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PRACTICE OF SHIFTING CULTIVATION IN NORTH-EASTERN INDIA

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Abstract

India dominantly an agricultural country has diverse land cultivation techniques. Shifting cultivation being one amongst it. The practice of shifting agriculture dates back to about 8000 BC in the Neolithic period. In India, shifting cultivation is practised in the hill areas of North-Eastern Region, Sikkim, Bihar, Orissa, Andhra Pradesh, Madhya Pradesh, Tamil Nadu, Kerala, Karnataka and Maharashtra. But among all these states, such practices are still prevalent in the hill areas of North-Eastern states, Orissa and Andhra Pradesh. In Northeast it is also known as jhum cultivation where a patch of land is set on fire for clearing after cultivating for limited number of years. This farming system has been widely disputed as environmentally and economically unfeasible. Since time immemorial, shifting cultivation has been component and parcel of the tradition and culture and its practice is still common to this day. An in-depth look at the importance of shifting cultivation to the indigenous tribes is required along with adoption of feasible measures to protect natural resources.

Keywords: Crops, Deforestation, Fire, Jhumming, Shifting cultivation

Introduction

Shifting cultivation is a practice prevalent throughout the world, particularly in the hills, which are inhabited by the tribals. This practice is called 'shifting cultivation' because in this the cultivators do not use a particular piece of land year after year. A patch of land is selected; all the trees, shrubs, herbs etc. are cut down at or near the ground level and then left to dry in the sun and thence set on fire. The clearing thus obtained is taken up for cultivation. Seeds are sown by dibbling small holes in the ground by means of a wooden stick or metal piece or they are broadcast. In this type of cultivation, no plough or animal labour is made used of. All the operations are carried out by human labour. Conklin (1961) has defined shifting cultivation as, "Any continuing agricultural system in which any impermanent field is cropped for some years and then are fallowed". FAO/UNFPA Project 1978 has defined shifting cultivation as, "Cultivation involving the removal and usually the burning of vegetation to create non-permanent clearings, which are fallowed to bush or forest for varying lengths of time; but also includes the temporary removal of vegetation for pasturage or other purposes of livelihood". One peculiarity of areas which have been under shifting cultivation is that they do not get any replenishment of nutrients in the form of manure (except ashes obtained from burnt material). Thus, yield from these areas starts diminishing from the second year onwards. The cultivators then move to a fresh patch of land. Vegetation reappears on this abandoned piece of land. The cultivator may or may not return to the same land again. The time interval that elapses between two series of cultivation of a piece of land varies with local conditions.

Shifting Cultivation in India

It has been estimated by Vidyarthi (1975) that about 2.6 million tribal people living in the interior hilly areas practice shifting cultivation. About 1.35 million acres of land is under this form of cultivation in India in Assam, Arunachal Pradesh, Andhra Pradesh, Meghalaya, Mizoram, Nagaland, Manipur, Tripura, Bihar, Orissa, Madhya Pradesh, Karnataka and Kerala. It is called Lo or jhum in Mizoram, Jhum in Assam, Tekeonglu in Nagaland, Adiabik in Arunachal Pradesh, Rookuis momo in Tripura, Bagada, Koman and Dahi in Orissa, Panda, Bewar, Dipa and Datus in Madhya Pradesh, Watra in South East Rajasthan, Walar in Gujarat, Kumasi or Kumari in Western Ghats, Podu in Andhra Pradesh and Khalla and Kurai in Bihar.

Patterns of Operations

By and large, shifting cultivation belongs to the community but when it is taken up for cultivation, the cultivating family has all the rights over it. After the land has been vacated, the land again goes back to the community. The broad set of operations followed in shifting cultivation in North east India are as discussed under:

a) Selection of Site: the area for cultivation is allotted to a household by a village community or headman or village council.
b) Clearing: The forest is cleared by cutting down all types of vegetation including trees, herbs and shrubs. They are then left to dry.
c) Burning: The dried material is burnt. For this step, a good sunny day is selected, so that most of the debris is burnt up and the clearing operation becomes easier.
d) Dibbling and Sowing: Paddy crop is sown by turning the soil. Ginger, potato etc. are raised by digging the soil, maize seeds are dibbled, brinjal, mustard sorghum seeds are sown broadcast, before the onset of monsoon.
e) Weeding: Due to the heavy rains in most of the area, weeding has become a must. Weeding is carried out 3 to 4 times in the entire cropping period.
f) Protection: The tribals protect their crops from wildlife, birds etc.
g) Harvesting: Harvesting of paddy is done mainly in November or early December.
h) Threshing, Storing: The harvested paddy is kept in bundles. Threshing is carried out on a good sunny day. Threshing may be done by beating the stalks on the ground or by trampling or beating with a stick. The grains are then stored in earthen pots.
i) Celebrations: After the crop has been harvested and stored, merry making takes place.

Some crude implements used in the above operations include axe, dao, clod crusher, hoe, digging stick or rod, rake, winnowing fan, spade, sieve etc.

Season of Cultivation

Land is selected in November or early December. During the winter months (from December to February) the forest patch is cut either collectively or cultivator wise and the debris is left to dry. Burning of the debris is done in April, before the onset of monsoon. After the first few showers, the ash mixes with the topsoil and the area is ready for sowing. It is a usual feature to sow a mixture of multiple types of crop. Weeding is a continuous process which may take place up to a few weeks before harvesting. Harvesting starts from the third month after sowing and continues up to December. Thus about a year is taken from clearing the land to its final harvesting.

Shifting Cultivation and Traditional Practices

Majumdar (1978) states that Garo religion is nothing but a way to obtain bumper crops and to keep away from disease and disaster. Hence all operations of shifting cultivation are carried out in close relation with religious practices in a series of annual rites. The festivals are linked with the different stages and operations of cultivation. Thanga (1982) in his dissertation has collected a set of religious festivals and rites, which are linked on to various stages of cultivation operations. “After allocation of plots for cultivation, each family performs a religious rite on the plot, marked by dancing and singing. Burning and planting is marked by the *Agal maka* rites. A series of festivals and rites are celebrated and performed at the end of the harvest and close of one agricultural season. The celebrations may go on for a considerable amount of time.

Jha (1976) is of the opinion that the socio-cultural life of the tribes of northeast India is regulated according to the Jhum calendar. As already discussed above, all the festivals are celebrated according to the completion of a particular set of jhuming operations. Social and religious pursuits such as marriages etc. centre around the timings of jhuming operations. In Siand district of Arunachal Pradesh, a newly married wife is brought inly when harvesting is complete or about to be completed.

In some of the areas, which have come under the effect of modern civilization and in areas

which have been influenced by Christianity, people are beginning to shed the habit of combining religious festivals and rites with jhuming operation. They now take up shifting cultivation merely as an occupation as the people in th rest of the world take their respective occupations. They do celebrate their festivals but more according to season than timing of jhuming operations.

Environmental Problems

The following are some of the environmental problems caused by shifting cultivation.

- Cutting and burning of vegetation reduces the forest cover leading to the loss of timber worth lakhs of rupees and loss of other forest produce. Loss of forest also leads to loss of potential sources of raw material for industries such as paper and pulp, plywood etc. it deprives the people of the area of a potential source of employment.
- Tribals working in the interior forest areas draw heavily upon forest resources, and even encroach upon forest areas.
- Damage to the vegetation leads to so erosion, silting up of rivers, reservoirs, choking up of soil, depletion of nutrients in the soil, floods and other environmental problems related to biotic pressure and forests.
- By accident, jhum cultivators may set fire to the adjoining forest. Burning of cut down debris is a very important part of jhuming cultivation. If by chance, the fire is not properly controlled, there is danger of its spreading to the adjoining forest area and destroying crores of rupees worth of valuable forest produce. Small fires may destroy seedlings upto pole stage, herbs, shrubs, may alter the status of the soil microbiology. Fire also disturbs the forest fauna by driving them away from the fire affected areas. Fire on jhum lands has been known to destroy villages, telephone-telegraph installations, wires etc., causing a great loss of resources.
- Shifting cultivation has also affected the lives of many reservoirs in east India.
- It is unfortunate that hundreds of square kilometres of land is engaged for 10-15 years in this type of cultivation, without giving any production. With the rapid increase of population, there has become a severe pressure on land, so much so that, a time is bound to come when the fallow period for jhum land will have to be brought down to let off this pressure.
- In some spots certain trees and shrubs are scarce and may become further rare or even eliminated from the flora of the region.
- In the process of cutting trees and burning the site, many parasites and epiphytes get eliminated from the flora.
- Jha (1979) has reported considerably lower content of total sesquioxides, aluminium, calcium, iron, potassium, phosphorus, cation exchange capacity in a jhum patch in comparison to other forest areas.
- Mishra and Ramakrishna (1980) report that the process of sediment and water loss increases by 21 and 5 times respectively when a 8-10 years old forest is put under this practice.
- Das (1976) states that in the plains of North east India, the problems of floods has become very serious and almost annual. This problem is not so grave as far as heavy runoff is concerned but with the associated silt load. The sediments are derived from the hills which are under shifting cultivation.
- The practice of shifting cultivation amongst the tribals of the area is a big impediment in the path of its development. Due to their almost nomadic habits, modern facilities such as schools, health centres, dispensaries, veterinary centres, drinking water supply, wells etc. cannot be provided to them. The provision of such facilities needs permanent settlements. These are generally lacking in the case of shifting cultivators who keep shifting from time to time, so that they may live near their lands.

Some of the plant species which occur in areas of jhuming cultivation are Euphorbia prostrate, *Oxalis corniculata, Spergula aroensis, Syprus, Gnaphelium enteoalbum, Galinsoga parviflora, Lumex, Chenopodium album, Cardamum hirsuta, Plantago major, Tridax, Spermaeoce hispida, Ageratum conyzoides, Erigeron, Mikemia Nacarantha, Eupatorium odoratum* etc.

When the patch of land under shifting cultivation is abandoned, the vegetation which gradually establishes itself includes species like *Lantana camara, Ageratum conyzoides, Eupatorium adenosperma, Gynura angulosa, Solanum, Erigeron* sp. Etc. Perennial grasses are gradually established and in a short time the area is covered with a wide variety of grasses,, intermingled with shrubs and herbs. At higher altitudes the lands are invaded by Artemisia, Eagopyron, Rubus etc. On the lower slopes Mikemia, Gleichemia, Canabis etc. get established.

The following are the main grasses which are established in an area which was previously under jhum: *Arundinalia, Saccolepis interupta, Saccharum munja, S. spontaneum, Pteridium acquilinum, Setaria pelmifolia, Themedia canadata* etc. The major herbs are *Anaphalus, Ainseiala, Calamintha, Solanum, Murdannia, Oldenlandia, Lagerstromium, Eupatorium, Hypercium, Impatiens, Careamine, Dichrocephala* etc. The main tree species are – *Syzygium fruticosum, S.cumini, S. nepalsis, S. mishimiansis, Sauraiya roxburhgii, Krema angustifolia, Rhododendron santapani, Calophyllum polyanthum, Diterocarpus alata, D. macrocarpus, Lagerstromia* sp. *Phoebe cooperiana, Bombax ceiba, Ficus sikkimensis, Anplectrum assamica, Terminalia alata, Castanopsis indica, Altingia excels, Amoora wallichii, Bischofia javanica, Eurya acuminate, Macaranga pellata* etc.

Shifting Cultivation in The North Eastern Region

Shifting cultivation, known as jhuming in the north eastern region, is regarded as the first step in the transition from food-gathering or hunting to food production. Although this system of farming is believed to have originated in the Neolithic period around 7000 B.C (Sharma, 1976), yet this most primitive system is still being practised in different form sin several parts of the world, particularly in the wet tropics (Schlippe, 1956; Conklin, 1957). Shifting cultivation is widely prevalent in the North-eastern region of India, comprising Assam, Manipur, Mizoram, Arunachal Pradesh, Tripura, Meghalaya and Nagaland. The reasons for the continuance of the practice are linked up with ecological, socio-economic and cultural factors, including the lack of communication, leading to physiographical remoteness and isolation.

The System

The essential features of jhuming, as practised in the region are:

i. The selecting of sites on hill slopes, usually before December
ii. The clearing of sites by cutting jungles in December-January
iii. The burning of jungles around mid-February to mid-March
iv. The planting of various crops in an intimate mixture by dibbling
v. The abandoning of the land after cultivation for two years usually, and shifting to another site
vi. Returning to the same site to repeat the process after 3-6 years

No animal or large implement is used by the jhumias for preparing the land. The only implements used in farming are the chopping-knife, the dibbling-stick and a small hoe for weeding. Similarly, no scientific technology is employed. The only inputs used are seeds and human labour. Except the cutting of jungles, and watching to protect the crops, the other operations including weeding, are usually carried out by women. All essential crops including rice, maize, tapioca, colocasia, sesame, cucurbits, beans, yams, banana etc., are planted in an intimate mixture although a single crop is rice is sometimes grown in the second year of jhuming. The land is left fallow for regeneration after 2-3 years of jhuming, to be used again after some years. The farmers then select another site and repeat the same method of farming. The jhuming cycle on the same land, which extended to 20-30 years in olden days, has now been shortened to 3-6 years because of pressure on land due to increased population and decrease in productivity, leading to the utilization of more areas under jhuming.

Effects of Jhuming

Although the system of jhuming was good when it commenced, yet it is considered to be extremely wasteful in the present time. The various adverse effects of jhuming are summarized below:

A. There has been large scale deforestation, resulting in the denudation of hilltops and slopes. This deforestation leads to undesirable ecological changes. Further, since the hilltops are the sources of water, the deforestation of them leads to the elimination of the source of water.
B. There occurs soil erosion on a large scale owing to deforestation and cultivation on hill slopes without effective soil-conservation practices, leading, in turn to several adverse effects:
    i. The erosion of soil in catchment areas results in the silting up of reservoirs and streams, leading to floods in the plains (Goswami, 1968)
    ii. The removal of top soil leads to the depletion of fertility, which is not easily built up again. This depletion leads to low productivity and subsequent pressure on land.
C. The continuation of this primitive form of agriculture leaves very little scope for introducing modern technology. This faulty agriculture, along with the loss of fertility, has led to such a low level of productivity that the jhumias live under-famine conditions (Saha

1973 & 1976). For a particular period during January to July, they have to live on root crops, jackfruit etc.

D. The system is labour-intensive compared with the low technology involved and very low productivity (Roy Burmon & Sarma; Goswami, 1970). Further there is no scope for developing sources of subsidiary income for the farmers. Besides these sources, which are directly related to agriculture, there are other aspects which adversely affect social welfare. Public health, education, communication and such other basic facilities are difficult to be developed when there is no permanent settlement. Further, the large size of a family is considered to be an asset, since there will be a large working force.

The Jhum Control Schemes

Each state of the North-eastern region has some programme of jhum control, either as special programmes or as part of the programme of the Department of Soil Conservation. In Meghalaya, there are two kinds of schemes in operation. These are:

- Integrated scheme for the Control of jhuming, and
- The Rehabilitation of jhumias though Aforestation and Cash Crop development.

In the first scheme, 100 acres of land is terraced in a compact area and 50 families of jhumias are settled, allotting 2 acres of land to each family. Assistance is provided in the first year for constructing houses and for agricultural operations. Roads and water are also provided under the scheme. Under the second scheme, the plantations will be raised by the Department and ultimately handed over to the jhumia families at one hectare per family.

In Tripura also, there are two schemes in the state sector. The scheme run by the Department of Agriculture includes the terracing of land for agriculture as well as for growing orchards and forest plantations. Another scheme operated by the Forest Department aims at providing terraced land, homesteads, link roads, poultry, piggery as well as assistance to purchase bullocks.

In the other areas of the North-eastern region, the Departments of Soil Conservation has formulated programmes of bench-terracing and other soil-conservation measures, including the planting of cash crops.

The North-Eastern Council has sanctioned eight schemes on soil conservation and jhum control with an outlay of 530.95 lakhs of rupees during the Fifth-Five year Plan. Out of these, two schemes are in operation in Mizoram, whereas there is one scheme each for the other six constituent units. These schemes aim at providing terraced land and orchard or forest plantations for the jhumia families, except in Assam, whereas the scheme includes soil-conservation measures.

In addition to the above schemes, a Central Sector scheme for the Control of Shifting Cultivation was sanctioned during 1977-78 with a provision of Rs. 140 lakhs for operation in the North-eastern region, Andhra Pradesh and Orissa. The scheme aims at providing one hectare of irrigable terraced land and one hectare of orchard or forest plantation to each family. Besides, there are provisions for link roads, homesteads as well as for inputs at a sliding rate for three years.

Problems

A few survey shave been made on the success of the schemes under operation, although no detailed and thorough survey has yet been taken up. It is, however, a fact that the schemes have not been as successful as expected. In many instances, the jhumias have either abandoned the new settlements or have carried on jhuming even after been settled.

The primary causes for the failure to attract the jhumias to permanent settlement are:

i. The new settlement cuts into their socio-cultural life abruptly;
ii. They are not used to cultivation on terraces, using bullocks and implements;
iii. They find the production to be low on the terraces in the first year owing to the removal of the top soil while developing the terraces;
iv. The production technologies for terraces, water-management, water-conservation practices, etc. are also not properly developed for the region.

Schlippe (1956) observed in his studies on shifting cultivation in Africa that “the modern civilisation has failed to improve African agriculture because it has proved so far incompatible with the environment of the wet tropics. Agriculture is that sector of human activity in which there is greatest interaction between the environment and the human culture which has grown in and from it.” He has therefore advocated “to find improvement without doing violence to the limiting framework of tradition and environment”.

Majumdar (1971) feels that shifting cultivation in the north-eastern region cannot be

avoided for a long time and hence conscientious efforts are needed to improve the productivity of the jhum cultivation and minimize soil erosion. While doing so, he advocates that "an important aspect duly recognised as a crucial strategy for the development is the need to tailor the programmes to the local conditions and values".

Unless the attitude of the jhumias is changed and they are convinced of the need for settled agriculture and terracing, governmental schemes will take many more years to terrace and replant other areas. It would not be desirable to allow the soil and fertility erosion to continue for long periods. Yet, there is no proven technology or message with the development departments to bring about the awareness among the jhumias, because there has been no systematic study of the problems faced by the jhumias particularly with regard to the improvement of agriculture in the environment in which they live. It may be of interest to note here that in the existing system of jhuming, cultivation is done on hill slopes, up to 100% or even more. In fact, in Mizoram, hills are so steep that areas with less than 50% slope are very limited.

The earlier studies on shifting cultivation were made primarily by the anthropologists and economists. May have advocated that this is a way of life and part of their socio-cultural system and hence should not be disturbed. It is, however, high time that we make concerted efforts to change this way of life in order to bring prosperity among the jhumias.

Corrective Measures

A publication by the Food and Agriculture Organization of the United Nations (FAO) suggest that if managed properly, shifting cultivation can be beneficial. As quoted by Frank Sejersen, Chairman of the Board of International Work Group for Indigenous Affairs (IWGIA) "Studies show us how the diverse and dynamic indigenous peoples' livelihood and land use systems are, but they also show that the age-old practice of shifting cultivation, that has been at the core of such systems for centuries, is still misunderstood by policy makers and thus under enormous pressure". Chaturvedi and Uppal (1953) are of the opinion that "the correct approach to the problem of shifting cultivation has in accepting it not as a social evil, but recognising it as a way of life, not condemning it as an evil way of life but regarding it an agricultural practice evolved as a reflex to the physiographic characters of the land."

On June 18 and 19, 1976, a seminar on the socio-economic problem of shifting cultivation in northeast India, organised by the North East India Council (NEIC) for Social Science Research was held at Shillong. The seminar brought out some very significant problems regarding shifting cultivation and suggested a broad based approach at solving the problems. The following are the deliberations made at this gathering:

1) The seminar agreed that shifting cultivation has to be replaced by improved form of land management but the switch over has to be in a phased manner and should be gradual and smooth, causing least disturbance to the people concerned. It is agreed that shifting cultivation is a way of life and as any way of life, is subject to change due to changed circumstances, the way of jhuming is also undergoing changes. However, the forces of change should perfectly enmate from within the society even though the role of state help, particularly in the form of technical and scientific guidance and funds cannot be denied to accelerate the pace of development. The provision of infrastructure for development including roads, credit and marketing facilities will play an important role in bringing about the desired change.
2) While bringing the change from shifting cultivation to settled cultivation there will necessarily come about some changes in the social and land reforms. Special care should be taken so that there is no undesirable social consequence.
3) It is estimated that data on shifting cultivation practices should be collected for a correct interpretation of the situation and suggestion of proper remedies. The authorities should refrain from basing their strategies as far as possible on inadequate information of the subject.
4) Any suggested change in shifting cultivation will have a bearing upon the forest policy. The forest policy may be suitably reformulated with special reference to the north east hill region.
5) The possible impact of the gradual decline in production of the cash crops like cotton and various oil seeds, consequent upon the decline of shifting cultivation upon the national economy should be studied.
6) Horticulture as an alternative and subsidiary occupation may be desirable and feasible provided there is an adequate organisation to cater to the production and marketing needs.
7) Terracing is costly and cannot be immediately resorted to, in many steep hills of north eastern India. However, the soil survey should

help in identifying the areas where it can be undertaken.

8) Immediate action should be taken to identify potential locations by some rapid soil survey technique and photo-interpretation, where the integrated approach for control of shifting cultivation can be tried.
9) The scope of animal husbandry, raising of plantation crops in the hill areas should be further explored.
10) Where settled land management is being introduced, adequate protection measures including shifting cultivation should be adopted. Integrated area development should be supported by effective supply of inputs including seeds, manures, fertilizers, tools, implements etc. as well as by effective follow up programme.
11) But since the switch over from shifting cultivation will take some time, it is necessary to undertake studies meanwhile to improve the farming practices of the jhumiyas, so as to cause minimum soil erosion and loss of soil fertility.
12) The loss and degeneration of flora and fauna as a result of shifting cultivation should be studied in greater details and loss of same from other sources should also be identified and estimated.
13) The seminar has made a strong plea for integrated research on the basic problem connected with the shifting cultivation by scientists of all disciplines including social scientists.

The detailed discussions at the seminar helped to highlight the seriousness of the problem and ways and means to solve it. The above mentioned suggestions/solutions can help overcome the problems of shifting cultivation without effecting tribal people drastically.

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