Working Paper 384

Usage of Land and Labour under Shifting Cultivation in Manipur

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ISBN 978-81-7791-240-1

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USAGE OF LAND AND LABOUR UNDER SHIFTING CULTIVATION IN MANIPUR

Marchang Reimeingam*

Abstract

Shifting cultivation remains the main source of employment for large sections of the rural people who depend on agriculture for their livelihood in the hill areas of Manipur. Its inputs continue to be crude and traditional in nature resulting in subsistence production and income. It is labour intensive and has a traditional character, as described by Mellor. Rapid population growth has raised the use of forest land for shifting cultivation in Manipur. It has led to huge loss of forest resources every year. Institutional changes in the form of private ownership of land have resulted in commercialising forest products like timber and firewood. Land use and forest laws need to be strengthened to safeguard and protect forest land. Restructuring of land system from community to private ownership may reduce the practice of shifting cultivation and conserve forest cover.

Introduction

Shifting cultivation, or jhumming as it is commonly known, is largely confined to the North Eastern Region of India as per the report of the Task Force on Shifting Cultivation, Ministry of Agriculture (1983). The Ministry, as cited in the Forest Survey of India (FSI) 1987, estimated that shifting cultivation was practised in thirteen states of India: extensively in Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura in the North Eastern Region and Orissa; and minimally in Andhra Pradesh, Bihar, Kerala, Karnataka, Madhya Pradesh, Maharashtra, Sikkim and West Bengal. Shifting cultivation, an age-old agricultural system, has been a way of life for a large number of indigenous ethnic groups. Ministry of Development of North Eastern Region and North East Council (MODONER and NEC), in a paper on North Eastern Region Vision 2020 published in 2008, remarked that shifting cultivation is widely practised in the hills by the ethnic tribal people. Its practice is contentious due to its harmful environmental costs. It is commonly practised in the hill areas of Manipur, one of the North Eastern States of India. It is "operative chiefly in the regions where more technologically advanced systems of agriculture have not become economically or culturally possible or in regions where the land has not yet been appropriated by people with greater political or cultural power" (Sachchidananda, 1989:5). Nevertheless, it leads to the loss of forest cover causing land degradation and deforestation, and has become one of the major issues in Manipur.

People living in hill areas of the state are recognized as Scheduled Tribes (STs) by the Government of India. In 2011, 36.44 percent of the total 2.6 million people of Manipur lived in the five hill districts. The ST population comprised 35.12 percent in the state. They largely practise shifting cultivation as the permanent terrace cultivation is limited to certain areas in the foothills. Shifting cultivation is a labour intensive mode of agricultural activity and degrades land, soil and flora. It has a traditional characteristic, and is similarly characterised by Mellor (1962) as the practice of traditional agriculture where land and labour are highly complementary to each another. Productivity is low, multi-

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cropping is the standard and use of human labour is the main input; and labour is reciprocal in nature under the system (Gupta, 2006). MODONER and NEC (2008) also noted that productivity under shifting cultivation is low. According to the FSI (2011), 190 km^2 of forest cover was lost during December 2006/January 2007 to January/February 2009 (satellite data) in Manipur. Further, the FSI (2013) recorded a loss of 100 km^2 forest cover. Such loss in forest cover is mainly because of the extensive practice of shifting cultivation (FSI, 1987, 1995, 2005, 2011 and 2013). Shifting cultivation contributed to soil erosion, deforestation and destabilisation of the ecology (FSI, 1987 and MODONER and NEC, 2008). However, the use of chemical fertilisers and pesticides under the system is insignificant (Kerkhoff and Sharma, 2006). Directorate of Economic and Statistics (2014) data shows that fertiliser usage in the Hills of Manipur was insignificant, implying that agricultural production was organic under shifting cultivation.

With this backdrop, the present paper evaluates the changing patterns of shifting cultivation under the forest environment and the growing labour force in the Hills of Manipur. It also studies the patterns and trends of land use, forest cover, and agricultural and forest income with special reference to shifting cultivation in recent times.

Methodology

The paper attempts to examine the usage of land and labour under shifting cultivation in the hills of Manipur in recent decades using secondary literature and data mainly from Agricultural Statistics, Crop Estimation Survey and Statistical Abstract published by the Directorate of Economic and Statistics (DES) of Manipur, Forest Survey of India (FSI) and Population Census. The state of Manipur is classified into Hill areas covering the districts of Senapati, Tamenglong, Chandel, Churachandpur and Ukhrul; and Valley areas consisting of the districts of Imphal East, Imphal West, Thoubal and Bishnupur. The study examines the status of forest cover, its type and density with emphasis on the Hill areas. It assesses the contribution of agriculture, forestry and logging that affects forest cover on shifting cultivation, and its impact on Gross State Domestic Product (at constant prices).

Moreover, trends and patterns of land use in Manipur are analysed in comparison with those at the national level. In the following section, under the system of shifting cultivation the nature and extent of its practice is examined by considering an area under rice classified by type (i.e. shifting or permanent including terrace) of cultivation, particularly in the Hill areas. Further, the combined share of cultivators and agricultural labourers as workers in agriculture is briefly analysed along with an examination on the extent of economic participation by the population measured by workers population ratio (WPR). The number of shifting cultivators was estimated based on the census of agricultural workers due to non-availability of data on the figure. The number and size of shifting cultivators in the Hills is estimated by assuming that 60 percent of the agricultural workers (cultivators and agricultural labourers) practise shifting cultivation since the system is more labour intensive than the permanent/terrace cultivation system. The conclusion summarises the analyses of usage of land and labour under the system.

Land and Forest

The total geographical area of Manipur as per the Census of India 2011 was 22,327 km^2. Out of this, about 90 percent is located in the Hills districts and the rest in the Valley. Forest cover has shown a gradual improvement in the state from below 17,000 to over 17,000 km^2 from 2001 to 2011 despite the wide practice of shifting cultivation in the Hills. In 2013, the FSI recorded a decline in forest area by about 100 km^2 from the previous figure. Moreover, the area of forest cover in the Hills in particular has remained almost unchanged in recent years. Forest cover in Manipur is concentrated in the Hills, where about 98 percent of the forest is situated (Table 1). Interestingly, there has been a slight improvement in forest cover in the Valley (in absolute as well as percentage share) due to protection and development of forest areas or afforestation while the Hills forest cover has fallen possibly due to shifting cultivation and forest re-vegetation issues.

Table 1: Share Share (%) of Hills or Valleys Geographical and Forest Areas, Manipur

Area/ state	Geographical	Forest			
	2011	2001	2005	2011	2013
Hills	89.98	98.59	98.01	97.94	97.93
Valleys	10.02	1.41	1.99	2.06	2.07
Manipur (km^2)	22327	16926	17086	17090	16990

Source: Calculated by the author based on data from FSI (various years) and RGCCI (2011).

Table 2: Share (%) of Forest Cover in the Geographical Area, Manipur

Area/ state	2001	2005	2011	2013	Geographical area (km^2), 2011
Hills	83.07	83.36	83.32	82.83	20089
Valleys	10.63	15.19	15.73	15.68	2238
Manipur	75.81	76.53	76.54	76.10	22327

Source: Calculated by the author based on data from FSI (various years) and RGCCI (2011).

Table 3: Share (%) of Type of Forest Areas, Manipur

Year	Reserved Forest	Protected Forest	Unclassified Forest	Total Forest *(km^2)
1991	9.65	27.52	62.82	15154
1995	9.65	27.52	62.82	15154
2001	8.42	23.95	67.63	17418
2005	8.42	23.95	67.63	17418
2009	8.42	23.95	67.63	17418
2011	8.42	23.95	67.63	17418
2013	8.42	23.95	67.63	17418

Note: * Figures are reported by Forest Department of Manipur and published in FSI (various issues).

Source: Calculated by the author based on data from FSI (various years).

In terms of share of forest cover in geographical area, the state of Manipur ranked seventh among Indian states and UTs (FSI, 2013). The forest cover is slightly more than three-fourth of the

total geographical area of Manipur (Table 2). The Hills of Manipur are mostly covered by forests with a whopping share of about 83 percent. Forest cover in the Hills has hovered around this proportion despite the extension of human settlements, developmental activities like road or dam construction and the practice of shifting cultivation affecting land rejuvenation and re-vegetation process. In the Valleys, the forest cover stood at about 16 percent of the entire geographical area of 2,238 km^2.

FSI (2005) defined reserved forest as an area so constituted under the provision of the Indian Forest Act or other State Forest Acts and enjoying full protection. In reserved forests, all activities are prohibited unless permitted. In protected forests, which is an area notified under the provisions of the Indian Forest Act or other State Forest Acts, the degree of protection is limited. In protected forests, all activities are permitted unless prohibited. Table 3 gives details of reserved, protected and unclassified forests in Manipur. The state's forests are mostly the unclassified type with a share of close to 68 percent of the total forest areas. The state's total forest area recorded was 15,154 km^2 in 1991; this remained the same again in 1995. From 2001 onwards till 2013, the total area recorded was 17,418 km^2 based on the information given by the Forest Department of the State (Manipur) and published by the FSI in the India State of Forest Reports (ISFR). Figures for reserved, protected or unclassified forests also remain unchanged for the corresponding years, raising questions about the authenticity of the data. Unexpectedly, these total forest areas figures (given in Table 3) did not correspond to the total forest cover areas given in the same ISFR. For example, FSI (2011) recorded a forest area of 17,418 km^2 as reported by the State Forest Department; however, in the same FSI (2011) 17,090 km^2 was reported as the forest cover area in Manipur. This difference is simply because the State Forest Department reports the same figure repeatedly. Nevertheless, the protected forest forms the second largest type of forest with a share close to one-quarter of the entire forest area. About eight percent of the forest comprises reserved forests. The share of reserved and protected forest areas has declined. The decline of reserved forest is due to land encroachment (Hueiyen News Service, 2011). The same reason could explain the declining share of protected forests as well. With the increase in population, the protected forests that are not well defined and safeguarded are being cleared for human settlement (example: house construction) thereby reducing the area.

Table 4: Share (%) of Density of Forest Cover Area, Manipur

Assessment Year	Very Dense	Moderately Dense	Dense	Open	Total forest (km^2)	Forest % Geographical area*
1987	--	--	26.42	73.58	17679	79.18
1991	--	--	30.02	69.98	17685	79.21
1993	--	--	30.12	69.88	17621	78.92
1995	--	--	30.29	69.71	17558	78.64
1999	--	--	34.15	65.85	17384	77.86
2001	--	--	33.74	66.26	16926	75.81
2005	5.40	32.43	37.83	62.17	17086	76.53
2009	4.06	31.68	35.73	64.27	17280	77.40
2011	4.27	35.99	40.26	59.74	17090	76.54
2013	4.28	35.87	40.15	59.85	16990	76.10

Note: *Geographical area: 22327 km^2. -- not available.

Source: Calculated by the author based on data from FSI (various years).

Prior to 2005, dense forests were not sub divided into 'very' or 'moderately' dense. FSI (1987) had just two main classifications: a dense forest categorised as all land covered with a tree crown density >40% and an open forest categorised as having crown density between 10 and 40%. Both the classifications were used until 2001. In addition, a scrub category was also defined, with a crown density <10%. However, in 2005 FSI classified forests into very dense forests, i.e. all land with a tree canopy density of >70%, moderately dense forests, i.e. canopy density between 40 to 70% and open forests, i.e. canopy density between 10 and 40%. The classification was maintained in 2013. Besides these, it classified scrub land as degraded forest land with a canopy density <10%. Canopy density is the percent area of land covered by the canopy, i.e. cover of branches and foliage formed by the crowns of trees. The conditions nurturing forests keep on changing due to human intervention. The share of dense forest including very dense and moderately dense forests is always less than open forest. However, the share of dense forest has increased due to improvement in re-vegetation and afforestation in the open forest. In 1987 just above a quarter of the forest was classified as dense and the rest three-quarters were in the form of open forest (Table 4). After more than two decades in 2013, the share of dense forest has substantially increased to about 40 percent. The definition of dense forest has remained the same in all the years of assessment. The increase in dense forests is largely contributed by the improving green cover of moderately dense forests. The share (also in absolute terms) of very dense forest declined slightly by a little more than one percentage point in 2013 (4.28 percent) from 2005 (5.40 percent). The decline and degradation of dense forests is largely due to the practice of shifting cultivation, especially in the Hill areas of Manipur (IBCN, 2011). Overall, the forest area has gradually declined and as a result, the share of forest cover in the total geographical area has also declined over the years indicating that deforestation is taking place. The decrease in forest cover area is due to shifting cultivation practices besides harvesting of short rotational plantations, forest clearance in encroached areas, biotic pressures, and developmental activities and so on (FSI, 2013). However, the specific reasons for the decrease are the practice of shifting cultivation and biotic pressure in major parts of the state (FSI, 2013). However, Sastry *et al* (2007:28) have pointed out that in Manipur, as in other North Eastern states, "there is no simple relationship between shifting cultivation and forest loss, implying dynamic changes in forest cover due to the interacting effects of various factors".

Table 5 shows the share of density of forest cover area in the Hills and Valleys of Manipur. The forest cover area in the Hills was improving during 2001-2005; however, thereafter it started declining. The improvement is due to conservation measures such as afforestation activities, and participation of locals for better protection measures in plantation and traditional forest areas (FSI, 2013). The combined share of very and moderately dense forest has increased. However, the share of very dense forest in the Hills has declined, and that is attributed to the shifting cultivation practised only in the Hill areas. In the Valley, the share of dense forest is dwindling resulting in the rise of open forest area in recent years. Loss of forest cover is a major environmental concern in the state irrespective of whether degradation or deforestation is causing it in the Hills or the Valleys. Deforestation, degradation of land and forest management challenges such as the rights of indigenous people to enjoy their traditional or customary privileges on land, lack of institutional support to communities etc., are major issues

concerning forests in Manipur (Sastry *et al*, 2007). Generally, deforestation is caused by residential area expansion, forest conversion for permanent pasture and agriculture, intensive shifting cultivation, infrastructure expansion etc. while forest degradation is attributed to selective logging, shifting cultivation, mining, deterioration of regeneration processes, etc.

Table 5: Share (%) of Density of Forest Cover Area by Hills and Valleys, Manipur

Forest type	Hills				Valleys				Manipur			
	2001	2005	2011	2013	2001	2005	2011	2013	2001	2005	2011	2013
Very Dense (a)	--	5.51	4.36	4.38	--	--	--	--	--	5.40	4.27	4.28
Moderately Dense (b)	--	32.50	36.26	36.13	--	28.82	23.30	23.36	--	32.43	35.99	35.87
Dense (a + b)	33.86	38.02	40.62	40.51	24.79	28.82	23.30	23.36	33.74	37.83	40.26	40.15
Open	66.14	61.98	59.38	59.49	75.21	71.18	76.70	76.64	66.26	62.17	59.74	59.85
Total forest (km^2)	16688	16746	16738	16639	238	340	352	351	16926	17086	17090	16990

Notes: Prior to 2005, the dense forest was not sub divided into very or moderately dense. -- Data not available.

Source: Calculated by the author based on data from FSI (various years).

Forest exploitation for practising shifting cultivation and tapping other forest products is widespread in the state. The major forest products like timber (teak and others), firewood, charcoal, and post and pole account for 71 percent of forest production and the minor ones such as cane, stone, sand, bamboo etc. account for 29 percent of production, with a total value of ₹ 13.53 million in 2007-08 (DES, 2014). As per the CSO data, the contribution of forestry and logging to gross state domestic product (GSDP) was ₹ 332.1 million in 1980-81 (at 2004-05 prices), and this has approximately increased six fold to ₹ 1,906.6 million in 2013-14 (at 2004-05 prices). It constituted 2.29 percent of the GSDP in 2013-14. Besides, the contribution of agriculture to GSDP has substantially declined, particularly due to the improvement in non-agricultural sectors, to about 16 percent in 2013-14 from 43 percent in 1980-81, as presented in Table 6.

Table 6: Share (%) of Real GSDP (at 2004-05 prices) at Factor Cost by Industry of Origin, Manipur

Sector	1980-81	1990-91	2000-01	2010-11	2011-2012	2012-13	2013-14
Agriculture	42.80	30.15	19.33	16.44	15.53	16.17	15.51
Forestry & logging	4.75	3.42	4.57	2.84	2.69	2.43	2.29
Fishing	0.93	2.39	2.88	1.94	1.58	1.72	1.92
Agri & Allied	*47.02*	*35.60*	*26.15*	*21.22*	*19.80*	*20.32*	*19.72*
Industry	*16.77*	*22.00*	*28.82*	*29.69*	*28.16*	*26.84*	*25.80*
Services	*36.21*	*42.41*	*45.04*	*49.10*	*52.04*	*52.84*	*54.48*
GSDP (%)	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*
GSDP (₹ million)	6988.3	11456.5	38600.7	66806.1	73267.0	78425.1	83304.2

Notes: Absolute figures up to 2000-01 is author's calculation, a convergence at 2004-05 prices, as follows: example, for GSDP 2000-01 at 2004-05 prices – firstly, measure the ratio between figure of the year 2004-05 at 2004-05 prices and figure of the year 2004-05 at 1999-2000 prices; and secondly, figure of 2000-01 at 1999-2000 prices is multiplied by the ratio.

Source: Calculated by the author based on CSO (http://mospi.nic.in).

Land Use

In Manipur, land use is administered through the Manipur Land Revenue and Land Reforms (MLR & LR) Act, 1960. The Act is applicable to the whole state of Manipur except the hill areas. However, the recent Manipur Land Revenue and Land Reforms (7th Amendment) Bill passed on 31st August 2015 during the special session of Manipur Legislative Assembly remains controversial as it is being termed anti-tribal by the hill people. The hill people are protesting for revoking the Bill. If it is enacted, land use would be administered through the MLR & LR Bill 2015, and its jurisdiction would extend throughout Manipur without any exception for the hill areas. This would eventually deprive the hill people of their rights of land holdings, ownership and control, all of which would be taken over by the state. This is one of the reasons why they are protesting against it. Land in the Hills of Manipur is owned by the community; however, private/individual land ownership also prevails in certain areas. Usually, land is owned by the community among the shifting cultivators; however, gradually private ownership of land has emerged (Maithani, 2005). Sachchidananda (1989:37) wrote that in "most of the hill areas of Northeast India, land is owned by the community as a whole. Individual ownership of land is recognised in certain areas usually confined to homestead and settled farm land." The land ownership system differs across ethnic groups and villages in the state. Some ethnic groups or villages follow community, clan or kinship ownership and some others private or individual ownership. Private land is owned by an individual for housing, permanent cultivation, farming etc. Community land is controlled and managed by the villagers as a whole among some ethnic groups and by the village head among others. The community land ownership system could partially be hindering investments, and also the development and adoption of modern technology, in shifting cultivation. Further, the land of tribal people cannot be sold to the non-tribal people. In Manipur, agricultural land is put to for various uses, including shifting, terrace and permanent cultivations. DES (2014) ascertained that permanent cultivation is mostly practised in the Valley whereas shifting and terrace cultivations are generally practised in the Hills. Forest areas are also cleared for temporary land use such as plantations as well as permanent land use like construction of roads or terrace farming. The land classified for different uses in Manipur vis-à-vis India is presented in Table 7. Over 90 percent of the entire geographical area of land is reported as available for land utilisation in the state as well as in the country. Out of the total land declared for utilisation, over 80 percent comprises forest land in Manipur against only 23 percent for India; the remaining is distributed for various other land use classifications. Out of the total area reported for land utilisation, about 11 percent was under net area sown in 1996-97 in Manipur. This remains at the same level till 2009-10; however, in 2010-11, it increased slightly to over 16 percent, with a reduction in the forest area. It indicates that land use pattern is not uniformly distributed over the years. In other words, a change in forest areas is occasionally due to shifting cultivation intensity. In India, the net area sown remains high at about 46 percent. A comparison of the share of net area sown between the state and the country highlights that there is possible scope to extend agriculture or that agricultural land is underutilised in the state.

In Manipur, land under permanent pasture and other grazing, land under miscellaneous tree crops and groves, cultivable wasteland, current fallow land and fallow land other than current fallows constituted less than one percent of the entire land declared for utilisation. Moreover, about one

percent of such land is not available for cultivation. At the national level, this category comprises about 31 percent of the total land reported for utilisation. It shows that Manipur has the potential to exploit forest land prudently for various kinds of land development for sustainable agriculture as well as other suitable developmental activities. Sustainable agriculture refers to improved agricultural food production without destroying the environment (Srinivas, 1996). The development of sustainable agriculture covers environmental, economic and social dimensions, which are closely interrelated (Bowler, 2002).

Table 7: Distribution (%) of Land Use Pattern in Manipur and India

Land use classification	Manipur					India				
	1996-97	2000-01	2005-06	2009-10	2010-11	1996-97	2000-01	2005-06	2009-10	2010-11
Forests	86.91	87.45	87.01	86.62	81.98	22.68	22.78	22.92	22.88	22.88
Not available for cultivation	1.39	1.39	1.34	1.34	1.27	13.30	13.59	13.86	14.17	14.24
Permanent pastures & other grazing land	0.05	0.07	0.07	0.07	0.06	3.57	3.49	3.42	3.38	3.37
Land under misc. tree crops & groves (not incl. in net area sown)	0.31	0.31	0.30	0.30	0.28	1.20	1.13	1.11	1.05	1.05
Cultivable wasteland	0.05	0.04	0.04	0.04	0.03	4.60	4.46	4.33	4.24	4.14
Fallow land other than current fallows	0.00	0.00	0.00	0.00	0.00	3.35	3.38	3.50	3.54	3.37
Current fallows	0.00	0.01	0.01	0.01	0.01	4.37	4.84	4.65	5.23	4.66
Net area sown	11.29	10.80	11.24	11.62	16.39	46.92	46.34	46.21	45.51	46.28
Reporting area for land utilisation	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	1948	*1936*	*2002*	*2011*	*2125*	*304621*	*305174*	*305447*	*305834*	*305903*
Geographical Area	*2233*	*2233*	*2233*	*2233*	*2233*	*328726*	*328726*	*328726*	*328726*	*328726*

Note: Figures in italic are in thousand ('000) hectares.

Source: Land Use Statistics at a Glance, 1996-97 to 2005-06 (2007) and 2001-02 to 2010-11 (2013), DES (Manipur), Department of Agriculture & Cooperation, Ministry of Agriculture, GoI, Delhi.

The distribution of households classified by the size of land possessed and cultivated, as per the National Sample Survey Organisation (NSSO), is given in Table 8 for Manipur and India for 2009-10 and 2011-12 for rural areas. Most of the households in the state, as in India, possessed less than one hectare of land, and as a result the majority of the households cultivated land smaller than one hectare. Similar is the case for STs of the state. The share of households which possessed and cultivated land of less than 0.001 hectare has increased in the state while the share of households which have cultivated land of <0.001 is much greater for the country than for Manipur. The share of households that possessed and cultivated land between one and four hectares was considerably larger for STs than others, especially in Manipur. Unlike India, not many households owned and cultivated large areas of more than four hectares in Manipur, among all social groups including STs.

Table 8: Distribution (%) of ST/All Social Groups Households by Size, Class of Land Possessed and Cultivated (Hectares) in Rural Areas in Manipur and India

Land Size Class (Hectares)	Manipur								India							
	Scheduled Tribe				All				Scheduled Tribe				All			
	Possessed		Cultivated		Possessed		Cultivated		Possessed		Cultivated		Possessed		Cultivated	
	2009-10	2011-12	2009-10	2011-12	2009-10	2011-12	2009-10	2011-12	2009-10	2011-12	2009-10	2011-12	2009-10	2011-12	2009-10	2011-12
<0.001	16.2	25.2	21.4	26.0	21.6	14.0	24.5	29.5	10.1	4.9	37.2	38.6	8.3	3.4	45.4	47.4
0.001-0.004	0.0	0.3	0.0	0.0	0.4	0.2	0.4	0.1	13.8	12.2	1.0	0.3	11.7	11.3	0.8	0.6
0.005-0.40	24.7	28.5	20.7	21.5	30.9	40.0	25.8	22.5	32.8	35.7	18.6	19.0	44.8	48.7	20.3	19.8
0.41-1.00	36.6	25.9	36.3	32.9	31.7	29.7	34.8	34.2	19.8	21.0	20.8	19.4	16.1	16.5	15.5	14.2
1.01-2.00	17.1	13.5	16.2	14.4	12.2	11.6	11.7	10.0	13.0	16.2	12.7	14.0	9.7	11.0	9.5	10.3
2.01-4.00	4.5	5.0	4.0	4.2	2.5	3.6	2.1	3.0	8.3	8.2	7.6	7.1	6.5	6.4	6.1	5.4
> 4.01	0.8	1.6	1.4	1.0	0.7	1.0	0.8	0.7	2.2	1.8	2.0	1.7	3.0	2.8	2.5	2.4
All Classes	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: Figures given per 1000 in NSSO Reports are converted into percentage.

Source: NSSO (2012 and 2015).

Shifting Cultivation

People categorised as Scheduled Tribes (STs) by the Government of India and living in the Hills of Manipur largely depend on land and forest for their livelihood through agriculture, food gathering and hunting. Jhum or "jhoom cultivation" (Gupta, 2000:605) or "shifting cultivation or slash and burn" (Seavoy, 1973:522) or "swidden cultivation" (Eden, 1993:146) or simply jhumming or "jooming" (Peale, 1874:476) has been practised as a way of life within the tribal communities and hill people from time immemorial. Seavoy (1973:522) defined shifting cultivation as "clearing a patch of forest by felling and burning trees and then cultivating this land for one or more years before abandoning it in favor of other patches". After the cropping, each patch is allowed to revert to secondary growth for a number of years before it is re-cleared and re-cultivated. The shifting cultivation system, according to Payn (1892) as quoted in Hodson (1911:15) and cited in Shimray (2004:1699), is a "primitive mode of agriculture all over the world and widely practised, even yet, where virgin forest land is abundant, for in such circumstances it is the most economical method, because it produces the largest net return." Ninan (1992) noted that shifting cultivation is an agricultural system characterised by rotation of fields rather than crops, with a short period of cropping alternating with long fallow periods, and use of slash-and-burn methods for clearing land. Burning under shifting cultivation reduces labour input for physical clearance, produces ash for valuable fertilizer, increases leaching effect for better availability of soil nutrients to plants and possibly kills off fungal diseases and noxious insects (Forestry Department, 1985). The ashes produced from burning are used as manure (DES, 2007). The "system of cultivation is mainly by what is called jooming [jhumming] where forest is felled and the site used for two years only, when, in consequence of the growth of rank weeds, fresh forest is again joomed [jhumed], and a system of permanent culture of one spot is impossible" (Peale, 1874:476-477). It is both labour intensive and land extensive, and occupies a distinct place in the tribal economy. It constitutes a vital part of the life-style and socio-economic set-up of the hill and tribal regions. Spencer (1966), as cited in Thomas (1968), regards shifting cultivation as one form of tropical agriculture and brings together data derived from many different approaches: area, commodity, economy, culture, technology, history, and government. Kerkhoff and Sharma (2006:6) remark that "[p]olicymakers, governments and analysts have often assumed that shifting cultivation is universally unsustainable and destructive of forests and wildlife and have failed to recognise the great variety of land use types involved, to understand the cultural knowledge of the indigenous peoples, or to realise the vast number of plant and tree species associated with shifting cultivation".

Shifting cultivation takes place in an earmarked forest area for cultivation, and then the forest is cleared by slashing trees using traditional tools. The felled trees are dried and subsequently burnt to enhance soil fertility. The tribals use traditional and unscientific tools like dagger, sword, axe, hoe, digging, sickle etc. for clearing the plot. Earlier, the fallow period between two shifting cultivation cycles used to be quite long for the regeneration of vegetation and soil fertility. This has reduced significantly due to population pressure. As the system is practised by the indigenous people, ILO Convention No.169 Article No.14, as noted by Roy, Xavier and William (2012), has specifically recognised their rights of ownership and possession, including those of shifting cultivators, over the land which they traditionally occupy. Further, ILO Convention No.107 safeguards the land and resource rights of the

indigenous people. ILO Convention No.111 guarantees that shifting cultivators may exercise the right to practise their traditional occupation. Moreover, the United Nations Declaration on the Rights of Indigenous Peoples recognises several rights for the communities practising shifting cultivation.

In Manipur, shifting cultivation is predominantly practised among the ethnic groups such as Nagas, Kukis, Mizos, Zhomis etc. A few ethnic groups practise terrace cultivation on the slope of the hills. Under shifting cultivation, the land is usually tilled for one year, and then allowed to lie fallow for seven to ten years. Where there is insufficient land for shifting, the same land is tilled for two or three years at the most. At present, a plot of land is tilled for just a year due to the decline in soil fertility and then laid fallow for some years. For example, in Nagaland, jhum fields are deserted after the first year due to both labour constraints and/or decline in soil fertility (Jamir and Lianchawii, 2013). The number of years the fields are kept fallow depends on population pressure in different areas. The "Kukis removed their villages to fresh sites when the land was used up, but the Nagas, who showed great attachment to their village sites, would proceed to great distances to cultivate, notwithstanding the labour of carrying back their harvests" (Godden, 1898:7). Nagas burn their field and grow rice, millets, corns, taro potato and so on. Some fields are terrace-styled for growing rice and taros. "Naga cultivation is said to have included rice, pea, several varieties of small grain, Indian corn, yams, chillies, ginger, garlic, pumpkins, and other vegetables, and cotton; gardens with sugar-cane, almonds and wild raspberries are mentioned for North Kachar" (Godden, 1898:10). Shakespear (1909:371-372) observed that "[Kuki] clans practise jhum cultivation, that is, they fell a piece of jungle and, when sufficiently dry, burn it and then dibble in the seed, and seldom cultivate the same piece of land for more than two years in succession. They therefore need much room, and the desire for new land, coupled with the fear of stronger clans, has led to the whole race adopting a more or less vagabond mode of life, which has been made fatally easy by the wide-spread growth of the bamboo, which makes house building, of a certain kind, very simple."

Shimray (2004) has remarked that some Nagas such as Tangkhul, Mao, Zeliangrong and Maring practise both shifting cultivation as well as sedentary terraced cultivation. A large proportion of Naga population is engaged in shifting cultivation. Ramakrishnan (1980), as cited in Shimray (2004), points out that shifting cultivation constituted the earliest form of agriculture and provided the basic needs of man. It also placed him in harmony with nature, of which he was an integral part, and on which he depended for survival. Shifting cultivation is deeply rooted and linked to indigenous ethnic culture (MEF and GBPIHED, 2009). Terraced cultivation is also practised in Naga society but it is confined to the lower gradient of the mountain ranges and to narrow river banks and valleys.

In Manipur, 1.13 percent of the total geographical area (22,327 km^2) grew rice under shifting cultivation in 1992-93. This increased to 1.78 percent in 2000-01, and 2.04 percent in 2005-06. Specifically, 1.26, 1.98 and 2.27 percent of the total Hill areas (20089 km^2) was under shifting cultivation in the respective years. It clearly shows that the practice of shifting cultivation is increasing constantly. This trend is caused by population growth coupled with underdevelopment in the Hills. Unavailability of suitable employment in the non-agricultural sector for the unemployed living in the Hills is forcing them to engage in agricultural activity in the predominant system of shifting cultivation. Non-agricultural employment is mostly available and concentrated in the urban centres. Specifically, formal

non-farm jobs are concentrated in the Valley areas in Manipur. This implies that shifting cultivation can be reduced by generating and providing non-farm jobs in construction, transportation, services etc., in the Hill areas. Mellor (1962) mentioned that lack of non-farm employment opportunities keeps the rural labour dependent on agriculture.

In both the Hills and the Valleys, rice is the staple food. Rice continues to dominate the acreage of all the crops in the state (DES, 2014). It is mainly cultivated under the system of permanent, terrace and jhum (shifting) cultivation. Table 9 gives a share of the area under rice by types of cultivation in the state. The state records only 17 percent under shifting cultivation and the rest is under permanent including terrace cultivation in the total cultivated area in 1992-93. The share of area under shifting cultivation has increased to about 27 percent in 2005-06. This implies that increasingly more forest land is brought under shifting cultivation due to the rapid population growth and pressure on land. The population density in the state, according to Census of India, has increased dramatically from 82 in 1991 to 115 in 2011. Population pressure has induced an extension of agricultural land. The area under rice has increased by about 17,000 hectares, due to the increase in area for shifting cultivation, from 1992-93 to 2008-09. However, in 2008-09, the shifting cultivation area declined to 16 percent.

Table 9: Share (%) of Area under Rice by Types of Cultivation, Manipur

Year	Hills			Valleys			Manipur		
	Permanent*	Jhum	Total ('000 Hectares)	Permanent*	Jhum	Total ('000 Hectares)	Permanent*	Jhum	Total ('000 Hectares)
1992-93	60.44	39.56	63.80	100.00	-	87.39	83.31	16.69	151.19
1995-96	48.11	51.89	57.41	100.00	-	77.52	77.92	22.08	134.93
1999-00	40.22	59.78	67.81	100.00	-	89.24	74.19	25.81	157.05
2000-01	41.45	58.55	67.96	100.00	-	89.00	74.65	25.35	156.96
2005-06	44.84	55.16	82.67	100.00	-	83.59	72.57	27.43	166.26
2008-09	-	-	-	-	-	-	83.95	16.05	168.40

Note: **-** Not available. *includes terrace cultivation. Area under jhum in 2008-09 was 27031 hectares. It is from Wasteland Atlas.

Source: DES (2001, 2007 and 2014) and Wasteland Atlas (http://www.dolr.nic.in).

In the Hill areas, people largely depend on cultivation for their livelihood. Cultivation area has increased by close to 20,000 hectares from the early 1990s to the mid-2000s. Shifting cultivation is a common practice only in the Hills, as there is no data record of it in the Valleys. Presently, it is reserved mostly for the rice cultivation in the Hills. In 1992-93, shifting cultivation accounted for about 40 percent of the 64,000 hectares of cultivated land. Later in 2005-06, about 55 percent of rice cultivated was under this system. Permanent and terrace cultivation occupies and plays an important role in rice cultivation in the Hills. However, the difficulties arising from financial and technological constraints, and irrigational problems in establishing it, have forced the growing population to move into shifting cultivation. In the Hills, the permanent and terrace cultivation area in absolute figures has declined marginally by about 2,000 hectares from about 39,000 hectares in 1992-93 to about 37,000 hectares in 2005-06. However, shifting cultivation has contributed to a major change in cultivation pattern. The area under shifting cultivation almost doubled in 2005-06 (about 45,000 hectares) from 1992-93 (about

25,000 hectares). This has serious implications for land and environment in the state, specifically in the Hill areas, and requires the attention of policy makers.

Labour in Shifting Cultivation

In an economy with a labour surplus due to booming population and scarce capital, there is a greater tendency for labour to be absorbed in agriculture in general and shifting cultivation in particular, especially in the Hill areas. Bhattacharya and Nanda (2005) mentioned that the entire range of work in shifting cultivation is performed by manual labour without using plough or animal power. Moreover, family labour is the main source of supply. Infrequently, labourers are pooled together from cultivators from other households on a reciprocal basis to perform bigger tasks such as harvesting that needs to be completed in a day. Similarly, Sachchidananda (1989) has pointed out that while human labour is the main source, the labour patterns are frequently co-operative in shifting cultivation. Further, he wrote that 73.5 percent of the tribal population of Manipur consists of shifting cultivators. The labourers are mainly engaged for work such as underbrushing, felling, burning, secondary clearing, dibbling (i.e. planting with a tool), sowing, hand weeding, spraying weeds, harvesting, transporting, threshing, winnowing, drying and harvesting secondary crops. Labour is also used for construction of huts (farmhouse) or farmsteads, wooden fencing and guarding farms from potential attacks by wild animals and birds. The use of labour in the state under shifting cultivation is similar to the one used in shifting cultivation in Malaysia, described by Cramb (1988). In Malaysia, the average labour input per hectare for underbrushing, felling, harvesting of secondary crops and miscellaneous activities (including visiting farms) is 209 days per hectare (Cramb, 1988). A similar number of labour days has been estimated for Manipur also since the labour requirement in shifting cultivation is so intensive.

In Manipur, more than half the population (excluding 0-6 year-olds) participated in economic activities, measured by workers-population ratio (WPR), in recent years (Table 10). The rate of economic participation was greater in the Hills by a few more percentage points than in the Valleys. In the Hills, employment in agriculture continues to dominate, with about 68 percent share in 2011, which is a decline of about three percentage points from the previous decade. In the Valley, the share of agriculture is less than half of the total employment. The overall share of agriculture in employment has declined in the Hills, where shifting cultivation is predominant, and also in the Valley, where permanent cultivation is predominant, as people are increasingly employed in non-agricultural sectors. It implies that with the improvement in educational attainment in particular and development in general, the level of withdrawal from agricultural activities in order to accommodate non-agricultural activities is increasing. An individual who has acquired a certain level of education has definite goals and aspiration, and prefers modern formal or non-agricultural jobs. Yet, due to severe unemployment issues, the new labour entrants are forced into shifting cultivation. This situation offers scope for the adoption and practice of modern agricultural methods among the literate and educated groups to raise production and take up a sustainable approach to agriculture.

The decline in agricultural employment is evident among both the cultivators and agricultural labourers. Among the agriculturists, the majority are cultivators. Importantly, the share of agricultural labourers in the Hills is less than in the Valley simply because everybody has a share in the community

land in the Hills unlike in the Valleys where the land is privately owned. The nature of agricultural activities, particularly shifting cultivation in the state, is seasonal and depends solely on monsoon for irrigation. This indicates that shifting cultivators engage in secondary non-agricultural activities such as construction work or take up work as agricultural labourers in permanent wet land fields during the off-season.

Table 10: Share (%) of Agricultural Workers and WPR, Manipur

Area/ State	Workers (main + marginal)						WPR
	Year	All workers (Nos.)	Cultivators (C)	Agri. Labours (AL)	Agri. workers (C+ AL)	Others	
Hills	2001*	343174	64.05	7.20	71.25	28.75	52.84
	2011	445562	61.21	6.67	67.88	32.12	54.86
Valley	2001	602039	26.56	14.77	41.33	58.67	49.81
	2011	713491	25.95	11.40	37.35	62.65	50.25
Manipur	2001*	945213	40.17	12.02	52.19	47.81	50.87
	2011	1159053	39.51	9.58	49.09	50.91	51.93

Notes: *Excludes three sub-divisions namely, Mao-Maram, Paomata and Purul of Senapati district. WPR: Ratio between workers and population (excluding 0-6 years of age) in percentage.

Source: Calculated by the author based on data from RGCCI (2001 and 2011).

A large number of people continue to engage in shifting cultivation in the Hills of Manipur (Table 11). It is ever increasing due to population growth and insufficient employment alternatives. There are no clear and exact empirical records on the shifting cultivators. Limited estimates are available, but this requires validation. Nevertheless, there are some estimates on shifting cultivators. For instance, NEC (1974) estimated that about 50,000 families were shifting cultivators in Manipur. Later in 1983, the Task Force Report on Shifting Cultivation in India estimated the number at 70,000 in the state. Furthermore, using census data and assuming that 60 percent of the agriculturists (cultivators plus agricultural labourers) were engaged in shifting cultivation, which is labour intensive, we can put the number of shifting cultivators in the Hill districts of Manipur in 1991 at close to 0.158 million. In the following decade in 2001, the number of people working under shifting cultivation came down to 0.147 million, partially due to the exclusion of three subdivisions of Senapati district located in the Hill area of the state. Later in 2006, the number of shifting cultivators rose marginally to 0.163 million. Similar estimates show that 0.181 million workers were engaged as shifting cultivators in the Hills of the state in 2011. Overall, the size of shifting cultivators has systematically increased due to rapid population growth and lack of adequate job opportunities outside agriculture. In recent decades, the growth of population in the state has been slowing down moderately as the level of literacy has improved, birth and death rates have declined, and living costs have risen. In fact, the literacy rate improved substantially from about five percent in 1941 before merger with India to about eleven percent in 1951, just after the princely Manipur kingdom merged with the Indian Union in 1949. At present, Manipur has attained over 79 percent literacy. Education has mainly contributed to the reduction in population growth as people are better informed, more knowledgeable, more responsible and more aware of

economic implications, specifically employment. Despite this, a large portion of rural labour still depends on agricultural activities, more specifically shifting cultivation, in the Hill areas of the state.

Shifting cultivation took up 2.04 percent of the total geographical area in Manipur in 2006. More precisely, 2.27 percent of the Hill areas were under shifting cultivation in the same year, which had increased from 1.26 percent in 1992. Concurrently, the number of shifting cultivators also increased. This does not reduce the per capita availability of shifting cultivation land area. For instance, the average per family land availability rose from 1.20 hectares in 1974 to 1.29 hectares in 1983 (data relatively comparable). Similarly, the per capita availability of land rose from 0.16 hectare in 1992 to 0.28 hectare in 2006. This implies that the fertility of land has declined, that each cultivator is attempting to produce targeted subsistence production, and that the cycle of jhum cultivation has further shortened. In Nagaland, "recently, the intensive energy and labour inputs to manage the jhum lands do not correspond with the yields that are now insufficient to meet a household's subsistence needs" (Jamir and Lianchawii, 2013:3).

Table 11: Extent of Shifting Cultivation in the Hills of Manipur

Year	Geographical area, Manipur (km^2)	Geographical area, Hills (km^2)	Shifting cultivation area (SCA) (km^2)	No. of families/ agriculturists engaged in SC	SCA % total Geo.	SCA % Hills Geo.	Average SCA per family or agriculturist in SC (Hectare)
(1)	(2)	(3)	(4)	(5)	(6 = 4/2)	(7 = 4/3)	(8 = 4/5)
1974	22327	20089	600.0	50000	2.69	2.99	1.20
1983	22327	20089	900.0	70000	4.03	4.48	1.29
1992	22327	20089	252.4	158569*	1.13	1.26	0.16
2001	22327	20089	397.9	146699*[#]	1.78	1.98	0.27
2006	22327	20089	456.0	163165*[@]	2.04	2.27	0.28
2008-09	22327	20089	270.3	-	1.00	1.35	-

Notes: Figures for 1974 and 1983 from North Eastern Council (NEC); figures for 1992 onwards are from Statistical Abstract of Manipur; geographical areas figures are from the Census of India (2011). For 1992 onwards column 6 to 8 are calculated by the author. *Agriculturist: Number of agriculture workers (cultivators + agricultural labourers) in the Hills. The figures of agriculturists of 1992, 2001 and 2006 are 60% of total agriculturists (cultivators + AL) in 1991, 2001 and 2006 ([@]Interpolated figure) censuses respectively. It is assumed that 60% of the agriculturists are engaged in shifting cultivation since the system is more labour intensive than the permanent or terrace cultivation system. [#]Figure excludes three sub-divisions namely, Mao-Maram, Paomata and Purul of Senapati district (Hill) of Manipur. [@]Interpolated figure that is estimated using exponential growth model as follows: $P_t = P_o e^{rt}$; where P_t is the population at current year (2011), P_o is the population at previous year (2001), e is a statistical constant (2.7183), t is the desired interpolated time interval (in 2006, t=5 years) and r is the growth rate $\{LN(P_t/P_o)/t\}$ (here t=10 years). – not available.

Sources: Calculated based on NEC Secretariat, Shillong (1974), Basic Statistics of North Eastern Region (1995) based on Task Force Report on Shifting Cultivation in India, MOA, New Delhi (1983), DES, RGCCI (various years) and Wasteland Atlas (http://www.dolr.nic.in).

Conclusions

The practice of shifting cultivation has contributed to the reduction of forest cover area in the Hills of Manipur. Population growth, which increases rural agricultural labour supply, has raised the demand for tillable agriculture land thereby reducing forest cover. Moreover, in Manipur, the reserved and protected forests have gradually declined due to land encroachment for development and human settlements. Forest land re-vegetation is also taking place as dense forest cover improves, particularly in the Hills. Concurrently, the contribution from agriculture to the state's income has declined substantially. However, income from forestry and logging has improved slightly in recent times. The actual cultivated land (i.e. net sown area) in Manipur has increased remarkably as more and more rural labour is pressed into shifting cultivation. In the Hills, more than half the area cultivated for rice was under shifting cultivation. The system's nature of intensive labour activity has absorbed a majority of the workers in the Hills into it, unlike in the Valleys. It is worth noting that about two percent of the entire geographical area of the Hills is under shifting cultivation. This requires the adoption of appropriate land-use planning strategies to avoid land degradation and deforestation. The per capita shifting cultivation land used by the cultivators has increased due to the decline in productivity and soil fertility. The pressure of shifting cultivators on land has slowly reduced the fallow period, resulting in poor land rejuvenation and low replenishment of soil fertility. It is important to set a minimum of five years as the threshold level for one complete cycle of shifting cultivation in order to adequately re-vegetate and regenerate soil fertility. Arrangements for an alternative to shifting cultivation are needed, and sufficient working capital has to be provided to ensure that cultivators adopt and use inputs efficiently. Ensuring food security and restructuring the land ownership system, from community to individual or private ownership, may reduce the practice of shifting cultivation and conserve forest cover. Shifting cultivation cannot be completely removed since it has linkages with indigenous ethnic culture. The current situation calls for steps to provide social and environmental security in order to reduce the negative effects of the system and promote sustainable, ecological and economic alternatives.

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Price: ₹ 30.00 ISBN 978-81-7791-240-1

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