

SHIFTING CULTIVATION: TOWARDS TRANSFORMATION APPROACH



A Draft Report

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TRANSFORMATIONAL APPROACHES IN SHIFTING CULTIVATION

Introduction

The history of shifting cultivation can be traced back to about 8000 BC in the Neolithic period which witnessed the remarkable and revolutionary change in man's mode of production of food - from hunters and gatherers to food producers. Shifting cultivation since its inception is identified with rotation of fields rather than rotation of crops, absence of draught animals and manuring, use of human labour only, employment of dibble sticks or hoe, and short period of occupancy alternating with long fallow periods to assist the regeneration of vegetation, culminating in secondary forests. Many social scientists have described shifting cultivation as a way of life of the societies practising it. It is found that the shifting cultivation fields and their surrounding forests provide two alternative sources of subsistence to the dependent population. In case the crops are not good or fail, the forest resources aid the farmers by augmenting their food supplies in addition to the provision of house building material, fuel wood and timber.

In the hilly region of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura, shifting cultivation locally known as jhum, continues to be a dominant mode of food production and is considered as primary means of economic mainstay. The social organisation of the tribes living in the hills is often built around the concepts of community ownership, participation and responsibility. The usual process in shifting cultivation followed in the region demands the selection of a plot on or near the hill side or jungle, usually done during the months of October to December by the village elders, clan leaders and households. In some tribes, community as a whole is collectively responsible for clearing of the selected jhum plots while in others, the clearing of trees and shrubs is made by the respective family to whom the plot is allotted. At the time of allotment of plots, the size and workforce in the family are taken into consideration. This is the fundamental basis for ensuring equitable and universal access to land as well as rationalisation of labour availability and is based on the principle of 'mouths to feed'. The area allotted per family varies between half hectare to one hectare among the different tribes, and states in the region. The process of clearing the plots which takes over a month is labour intensive, being undertaken almost with indigenous and traditional equipment. Households remove useful biomass – big branches, trunks and boles – for house building, timber and fuelwood requirements and the remaining debris are left to dry. The dried slash as well as the tree trunks standing in the clearance area are set on fire between the months of February and March, care being taken during the firing operations to ensure that fires do not spread out of control. The ashes are then scattered over the ground and dibbling of seeds begin right after that, before the advent of monsoon. The dibbling and planting of seeds is an exclusive job of the female members. The male members broadcast seeds of crops like millets and small millets, whereas crops like maize, pulses, cotton, sesame and vegetables are dibbled by females. Most interestingly, before sowing starts, evil spirits and village deities are worshipped and sacrifices are made for a good crop and prosperity of the family. At the advent of rains, the seeds begin to germinate. In shifting cultivation, the soil is never ploughed and no irrigation is used. After sowing the crops, the shifting cultivators pay attention to the crops regularly removing weeds from the field. In some places the crop is, however, protected from stray cattle and wild animals by fencing the fields with bamboo. Many shifting cultivators in the region have the custom of constructing a hut in the field to look after the crop. Shifting cultivators practice mixed cropping however the composition of crops varies from tribe to tribe within the region. In mixed cropping, soil exhausting crops like rice, maize, millets, cotton and soil enriching crops like legumes are

grown together. These crops are harvested at different periods, thereby providing the farmers a sequential harvesting and a variety of foods throughout the year. The land is cropped for two or three years, thereafter, it is fallowed to recuperate. Traditionally the shifting cultivators grew only food grains and vegetables however during present times most communities have shifted to cultivation of cash crops such as ginger, turmeric, pineapple, jute etc. Among food grains, the traditional varieties of rice, followed by maize, millet, job tears and small millets are the principal crops. Among vegetables, a variety of legumes, potato, pumpkins, cucumbers, yams, tapioca, chillies, beans, onion and arum are mostly cultivated. In fact, the choice of crop is mostly consumption oriented. Ginger, linseed, rapeseeds, upland sesamum (perilla), oranges, pineapple and jute are the important cash crops grown in jhum fields. The cash crops are mostly sold in the nearby weekly markets and in recent years, to a growing market in urban settlements and larger towns and cities.

Changing Perceptions about Shifting Cultivation in Northeast India

There are divergent opinions about the adverse effects of shifting cultivation on the land, water and biodiversity of the northeastern India. A section of researchers believe that continuance of shifting cultivation with necessary and effective reforms can do little damage to soil as high humidity and fairly long duration of rainfall in the region do not permit the soil to remain uncovered for long. Some form of vegetation immediately covers the top soil which checks the soil erosion. During the agricultural operations also, no ploughing, hoeing and pulverization of soil is done, therefore the soil remains compact. Moreover, the jhum lands are generally located on hill slopes on which sedentary cultivation cannot be developed easily. These people often consider that jhum cultivation is a way of life, evolved as a reflex to the physiographical character of land under special ecosystems. It is practiced for livelihoods and not without the knowledge of its adverse effects. Yet, another section of experts hold the view that jhum cultivation is primitive and unscientific land use that depletes the forest, water and soil resources. It is said that felling of trees and clearing of bushes accelerate soil erosion and accentuate variability of rainfall which may lead either to droughts or floods. The overall impact is the decline in soil fertility. The agro ecosystems lose their resilience characteristics. The village households dependent on shifting cultivation face shortage of food, fuel wood and fodder. Consequently, the food availability and nutritional status of the households goes down. These processes culminate into poverty and ecological imbalance. This view is however being challenged globally and an increasing body of literature as well as recent publications from FAO suggest the need for re-examining such perceptions. Recent analyses of the issue has shown that the traditional shifting cultivation (long cycle >10 years) generally prevalent in places where population density is low and in remote places appears to be good as it provides food security and livelihood without causing any significant degradation of land. However, the distorted shifting cultivation (short cycle < 5 years), a consequence of increasing land use pressure, is not good land use and therefore, requires to be transformed.

For successive governments, both at the Centre and States, the management of shifting cultivation, has been — and still remains — a fundamental imperative for agricultural development planning pertaining to the uplands of the northeast India. Most development planners and policy makers perceive the practice of shifting cultivation as subsistence, economically unviable, and environmentally destructive and hence, a major hurdle to the agricultural development of the states where shifting cultivation is practised. Governments therefore, have consistently tried to replace the practice with settled agriculture, allocating substantial financial outlays to support agricultural transformation. With increasing exposure to the outside world and rising aspirations, shifting cultivators too, desire change as much as the

governments do and desperately seek options that would help them transgress the practice and move towards attaining their aspiration of assimilation into the mainstream economy. Towards this end, they perceive government programmes as a critical – often the only - means to take them out of poverty and hence, eagerly await opportunities to avail the benefits of such programmes. However, despite the desire of the community and efforts by the government to usher in change, shifting cultivation remains an enigma and persists in large parts of the region even today.

Considering importance of the problem and in order to improve the livelihoods of the people, eradicate poverty and stop the degradation of land due to shifting cultivation, the NITI Aayog, Government of India constituted a thematic working group on ‘Shifting Cultivation: Towards a Transformation Approach’ and suggested five action points: 1. Consolidate the learning on magnitude of the problem, 2. Identify viable best practices having upscale potential, 3. Assessment of Institutions (formal and traditional one’s) and needs for transformation, 4. Ascertain to what extent and which “Co-Benefits” could be delivered (to Jhumias and State agencies), and 5. Suggest Action Agenda (short, medium and long term). The working group comprised of Lead Institution: NIRDPR-NERC, Director, Dr RM Pant, and NERCORMP, MoEF &CC, DoNER, Ministry of Agriculture and Representative from ICIMOD as members. On a later date, Professor B. K. Tiwari of NEHU was co-opted as a member.

Methodology

The working group reviewed the published and unpublished literature, reports of various task forces, and had formal and informal consultations with experts in the field. The NIRDPR-NERC, NERCORMP, ICIMOD, G.B. Pant National Institute of Himalayan Environment and Sustainable Development (GBPNIHESD) Rain Forest Research Institute submitted their inputs to the working Group. Based on these inputs the working group prepared a draft report. The report has 5 chapters each dealing with the five action points suggested by the NITI Aayog.



Propitiating Nature before starting Jhum Cultivation

CHAPTER 1

CONSOLIDATE THE LEARNING ON MAGNITUDE OF PROBLEM

Paucity of Accurate Statistics

- i. **Area under shifting cultivation** Although the exact figures for the total area under shifting cultivation and the total number of households involved in the practice are hard to come by, the Task Force on Shifting Cultivation set up by the Government of India, in their report of 2003 estimated a cumulative area of 1.73 million hectares under the practice in NE India during the period 1987-97, based on a report of the Forest Survey of India published in 1999. The Task Force also reported an estimated 620,000 families dependent on shifting cultivation which is based on the Ministry of Agriculture Task Force Report 1983. More recent figures provided by the Indian Council of Forestry Research and Education published in the Statistical Year Book 2014 by MoSPI, suggest significant reductions in the area under shifting cultivation during the last decade (2000-2010). A comparison of the data, however, suggests that the data for the year 2010 presented in the ICFRE document is more or less the same as published in Wastelands Atlas of India (2010) for the year 2005-6 for Assam, Manipur, Mizoram and Tripura (Table 1 and 2). The Wastelands Atlas Map shows a reduction in shifting cultivation in northeastern states from 16435.18 sq km to 8771.62 sq km in two years. Never in the past has so much change taken place in such a short period. Therefore, the authenticity of this data remains uncertain. A reduction of >92% in Assam in two years and 82% in Manipur in the same period calls for verification. The variations in data published by various agencies raises a serious concern on the accuracy and veracity of figures provided by different agencies and merits the need for urgently generating authentic data and/or reliable estimates for the present area under shifting cultivation on a decadal time series basis. This should be possible with the application of remote sensing imageries and such an exercise should then be able to provide a reliable basis on which to assess accurately the area under the practice for each state and also help generate the temporal trends of change over the last few decades.

**Table 1: Changes in the Extent of Shifting Cultivation in India(2000-2010)
(Area in km²)**

State/Union Territory	Shifting Cultivation Area (2000)	Shifting Cultivation Area (2010)	Change (km ²)	% Decadal change
Andhra Pradesh	13.80	16.45	+ 2.65	+ 1.92
Arunachal Pradesh	3088.08	1531.46	- 1556.62	-50.41
Assam	8391.48	239.56	- 8151.92	- 97.15
Bihar	45.45	0.00	- 45.45	- 100.00
Manipur	12014.06	852.20	- 11161.86	- 92.91
Meghalaya	2086.77	448.99	- 1637.78	- 78.48

Mizoram	3761.23	2617.56	- 1143.67	- 30.41
Nagaland	5224.65	2827.74	- 2396.91	- 45.88
Orissa	115.28	1445.44	+ 1330.16	+1153.85
Tripura	400.88	254.11	- 146.77	- 36.61
Total	35142.21	10306.84	- 24835.37	- 70.67

Source: Indian Council of Forestry Research and Education and published under Statistical Year Book-2014 by MoSPI

**Table 2. Change in area under shifting cultivation from 2003-2005-6
(Area in km²)**

State	2003	2005-6	Change	% Change
Arunachal Pradesh	1613.13	1531.44	-81.69	-05.06
Assam	2930.97	239.56	-2691.41	-91.82
Manipur	4816.68	852.20	-3964.48	-82.30
Meghalaya	743.83	448.99	-294.84	-39.63
Mizoram	4017.41	2617.56	-1399.85	-34.84
Nagaland	1917.90	2827.74	+909.84	+47.43
Tripura	395.26	254.11	-141.15	-35.71
Total	16435.18	8771.62	-7663.56	-46.62

Source: Wastelands Atlas of India 2010,

<http://www.indiawaterportal.org/articles/wastelands-atlas-india-national-remote-sensing-centre-and-ministry-rural-development-2010>

- ii. **Households practicing shifting cultivation:** While the ICFRE report provides figures for the area under shifting cultivation, statistics for the number of households continuing the practice of shifting cultivation could not be retrieved despite a search in the available documents from the different concerned Ministries. Indications of the total population or the number of households presently practicing shifting cultivation, therefore, remain undetermined and is a serious lacunae in the information available, compromising any serious appraisal of the magnitude of the 'problem'. The Ministry of Agriculture Task Force of 1983 has given a figure of 6.2 lakh families. All subsequent publications have quoted this data. In the absence of any official data on this aspect, inferences are to be based on published research findings available in the public domain. Research studies conducted in the West Garo Hills, Meghalaya and Ukhrul district, Manipur by ICIMOD in collaboration with NERCORMP and MRDS

during the period 2002-2009, suggest that despite transformations and adoption of multiple farming systems, 70% of the households in Ukhrul and over 90% in West Garo Hills still continue to practise shifting cultivation, complimenting other farming systems that they may have adopted. The findings from these studies suggest that it would be erroneous to conclude that the mere adoption of a form of settled agriculture by upland farmers in NE region means that the same farmers have given up shifting cultivation. A shifting cultivator may adopt multiple settled farming practices, but could still retain the practice of shifting cultivation. Therefore, in addition to generating accurate estimates on the area under shifting cultivation, it is a critical imperative to enumerate the exact number of households continuing with the practice of shifting cultivation. These two data sets are crucial for getting a realistic and accurate understanding of the magnitude of the 'problem'. The generation of exact estimates of households practicing shifting cultivation and the population dependent on the practice, therefore, is a fundamental action required to be taken up before effective plans to address the issue of transformation of shifting cultivation can be drawn up. The data on geographical distribution and typology of shifting cultivation (distorted, innovative, modified or traditional) are also required for the purpose of designing the interventions.

Possible Reasons why most programmes and projects on shifting cultivation did not yield desired result

- i. ***Department of Forest and Environment:*** The Forest Departments of Government of India as well as states have implemented afforestation programmes to stop shifting cultivation since pre-independence. This was because almost all forest policies have considered that shifting cultivation is a 'bad land use', and therefore, it must be stopped. The Forest Department personnel tried to use their knowledge of forestry to stop or reduce shifting cultivation by bringing the land under forest cover. For this, they implemented schemes like Social Forestry and National Afforestation Programme for tree plantations on jhum lands. Mostly timber and fuel wood yielding species were planted. Bamboo plantations were promoted under the National Bamboo Mission and Medicinal Plants were planted under the Medicinal Plant Board. These plantations did not address the food security needs of the jhum farmers; therefore, though the jhum farmers accepted the programme they did not stop practising jhum cultivation which was continued for production of food. Most plantation schemes were implemented for a period of 3 to 5 years. After the scheme was over, there was no mechanism to monitor the success achieved and the farmers at times were also not interested in tree plantation any more. In a number of cases the afforested lands reverted back to shifting cultivation.
- ii. ***Department of Agriculture and allied Departments:*** The Department of Agriculture, Horticulture and Rural Development generally promoted conversion of jhum with settled agriculture, promotion of fertilizers, high yielding varieties, irrigation and introduction of a variety of models which generally were not found akin to the availability of skill and man power, topography, food preferences and land tenure system of the place. Sericulture and horticulture were successful only in areas where

market was available. Spectacular results were noted in the state of Tripura through promotion of rubber plantation. This was mainly because of assured market availability and financial and technical support. Tea, cashew nut, coffee, floriculture, passion fruit were also introduced as alternatives to shifting cultivation and these were successful in areas where it was connected to the market. The convergence of departments was lacking and each department worked according to their own understanding and scope of the department. Each department tried looking at the problem through its own lenses and therefore, did not get a holistic perspective. In fact, most personnel implementing the jhum control or rehabilitation schemes had no scope of experimenting or undertaking any activity beyond the mandate of their department.

- iii. **Task Forces:** Three task forces were appointed by the government, i) Ministry of Agriculture, 1983, ii) MoEF 2002, and iii) Interministerial Task Force of MoEF, 2008. Each one suggested the actions to be taken up by their respective ministries. Jhum being an issue related to food security, livelihood, culture and land tenure, and climate and land topography, each task force could attain limited objectives, and the extent of jhum remained almost same even after implementation of their recommendations.
- iv. **Need of Cash for Modern Living:** The jhum farmers need cash for education of their children, increasing assets and enhancing their purchasing power. Most schemes and programmes have not adequately addressed this issue hence the alternate landuse and livelihood option suggested by such schemes does not prove any better than the one they have been practicing at least in this respect. It is said that in places where the MGNREGA has been implemented, the dependence of people on jhum has to some extent declined (though no empirical data is available on this). Broad understanding therefore is: the jhum transformation schemes must generate cash income in order to be successful.
- v. **More emphasis on land management less on the livelihood enhancement:** Most jhum rehabilitation schemes emphasised on afforestation, raising of plantation crops and converting jhum lands to settled agriculture etc. Such conversion of shifting cultivation lands to other land uses reduced the net area available for shifting cultivation thus have contributed to the reduction of fallow periods. Presently, jhum cycles in most areas of northeast India have been reduced to as short as 3-4 years. This drastic reduction in the cycle is not long enough for the soil to recuperate or for secondary forests to regenerate. The consequences in many places has been a drastic reduction in productivity of shifting cultivation fields as well as an increase in soil erosion, forest degradation and loss of biodiversity and ecosystem services. Together, this has resulted in gradual marginalisation of shifting cultivator communities and making them fall into the vicious cycle of poverty and environmental degradation feeding each other making it difficult for the communities to come out of the trap.

The schemes aimed at restoring jhum lands through alternate land use without providing/enhancing livelihood options and food security have failed.

- vi. ***Socio-economic and infrastructure development:*** An analysis of various projects and programmes implemented by the government and development agencies including the ones supported by the international donors, it emerged that socio economic development has greater impact on jhum reduction than afforestation works carried out by the forest departments, promotion of modern agriculture by department of agriculture and promotion of cash crops by other land based departments. Further, a general observation on change in geographical distribution of shifting cultivation over a period of time supports that jhum has ‘shrunk’ to places in remote areas, and to places where the fruits of development like good roads, schools, markets and hospitals are yet to reach. The learning from this analysis is that the social, economic and infrastructure development are keys to jhum control. In particular, poor connectivity limits access of the people to market and technology which in turn promotes perpetuation of shifting cultivation.

Possible reasons as to why do upland farmers continue with the practice?

- i. ***Crop Diversity and Food Availability:*** Government schemes in the context of managing shifting cultivation have promoted settled agriculture by providing support for construction of terraces or towards development of plantation crops. This process has predominantly prioritized cereals and plantation crops and has caused reduction in the diversity of crops that farmers were hitherto able to access. The new crops and cropping pattern have severely limited the seasonal availability of food crops and in the case of plantation crops, has restricted and compromised food availability during the gestation period, resulting in a growing sense of food insecurity. Food availability, and a compromised sense of nutritional security, thus becomes an issue of concern during transition. This is one of the reasons why a good number of farmers continue shifting cultivation even after adopting some alternative farming system.
- ii. ***Changing Land Use and Tenurial Security:*** Transformation to settled agriculture means change in land use, and hence in community access and ownership of land or the tenurial framework. Under shifting cultivation, land is managed customarily as a common property; the changes to private ownership of land compromises tenurial access to land and often means that farmers, particularly women farmers, are left with either less land or no land at all. This has implications for both tenurial access and livelihood security for affected households. Such changes also modify institutional regulatory frameworks (often bringing in conflicting roles) and hence require a thorough understanding of how changes in the institutions that govern these resources are to be managed. Insecurity of tenure also demotivates the farmers for making any investment in up keep of the land which in turn accelerates land degradation. In villages where the community institutions have lost control over land, landlessness

has become a major socio-economic issue. In many places the farmers continue jhum in order to keep the right over the land intact and not to become landless. In many states of northeast landlessness is emerging as a big concern among the tribal communities. Any jhum transformation that encourages landlessness cannot be sustainable.

- iii. *Challenges to Ecosystem Services:*** Promotion of cash crops and overall changes in land use patterns is not only promoted through government programmes, but often through aspiration of communities, who seek better integration with expanding market forces. The focus on economy, and the resultant changes in land use, however, has implications for ecology, in particular for vegetal cover. With settled farming, the regenerative fallow cycles undergo changes in land cover, often being converted into non-forest vegetation, leading to a loss of vital ecosystem services and land degradation. Drying of water sources and depletion of soil fertility (and the ramifications there of) and reduced availability of fuel wood, fodder and wild edibles are serious concerns under conditions of agricultural intensification. Any land use change suggested for transformation of shifting cultivation, therefore needs to consider its impact on ecosystem services in general and hydrology in particular.
- iv. *From Sustainable Management of Community Resources to a Tragedy of Commons:*** Management of common property resources under traditional customary norms ensured a sustainable natural resource management regime that respected conservation and regeneration of resources while ensuring equitable access and benefit sharing founded on the principles of Common Property Regime framework. As government programmes and schemes designed to replace and eradicate shifting cultivation through settled agricultural practices began to be promoted, traditional institutions and customary norms gradually eroded, resulting in increasing elite capture and a rapid erosion of traditional access and benefit sharing frameworks. This has resulted in degrading a fairly sustainable natural resource management approach into a tragedy of commons. Most deforestation and land degradation in the northeast is directly or indirectly a result of this tragedy of commons. With increasing elite capture and the resultant transformation into private property regime, common lands such as shifting cultivation fields are rapidly shrinking with a growing uncertainty about the continuity of long-term access to such lands. Consequently, the Jhum farmers, has therefore no incentive and motivation to look after the land. The changing circumstances, therefore, force him to protect his interests and look for temporal, short term gains. The vast stretches of land degraded due to the practice of ‘distorted jhum’ in the landscapes of Nagaland, Arunachal Pradesh, Meghalaya, Manipur and Mizoram are a product of this ‘Tragedy of Commons’. There is a need to develop institutional set up to reverse this tragedy of commons and make the ‘Ostrom’s Principle for Managing Commons’ work. A reappraisal of existing legal instruments – Sixth Schedule Constitutional Provisions, FRA and existing Jhum

Control Regulations for different states – is urgently required to strengthen local level decision making in regard to land use and access to land resources.

- v. ***Access to Programs and Scheme, Credit, and Market:*** Successful transformation of shifting cultivation requires a range of enabling programmes and policies that can provide the right environment to support communities to overcome the challenges related to transformations. Most programmes and schemes for addressing transformations in shifting cultivation are designed for selected watersheds or localities, and do not always cover large areas, limiting implementation of such programmes and schemes to a section of the population. The access and benefits of such programmes, therefore, are restricted to the populations inhabiting these specific areas and are not universally applicable to the whole population. This raises the issue of equity and the problem is tackled only in a small area. Gender is also a major concern on the issue of access to such programs and schemes. Consequently, even if shifting cultivators want to adopt transformative changes, they have no access to support services that would help them to undertake the transformation. Therefore, the issue of universal coverage over a state or region needs to be examined so that the issue can be settled for all time to come and there will not be a requirement of another scheme for transformation of shifting cultivation in the same village after some time, as is happening presently. A related issue of concern is with regard to access to credit and markets. Credit facilities are extended against land mortgages and for shifting cultivators, this effectively deprives them from accessing credit as they lack any land title deeds. Credit facilities, therefore, need to explore possibilities of extending credit against group/institutional guarantees. Such guarantees could be extended by the clan or the village council/institution. It has been observed that cash and plantation crops based programmes in shifting cultivation areas have often not achieved the desired success if the market and related infrastructure is not concurrently evolved. Failure of orange and pineapple plantations in remote places of Arunachal Pradesh is a living example of such actions. Not being able to fit in the modern agriculture which requires cash input they continue the practice of jhum which does not need any cash or credit for producing food.

CHAPTER 2

VIABLE, BEST PRACTICES HAVING UPSCALE POTENTIAL

- i. ***Home Gardens:*** An effective, fairly easy to replicate and scale up approach to transformations is the promotion of home gardens (or extended home gardens). This approach, based on the model developed by villagers in Chandigre, West Garo Hills, has been successfully promoted by NERCORMP across many of their project districts. Home gardens allow households to grow many of their crops cultivated in the shifting cultivation fields around their household. This not only gives the households access to food crops for which they are habituated over the seasons thereby contributing to the household's nutritional security, but also allows an income generating opportunity. Combined with horticulture and animal husbandry, the promotion of home gardens has helped many households to increase income significantly and improve their economic status. More significantly, home gardens give tenurial security of this productive system to all households, irrespective of their economic or social status. This security encourages households to further invest in their home gardens thus increasing their options for economic returns and in the process, gradually reduces dependency on shifting cultivation. For women in such households, home gardens have helped in reducing drudgery and increasing nutritional and economic security.
- ii. ***Fallow Forestry*** In Nagaland, NEPED has, over the years provided a good model for fallow forestry promotion. NEPED's approach of encouraging native species promotion for provisional and regulatory services over exotic tree species has proved to be the underlying rationale for the widespread acceptance of this model by villagers across Nagaland. This is an excellent model for replication and promotion of fallow forestry practice.
- iii. ***Traditional Practices of Cultivation of Food Crops:*** Aji system of Apatanis, Zabo system of Chakesangs, Bun system of Khasi Hills, Alder-based system of Angamis, Tree based rice cultivation of Konyaks are some of the best practices being followed by traditional communities. They are successful in their respective areas but there is hardly any example where they have been replicated successfully. However, while trying to transform shifting cultivation, these traditional food production systems must not be disturbed.
- iv. ***Agroforestry:*** NEPED has improved jhum by introducing a strong component of agroforestry. Large scale plantation of fast growing timber and economically important tree species with intercropping of ginger, turmeric, black pepper, lemon grass etc have proved to be ecologically viable, economically sustainable and socially acceptable. The success of the programme is attributed to strong leadership, community participation and need based research support.
- v. ***Cash Crop Cultivation:*** There are numerous examples where cash crops have totally replaced shifting cultivation. Broom grass cultivation in Meghalaya, Rubber plantation in Tripura, Tea cultivation in Tripura, Manipur Meghalaya and Arunachal Pradesh, Cashew Nut plantation in Garo Hills of Meghalaya,

Floriculture in Mizoram and Passion Fruit Cultivation in Nagaland, Manipur and Mizoram are a few examples where cash crop cultivation has transformed shifting cultivation in the area. But the fundamental requirements of this transformation have been the market and handholding by various government agencies. In some places, shifting cultivation has been totally stopped and people are buying their staple food from the market while in some other places, jhum continues where the jhumias cultivate cash crop for attending to their cash needs. A caution has to be introduced here. In the quest for promotion of cash crop plantations (and conversion of shifting cultivation fallows into settled agriculture), an important ramification for land use and land cover is overlooked. Fallows, where cash crop plantations are expanding into, ensure forest regeneration and the development of secondary forests over time. Indiscriminate expansion of plantations has been at the cost of fallow forests and hence, of a drastic erosion of forest cover and depleting ecosystem services that is irreversible. This has also reduced fallow cycles, marginalising the practise of shifting cultivation and been responsible for the distortion of the practice. In addition, this has compromised universal access to land and resulted, in many places, in elite capture and landlessness among upland communities. Promotion of cash crop plantations, therefore, has to be conducted with serious assessments of implications for forest cover change, access to land and inclusiveness.

- vi. ***Timber Tree Plantations:*** In villages where the land is enough and people have moved out for service or business (de-population), a large area of shifting cultivation land has been converted into timber tree plantations. This has happened in the states of Nagaland, Manipur, Mizoram, and on a small scale in Meghalaya. This practice has helped in restoration of land creation of wealth for the land owners. However, caution has to be exercised here as such conversions have led to increased elite capture of land, depriving the poor and marginalised of access to land for their basic livelihood needs and a rapid depletion of quality, mixed forest cover. Further, a rigorous assessment needs to be done for calculating opportunity costs and making such approaches inclusive and universally acceptable.
- vii. ***Models Developed by Various R&D Institutions:*** A good number of hill farming models have been developed by the national research institutes viz., ICAR, GBPNIHESD etc and have been demonstrated across several villages. However, very few have been accepted by the farmers on large scale and for a long period of time. Also, there is hardly any mechanism of follow-up and feedback for redesigning and revamping the same as per local needs.

Village level micro planning is the key to success. Cash crops integrated with other livelihood options have been successful in many places, particularly where market is available and transport network is in place. However, often this has not helped the jhum farmers to come out of the poverty; added to it, the degraded lands continue to degrade or remain as such. The object of transformation of shifting cultivation must not be to stop shifting cultivation all at once. It has to be a gradual process as it is not only a food production practice but is also linked with the culture and tradition, in particular the food habit of the people practising it. In order to make the transformation sustainable, it must result in improvement of the standard of living of the jhumias. From the review of various projects and programmes implemented for rehabilitation of jhum farmers, it

could be concluded that there is no one best practice which can be up scaled on a large scale at a regional or even state level. The variation in agro ecological conditions, land tenure, traditional governance/institutions and tribes and sub-tribes make the situation so unique and incomparable that a practice that proves to be very good at one place completely fails in another situation. It is true to the extent that the system of jhum practiced by the people of Khonoma does not work in the neighbouring village of Mezoma. Therefore, there can be no one technology that can be replicated everywhere following the dictum that there is no size that fits all.

CHAPTER 3

ASSESSMENT OF INSTITUTIONS AND NEEDS OF INSTITUTIONS FOR TRANSFORMATION

For assessment of institutions the two common meanings of Institutions have been used. i) the common man's understanding of the term that relates to the organisations and the other ii) which is understood by the sociologists and political economists and relates to established laws, customs, policies, practices, procedures, traditions, and rites and rituals.

i) The Organisations:

At the village level, traditional tribal institutions command great power and often act as leaders of their communities. While traditional institutions lack access to information on modern technologies, approaches and options, they are a rich repository of local resource management approaches (including sustainable management of ecosystem services). A dialogue and discourse with the heads of these institutions on the needs of transformation of jhum can help in introducing new technologies and in making the contemporary practices more efficient and in tune with current needs and aspirations of the communities.

A number of government officials belonging to land based departments routinely interact with the jhum farmers for implementation of projects and programmes related to rural development, forestry, agriculture, horticulture etc. These extension service providers often do not possess latest development in the field and therefore require knowledge and capacity enhancement at two levels – first, regular updating on the latest technological advances in agriculture and simultaneously educating them with the different dimensions of the practice of shifting cultivation, particularly tenurial arrangements and intricacies of common pool resource (CPR) management. An understanding of the latter will ease their ability to suggest approaches which facilitate acceptance of new alternatives and thus in effecting transformation. At the higher levels, there is a need for facilitating a better understanding of the practice of shifting cultivation so that the strengths of the practice – maintaining crop diversity, fallow forestry management and conservation of ecological services, access and tenurial frameworks can be retained while facilitating transformation.

The Agricultural universities, ICAR Research Complex for North-Eastern Hill Region, Rain Forest Research Institute, National Institute of Rural Development and Panchayati Raj and State Institutes of Rural Development have not taken research and development programmes on shifting cultivation as much as was expected from them. These institutes and organisations need to be more proactively involved in finding solution to the problem. The Krishi Vigyan Kendra and other village level formal or informal institutions e.g. JFM Committees (under Forest Department), Village Employment Council (under MGNREGA) etc need to be educated about the ill effects of distorted jhum and be involved in planning and implementation of the projects for transformation of jhum. The ICAR Research Complex for North-Eastern Hill Region was established with primary object of conducting research on shifting cultivation and find solution to the problems relating to shifting cultivation. Therefore the institute is expected to be repository of up to date data on the extent and status of shifting cultivation in northeast India. However, over the years the institution has transformed itself to such an extent that jhum has

become a subsidiary component of their overall activity and does not seem to be in focus anymore. There is a need that ICAR RC NEHR takes a lead role in transformation of shifting cultivation.

The traditional universities of the region have confined their research on shifting cultivation to the area of documenting the practice and analysing the impact of jhum on the soil and vegetation of the region. By and large they never ventured into the realm of finding solutions to the problem.

Another major shortcoming that emerges from the analyses of organisations engaged in research and development in the field of shifting cultivation is general lack of cooperation and convergence among various institutions and departments. Central as well as state government Departments of Forests and Environment, Agriculture and allied departments often have divergent approaches towards shifting cultivation. This creates confusion at grassroots level workers and also among the jhum farmers.

ii) **The established laws, rules, customs, traditions including policies.**

In northeast India shifting cultivation has been working on an institutional framework which by and large followed Ostrom's principles on common pool resource. The communities have evolved a set of customary laws, rules and traditions which governs the common pool resource and regulates the tenure. Over the years due to modernisation, population increase and pressure of market forces these institutional arrangements have weakened leading to distortion of jhum and degradation of the CPR. In several places the land has been privatised leading to jhum being practised on private lands or on leased lands. Thus any transformational approach for shifting cultivation has to keep in mind this development in order to protect the interest of poor jhum farmers.

The inconsistency and incongruence among policies of various departments of government of India and state governments with respect to shifting cultivation needs to be done away with. The dispute of land use of jhum should be settled once for all. The shifting cultivation land should be recognised as agricultural land where farmers practice agroforestry for production of food. The land should not be classified as forest land which needs to be converted into forest as claimed by department of forest and environment.



Jhum fields getting ready

CHAPTER 4

SUGGESTED ACTION AGENDA (SHORT, MEDIUM AND LONG TERM)

Managing transformations in shifting cultivation areas and bringing shifting cultivators into the mainstream of economic development is a complex process requiring action from various quarters. Given the complexity of the issue and the immediate area of action that the NITI Aayog can galvanise action, the Working Group suggests the following action points in the immediate, medium and long-term time frame:

- i. **Facilitating transformations; Institutional mechanism:** Managing transformation of shifting cultivation areas is a complex process, requiring the active participation of multiple Ministries and agencies. Assigning the responsibility of effecting change to a single Ministry and expecting the cooperation of other Ministries in achieving the objectives of transformation is unrealistic (and has proved to be ineffective, given the lack of coordination and synergies already witnessed). For an effective management of transformation in shifting cultivation areas, it is recommended that a Special Project/Programme Vehicle (SPV) be set up under the direct supervision of the PMO or the NITI Aayog. This will ensure accountability of all related Ministries and agencies that need to actively contribute to the process while also strengthening coordination among agencies as well as monitoring of the progress and achievement of set targets. Participation of State Governments needs to be built in while designing the institutional mechanism for planning transformation strategies, operational plans and implementation of planned programmes/schemes.

- ii. **Bridging Data Gaps:** Non-availability of reliable data on temporal variation and extent of jhum in terms of area, population involved and geographical distribution makes proper planning and implementation of any project/scheme difficult. This needs to be addressed immediately and on a Mission mode.
 - a. **Remote Sensing** approaches can be immediately harnessed to determine the area affected and temporal changes in area under jhum. This exercise can be entrusted to the appropriate agency but should have a close link to the actions initiated under WG on Data Base. This will also require adequate ground truthing and the appropriate involvement of District Revenue department and District Councils.

 - b. **Village survey:** Enumeration of the number of families (households) and percentage of population who are dependent on shifting cultivation in an area also need to be carried out as an immediate measure complimenting the action suggested in i(a). Unit of this survey shall be the village; and the officials to be made responsible shall be the village level workers of Rural Development Department viz., Gram Sevak. This survey should also include information on the type of shifting cultivation being practiced in a village viz., Distorted or Traditional and land tenure i.e. community land, traditional chief's, clan land, private land including the custodian of the land. Jhumias need to be categorised for their degree of dependence on jhum i.e. 100%, 50-100% and <50%.

- c. **Census of Jhumias:** This may be included in 2021 Census of India as a long-term action.
- iii. **Addressing food and nutritional security during transition and transformation:** One of the main concerns of shifting cultivators is the rapid depletion of the diversity of crops that are available from jhum fields subsequent to conversion to settled agricultural practices and the consequent non availability of food crops during different seasons. Immediate action that requires to be taken to address this issue are suggested below:
- a. **Promotion of Home Gardens for cultivating season local crops and fruits:** Promotion of home gardens will ensure the cultivation of native crops, vegetables and fruits that are presently grown in jhum fields. Home gardens also ensure secured tenure for all participating households, can safeguard native crop species (hence provide nutritional security, income with surplus) and reduce drudgery for women. Homegardens are not included in any agricultural promotion schemes or programmes for rural areas. Such a promotion needs to be encouraged immediately through the state governments. Access to this scheme must be made to all, but should provide special considerations for the poor and marginalized. This scheme should be rolled out immediately through the State Agriculture and Horticulture Departments, with adequate technical support from the KVKs in each state/district and regular backstopping by extension agencies. Successful models have been implemented by NERCORMP and this agency could be enlisted for wide implementation.
- b. **Addressing Food Security issues during transition:** Strengthen and broaden PDS systems to ensure widespread access to cereals and other basic food items. The PDS can be broadened and strengthened by enlisting well established and well performing SHG Cluster Federations already established in several of the NE states through NERCORMP and other projects. Where such SHG Cluster Federations have not been established, efforts should be made to do so drawing from existing programmes that are mandated to facilitate the establishment of such institutions. In addition, widen the list of food grains that are procured and distributed through the PDS to include local food grains such as local rice varieties, millets and other local food grains.
- iv. **Promotion of jhum agricultural and fallow produces:** Although the organized market mechanisms do not formally recognize produces from jhum fields or fallow forests, the unorganized market actors have been procuring several such produces for years – oilseeds, NTFPs. This needs to be corrected and produces from these systems promoted in an organized manner. This will help shifting cultivators in getting a fair return from such produces, open up opportunities for value addition at the local level and also opportunities for promotion of enterprises and local entrepreneurs, thus contributing to the local economic growth and in long term transformations.

- a. Conduct market surveys to identify produces from jhum fields and fallows that are being traded locally and assess the volume of trade. Such surveys and assessments will provide insights for identification of produces with high market demand, the volume of trade (quantities and fiscal market values) as well as an understanding of the value chains. This exercise can help in identifying potential produces, the clusters which can be developed viably for their promotion and help in drawing up programmes for development and promotion of these produces.
 - b. Forest Development Agencies in conjunction with District Councils (where existing) in each state should conduct extensive surveys to list NTFPs that are being traded from these areas. On identifying NTFPs that are being traded and determining their trade volume, develop schemes (through JFM and/or FDA) that encourage assisted afforestation/regeneration of fallow forests and simultaneously support local processing and value addition initiatives. Such schemes could enlist local, village level institutions to encourage the promotion and management of Village Forests.
- v. **Ensuring Tenurial Security and management of ecosystem services during transformation:** The universal access to land and other resources have been severely disrupted in many areas as a result of landuse changes consequent to agricultural transformation through the promotion of wet rice terraces and cash crop plantations. While this has severely affected access to land for the poor and marginalized, it has also resulted in uncontrolled expansion of plantations at the cost of regenerating fallows and encouraged elite resource capture. This needs to be arrested, if not reversed and needs immediate action.
- a. **Perspective Landuse Planning:** PLP exercises need to be conducted for each village, involving the village institutions (Traditional institutions that determine tenurial access and landuse), line departments (Agriculture, Horticulture, Forest and Revenue as well as the District Councils). PLP determine/record present landuse as well as future/planned landuse changes. Such planning incorporates existing landuses as well as planned expansions for plantations, rice terraces, forests and settlements. Such planning should also respect traditional tenurial arrangements that have been respected and perpetuated by the local institutions. This will provide a degree of tenurial security and help reduce elite capture. PLP exercises can also facilitate land zonation which will result in identification of landuses that need to be conserved and managed for ensuring continuity of ecosystem services – catchment forests that are essential for continuity of springs, streams and other water sources, areas that are fragile and need to be left uncultivated etc. Once PLP mappings are agreed upon by all parties (villagers, District Council, line departments), they need to be ratified by the district administration and no deviations entertained for any purpose. Such an exercise will help in ensuring forest cover and the sustainable management of ecosystem services.

- b. **Formalise traditional tenurial arrangements and provide Tenurial titles to households:** Shifting cultivators and upland communities usually do not have ownership rights in common property resources, but have tenurial security that is handed over through generations. The formal regulatory system presently does not have provisions for providing tenurial titles to such households. Traditional institutions should be encouraged to provide such tenurial titles and this should be formally recognized and ratified by all statutory bodies. While this measure cannot be executed immediately, it is essential to mobilise discussions from all quarters so that necessary changes in legislation can be initiated in the long run.
- vi. **Access to Credit:** Shifting cultivators cannot access credit from banks and other financial agencies due to the absence of land ownership titles of their jhum land. Steps need to be initiated so that a guarantee and vouchership from the village institution can be recognized as a viable alternative to land titles required as mortgages for credit from Banks and financial institutions.
- vii. **Policy Coherence:** Forest Policy (1988) considers jhum as ‘not a right to land use’ and aims to ‘discourage shifting cultivation’ and ‘rehabilitate the jhum lands through social forestry and energy plantations’. Agriculture Department is promoting agriculture, horticulture and cash crops on jhum lands. Multiple agencies of state and central government target jhum lands for cultivating cash crops like timber trees, tea, coffee, rubber etc. The Supreme Court ban on timber extraction and coal mining has made shifting cultivators return to jhum practice. There is an urgent need therefore, for bringing about a policy coherence that will help in transformations while reducing the unwanted negative impacts.
- viii. **Policy synchronization** is a necessity. All government departments should look at the jhum land as an agricultural land. A land use policy needs to be evolved restricting land use change. Definitely, jhum land should not be considered as wasteland as done by some government departments.
- ix. Jhum must not be attributed as a reason for loss of forest (Refer: ISFR 2015). A jhum fallow may look as a forest when sensed from a remote satellite but it is a temporary phase and the jhumias have a right to convert it back to agriculture. If all jhum lands are converted to forest where from the farmers will produce their food, the Forest Department must not look at the jhum lands as prescribed in Forest Policy 1988. Forest Policy needs to be suitably revised.
- x. **Encouraging universal access to government schemes and programmes:** Although the government has developed several programmes to help transformation in shifting cultivation areas, many of these programmes are implemented in selected areas and do not offer access to programmes for all (eg Watershed Management in shifting cultivation areas under MoA). Programmes need to be designed at state levels with coverage of the whole state and access for all. Mechanisms to do this needs to be looked into by the NITI Aayog and concerned ministries.

CHAPTER 5

ASCERTAIN TO WHAT EXTENT AND WHICH CO-BENEFITS COULD BE DELIVERED TO JHUMIAS AND STATE AGENCIES

Co-Benefits to Jhumias: If the suggested actions are undertaken, the socio-economic scenario of rural northeast will be transformed. There will be better infrastructure, roads, schools, hospitals and markets. Availability of loan and employment for jhum farmers will improve and the public distribution system will be revitalised in the villages where jhum is practised on large scale. With reduction in land degradation, availability of water too will be enhanced through rejuvenation of springs and return of green cover. There will be a reduction in out migration, leading to better use of natural resources and even better care of the elderly in family. The increased availability of medicinal herbs will rejuvenate the local traditional health care system.

Co-Benefits to the State Agencies: The emission of GHG due to burning of vegetation and emission of CO₂ from the soil due to cultivation will be substantially reduced. This will help achieve the national commitment on carbon emission reduction. The restoration of lands degraded due to shifting cultivation will also contribute to India's commitment to Bonn Challenge. Transformation of shifting cultivation will end hunger, achieve food security and improve nutrition and promote sustainable agriculture which is same as Sustainable Development Goal 2. Thus, this will contribute towards achieving the SDG Goal 2. The migration of people from rural to urban centres will be substantially reduced which will check unregulated growth of cities and towns. Transformation of shifting cultivation will also contribute to achieving the SDG Goal 15 i.e. reduce poverty, enhance ecosystem services, and forest cover. Better standard of living in rural areas will increase demand for manufacturing goods which will increase industrial growth and create more jobs in the secondary sector. Reduction in poverty will cause a reduction in social conflict and political unrest emanating from unhealthy competition for natural resources. With reduction in area of jhum, frequency of forest fires may come down thus reducing the emission of GHGs and degradation of forests.

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Annexure 1

Table 1. Summary of the actions points recommended for transformational approaches

Sl. No.	Problem	Suggested Action	Time Frame	Agency/Department
	<p>Data Gap: Non-availability of reliable data on temporal variation and extent of jhum in terms of area, population involved and geographical distribution makes proper planning and implementation of any project/scheme difficult.</p>	<p>i. Remote sensing: To determine the area affected and temporal change in area under jhum. It may be done using remote sensing with adequate ground truthing.</p> <p>ii. Village survey: The number of families and percentage of population who are dependent on shifting cultivation in an area. Unit of this survey shall be the village; and the officials to be made responsible shall be the village level workers of Rural Development Department viz., Gram Sevak. This may also include the type of shifting cultivation viz., Distorted or Traditional and land tenure i.e. community land, traditional chief's, clan land, private land including the custodian of the land. Jhumias need to be categorised for their degree of dependence on jhum</p>	<p>Short term (1-5 years)</p>	<p>i. National Remote Sensing Agency (NRSA)</p> <p>ii. State Department of Rural Development BDO through Gram Sevak or similar village level official under the control of BDO.</p> <p>iii. Registrar of Census of India</p> <p>Note: Regional Coordination & Funding: DONER, North Eastern Council (NEC)</p>

		<p>i.e. 100%, 50-100%, <50%.</p> <p>iii. Census of Jhumias: This may be included in 2021 Census of India</p>		
1.	<p>Land Tenure: Most jhumias do not have a secure land tenure or ownership. The tenurial system is different in each state and often in each tribe and sub-tribe. As a result, land management and investment in land care is lacking. Land cannot be mortgaged and no loan can be taken on the land. There is existence of unclassified state forest e.g. Arunachal Pradesh and unclassified forest in other states which are at times under shifting cultivation. Although no data is available, it is likely that parts of some Reserved Forests and PAs may also be under shifting cultivation.</p>	<p>i. Land tenure needs to be made secure through a legislation</p> <p>ii. Areas of Unclassed State Forests and unclassified forests should be declassified in favour of jhumias or Village Council. This is not a large area and there is no hope that in near future the forest department will be in a position to claim the land and bring under their custody.</p>	Short term (1-5 years)	<p>i. Village Councils in Nagaland and in Naga inhabited areas of Manipur and Mizoram, Anchal Samities in Arunachal Pradesh, Autonomous District Councils, territorial Councils and State Governments, Ministry of Law and Justice</p> <p>State Forest Department and MoEF & CC</p> <p>Note: Regional Coordination & Funding: North Eastern Council (NEC)</p>
2.	<p>Poverty and Land Degradation Nexus: The jhumias are poor subsistence farmers. Primarily, they practise jhum for food security. They do not</p>	<p>i. Employment generation among the shifting cultivators is a must to motivate them to stop the practice and to bring them out of</p>	Short term (1-5 years)	<p>i. Ministry of Rural Development, Government of India, State Ministry of Rural Development and NITI AAYOG Government of</p>

	<p>have access to modern agricultural inputs to increase the productivity of their jhum lands. As land degrades due to shifting cultivation, their productivity further declines and they become poorer. This nexus needs to be broken.</p>	<p>poverty –land degradation nexus. It has been observed in several villages of Meghalaya and hill districts of Manipur that the farmers have stopped shifting cultivation in favour of MGNREGA but have not come out of poverty as the number of days is too less to suffice their cash needs. It is suggested that the number of days of guaranteed employment under MGNREGA be increased from present 100 to 200 days for jhumias. Food security needs to be enhanced through strengthening of Public Distribution System (PDS) and making available staple food at subsidised price.</p>		<p>India i. Department of Food and Civil Supplies of State Governments and Government of India</p>
3.	<p>Policy Mismatch: Forest Policy (1988) considers jhum as ‘not a right to land use’ and aims to ‘discourage shifting cultivation’ and ‘rehabilitate the jhum lands through social forestry and energy plantations’. Agriculture Department is</p>	<p>i. Policy synchronization is a necessity. All government departments should look at the jhum land as an agricultural land. A land use policy needs to be evolved restricting land use change. Definitely, jhum land should not be considered as wasteland as done by the Department</p>	<p>Short term (1-5 years)</p>	<p>MoEF &CC, Government of India North Eastern Council (NEC), <i>Ministry of Development of North Eastern Region (DoNER), State Forest Departments, Ministry of Agriculture of Central Government and State</i></p>

	<p>promoting agriculture, horticulture and cash crops on jhum lands. Multiple agencies of state and central government target jhum lands for cultivating cash crops like timber trees, tea, coffee, rubber etc. As a result, the jhum farmers are confused. At times, they also resort to illegal practices like charcoal making (Meghalaya), and poppy and cannabis cultivation (Manipur) for cash. The Supreme Court ban on timber extraction and coal mining has made shifting cultivators return to jhum practice.</p>	<p>of Soil and Water Conservation (Meghalaya) and Department of Wastelands (Nagaland).</p> <p>ii. Jhum must not be attributed as a reason for loss of forest (Refer: ISFR 2015). A jhum fallow may look as a forest when sensed from a remote satellite but it is a temporary phase and the jhumias have a right to convert it back to agriculture. If all jhum lands are converted to forest where from the farmers will produce their food, the Forest Department must not look at the jhum lands as prescribed in Forest Policy 1988. Forest Policy needs to be suitably revised.</p>		<p><i>Governments</i></p>
<p>5.</p>	<p>Poor Infrastructure and Underdevelopment:</p> <p>Most shifting cultivation areas are now in remote locations like interiors of Meghalaya, Nagaland and Arunachal Pradesh. These relatively isolated places have very poor accessibility and almost defunct</p>	<p>Build and maintain roads. Build and run schools and hospitals. Make Public health care centres functional and more importantly, develop markets. Once the road conditions are improved, the market may develop on its own and the government personnel may also start reaching these places</p>	<p>Short term (1-5 years)</p>	<p>Ministry of Road and Transport, Ministry of Education, Ministry of Health, Ministry of Commerce and Civil Supply</p>

	<p>school and hospital facility. School dropouts are more. Poor road connectivity makes the area less accessible to government personnel. Presence of government is close to negligible.</p> <p>Government schemes are poorly executed. There is limited market for the agricultural and forest produce and at times it takes 4-5 hours to travel 40-50 kms by vehicle in some shifting cultivation areas like Churachandpur (Manipur) and in the interiors of West Khasi Hills (Meghalaya).</p>	regularly.		
6.	<p>High Rate of Population Growth: Many states have very fast decadal population growth. Meghalaya: 27.82%, Arunachal Pradesh 25.92%, Mizoram 22.78%, Nagaland average 25% in past two decades. In rural areas, it is higher than the state average. This increase in population puts</p>	<p>Education, Health Care and Family Planning awareness.</p> <p>Women Empowerment, Promotion of Income Generating Activities for Women</p>	Short term (1-5 years)	Ministry of Education and Ministry of Health of Central and State Governments, Ministry of Tribal Affairs

	increasing pressure on land and natural resources and contributes to perpetuation of poverty.			
7.	Insurgency and Poor Governance: Shifting cultivation is mostly prevalent in remote villages. These places are also often infested with insurgency and poor access/implementation of development schemes. The two feed each other leading to perpetuation of poverty, illiteracy, migration of able bodied people and also probably militancy and insurgency.	Infrastructure development, settlement of the issues politically and better administration	Short term (1-5 years)	Government of India, Ministry of Home, Ministry of Tribal Affairs, <i>Ministry of Development of North Eastern Region</i>
8	Culture and Tradition: Jhum farmers have been practicing jhum for generations. The knowledge relating to jhum is transferred from generation to generation. Lack of exposure to exogenous knowledge compels them to continue the livelihood practices of their forefathers as they do not know any	Education extension programme for village leaders highlighting the ill-effects of jhum and suggesting better alternatives and or providing them support to improve their jhum cultivation	Short term (1-5 years)	Government of India, Ministry of Human Resource Development, Ministry of Information and Public Relations, Ministry of Agriculture, Government of India and State Governments

	<p>other means of producing food. The type of food habit and life style they are tuned to gets support from jhum. In absence of any other alternative livelihood option, they continue practising jhum even if it is lowly productive and does not yield enough for the year round food requirement. Many jhum farmers prefer the rice, oil seeds and vegetables grown in Jhum as they say this food is healthier and they do not feel hungry for a long time.</p>			
9.	<p>Reluctance to Accept Modern Agriculture:</p> <p>Modern agriculture is generally not suitable for hill slopes. It requires high inputs in terms of money, energy and material which is not available with the jhum farmers.</p> <p>This makes the farmers dependent on the market which is poorly developed. The sale price of agricultural and horticultural produce</p>	<p>In places and for the produce where the market is developed, the jhum farmers have switched over to cash crops. For example, Passion fruit cultivation in Nagaland, Floriculture in Mizoram, Broom grass cultivation in Khasi Hills, Meghalaya, Cashew nut cultivation in Garo Hills, Meghalaya and Rubber Cultivation in Tripura. However, except Rubber and</p>	<p>Short term (1-5 years)</p>	<p>Department of Agriculture, NEDFi, North Eastern Regional Agricultural Marketing Corporation</p>

	<p>in remote places is very less, making the cultivation of cash crops less remunerative. Also, the traders exploit the farmers in order to maximise their margins. Therefore, jhum continues. As a result, the farmers remain poor and land continues to degrade.</p> <p>Modern agriculture often does not produce food of their liking; therefore, even if they adopt some exogenous crop, they continue to cultivate the traditional jhum crops for self-consumption.</p>	<p>Broom grass, the other cash crops could not be scaled up primarily due to market constraints. There is a need that before introducing cash crops or any agricultural produce that is produced for the market, infrastructure for transport and market availability needs to be put in place.</p> <p>The traditional crops must not be discouraged in favour of cash crops and high yielding varieties as food preference do not change overnight.</p>		
10.	<p>Security of Tenure, Nutritional Security, Drudgery to women, Loss of man hour in travel to jhum fields which are often far away.</p>	<p>Promote Home gardens. Promotion of home gardens will ensure secured tenure for all participating households, can safeguard native crop species (hence provide nutritional security, income with surplus) and reduce drudgery for women.</p>	<p>Short term 1-5 years</p>	<p>Department of Horticulture, Rural Development</p>
11.	<p>Need of Cash for Modern Living</p> <p>The jhum farmers need cash for sending</p>	<p>Promote and support mountain niche crops as health food, especially crops found in shifting cultivation:</p>	<p>Short term (1-5</p>	<p>Department of Horticulture, Rural Development, Department of</p>

	their children to school, buying medicines, mobiles, TV, Fridge and other household gadgets.	rice, millet, sorrel, oil seeds (perilla) – and promote native species in horticulture. Some of the shifting cultivation crops can be promoted as health food. A variety of spices, condiments, wild edibles and local fruits can also be cultivated. There is a big market in the metropolis for such foods. This will help in facilitating transformations for shifting cultivators.	years)	Commerce
12.	Absence of Land use Plan. This causes unscientific land use and thereby degradation of land.	Facilitate Participatory Perspective Landuse Planning – Village level land use maps (of existing and planned interventions), which will then facilitate conservation and management of forests, biodiversity and ecosystem services. These land use maps to be endorsed by traditional and statutory authorities – all future land based interventions by different departments must adhere to the agreed land use maps.	Short term (1-5 years)	Department of Agriculture and Rural Development, Village Council, Autonomous District Councils
13.	Loss of Agro Biodiversity	Promote Conservation of Agro biodiversity: Shifting cultivation farms are a large	Short term	Department of Agriculture, Horticulture and

		repository of agro biodiversity. Pro-actively promote and support community managed agro-biodiversity living gene banks – agro-biodiversity sanctuaries at landscape levels (e.g. Potato Gene Bank Landscapes, Peru)	(1-5 years)	Rural Development
14.	Lack of Research and Education on Mountain Agriculture	Introduce, encourage special focus on mountain agriculture in agricultural institutes and universities of the region. The ICAR Research Complex for NE Hill Region must play a greater role than it is currently plying in the transformation of shifting cultivation. Finding solution to shifting agriculture should be mandated to these Institutions. They should act as knowledge bank for Shifting Cultivation	Short term 1-5 Years	ICAR Research Complex for NE H Region, Barapani Central Agricultural University, Imphal Assam Agricultural University, Jorhat Rain Forest Research Institute, Jorhat