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Extent of Shifting Cultivation and its Socio-economic Implications in Saiha District, Mizoram, India

Bobby Beingachhi[1]* and David Zothansanga[2]

[1]Department of Geography, Mizoram University, Pachhunga University Campus, Aizawl, Mizoram, India
[2]Department of Public Administration, Mizoram University Pachhunga University Campus, Aizawl, Mizoram, India

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ABSTRACT

Shifting cultivation is a primitive form of agricultural practice that barely meets the minimum requirements of food grains. It is largely confined to the hill slopes, often extending to steep gradients in all the hill districts of the region. This practice normally involves the clearing of forests and is allowed to dry up and the residue is burnt up. The fields or the clearings are prepared and wait the onset of the rains. After which, with the broadcasting methods seeds are sown and crops are cultivated. These jhum fields are frequently located near the permanent settlement sites or located within accessible distance. These fields are temporary as they are used only for one or two seasons; after this, the same process is repeated in adjacent forest areas. In other words, there is a distinct rotation of fields that averages 3 to 10 years, this is the jhum cycle. With increasing population pressure, this jhum cycle has gradually declined. As a result this practice has become an uneconomical preposition.

***Key word** : Shifting cultivation, Saiha, Mizoram*

Introduction

The jhum practice had formed an important element in the hill and mountain inhabitants' perceptions, traditions and socio-economic relations. Frequently, the outer perimeter of these jhum lands formed their respective boundaries with other groups and sub-groups. Thus they formed a deciding feature in their perception of space. The sub-division of this space, in the form of allotment of jhum fields to the individuals and families or between the different communities within the settlement sites was directly dependent on the socio-political structure of the settlement unit. More or less, all the hill districts of the region had a generalized pattern that dominated this practice.

Despite its drawbacks and low returns in terms of output, no viable alternative has been found so far. Efforts have been undoubtedly channelized to improve through infusion of technology and capital. In many areas, as in Meghalaya and Arunachal Pradesh, these efforts have been complemented by extensive introduction of horticulture. Exact area under jhum cultivation in the region has remained a matter of estimates and approximation. This has been largely due to the lack of availability of reliable data, absence of land records as well as of cadastral surveys. However, the present effort relies heavily on the reports of North Eastern Council. Thus, one finds that out of the nearly 60% of the total geographical area of the North East under hills and mountains nearly 9.77% of the area is under jhum at

one time or the other, with an annual area of 2.58% under actual cultivation. That is, 2.7 million hectares of land are available for jhum cultivation in the region. However, administrative re-organization and rapid growth of population, particularly in the hill section of the region, has exerted corresponding impact on the availability of land for this practice. Moreover, the traditional practices were not able to keep pace with the requirements and demands for foodgrains.

Besides the necessity for continuous spatial extension of the jhum areas in the forest areas, the commercial exploitation and to some extent urbanization have also significantly influenced the course of development. One of the important fall out of these practices has been steady and rapid depletion of forests in the region. In jhum cultivation the choice of crop is normally consumption oriented and varies according to the individual family requirements. Paddy is the main dominant crop and is followed by maize, millets, beans, tapioca sweet potatoes, chilies, ginger, leafy vegetables etc. All the crops are rainfed, often harvested in August. Periodicity of cropping not only differs from one tribe to another but also from one region to another.

In Jhum cultivation extensive forests are required for this form of agriculture along with heavy rainfall regime in the region. This has led to serious soil erosion problems. This coupled with commercial exploitation of forests has led to heavy silting in the major rivers and consequent increase in the destruction caused by floods in the region. The most common impact has been in the form of loss of top soil. In the predominantly jhum areas, this loss of top soil has been variously estimated at 22% of the cover with secondary vegetation replacing the original dense cover. This has contributed to declining soil fertility and production.

Besides, coming under the generally free ownership, there is very little effort to invest on soil conservation methods and other measures to increase the agricultural returns. This as a result has left hardly any surplus that could have been effectively invested in other developmental activities.Initial attempt to tackle the problems associated with the jhum cultivation was started in the 1950's with the introduction of alternative crops like rubber, coffee, cashew nut and black pepper. However, major thrust to resolve the consequences of the agricultural practices was started from the 5th Plan onwards.

Study Area

The study area Saiha District which comprises of 52 villages is located in the southern corner of Mizoram bordering Myanmar, the location lies within 92°30′ – 92°58′ E longitude and 21°9′ – 22°47′ N latitudes. Many of the villages in this district is well known for its economic backwardness due to its remoteness, especially those villages in the southern part bordering Myanmar, rural inhabitants are scattered along the international boundary comprising of few houses ranging from 20-50 with a population of less than 300 people. These villages are connected by seasonal road which are sometimes cut off from the rest of the district during rainy season. It is also true to mention that there are no medical facility and even for treatment of minor illness and they have to go the nearest Sub-Centres, in many cases the villagers could not afford to do so and sometimes it results in a very bad and awful situation.

The study area has a hilly landscape and the altitude ranges between 900 m and 1200 m. The area is largely constituted by Tertiary rocks of Bhuban sub group. The highest point of the area is 6470 feet from mean sea level. The rocks are covered by an uneven layer of soil which is composed mainly of alternate thinly bedding shale. Many of the villages in this district is well known for its age old practices, i.e. shifting cultivation where majority of its population depend for their livelihood. Despite its drawbacks and low returns in terms of output, no viable alternative has been found so far. Efforts have been undoubtedly channelized to improve through infusion of technology and capital. In many areas, these efforts have been complemented by extensive introduction of horticulture.

The location of the study area falls within monsoon type of climate, the study area also experience the same climate with a marked dry season from November to April during which about 10% of the annual rainfall is recorded and a wet season from May to October with and average annual rainfall of 250 cm (accounting for 90% of annual rainfall). The temperature in the study area sometimes fluctuates between 17 °C in winter and 27 °C in summer. As a result the climate is pleasant throughout the year.

Objectives

The objectives of the present study are as follows:

1. To examine the extent of shifting cultivation.
2. To analyze the spatial variation of shifting culti-

vation in the study area

Methodology

The main objectives of this study is to investigate the extent of shifting cultivation in Tuipang RD Block of Siaha District etc, the investigation is mainly done on the basis of number of household practicing shifting cultivation in every villages. This study will be carried out by utilizing relevant and reliable data obtained from both primary and secondary sources. The extent of shifting cultivation will be examined by a close and in-depth investigation and comparision of village-wise number of families practicing shifting cultivation.

Distribution of Population

The total population was 56,574 *(Census of India, 2021, provisional),* of which male and female were 28,594 and 27,890 respectively. The density of population was 44 person sq/km. Saiha town is the capital and it is the only urban center within the district having a total population of 10,421, while the rural population constitutes 31,464. There are two rural development blocks namely Saiha R.D. Block and Tuipang, R.D. Block, the total number of inhabited villages in the whole district was 52, of which 33 villages falls under Tuipang R.D. Block and the remaining 19 villages falls under Saiha R.D. Block.

Socio-Economic Background

An interesting fact about this area is that most of the agricultural practices are carried out through shifting cultivation. It is characterized by the dominance of subsistence crops. Crops are mostly grown during the monsoon season on the gentle to steep slopes without terracing of fields. Vegetables and fruits are also grown and consumed domestically. Commercial uses of these crops are largely negligible. Some small proportion of agricultural lands is spread in the lowlands, where permanent agricultural is practiced. Mostly, wet rice is cultivated.

Shifting cultivation has a tremendous impact on the socio-economy and on the environment. Being as a main source of livelihoods of the poor rural people, it has negative impact on the environment. It is mainly due to clearing and burning of forests. Mizoram enjoys with rich biodiversity. It is one amongst the rich biodiversity hotspots in India. Natural vegetation comprises of tropical evergreen in the lower altitudes and semi-evergreen on the upper slopes. The marginal farmers generally clear

Total No. of Households and No. of Jhumia in Siaha District, 2021

	Name of Village	Household	No. of Jhumia	%. of Jhumia
1	Tuisih	187	159	85.02
2	Theiri	117	90	76.92
3	Serkawr	212	156	73.58
4	New Serkawr	27	22	81.48
5	New Latawh	150	80	53.33
6	Tuipang L	138	70	50.72
7	Tuipang V	143	92	41.25
8	Tuipang Diary	210	180	85.71
9	Siatlai	62	46	74.19
10	Zawngling	216	189	87.5
11	Chheihlu	133	85	63.90
12	Chakhang	236	170	72.03
13	Siasi	63	54	85.71
14	Mawhre	106	95	89.62
15	Chapui	172	113	65.31
16	Khopai	104	59	56.73
17	Ahmypi	40	40	100
18	Kaisih	83	71	85.54
19	Maisa	52	50	96.15
20	Lohry	52	50	96.15
21	Lawngban	111	75	67.56
22	Lodaw	58	56	96.55
23	Phura	227	210	92.51
24	Vahai	165	120	61.81
25	Tongkalong	105	98	93.33
26	Miepu	52	52	100
27	Laki	182	137	75.27
28	Supha	35	1	28.57
29	Lomasu	105	95	90.47
30	Bymari	85	10	11.76
31	Lope	31	27	87.09
32	Lungpuk	133	130	97.74
33	Khaikhy	49	25	51.02
34	Phalhrang	76	60	78.94
35	Romibawk	92	90	97.92
36	Riasikah	32	30	93.97
37	Tuipuiferry	52	50	96.15
38	Zeropoint	127	30	23.62
39	Maubawk L	139	100	71.94
40	Maubawk'Ch'	59	59	100
41	Kawlchaw'E'	227	31	13.65
42	Lower Theiva	133	97	72.93
43	Lungbun	167	167	100
44	Ainak	114	114	100
45	Siata	193	150	77.72
46	Tuisumpui	96	86	89.58
47	Thingsen	57	56	98.24
48	Niawhtlang-I	213	198	92.95
49	Niawhtlang-II	203	167	82.26
50	Chhuarlung-I	167	120	71.85
51	Chhuarlung-II	67	36	53.73
	Total	**5996**	**4607**	**76.83**

forest for agriculture during the month of January and February. The slash dries on the hill slopes and is burned during March-April. Prior to the onset of pre-monsoon rain, sowing operations are carried out.

The average annual rainfall is 2150 mm. It occurs mostly between June and September by the south-west monsoon. The winter (Oct-Jan) is a cool dry season with few rainy days. Summer (March-May) is largely hot and dry with occasional thundershowers and pre-monsoon rains in April-May. Temperature accedes to 32 °C during April and May and after occurrence of monsoon rain, temperature recedes slowly. During winter, average temperature remains 9 °C. The sky remains clear and the days are sunny during the four months of winter.

Before 1947, agriculture in the study area predominantly used to be slash-and-burn driven *Jhum* cultivation. This was discouraged by the state government, and the practice has been slowly declining. A 2017 report estimates the proportion of shifting cultivation area had been estimated to be about 30% - predominant part of which was for rice production (56% to 63% depending on the year). Despite dedicating largest amount of labour, jhum cultivated and non-jhum crop area to rice, the yields are low; the average rice yields per acre is about 70% of India's average rice yield per acre and 32% of India's best yield. It produces about 26% of rice it consumes every year, and it buys the deficit from other states of India.

The crop area used for jhum cultivation rotates in Siaha district; that is, the area slashed and burnt for a crop is abandoned for a few years and then *jhumias* return to slash and burn the same plot after a few years of non-use. The primary reasons for cyclical jhum cultivation includes, according to Goswami *et al.* (2012) personal, economic, social and physical. Jhum cultivation practice offers low crop yields and is a threat to the biome, they suggest increased government institutional support, shift to higher income horticultural crops, assured supply of affordable food staples for survival as means to further reduce jhum cultivation.

In the study area shifting cultivation occupies about 85 % area out of the total cultivated land (Singh and Singh, 1992). Singh and Ramakrishnan (1982) observed that shifting cultivators comprise of 82 per cent of the rural main workers and few urban main workers also involved in shifting cultivation. In this area too, shifting cultivation is the main source of livelihood for the poor rural people. Maithani (2005) observed that shifting cultivation is widely practice in Mizoram, the main occupation of the people and a major source of economy. The efforts were also comprised of to increase food production through settled cultivation and through launching of a new land use policy (NLUP).

The above table reveals that there are 5996 households in Siaha District,out of the total households, 4607 households are practicing in shifting cultivation in the entire district. This figure shows that an overwhelming majority i.e. 76.83 of the households in Siaha District are engaged in shifting cultivation. The overall analysis shows that while 76.83% of the households in the study area but a closer examination into the total number of households practicing shifting cultivation differs from village to village another within the district quite significantly. Taking the district average as a whole, i.e. 76.83% of the households engaged in shifting cultivation, 33 villages, i.e. 64.70 % in Siaha District recorded a higher engagement in shifting cultivation than the overall while 18 villages, i.e. 35.29 % recorded below the district average.

For a better understanding with regard to the extent of shifting cultivation in the study area, village wise engagement in shifting cultivation has been categorized into the four group, i.e very high, high, medium and low.

Class	No. of Villages	%
Below 30	4	7.84
30 - 60	6	11.76
60 – 90	24	47.05
Above 90	17	33.33

The above table shows that the practice of shifting cultivation is very low, i.e. below 30 % in 4 villages which accounts for 7.84 %, for e.g. the total household in Bymari is 85; out of the total householdsonly 10 households (11.76%) practice shifting cultivation similarly in Kawlchaw 'E' out of the total households of 227 only 31 households (13.65%) practice shifting cultivation.

From the above table it can be seen that to certain extent the practice of shifting cultivation is in Siaha District has been characterized by a certain degree of spatial variation, for instance village wise practice of shifting cultivation is as low 11.76 % and 13.65% in Bymari and kawlchaw'E' village while the entire households in Ahympi, Miepu, Maubawk 'CH',

Lungbun and Ainak villages are engaged in shifting cultivation. It can also be observed that the two village namely Miepu and Ahympi the entire families of the village are practicing shifting cultivation. It was above 90% in seven villages namely Lungpuk, Maisa, Lohry, Lodaw, Tokalo, Phura and Lomasu. While majority of the families in all the village are engaged in shifting cultivation, it was lowest in Bymari (11.76%) and Supha (28.57%) only.

Socio-Economic Implications of Shifting Cultivation

There are two schools of thought, advocating about the impact of shifting cultivation on socio-economy and on the environment. The scholars of the first school advocate that shifting cultivation is a wasteful method that degrades natural landscape through soil erosion and depletion of forests. According to the Government of India's report of 1995, 'shifting cultivation is a major cause of land degradation that has constantly declined the agricultural productivity and thus income of the farmers.

Whereas, the other scholars believe that it is a major source of livelihood of the people and a way of life to them. Scientific studies have been consistent, suggesting that there is optimal utilization of natural resources in the shifting cultivation regime, which is helpful for the stability and sustainability of agriculture in the mountains (Ramakrishna, 1992; Sharma, 1992). It becomes an imperative that controlling shifting cultivation will not only improve the ecological quality but also will enhance crop productivity.

The crop cycle of shifting cultivation has become more frequent and intensified. As a result, the fallow land cycle has been reduced to 2 – 3 years. Earlier it was 20 – 25 years duration. It is therefore permitting the land to return to natural condition (Patro and Panda, 1994). Due to reduced fallow land cycle, ecosystem resilience has reduced considerably. Frequent shifting cultivation from one land to other has affected the landscape ecology. The fragmentation of habitat, local disappearance of native species and invasion by exotic weeds and other plants are some of the other ecological consequences of shifting cultivation.

Studies defer in terms of economic productivity of shifting cultivation as some observed it is productive and vice versa. The economic productivity of shifting cultivation may be assessed though assessing the number of people supported by it. It is relevant to say that shifting cultivation is productive as its practices have been quite productive in many areas supporting relatively large populations (Thrupp *et al.,* 1997). In Mizoram, according to the Agriculture Department Report (2009-2010), more than 20% population is engaged directly and indirectly in shifting cultivation. It is the major source of livelihoods for them. In the tropical regions of Kalimantan, Indonesia, shifting cultivation supports 23 people/sq km, which is more than twice the number supported by commercial cultivation.

Shifting cultivation, in its traditional form, contributes to conservation of agro-biodiversity. It represents an effective form of land use. It utilizes space optimally. About 60 varieties of crops are cultivated in a given time and space. Shifting cultivation has also adverse impact on economy. From the productivity point of view, some researchers have largely termed shifting cultivation as unproductive and uneconomical. It was mainly due to the high frequency and intensity of shifting cultivation. During the past decades, the fallow period of shifting cultivation was long. Therefore, it was not so unsustainable (Luoga, 2000a).

However, due to increased population pressure, high demand of cereals and growth of urban markets for forest products, fallow period for shifting cultivation has been reduced from 20-25 years to 2-3 years. A Study from the Agro-Economic Research Centre of the NEI has compared per ah yields of shifting cultivation, varied between 8 quintal/ha in Mizoram and 12 quintal/ha in Assam. Other study says per ha yield of paddy was 17.7 quintal. It was 19.59 quintal/ha for the other crops in 2020-21.

Socio-economic development of the people, those are engaged in the shifting cultivation and living in the highlands, are fully dependent on its practices to carry their livelihoods although, per ha yield from shifting cultivation crops is not sufficient. The high growth of population, particularly in the areas where shifting cultivation is practiced, has put tremendous pressures on land. The extension of cropped land on the marginal mountain niche for increasing food production has also reduced the forest and grassland areas. Further, high soil and land degradation was due to high intensity and frequency of shifting cultivation.

Conclusion

All the schemes that were designated to control

shifting cultivation correspond with quantitative and qualitative changes made to suit the individual states. But on the whole afforestation programmes and measures to control the soil erosion received high priority in each of the state's plan. Terrace cultivation, provision of minor irrigation facilities etc, were some of the steps that were initiated in this direction. Pilot schemes in the jhum control measures, provided a means to decide on the strategy to control and if possible replace it with more stable and permanent form of agricultural practices.

Several recommendations for a change in the land use pattern not only aimed at minimizing the loss of top soil through erosion but also provided for increasing the cash returns for the jhummias. The problem of shifting cultivation, in the form of affecting a control in its spatial extent, required investment, technology and viable alternatives continues to dominate the developmental scenario of the region. Despite the priority in the various plans, research and volume of research work; this aspect continues to pose challenge as it has so far avoided any long term strategy towards resolution. What is infact required is detailed analysis of the land use pattern in the predominantly jhum areas of the region through the latest techniques and approaches available for each of the constituent states. This assessment will go a long way in suggesting concrete measures instead of concentrating on generalized information basis reinforced by few case studies.

Finally, nature bonding is the fourth most important dimension – forests are sacred to those who practice Shifting cultivation and the diversity of crops strongly links with food security. Shifting cultivation differs not only from state to state in the northeast but village to village and among families too. The current systems have adapted to the locations and access available to them: "The more remote locations have continued to practice Shifting cultivation as they always have with minor modifications, whereas communities closer to urban centres have completely modified their practice and undertake it almost completely for monetary outputs," he says.

The dense forests supply them with everything they need to survive, including timber to build homes, food and medicines, increasing the probability they can earn livelihoods and survive. "Shifting cultivation is not only a land-use system but a way of life, hence, the people cling on to this," said Pandey. "To safeguard sustainability, optimise ecosystem-based approaches and socio-ecological system frameworks, harmonisation of cultural ecosystem services and human wellbeing would be essential so as to ensure positive outcomes of management interventions on Shifting cultivation."

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