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Shifting Cultivation and its impacts in the hill districts; a study on Karbis of Assam

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Abstract

Shifting cultivation is one of the most distinct traditional form of agriculture practiced all over the hills slopes of the Northeast India. For the preindustrial tribal society like the Karbis, shifting cultivation has been the main occupation around which their social and economic lives revolve and for the past many centuries jhum practices does have many ramifications on the environment due to clearing and burning of forest, and on the other hand the question of economic viability from the modern developmental point of view. However jhum has always been part of the culture and continues even in the present lives. The hill district of Karbi Anglong by and large still retains underdeveloped and people in the rural areas practice a primitive agricultural system which is also subsistence in nature. Hence, their livelihood security and survival depend much on the success of the jhum cultivation. Considering the cruciality of the traditional jhum cultivation the attempts is to draw some insights on the merit and demerits of the jhum practices and to explore probable alternative for more viable and sustainable livelihood.

Keywords: Shifting cultivation, Jhum practices, retains underdeveloped, Livelihood, Sustainability.

Introduction

Shifting cultivation is the most primitive method of cultivation and its evolution is traced to the Neolithic period 7000 BC through the archaeological discoveries (Borthakur, 1992). The fundamental change in mans attitude towards environment and his quest for the new frontier has led to a new beginning of a settled life as he began to produce grains from a hunter and food gatherer. Shifting cultivation practices is the most primitive forms of agriculture generally practice in the hill slopes by the Indigenous peoples and natives across the globe. Shifting cultivation which is commonly prevalent in the tropical and sub-tropical parts of the world is extensively practiced in the Northeastern part of India in the states of Arunachal Pradesh, the foothills of Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura. Other states like Bihar, Orissa, Madhya Pradesh, Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, Rajasthan, Gujarat, and Maharastra are also known for practicing shifting cultivation. In the Northeastern states of India shifting cultivation is commonly known as Jhum and the cultivator practicing Jhum is generally known as Jhumia. The Jhum cultivation is known by different names such as Hichusisomoms among the Riang of Tripura, Adimdik among the Adis of Arunachal Pradesh, Lyngkhalum or Shyrti among Khasis, Bogma among Garos of Meghalaya, Tekong-lu among the Ao of Nagaland and Inglong Arit among Karbis of Assam.

Among the Karbis the Shifting cultivation has been practiced for ages and this been the main economic occupation of the Karbis. In the Karbi Anglong district about 65% of the people are depended on the traditional jhum cultivation. In the traditional jhum practice many forest area is cultivated on a rotational pattern. The farmers cultivate certain forest area for a fixed period of two years and move to another forest till they come back to the same plot with an interval of 8-10 years. In the Jhum cultivation the farmers will clear the forest and burn them before cultivating the paddy and other crops. During such process forest area is subjected to clearing of trees and grasses which often lead to open exposure of soil causing massive topsoil erosion during the monsoon rainy seasons. Sometimes on the hill slopes silting up of river beds causing devastating floods in the downstream and

plains. Such floods are commonly known in Assam as regular monsoon catastrophic happenings. The contribution of the pollutants to the atmospheric air by burning of vegetation in jhum cultivation is also accompanied by the destruction of biodiversity and animal, bird's habitat in the forest. With the increase in food demand due to the unprecedented increase of population in Karbi Anglong over the past two decades have now directly impacted the rotational cycle to 5-6 years and even less in some cases. At the rapid pace of decrease in the rotational cycle it has also been noticed that the crop yield has also been drastically reduced leading to a serious food shortage among the agricultural communities in the district. Jhum cultivation is a sustenance agricultural system, but in the case of the Karbi Anglong it is no longer able to provide the basic requirements for the year long food supply.

Extent of jhum cultivation in Assam and N.E.India

Places	Area available for jhum (0,000 ha.)	Annual area under jhum (sq.km)	Area sown at one time (0.0000 ha.)	Minimum area under jhum at one time (sq.km)
Assam	498.30	696	69.90	1,392
N.E. India	2695.70	3,869	455.05	14,660

Source: basic statistics o NEC-2006

Changing trends in forest cover from 1978-2006 in Karbi Anglong District

Year	Area under forest (sq.kms)	Percentage to total districts
1978	2735.14	26.44
1990	4365.15	42,20
2006	2249	21.74

Source: Niangpi Guite,2013 & the Directorate of Economics and Statistics, Govt of Assam, Guwahati

Study Area

Karbi Anglong district, the area for the present study is situated in the central part of Assam in India. The district lies between 25^0 32' to 26^0 36' north latitude and 92^0 10' to 95^0 50' east longitudes which is one of the largest and oldest district of Assam. It is bounded by north of Nagaon, and Golaghat district, on the south by North Cachar hills districts, on the east by Golaghat and Nagaland, and on the west by Meghalaya. The total geographical area of karbi Anglong is 10,434 sq.km characterized by a dense forest cover with hills and flat plains accounting for 76% of the total area of the districts. The district had a population of 956313 in 2011 with a decadal growth rate of 17.58 percent (Census of India, 2011). A district vastly rural in its urban population composition had only 11.81 percent of its total population living in urban areas (Census of India, 2011). Seven villages of the districts, namely Langmet, Umlapher, Hing-arleng, Langsoliet, hapjan, langminso, Paklangso have been surveyed for the study.

Objectives of the study

The main objective of the study is to highlight the traditional agricultural system ie. the jhum cultivation and its relationships with the socio cultural lives of the Karbis of Assam. Secondly, the study intend to critically vied at the multiple ramifications of the Jhum practices on the physical environmental and on the other hand the economic viability of the jhum practices, hence an alternative to sustainable livelihood would be explored.

Data and Methodology

The paper is based on both primary and secondary sources of data. The major source of data is from selected villages where the perception of the inhabitants was collected with the help of structured questionnaire. Techniques such as field survey, interview and focused group discussions among community leaders, farmers, professionals and general citizens were conducted in the study area. A total of 100 household have been selected in the study as per probability proportional to size of the population of the selected villages. Stratified random sampling techniques have been used for the selection of the household. Secondary data were obtained from the government reports, census, articles, journals, books, and other forms of publications.

Discussion

Shifting cultivation, traditionally an important rain fed cropping system is practiced on forest lands of mild to steep slopes. This traditional practice of Jhum cultivation is found not only in Karbi Anglong but in the entire North eastern regions but in Myanmar and Thailand particularly in the hilly regions where different ethnic practice subsistence way of lives. The practices essentially consist of slashing the forest vegetation during winter months and burning the same in situ after drying. The slashing and burning of natural vegetation marks the beginning of the cycle of shifting cultivation. While slashing, larger logs and bamboos are removed for family use either as fuel wood or as timber. The process of clearing and burning of forested area exposes the soil to exogenic process of direct and indirect impact on the upper layer of the soil. The field is then prepared to cultivate mixed crops dominated generally by paddy. The use of hand tool technology in all the operation makes shifting cultivation demands intensive labor and man power throughout the year till the harvest time. The crops are generally cultivated for one year but in some cases cultivation may continue for second year also. The field is then left fallow and the cultivator moves to another forest area. In the past the duration of the cycle was about twenty five years or more which synchronized well with the period need to reach forest maturity. The fallowing is to restore the fertility of the soil and simultaneously allow the forest to grow and to attain maturity. Also the soil form during longer fallow periods compensates for the soil lost remains practically unaltered and the system remains stable. Over the past two decades, the rapid increase population has exerted intense pressure on the land. Not only the rotational cycle has been reduced but there is diversification of different types of commercial farming which adversely affects the smooth cyclic rotational jhum cultivation. The present practice of rotational years of 5-6 years is not enough to regain the fertility of soil required for successful agriculture. The forest also does not attain the expected to attain maturity within such a short period of time. Thus the forest yield becomes poorer and poorer as more pressure is exerted. There is hardly any primary forest left except the reserve forest and few in the wilder terrain and higher altitude. In the recent years most of the jhum cultivation is done on degraded or scrubs forest.

The approximate ratio of hills in the districts of Karbi Anglong is 60:40. The plains of Karbi Anglong inhabited by the Karbis and other communities practices wet cultivation while in the hills and low lying foothills mostly inhabited by the tribal practices jhuming and other types plantations. In the hills, the tribals generally have a customs that all forest belongs to the community and so the forest resources are common property resources (CPR) for all.

The process of Jhum cultivation starts with selection of suitable plot of land in the month of February, after which the trees, bamboo, shrubs and other plants are cut and the rubbishes are left for about a month under the scorching sun. When the slashed vegetation/plants are dried properly they are burned to ashes by early April, it is known as Jangmi. The following months i.e. May (Aru) and June (Vosik) the farmers intensely work

to see that all dried plants are properly burned and to assure that plot is free from any debris. Ashes are scattered over the whole area and as soon as the rain start, the seeds of Paddy and some other crops like maize and cotton and other vegetables are sown in the designated areas. During the process of sowing different varieties of seeds and rice shown in both the districts the farmers in group sing lively and love songs (Bongoi alun). In fact, the culture of the Karbi tribes is interwoven with the practice of the jhum cultivation. Like most of the practices of Jhum the Karbis cultivate mixed crops in their jhum land. Jhum practice is not only associated with the culture but is also spiritual for the Karbis. As the paddy starts to grow, they will observe choklim kangthur by worshipping the spirit *Longle-A-hii Arnam* praying for the protection of their fields and plantations from the wild animals like monkeys, wild boars and elephants and also grant the household from any misfortune and illness. With the fast growing of the rice and other vegetations in the fields the farmers prepare for weeding of the unwanted plants and weeds. Weeding (Sok-Karlu) takes place in the month of july (Jakhong) and it is considered as the most busiest month battling the weeds and nurturing the paddy. Again Sali paddy begins to bears cereals in the month of September (Chiti) and it is harvested in the month of October (Phre). The paddy thus harvested is stocked in the jhum courtyard in the month of November (Phaikuni). Paddy is trashed in December (Matijong) and the thrashed paddy is brought home by the males in basket (Mantung) in January (Arkoi). The well to do families observed sok keroi kekan on the occasion where girls are not allowed to dance in this festival.

The different stages of jhum operation as practiced by Karbis are:

1) Ritkepan- the feeling of trees and clearing of the undergrowths
2) Mekekai- the burning of the debris
3) Arhik-karhi – The removal of half-burnt logs
4) Rik – Sowing of various types of seeds
5) Sok karlu – Harvesting

Karbi Anglong is populated by the hills tribes having their cultural and spiritual lifestyle closely intertwined with forests, wildlife and jhum (Shifting) cultivation. In the past the jhum cultivation had a long jhum cycle of about 20-25 years, but the sudden increase in population over the past few decades have drastically reduced the cultivable land and hence altered the jhum cycle into less than a decade and 5- 8 years. Though the jhum practice have been known for hundreds of years there is not much change in the techniques as well as in the applications of improvised tools and seeds. Tools and implements used in jhum continues as simple as was in the past half a century's back. They include spade (Ku), Dao (Nokek rangso), hoe (kuso) and axe (Cho) etc. they also use mortar long and pestle (lengpum) for the purpose of dehusking paddy. With these basic tools and simple seeds the only basic aim of the farmers is to sustain their family for another year till another harvest time, hence the jhum is very much a sustainence farming. In was also known in the past that the community or the village would shift along with the rotation of the jhum land but is no longer the same. At present this tendency of shifting the whole villages in the neighborhood of the jhum site has become very rare as shifting the entire village is no longer possible, but still some families does practice shifting near to jhum land till they move to other areasThe table no.1 & 2 depicts the distribution of varieties crops practices by the jhumias in both of and the Karbi Anglong and West Karbi Anglong district under the KAAC. Those items were both for the commercial as well as self sustenance. Among the crops ginger has the highest area in hectares and the average yield in production in the Karbi Anglong district; cucumber has the lowest production crops in

the study area. Whereas in the West Karbi Anglong pumpkins has the highest area grown but the ginger has the highest production.

Table: 1 Crops under Jhum Cultivation in Karbi Anglong District

SL No.	Name of Crops	Area In Hectare	Average Yield in Kg/ha.	Production in metric ton
1	Rice	395	1500	592.5
2	Maize	225	2350	528.75
3	Seasum	520	1027	534.04
4	Ginger	1500	58520	87780
5	Turmeric	254	13525	3435.35
6	Pumpkin	68	65000	4420
7	watermelon	160	18000	2880
8	yam	252	15800	3981.6
9	Pineapple	325	17824	5792.8
10	cucumber	67	265	17.755
11	Others	89	358	31.862
Total Area under Jhum Cultivation		3855	194169	109994.66

Source: Computed by authors based on field survey

Table: 2 Crops under Jhum Cultivation in west Karbi Anglong

SL No.	Name of Crops	Area In Hectare	Average Yield in Kg/ha.	Production in metric ton
1	Rice	372	1050	390.6
2	Maize	220	2535	557.7
3	Seasum	453	827	374.631
4	Ginger	643	25000	16075
5	Turmeric	382	15252	5826.264
6	Pumpkin	105	68525	7195.125
7	watermelon	209	1254	262.086
8	yam	326	15240	4968.24
9	Pineapple	480	20500	9840
10	cucumber	85	325	27.625
11	Others	120	397	47.64
Total Area under Jhum Cultivation		3395	150905	45564.9

Source: Computed by the authors based on field survey

Impact of shifting cultivation on the degradation of ecosystem

There are multiple impacts on social as well as environmental fronts due to the juhm cultivation, however the dilemma of the Karbis and the tribal population practicing Jhum for centuries is that the Jhum practices have deeply been interwoven into the social and cultural lives of the people, that their daily activities, and seasonal activities are well tuned with the process of the jhum cultivations. Besides their festivals and spiritual believe systems are deeply rooted that the any changes and alterations in the Jhum will amount to the changes in modifications in their culture and believe systems. Besides the knowledge systems that have been developed over the many centuries will be affected once Jhum is abandoned or replaced by other means of farming systems. In the backdrop of this crucial

importance of the Jhum practice by the tribals there are equally many concerning issues related to Jhum practices. The prime consideration on environment is the degradation of ecosystem due to jhum practices as for instance, rapid loss of top soil, organic matter, plants nutrition as a result of burning of forest and exposing the soil for one-two years to rain, wind and sun. every year large quantities of top soil is washed down the slopes during the 5-6 months of monsoon season and in some lower slopes even flood occurs on the riverbanks and floodplains. The impact of shifting cultivation on the ecosystem degradation would be higher when practiced with short duration cycle as compared to long duration cycle, theoretically would mean that the rate of soil and plant nutrition loss would be increased.

The hill of Karbi Anglong is populated by hills tribes having their own cultural life style interwined with with forests, wildlife and jhum (Shifting) cultivation. A study using satellite mapping of forest clearly shows the degradation of forest is more in the hill regions where jhum cultivation is extensively carried out by the Karbis. According to the Assam Remote Sensing Application Centre, (ARSAC) out of 423,885 hectares of land under jhum cultivation of karbi Anglong districts, 6844 hectares, become degraded forest land. The study further shows that indiscriminate feeling of trees; primarily for jhum cultivation in the districts is causing certain serious environment problems like loss of soil fertility, soil erosion, floods and siltation in the plains.

Impact of shifting cultivation on the forest

Forest is the most important resources for the Karbis in which they have been directly dependant for centuries. For very long time their social and economic needs have been provided by the forest is now become more susceptible due to fast depletion and degradation of forest as a result of logging, felling of trees for commercial purpose besides traditional jhum practice. The rapid increase population and the intensification human activities is exerting more pressure on the limited forest especially in the past two-three decades. The changing dynamics of forest and forest cover in return adversely affects the climatic regime in the state. The rainfall has become erratic, the temperature has risen and in many places the sign of desertification has set in. because of the loss of water retention capacity of the soil, rain in the upper reaches of the river have led to heavy soil erosion leading to siltation of river bed thereby causing a river flash floods. Such floods destroy more forest. Creating a vicious cycle and destroying a large number of varieties of flora and fauna including medicinal plants. There has been a wide spread of herds of wild elephants coming inside the human habitation in search of food and damage paddy field and properties, trampling huts and even killing people. Lack of food in their natural habitats must have driven them to human locality.

Decrease in forest cover due to jhum cultivation and status of jhum in the districts:

Year	% decrease in forest due to jhum	Jhum area increase	Family involved in jhum
1978	26.5	21,853	20,000
2006	21.8	64000	54000

Sources: Director of economics and statistical, govt of Assam, Guwahati. (IJDP), Karbi Anglong Autonomous Council, 2011.

Strategies to control jhum cultivation

Jhum cultivation is the age old preferred practiced of crops cultivation prevalent over large tracts of land and is more prevalent in the study area. The adverse effects of jhum are becoming more manifested due to short cycles fallowed. Not only the forest cover is shrinking in Karbi Anglong but the jhum land are becoming unfit for crop cultivation as most of the jhum cultivation is now done in the degraded forest. However the practice

cannot be eliminated altogether hence there is a need for improved agricultural practices than the existing aged old jhum practice that can have less environmental impact and more economically viable one. Karbis like any other tribes in the Northeast are traditionally are agriculturist whose lives depend on the food crops they cultivate. They are also heavily dependent on their forest for fuel, food, household materials etc. hence forest and agriculture becomes their prime importance in which their socio economic lives revolves. With the given socio economic conditions it is imperative to make the basic sustenance through the agriculture practices must be made sustainable and more economically viable. While on the other hand, protection of the forest and its environment is equally important in which the survival of their social and cultural as well as economic development depend on. One viable suggestion could be the practice of agroforestry based intensified systems[*]. Under the agroforestry systems which has been successfully experimented in Vietnam, Laos and Nagaland by cultivating the rice alongside the varieties of trees that are climatically suited to the region[†] can be done in the traditional way alongside the rice or crop plantations simultaneously planting selective tree species. This makes the jhum a mixed crop cultivation. Further sowing of nontraditional winter crop can be initiated where crops like wheat, barley, peas etc can be grown during the fallow period. This agroforestry can have multiple benefits to the traditional jhum farmers to continue their social cultural relationship with the jhum practices along with the continuity of their traditional knowledge systems. It also allows the aforestation in a natural way without incurring additional expenditure as trees will be planted and allow to grow for certain period of time when the farmer cultivate food crops in their farms. Such practice can only add to using the forest and the land in a more scientific way and allowing the forest to grow instead of degrading during the fallow period.

Conclusion

Shifting cultivation is the earliest type of agriculture and is still in existence across the globe and is known by different nomenclature in different parts of the world. Jhum practice which is the most extensively practiced in Karbi Anglong even in the present days is crucially linked to the geography of the region and also in their history and culture besides economic considerations. The challenges posed by the Jhum practice is exacerbated by the sudden increase of population in the Karbi Anglong district compelling the jhum cycle to drastically come down into a shorter period. This has caused many social and physical environmental issues and problems. in a tribal centric district like the Karbi Anglong hill regions of Assam the only plausible activities is the agriculture and that must be given the priority for sustainable development of the people. Whatever the challenges may be the within the given situation in a hill regions like the Karbi Anglong jhuming is the only feasible way of raising food from rugged hills slope. Hence the most pragmatic way would be to alter the jhum cultivation practices to lessen its negative impact on the environment through the agroforestry in the Jhum practice and also to initiate ways and means for optimum production of food crops within the Jhum practice. This does not necessarily calls for the introduction of the high yielding varieties of seeds in the Jhum practice rather, it encourages introduction of varieties of indigenous seeds that were used for centuries as time tested seeds used in the jhum land at different seasons. Such intensification of the indigenous seeds is a measure of not only self reliant but to assure food security for the people in the region. Such policy may not be able to attract the market oriented stereotype modern policy maker but will certainly be able to serve the most needed indigenous

[*] Nagaland Environmental Protection and Economic Development (NEPED) and International Institute of Rural Reconstruction (IIRN), " Under Building upon Traditional Agriculture in Nagaland, India" p.v.1999

[†] Ibid, p42

communities where food security and ecological crisis is at stake due to unchecked population pressure on the communities practicing jhum cultivation.

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