



NITI Aayog

Report of Working Group III Shifting Cultivation: Towards a Transformational Approach



Contributing to
Sustainable Development in Indian Himalayan Region

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Contents

Acknowledgements	ii
Acronyms and Abbreviations	iii
Executive Summary	iv
Chapter 1: Transformational Approaches in Shifting Cultivation	1
Chapter 2: Consolidate Learning on Magnitude of the Problem	5
Chapter 3: Viable Best Practices with Potential for Upscaling	12
Chapter 4: Assessment of Institutions and Needs of Institutions for Transformation	15
Chapter 5: Suggested Action Agenda (Short, Medium and Long Term)	18
Chapter 6: Ascertain to What Extent and Which Co-Benefits could be Delivered to Jhumias and State Agencies	24
References	25
Annexure 1: Summary of the actions points recommended for transformational approaches	26

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Acronyms and Abbreviations

CPR	Common property resources
FAO	Food and Agriculture Organisation
FSI	Forest Survey of India
GBPNIHESD	Govind Ballabh Pant National Institute of Himalayan Environment and Sustainable Development
ICT	Information and communication technology
MDoNER	Ministry for the Development of North Eastern Region
MoA	Ministry of India
MoEF&CC	Ministry of Environment, Forest and Climate Change
MGNREGA	Mahatma Gandhi National Rural Employment Gurantee Act
MRDS	Meghalaya Rural Development Society
MoSPI	Ministry of Statistics and Programme Implementation
NEHU	North Eastern Hill University
NEPED	Nagaland Empowerment of People through Energy Development
NERCORMP	North Eastern Region Community Resource Management Project
NIRDPR-NERC	National Institute of Rural Development and Panchayat Raj – North Eastern Regional Centre
NTFPs	Non-timber Forest Products
SDGs	Sustainable Development Goals
SHGs	Self Help Groups
SPV	Special Purpose Vehicle

Executive Summary

Managing transformations in shifting cultivation areas is fundamental to agricultural development in the uplands of northeast (NE) India and an important element of the Act East Policy. Transformation of shifting cultivation is therefore key to the thrust for agricultural transformation in the region. While different programmes designed to address the management of shifting cultivation have claimed drastic reductions, both in terms of area under cultivation as well as number of households involved, the Forest Survey of India's reports over the years continue to attribute large scale deforestation and loss of forest cover in NE India to shifting cultivation (FSI, 2015). This suggests a lack of updated and authentic data on the area under shifting cultivation as well as the total number of households practicing shifting cultivation. About 8,500 sq. km of area in northeast India is shown under shifting cultivation (MoSPI, 2014), but there is inconsistency in the data of various agencies. There is an urgent need for accurate and up to date information on shifting cultivation as the design and scale of all future programmes/projects depend on this. Managing transformative change in the context of shifting cultivation requires the active involvement of multiple ministries and agencies.

At the field level, promotion of home gardens (and extended home gardens) by the North Eastern Region Community Resource Management Project (NERCORMP) has resulted in positive outcomes, improving food and nutritional security and incomes for women, while gradually reducing dependency on shifting cultivation. Such initiatives must be encouraged and further supported. Home gardens presently do not figure as a land use category and therefore there are no specific schemes/programmes to promote home gardens. Central and State agricultural agencies must recognize home gardens as a distinct land use category and develop dedicated schemes and programmes for promotion of home gardens, and allocate adequate funds for each rural household in shifting cultivation areas, specially for women. Products from shifting cultivation fields and fallows have market demand and are being sourced for trade through the unorganized sector. State agencies – agricultural marketing, forest development corporations – of concerned states should take steps to formalize, promote and organize marketing of such products. Steps should also be initiated in full earnest for value addition of such products, ensuring opportunities for large scale involvement of rural youth and women. Under-utilised crops from shifting cultivation have potential for being developed and promoted as health foods. Products from fallows can be used for the development of vegetable dyes and other high value products linked to weaving, a strength of upland women. This will address income generation and youth employment while providing a comparative advantage for such products, contributing to several Sustainable Development Goals (SDGs).

The promotion and expansion of settled agriculture such as terrace farming and plantations have come at the cost of regenerating fallows, which would otherwise have regrown into secondary forests. The resultant land use change has long-term implications, leading to loss of vital ecosystem services and land degradation. Drying of water sources and depletion of soil fertility (and the ramifications thereof) and reduced availability of fuel wood, fodder and wild edibles are serious concerns related to 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. Village level perspective land use planning and land zonation must be initiated and each land use plan ratified and honoured by all concerned authorities for future land based activities. A close collaboration on revival of springs can be developed, and the suggested Mission on Spring Water Management (working group I) could include the selected blocks in their first phase of implementation.

Specific actions need to be initiated to facilitate and accelerate the process of transforming shifting cultivation systems. The more salient needs and actions are outlined below:

Capacity building

- As pointed out under capacity building, research needs to focus on opportunities offered by mountain specificities. An area where research needs to be strengthened is in blending traditional knowledge on resource use and management with modern scientific approaches. For instance, building upon traditional agriculture in NE India and understanding their strengths while seeking to find solutions to address challenges brought about because of change. The approaches for transformation – and supportive research and development (R&D) – should not summarily dismiss traditional land use, but try to blend the traditional with the modern and, wherever possible, improve the productivity of existing practices through locally acceptable technological interventions.
- Research should also focus on technology and approaches for value addition of typical or niche products found in shifting cultivation systems. In addition, research should also include development of appropriate farm and processing machineries suitable to upland systems.

Research and technology

- As pointed out under capacity building, research needs to focus on opportunities offered by mountain specificities. An area where research needs to be strengthened is in blending traditional knowledge on resource use and management with modern scientific approaches. For instance, building upon traditional agriculture in NE India and understanding their strengths while seeking to find solutions to address challenges brought about because of change. The approaches for transformation – and supportive research and development (R&D) – should not summarily dismiss traditional land use, but try to blend the traditional with the modern and, wherever possible, improve the productivity of existing practices through locally acceptable technological interventions.
- Research should also focus on technology and approaches for value addition of typical or niche products found in shifting cultivation systems. In addition, research should also include development of appropriate farm and processing machineries suitable to upland systems.

Finance and markets

- Access to credit for shifting cultivators is denied because they are unable to offer shifting cultivation land as collateral for loans in the absence of land titles. Credit guidelines should be amended to allow group guarantee (from village/clan authorities) for loans instead of land title deeds in these areas.
- Products from shifting cultivation fields and fallows have market demand and are being sourced for trade through the unorganized sector. State agencies – agricultural marketing, forest development corporations – of concerned states should take steps to formalize, promote and organize marketing of such products. Steps should also be initiated in full earnest for value addition of such products, ensuring opportunities for large scale involvement of the rural youth and women. Under-utilised crops from shifting cultivation areas have potential for being developed and promoted as health foods. Products from fallows can be utilized for developing vegetable dyes and other high value products linked to weaving, a strength of upland women. This will address income generation and youth employment while providing a comparative advantage for such products, contributing to several SDGs. The Working Group on Skill and Entrepreneurship Development has to develop close synergies in this respect and promote this as an agenda for action in the NE region.

Policy environment

- Shifting cultivation lands fall under the purview of agriculture during the cultivation phase, but come under Forests during the fallow phase – the same piece of land under two subjects at different time periods. This causes such land to be subjected to different laws, regulations and management, many of which often become self-contradictory and negatively affect the upland farmers, restricting their control, decisions and investments on such plots. This ambiguity needs to be addressed and shifting cultivation lands with long fallow cycle should be categorized as a distinct land use, thus removing their categorization as ‘abandoned land’, ‘wastelands’ and ‘Unclassed State Forests’. All government departments should consider jhum land as a distinct land use, with an exceptionally long fallow phase. A review of all relevant legal regulations and frameworks should be initiated immediately to develop a solution acceptable to all and respecting the rights of access and management of the recognized tenure holders.
- Shifting cultivation fallows must be legally perceived and categorized as ‘regenerating fallows’, which may, if given sufficient time, regenerate into secondary forests. Such regenerating fallows add to the forest cover of an area. The practice of shifting cultivation, therefore, could increase forest cover through the regenerating fallows. This fact must be duly recognized and due credit accorded to the practice. The forest cover and forest cover change assessments, in future, need to acknowledge the additional forest cover resulting from regenerating fallows. Relevant authorities also need to categorise shifting cultivation fallows as ‘arable, regenerating fallows’ instead of the present practice of categorizing such fallows as ‘abandoned wastelands’ and as ‘Unclassed State Forests’.

- Managing transformative change in the context of shifting cultivation requires the active involvement of multiple Ministries and agencies posing a challenging task for coordination and synergetic action. For ensuring effective coordination and strong synergistic action, setting up a “Mission on Shifting Cultivation: Towards Transformative Changes” is proposed under the Agriculture Ministry. The proposed mission should be set up in collaboration with the Ministry of Environment, Forest and Climate Change (MoEF&CC) and Ministry of Development of North Eastern Region (MDoNER).
- Finally, some of the key elements of the road map to manage transformation in shifting cultivation are:
 - ◇ Launching a mission and setting in motion steps to update and authenticate data/information on shifting cultivation (area under cultivation/fallow and total number of households/population involved),
 - ◇ Encouraging States and relevant Central Ministries to recognise home gardens as a distinct land use category with dedicated schemes and programmes for promotion of home gardens and the promotion of niche crops and other products found in shifting cultivation systems. This will provide income generation and entrepreneurship development opportunities for upland farmers,
 - ◇ Initiating village level perspective land use planning and land zonation and ratification with the objective of improving land use, land use zonation, resource conservation and tenurial security,
 - ◇ Amending credit guidelines to allow group guarantee (from village/clan authorities) for loans instead of land title deeds in shifting cultivation areas, and
 - ◇ Categorizing shifting cultivation lands as distinct land use, recognising that it is both an agricultural and forest management practice conducted on the same plot of land but at sequentially separated times.



Chapter 1

Transformational Approaches in Shifting Cultivation

Introduction

The history of shifting cultivation can be traced back to around 8,000 BC in the Neolithic period, which witnessed a remarkable and revolutionary shift in humankind's mode of food production – from hunter-gatherers to food producers. Since the beginning, shifting cultivation has been characterised by rotation of fields rather than rotation of crops, the exclusive use of human labour, absence of draught animals and manuring, use of dibble stick or hoe, and short periods 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. Shifting cultivation fields and their surrounding forests provide two alternative sources of subsistence for the dependent community. In case of crop failure, the forest resources augment their food supplies and also provide 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 the economic mainstay of many rural households. The social organisation of hill tribes is often built around concepts of community ownership, participation and responsibility. The process of shifting cultivation in the region begins with the selection of a plot on or near the hill side or jungle by the village elders, clan leaders and households, usually from October to December. In some tribes, the community as a whole is collectively responsible for clearing the selected *jhum* plots, while in others the clearing of trees and shrubs is done 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 from half hectare to one hectare among different tribes and in different states in the region. The process of clearing the plots, which can take over a month, is labour intensive and undertaken almost entirely with indigenous and traditional equipment. Households remove useful biomass – big branches, trunks and boles – for house building, timber and fuelwood requirements, while the remaining debris is left to dry. The dried slash as well as the standing tree trunks in the cleared area are set on fire between February and March, care being taken to ensure that fires do not spread out of control during firing operations. The ashes are then scattered over the ground and dibbling of seeds begins soon after, before the advent of monsoon. The dibbling and planting of seeds is the exclusive job of women. The men broadcast seeds of crops like millets and small millets, whereas crops like maize, pulses, cotton, sesame and vegetables are dibbled by women. 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. With the advent of rains, the seeds begin to germinate. In shifting cultivation, the soil is never ploughed or irrigated. After sowing, the shifting cultivators tend to the crops regularly by removing weeds. In some places the crop is 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 in general practice mixed cropping but 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 sequential harvesting and a variety of foods throughout the year. The land is cropped for two or three years and thereafter fallowed to allow it to recuperate. Traditionally, shifting cultivators grew only food grains and vegetables. However, most communities have shifted to cultivation of cash crops such as ginger, turmeric, pineapple and jute, among others. Among food grains, the traditional varieties of rice, followed by maize, millet, Job's-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 cultivated. In fact, the choice of crop is mostly consumption oriented. Ginger, linseed, rapeseed, perilla, orange, 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 land, water and biodiversity in northeast India. A section of researchers believe that persistence of shifting cultivation with necessary and effective reform 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 returns immediately to cover the top soil and checks erosion. Also, there is no ploughing, hoeing and pulverization of soil during agricultural operations and so the soil remains compact. Moreover, *jhum* lands are generally located on hill slopes where sedentary cultivation cannot be developed easily. These researchers also regard *jhum* as 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 knowledge of its adverse effects. Yet, another section of experts hold the view that *jhum* cultivation is primitive and unscientific land use that depletes forest, water and soil resources. They hold that felling of trees and clearing of bushes accelerates soil erosion and accentuates variability of rainfall, which may lead to droughts or floods. The overall impact is the decline in soil fertility. The agro ecosystems lose their resilience characteristics as a result of which village households dependent on shifting cultivation face shortage of food, fuel wood and fodder. Consequently, food availability and nutritional status of the households declines. These processes culminate in poverty and ecological imbalance. This view is however being challenged globally and an increasing body of literature as well as recent publications from the Food and Agriculture Organisation (FAO) suggest the need for re-examining such perceptions. Recent analyses of the issue have shown that traditional shifting cultivation (long cycle >10 years), generally prevalent in places where population densities are 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 in the States, the management of shifting cultivation has been – and still remains – a fundamental imperative for agricultural development planning in the uplands of 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 agricultural development in 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 within the communities, shifting cultivators too desire change as much as the governments do and desperately seek options that would help them transform 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 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 the importance of the problem and in order to improve the livelihoods of the people, eradicate poverty and stop the degradation of land, 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 with potential for upscaling, 3) assess institutions (formal and traditional) and need for transformation, 4) ascertain to what extent and which “co-benefits” could be delivered (to *jhumias* and State agencies), and 5) suggest an action agenda (short, medium and long term). The Working Group comprised of Lead Institution: National Institute of Rural Development and Panchayat Raj (NIRDPR-NERC), Director, Dr RM Pant, and NERCORMP, MoEF&CC, MDoNER, MoA and Dr Dhruvad Choudhury, representative from ICIMOD as members. On a later date, Professor B. K. Tiwari of North Eastern Hill University (NEHU) was co-opted as a member.



Propitiating nature before starting *jhum* cultivation

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. NIRDPR-NERC, NERCORMP, ICIMOD, G.B. Pant National Institute of Himalayan Environment and Sustainable Development (GBPNIHESD) and 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 five chapters each dealing with the action points outlined by the NITI Aayog.

Chapter 2

Consolidate Learning on Magnitude of the Problem

Paucity of accurate statistics

Area under shifting cultivation

Although the exact figures for the total area under shifting cultivation and 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 that an estimated 620,000 families are dependent on shifting cultivation, based on the Ministry of Agriculture Task Force Report of 1983. More recent figures provided by the Indian Council of Forestry Research and Education, published in the Statistical Year Book 2014 by the Ministry of Statistics and Programme Implementation (MoSPI), suggest significant reduction in the area under shifting cultivation over the last decade (2000-2010). A comparison of the data, however, suggests that the data for 2010 presented in the Indian Council of Forestry Research and Education (ICFRE) document is more or less the same as published in Wastelands Atlas of India (2010) for the year 2005/06 for Assam, Manipur, Mizoram and Tripura (Tables 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 questionable. A reduction of >92% in Assam in two years and 82% in Manipur in the same period calls for verification. The variation in data published by various agencies raises serious concerns regarding the accuracy and veracity of figures provided by different agencies and highlights the need for urgently generating authentic data and/or reliable estimates for the current area under shifting cultivation on a decadal time series basis. This should be possible through remote sensing and such an exercise should then be able to provide a reliable basis on which to accurately assess the area under shifting cultivation in each State as well as temporal trends of change over the last few decades.

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 of available documents from the concerned Ministries. This lack of information on the total population or the number of households presently practicing shifting cultivation constitutes a major information gap and compromises 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

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	3,088.08	1,531.46	- 1,556.62	-50.41
Assam	8,391.48	239.56	- 8,151.92	- 97.15
Bihar	45.45	0.00	- 45.45	- 100.00
Manipur	12,014.06	852.20	- 11,161.86	- 92.91
Meghalaya	2,086.77	448.99	- 1,637.78	- 78.48
Mizoram	3,761.23	2,617.56	- 1,143.67	- 30.41
Nagaland	5,224.65	2,827.74	- 2,396.91	- 45.88
Orissa	115.28	1,445.44	+ 1,330.16	+1,153.85
Tripura	400.88	254.11	- 146.77	- 36.61
Total	35,142.21	10,306.84	- 24,835.37	- 70.67

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

Table 2: **Changes in area under shifting cultivation from 2003-2005/06**
(Area in km²)

State	2003	2005/06	Change	% Change
Arunachal Pradesh	1,613.13	1,531.44	-81.69	-05.06
Assam	2,930.97	239.56	-2,691.41	-91.82
Manipur	4,816.68	852.20	-3,964.48	-82.30
Meghalaya	743.83	448.99	-294.84	-39.63
Mizoram	4,017.41	2,617.56	-1,399.85	-34.84
Nagaland	1,917.90	2,827.74	+909.84	+47.43
Tripura	395.26	254.11	-141.15	-35.71
Total	16,435.18	8,771.62	-7,663.56	-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>

available in the public domain. Research studies conducted in the West Garo Hills, Meghalaya and Ukhrul district, Manipur by the International Centre for Integrated Mountain Development (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, complementing 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 the NE region means that the same farmers have given up shifting cultivation. A shifting cultivator may adopt multiple settled farming practices, but still practice 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 arriving at 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. Data on geographical distribution and typology of shifting cultivation (distorted, innovative, modified or traditional) are also required for designing interventions.

Limited achievements of programmes and projects on shifting cultivation

Department of Forest and Environment

The State Forest Departments have implemented afforestation programmes to stop shifting cultivation since pre-independence. This was because almost all forest policies considered shifting cultivation as 'bad land use' that must be stopped. 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 projects of the Medicinal Plant Board. These plantations did not address the food security needs of the *jhum* farmers; therefore, although the *jhum* farmers accepted the programmes, they did not stop practising *jhum* for food production. 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 outcomes 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 after the schemes ended.

Department of Agriculture and allied departments

The departments of agriculture, horticulture and rural development generally promoted conversion of *jhum* to settled agriculture, along with the use of fertilizers, high yielding varieties, irrigation and introduction of a variety of models which were not suited to the available skills and man power, topography, food preferences and land tenure system. Sericulture and horticulture were successful only in areas where there was a market for the produce. 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 connected to the market. Convergence was generally lacking and departments worked according to their own understanding and scope. Departments looked at the problem through their own lenses and therefore, did not have 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.

Task forces

Three task forces were appointed by the Government of India, i) Ministry of Agriculture, 1983, ii) MoEF, 2002 and iii) Inter-ministerial Task Force of MoEF, 2008. Each suggested actions to be taken up by their respective ministries. *Jhum* being an issue related to food security, livelihood, culture and land tenure, as well as 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. The learning from the limited successes of these task forces is that any approach towards transformation must be holistic, encompass multiple issues and fulfill most if not all needs and aspirations of *jhum* farmers.

Cash for modern living

Jhum farmers need cash for the education of their children, increasing assets and enhancing their purchasing power. Most schemes and programmes have not adequately addressed this issue and hence the alternate land use and livelihood options suggested by such schemes did not prove any better than shifting cultivation, at least in this respect. It is said that in places where the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) has been implemented, dependence on *jhum* has declined to some extent (although there is no empirical data on this). Success of *jhum* rehabilitation in Tripura through promotion of rubber plantation is a shining example of this happening in real life. The broad understanding therefore is that *jhum* transformation schemes must generate cash income in order to be successful.

More emphasis on land management, less on livelihood enhancement

Most *jhum* rehabilitation schemes emphasised afforestation, raising of plantation crops and converting *jhum* lands to settled agriculture. Such conversion of shifting cultivation lands to other land uses reduced the net area available for shifting cultivation and thus contributed to the reduction of fallow periods. Presently, *jhum* cycles in most areas of northeast India have been reduced to as little as 3-4 years. This drastic reduction in the cycle leaves insufficient time for the soil to recuperate or for secondary forests to regenerate. The result is 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 pushed them into a vicious cycle of poverty and environmental degradation that feed off each other. The schemes aimed at restoring *jhum* lands through alternate land use without providing/enhancing livelihood options and food security have generally failed in achieving their long term objectives.

Socio-economic and infrastructure development

From an analysis of various projects and programmes implemented by the government and development agencies, including ones supported by international donors, it is evident that socio-economic development has a greater impact on *jhum* reduction than afforestation works carried out by the forest departments,

promotion of modern agriculture by the agriculture department and promotion of cash crops by other land based departments. Further, a general observation on changes in the geographical distribution of shifting cultivation over a period of time suggests that *jhum* has 'shrunk' to remote areas, and to places where the fruits of development like roads, schools, markets and hospitals are yet to reach. The learning from this analysis is that social, economic and infrastructure development are keys to *jhum* control. In particular, poor connectivity limits access of the people to markets and technology which in turn perpetuates shifting cultivation.

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 principles of the 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, *jhum* farmers have no incentive and motivation to look after the land. The changing circumstances, therefore, force them to protect individual interests and look for temporary, 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 an institutional set up to reverse this and make the 'Ostrom's Principle for Managing Commons' work. A reappraisal of existing legal instruments – provisions of the Sixth Schedule, Forest Rights Act (2006) and existing *Jhum* Control Regulations, for different states – is urgently required to strengthen local level decision making with regard to land use and access to land resources.

Possible reasons for upland farmers continuing with the practice

Crop diversity and food availability

In their efforts to manage shifting cultivation government schemes have promoted settled agriculture by providing support for construction of terraces and development of plantation crops. The schemes have mostly prioritized cereal and plantation crops and caused a reduction in the diversity of crops that farmers were hitherto able to produce and access. The new crops and cropping patterns have severely limited the seasonal availability of food crops and, in the case of plantation crops, restricted and compromised food availability during the gestation period, resulting in 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.

Changing land use and tenurial security

Transformation to settled agriculture means change in land use, and hence changes in community access and ownership of land or the tenurial framework. Under shifting cultivation, land is managed customarily as a common property; the change to private ownership 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 farmers from making any investments in the upkeep of land which in turn accelerates land degradation. In villages where community institutions have lost control over land, landlessness has become a major socio-economic issue. In many places farmers continue *jhum* in order to maintain their rights over the land and not become landless. In many states of northeast India landlessness is emerging as a big concern among tribal communities. Any *jhum* transformation that results in landlessness cannot be sustainable.

Challenges to ecosystem services

Promotion of cash crops and overall changes in land use patterns are not only the result of government programmes and schemes, but often driven by the aspiration of communities seeking greater 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 thereof) and reduced availability of fuel wood, fodder and wild edibles are serious concerns under conditions of agricultural intensification. The farmers do not look at the '*jhum*scape' as a food production system alone. They derive a wide gamut of other benefits from the system. 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.

Access to programmes and schemes

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 transformation. 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 districts/villages not covered under such schemes continue to practice *jhum*. 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 programmes 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 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.

Credit and market

Another 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 crop based programmes in shifting cultivation areas have often not achieved the desired success if the market and related infrastructure are not concurrently evolved. The failure of orange and pineapple plantations in remote places of Arunachal Pradesh is an example. Unable to take up modern agriculture which requires cash input, farmers continue to practice *jhum* which does not need any cash or credit for producing food.

Chapter 3

Viable Best Practices with Potential for Upscaling

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 the crops cultivated in shifting cultivation fields around their household. This not only provides access to traditional food crops and contributes to nutritional security, but also allows for income generating opportunities. 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.

Fallow forestry

Nagaland Empowerment of People through Energy Development (NEPED) has, over the years, provided a good model for fallow forestry promotion in Nagaland. NEPED's approach of encouraging planting of native tree species for provisional and regulatory services 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. Of course, site specific modifications will be required to make it acceptable to the people and suited to the edapho-climatic conditions of the place.

Traditional practices of cultivation of food crops

Aji system of the Apatani, *zabo* system of Chakesang, *bun* system of the Khasi Hills, alder-based system of the Angami, and the tree-based rice cultivation of the Konyak 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 elsewhere. However, while trying to transform shifting cultivation, these traditional food production systems must not be disturbed.

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, and lemon grass has 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.

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 the 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. But the fundamental requirements of this transformation have been market access 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 other places *jhum* continues where the *jhumias* cultivate cash crops mostly for attending to their cash needs. A caution has to be introduced here. In the quest to promote cash crop plantations (and conversion of shifting cultivation falls into settled agriculture), an important ramification for land use and land cover is often overlooked. *Jhum* fallows quite often ensure forest regeneration and the development of secondary forests in places where cash crop plantations are expanding. 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 can be irreversible. This has also reduced fallow cycles, marginalising the practise of shifting cultivation and has 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 of land 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.

Timber tree plantations

In villages where the land is sufficient and people have moved out for jobs 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 and 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 in quality of forest cover. Further, a rigorous assessment needs to be done for calculating opportunity costs and making such approaches inclusive and universally acceptable.

Models developed by 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 farmers on a large scale and for a long period of time. Also, there is hardly any mechanism of follow-up and feedback for redesigning and revamping interventions to suit 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 there are markets and transport network. However, often this has not helped the *jhum* farmers to come out of poverty; instead, the degraded lands continue to degrade or remain as such. The object of the 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 culture and traditions, in particular the food habits 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 a review of various projects and programmes implemented for rehabilitation of *jhum* farmers, it is clear that there is no one best practice which can be scaled up to the regional or even state level. The variation in agro ecological conditions, land tenure, traditional governance/institutions and tribes and sub-tribes makes each situation so unique and incomparable that a practice that proves to be very good in one place completely fails in another. 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 4

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 organisations, and ii) that which is understood by sociologists and political economists and relates to established laws, customs, policies, practices, procedures, traditions and rites and rituals.

The organisations

At the village level, traditional tribal institutions command great power and often lead and decide on behalf of their communities. While traditional institutions lack access to information on modern technologies, approaches and options, they are a rich repository of traditional ecological knowledge particularly related to 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 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 and horticulture. These extension service providers are often unaware of the latest developments in the field and therefore require knowledge and capacity enhancement at two levels – first, regular updates and training on the latest technological advances in agriculture, an understanding of 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 increase their ability to suggest approaches which facilitate acceptance of 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 up 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 solutions to the problem. The Krishi Vigyan Kendra and other village level formal or informal institutions e.g. Joint Forest Management (JFM) Committees (under Forest Department) and Village Employment Council (under MGNREGA) need to be educated about the ill effects of distorted *jhum* and be involved in planning and implementation of projects for the transformation of *jhum*. As it is popularly understood, the Indian

Council of Agricultural Research (ICAR) Research Complex for North-Eastern Hill Region (ICAR RC NEHR) was established with the primary objective of conducting research on hill agriculture and finding solutions to the problems relating to shifting cultivation. Therefore the institute is expected to be a repository of up to date data on the extent and status of shifting cultivation in northeast India. However, over the years *jhum* has become a subsidiary component of their overall research and extension activity and does not seem to be a focus area anymore. There is a need for ICAR RC NEHR to take a lead role in the transformation of shifting cultivation.

The traditional universities of the region have confined their research on shifting cultivation to documenting the practice and analysing the impact of *jhum* on soil and vegetation cover of the region. By and large they have not 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 among grassroots level workers and *jhum* farmers.

The established laws, rules, customs, traditions and policies

In northeast India, shifting cultivation functions on an institutional framework which by and large follows Ostrom's principles on common pool resource. The communities have evolved a set of customary laws, rules and traditions which govern the common pool resource and regulate 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. In many villages *jhum* is no



Jhum fields being prepared

longer practiced on community/village 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 the government of India and State governments with respect to shifting cultivation needs to be done away with. The dispute over land use categorisation of *jhum* land should be settled once for all. Shifting cultivation land should be recognised as agricultural land where farmers practice agroforestry for the production of food. These lands should be recognised as distinct land-use – where farmers practice agroforestry for the production of food – rather than as forest land *per se*.

Chapter 5

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 areas where the NITI Aayog can galvanise action, the Working Group suggests the following action points. We recommend that all these actions, except census of *jhumias*, be taken up in the short-term, i.e. in five years.

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 in a conventional manner and expecting the cooperation of other ministries in achieving the objectives of transformation is unrealistic (and has proven 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 the programme be taken up in a mission mode. “Mission on Shifting Cultivation : Towards Transformative Changes” needs to be launched under the Agriculture Ministry. The mission should set an institutional mechanism that ensures inter-ministerial convergence, particularly with MoEF & CC and MDoNER, as well as with other related ministries/departments at the centre and NE states. 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.

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. Some states viz., Tripura may have authentic data and the same may be collected and collated at national level.

- **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 on the recommendations of the Working Group on Data Base/

Information for Decision Making by Multiple Stakeholders. This will also require adequate ground truthing and the appropriate involvement of district revenue department and district councils.

- **Village survey:** Enumeration of the number of families (households) and percentage of population who are dependent on shifting cultivation in an area also needs to be carried out as an immediate measure. The unit of this survey shall be the village and the officials responsible should 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, as well as land tenure, i.e. community land, traditional chief's, clan land, private land, including the custodian of the land. *Jhumias* also may be categorised according to their degree of dependence on *jhum* i.e. 100%, 50-100% and <50%.
- **Census of *jhumias*:** This may be included in the 2021 census of India as a long-term action.

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 can be taken up to address this issue are suggested below:

- **Promotion of home gardens for cultivating seasonal 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 security of tenure for all participating households, can safeguard native crop species (nutritional security and an income from surplus) and reduce drudgery for women. Home gardens are not included in any agricultural promotion schemes or programmes for rural areas. Such promotion needs to be encouraged immediately through the State governments. This scheme must be made accessible to all, with 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 Krishi Vigyan Kendras (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 wider implementation.
- **Addressing food security issues during transition:** There is a need to strengthen and broaden the public distribution system (PDS) to ensure widespread access to cereals and other basic food items. This can be done 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, it is important to widen the list of food grains that are procured and distributed through the public distribution system (PDS) to include local food grains such as local rice varieties and millets.

Promoting *jhum* agricultural and fallow produce

Although organized market mechanisms do not formally recognize produce from *jhum* fields or fallow forests, unorganized market actors have been procuring several such produces for years – e.g. oilseeds and NTFPs. This needs to be corrected and produce from these systems must be promoted in an organized manner. This will help shifting cultivators get a fair return from such produce, open up opportunities for value addition at the local level and also opportunities for promotion of enterprises and local entrepreneurs, thus contributing to local economic growth and long-term transformation.

- Conduct market surveys to identify produce from *jhum* fields and fallows that are being traded locally and assess the volume of trade. Such surveys and assessments will provide insights for the identification of produce 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 produce and clusters that can be developed viably for their promotion, and help in drawing up programmes for the development and promotion of these produce.
- 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 joint forest management (JFM) and/or Forest Development Agency (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.

Ensuring tenurial security and management of ecosystem services during transformation

Universal access to land and other resources has been severely disrupted in many areas as a result of land use 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.

- **Perspective landuse planning (PLP):** These exercises need to be conducted for each village, involving village institutions (traditional institutions that determine tenurial access and landuse) and line departments (agriculture, horticulture, forest and revenue as well as the district councils). PLP can 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 check elite capture. PLP exercises can also facilitate land zonation which will result in identification of land uses that need to be conserved and managed for ensuring continuity of ecosystem services – catchment forests that are essential for springs, streams and other water sources, areas that are fragile and need to be left

uncultivated, etc. Once PLP maps are agreed upon by all parties (villagers, district council, line departments), they need to be ratified by the district administration and no deviations can be entertained for any purpose. Such an exercise will help in ensuring forest cover and the sustainable management of agriculture and ecosystem services.

- **Formalise traditional tenurial arrangements and provide tenurial titles to households:** Shifting cultivators and upland communities usually do not have ownership rights but have tenurial security in common property resources 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 mobilize discussions from all quarters so that necessary changes in legislation can be initiated in the long run.

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 for accessing credit from banks and other financial institutions.

Need for policy coherence

Shifting cultivation involves two distinct land uses – agriculture and fallow forestry – that alternate in sequence and time on the same plot of land. This fundamental characteristic – two distinct land use types alternating on the same piece of land – has never been considered while formulating policies in the context of managing shifting cultivation. The oversight of this reality while formulating policies has led to the present policy incoherence and contradictions in the management of shifting cultivation and transformations of this practice. Thus, while the Forest Policy (1988) considers *jhum* lands forest land, and hence, ‘not a right to land use’ and aims to ‘discourage shifting cultivation’ and ‘rehabilitate the *jhum* lands through social forestry and energy plantations’, agricultural development programmes promote agriculture, horticulture and cash crops on *jhum* lands as such lands are perceived as arable agricultural land. Multiple State and central government agencies target *jhum* lands for cultivating cash crops like timber trees, tea, coffee, rubber, etc. The ambiguities with regard to how shifting cultivation lands are perceived and policies pertaining to them are formulated need serious reappraisal. There is an urgent need for policy coherence that will help in transformations while reducing the negative impacts of this ambiguity.

- Policy synchronization is a necessity. All government departments should look at the *jhum* land as a distinct land use, with an exceptionally long fallow phase. Policy clarity with regard to categorization of shifting cultivation lands must be arrived at so that the ambiguity of categorizing the same land as ‘arable land’, ‘wasteland’ or ‘fallow forest’ (and Unclassed State Forest) at different times is dispensed with and such lands are categorized as a single distinct land use type – logically, as a distinct agricultural land use.

- Shifting cultivation fallows must be legally perceived and categorized as ‘regenerating fallows’ which may, if given sufficient time, regenerate into secondary forests. Such regenerating fallows add to the forest cover of an area. The practice of shifting cultivation using transformation approach, therefore, could increase forest cover through regenerating fallows. This fact must be duly recognized and due credit accorded to the practice. The forest cover and forest cover change assessment in future need to acknowledge the additional forest cover brought about by regenerating fallows. Relevant authorities also need to categorize shifting cultivation fallows as ‘arable, regenerating fallows’ instead of the present practice of categorizing such fallows as ‘abandoned wastelands’ and as ‘Unclassed State Forests’.

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 (e.g. Watershed Management in shifting cultivation areas under MoA). Programmes need to be designed at State level 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.

Key principles for implementation

While facilitating transformations in shifting cultivation areas, five basic principles are recommended:

- Mountain agriculture has a landscape approach that links agriculture, animal husbandry and forest. Adopt a ‘landscape or systems’ approach, not a crop based approach. Integration of various land use elements at the landscape level is fundamental for the success of transformation of shifting cultivation in northeast India.
- Learn from and draw upon traditional agriculture in northeast India. The approaches for transformation should not summarily dismiss traditional land uses, but try to blend the traditional with the modern and wherever possible, improve the productivity of existing practices through locally acceptable technological interventions (e.g. *Aji* system of the Apatani, *zabo* system of the Chakesang, *bun* system of Khasi Hills, alder-based system of the Angami, tree-based rice cultivation of the Konyak, among others).
- The third principle, specifically applicable to shifting cultivation is ‘Do not try to stop shifting cultivation – help communities to transform shifting cultivation practices rather than blanket ban’.
- Safeguard customary tenure and access rights to land and resources. This principle is of critical importance as this will ensure the continuance of tenurial security for all and thereby, allow an inclusive transformational process that will benefit all.
- Ideas based on experiences in other situations may not be the best fit. Let the communities take some time to evolve with the process of change. This principle states that indigenous innovation and participatory decision making are key to success.

If these five guiding principles are kept in mind while designing approaches for transformation, the chances of acceptance and affordability of the approaches will be higher.

2030 Agenda for SDGs and Managing Transformations in Shifting Cultivation

SDG	Relevant Target(s)	Context
1. Poverty	1.4 rights, access and control (land) 1.5 build resilience, reduce exposure	Transformations must strengthen not dilute
2. Hunger	2.1 end hunger, access to safe, nutritious and sufficient food 2.2 malnutrition 2.3 productivity and income 2.4 sustainable and resilient production systems 2.5.2 a genetic diversity, gene banks	Transformations must <ul style="list-style-type: none"> • safeguard crop and nutritional diversity • ensure seasonal availability • conservation agro-diversity • strengthen resilience
6. Water and sanitation	6.1 access to safe, affordable drinking water 6.4 water use efficiency 6.6 protect water related ecosystems	Transformations must safeguard ecosystem services, especially hydrological services, not deplete them
13. Climate change	13.1 strengthen resilience	Safeguard diversity of crops, natural systems and conservation of traditional NRM institutions
15. Sustainable use of ecosystems	15.1 conservation, restoration 15.2 sustainable management (forests) 15.4 conservation of mountain ecosystems 15.5 reduce degradation	Transformations must guard against deforestation, degradation through land use change – safeguard ecosystem services

Chapter 6

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 the rural northeast could be transformed. Availability of credit and employment for *jhum* farmers will improve and the public distribution system will be revitalised in villages where *jhum* is practised on a large scale. When land degradation is checked, the availability of water too will be enhanced by the 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 these communities. The increased availability of medicinal herbs will rejuvenate the local traditional health care system. Overall, the standard of living of *jhum* farmers will improve and the incidence of poverty will decline.

Co-benefits to State agencies

The emission of greenhouse gases (GHGs) 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. With reduction in area of *jhum*, the frequency of forest fires may also reduce thus reducing the emission of GHGs and degradation of forests. The restoration of lands degraded due to shifting cultivation will also contribute to India's commitment to the Bonn Challenge. Transformation of shifting cultivation will end hunger, achieve food security, improve nutrition and promote sustainable agriculture and contribute the achievement of 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. Transformations in shifting cultivation will also contribute to the achievement of 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.

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Annexure 1

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

S.N.	Problem	Suggested Action	Time Frame	Ministry/Department/ Agency
1	Data Gap: Non-availability of reliable data on temporal variation and extent of <i>jhum</i> in terms of area, population involved and geographical distribution makes proper planning and implementation of any project/ scheme difficult.	<ul style="list-style-type: none"> • Remote sensing: To determine the area affected and temporal change in area under <i>jhum</i>. It may be done using remote sensing with adequate ground truthing. • 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, and clan land, private land including the custodian of the land. <i>Jhumias</i> need to be categorised for their degree of dependence on <i>jhum</i> i.e. 100%, 50-100%, <50%. • Census of Jhumias: This may be included in 2021 Census of India 	Short term (1-5 years)	<ul style="list-style-type: none"> • National Remote Sensing Agency (NRSA) • Forest Survey of India (FSI) • State Department of Rural Development, BDO through Gram Sevak or similar village level official under the control of BDO. • Registrar of Census of India <p>Note: Regional Coordination and Funding: MDoNER, North Eastern Council (NEC)</p>
2	Land Tenure: Most <i>jhumias</i> 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.	<ul style="list-style-type: none"> • Land tenure needs to be made secure through a legislation • Areas of Unclassed State Forests and unclassified forests should be ascertained and dealt with under Forest Right Act (FRA). 	Short term (1-5 years)	<ul style="list-style-type: none"> • 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 • State Forest Department and MoEF & CC <p>Note: Regional Coordination & Funding: NEC</p>

S.N.	Problem	Suggested Action	Time Frame	Ministry/Department/ Agency
3	<p>Poverty and Land Degradation Nexus: <i>Jhumias</i> are poor subsistence farmers. Primarily, they practise <i>jhum</i> for food security. They do not have access to modern agricultural inputs to increase the productivity of their <i>jhum</i> lands. As land degrades due to shifting cultivation, their productivity further declines and they become poorer. This nexus needs to be broken.</p>	<ul style="list-style-type: none"> • Employment generation among the shifting cultivators is a must to motivate them to stop the practice and to bring them out of 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 the present 100 to 200 days for <i>jhumias</i>. Food security needs to be enhanced by strengthening the Public Distribution System (PDS) and making staple food available at subsidised rates. 	Short term (1-5 years)	<ul style="list-style-type: none"> • Ministry of Rural Development, Government of India; State Department of Rural Development and NITI Aayog; Government of India
4	<p>Policy Mismatch: Forest Policy (1988) considers <i>jhum</i> as ‘not a right to land use’ and aims to ‘discourage shifting cultivation’ and ‘rehabilitate the <i>jhum</i> lands through social forestry and energy plantations’. The Agriculture Department is promoting agriculture, horticulture and cash crops on <i>jhum</i> lands. Multiple agencies of the State and central government target <i>jhum</i> lands for cultivating cash crops like timber trees, tea, coffee, rubber, etc. As a result, <i>jhum</i> 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 <i>jhum</i> practice.</p>	<ul style="list-style-type: none"> • Policy synchronization is a necessity. All government departments should look at <i>jhum</i> land as agricultural land. A land use policy needs to be evolved restricting land use change. <i>Jhum</i> land should not be considered as wasteland as done by the Department of Soil and Water Conservation (Meghalaya) and Department of Wastelands (Nagaland). • <i>Jhum</i> must not be attributed as a reason for loss of forest (Refer: ISFR 2015). A <i>jhum</i> fallow may look like a forest when sensed from a remote satellite but it is a temporary phase and the <i>jhumias</i> have a right to convert it back to agricultural land. If all <i>jhum</i> lands are converted to forests there will be no land for <i>jhum</i> farmers to grow their food, the Forest Department must not look at <i>jhum</i> lands as prescribed in Forest Policy 1988. The Forest Policy needs to be suitably revised. 	Short term (1-5 years)	<ul style="list-style-type: none"> • MoEF &CC, NEC, MDoNER, State Forest Departments, Ministry of Agriculture of Central Government and State Governments

S.N.	Problem	Suggested Action	Time Frame	Ministry/Department/ Agency
5.	Poor Infrastructure and Underdevelopment: Most shifting cultivation areas are now in remote locations like the interiors of Meghalaya, Nagaland and Arunachal Pradesh. These relatively isolated places have very poor accessibility and almost defunct school and hospital facility. School dropouts rates are high. Poor road connectivity makes the area less accessible to government personnel. The presence of government is close to negligible. Government schemes are poorly executed. There is limited market for 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 the West Khasi Hills (Meghalaya).	<ul style="list-style-type: none"> • Build and maintain roads. Build and run schools and hospitals. Make Public health care centres functional and more importantly, develop markets. Once road conditions are improved, a market may develop on its own and government personnel may also start reaching these places regularly. 	Short term (1-5 years)	<ul style="list-style-type: none"> • Ministry of Road and Transport, Ministry of Education, and Ministry of Health
6.	High Rate of Population Growth: Many states have shown rapid decadal population growth. Meghalaya: 27.82%, Arunachal Pradesh: 25.92%, Mizoram 22.78%, Nagaland: 25% in the past two decades. In rural areas, rates are higher than the State average. This increase in population puts increasing pressure on land and natural resources and contributes to perpetuation of poverty.	<ul style="list-style-type: none"> • Education, health care and family planning awareness. • Women empowerment, promotion of income generating activities for women 	Short term (1-5 years)	<ul style="list-style-type: none"> • Ministry of Education and Ministry of Health of Central and State Governments, and Ministry of Tribal Affairs
7.	Insurgency and Poor Governance: Shifting cultivation is mostly prevalent in remote villages. These places are also often affected by 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.	<ul style="list-style-type: none"> • Infrastructure development, political settlement of issues and better administration 	Short term (1-5 years)	<ul style="list-style-type: none"> • Government of India: Ministry of Home Affairs, Ministry of Tribal Affairs, Ministry of Development of North Eastern Region

S.N.	Problem	Suggested Action	Time Frame	Ministry/Department/ Agency
8	<p>Culture and Tradition: <i>Jhum</i> farmers have been practicing <i>jhum</i> for generations. The knowledge relating to <i>jhum</i> 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 other means of producing food. The type of food habit and life style they are tuned to gets support from <i>jhum</i>. In the absence of any other alternative livelihood option, they continue practising <i>jhum</i> even if it is lowly productive and does not yield enough for the year round food requirement. Many <i>jhum</i> farmers prefer rice, oil seeds and vegetables grown in <i>jhum</i> as they say the food is healthier and that they do not feel hungry for a long time.</p>	<ul style="list-style-type: none"> • Education extension programme for village leaders highlighting the ill-effects of <i>jhum</i> and suggesting better alternatives and or providing them support to transform their <i>jhum</i> cultivation 	Short term (1-5 years)	<ul style="list-style-type: none"> • Government of India: Ministry of Human Resource Development, Ministry of Information and Public Relations, Ministry of Agriculture, and State Governments
9.	<p>Reluctance to Accept Modern Agriculture: 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 <i>jhum</i> farmers. This makes the farmers dependent on the market which is poorly developed. The sale price of agricultural and horticultural produce 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, <i>jhum</i> 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 crops, they continue to cultivate the traditional <i>jhum</i> crops for self-consumption.</p>	<ul style="list-style-type: none"> • In places and for the produce where the market is developed, the <i>jhum</i> 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 broom grass, the other cash crops could not be scaled up primarily due to market constraints. Before introducing cash crops or any agricultural produce intended for sale in the market, infrastructure for transport and market availability needs to be put in place. • Traditional crops must not be discouraged in favour of cash crops and high yielding varieties as food preferences do not change overnight. 	Short term (1-5 years)	<ul style="list-style-type: none"> • Department of Agriculture, NEDFi, North Eastern Regional Agricultural Marketing Corporation

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10.	Security of Tenure, Nutritional Security: Drudgery to women, loss of man hours in travelling to <i>jhum</i> fields which are often far away.	<ul style="list-style-type: none"> 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. 	Short term (1-5 years)	<ul style="list-style-type: none"> Department of Horticulture, Rural Development
11.	Need of Cash for Modern Living: <i>Jhum</i> farmers need cash for sending their children to school, buying medicine, mobiles, TVs, fridges and other household gadgets.	<ul style="list-style-type: none"> Promote and support mountain niche crops as health foods, especially crops found in shifting cultivation – rice, millet, sorrel, oil seeds (perilla) – and promote native species in horticulture. Some shifting cultivation crops can be promoted as health foods. 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. 	Short term (1-5 years)	<ul style="list-style-type: none"> Department of Horticulture, Rural Development, Department of Commerce
12.	Absence of Land use Plan: This causes unscientific land use and thereby degradation of land.	<ul style="list-style-type: none"> Facilitate participatory perspective landuse planning – village level land use maps (of existing and planned interventions), will facilitate conservation and management of forests, biodiversity and ecosystem services. These land use maps should be endorsed by traditional and statutory authorities. All future land based interventions by different departments must adhere to the agreed upon land use maps. 	Short term (1-5 years)	<ul style="list-style-type: none"> Department of Agriculture and Rural Development, Village Council, Autonomous District Councils
13.	Loss of Agro Biodiversity	<ul style="list-style-type: none"> Promote conservation of agro biodiversity: Shifting cultivation farms are a large repository of agro biodiversity. Proactively promote and support community managed agro-biodiversity living gene banks – agro-biodiversity sanctuaries at landscape levels (e.g. Potato Gene Bank Landscapes, Peru) 	Short term (1-5 years)	<ul style="list-style-type: none"> Department of Agriculture, Horticulture and Rural Development
14.	Lack of Research and Education on Mountain Agriculture	<ul style="list-style-type: none"> Introduce and encourage special focus on mountain agriculture at 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 a solution to shifting agriculture should be mandated to these Institutions. They should act as knowledge banks for shifting cultivation 	Short term (1-5 years)	<ul style="list-style-type: none"> ICAR Research Complex for NE H Region, Barapani Central Agricultural University, Imphal Assam Agricultural University, Jorhat Rain Forest Research Institute, Jorhat



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