THE SHIFTING CULTIVATION AND ITS IMPACT ON ANTHROPOGENIC ENVIRONMENT IN MANIPUR

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Abstract:

The increase in population, particularly in the developing countries, has put tremendous pressures on land. Shifting cultivation is an age-old practice and commonly prevailed in the hill districts of Manipur where jhumians expenses high and unscientific form of land uses. The cycle of shifting in the early days of 20-30 years on a particular area has reduced to 2-5 years because of raising population; resulted degrading problems of environment and anthropogenic as well as geomorphologic of the region. The paper presents the causes and consequences of shifting cultivation and its direct and indirect impacts on the ecology. The present paper is base on secondary data that collected from various census publications of Directorate of Census Operation, Government of Manipur and primary sources of data collected from survey of four sampled villages from Ukhrul, Chandel, Tamenglong and Churachandpur districts of Manipur. The total population of the state is 28.56 lakhs and out of this, 40.88% are of Scheduled Tribes settles in the districts. Permanent cultivation is generally practise in the valley districts while jhum/shifting cultivation is widely adopted in most of the hills (40.18%). The findings from the study show that traditional slash and burn method of cultivation becomes land degradation and environmental disturbances. Shifting cultivation occupies a vital place in the tribal economy and constitutes a distinct part on the socio-economic set up and the life style of the hill tribes of Manipur. However, it is the most primitive and popular type of cultivation practised by the hill tribes, in fact, intense labour, degraded top soil due to deforestation and it seriously affect the ecology. It has reported that, during 2012-13, the total percentage distribution of reserved forests, protected forests and un-classed forests are 8.42, 23.95 and 67.63 respectively.

Keywords: Deforestation; Ecological imbalance; Soil degradation; Forestation, Siltation

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Introduction:

Manipur has a geographical area of 22,327 sq. km, which constitutes 0.7 percent of the total land surface of India. Ninety percent of the total geographical area of the state (20,089 sq. km) is cover by hills and the remaining area (2,238 sq.km) accounting for only one-tenth of the total area of the state is plain of lacustrine formation. According to 2011 census, the state is 28.56 lakhs registering a population density of 128 people per sq.km.

A primitive type of agriculture practiced by several ethnic and tribal communities in the hill areas so called slash and burn or shifting cultivation has been common type of agriculture in the hill districts of Manipur. Shifting cultivation implies an aimless, unplanned, nomadic movement or an abrupt change in location, of which may refer either to the cropping areas, the agriculturist, or the both (Conklin, 1957). Shifting cultivation, also known as 'jhum'; an Assamese word; Meitei called it '*pam- lou'* and in the Tangkhul dialect, it is call 'ahanglui'. Jhum is practicing in the hilly, hot and humid sites, where jhumians confronted with the problem of clearing land from either dense forests or overgrown grasses. The continuation of jhum in a state is closely link to the ecological, socio-economic, culture and land tenure systems of tribal communities.

The present work is a close look at jhum cultivation from the point of view of its impact on anthropogenic environment in Manipur and ecological sustainability by establishing agro-forestry, sericulture and horticulture as alternative activities to upgrade and develop jhum cultivation in the state. According to ecologists and environmentalists, jhum is economically unviable and ecologically unsustainable (Shah, 2005). Nevertheless, jhum or shifting cultivation in the hill areas of the Northeastern states, particularly to the tribal peoples, it is a burning question to stop the system in the sake of soil degradation, ecological and environmentally unsustainable. Permanent cultivation is generally practice in the valley districts while terrace cultivation is practise in some pockets in the hill areas where shifting or jhuming cultivation is widely adopted in the hills of the state.

The rapid increase of tribal population in the hill districts of Manipur (3.41% in 2011 Census) has put tremendous pressure on land. Shifting/jhum is cycle cultivation for 20-25 years in the long back but due to anthropogenic demands of more food has cleared greater chunks of forests, today most of the shifting cycle has reduced to 5-10 years and sometime 3-5 years and this adversely affecting eco-restoration, ecological process of forests and geomorphologic.

Forests cutting, burning and destruction of new growing plants for jhuming purpose causes denudation of forests, degradation of soil, loss of valuable flora and fauna are the direct impacts of shifting cultivation on ecosystem. Why are Trees so important? Trees are vital. As the plants on the planet give us oxygen, store carbon, stabilise the soil and give life to the world's wildlife, trees are undoubtedly important. They also provide us with the materials for tools and shelter. Forests are the life tonic of living bodies for providing oxygen during daytime in the process of photosynthesis that we inspirit and absorbs carbon dioxide, which affect our ecosystem. Moreover, trees protect swift running of rainwater and control causes of flood in the plains, retain infiltrate percolate water, and regulate river channels. Due to reduction of shifting cycle, the resilience of ecosystem has tremendously broken down, the hills are increasingly deteriorating, and valuable lakes as well as low-lying water storage areas are sedimentation. The actual unsustainable shifting cultivation creates a lot of inverse consequence. According to the Forest Report, 2013 by Forest Survey of India (FSI), Dheradun, the total forest cover of Manipur is 16,990 sq.km as against 17, 280 sq.km in 2009 (Govt. of Manipur,2014-15). The highest percentage of geographical area where shifting cultivation practiced is records in Tamenglong and Churachandpur (accounting for 45% of the total area under jhum cultivation in the state) and the lowest in Senapati district (even though Senapati has the highest proportion of forest area degraded by jhum). In Churachandpur district, about 84.6 per cent of the population depends on jhum cultivation

Objectives:

1. To examine the causes of destruction forest cover due to shifting cultivation in Manipur during the recent decades,
2. To find out the reasons behind them and to suggest policy measures for alleviating such discrepancies in agricultural, ecosystem and landscapes both in hills and valley areas of the state.

Material &Method:

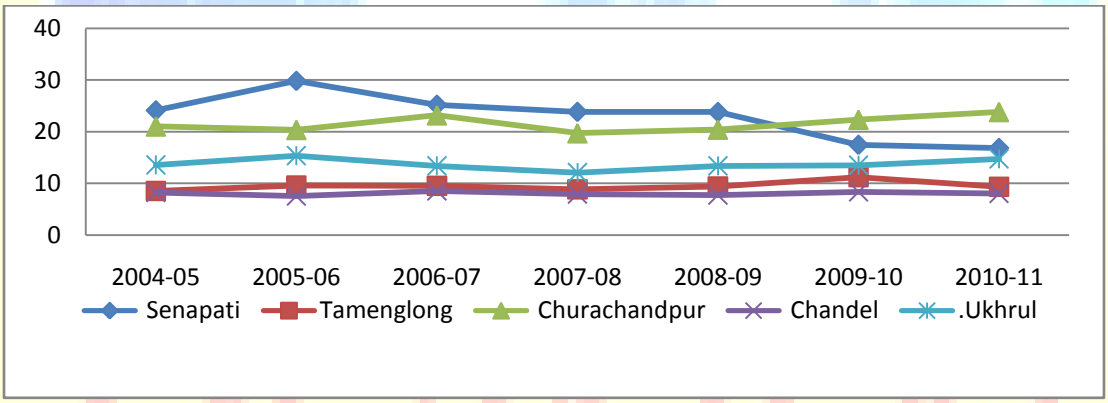
The present study is design to carry out with intense field visits on the spots and interaction with the jhumians of Ukhrul, Churachandpur and Machi, Karongthel, Laibi and Kwatha villages of Chandel District. Relevant data used in the paper are collected from the secondary published census data published by the Directorate of Economics and Statistics

Government of Manipur, Forest Survey of India (FSI), books and journals. A suitable tables, figures, and graphs also are employing to highlight the finding.

Results and discussion:

Sifting cultivation, which is still prevalent in the hill areas of Manipur that contributes significantly to forest losses and is the main cause of land degradation. This paper presents the causes and consequences of shifting cultivation and its potential land use alternatives in the hill areas of the state. The results of the study show the traditional land practices exacerbated by poverty and associated with a lack of technical knowledge is the main cause for the continuation of unsustainable shifting cultivation. Population pressure, inadequate land for cultivation, low education levels, lack of policy and planning and implementation without local participation are all factors that influence farmers to continue shifting cultivation in the area.

Fig.1: Area under Rice of shifting cultivation, 2004-10



According to the estimates of paddy shown area (shifting cultivation) in hill districts of Manipur, particularly during 2004-05 and 2010-11, paddy shown areas under shifting show signs of increasing up to 2006-07 (Table-1) 75.48% in 2004-05; and 82.67% to 79.83% in 2006 and 2007 respectively. The estimated area of shifting cultivation in the state was gradually increased from 2004-2006 and a sudden change of narrow down from 2008 except in Senapati and Ukhrul Churachandpur District, the highest concentration of shifting cultivation (23.83%) of total cultivable land above the previous records of the state. Area under shifting cultivation has tremendously increased from all hill districts in 2004-05 except in Senapati district. This gradual

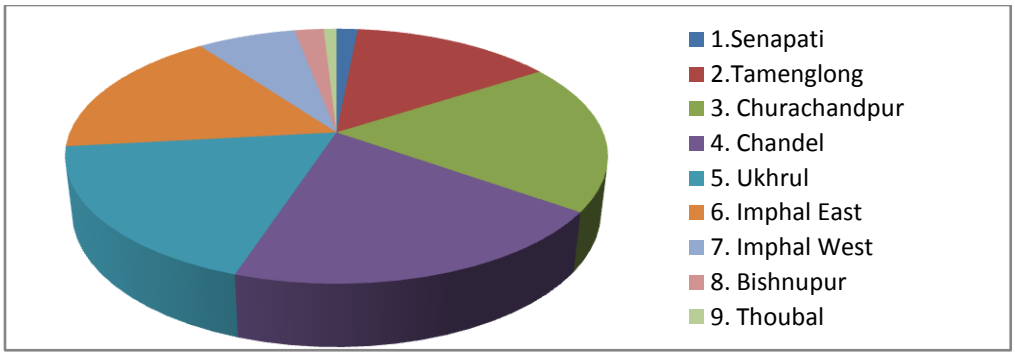
decline of shifting cultivation in the districts of Senapati and Tamenglong of Manipur is because of its replacement by horticulture or other plantations. Orange, litchis, pineapple, banana as fruits and cardamom, ginger as condiments etc, are extensively introduce in the hill districts of Manipur.

Paulownia Elongata, a tree species in the *Paulowniaceae* family and the fastest growing hardwood in the world, is widely planted on the hill slopes of Manipur. This species can withstand a very wide range of environmental conditions. The plant is popular for its outstanding income potential, control soil erosion and Nitrate contamination.

Paulownia Elongata (China Teak) growing on the hill slope of Manipur.

Indiscriminating cutting and injudiciously destruction of forest trees and vegetation for the shifting cultivation cause denudation of forests. The treeless hill slopes, that had been cleared by slash-and –burn ,occurred soil erosion, and completely degrade the top lose soil due to exogenesis agents. Due to these, forest degradation, soil erosion, loses of valuable flora and fauna are considering as the direct impact of shifting cultivation. Deforestation is again associated with many extreme hazardous problems in the ecosystem such as changes in hydrological cycle, flood, drought, greenhouse effects, destruction in the landscapes and global warming.

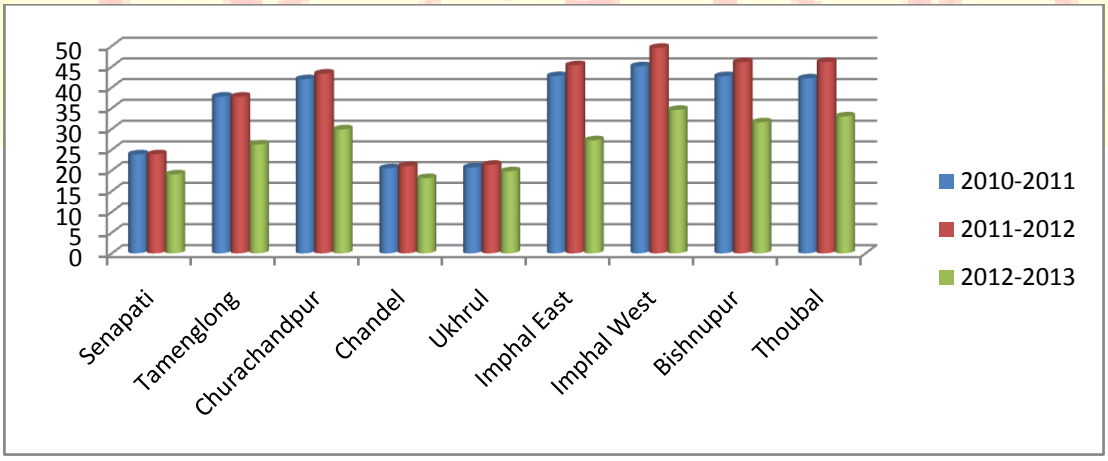
Fig-2: District-wise Covering Forest Area in Manipur-2013



Permanent cultivation is generally practice in the valley districts of Impala East, Imphal West, Thoubal and Bishnupur, while jhum cultivation is widely adopted in most of the hill districts. Rice is the staple food of Manipur and about 98 percent of food grains of the total food crop area are cover by rice.

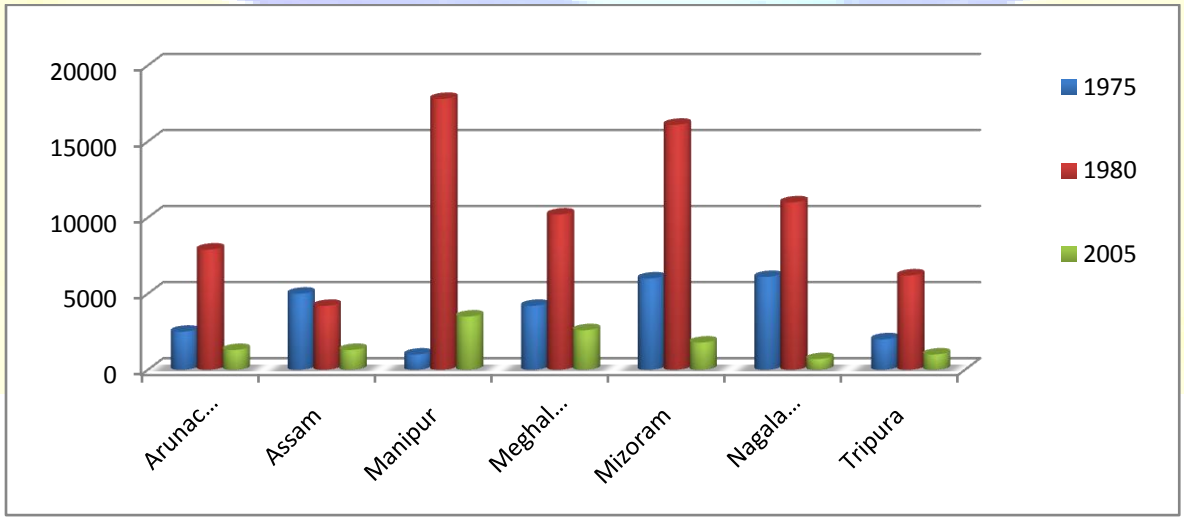
Table 3 (figure 5) clearly shows the areas under shifting in the states of northeast India has been tremendously decreasing. According to NEC Forest Survey Report 1978, 1980 and 2005 area of jhuming in Manipur was increase from 1000 sq.km to 17800 sq. km in 1978 to 1980 and again decrease to 3500 sq.km in 1980 respectively. During 2010-12, the total crop area in the hill districts of the state remains almost a slide change excepting in the valley districts where increases the total crop area. A tremendous change of downfall of total crop area in the hill districts except Ukhrul and Chandel is recorded from the previous years (Fig-3). It is because of the fact that, shifting cultivation in the hill areas for the last two decades has been decreasing and most of the paddy crop fields replace by cereal crops, tree plantation etc.

Fig.3: Land-Use Classification (Total crop area) of Manipur, 2010-13



Intensive land management through agro-forestry is a promising alternative that can sustainably manage the remaining forest resources in the Catchment areas of the river basin. Economic sustainability of the people is a great challenging task in context of emerging scenario of globalization and its controlling system of market economy. The progress of human development and sustainability of natural environment are the two important characters that the researchers are still trying to integrate for long-term development and sustainability in river basin environment. The Wangjing river basin catchment area has long history of development in terms of economic, cultures, social integration of various communities for common causes. The age-old practise of shifting cultivation in the catchment areas of the Wangjing River, at present it has become very harmful to the catchment in respect of erosion in the surrounding hill of the catchment areas and siltation of sediments, which brought down by the Wangjing River and her tributaries. Sediments deposited at the valley areas of Wangjing, Heirok, Lamding, Sangaiyumpham, Khangabok, Tentha and finally to the Ikop pat and Kharung Pat. Due to gradually siltation into these pats, the level of water during early monsoon rain has flooded and damaged to the resourceful paddy fields.

Fig. 4: Area under Jhum cultivation in North East India-1975, 1980 and 2005



Impact Of Shifting Cultivation:

The rotation of slash and burn of forest after a gap of 20-30 years to 2-3 years is causes the common problems of indiscriminate cutting and destruction of large quantity of forest trees and vegetation in the process of shifting cultivation. Frequent shifting from one land to other has affected the ecology of the area by declined the natural flora and fauna. The area having the shifting cycle of 2-3 years is more vulnerable to weed invasion compared to the area having of 20-30 years. From the findings, it is reporting that water and nutrient losses in shifting cultivation areas are far greater than in the virgin areas, and areas left for 50 years after jhuming.

Strategies Of Controlling Shifting Cultivation:

As and when the rotation of shifting were 15 or more, this type of cultivation did not pose any threat to the ecological firmness and soil degradation of the forested hill areas. The strategies of regulating the shifting cultivation include:

1. Providing employment opportunities and income generation to the villagers and provision of alternative means of livelihood;
2. Introducing terrace cultivation or forestry cooperative on jhum lands;
3. Convince the farmers by launching mass awareness programme for introducing horticulture, floriculture, and sericulture;
4. Provided mass awareness programmes to the tribal women and children to understand the importance of forests and causes of soil erosion, ecological imbalance and global warming due to deforestation.

Table 5 (figure 6) clearly shows the areas under shifting in the states of northeast India has been tremendously decreasing. According to NEC Forest Survey Report 1978, 1980 and 2005 area of jhuming in Manipur was increase from 1000 sq.km to 17800 sq. km in 1978 to 1980 and again decrease to 3500 sq.km in 1980 respectively.

Conclusion:

Agriculture is the vital source of economy of the state. Both increase in shifting area and decrease in the shifting cycle due to the increase in population, 35.46% in 2001 and 38.54% in 2011, particularly in the hill districts of Manipur, has put a tremendous pressure on land. Due to

reduction of shifting cycle from 20-30 years to 2-3 years, the resilience of ecosystem has broken down and the land is increasingly deteriorating. The cooperation of village people, voluntary organisation, stakeholders and the officials of all concerned departments should accelerate environmentally sustainable development of resources affected by jhum cultivation practices in the state. The fact is that due to lack of socio-economic condition, these people are certainly follows the old and traditional system of agriculture. Fix shifting cultivation with intensive method, terracing cultivation, knowledge and mass awareness to the jhumians to adopt afforest to bring a sustainable land-use and rich biodiversity can solved the present problems of shifting cultivation in the state.

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APENDIX:

Table-1:

Hill Districts under Rice by different varieties of Seeds used in Manipur, 2004-2010

(Area in '000 hectares)

District/State	Area under Rice type of Shifting /Jhum cultivation						
Manipur	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
1	2	3	4	5	6	7	8
Senapati	24.11	29.81	25.20	23.82	23.79	17.45	16.83
Tamenglong	8.52	9.58	9.52	8.85	9.37	11.18	9.32
Churachandpur	21.04	20.37	23.19	19.72	20.43	22.33	23.83
Chandel	8.23	7.54	8.52	7.89	7.74	8.34	8.04
Ukhrul	13.58	15.37	13.40	a12.09	13.39	13.53	14.76
Hill Total	75.48	52.67	79.83	72.37	74.72	72.82	72.78

Source: Directorate of Economics & Statistics, Government of Manipur, 2013

Table-2:

Land-Use Classification (Total Crop Area) of Manipur, 2010-11 to 2012-13

District	Classification of Reported Area								
	2010-2011			2011-2012			2012-2013		
	Net area sown	Area sown more than once sown	Total crop are a	Net area sown	Area sown more than once sown	Total crop area	Net area sown	Area sown more than once sown	Total crop area
Senapati	17.40	6.46	23.86	17.48	6.79	23.86	10.91	8.12	19.03
Tamenglong	30.85	6.91	37.76	30.85	6.91	37.76	17.65	8.58	26.23
Churachandpur	35.46	6.51	41.97	36.36	6.96	43.32	21.63	8.24	29.87
Chandel	14.67	5.82	20.49	14.86	6.15	21.01	10.65	7.47	18.12
Ukhrul	13.27	7.44	20.71	13.51	7.82	21.33	10.67	9.11	19.78
Imphal East	35.37	7.35	42.72	35.72	9.61	45.33	17.14	10.11	27.25

Imphal West	32.26	12.83	45.09	32.54	16.99	49.53	19.21	15.37	34.58
Bishnupur	25.90	16.81	42.71	26.28	19.79	46.07	13.54	18.03	31.57
Thoubal	26.01	16.15	42.16	26.27	19.85	46.12	14.88	18.12	33.00

(Area in '000 hectare)

Source: Department of Agriculture, Government of Manipur, 2013

Table No.3:

District-wise Covering Forest Area in Manipur

(Area in sq. km)

District	Geographical Area	Forest Cover/ 2013 Assessment				Percent (%)
1	2	3	4	5	6	7
.Senapati	3,271	232	861	1,080	2,173	66.43
Tamenglong	4,391	279	1,766	1,820	3,865	88.02
hurachandpur	4,570	36	1,671	2,579	4,286	93.79
Chandel	3,313	0	734	2,055	2,789	84.18
Ukhrul	4,544	181	980	2,365	3,526	77.60
Imphal East	669	0	53	167	220	32.58
Imphal West	559	0	24	31	55	9.64
Bishnupur	496	0	1	20	21	4.23
Thoubal	514	0	4	51	55	10.70
Total	22,327	728	6,094	10,168	16,990	76.10

Source: Forest Survey of India, Forest Department, 2013

Table-4:

Area under shifting cultivation in North East India ('000 sq.km)

State	1975 (Estimated by NEC)	1980 (Estimated by NEC)	2005 (Estimated by NEC)
Arunachal Pradesh	2500	7900	1300
Assam	5000	4200	1305
Manipur	1000	17800	3500
Meghalaya	4200	10200	2600
Mizoram	6000	16100	1790
Nagaland	6100	11000	708
Tripura	2000	6200	1005

Source: State Forest Division, 2005