with crops.
4. Valley lands Agroquaculture, Paddy-cum-sericulture, paddy-cum-fish culture

#### B. PHYSICAL AND NUTRIENT CONSTRAINTS:

- i) Shallow soil depth, poor textured soil restricting proper root extension.
- ii) Undulating topography and high degree of slope,
- iii) Landslides and exposed sites,
- iv) Sparse flora and fauna, absence of humus formation and nutrient recycling,
- v) Low soil fertility, acidic soil reaction and p deficiency.

#### C. BIOTIC DISTURBANCES :

The major causes of poor survival of plantation are cattle damage and forest fires. The system of "free grazing" in many parts during winter months is the principal factor for limited success of afforestation programmes. Slash and burn method of shifting cultivation

and accidental fires in the forests lead to deforestation and degradation.

#### D. LONG GESTATION PERIOD :

Most forestry programmes have long gestation/waiting period. People in general tend to ignore long-term effects of the programme. Planting fast growing MPTS like *Alnus nepalensis* (alder), *Albizia* spp., *Gmelina arborea* (gumhar), *Michelia champaca* (tita chop), *Prunus cerasoides* (cherry), *Parkia roxburghii* (tree bean) etc., and multi-purpose tree species (MPTS) based silvipastoral system is likely to generate interest among the people.

#### TECHNOLOGICAL INNOVATIONS

The constraint analysis brings out that for reversion and rehabilitation of degradation process as well as organising forest resources, it needs innovations in the technological aspects of afforestation and reforestation. Further, suitable plant species and proper management practices which may be sitespecific, based on socio-economic needs of the people are vital for achieving the success. Some of the points worth mentioning here are as below.

##### I. What to plant?

Species selection-important factors;

1. SURVIVAL & GROWTH
2. PEST RESISTANCE
3. END USE / FUNCTION OF TREE/ECONOMIC RETURN (Fuel, Fodder, Fibre, Timber etc.)
4. CHOICE OF LOCAL PEOPLE
5. INHERENT BRANCHING, FOLIAGE & ROOTING PATTERN
6. ENVIRONMENTAL CONDITIONS
7. SOIL IMPROVEMENT / IMPACTS (E.Q.NFTS)

The I step in the planting process is to get best species for the site. Poor adopted seedlings grow poorly or die.

*Alnus nepalensis*, *Gmelina arborea*, *Michelia champaca*, *Peraserianthes falcata*, *Prunus cerasoides*, *Parkia roxburghii* etc. are some of the promising fast growing species for this region.

##### II. How to plant?

\* Soilworking- deep soil working (11/2' x 11/2' x 2') helps quick establishment & growth of the seedlings.

\* Fertilizers and plant protection-In wasteland and other



degraded sites the soil fertility is generally poor which indeed inhibits growth and productivity of the site. This issue is often overlooked or under emphasized. Hence, initial fertilization with NPK mixture and FYM and suitable culture for nitrogen-fixing trees will definitely boost growth and survival on poor sites.

\* Planting guidelines-

1. MINIMIZE TIME BETWEEN LIFTING (NURSERY & PLANTING)
2. PLANT TALL & HEALTHY SEEDLINGS
3. DELAY PLANTING IF THE SOIL IS DRY. TO SURVIVE, A NEWLY PLANTED SEEDLING MUST BEGIN TAKING UP WATER & NUTRIENTS QUICKLY, & IT CAN NOT DO SO IF THE SOIL IS DRY
4. AVOID PRIMARY CAUSE OF MORTALITY
  - TOO SHALLOW
  - LOOSELY PLANTED
  - ROOTS DRY OUT BEFORE PLANTING
5. PLANTING HOLES VERTICAL, DEEP & WIDE
6. PROTECT ROOT SYSTEMS & SPREAD THEM OUT IN PIT-J-rootin & I-rooting slow early growth
7. CUT & REMOVE POLYTHENE BAGS FROM SIDE
8. OVER TOP OF ROOT COLLAR WITH FIRMLY PACKED SOIL
9. PLANT ON COOL, CLOUDY OR RAINY DAY  
Grazing protection

Aftercare and maintenance for first 2-3 years has to be ensured for plantations. The area can have "social fence" for a certain period. A scheme similar to deferred rotational grazing for protection of young plantations could be followed.

**People's participation for organising Forest Resources:-**

**Work plan:**

In order to prepare a work plan for organising forest resources in the two hill districts, the following outline could be followed,

1. Introduction: aims and objectives of plan.
2. Description of area
  - 2.1 Location
  - 2.2 Climate-rainfall etc.
  - 2.3 Geology

2.4 Soils and land capability classification

2.4.1 Land capability classes- A detailed soil survey is to be carried out to group the land into different land capability classes.

3. Present land use-agroforestry and forest resources  
Bench mark quantitative survey of natural vegetation outlining plant community structure and composition is to be carried out.

4. Proposed land use-on the basis of LCC and resource available.

4.1 Diversification of Community land use Rehabilitation of such areas through alternative systems of biomass production as outlined earlier should be initiated. Hybrid napier (*Pennisetum purpureum*) is a very good high yielding fodder and can give 4-5 cuttings throughout the year. It could be planted in Common land reclaimed after removing unwanted and uneconomical weeds like Lantana and other wild growth. This plantation not only serves as a source of revenue to the village Society but is also a source of planting material for propagation in other lands.

**Some Salient Points :**

The success of such plan depends on community participation right from the beginning. The participation becomes easy if the community is convinced of the aims and objectives of the plan. The community must be assured that the plan will deliver goods and services which will be beneficial to them.

Members of the local community could be engaged to assist in survey, planning, designing and implementation of the programme. Farmers can be entrusted for raising seedlings for various forestry programmes. Polythene bags, seeds and necessary technical advice for raising nursery be arranged with the help of Forest Department. Once the seedlings are ready, it should be ensured that they are purchased from the farmers so that he gets good remuneration. This is the best way to get people's cooperation as well as creating awareness. Other operations such as pit digging, adding farm yard manure, filling the pits, planting saplings and after care of plants could be entrusted to farmers. Land levelling, field bunding and stabilisation of bunds by



vegetative measures are other operations where farmeres could take initiative for day to day management of the programme, a Forest Resource Users Society (FRUS) could be constituted and registered. The society accrue its income from the sale of grass, fodder and fuelwood produced on common lands. Its responsibilities include regulation and management of common lands, prevention of grazing and felling of trees and settlement of disputes among members. Educated unemployed youth could be engaged for these operations.

#### **Benefits.**

Three benefits will accrue from the plan-protective, productive and Social. By adoption of proper soil conservation measures the area will be protected from soil erosion. Closure of the hilly area to the grazing of animals will also minimise soil loss from the area. At the same time protective benefits like saving of habitats from land cutting, saving of fertile top soil from crop land will also help in protection. Impact of the plan in augmenting ground-water recharge and greening hill slopes are the direct protective benefits. Productive benefits will be obtained from community lands by generating extra income from horticulture, agroforestry, grass production and dairy development. The benefits will also accrue to landless of the village in the form of broom making, as more and more broomgrass will be available. Significant social benefits through employment generation from clearance of area, planting operations for saplings and grasses etc, will be obtained.

Thus, organising forestry resources has to be viewd as an activity encompassing in its the whole gamut of socio-economic development of the rural communities. The results distinctly reveal that the meanace of land degradation specially under shifting cultivation could be effectively checked through integrated management of soil and water resources. The systems outlined here have shown build in dynamism with regards to food security, employment generation and maintenance of soil fertility- a key factor for developing sustainable production systems on sloping lands.

## **Recommendations of the Seminar on Forest Resources of the Hill Districts of Assam - Constraints of Development**

### **1. Policy**

#### **A. Area of Forest Cover :**

The Forest Policy of India states that 30% of the land area of the country as a whole should be kept under forest cover. This figure has neither scientific nor economic basis. Repeating this unscientific and un-attainable target only detracts attention from the priority task of preserving all our existing forests. Many highly developed countries of the world have much less forest cover whereas many countries with far higher percentage of land under forest cover are economically amongst the least developed countries. Though the Forest Policy does state that in the hilly areas percentage of forest cover should be 60%, in Assam in the two hill districts the area of Reserved Forests is as little as 4.2 percent; the unclassed state forests in these two districts are actually jhum land and subjected to increasingly severe denudation.

The policy objectives and priorities should be (a) to preserve all existing forests in the plain Districts (b) to increase Reserved Forest Areas in the hill districts by constituting new Forest Reserves on steeply sloping jhum land (c) constitute new forest reserves in the all the districts of Assam on land unsuitable for agriculture or horticulture for which proposals have been submitted by the Forest Department but are pending with government since many years.

#### **B. Private Industrial Forests**

To meet industrial requirement of forest produce, industrial houses such as plywood mills, paper mills, large saw mills should be encouraged to create their own forests taking on long lease



land from the Govt/ District Councils, both on fallow land outside forest reserves and other degraded areas with sparsely stocked economic vegetation. Areas suitable for natural regeneration should not be leased out. The lease for this purpose should not only specify monetary conditions but should mention silvicultural and management requirements. In developed countries, private forests not only constitute nearly 50% of the commercially valuable forests (more than 50% of Northern timber regions and West Coast forest areas are owned and managed by industrial timber companies. These timber companies train their own forestry staff in University forestry courses but promote trained forestry staff to company management boards) Private forests also will be able to tap Bank finance for regenerating degraded forest land.

### C. Control of Forest Reserves :

The control and management of Forest Reserves have recently transferred to the District Council which is against the concept of constitutional provision of Forestry as a concurrent subject. The District Councils are for the development of the districts/ sub-divisions under their jurisdiction but without sacrificing national interests. The hill districts have so little Reserved Forests that if these are also managed for short term Revenue earning as District Councils are doing, climate, Soil and River flow are bound to be adversely affected both in the plains and the hills and intensity of floods will increase. To ensure scientific management for long-term benefits for the Nation, the entire control and management of the Reserved Forests should revert to the state Government very soon. The revenue from these R.F. should be given to the District Councils to augment their income.

### D. Tribal Rights:

The rights of any person or class of persons were duly extinguished within Reserved Forests at the time of their

constitution. Some privileges were recorded within unclassed Forests in respect of grazing, fuelwood collection etc. In respect of wildlife protection, endangered species are fully protected and 'closed seasons' are applicable to tribals and non-tribals alike. It has been seen that some persons (whether all are tribals or mercenaries using the tribal label is unclear) are seen clamouring that by preventing hunting in accordance with the wild Protect Act, the rights of the tribals have been denied! It is forgotten that tribals used to hunt in earlier times by using bow and arrows or spears or traps - not wantonly killing by automatic or even non-automatic firearms. Besides, in the interest of the country and the Nation, all communities have to voluntarily forego some harmful practices. It is necessary to make all communities aware through publicity campaigns of the danger of wanton killing of wildlife, in their own interest as well as the broader interest of the Nation.

### E. Food Forests :

Experience has shown that shifting cultivators can be attracted to settled land-use practices through agro-forestry systems. If tribals are encouraged to grow some fruit trees or utility trees along with their jhum crops at wider spacings, they continue to have the yield of annual crops till the canopies of the fruit trees (Citrus, Lichi, mango, banana, etc.) closes. By then the hill-side farmers begin to get the yield of fruits (for selling) and feel no need of growing annual crops - at least on the same land. Reversely, in tree crop or plantation crop plantations, in the early stages, food and spice crops such as banana, pineapple, ginger, turmeric, cardamom etc can be profitably grown till the main plantation crops begin to give commercial yield.

It is recommended that establishment of "Food Forests" through agro-forestry practices be undertaken amongst the jhum cultivators to attract them to settled land use practices.

### 2. Women's Role in Forest conservation :

Studies have shown that women's involvement in forestry



activities, specially in shifting cultivation and fuel wood collection are far greater than men's. Women are also the direct users of fuel used for cooking. In fodder and materials for minor house hold articles women are engaged more than men. They also contribute substantially in nursery and plantation activities.

Despite recent amendments of various acts relating to wage and welfare of women & they are still discriminated against in many areas. Women role in preventing environmental degradation is very considerable as they are engaged directly in collection of forest produce specially in localities where forest are fast disappearing.

Although there are many non-government women's organizations, they need to be encouraged and guided by concerned government departments to involve themselves more in improving the working conditions of the women engaged in forestry activities. These organisations should also be assisted to impart education on the importance of protection of the environment in rural and tribal areas.

### **3. Research and Demonstration :**

The agricultural research institutions in the North East, specially the I.C.A.R. and the Agriculture University should intensify research on replacing shifting cultivation with settled agriculture developing packages for different locations keeping in view the traditional social customs of the hill side land users. These research should take into account the excellent works already done by the Soil conservation, Agriculture, and Forest Departments of the North-Eastern states in formulating the research programs. More research is also needed in developing agro-forestry packages for different hill districts keeping in view the preferred and needed produce by different communities. Technical soundness should not be the only criteria but economic considerations and acceptability of the practices by the concerned communities also should be taken into consideration in recommending improved practices. Before recommending

any research findings for general adoption, full scale trials and demonstrations should be undertaken on farmer's fields.

### **4. Allternate Measures for introduction of settled land-use Tea Plantations :**

A. Out of a total area of 15,220 sq. km. of the two hill districts of Assam, only 1470 km<sup>2</sup> are under permanent cultivation, the area of Reserved Forests is 6457 km<sup>2</sup>. Though precise figures are not available, 6500 km<sup>2</sup> of land can be taken as used for jhum cultivation and fallow land unsuitable for traditional agriculture, Plantation crops like coffee, Para-rubber and black-Pepper are being encouraged on land used for jhumming by the Assam Soil Conservation Department, and the plantation Crop Development Corporations. However attention has so far not been paid to grow tea on some of the available land although it is a proven crop for the high and undulating land of the N.East.

Presently 2200 km<sup>2</sup> of land under tea in Assam supports a work force of 70,000 in the tea-garden factories only and supporting generally a population of 50,000 from the tea economy.

It is estimated that at least 200 km<sup>2</sup> of land suitable for tea cultivation is available in the two hill districts. It is therefore suggested that tea cultivation on a large scale should be undertaken in N.C. Hills and Karbi Anglong districts through private enterprises following the very successful private tea garden model of the country.

### **B. Constitution of Forest Reserves :**

The existing Forest Reserve in the two hill districts (6457 km<sup>2</sup>) are too meagre to protect the soil and regulate the river flows and control floods. Many of the most vulnerable catchment areas are not Reserved Forest - and are presently jhummed or are abandoned jhum lands. It is recommended that the steep catchments of the rivers be constituted into Forest Reserves before all the Soil is washed down and it becomes too late even for forests to grow.