

## Chapter VI

LAND USE AND JHUM CULTIVATION IN MANIPUR:  
PROBLEMS, PROSPECTS AND ALTERNATIVES

## 6.1 Introduction

Shifting cultivation, also known as ‘jhum’<sup>i</sup> cultivation in Northeast India, is an ancient method of agriculture that is still practiced by tribal communities in many parts of the world, particularly in the wet tropics<sup>ii</sup>. In 1984, the Central Forestry Commission estimated that 6.7 million ha of cultivable area was affected by jhum in India. According to the Task Force on Shifting Cultivation, as many as 70,000 families in Manipur practiced jhum cultivation bringing 90,000 ha under this method of cultivation annually. Table 6.1 below highlights the status of Jhum cultivation in the North-Eastern Region.

State	Annual Area under shifting cultivation (Sq.Kms.)	Fallow period (in years)	Minimum Area under shifting cultivation one time or other (Sq. Kms.)	No. of families practicing shifting cultivation
Arunachal Pradesh	700	3-10	2100	54000
Assam	696	2-10	1392	58000
Manipur	900	4-7	3600	70000
Meghalaya	530	5-7	2650	52290
Mizoram	630	3-4	1890	50000
Nagaland	190	5-8	1913	116046
Tripura	223	5-9	1115	43000
Total	3869 (1.5 Per cent)	-	14660 (5.7 per cent)	443336

Source: RTFSC (1983),

Basic Statistics of NE, 2002, Government of India, North Eastern Secretariat, Shillong. p. 42.

The continuance of jhum in the state is closely linked to ecological, socio-economic, cultural and land tenure systems of tribal communities. Since the community owns the lands the village council or elders divide the jhum land among families for their subsistence on a rotational basis. In this chapter, we take a close look at jhum cultivation from the point of view of ecological sustainability and tribal livelihoods, examine the role of agro-forestry, sericulture and horticulture as alternatives/supplementary activities and review the current thinking on methods to upgrade and develop jhum.

Table 6.2: Trend of Shifting Cultivation in Manipur

Parameters/ Years	1976 <sup>1</sup>	1983 <sup>2</sup>	1986-1997 <sup>3</sup>
Area affected by shifting cultivation (hectare)	1,00,000	3,60,000	3,60,000
Jhum cycle (years)	NA	4-7	NA
Annual area under shifting cultivation (hectare)	60,000	90,000	60,000
Number of families practising shifting cultivation	50,000	70,000	NA

Source: NCA, (1976), TFSC, Ministry of Agriculture (1983), FSI, The State of Forest Report, 1999.

## 6.2 Land Use And Cropping Pattern

The dry broadcast or ‘punghul’ method involves sowing in the month of March/April and harvesting in August/September. Wet sowing or ‘pamphel’ is done in the month of May/June and harvested during October/November. Transplanted paddy or ‘aringba’ is also sown in the month of May/June and harvested in the month of October/November.<sup>iii</sup>

In the hilly areas of Manipur, shifting cultivation is widely practiced, with settled terrace farming in foothill or low slope areas, above the adjacent rivers and streams. Depending on the slope, wet broadcast on banded fields or dry broadcast on unbanded fields is practised. In

the plains wet paddy rice cultivation is prevalent. Traditional methods of production are still widely used by the farmers, especially on the hill slopes.

The cultivable area is limited while the population pressure has increased. The valley districts, comprising a tenth of the geographical area of the state, support roughly two-thirds of the population. Most of the permanent cultivation and agricultural land is in the valley, with the four districts accounting for over seven-tenths of settled cultivation and agricultural land resources, even though the hills comprise 90 per cent of the state's total area.

Table 6.3: Land Under Different Uses as a Percentage of Geographical Area, 1990

District/State	Agricultural Land	Moderately dense forest (canopy cover 20% - 40%)	Land with or without scrub (canopy cover below 30%)	Area under Lake/Reservoir/Tank/Canal	Area under waterlogged/marshy/swamp land	Area under biomass	Area under submerged croppped land	Area under River/Stream	Area under Road	Waterlogged area converted to new agricultural land	Area under permanent paddy including terrace cultivation	Total Jhum Area in 1997
Senapati	3.39	38.76	53.93					0.80	0.62		5.58	2.89
Tamenglong	1.57	54.39	35.12	0.01				5.28	2.53		0.52	6.15
Churachandpur	2.12	58.58	32.46					0.45	0.44		0.89	6.42
Chandel	1.87	37.77	50.46					0.60	0.60		0.85	2.86
Imphal (U)	50.47	12.21	10.40	1.36	0.61	3.85	1.07	1.17	1.33	0.22	42.56	
Bishnupur	49.32	1.25	3.05	18.13	0.72	7.49	3.62	2.14	2.69		35.15	
Thoubal	42.40		5.77	3.80	20.45		0.55	2.18	2.37	2.90	59.13	
Ukhru	1.42	71.26	44.34					0.39	0.35		1.91	1.86
Manipur	6.65	44.68	38.72	0.59	0.52	0.39	0.16	0.62	0.58	0.08	6.08	3.51

Note. The total across rows do not add up because area under settlement is not included.

The land use/land cover patterns of the state have been classified into five categories, namely settlement, agricultural land, forest, water bodies and others. The last category of others includes rivers/streams, roads, water logged areas converted to new agricultural land, etc. There are sharp differences in land use patterns between the valley districts and the hill districts. In the valley districts, settlements account for more than ten per cent of their respective areas (in fact, for Thoubal district it is almost 20 per cent) whereas for the hill districts settlements account for less than one per cent of the area excepting Churachandpur for which the figure is 1.44 per cent. For the state as a whole, it is 2.44 per cent.

Agricultural land in the valley districts, is more than 40 per cent of the land area with the figure touching the 50 per cent mark for Imphal district. In contrast, the figures for the hill districts are found to be less than 2, except for Senapati whose figure is 3.39 per cent. For the state as a whole, it is 2.44 per cent.

Forest land for all the hill districts was above 95 per cent of the areas. In Thoubal and Bishnupur, it is about five per cent and for Imphal it is 22.71 per cent. For the state, it is quite high at 78 per cent. However, dense forest (forest with crown density greater than 40 per cent) accounted for less than ten per cent of the forest lands in all the districts with the figure for Senapati district being as low as two per cent and the valley districts scoring a blank on this front. For the state, dense forest accounted for a meagre 5.19 per cent of the forest land (See Chapter -V). Not surprisingly, the valley reports a large area under lakes, waterlogging and biomass (in particular, Bishnupur and Thoubal). The rate of expansion of swampy land is rising at an alarming rate every year on account of conversion of basins and lakes into residential areas in the valley resulting in a loss of natural drainage, rapid siltation on account

of illegal felling, jhum-induced deforestation, as well as closing of the barrage at Ithai under the Loktak Hydro-electric Project.

Year	Geographical Area	Total Forest	Area under Jhum Cultivation (Rice & Maize)	Area under foodgrains
1982-83	2232700	67.87		
1992-93		78.92	3.40	6.83
2000-2001		78.01	3.51	7.35

Source: (i) RGI, (ii) PCCF, (iii) MI; for the period, 1984-85 to 2000-01, from BSNR, 2002, Shillong, p.70

Year	1986-87	1990-91	1996-97	2001-02
Gross cropped Area to Geographical Area	11.77	14.78	12.75	12.52
Area under Kharif Crops	83.64	85.91	85.18	84.31
Area under Rabi Crops	16.36	14.09	14.83	15.69

Source: Department of Agriculture, Government of Manipur

The area under cultivation has not increased much, but what is more disturbing is that cropping intensity has not increased either. After rice, maize is the second important crop and is grown both in the hills and in the plains. In 2002, there was an increase in the area under jhum maize in all the hill districts (Table 6.5). One reason for this may be the planting of maize as a cash crop with a ready market in the plains. Other crops like, potatoes, sweet potatoes, root crops; cotton, chillies, tobacco, etc., along with plantation crops like tea, coffee, rubber, sandalwood, etc. and a variety of fruits like oranges, pineapples, plums, passion fruit and bananas are also grown in the state.

### I. Area Under jhum

The area under jhum cultivation is roughly half that under permanent cultivation and supports 34 per cent of the state's population. The highest percentage of geographical area where shifting cultivation is practiced is recorded in Tamenglong and Churachandpur (accounting for 45 per cent 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). It is also practiced in the southern and eastern parts of Ukhrul district. In Churachandpur district, about 84.6 per cent of the population depends on jhum cultivation<sup>iv</sup>. Overall, the area and production of jhum rice in Manipur has remained more or less constant.

District	1997	1998	1999	2001	2002
Senapati	2.89	2.89	2.89	2.89	2.72
Tamenglong	6.15	6.15	6.15	6.15	6.04
Churachandpur	6.42	6.42	6.53	6.42	6.39
Chandel	2.86	2.86	2.86	2.86	2.86
Ukhrul	1.86	1.86	1.86	1.85	1.86

Source: AC, p.16

Much of the permanent cultivation in the hills is in Senapati district, followed by Ukhrul. The precariousness of production through jhum cultivation is clear from both the low levels of yield as well as its unreliability.

Table 6.7: Percentage of Jhum area under Paddy to total Jhum area Paddy and Maize

S. No.	District	Years
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		2001-02	2002-03	2003-04	2004-05
1.	Senapati	88.39	97.50	03.17	-
2.	Tamenglong	100.00	100.00	100.00	100.00
3.	Churachandpur	90.33	100.00	98.92	99.38
4.	Chandel	94.78	88.44	95.87	95.95
5	Ukhrul	95.75	96.86	96.64	90.30
Total		94.67	98.09	96.71	95.09

Estimates for the area under jhum vary widely. The Registrar General of India and the Principal Chief Conservator of Forests, Manipur, reported an average 40,000 hectares in the 1990s, while the Agricultural Census, Department of Agriculture, Government of Manipur, reported an average of 90,000 hectares and the Directorate of Economics & Statistics, GoM reported around 44,000 hectares in the same period. The most widely quoted estimate is that of the study by the 'Task Force on Shifting Cultivation', Ministry of Agriculture, according to which, 90,000 ha are cultivated by 70,000 families in the state. Table 6.8, shows the alarming divergence in database, which would make planning very difficult.

District State	Col. 1	Col. 2
Senapati	1.96	9.34
Tamenglong	8.94	26.92
Churachandpur	11.13	29.40
Chandel	5.61	9.47
Ukhrul	12.96	8.45
Manipur	40.61	83.57

Source for Column 1: SAM, 1998, pp. 97-9; and for 1998-9 to 2001-02 from RCES, 2000-02, pp. 48-52 and for Column 2: AC.

Combining jhum and permanent cultivation, the area under foodgrains (97 per cent of the gross cropped area) comes to only 7 per cent of the state's geographical area, with the forest area accounting for 78 per cent. Rice is the main crop of the region, though diversification is high in the hill districts of Chandel, Senapati and Ukhrul.

District/State	Gross Cropped Area (000 hect.)	Kharif					Rabi			
		Paddy	Maize	Pulses	Oilseeds	Sugarcane	Wheat	Pulses	Oilseeds	Potato
Senapati	22.22	56.36	13.50	4.37	1.31	5.58	1.47	5.45	7.07	4.91
Tamenglong	37.91	75.28	2.90	1.11	0.66	3.14	2.90	3.43	7.78	2.80
Churachandpur	43.88	70.72	11.62	1.66	0.84	4.40	0.42	2.58	6.50	1.25
Chandel	19.48	55.90	14.37	3.90	1.59	4.98	0.00	5.39	10.78	3.08
Imphal (U)	72.78	86.14	1.37	0.52	0.82	1.04	0.40	5.18	3.63	0.89
Bishnupur	42.26	75.65	1.77	0.85	1.66	3.41	0.47	7.62	6.01	2.56
Thoubal	34.20	71.43	4.53	1.29	1.93	3.10	0.73	7.28	6.49	3.22
Ukhrul	20.42	52.16	8.32	2.15	1.27	8.18	0.00	9.55	12.88	5.48
Manipur	279.54	74.31	6.08	1.43	1.23	1.25	0.45	5.77	6.98	2.50

Source:AC, p.31

Year	District/State	Senapati	Tamenglong	Churachandpur	Chandel	Ukhrul	Imphal (U)	Bishnupur	Thoubal	Manipur
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1997-98	Total Rice Area (000 hec)	23.47	9.32	14.19	7.05	15.35	42.56	17.72	28.14	157.9
	Percentage of Jhum Rice to Total Rice Area	8.82	89.38	81.47	64.40	90.88	0.00	0.00	0.00	25.62
2000-01	Total Rice Area (000 hec)	23.23	9.19	12.60	9.41	13.53	97.01	18.66	23.33	156.96
	Percentage of Jhum Rice to Total Rice Area	3.19	100.00	82.94	74.07	91.94	0.00	0.00	0.00	25.35
2003-04	Total Rice Area (000 hec)	25.97	10.07	20.08	7.24	13.69	42.17	16.47	22.14	157.83
	Percentage of Jhum Rice to Total Rice Area	0.08	82.42	82.32	67.27	88.17	0.00	0.00	0.00	26.48
2004-05	Total Rice Area (000 hec)	24.11	8.52	21.04	8.23	13.58	53.34	21.74	25.75	176.31
	Percentage of Jhum Rice to Total Rice Area	0.00	94.60	83.56	80.56	91.83	1.20	0.00	0.00	25.74

Source: SAM 2005, p.150-151

Much of the area under rice in the hills, and about 40 per cent of it in the state as a whole is under jhum cultivation. Considering that rice is the staple crop, this is alarming and has serious food security implications. Most of the areas under jhum have low productivity and are in remote and isolated parts of the state without proper transport facilities, resulting in serious shortages.

District/State	Yield (Kg/Hectare)						
	1994	1997	1998	1999	2000	2001	2002
Senapati	430.21	1066.67	1045.50	991.53	970.00	1044.44	578.00
Tamenglong	429.92	924.84	917.44	957.05	972.67	926.32	850.79
Churachandpur	421.69	962.15	955.34	906.13		891.92	712.82
Chandel	429.34	961.99	940.87	955.65	969.80	925.03	713.83
Ukhrul	429.91	962.17	938.53	1028.37	969.03	908.45	398.72
Manipur	428.57	961.90	949.59	955.57	970.09	925.66	710.58

Source: AC, various issues.

## 2. Characteristics Of Jhum Cultivation In The Northeast

The characteristics of jhum cultivation in Manipur are as follows: (i) Cutting and clearing of forest areas and burning of the dried biomass by fire, (ii) rotation of jhum land every four to seven years, (iii) use of human labour as the chief input, (iv) non-employment of animals implements or machinery, (v) collective ownership of land, (vi) reciprocal labour sharing and (vii) mixed cropping system. Women predominate in seed selection and planting, weeding, and other operations, while operations such as cutting of the jungle, clearing, burning of the cut undergrowth, etc., are done by men. Both men and women participate in harvesting. The produce is transported from the jhum land to the village by head-loading.

Based on a long-term study of jhum, Toky and Ramakrishnan (1981) state that, 'the version found in this region is that the cultivation is carried out on slopes of 30-40° angles; the

climate is monsoonic with a high rainfall of over 2,200 mm followed by a dry winter and a brief warm summer, supporting a mixed sub-tropical humid forest. The normal jhum cycle is of three-four years, but rarely longer; and the forest is clear felled before planting<sup>v</sup>.

Jhum enables multiple cropping of several crops which provide a balanced diet and also offers some form of crop insurance to the Jhumias in the event of failure of some crops. This system of food production might have worked well in the past when a balance was maintained between population and soil fertility as a result of a longer fallow cycle of 20 to 30 years.<sup>vi</sup>

The shortening of the jhum cycle to an average of four-five years due to increase in population has resulted in a number of distortions appearing in the system including decreasing soil fertility and crop yields and inadequate management of fallows.

### 3. Impact Of Shifting Cultivation

So long as the jhum cycle has a duration of 10 years or more this type of cultivation did not pose any threat to the ecological stability and soils of the largely forested hill area.

Underlying the view that shifting cultivation has alone been responsible for deforestation and environmental degradation is a deep-seated resentment felt by some sections of Manipuri society and the state administration at the lack of control over land and forests in the hills, the acknowledged power of traditional village councils and headmen, and the assertion by the hill tribes of their rights over local natural resources. The solutions offered in terms of regulating jhum cultivation include: a) resettlement of jhum farmers by relocation of their villages and provision of alternate means of livelihood; b) introducing terrace cultivation or forestry cooperatives on jhum lands; c) diversification into horticulture, floriculture and plantation crops and d) a complete change in the land tenure system in the hills whereby communally-owned and operated holdings are replaced by individual holdings. If these programmes are implemented without massive public investment and instituting a more participatory model of development planning in consultation with the communities for whom they are designed, they are, likely to cause major disruptions in the agricultural systems, food security, and way of life of the hill people and possibly endanger the very identity of tribal societies and their traditional institutions.

### 4. Soil Conservation Programmes Under Five-Year Plans

The ICAR's model of land use for the hilly areas in the Northeast region of India consists of bench terracing for agriculture at the lower portion of the hill slopes. The mid-portion of the hill slope is to be converted into half-moon terraces for horticulture and the top portion for forestry. The prevailing pattern of community land ownership in the hill areas and the high capital investment involved in the ICAR model deter the Jhumias from adopting it.<sup>vii</sup>

In Manipur, soil conservation and land use programmes initiated to control or reverse the deleterious consequences of jhum are carried out by two agencies, viz., the Department of Horticulture and the Forest Department. Soil conservation works are also undertaken under a number of centrally sponsored schemes, viz; Watershed Development Project in Shifting Cultivation Areas (WDPSCA), and National Watershed Development Project in Rain-fed Areas (NWDPR). WDPSCA is executed by (i) the Department of Horticulture and Soil Conservation, (ii) Barak River Development Board, and (iii) Eastern Border Area Development Agency. With regard to NWDPR, the nodal agency is the Department of Horticulture and Soil Conservation. The concept of the carrying capacity of land under jhum

wherein a certain population density is to be maintained to sustain jhuming is not practical today since existing population density far exceeds the carrying capacity.<sup>viiiix</sup>

The first major thrust for jhum regulation was given in the Fifth Plan under which three different programmes were introduced in the state. These programmes consisted of soil conservation schemes in the state's Plan and centrally-sponsored and NEC river basin schemes for the control of shifting cultivation. Under the scheme, 'Control of Shifting Cultivation', implemented by the State's Department of Horticulture and Soil Conservation, a cumulative area of 29,694 ha under the State plan and 7876 ha under the centrally-sponsored scheme has been covered up to the Eighth Plan (1992-97) with outlays of Rs. 1053.57 lakhs and Rs. 709.20 lakhs, respectively. The components of this scheme were of terrace construction/land development, horticultural plantations, agro-forestry, plantation crops and irrigation channels. During the same period, the Forest Department's scheme of 'Rehabilitation of Jhumias', was launched to rehabilitate on 135 jhumia families out of a total of 80,000 families through the provision of 1 ha of terrace and 2 ha of land for forestry and horticultural plantations to each family.<sup>xi</sup>

During the Fifth Plan, a soil conservation programme on agricultural lands was initiated. An Intensive Valley Development Programme was taken up in two hill districts, Churachandpur and Tamenglong. The Seventh Plan saw an attempt being made to bring a total of 20,000 ha under terrace cultivation. The major programmes introduced in this period were: coffee plantations, model projects in integrated watershed management and establishment of soil conservation demonstration farms. The total outlay for this plan was Rs. 675,000 lakhs.<sup>xii</sup>

During the Ninth Plan (1997-2002) a part of the schemes was extended to the Agriculture Department. The agreed outlay for the Ninth Plan under the Soil Conservation (Horticulture) was Rs. 3700 lakhs against which the expenditure was only Rs. 664.80 lakhs<sup>xiii</sup>. The proposed outlay for the Tenth Plan (2002-2007) under Soil Conservation (Horticulture) for the implementation of the five ongoing schemes<sup>xiv</sup> is Rs. 1760 lakhs.

Some of the causes of the failure of these schemes are as follows<sup>xv</sup>:

- (i) Non-involvement of the community and rural institutional infrastructure in decision-making and execution.
- (ii) Undue stress on development of terraces and poor production in dry terraces devoid of top soil due to lack of irrigation.
- (iii) Exclusion of entire villages or communities from the programme, in many cases.
- (iv) Laying of stress exclusively on raising rice crop inducing farmers to revert back to jhuming for raising the other crops.
- (v) Conversion of farmers of horticultural and plantation crop to wage earners without taking care of food security in remote areas.

##### 5. Jhum 'Re-development' Strategies

There is now a significant body of literature that shows that jhum cultivation with longer cycles has many advantages over other agricultural systems in the hills. Much of the current thinking has evolved out of a series of long-term inter-disciplinary studies carried out under the aegis of the North Eastern Hill University (NEHU) with support from agencies like the CSIR, UGC, DST, and the MoEF, from the 1970s to the early 80s. A synthesis volume on shifting agriculture was published under the imprint of UNESCO's 'Man and the Biosphere' (MAB) project. The various reports of these studies outlined the methods to 'redevelop' jhum and other agro-ecosystems for "effective resource management and conservation in north-eastern India"<sup>xvi</sup> There are over 250 reports and publications on jhum alone which establish

the merits of this form of agriculture and identify the methods by which distortions in jhum systems may be remedied.

Amongst the advantages of jhum farming is a high species diversity. Farmers are known to plant up to 35-40 species on individual plots including seven-eight varieties of rice and alternate cereal crops. Mixed cropping creates a multi-layered canopy above and root system below for efficient light capture and optimal nutrient use respectively<sup>xvii</sup>

Economic and energy analyses suggest that a 10-year period is the minimal cycle length “if jhum in its present form is to be sustained.”<sup>xviii</sup> Distortions set in and the system breaks down when the cycle is reduced to four-five years. The two options presented are:

- a) to strengthen alternate land use systems, and
- b) to stabilize or ‘redevelop’ jhum under the shortened five-year cycle by introducing agro-forestry and commercial horticulture as well as modern agronomic practices into the system.

#### *6. Jhum and Food Security*

The potential of horticulture (and plantation to some extent) development is rated very high on account of the soil and climate suitability. Horticulture and plantation crops are high value, labour intensive and yield more per unit area, and citrus fruits are more suited to the soil. Constraints for the realization of the high potential of horticulture are lack of proper research and extension support for upgradation of production technology, inadequate communication and transport facility, improper post-harvest handling and storage and the absence of an organized market system.

Lack of viable alternatives result in the continuation of jhum. The jhumias are extremely poor and they have no other viable options. Through jhum they are assured of at least the food and fibre requirement for their survival. Food security is thus the most critical reason for the continuance of jhum. The absence of a reliable public distribution system exacerbates the problem further

#### *7. Recommendations For Jhum Control*

The planning department of Manipur has laid considerable emphasis on the control of shifting cultivation. The government has introduced certain measures aimed at i) restricting jhuming like allowing natural forest to grow in jhum lands, ii) initiating resource surveys, iii) increasing the area under terrace cultivation, iv) promoting programmes for intensive valley development and development of horticulture, v) plantation farming in jhum land and vi) the development of sericulture and a few forest-based industries<sup>xix</sup>. However, the performance of these programmes and schemes was very poor.

The primary cause of the failure to attract people to settled farming was that the new settlements provided were not readily accepted by the people due to their close attachment to their traditional villages and way of life. Moreover, the switch to terrace cultivation or the use of bullocks for ploughing causes great technical difficulties for jhum farmers. Limited availability of land for terrace farming at higher altitudes is also a major problem. Some terraces, built with retaining walls at a height of three-seven feet, are very difficult to maintain during the rains, resulting in the collapse of whole terraces with standing crops. A prerequisite for the success of terrace farming is the development of a proper technology for water management and water conservation. Since terraces are above perennial streams and rivers, it is essential that adequate power is available for lift irrigation schemes. Thus, while



promoting terrace cultivation on the model recommended by the Indian Council of Agriculture Research (ICAR), due consideration and attention needs to be given to all the above-mentioned requirements.

Essentially, jhum control will only be possible if there are alternative land use systems. Alternative land use systems like horticulture require marketing and other infrastructural facilities to the farming communities. Until such systems are evolved any attempt to stop jhum cultivation will amount to depriving the people of their basic means of survival.

Along with development of land up to 50 per cent slope by constructing bench terrace, contour bund in the low hill slopes for permanent cultivation and creation of irrigation facilities by constructing dams, water harvesting structures, channels, etc, horticulture development along with soil and conservation plantation crop is vital. Afforestation too must be encouraged in the hills and non-agricultural activities to be given utmost priority, with technical, financial and marketing supports from the government and NGOs.

#### 8. Emerging Strategies

- a) Transfer of indigenous technology from one tribe to another or one area to another;
- b) Upgrading of jhum by introducing variations in the species composition in the crop mix in order to increase economic returns and improve ecological efficiency;
- c) Use of bamboo varieties and other fast-growing native trees as wind-breaks to check wind and minimize the loss or water borne soil, ash and nutrients;
- d) Introduction of appropriate rural technology such as rainwater harvesting, tanks, mini-hydel, biogas, to strengthen village ecosystems; and
- e) Participatory development based on jhum fallow management including community involvement in the selection of preferred species for fallow cycles
- f) Creation of the right kind of institutions for natural resource management at the local level that are built on the pattern of the traditional institutions that already exist
- g) Redevelopment of valley wet rice cultivation and improvement of other land use systems such as homestead gardens to increase productivity in the plains for state level food security.

#### 9. The Redevelopment of Jhum

Redevelopment and diversification is the only way in which the jhum system can be stabilised. The system should have high crop as well as species diversity to ensure a sufficiently long cycle that can also take care of the need to harvest food. The species suggested are the alder tree (*Alnus nepalensis*), which has been widely adopted in Nagaland. Bamboo brakes are recommended around the jhum fields to prevent leaching and soil erosion. The crop patterns can include forbs or perennial broad-leafed herbs that are not grasses (beans and pineapple), grasses (corn and sugarcane), woody species (yucca, cashew and papaya), and larger trees (brazilnut and jackfruit). After the first two years, the crop area may be planted with fast-growing species such as alder in one or two additional strata so that the jhum plot has continuous crop cover. The cinnamon tree is another tree that can be promoted in these areas. The investment projected for cycles of different duration for the hilly regions of Meghalaya where these experiments have been tried is given in the table below (table 6.12):

Table 6.12: Economics of Jhum Redevelopment

Production Measures	Jhum Cultivation Cycle (Rs)			
	15 Year	10 Year	5 Year	
			1 <sup>st</sup> Year Crop	2 <sup>nd</sup> Year Crop
<b>a) Input:</b>				
Labour	2220	2049	1613	1604
Organic Manure	NA	175	287	537
Fertiliser	NA	NA	19	39
Seed	1061	1206	1235	1254
Interest on Working Capital (12%)	394	412	378	412
<b>b) Output:</b>				
Root and Tuber Crops	14711	9875	6463	3914
Cereal Grains	65	90	94	13
Legumes	16	9	NA	NA
Fruits and Other Vegetables	4220	3908	NA	NA
Leafy Vegetables	778	289	1631	500
By Products	NA	NA	NA	NA
<b>c) Cost of Production</b>	3675	3842	3532	3846
<b>d) Gross Return</b>	19790	14171	8188	4427
<b>e) Net Return</b>	16115	10329	4656	581
<b>f) Return Per Rupee</b>	5.4	3.7	2.3	1.4

Source: P.S. Ramakrishnan, *SCAD*, 1992, p.32.

Table 6.12 shows that the ten years cycle is viable for the current situation, but given needs of the local population, this may not be possible. Hence, it is important to stabilise jhum through the cover strategy described above and a silvi-pastoral system that maintains a four to five year cycle. This can be done by promoting mixed plantation and silvi-pasture development in the 4905 hectares of forest degraded by jhum under the National Afforestation Programme. The total investment for five years is about Rs.18985 per hectare or Rs. 93.12 lakh in five years.

The MAB report, referred to earlier, also recommends encouraging artisanal skills and products based on accessible natural resources like bamboo and wood<sup>xx</sup>. Horticulture, sericulture and related activities as an alternative to or a modification of the jhum cycle are dealt with below.

#### A) Sericulture

Sericulture is a highly labour intensive industry. Since the 1950s hundreds of cooperatives have been set up to carry out silk reeling and weaving activities, some exclusively by women.

During the Ninth Plan period, the goal was to increase the area under silkworm food plants in order to increase production of silk yarn from 216 MTs to 324 MTs by 2001-2. The Japanese-aided Manipur Sericulture Project (MSP) gave an impetus to mulberry and sericulture. The Tenth Plan aims to a) generate employment opportunities for individual farmers and rearers and b) upgrade traditional silkworm rearing, yarn production and silk weaving techniques to international grades. The government proposes introduction of improved mulberry varieties, *Quercus* species for Chinese tasar, experimental food plants and a new silkworm breeds evolved by the Central Silk Board (CSB).<sup>xxi</sup> The CSB has opened one grainage-cum-extension centre at Imphal to supply DFLs (Disease Free Layings) to rearers and conduct field trials. However, infrastructural constraints remain a major impediment to the development of this industry.<sup>xxii</sup>

To date, 760 primary sericulture cooperatives have been established in Manipur of which 117 are village based cocoon producers' societies and 645 are silk weavers' societies. About 700 of these societies are federated into two umbrella organisations, the Manipur State Sericulture

Cooperative Ltd. and the Manipur State Handloom Women’s Cooperative Societies. They are provided financial assistance from the State Cooperative Bank under NABARD’s handloom finance schemes. However, sales by weavers cooperatives or the KVIC (Khadi and Village Industries Commission) remain limited and marketing of both yarn and fabrics is largely in the hands of private traders who do not always give a fair price to the primary producers.

Some of the recommendations for the development of the sericulture industry are:

- i) Oak tasar should be promoted in degraded forests in the hill areas and training provided to local communities, particularly women, in rearing, protection, and tasar yarn and fabric production. Both mulberry sericulture and oak tasar could be promoted as supplementary sources of livelihood for farm families practicing jhum. However, new oak plantations would need a long lead time or gestation period to establish, while the use of existing oak forests for tasar cultivation will need: a) the approval of the forest department, and b) regulation by village councils/traditional authorities, as many communities enjoy usufructory rights over a variety of MFPs in these forests.
- ii) The Loi and other groups in the Manipur valley who have traditionally practiced sericulture could be targeted for skill development and income-generation programmes.
- iii) The present thinking on eliminating the use of indigenous silkworm races should be reviewed as Manipuris have a long familiarity with them, and,
- iv) The high value non-mulberry (eri and tasar) ‘Ahimsa’ line of products being promoted by the KVIC should be developed and marketed.

### B) Horticulture

The state has considerable scope for the development of horticulture. The hilly terrain and acidic soils are especially suitable both for citrus fruits and other plantation crops<sup>xxiii</sup>. Farmers grow fruits for home consumption. Large quantities of fruit that cannot be marketed locally are wasted during good harvests. Lack of storage, processing and marketing facilities has discouraged farmers from going in for commercial horticulture.

Table 6.13: Area Under Some Fruits And Vegetables in Manipur, 1990-91 to 2001-2002 (Area in '000 Hectares)

Crops	Pineapple	Orange	Lemon	Papaya	Arum	Banana	Bean	Cabbage	Cauliflower	Peas	Potato
1990-91	1.47	0.54	0.12	0.03	3.29	3.11	0.50	3.05	0.68	3.28	3.59
1991-92	1.47	0.48	0.18	0.08	3.37	3.10	0.72	3.13	0.73	2.87	3.79
1992-93	1.55	0.67	0.40	0.08	4.08	3.58	0.91	3.29	0.87	2.52	3.29
1993-94	1.58	1.06	0.90	0.08	4.48	3.52	0.03	3.04	0.61	2.00	3.64
1994-95	1.01	1.13	0.88	0.09	4.92	3.15	1.49	2.87	0.58	2.24	3.31
1995-96	0.57	1.06	0.90	0.10	5.07	3.07	1.40	3.03	0.88	1.82	3.41
1996-97	0.63	1.07	0.84	0.04	5.39	3.30	1.32	3.03	0.78	1.91	3.23
1997-98	0.46	0.99	0.67	0.06	4.99	4.41	0.60	3.87	0.76	4.45	3.23
1998-99	0.24	1.65	0.93	0.07	5.39	2.90	1.25	2.23	0.43	1.79	2.17
1999-00	0.30	1.66	0.82	0.09	6.22	3.51	1.72	2.28	0.44	2.28	2.47
2000-01	0.55	1.67	0.86	0.12	6.23	3.53	1.72	2.39	0.38	2.34	2.59
2001-02	0.45	2.11	0.92	0.02	6.28	4.42	1.66	2.71	0.40	2.44	3.04
2002-03	1.03	1.13	0.07	0.15	7.22	3.88	2.30	3.22	0.59	1.82	4.22
2003-04	0.73	1.71	0.37	0.07	9.18	4.14	2.75	6.63	0.76	1.23	4.98

Source: ES, 2003-2004 P.81 & SAM, 2005, P. 148-149.

Cultivation of both traditional crops like pineapple and exotics like passion fruit are being developed. The Horticulture Department is also experimenting with potato and other vegetables for production on a commercial scale<sup>xxiv</sup>.

Table 6.14: Horticulture Production of Manipur for The Last Few Years (M.T.)

Year	Fruits	Vegetables	Spices
1992-93	3800	6000	640
1993-94	4577	8000	700
1994-95	5100	10043	850
1995-96	5868	12084	1000
1996-97	6813	13414	1100
1997-98 (T)	9950	15460	1400

Source: ES, 1999-2000, P.47.

Horticultural development has been promoted in Manipur since the Third Plan period. A horticultural research station was set up at Churachandpur in 1975. Progeny orchard-cum-nurseries were set up in Maram, Ukhrul and Tengnoupal in the same year under the North Eastern Council. The construction of the Trans-Asian Highway linking South-east Asia with India may open up new markets in neighbouring countries for fresh fruits and processed foods.

Among the plantation crops, tea and coffee cultivation appear promising and can be tried out on abandoned jhum lands. Tea is growing satisfactorily, in Ukhrul and Tamenglong districts. According to government reports there is an immense potential for the establishment of tea, coffee and fruit processing industries in the state. However, the growing role of global agri-business concerns, the overall decline in global prices, particularly of tea and coffee, and imposition of new phyto-sanitary and other norms under the WTO regime threaten the survival of these industries in other parts of the country.

### 6.3 Conclusion

Programmes aimed at arresting or eradicating shifting cultivation in the Northeast had been underway since the start of the 20th Century. After Independence, jhum control programmes started in earnest. Initially these programmes were based on the assumption that the introduction of cash crops would help to wean people away from jhum. Jhumias were given planting material and financial help to switch over to these crops. Coffee, pepper, and rubber plantations achieved some success. However, it was soon realized that cash crop cultivation couldn't be adopted as an alternative to jhuming which people practice mainly to meet their essential food requirement.<sup>xxv</sup>

In areas where farmers have taken up wet rice cultivation on terraces and valley bottoms with the support of government subsidies, farm families continue their jhuming activities on other fields. Single crop wet rice cultivation in the hills is a seasonal activity while jhum provides work around the year. Moreover, people prefer the taste of jhum rice over improved wet rice varieties.<sup>xxvi</sup>

Jhumias are unable to shift overnight to plough agriculture from hoe agriculture, and only the better-off families can afford to hire the additional labour needed for transplanting and maintaining of terraces. Schemes to resettle jhumias by distributing marginal lands for permanent cultivation in Tripura have lead to greater indebtedness, land alienation and impoverishment of the resettled families.<sup>xxvii</sup> A series of research projects on the agro-ecological systems of the Northeast has led to a shift in emphasis in recent years from jhum control to jhum management, more specifically, to the management of fallows.. The Government of Nagaland pioneered agro-forestry interventions in jhum farming cycles.

The Task Force on Strategy for Management of Shifting Cultivation, which presented its report to the Ministry of Environment and Forests in January 2003, reviewed the work undertaken under the Eighth and Ninth Plans, respectively, as well as the implementation of the Watershed Development Project in Shifting Cultivation Areas of northeastern states (WDPSCA) that emphasized soil conservation as a remedy to mitigate the ill effects of jhum.

The setting up of the task force marks a significant departure from the approach of earlier reports dealing with forests and shifting agriculture. It cites the unique socio-economic conditions of the different tribal communities as reasons for 'precluding uniform prescriptions and requiring the development of location-specific solutions' to deal with the problems currently affecting jhum cultivation.<sup>xxviii</sup>

The major constraints identified by the report are: lack of coordination between different line departments and inexperience of extension staff in 'participatory development' techniques, lack of service facilities such as credit, input supply and marketing; and lack of scientific analyses of farming systems in different locations and micro-climatic conditions. It expressly seeks to dispel the notion that large-scale erosion is chiefly caused by shifting cultivation and takes the view that land use based on long periods of fallow rotation is a sustainable model.

In its vision for the Tenth Plan, the report rejects "the *a priori* assumption that shifting cultivation... must be replaced by more 'permanent' or 'settled' forms of agriculture" and states that given the fact that jhumming continues to be a way of life for many of the hill tribes, efforts should instead be directed towards making it more productive and effective in meeting the needs of the hill people<sup>xxix</sup>.

The report mentions eliciting people's participation and addressing livelihood concerns, and 'farmer-developed indigenous fallow management strategies' of the Northeast and elsewhere for 'tree-based, shrub-based, herbaceous legume-based and animal based fallow management.' The report recommended a) 'improvement' and not 'replacement' as the approach to be followed; b) mixed tree farming to avoid the dangers of monocultures in forestry and c) conducting small research projects and pilot projects with appropriate institutions to study shifting cultivation in different micro-regions.

By stressing people's needs and avoiding the 'one size fits all' approach this report could well be a first step towards sensitising governmental agencies to the special needs of the hill tribes and evoking better appreciation of the unique features of the various farming systems developed in the Northeast.

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<sup>i</sup> 'Jhum' is an Assamese term used commonly in Northeast India. Every tribe in the region has its own name for the practice; the Meitei called it '*pam lou*' and in the Tangkhul dialect it is called '*ahanglui*.'

<sup>ii</sup> Schlippe, P.D. (1956) *Shifting Cultivation in Africa*, Routledge and Kegan Paul, London. In Agro-forestry Based Farming System as an Alternative to Jhumming. Reprinted from Proceedings of a Seminar on Agro-Forestry organised by ICAR at Imphal, Manipur, May 16-17, 1979.

<sup>iii</sup> Thokcham, Biren Singh (1993). P. 73.

<sup>iv</sup> L. Chinzakham Ngaihte (1998) *Tribal Agrarian System Of Manipur (A Study of Zomi)*, Anmol Publication, New Delhi.

<sup>v</sup> P.S. Ramakrishnan (1981). Cropping and yields in agricultural systems of the northeastern hill region of India. *Agro-Ecosystems* 7: pp. 11-25. in P.S. Ramakrishnan. *Shifting Cultivation and Sustainable Development*. Man and the Biosphere Series, Vol. 10. 1993. Paris/New Delhi: UNESCO/Oxford University Press.

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- <sup>vi</sup> Ramakrishnan, P.S. *Shifting Cultivation and Agricultural Development*, UNESCO and OUP, 1992. Also See Arti Nandi and P.K. Bose 'Shifting Cultivation in Manipur'.
- <sup>vii</sup> ICAR, *Technological Bulletin – ICAR Research Complex for NEH Region during the decade (1975-1984)*, Vol-I: Crop Science, ICAR Research Complex for NEH Region, Shillong, Meghalaya, 1990.
- <sup>viii</sup> Saradindu Bose, *Carrying Capacity of Land under Shifting Cultivation*, Asiatic Society, Calcutta, 1968.
- <sup>ix</sup> J.B. Ganguly, *Economic problems of the jhumias of Tripura*, Bookland Pvt. Ltd., Calcutta, 1969.
- <sup>x</sup> N. Saha, 'Economics of shifting cultivation in Assam', Ph D Thesis (unpublished), Gauhati University, Gauhati, Assam.
- <sup>xi</sup> Government of Manipur, *Ninth Five Year Plan and Annual Plan*, Planning Department, 1997-98; Government of Manipur, *Draft Annual Plan*, Planning Department, 1990-91.
- <sup>xiii</sup> 'Draft Annual Plan (2003-2004) Proposals (write-up), Vol. 1' *Planning Department*, April, 2003. p. 8.
- <sup>xiv</sup> Ibid.
- <sup>xv</sup> D.N. Borthakur, 'Shifting Cultivation in Northeast India: An Approach Towards Control', in BJ Deb (Ed.), *Development Priorities in Northeast India*, Concept Publishing Company, New Delhi, 2002, pp. 123-134.
- <sup>xvi</sup> PSR-P 384
- <sup>xvii</sup> P.S. Ramakrishnan: *Shifting Agriculture and Sustainable Development*. Man and the Biosphere Series, Volume 10. 1993. Paris/ New Delhi: UNESCO/Oxford University press. Pp 39-40
- <sup>xviii</sup> PSR Idib p. 42
- <sup>xix</sup> See, Ansari. p. 108.
- <sup>xx</sup> PS Ramakrishnan op.cit. pp 384-385
- <sup>xxi</sup> 'Draft Annual Plan (2003-2004) Proposals (Write-Up), Vol. 1' Planning Department, April 2003. p. 42.
- <sup>xxii</sup> Manipur Sericulture Project in India, Final Report submitted to the Overseas Economic Cooperation Fund, Japan. Imphal: SAPROF team, May 1997.
- <sup>xxiii</sup> Biren Singh (1993) p. 82.
- <sup>xxiv</sup> Ibid. p. 6.
- <sup>xxv</sup> : L. Rinjah, 'Land Use Pattern – Jhumming and Control, Settled and Terraced Cultivation with Related Problems,' in T. Mathew (Ed.), (1981), *North Eastern Hills Regions of India – Problems and Prospects of Development*. New Delhi: Agricole Publishing Academy
- <sup>xxvi</sup> Anthony Patton (1981), '*Socio-Economic Impact Of Shifting Cultivation Control Schemes In Nagaland - A Case Study Of Baghty In Wokha District*,' Pp 38-40. in T. Mathew (1981, Ibid.)
- <sup>xxvii</sup> Tripura Statistical Department: 18<sup>th</sup> Round of NSS (1963-64). Indebtedness of Scheduled Tribe Households in Tripura. In J.B. Ganguly, 'Progress of Jhumia Rehabilitation in Tripura: a critical review,' in T. Mathew (1981, *ibid.*)
- <sup>xxviii</sup> MoEF 2003, p.10
- <sup>xxix</sup> Ibid, p.14