IFAD
Investing in rural people

India

Fostering Climate Resilient Upland Farming Systems in the Northeast (FOCUS)

Design completion report

Main report

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Currency equivalents

Currency Unit	= Indian Rupees (INR)
USD 1.0	=INR 68

Weights and measures

1 kilogram	=	1000 g
1 000 kg	=	2.204 lb.
1 kilometre (km)	=	0.62 mile
1 metre	=	1.09 yards
1 square metre	=	10.76 square feet
1 acre	=	0.405 hectare
1 hectare	=	2.47 acres

Abbreviations and acronyms

AG	Auditor General
AO	Accounts Officer
AOS	Annual Outcome Survey
APC	Agriculture Production Commissioner
APDMP	Andhra Pradesh Drought Mitigation Project
APMC	Agriculture Producers' Marketing Committee
ATMA	Agriculture Technology Management Agency
AWP&B	Annual Work plan and Budget
BPCC	Block Project Coordination Committee
CAG	Comptroller and Auditor General
CAHW	Community animal health worker
CAIM	Convergence of Agricultural Interventions Programme in Maharashtra
CPE	Country Programme Evaluation
CRPs	Community Resource Persons
CSSs	Centrally Sponsored Schemes
DAHV	Department of Animal Husbandry and Veterinary Services
DEA	Department of Economic Affairs
DMU	District Project Management Unit
DoA	Department of Agriculture
DPCC	District Project Coordination Committee
FAS	Finance and Accounts Specialist
F&AO	Finance and Accounts Officer
FAO	Food and Agriculture Organization of the United Nations
FIGs	Farmer Interest Groups
FOCUS	Fostering Climate Resilient Upland Farming Systems in the Northeast
FPO	Farmer Producer Organization
GEF	Global Environment Facility
GoI	Government of India
GoM	Government of Mizoram
GoN	Government of Nagaland
HH	Household
ICAR	Indian Council of Agricultural Research
ICEF	India-Canada Environment Facility
ILRI	International Livestock Research Institute
ILSP	Integrated Livelihoods Support Programme
JRMC	*Jhum* Resource Management Committee
JTDP	Jharkhand Tribal Development Programme
JTELP	Jharkhand Tribal Empowerment and Livelihoods Programme
M&E	Monitoring and Evaluation
MGNREGS	Mahatma Gandhi National Rural Employment Guarantee Scheme
Ministry of DoNER	Ministry of Development of Northeast Region
MIS	Management Information System
MoU	Memorandum of Understanding
MOVCD	Mission on Organic Value Chain Development

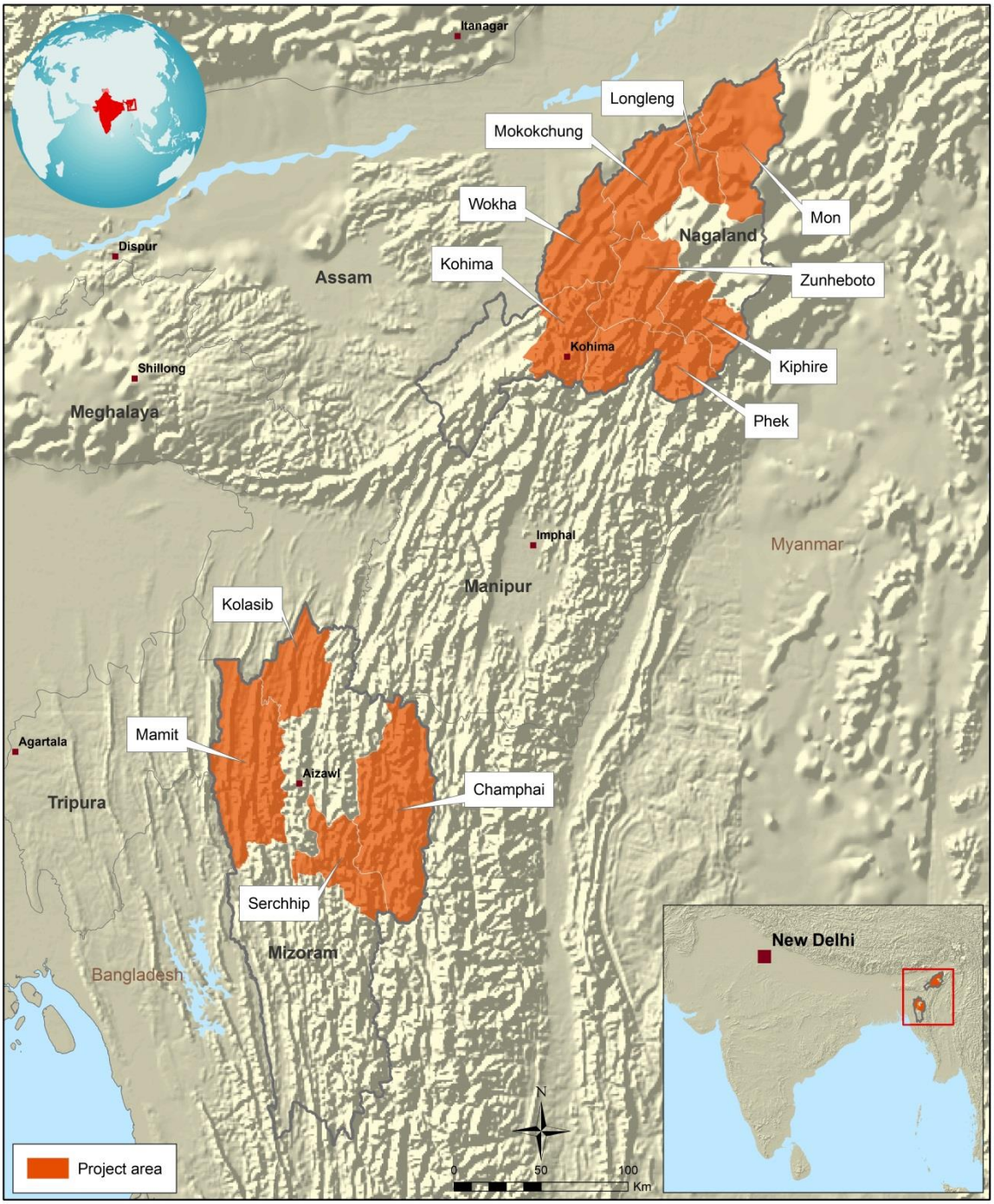
NAPCC	National Action Plan on Climate Change
NEPED	Nagaland Environment Protection and Economic Development through People's Action
NER	Northeast Region
NERCOMP	Northeast Region Community Resource Management Project for Upland Areas
NGO	Non-governmental Organization
NLUP	New Land Use Policy
OPELIP	Orissa PTG Empowerment and Livelihoods Improvement Programme
OTELP	Orissa Tribal Empowerment and Livelihoods Programme
SPD	State Project Director
PEFA	Public Expenditure Financial Accountability Assessment
PFM	Public Finance Management
PFS	Project Financial Statements
PLUP	Participatory Land Use Planning
PMC	Project Management Committee
PMKSY	Pradhan Mantri Krishi Sinchayi Yojana
PMU	State Project Management Unit
PSC	Project Steering Committee
PTSLP	Post Tsunami Sustainable Livelihoods Project
PWD	Public Works Department
RIMs	Results and Impact Management System
RKVY	Rashtriya Krishi Vikas Yojana
SAABs	Site Allotment Advisory Boards
SCRAM	Society for Climate Resilient Agriculture in Mizoram
SoCRAN	Society for Climate Resilient Agriculture in Nagaland
SHG	Self Help Group
SLEM	Sustainable Land and Ecosystem Management
SoE	Statement of Expenditure
SRI	System of Rice Intensification
SSI	Sustainable Spice Initiative
SWCAs	Soil and water conservation Assistants
TA	Technical Assistance
ToR	Terms of reference
ToT	Training of Trainers
TRC	Terrace Rice Cultivation
TRWEP	Tejaswini Rural Women's Empowerment Project
UC	Utilization certificate
UNDP	United Nations Development Programme
USD	United States Dollar
VC	Village Council
VFAs	Veterinary Field Assistants
WRC	Wet Rice Cultivation

Map of the project area

India

Fostering Climate Resilient Highland Farming Systems in the North East in Mizoram and Nagaland States

Design report



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The designations employed and the presentation of the material in this map do not imply the expression of any opinion whatsoever on the part of IFAD concerning the delimitation of the frontiers or boundaries, or the authorities thereof.

Map compiled by IFAD | 15-12-2017

Executive Summary[1]

1. **Background and rationale.** Nagaland and Mizoram are two of the eight states in the North Eastern Region (NER) of India, a biodiversity hotspot where climate change adaptation is of critical importance for the largely rural population. With a hilly terrain, low population density, shallow soils and high rainfall, farmers have adopted a shifting cultivation system known as *jhum*. This largely self-sufficient system has adequately met the various needs of rural communities, including food, fibre and energy, but is now getting disrupted due to shortening *jhum* cycles as a result of increasing population, focus on high value crops for cash income, soil fertility degradation and top soil erosion on account of decreased fallow cycles. Changing climate patterns is further exacerbating these disruptive trends.

2. In Nagaland the *jhum* system covers 60 percent of the area under food grain cultivation, and about half of rural households are engaged in *jhum* cultivation, with about 100,000 ha of forest being cleared for cultivation each year. In Mizoram about 60 percent of the people are engaged in agriculture with *jhum* being the main land use and 20,000 ha are being cleared each year for *jhum* cultivation. In both states, rice is the main staple food, and upland paddy is the main *jhum* crop, grown mixed with other crops. *Jhum* land and forest-fallows also meet most community firewood and timber needs, and are also sources of wild foods and medicinal plants, as well as catchment areas of local streams.

3. *Jhum* is a way of farming poor upland soils by utilising fertility accumulated in the forest-fallow period. The practice of burning controls weeds and disease pathogens. Almost no external inputs are used, and the system is naturally organic. The mixed cropping with traditional varieties reduces risk and supports traditional food habits linked to distinctive local cultures. On the other hand, *jhum is* widely held to be a destructive farming system, causing severe soil erosion, atmospheric pollution, damage to soil biology and loss of biodiversity. The system is increasingly becoming unsustainable as *jhum* cycles are becoming shorter, with less time to restore soil fertility and biodiversity. *Jhuming* is labour-intensive, with no potential for mechanisation, and most work is done by women. With low crop yields, not much is produced per day worked, and production usually does not meet household food needs or generate much needed cash income.

4. **Approach**. The project will address the issues facing *jhum* cultivation through: (i) better *jhum* cultivation practices that will be both more productive and more sustainable creating an ecological balance; and (ii) supporting *jhumia* households to adopt alternative farming systems, particularly, sedentary farming. Both of these approaches, along with more productive wet rice fields, better plantation crops, improved livestock systems and increased off-farm income, will enhance farmer's income and reduce pressure on natural resources and increase resilience to climate change. As farmers move to more market-orientated production, the project will support improved market access and value chain development.

5. **Targeting:** Virtually all households in both these states are members of tribal ethnic groups. In Nagaland, the project would cover eight out of the state's 11 districts, and in Mizoram, four out of eight districts. The criteria used by the respective states to identify these districts are (i) high prevalence of shifting cultivation (ii) prevention of an overlap with another large donor funded project and (iii) focusing only on hill states and not the plains. In Nagaland the project would cover 650 villages (about two-thirds of all villages), with clusters being selected on the grounds of high levels of *jhum* cultivation and shortening *jhum* cycles, along with potential for high value crops. In Mizoram, all 272 rural villages in the four districts would be covered. In the selected villages all agricultural households would be covered (137,000 in Nagaland and 64,500 in Mizoram), with support for disadvantaged households, women and youth. In total 201,500 households with 1,007,500 persons will be reached by the project.

[1]Mission composition:Shreekantha Shetty (Mission Leader);A. M. Alam (Economist); Antonio Rota(Lead Adviser, IFAD, Rome); V.P Singh (Agronomist and Agroforestry Specialist); Venkatesh Tagat (NRM Specialist); A.B. Negi, (Livestock Specialist); Pratul Dube (Financial Management Specialist); Mahendra Chhetri (Farm Road Engineer); Meera Mishra (Country Coordinator, IFAD-ICO); and Sankarasubramaniam Sriram (Programme Support Analyst – Procurement Specialist, IFAD-ICO).

6. **Scaling up:** FOCUS will build on current and recent initiatives in the two states that have demonstrated the effectiveness of a twin approach of promoting better management of *jhum* on the one hand and gradually shifting towards sedentary agriculture on the other. In Nagaland these are: (i) NEPED[2], funded by the India-Canada Environmental Facility (ICEF) during 1995-2006; and (ii) Sustainable Land and Ecosystem Management in shifting cultivation areas of Nagaland for ecological and livelihood security (SLEM) project funded by UNDP-GEF. In Mizoram, the New Land Use Policy (NLUP) promotes sedentary agriculture. Additionally, the North Eastern Region Community Resource Management Project for Upland Areas (NERCORMP), a project supported by IFAD in Manipur, Meghalaya and the hill districts of Assam, demonstrated community planning and implementation for more sustainable land use systems.

7. **Objective**: The overall goal of the project is to increase agricultural income of 201,500 households, and to enhance their resilience to climate change. This would be achieved through the development objective of increasing the environmental sustainability and profitability of farming systems practiced by highland farmers.

8. **Components:** The project will have three components: (i) Improved *jhum* management; (ii) value chain and market access; and (iii) project management and knowledge services

Component 1: Improved *Jhum* Management will aim to promote proven and emerging climate resilient best practices.

1.1 – Better *jhum* and conservation will support: (i) capacity building of staff, lead farmers and farmers; (ii) land use planning to develop rational and sustainable systems for village land utilisation; (iii) better *jhum* management through introduction of a package of improved practices for soil and fertility management, crop production, agro-forestry and fallow management; and (iv) community forest conservation with re-vegetation and soil conservation. The project in total will support 25,300 ha of better *jhum*, 29,850 ha fallow management in *jhum*, and 18,440 ha of community/village forests.

1.2 - Settled agriculture will support: (i) existing rice cultivation on the lowlands through short duration seeds, fertility improvement techniques and improved cropping intensity; and (ii) existing orchards and plantation through demonstration of soil and water conservation works, improved planting materials and planting of high value trees. In Mizoram, the poorest households in each village will be supported to get access to land for settled agriculture. The project in total will support 15,190 ha of existing terrace cultivation, 15,190 ha of upland settled agriculture and 2,720 ha of settled agriculture to landless.

Component 2: Value chain and market access

2.1 - Value chain development will support: (i) production support for clusters of market-orientated spices (chilli, turmeric and ginger in Mizoram and large cardamom, chilli and ginger in Nagaland), including supply of planting materials and training; (ii) marketing support for a range of cash crops (chilli, ginger, turmeric, cardamom, oranges, other fruit, bamboo and other *jhum* crops with marketable volume); (iii) livestock support largely covering pigs with support for breeding, feed improvement, and animal health; and (iv) innovation support for testing and dissemination of innovative technologies and approaches for agriculture, livestock and marketing. The project will support 3,600 ha and 4,000 ha of spice production support in Mizoram and Nagaland respectively.

2.2 - Market access infrastructure will support construction of market infrastructure using climate resilient building techniques. The project will support building agriculture link roads in Mizoram and cross drain structures in Nagaland.

Component 3: Project Management and Knowledge Services: The project will be implemented by new societies to be established within the Agriculture Production Commissioner's Office (APC's Office) in

[2] Implemented in two phases, the first phase (1995-2001) was called Nagaland Environment Protection and Economic Development through People's Action and the second phase (2001-06) was called Nagaland Empowerment of People through Economic Development. https://www.nagaland.gov.in//Nagaland/GovernmentAndPrivateBodies/Department_of_NEPED.html

Nagaland and within the Department of Agriculture (DoA) in Mizoram. As this project covers two states, it will be a testing ground for improved *jhum* practices for the north-eastern region. To facilitate cross learning, the project in each state, will engage Indian Council of Agricultural Research (ICAR) to generate knowledge on upland farming systems and their response to climate change and to create a learning platform for other states in NER. In addition, IFAD will provide a grant to both states for the engagement of FAO for capacity building and provision of technical assistance. FAO will be requested to contribute from its own resources for this technical assistance sub-project.

9. **Organisational Framework**: At the state level, the APC's office in Nagaland and DoA in Mizoram will be the nodal agencies, with the implementing agency being the two states' Society for Climate Resilient Agriculture. The Chief Executive Officer/Secretary of the Society would be the State Project Director (SPD), supported by a team of technical and administrative staff. The SPD would be reporting to the APC in Nagaland and to the Secretary, Agriculture / Director, Department of Agriculture, in Mizoram. At the district level, a District Management Unit (DMU) will be established within the office of District Agriculture Office. The District Agriculture Officer would be the District Project Manager, with a small team of professionals to facilitate project implementation.

10. **Project cost**: The project would be implemented over a six year period. Total cost is estimated at USD 168.47 million for the two states, which would be financed by an IFAD loan of USD 75.5 million, an IFAD grant of USD 1 million, parallel financing using Centrally Sponsored Scheme (CSS) funds of USD 27.51 million, state government contributions of USD 31.92 million, convergence funding of USD 26.27 million, and a beneficiary contribution of USD 6.27 million.

11. **Benefits and beneficiaries**: A total of 201,500 households (137,000 households in Nagaland and 64,500 households in Mizoram) would directly benefit from the project. Wider benefits will accrue from the generation and dissemination of knowledge, and from the institution building of organisations at the village level.

1. **Economic Internal Rate of Return and Sensitivity Analysis:** The project investment in Nagaland has an overall Economic Internal Rate of Return of 29 percent, Benefit cost ratio of 1.78 and Net Present Value of INR 6,593 million (discount rate of 10 percent). The project investment in Mizoram has an overall Economic Internal Rate of Return of 25 percent, Benefit cost ratio of 1.51 and Net Present Value of INR 3,141 million (discount rate of 10 percent). A switching value analysis demonstrates that costs would have to increase by 78% or benefits to decrease by 44% for the NPV to be zero in case of Nagaland. Similarly costs would have to increase by 51% or benefits to decrease by 34% for the NPV to be zero in case of Mizoram.

12. **Sustainability.** Project interventions should be sustainable. Improved agricultural practices, if found by farmers to be useful and profitable, will be sustained provided inputs and markets are available. Interventions in the market access and value chain component (largely in the private sector) will aim to ensure this. The project will build capacity of local service providers at the village level and will establish village level suppliers of inputs. All of these will be operated by local people and groups, and be financially viable and so sustainable after the project is completed.

13. **Adherence to IFAD policies.** The project is fully in line with IFAD's Strategic Framework (2016-2025), and adheres to IFAD policies for targeting and gender mainstreaming, climate change and social, environmental assessment, engagement with indigenous peoples, nutrition sensitive agriculture, and scaling up. It is also aligned to the India COSOP. The environmental and social category is considered to be B, while the climate risk classification is deemed to be Moderate.

Logical Framework –combined

Results Hierarchy	Name	Indicators			Means of Verification			Assumptions (A) / Risks (R)
		Baseline	Mid-Term	Endline	Source	Frequency	Responsibility	
Outreach	-estimated corresponding total number of household members -Number of youth receiving services promoted by the project	0 0	402,000 24,180	1,007,500 60,450	Project MIS	Yearly	M&E Unit	
	Number of HH reached	0	81,400	201,500	Project MIS	Yearly	M&E Unit	
Goal: Income of 201,500 farm households in hill areas of Nagaland and Mizoram increased and their resilience to climate change enhanced	% of HH *jhum*- farming for 3 or more years continuously on single plot	0		70%	Impact assessment	Baseline End-line	M&E Unit Commissioned Study	(A) economic growth and social stability
	Number of HH reporting increase of >100% in household incomes	0	61,050	151,125	Impact assessment	Baseline End-line	M&E Unit Commissioned Study	
Development Objective: Environmental sustainability and profitability of *the* farming systems in hill areas enhanced	% soil carbon			4%	Soil carbon test	Baseline Annual	M&E Unit	(R) Climate change and/or better non-farm opportunities makes farming unattractive.
	Real increase in net farm income (in 2017 prices) in million INR	0	3,151.2	4,754.6	TOS	Baseline MTR End-line	M&E Unit Commissioned Study	
	Number of trees increased at least 20 per ha in *jhum* plot	0	10 #/ha	20#/ha	TOS	Baseline MTR End-line	M&E Unit Commissioned Study	
Outcome *1*: Improved farmers' capacities to manage upland farming sustainably	Number of HH reporting adoption of environmentally sustainable and climate resilient technologies and practices[3]	0	81,400	201,500	Project MIS	Yearly	M&E unit	(A) Producers are able to finance the continued investments required to climate proof their farms
Outputs:								
a. Participatory Land Use Planning conducted	No of VC with completed PLUP and land suitability maps	0	922	922	Project MIS	Yearly	M&E unit	(A) Access to reliable technical advice and planting material is secured
b. improved *jhum* management	No farmers trained (W/M) on better *jhum* and fallow management	0	101,800	290,800	Project MIS	Yearly	M&E unit	

[3]Climate resilient technologies and practices refer to agro-forestry, soil and water conservation, improved planting material, integration with livestock

Results Hierarchy	Name	Indicators			Means of Verification			Assumptions (A) / Risks (R)
		Baseline	Mid-Term	Endline	Source	Frequency	Responsibility	
	No farmers trained (W/M) on settled agriculture	0	35,000	105,200	Project MIS	Yearly	M&E unit	(A) Effective convergence with Govt programme to build the assets of the poorer HH
	Area in ha under SWC, by *jhum*, *jhum* fallow, settled agriculture	0	58,240	88,250	Project MIS	Yearly	M&E unit	
c. Village forest conserved	Area under CCA managed by VC	0	10,600	18,440	Project MIS	Yearly	M&E unit	
d. Access of poorest households	No of HH benefitting from support to landless	0	5440	10,880	Project MIS	Yearly	M&E unit	
***Outcome 2*:** Increased volume of marketed crops and livestock , with improved returns to producers	Gross returns from spices (million INR) Gross returns from livestock (million INR)	0 0	289.9 295.8	947.0 584.4	Project MIS	Yearly	M&E Unit Commissioned Study	(R) High transaction cost due to small volume and remote location (R) Implementation of APMC Act prevents new types of market linkages and reduces farm-gate prices.
Outputs: a. Spice producers are integrated in national and international spice markets	No participating HH in organized spice value chain	0	6800	15,200	AOS	Annual	M&E unit	
b. Increased productivity of pig production	Pig off-take number	0	27,000	55,000	AOS	Annual	M&E unit	
c. value-chain clusters developed	Number of clusters	0	35	80	AOS	Annual	M&E unit	
Outcome 3: Improved access to markets	Number of farmers reporting improved physical access to markets	0	20,000	48,000	AOS	Annual	M&E unit	(A) Operation and maintenance by communities and Govt is effective.
Outputs: a. Rural roads rehabilitated	Length and type of access road rehabilitated in km	0	300	800	Project MIS	Quarterly	M&E unit	

Underlined indicators are IFAD RIMS indicators

I. Strategic context and rationale

A. Country and rural development context

1. India's economic and agricultural development

2. **Poverty**: with over 250 million poor people, India remains home to the largest population of the poor in the world. Despite being the third largest economy in the world in terms of purchasing power parity (PPP) and the fastest growing large economy, reducing poverty remains a key challenge for the country. Headcount poverty in the country declined from 37.2 percent (rural 41.8 percent) in 2004-05 to 21.90 percent (rural 25.70 percent) in 2011-12. India also achieved Millennium Development Goal 1 of reducing extreme poverty by half. Even so, removing poverty continues to be a key development priority for the country and is important globally for the achievement of SDG 1.

3. **Agriculture:** India's agricultural performance has been remarkable over the past decades, transforming the nation from chronic dependence on grain imports into net exporter of food, particularly of rice, cotton, sugar and beef. Nevertheless, with faster growth in other sectors, the share of agriculture in India's economy has declined to less than 17 percent. Agriculture continues to be a key livelihood source and an economic anchor for a majority of people in the country. Growth and stability of the farm sector therefore is critical to impact poverty as rural areas account for over 71 percent[4] of poor people in the country. About 60 percent of agriculture in India continues to be rain-fed and therefore highly sensitive to climate variability. Even a modest deficit in monsoon, delay in its arrival or its erratic performance can adversely impact the main *kharif* crop, food production, food prices, incomes and food security.

4. **Climate change:** the Government of India (GoI) has been alive to the challenges of climate change and has taken initiatives to address climate risks. The ratification of the Paris Treaty on Climate Change in October 2016 whereby India committed to reduce greenhouse gases, promote use of renewable sources of energy and increase forest cover is an example of India's conscious efforts to tackle the issue of climate change. Earlier in 2008, India released its National Action Plan on Climate Change (NAPCC), focused on adaptation to climate change. Protection of the poor and vulnerable sections of society through sustainable development strategies is a key priority in the plan. There are eight missions under the NAPCC, of which four directly relate to adaptation, including the National Water Mission, National Mission for sustaining the Himalayan Ecosystem, National Mission for a Green India and National Mission for Sustainable Agriculture. A detailed mission document has been prepared for each mission, outlining the key challenges, proposed strategies and actions, specific activities and implementing agencies. All the missions have been approved by the Prime Minister's Council on Climate Change.

5. **Policies and programmes:** GoI has put in place several rural development schemes with important policies, strategies and acts that provide the framework for agriculture, forestry, rural development and growth, and which are central to IFAD's efforts in India. The GoI has over the years, implemented flagship programmes across the country to increase the livelihood potential, especially in rural areas. Among these, the Mahatma Gandhi National Rural Employment Guarantee Scheme, the National Rural Livelihood Mission, and the Food Security Program under the National Food Security Act and the National Mission for Sustainable Agriculture are the main ones.

2. North-Eastern India: Climate change and agriculture

6. The North Eastern Region (NER) of the country is one of the 12 bio-diversity hotspots, being home to more than one-third of the country's bio-diversity. Climate change adaptation for North Eastern Region is critical as more than 81 percent of the population in the region is rural (Census 2011) and dependent on

[4]As per the Rangarajan Committee report (http://planningcommission.nic.in/reports/genrep/pov_rep0707.pdf), of the 363 million poor people in India in 2011-12, approximately 260.5 million were rural. The estimates as per the Tendulkar Committee (http://planningcommission.nic.in/reports/genrep/pov_rep0707.pdf)for the same year were 270 million total and 217 rural.

climate sensitive production systems and natural resources. With a hilly and mountainous terrain, relatively low population density, shallow soils, high rainfall and physical isolation from the main land mass of India, the natural resource management practices, livelihood systems and food habits of people in the hill states of NER have evolved around a shifting cultivation system known as *jhum*. This largely self-sufficient system has adequately met the various needs of rural communities, including food, fibre and energy, but is now getting disrupted due to shortening *jhum* cycles as a result of increasing population and conversion of land to permanent plantation and other crops. Changing climate patterns is further exacerbating these disruptive trends.

7. Conscious of these challenges, Nagaland and Mizoram, two of the eight NER States, are seeking to restore the balance between the ecological imperatives of their complex highland ecology and growing human needs by integrating modern scientific and technological knowledge with traditional know-how, experience and locally evolved systems of resource governance with embedded cultural practices. This calls for a flexible, deliberative and multi-disciplinary approach of engaging with village communities towards sustainable intensification of *jhum* with the end goal of promoting climate resilient practices through the twin approaches of systematically aligning *jhum* cycles to the natural regeneration cycle of forests and simultaneously encouraging sedentary agriculture where possible. Government of Nagaland (GoN) and Government of Mizoram (GoM) have sought IFAD support as the latter has carried out successful programming in the area of community-based natural resources development in the NER and elsewhere.

8. In Nagaland the *jhum* based upland farming system covers 60 percent of the total agricultural area under food grain cultivation and half of the state's production of food grains. About half of rural households in the state are engaged in jhum cultivation, with about 100,000 ha of forest being cleared for cultivation each year. In Mizoram, about 60 percent of the people are engaged in agricultural pursuits and the main agricultural land use is jhum, with about 20,000 ha being cleared each year. In both states, rice is the main staple food, and upland paddy is the main *jhum* crop. The hilly topography of both states limits the area of wetland paddy that can be grown, meaning that neither state is able to meet its needs for rice from domestic production.

9. Alongside upland paddy, other cereals, root and tuber crops, pulses, oilseed, vegetables and spices are grown on *jhum* land. Cultivated *jhum* land and forest-fallows also meet most of community firewood and timber needs, and are sources of a variety of wild fruits, berries and medicinal plants, as well as being the catchment areas of local springs and streams. Governments in both states have made efforts to promote settled agriculture in upland areas, with plantation crops such as oranges, tea and oil palm, being most suited to the hilly topography.

10. **Rural Poverty in the project area**. In Nagaland, the poverty analysis conducted as part of the preparatory activities for the project design, shows that poverty has multiple dimensions in the rural areas of the state, namely in terms of access to basic services, connectivity and low incomes. It is closely associated with the agriculture and natural resources based livelihoods of the rural households: the low productivity, the high inputs of family labour for agriculture, the limited options to diversify livelihoods, and the high cost of living in the State, trap households in poverty and render them vulnerable to price shocks on the one hand and to climate change on the other. As per census data, the incidence of rural poverty in the state has doubled from 2004 to 2012 and stood at 19.9% in 2011-2012 equivalent to 280,000 persons. The qualitative wealth ranking exercise conducted in sample villages suggests that on average 16% of rural households earn less than 75,000 INR/year which puts them close to or below the poverty line. The poor rely on a production system comprised of *jhum* cultivation, terrace cultivation and livestock rearing, and their landholdings are typically less than 1 ha of *jhum* and 1 ha of terrace cultivation. Landlessness is less than 10% of rural households.

11. In Mizoram, poverty and under development is primarily linked to the continued subsistence mode of farm production with over 85% of rural households dependent on some kind of farming including *jhum*. Nearly 93% of self-employed population in agriculture are considered as poor primarily due to several factors negatively impacting performance of agriculture including small, unproductive land holding with traditional *jhum* farming, acidic soil with low fertility and overall less sunlight affecting better growth, low productivity of food grains per unit area, challenges of access to credit and agricultural input services, difficulties in marketing even where there is surplus production, low skills of agricultural labourer for high technology, etc. The incidence of poverty increased during the period 2003/04 to 2009/10, from 23% to 31% and this put the number of rural poor at 160,000 persons. The qualitative wealth ranking conducted as part of the preparatory study for the design of the project suggests that 35% of rural households earn less than 5,000 INR/month/HH which is less than the state poverty line. More than half of agricultural holding (54.65%) are marginal holdings (below 1 ha). The highest percentage of youths (18-35 years) are engaged in household agricultural activities (53.7%), followed by casual labour (detailed analysis of poverty, gender and youth in Appendix 2).

12. **Nutrition** indicators for the states in the north-east of India are varied. However, both Nagaland and Mizoram fare better than the national average in terms of all key major indicators of underweight, stunting and wasting in children aged under 5 years. For example, whereas the national average for prevalence of underweight in under 5 children is 29.4 percent, the prevalence in Nagaland is 19.5 percent and for Mizoram it is 14.8 percent. In terms of prevalence of wasting, again Nagaland (11.8 percent) and Mizoram (14.3 percent) are lower than the national average of 15.1 percent. Similarly, against the national average of 38.7 percent for stunting, the percent prevalence in Nagaland and Mizoram are 29.1 and 26.9 respectively. In terms of low birth weight of children under 3, Nagaland is slightly lower than the national average whereas Mizoram is the best in the country[5]. The two states also fare better than the national average in terms of prevalence of anaemia.

B. Rationale

1. The problems to be addressed

13. In the hilly tracts of Northeast India, *jhum* agriculture is the dominant economic activity and over 86 per cent of the people living in hills are dependent on it. With increasing population, the area under *jhum* increased from 1,326,000 hectares in 1980 to 1,685,000 hectares in 1990, although there has been a decline in recent years. Shifting cultivation usually involves the following steps: (i) selection of forested hilly land; (ii) cutting down trees and shrubs; (iii) allowing this vegetation to dry before burning; (iv) traditional rituals; (v) broadcasting and dibbling seeds, tubers and cuttings; (vi) weeding and protection of crops; (vii) harvesting and threshing; and (viii) post-harvest festivals.

14. Land is usually cultivated for between one and two years, although cultivation can sometimes extend to three or four years, before the land is abandoned to naturally regenerate and return to forest for a number of years. The choice of crop is consumption-oriented with a mixture of crops being grown on the same plot, however the need for cash means that there is increased cultivation of crops for sale, such as ginger and chilli. The length of the *jhum* cycle (the total period of cultivation plus fallow-forest period) is influenced by population pressure, nature and density of forest re-growth, terrain, angle of slope, texture of soil and rainfall. Areas of sparse population generally have longer *jhum* cycle (15-25 years), while areas with high density of population have shorter *jhum* cycle (5-10 years).

15. The practice of *jhum* has many arguments in favour and against. Those in favour believe that it is built on the forest's natural cycle of regeneration, causing only temporary loss of forest cover which regenerates itself quickly after the farmers abandon *jhum* land. *Jhuming* is a way of farming thin and infertile upland soils, where normal sedentary agriculture is not possible, by utilising the fertility that

[5] India Health Report- Nutrition (2015). http://www.indiaenvironmentportal.org.in/files/file/INDIA-HEALTH-REPORT-NUTRITION_2015.pdf

accumulates in organic matter during the forest-fallow period. Unlike permanent crops and plantations, forest loss is only temporary, and in this way bio-diversity is deemed to be maintained. The practice of burning controls weeds and disease pathogens. Almost no external inputs are used, and the system is naturally organic. The mixed cropping system using traditional crop varieties reduces risk and supports rich and diversified traditional food habits linked to distinctive local cultures. This argument in favour of *jhum* however does not take into account the distortions that have crept into *jhum* farming system including reduced *jhum* cycle resulting in inadequate time for regeneration, and cultivation of cash crops such as ginger which leads to extensive top soil disturbance leading to top soil erosion.

16. The arguments against *jhum* centre on it being a destructive and unsustainable farming system. It is said that this is the major cause of land degradation in the north-east[6]. *Jhuming* is often carried out on very steep slopes, and can result in severe soil erosion[7]. Burning vegetation creates pollution and adds to atmospheric CO_2, as well as destroying soil microbes and organic matter, and resulting in a loss of organic carbon and nitrogen from the soil (although it may enhance phosphorus and add potash). The destruction of forest is also believed to negatively impact biodiversity. In particular, the system is increasingly unsustainable as *jhum* cycles become shorter, with less time for fertility to recover and biodiversity to be restored. *Jhuming* is labour-intensive, with almost no potential for mechanisation, and most work is done by women[8]. With low and declining crop yields, not much is produced per day worked, and *jhum* production usually does not meet household food needs, or generate much in the way of cash income. *Jhuming* is also vulnerable to weather variations – as crops rely entirely on rainfall and there is little scope for effective measures to increase infiltration of water. At the same time, early rains can delay the burning of vegetation, so preventing timely planting of crops. In both states population growth and other demands on land, mean that the *jhum* cycle is becoming shorter and the system less productive and sustainable. This is visible in Nagaland with *jhum* cycles coming down to less than seven years in one-third of the villages, and in some places to only 5 to 6 years. As *jhum* cycles shorten, the soil does not get adequate time to recoup and a downward spiral of degradation, leading to lower yields, resulting in an expansion of *jhum* area to meet household needs, and even shorter cycles set in. The situation in Mizoram is not much better with *jhum* cycles reduced to 5 years in many villages.

2. Approach and logic behind project interventions

Support for traditional practices and culture

17. The design of this project is in consonance with the following nine principles of engagement espoused in the IFAD Policy on Engagement with Indigenous Peoples: (i) cultural heritage and identity; (ii) free, prior and informed consent; (iii) community driven development; (iv) equitable access to land and resources; (v) building on indigenous knowledge; (vi) environmental issues and climate change; (vii) access to markets; (viii) empowerment; and (ix) gender equality.

18. *Jhum* cultivation and the traditional foods that it produces are the cornerstones of the tribal *cultural heritage and identity* in Mizoram and Nagaland, and the project is focused on making this system more productive and sustainable. Village livestock also have an important role in traditions and food - often being consumed at festivals. The participatory planning process through elected Village Councils will ensure *free, prior and informed consent*, and a *community driven development* approach. There are no land tenure issues in Nagaland and households largely have *access to land resources for jhuming*. Three types of land ownership pattern exist in Nagaland. They include: (i) private lands which are used for both *jhuming* and also for terraced rice cultivation; (ii) clan lands which are owned by a clan collectively and used for fuel wood collection; and (iii) community lands owned collectively by the entire village which is

[6]Task Force on Shifting Cultivation, Ministry of Agriculture, New Delhi. Thoughts on Rural Development in North-East India in the 21st Century', Journal of North- Eastern Council, Shillong, May 1995
[7]Soil loss on steep slopes can be as high as 40.9 ton/ha, with corresponding loss of soil nutrients.https://www.researchgate.net/publication/258386412_Soil_Health_Management_under_Hill_Agroecosystem_of_North_East_India
[8] 75% of *jhum* work is done by women, NEPED (2007). Adding Value to Shifting Cultivation in Nagaland, India.

largely used as conservation forests and for fuel wood collection. There are generally three ways of *jhuming* on private lands excluding terrace rice fields: (i) *Jhum* land is in 8-15 blocks depending upon the *jhum* cycle and majority of the households own a parcel of land in each block and undertake *jhum* cultivation collectively; (ii) *jhum* land is in 8-15 blocks depending upon the *jhum* cycle and some (not majority) of the households own a parcel of land in each block and only those who own land undertake *jhum* cultivation in that *jhum* cycle while others do not take up *jhuming* or use land owned by others for *jhuming*; and (iii) *jhum* land are divided into blocks owned by individual households and the households practice *jhum* on their private land individually. The first scenario where *jhum* land is divided into 8-15 blocks in which majority of the members own land is the most common scenario. However, the land ownership is *de jure* as there are no land records and title documents. The mechanism for resolving disputes is vested with the village council *recognizing the cultural heritage and identity* of the indigenous people. Land in Mizoram is generally community managed with traditional free access to all households living in the villages. GoM holds these lands in trust on behalf of the community. On the recommendation of Village Councils, the state government is issuing title deeds for up to eight hectares to persons taking up settled agriculture, but this can effectively exclude households who lack the resources to invest in settled agriculture. FOCUS will address this issue to ensure *equitable access to land resources.*

19. *Building on indigenous knowledge* will be a key to improving both *jhum* cultivation and settled agriculture. There are a number of examples of traditional practices for more productive *jhum* management in Nagaland and Mizoram which provide the basis for the improved practices to be supported by FOCUS[9]. Wetland rice cultivation in Nagaland is based around the traditional *zabo* system of rainwater harvesting. Representation of women is already mandated by state policy and laws in the Village Council (VC), the principal local governance institution at the village level. Women are already fully involved in production and marketing of farm produce, as well as in credit group. The project will build on this to ensure *empowerment and gender equality*, with full participation in project institutions, capacity building for women, and reduction in their often excessive workload.

Improving *jhum* cultivation

20. The project will address the issues facing *jhum* cultivation through: (i) better *jhum* cultivation practices that will be both more productive and more sustainable, with an ecological balance being created; and (ii) gradually shifting *jhumia* households to sedentary farming. Both of these approaches, along with more productive wet rice fields, better plantation crops, improved livestock systems and increased off-farm income, will enhance farmer's income and reduce pressure on land and enhance adaptation to climate change. As farmers seek to increase their income via more market-orientated production, they will need support for marketing, including orientation of production towards what the market needs in terms of volume, quality and price.

21. More productive and sustainable *jhuming* ("better *jhum*") requires a judicious combination of modern scientific knowledge, agricultural technologies and practices in natural resource management with the traditional wisdom and adaptive practices of the highland communities. For instance, farmers already practice certain measures to conserve soils, such as placing logs along contours; and this can be augmented by a ground cover of nitrogen-fixing legumes to add fertility, conserve moisture and suppress weeds. Such measures will enable communities to cultivate a *jhum* field for a longer period, thereby restoring the *jhum* cycles to the earlier, sustainable levels of 15 to 20 years. A virtuous cycle can thus be created. Similarly, planting of carefully selected indigenous species of trees and shrubs on *jhum* fallows can reduce soil degradation and increase the biomass for soil fertility restoration and as firewood and timber. This, together with better planting material for *jhum* crops (and judicious introduction of new crops

[9] For example "The Alder Managers, the cultural ecology of a village in Nagaland", Malcolm Cairns, PhD thesis, 2007. Also see Building upon Traditional Agriculture in Nagaland, IIRR, 1999. In Mizoram there is the indigenous Changkham technology - see https://www.cinram.umn.edu/sites/cinram.umn.edu/files/purama_may_28_2015.pdf.

and varieties), will increase household food production and also enable additional sales of surplus cash crops.

22. The communitarian systems of resource governance embedded in the cultural ethos and customs of the highland communities in the two States provide an ideal setting to introduce such changes, and the project will support participatory land use planning in each village to enable communities to come up with a rational plan for equitable and sustainable use of natural resources, including reservation of steeper slopes for trees and the establishment of community conservation areas which will be reserved for traditional timber and non-timber forest products.

More productive and sustainable settled agriculture

23. As farmers become able to cultivate more productive *jhum* plots for a longer period, and as they invest in planting trees and soil conservation methods, they will be less inclined to shift their cultivation plots and *jhum* will evolve into sedentary farming. *Jhum* farming is highly labour intensive (and a real burden for women), and improvements to enhance the productivity and income generation from settled agricultural and livestock enterprises, will mean that households will earn considerably more from non-*jhum* activities and so reduce the amount of *jhum* they cultivate[10]. The design mission saw examples of this – such as a village in Nagaland that had given up *jhum* in favour of pig production. With only a limited area of terraces for wetland paddy cultivation (the topography means it is difficult to create more terraces), settled agriculture on sloping land means, to a large extent, a move to permanent tree and plantation crops which are produced for sale rather than meeting subsistence food production. The approach to support settled agriculture will be to improve the productivity of land and provide access to better planting materials (with village level plant nurseries and local seed systems) and other inputs, along with training. Where possible, intercropping with annual crops will contribute to food security and also ensure the continued production of the traditional crops that were previously grown in *jhum.*

24. Particular attention will be paid to the poorest households who may otherwise lack the resources to invest in settled agriculture. In Mizoram, where there is greater emphasis on conversion of *jhum* to settled agriculture, these households will be identified and provided with land titles for a specific area of *jhum* land for conversion to settled agriculture. The project will then provide support for these households for land development and the establishment of permanent crops. In Nagaland, where much less land has so far been converted, the project will support *jhum* conversion via physical and vegetative soil and water conservation methods (including narrow bench terraces for wet rice cultivation) to make sloping land agriculture productive and sustainable.

25. The technologies and methods used in production of these relatively new commercial crops are often out of date and crops are nowhere near as productive as they should be. Up to now the emphasis for government support has been on getting these crops established rather than on improving productivity. Standards of crop husbandry are often poor, and pests and diseases are not effectively controlled. In some cases farmers are using dangerous pesticides such as Furadan and DDT, and it may well be possible to reduce production costs as well as increase productivity.

26. Household food security will not be overlooked. There is a major opportunity to increase the productivity of wetland rice through integrated soil fertility management, improved irrigation, better seed and improved crop varieties (although care will be taken to preserve traditional varieties, many of which fetch premium prices in local markets). Pulses, oilseeds and maize can be sown after paddy has been harvested to utilise residual soil moisture and produce fodder. There are also opportunities to grow food crops, especially the local vegetables and grains found in traditional *jhum,* as intercrops in orchards and in homestead vegetable gardens.

Access to value chains

[10] Not only does settled agriculture require less labour, but a higher share of this labour comes from men.

27. This shift from subsistence to commercial production can result in a major increase in household income and improvement in living standards. However more engagement with markets has risks and needs to be accompanied by improved access to markets and better value chain management. If this does not happen, households may revert to *jhum* cultivation[11]. FOCUS value chain support will aim to address bottlenecks in the production and marketing system, to ensure that farmers are able to produce products for specific market opportunities. It will complement and support better *jhum* and the expansion of settled agriculture.

28. There is potential to capitalise on *jhum* products as being traditional varieties produced under natural conditions (they are effectively organic by default). Markets for such products exist within the state[12], however to access larger and more distant markets may need some form of certification - such as organic. FOCUS will enable partnerships with external agribusiness and trade organisations to enable access to such markets[13]. Processing of products adds value and can reduce the volume and increase shelf life to make access to external markets easier. There are opportunities to produce ground and packaged spices for local markets and semi-processed (cleaned, sliced and dried) spices for markets outside of the state (providing new opportunities for local youth). Drying is not so easy due to the amount of rainfall at the time of harvesting some crops, but there is potential to support the development of new approaches and drying technologies - which would also be useful for paddy and maize as well as spices.

29. FOCUS will develop value chains for selected products. A value chain study[14] carried out as part of the project design process, has identified a number of sub-sectors with potential for value chain interventions. These are spices (large cardamom, ginger, chilli, and turmeric), oranges, areca nut, bamboo, vegetables, and pineapple. Based on the potential benefits from improving market linkages, the project will initially focus on cardamom, ginger and chilli in Nagaland, and turmeric, ginger and chilli in Mizoram - once dried these are non-perishable, low volume and high value products that can withstand transport to more distant markets. At the same time, the project will provide marketing support for widely growing cash crops, such as ginger and oranges, as well as bamboo, including support for aggregation and producer organisations, and links with the private sector. The project will support the establishment of small marketing units in the Horticulture Department of Mizoram and in the State Agriculture Marketing Board of Nagaland to provide support on policy, market intelligence and planning issues.

30. Market access is also hindered by poor road infrastructure. In Nagaland the road network is not well developed, although around 80% of villages are connected by a road, only about 20% have an all-weather bitumen road. Many villages are connected by little more than a farm track, which gets very muddy and may be prone to landslides, making it impassable during the rains. In Mizoram almost all villages are now connected by all-weather roads, these tend to run along the ridges where settlements are located. Much of the land with good potential for the development of plantation and other permanent crops are in lower valleys, which lack any road access. In response to these needs in Mizoram the project will invest in access roads and in Nagaland the emphasis will be on building cross drain structures to make the roads usable during rainy season. In both states, funds will be provided to support innovative sub-projects to be implemented by selected government agencies, universities and NGOs.

Supporting village livestock development

[11] The design mission saw an example of this in Mizoram, where farmers had taken up grape cultivation for winemaking. This had done well while the state prohibited the sale of other alcoholic drinks, but relaxation of this policy to allow sales of liquor from outside of the state has meant a big drop in demand for locally produced wine. In Hnahlan village, the number of *jhum* households had fallen to only 40 (out of 730 in the village) with the growth in grape production. However, with problems in marketing wine over the last two years, the number of *jhum* households has now increased to 350. The village Grape Growers Association is actively looking for other opportunities such as grape juice, while some farmers are moving into oranges.

[12] http://www.in.undp.org/content/india/en/home/library/environment_energy/market-development-assessment-for-organic-agri-horticulture-prod/

[13] Contact has already been made with this spices initiative: https://www.idhsustainabletrade.com/sectors/spices/

[14] Value Chain Analysis Report for Mizoram and Nagaland, Sanjay Kumar Gupta (Value Chain Consultant)

31. The project will also support livestock production in project villages. Livestock are an integral part of rural livelihoods and traditions, and in both states most village households keep a few pigs and/or chickens. Cattle and goat rearing are also significant in some locations, and in some areas mithun (gayal - *Bosfrontalis*) are kept. Mithun have a special place in the culture of north-east India. Poultry contribute to household food security, while pigs represent a form of savings which can be sold for a significant lump sum (INR15,000 to INR 20,000) at times of need. Pigs and poultry are, to a large degree, fed on domestic food waste and crop by-products, but manufactured feeds are also used. Support for pigs will enable project interventions to reach most of the households in project villages.

32. The rationale to include livestock in the project is to increase household income, reduce dependence on *jhum* cultivation, utilize crop by-products, and to realize new opportunities through improved production technologies, both for livestock and feed production. Villages do not allow pigs to roam, and all pigs are housed, generating a significant volume of manure. However almost no use is made of pig manure and there is an opportunity to demonstrate improved composting systems, which households can be shown how to use to make compost that could be utilized in homestead vegetable gardens and on areas of permanent cropping.

33. The approach to livestock development will be based on the successful "Pashu Sakhi" model [15]. This involves having a trained Community Animal Health Worker (CAHW) in each village who will provide preventive health services and first aid, as well as providing advice and information on improved husbandry practices including feeding and housing. The CAHW will act as a link between livestock producers and the Department of Animal Husbandry – with the project also providing support to DAHV. CAHW will be expected to charge for their services and become self-sustaining during the project period. In each village, the CAHW would be selected from the village community and it is expected that a great majority of them would be women, particularly younger women.

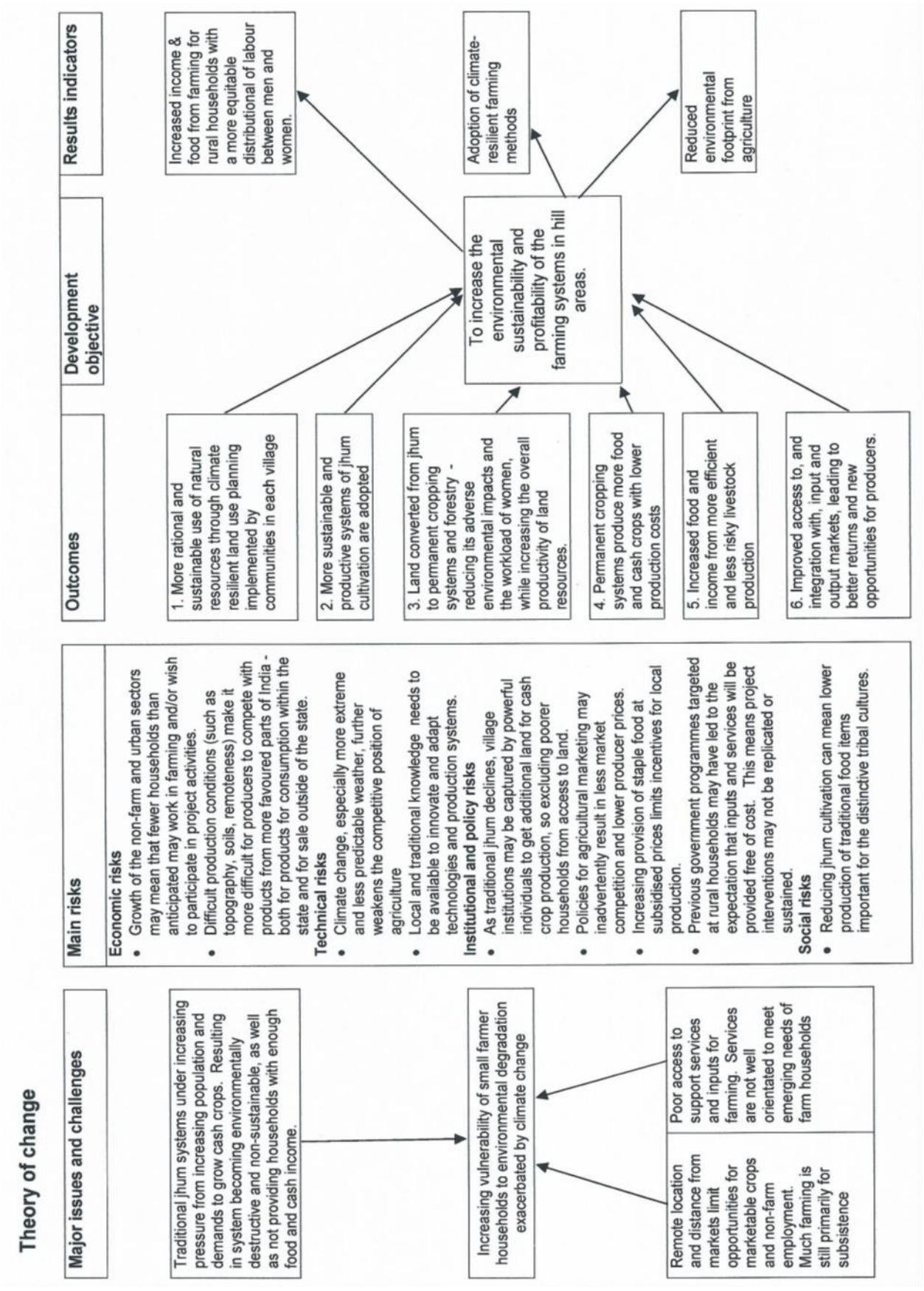
34. Although the project will focus primarily on pigs and to a lesser extent on poultry, there will also be opportunities in specific villages to undertake pilot initiatives to support goats and mithun, and to develop dairy production and marketing groups which the states may decide to scale up later. .

3. Theory of change

35. The governments of both states look upon this project as a means of developing and showcasing methodologies to foster climate resilient development of the traditional highland farming systems based on *jhum,* and to initiate value chains around selected spices, horticultural crops and livestock to diversify livelihoods and enhance incomes of their rural population.

36. The project's overall theory of change is shown in the figure below. This shows how the increasing pressure on *jhum* systems, combined with limited market opportunities and poor support services are increasing the vulnerability of small farmers to environmental degradation and climate change. The project will respond to these needs through: (i) promoting more rational systems for planning sustainable land use; (ii) more sustainable and productive *jhum* cultivation systems; (iii) land conversion from *jhum* to permanent cropping (reducing adverse environmental impacts and the workload for women); (iv) more productive permanent cropping systems for food and cash crops; (v) increased and less risky livestock production; and (vi) improved access to, and integration with, input and output markets leading to better returns and new opportunities for producers.

[15] The Pashu Sakhi model has been successfully used by IFAD-supported project in India (MPOWER, Tejaswini MP) as well as other development programmes. See www.goattrust.org for further details.


Theory of change
Major issues and challenges
Traditional jhum systems under increasing pressure from increasing population and demands to grow cash crops. Resulting in system becoming environmentally destructive and non-sustainable, as well as not providing households with enough food and cash income.
Increasing vulnerability of small farmer households to environmental degradation exacerbated by climate change
Remote location and distance from markets limit opportunities for marketable crops and non-farm employment. Much farming is still primarily for subsistence
Poor access to support services and inputs for farming. Services are not well orientated to meet emerging needs of farm households
Main risks
Economic risks
• Growth of the non-farm and urban sectors may mean that fewer households than anticipated may work in farming and/or wish to participate in project activities.
• Difficult production conditions (such as topography, soils, remoteness) make it more difficult for producers to compete with products from more favoured parts of India - both for products for consumption within the state and for sale outside of the state.
Technical risks
• Climate change, especially more extreme and less predictable weather, further weakens the competitive position of agriculture
• Local and traditional knowledge needs to be available to innovate and adapt technologies and production systems.
Institutional and policy risks
• As traditional jhum declines, village institutions may be captured by powerful individuals to get additional land for cash crop production, so excluding poorer households from access to land.
• Policies for agricultural marketing may inadvertently result in less market competition and lower producer prices.
• Increasing provision of staple food at subsidised prices limits incentives for local production.
• Previous government programmes targeted at rural households may have led to the expectation that inputs and services will be provided free of cost. This means project interventions may not be replicated or sustained.
Social risks
• Reducing jhum cultivation can mean lower production of traditional food items important for the distinctive tribal cultures.
Outcomes
1. More rational and sustainable use of natural resources through climate resilient land use planning implemented by communities in each village
2. More sustainable and productive systems of jhum cultivation are adopted
3. Land converted from jhum to permanent cropping systems and forestry - reducing its adverse environmental impacts and the workload of women, while increasing the overall productivity of land resources.
4. Permanent cropping systems produce more food and cash crops with lower production costs
5. Increased food and income from more efficient and less risky livestock production
6. Improved access to, and integration with, input and output markets, leading to better returns and new opportunities for producers.
Development objective
To increase the environmental sustainability and profitability of the farming systems in hill areas.
Results indicators
Increased income & food from farming for rural households with a more equitable distributional of labour between men and women.
Adoption of climate-resilient farming methods
Reduced environmental footprint from agriculture

II. Project description

A. Project Area and Target Groups

37. **Project area and target group:** The criteria used by the respective states to identify the districts where the project would be implemented are (i) high prevalence of shifting cultivation (ii) prevention of an overlap with another large donor funded project and (iii) focusing only on hill states and not the plains. Accordingly, in Nagaland, the project would focus on eight out of 11 districts namely, Mon, Longleng, Zunheboto, Wokha, Kiphire, Phek, Mokokchung and Kohima. Dimapur district is not being considered as it is largely situated in the plains. Tuensang and Peren districts are not included as these are covered under the World Bank supported North East Rural Livelihoods Programme (NERLP). The eight selected districts have approximately 200,000[16] rural households.

38. In Mizoram, the project would be implemented in the four out of eight districts namely, Champhai, Mamit, Serchhip and Kolasib. The remaining four districts of the state, namely Aizawl, Lunglei, Lawngtlai and Saiha, have not been considered due to the on-going implementation of other major projects. The four selected districts have approximately 83,254[17] households.

39. **The target group:** The population of the state of Nagaland is largely tribal[18] with about 16 recognized tribes. Mizoram is also a predominantly tribal state[19]; majority of the population are Mizo, but there are also some Maras, Chakmas, Riangs and Bru. The project's target group would be entirely tribal and would include all farmers in the project villages who are dependent on *jhum* cultivation. As the project would involve participatory land use planning for the entire village and seek to create community conserved areas and firewood forests besides *jhum* improvement, low land rice cultivation, upland orchard/plantation crop cultivation and value chain development, the project will largely target all farming households in selected villages.

40. **Targeting Approach:** The project would adopt a two stage targeting strategy. First, the project would adopt geographic targeting by excluding the districts with other major development projects. The project area in a district will be selected primarily based on high levels of *jhum* cultivation with an aim to increase the *jhum* cycle and at the same time increase the number of years of *jhum* cultivation to make a gradual shift towards settled agriculture. Second, the project would adopt a social targeting approach by excluding the households with permanent government jobs. The target group categories would therefore include all tribal households involved in *jhum* farming and those unable to take up *jhum* cultivation on account of labour shortages and other vulnerable households having persons with disability and other challenges. Women are the main contributors to both agriculture and livestock activities and therefore gender would be mainstreamed into the project activities so that women have access and control over resources both in terms of targeting of project activities and also their participation in various committees of the project.

41. Similarly youth would be engaged in various project activities which include training them in pig value chain which is a low risk investment and providing them with capital, and engaging them as the main grassroots level project facilitators in the form of Lead Farmers, Community Resource Persons (CRPs) and CAHWs. Youth associations in both the states would be supported to participate in the innovation fund related activities in both the states.

42. In Nagaland, the project would select a cluster villages in each district depending on the size of the district after excluding the clusters allocated the proposed JICA project. A cluster approach would be followed in order to be ensure ease of delivery of project services and to promote economies of scale in

[16] 196,827 as per Census 2011
[17] As per state statistics assuming growth rate of 13.5% between the 2011 census and 2017.
[18] 89% in Nagaland as per 2001 Census
[19] 94% in Mizoram as per 2001 census

selected commodities to facilitate aggregation of both inputs and output for enhancing marketability to outside markets and also reduction in transaction costs. The main village clusters selection criteria include: (i) at least 75% of the villages with high levels of *jhum* cultivation with more than 60% of the households undertaking *jhum* cultivation; (ii) more than 50% of the *jhum* cultivating villages have a *jhum* cycle of eight years and less; (iii) one cluster per district covering the blocks falling in the cluster in their entirety to ensure that the cluster boundary is in consonance with the administrative boundaries for ease of management; ((iv) existence of access roads; and (v) potential for cultivating high value crops on *jhum* land. In total the project would cover a total of 650 villages (69% of all villages in the eight districts with approximately 137,000 rural households) - covering a population of 685,000 persons. A saturation approach will be followed within each cluster to ensure comprehensive land use planning for the entire village landscape.

43. In Mizoram, the project would cover all the villages of the four project districts. A saturation approach will be followed to ensure comprehensive land use planning for the entire village landscape and provision of support services to address the needs of 77% of the households who are involved in farm activities. In total the project would cover all 272 villages in the four project districts and would support 64,500 households comprising a population of 322,500 persons in these districts.

44. Based on the profile of the households activities related *jhum* improvement, settled agriculture, value chains and livestock development would be targeted. In case of land use planning, village/community forest conservation marketing support and market access promotion, the project would generate benefits to all the households in project.

45. **Scaling up:** The project will scale up a number of current and recent efforts for *jhum* improvement and conversion. In Nagaland these are: (i) NEPED[20], funded by the India-Canada Environmental Facility (ICEF) during1995-2006; and (ii) Sustainable Land and Ecosystem Management in shifting cultivation areas of Nagaland for ecological and livelihood security (SLEM) project funded by UNDP-GEF. In Mizoram the New Land Use Policy (NLUP) promotes sedentary agriculture. Additionally, the North Eastern Region Community Resource Management Project for Upland Areas (NERCORMP), a project supported by IFAD in Manipur, Meghalaya and the hill districts of Assam demonstrated community planning and implementation for more sustainable land use systems. Details of lessons learned from these projects can be found in the Appendices 3 and 12.

46. Regarding livestock, the project will build on lessons from pig production interventions in the north-east, especially in Nagaland, sponsored by Tata Trusts with support from ILRI. These include improved feeding systems, as well as low cost pig housing and breed improvement. Other innovations that could be scaled up include the use of azolla as a protein supplement, silage from sweet potato plants (an idea from Nagaland), and chopped and fermented banana plant stalks (an idea from Mizoram). Mithun development can be based on the approach adopted in Nagaland by Entrepreneurs Associates (EA), an NGO, with funding from Tata Trusts. This involves fencing of forest areas for grazing and the introduction of improved husbandry practices.

B. Development objective and impact indicators

47. The overall goal of the project is to increase household agricultural income of 137,000 rural highland households in Nagaland and 64,500 households in Mizoram and to enhance their resilience to climate change. This goal would be achieved through the development objective of increasing the environmental sustainability and profitability of farming systems practiced by highland farmers. The project will strengthen the capacities of state agencies and community based institutions to develop and

[20] Implemented in two phases, the first phase (1995-2001) was called Nagaland Environment Protection and Economic Development through People's Action and the second phase (2001-06) was called Nagaland Empowerment of People through Economic Development. https://www.nagaland.gov.in//Nagaland/GovernmentAndPrivateBodies/Department_of_NEPED.html

implement climate resilient resource management systems, soil and water conservation, *jhum* improvement, existing settled agriculture improvement, diversification of land use/farming systems, crop productivity enhancement and development of climate resilient and equitable farm based value chains.

48. Key combined indicators at the goal level will include: (i) 70% of the *jhum* households farming for three or more years on the single plot; and (ii) 75% of the households (151,125 households) reporting increase of more than 100% in household income. Development objective level indicators to be measured include: (i) Soil carbon percentage of at least 4% on *jhum* land; (ii) Real increase in net annual farm income (in 2017 prices) to INR 4,754.6 million; and (iii) number of trees per ha of *jhum* land increased to 20. These require data to be collected on an annual basis. The tracking of results from outputs to outcomes and impact would enable the project to attribute the results to project interventions and generate useful lessons on what worked best and what did not work and why.

C. Outcomes/Components - Nagaland

1. Outcomes and outputs

49. One of the most important outcomes of this project will be the gradual transition from current form of *jhum* cultivation to more sedentary cultivation practice along with adoption of climate resilient farming practices and a resultant increase in net farm income. The major outcomes of this project will include: (i) 137,000 households reporting adoption of environment friendly sustainable and climate resilient technologies (use of agro-forestry, soil and water conservation, improved planting material and integration with livestock; (iii) gross returns from spices increased to INR 669.1 million; and (iv) gross returns from livestock increased to INR 316.5 million.

50. The major outputs of this project will include (i) 100% of the villages (650) with completed participatory land use plans; (ii) 182,000 farmers trained on better *jhum* and fallow management; (iii) 78,000 farmers trained on settled agriculture; (iv) 47,450 ha under SWC by *jhum*, fallow and settled agriculture; (v) 13,000 ha under community conservation areas; (vi) 8,000 households participating in organized spice value chain; (vii) 30,000 households benefitting from pig rearing; (viii) 75.000 households reporting improved access to markets; and (ix) 400 km of farm link road improved.

2. Components

51. The project will have three components: (i) Improved *jhum* management; (ii) Value chain and market access; and (iii) Project management and knowledge services.

i. Component 1: Improved *Jhum* Management

52. Agriculture in Nagaland is practiced on hill slopes and valley lands. Normally farmers have been farming on the slopes of the hills by clearing forests and preparing the cleared land for rain-fed mixed cropping systems for few years, generally for 1-2 years. They leave the land as fallows and return after 8-10 years to cultivate it the same way for another 1-2 years. They also cultivate wet land rice on the terraced lowlands, called terraced rice cultivation (TRC) year after year. The *jhum* cycle in Nagaland has been decreasing and in some places it has come down to just 5-6 years.

53. The project intends to introduce agricultural interventions by taking into account climate change and its impact on food production and livelihoods and promote proven and emerging climate resilient best practices. These include: (i) use of remote sensing capacities to facilitate Village Councils to identify lands appropriate for cultivation and to avoid using steeply sloping lands for *jhum* cultivation, as is prevalent currently; (ii) introduction of fertility management practices using both biological measures and also possibly through the introduction of “nano-nutrient delivery systems”; (iii) use of traditional knowledge in erosion control for ensuring extension of cultivation period from currently one year to at least three years; and (iv) use of better agronomic practices, introduction of agro-forestry, linear planting, cereal and pulse

cultivation to build synergy between crops to maintain soil health on one hand and improved farmer income on the other.

Sub-component 1.1 – Better *jhum* and conservation

54. Capacity building: The project will train PMU staff who in turn will train all the district level /Block/Circle level staff to explain the project concept, project components and step-wise implementation modalities including the process of village level micro-plan preparation. Village level workers will be trained thereafter. The project will initially conduct a workshop at the district level by inviting all the Chairpersons of Village Councils (VCs) and Secretaries of *Jhum* Resource Management Committee (JRMCs) in the project area to orient them on project goal and activities with deliberations on the impact of the project. Subsequently a meeting of the Village Assembly will be held to deliberate on village's interest to participate in the project with view to comply with free prior informed consent requirements. Based on the willingness of the community, the project implementation will proceed. The project will identify a Lead Farmer from each village and train them in better agronomic practices. These Lead Farmers will be the focal points for implementing village level activities and will be supported by Block/Circle level line department officers and village level workers.

55. Land use planning: The project will engage Nagaland GIS and Remote Sensing Application Centre (NaRSAC) to assist in the preparation of land use maps and land suitability maps for the eight project districts. A PLUP for each village will be finalised after validation from the Village Council. Based on the PLUP and also land suitability classification maps, Village Councils will be trained to: (i) identify lands suitable for growing various crops based on the slope, altitude and soil texture, and to allocate land based on this scientific information for *jhum*, settled agriculture and community forest conservation areas; (ii) fix boundaries for land allocated for settled agriculture; and (iii) decide on the crops to be cultivated to ensure development of economies of scale required for accessing markets.

56. Better *Jhum*: *Jhum* system has two phases: (i) crop production phase; and (ii) fallow phase. The fallow phase is also known as *jhum* cycle in Nagaland. The duration of both, cultivated and *jhum* fallow varies according to the fertility and productivity status of the land. Usually in *jhum* system, many crops of different duration, such as rice, chillies, ginger, vegetables, etc. are grown in the same piece of land and in an inter-spread (non-linear) manner. The project will focus on improving current *jhum* and improved management of *jhum* fallows, which will give two-fold results. First, it will increase the productivity and second it will lengthen *jhum* cycle, resulting in increased fallows. The project will promote Farmer Interest Groups (FIGs) to take up activities related to current *jhum* improvement and fallow *jhum* management. Each FIG will comprise of 10-20 farmers and each member of the FIG will be connected to 20 *jhum* families and these 20 households will be the associates of FIG members. The project will train FIG members and provide project support for implementation of activities.

57. *Current Jhum Improvement:* FIGs comprising *jhum* farmers will be encouraged to earmark the ridge and steep slopes for permanent tree farming, and side slopes for crop farming along with trees, including fruit trees. All *jhum* farmers will be covered and each *jhum* farmer will get support for about 25% of their *jhum* plot (estimated at 0.13 ha per *jhum* farmer). The project will support the construction of water harvesting ponds, low cost bunds, and trenches that will improve the availability of moisture. This will be complemented by planting of the leguminous crops on contour bunds (perpendicular to the incline), such as, Leucaena (*Leucaena leucocephala)*, Alder (*Alnus nepalensis),* Neel (*Indigo fertinctoria), perennial pigeon pea* and Gliricidia (*Gliricidia sepium)*.In current *jhum* fields, wild sunflower (*Tithonia diversifolia*) and stylo (*Stylosanthes hamata*) may also be grown and chopped off before sowing of the main crops.[21] The project will also support introduction of nano-nutrient delivery systems. Crops/commodities such as, rice, maize, sesame, cowpea, vegetables and other pulses will also be promoted for consumption

[21]B. Jama, C. A. Palm, R.J. Buresh, A. Niang, C. Gachengo, G. Nziguheba, and B. Amadalo (2000). Tithoniadiversifolia as a green manure for soil fertility improvement in western Kenya: A review. Agroforestry Systems, 49: 201-221

purposes to add to dietary diversity and to improve nutritional security in addition to fodder trees, tubers, etc, for use as animal fodder and feed.

58. The project will promote linear manner planting (proper row and plant spacing) to increase the possibility of using farm implements and to control weed growth. Mulching using local materials, use of nano-nutrients, planting leguminous plants on the upper edge of the bunds and cereals on the lower edge of the bund to improve farm productivity and income of the farmers in the short and medium term will be promoted. These interventions are climate resilient as there will be reduction in erosion and improved fertility reducing the need to slash and burn and shift to another *jhum* plot. The project support will be spread over three years to ensure continued cultivation on the same plot with better practices. The project will support current *jhum* improvement in a total of 65,000 ha with direct support in 11,700 ha covering 91,000 households.

59. *Fallow Jhum Management:* Fallow *jhum* management gives benefits for both, in-situ and downstream areas. The project will support low cost contour bunding, trenching, creating terraces using vegetative strips of fast growing plant/tree species and grasses, such as *Leucaena, Gliricidia, Alder, Indigo/ neel, perennial pigeon pea* and vetiver. The project will support seeding the fallows with both, annual and perennial legume cover crops, such as the *perennial pigeon pea*, wild sunflower (*Tithonia diversifolia),Sesbania species (speciosa and aculeate)*, *Trifolium alexandrinum*, *Indigofertinctoria,* stylo (*Stylosanthes hamata*),*etc.* The project will support fallow *jhum* management in all project villages covering a total of 65,000 ha, out of which direct project support will be for 16,250 ha covering some 91,000 households. Each household will get support for about 0.18 ha of fallow *jhum*.

60. Community Conservation Area: The community forests remain the vital community asset for protecting water sources, supply of non-timber forest produce (NTFP), and controlling forest fires. The project will fund contour bunding, contour trenching and water harvesting structures and biological measures, including seeding the area with leguminous plants, such as the wild sunflower, glyricidia and stylo, and perennial pigeon pea. Protection of water sources, raising nurseries and supplying planting material of locally preferred species such as, Tree bean (*Parkia timoriana, Parkia speciosa,* Badrang / Indian Pepper *(Xanthozylum rhetsa, Champa (Michella champaka)*, Gamar (*Gmelina arborea*), Cotton tree (*Bombax ceiba)*, etc. Non-structural vegetative measures will also be promoted to recharge springs after mapping of the geology, vegetation and data on water availability.[22] The project will support this activity in 20 ha of community forest per village covering in total 13,000 ha.

Sub-component 1.2 – Support to Settled Agriculture

61. The project does not directly promote settled agriculture. Many farmers have made the transition from *jhum* only system to *jhum* and settled agriculture mixed system. The project will support two aspects related to settled agriculture: (i) the existing terrace rice cultivation; and (ii) orchards and plantations in sloping uplands.

62. Support to existing terrace rice cultivation*:* The project will support farmers undertaking terraced rice cultivation to increase soil fertility, productivity and cropping intensity, and stabilize productivity. 1-2 FIGs in each village, comprising of about 10-20 members will be established and supported by the selected Lead Farmer and trained on better agro-techniques. Farmers will be encouraged to grow *Sesbaniarostrata*, and *azolla* as green manure before transplanting of paddy in the lowland rice fields.[23]The project will select short duration improved local paddy varieties in consultation with

[22] ICIMOD -2016- Spring recharge interventions in Nepal
[23] S.Kannaiyanand K. Kumar (2005). Azolla Biofertilizer for Sustainable Rice Production. https://books.google.co.in/books?isbn=8170353564

KVKs/ATARI. The possibility of two crops of decent productivity with first crop of low land short duration rice and a second crop of pulses/ginger/ onion after rice cultivation will be explored.[24]

63. The project will also support sustained low cost water supply, better seeds and better practices (seed selection, management and replacement, row planting, and crop rotation) in terraced lands. Introduction of ducks or fish into the rice cultivation areas[25], development of supplementary irrigation system such as lift irrigation, and water harvesting ponds for rice cultivation and also micro-irrigation will be supported. The project will support 39,000 households covering 9,750 ha. Each household will get support for 0.25 Ha of terrace rice cultivation.

64. Support for upland settled agriculture: In Nagaland, transition from *jhum* to settled agriculture is taking place on medium slopes situated close to the village. These are being converted into vegetable gardening, fruit orchards and spice cultivation plots. In such villages, the project will establish a FIG comprising of about 10-20 members with support from the Lead Farmer. Each FIG member will be linked to 20 associate members. The FIG members will be provided training on soil and water conservation, improved farming systems and better agro-techniques. The project will also support soil and water conservation works such as contour bunding and trenching as demonstrations. Construction of water harvesting ponds will be taken up, wherever feasible to provide for protective irrigation.

65. The project will support construction of low cost terraces wherever feasible.[26] Better agronomic practices will be supported which includes compost pits, *azolla* pits, and legume, fodder trees and multi-purpose tree planting, such as *Buteamonosperma, Albizialebbec, and Gliricidia* on bunds. The treated area will be utilized for planting high value trees like *Meliacomposita, Alnusnepalensis,* and other locally available tree crops.[27] Commercially important trees like walnut (*Juglans regia*), chestnut (*Castanea dentata*), bay leaf (*Laurus Nobilis*), cinnamon (*Cinnamomum tamala*), large cardamom (Amomum Sabulatom) and chillies (*Capsicum chinense* and *Capsicum frutescens)* and other species will be supported.[28] The project will support *transition to settled agriculture covering 9,750 ha covering 39,000 households.* Each selected household will get support for 0.25 Ha of upland settled agriculture.

ii. Component 2: Value Chain and Market Access

66. *Jhum* improvement, settled agriculture and value chain and market access are clearly interlinked. Many farmers have both *jhum* and settled agriculture (mainly plantations, spice cultivation, and lowland rice). The shift to settled agriculture is on account of labour shortage for taking up labour intensive *jhum* cultivation; disinterest of youth to take up *jhum* cultivation and also the need to cultivate high value crops to generate cash income. The beneficiaries under Value Chain and Market access will be a subset of beneficiaries under better *jhum* and settled agriculture. Livestock support will also target a subset farmers undertaking *jhum* to increase their income so as to reduce their dependence on *jhum*.

67. A cluster approach for promotion of select value chain commodities will be adopted wherein on an average four villages form a cluster, which ensures economies of scale in terms availability of a minimum truck load of produce for marketing players to get into business partnership with value chain farmers.

[24] Singh V P, Singh RK, Sastri ASRAS, Baghel SS, Chaudhary JL.1999. Rice growing environments in Eastern India: An agro-climatic analysis. Indira Gandhi Agril. Univ. and the International Rice Research Institute. Pub. Pp 76.
[25] Singh VP, Early AC, Wickham TH. 1979. Rice agronomy in relation to rice-cum-fish culture. Pp.15-36. In Proc. International conference on integrated systems. ICLARM / SEARCA, Manila, Philippines.
[26] Early AC, Singh VP, Tabbal DF, Wickham TH. 1979. Land evaluation criteria for irrigated lowland rice. Report of an expert consultation. In Land Evaluation Criteria for Irrigation. World Soil Resources. Food and Agriculture Organization of the United Nations, Rome, Italy, 50:114-144.
[27] V.P. Singh, (2007). Agro- horti- silviculture in hill slopes for enhanced and sustained production and hill conservation. Pp 70-73 In: Islam, Z., Hossain, M., Paris, T., Hardy, B., and Gorsuch, J. (Eds) Technologies for Improving Rural Livelihoods in Rainfed Systems in South Asia. IRRI, Los Banos, Laguna, Philippines. Pp 124.
[28] A.K. Singh, G.C. Munda, S.V. Ngachan, A.S. Panwar, P.K. Ghosh, Anup Das, D.P. Patel, B.U. Choudhury, A.K. Tripathi and K.P. Mohapatra. 2012.

Clusters ensure collective procurement of agriculture inputs and business development services i.e. transportation and logistics services to make these service economical.

Sub-component 2.1 – Value chain development:

68. Production Support: The project will support activities for enhancing production of Naga-chillies, large cardamom and ginger using a cluster approach. The clusters / villages will be selected based on the suitability (soil, climate, water, etc.) of soils and slopes, interest and ability of farmers to invest in labour to cultivate selected crops and ability to allocate a separate plot of about 0.5 ha either in current *jhum* or in fallow *jhum* to grow only the selected crops. Once the clusters are identified, the project will identify and train two CRPs for each cluster in various aspects of nursery management, planting material selection and in micro-propagation techniques for rapid multiplication of quality planting material and package of practices. The project will identify and support 100 CRPs in the project districts with about 2 CRPs per cluster.

69. The project will promote FIGs comprising 20 farmers per group in respect of three spice crops namely Naga-chill, ginger and cardamom in 50 clusters covering about 4 villages per cluster. The FIG members will be provided access to improved planting material of Naga-chilli, ginger and cardamom, and bio-fungicide such as Trichoderma for cardamom and trained in better package of practices which will help in increasing survival of plants and better application of nutrients (organic) and management of pests and diseases.[29] In total about 400 FIGs will be supported. CRPs will support FIGs by providing quality planting materials. The project in total intends to support 8,000 households and expand production in 1,000 ha for Naga-chilli, 1,000 ha for ginger and 2,000 ha for cardamom.

70. The project plans to introduce an innovative modality for digital delivery of extension and monitoring of production practices, input use and expected production. This can be accessed by market players across the world to support their procurement decisions by identifying number of farmers cultivating a particular crop, quantity of produce expected, and package of practices used. This would reduce the need for face to face interaction required to access market players, increase the reliability quotient and enable the farmers to make a quick progression into organic certification.

71. Marketing Support: The major constraints to value chain development of traditional spice, and agricultural and horticultural crops are mainly issues related to marketing. They include: (i) limited aggregation for achieving economies of scale required for cost effective collection, transportation and storage; (ii) insufficient investment in post-harvest management practices, including primary processing to add value and also to reduce volume for transportation; (iii) inadequate data on marketable quantity to feed into supply chain, (iv) inadequate linkage with premium markets on account of issues related compliance to certification and quality standards; and (iv) limited access to market players from outside the state.[30]

72. The project's marketing efforts will be directed towards both the project promoted commodities (Naga-chilli, ginger and Cardamom) and also other commodities and crops promoted under *jhum* improvement and settled agriculture, including commodities such as turmeric, orange, passion fruit and pineapple, which are grown in sufficient quantities for market entry to be viable. The project will support aggregation and primary processing and will support establishment of market linkages, common facility ecntres and collection centres. In addition, the project will also support extraction of oleoresins, capsanoids, natural plant based dyes, etc. The project will support value addition to bamboo in terms of manufacture of handicrafts and incense sticks and partial processing such as flattening including better designs.

[29] ATMA and Horticulture Mission for NE states and Himalayas- http://tmnehs.gov.in)
[30] Livelihood based Agri-business and Market studies for North East Rural Livelihoods Project, MART, 2011

73. In order to facilitate production based on market needs and to identify market linkage partners, the project will support establishment of a marketing unit within the State Agriculture Marketing Board. The marketing unit will establish contacts with agencies, such as Sresta Organics, Patanjali, and other agencies to develop contract farming modalities for the FIGs promoted under the project. Patanjali has shown interest to buy dried turmeric, tulsi, aloe vera, etc. The marketing unit will analyse all market interests and explore the possibility of entering into contract farming arrangements. Collaboration with IDH India and its Sustainable Spice Initiative will be formalized to attract private sector participation into marketing of farm produce. The project will support construction of common facility /collection centres, participation in trade fairs and exhibitions, and will also organize buyer-seller meets. The project will also prepare plans to attract private sector rom outside the state to establish processing and value addition of select crops. The project will also support progression of farmers into organic production.

74. Livestock support services: The project will train a CAHW, in all the 650 project villages. With women having a major role in livestock, about 50% CAHWs will be women and remaining will be men folk committed to serve the community and stay in the village. The project envisages immunizing the pigs and poultry in the project area and the pigs will also be de-wormed on a limited scale during the first three years of the project. The project will focus mainly on the pig sub-sector by developing support services related to breed improvement, feed improvement, and animal health. The project will demonstrate and promote feed crops cultivation (e.g. sweet potato, tapioca, colocasia, cow-pea, maize, azolla, etc.) in the backyard and create awareness among the farmers about the nutrient requirement of pigs. The project will encourage existing retail outlets to sell fish meal, soya bean meal and oil cakes and mineral and vitamin mixture. Small feed grinding units will be established to utilise locally produced maize, dried cassava, etc.

75. The project will support establishment of 148 small pig breeding units (6:1 unit) to be operated by progressive/ experienced farmers, distribution of about 30,000 improved piglets for individual households on 50% cost basis, and demonstration of improved pig housing and compost production from pig manure. Existing artificial insemination services for pigs will be expanded by strengthening the existing boar stations under DAHV. The project will aim to raise awareness of the quality threats among the pig slaughterers, retailers and transporters through information campaign and imparting training on hygienic slaughtering including provision of slaughter slabs, handling, displaying and selling of pork.

76. Innovation Fund: FOCUS will fund the testing and dissemination of innovative technologies and approaches to improving settled agriculture, livestock and marketing. Several organizations, such as Entrepreneurs Associates have started training youth and providing them with credit for starting enterprise and Mithun rearing as a biodiversity initiative.[31] Similarly, The Green Caravan has started aggregation of local produce and marketing these products outside the state and also value addition of local pork through smoking to market outside the state.[32] These, and other similar efforts need a funding mechanism for expansion. Fragmented pockets of production, high cost of production, limited value addition efforts and limited aggregation efforts to ascertain volume and transaction costs to test market viability constrain production scaling up and higher value realization. Innovative aggregation and marketing efforts need funding support. In order to address these issues, the project will set up an innovation fund that will provide flexibility to fund any emerging innovation.

77. Development of entrepreneurial skills of youth remains a challenge. Skill development and financing challenges mainly constrain young entrepreneurs.[33]The project will prioritize the needs of youth while approving sub-projects funded by the Innovation Fund. Sub-projects of youth taking up enterprise

[31] https://www.eanagaland.com/
[32] https://www.facebook.com/TheGreenCaravanNagaland/
[33] Rural Entrepreneurship in India: Challenge and Problems; Brijesh Patel, Kirit Chavda, G. H. Patel Institute of Business Management, Vallabh Vidhyanagar Sardar Patel University, Gujarat, India

related to aggregation and value addition will be funded on a priority and capacity building aspects will be built into this. In addition, the project will actively identify agencies that have capacity to submit sub-projects that train youth in specific vocations and provide funding for enterprise establishment coupled with technical backstopping. Such agencies will be funded using Innovation Fund.

Sub-component 2.2 - Market access infrastructure

78. A major constraint for the development of market-orientated agriculture is poor road access to production areas. Although almost all villages are now connected by all-weather roads, these tend to run along the ridges where settlements are located. Much of the land with good potential for the development of plantation and other permanent crops are in valley bottoms and on the lesser steep-slopes. However, such areas often have no road access, making it difficult to supply inputs and extract crops. Farm link roads are therefore a major priority of the government. However, many of the roads that have been built, either by DoA or using village labour funded via MGNREGS have been constructed without proper survey and design resulting in poor quality, high gradient and largely unpaved; they are not resilient to intense monsoon seasons or extreme events exacerbated by climate change.

79. IFAD loan funds In Nagaland will be only allocated for construction of critical gaps in the existing road infrastructure such as bridges, culverts and other cross drainage structure. The plan is to construct a total of around 200 km of earth road (with proper side slopes and cross drainage and base course) using convergence funds (MGNREGS). In addition, the project will build 600 cross drainage structure using IFAD funds which will result in improvements to 200 km of existing gravel roads.

iii. Component 3: Project Management and Knowledge Services

80. A new society has been established headed by the Chief Secretary which will be the lead implementing agency. The APC will chair the Project Management Committee and has been appointed as the Mission Director. An Indian Administrative Services officer has been appointed as the Chief Executive Officer, who will be the Secretary of the society. The details regarding project management, implementation arrangements are described in Appendix 5.

81. Knowledge Management: The project will develop a Knowledge Management strategy and action plan for knowledge generation and dissemination. This will include internal learning through regular progress review meetings, and participatory M&E at the community level. Information will be shared at the village level. Knowledge will also be shared with external stakeholders and the wider development community through generation of knowledge products. A project website will be established as a knowledge sharing tool, with information on good practices and innovations shared with NITI Ayog, DEA and Ministry of DoNER, and also displayed on the IFAD Asia website.

82. Capacity building and knowledge generation: The project will be working on both *jhum* improvement and settled agriculture. In order to generate concurrent impact data and to demonstrate the effectiveness of these approaches, the project will engage the ICAR, Regional Centre in Barapani and the Regional Agriculture Technology Application Research Institute (ATARI). Both these institutions come under the Deputy Director General (Extension), ICAR, GoI. An agreement will be signed between GoN and ICAR detailing the terms of engagement.

83. The project with assistance from ICAR will aim to be a platform for learning for the other states in NER wherever *jhum* is being practiced. The project has allocated USD 260,000 to generate knowledge on the evolution and sustainability of upland farming systems and their capacity to respond to climate change.

84. Technical Assistance: IFAD will provide a grant of about USD 550,000 to GoN for capacity building. Capacity building will cover *jhum* improvement, settled agriculture, value chain development and monitoring and evaluation. The major activities envisaged under technical assistance includes; (i) preparation of training materials and conducting training of all Veterinary Doctors in animal production

related issues covering pigs, cattle, goats and poultry; (ii) preparation of training materials for establishment of private nurseries for nut trees, timber trees, and fuel wood trees and conducting TOT for Agriculture Research Station staff on nursery management; (iii) preparation of training materials for spice production and training of trainers; (iv) engagement of specialist consultants in Highland farming systems, Agroforestry and Soil and Water Conservation, and for ongoing technical support to the PMU; (v) prepare a long term weather data based agro-climatic atlas for Nagaland; (vi) development of a computerised MIS and training of MIS staff in its management; and (vii) support for project monitoring and evaluation including assessment of outcomes and impact. GoN will engage Food and Agriculture Organization of the United Nations (FAO) to implement these activities. FAO will also be requested to contribute from its own resources into this technical assistance sub-project. A technical assistance agreement will be signed between GoN and FAO detailing the terms of this engagement.

D. Outcomes/Components - Mizoram

1. Outcomes and outputs

85. One of the most important outcomes of this project will be the gradual transition from current form of *jhum* cultivation to more sedentary cultivation practice along with adoption of climate resilient farming practices and a resultant increase in net farm income. The major outcomes of this project will include: (i) 64,500 households reporting adoption of environment friendly sustainable and climate resilient technologies (use of agro-forestry, soil and water conservation, improved planting material and integration with livestock; (iii) Gross returns from spices increased to INR 277 million; and (iv) Gross returns from livestock increased to INR 267.9 million.

86. The major outputs of this project will include (i) 100% of the villages (272) with completed participatory land use plans; (ii) 108,800 farmers trained on better *jhum* and fallow management; (ii) 27,200 farmers trained on settled agriculture; (iii) 40,800 ha under SWC by *jhum*, fallow and settled agriculture; (iv) 5,440 ha under community conservation areas; (v) 10,880 households benefitting from landless support; (vi) 7,200 households participating in organized spice value chain; (vii) 25,000 households benefitting from pig rearing; (viii) 48,000 households reporting improved access to markets; and (ix)) 400 km of farm link road rehabilitated.

2. Components

87. The project will have three components: (i) Improved *jhum* management; (ii) Value chain and market access; and (iii) Project management and knowledge services.

i. Component 1: Improved *Jhum* Management

88. Agriculture in Mizoram state is practised on hill slopes and terraced low lands. The forest cover has been reduced from over 90% to 88% during the last 25 years due to the practice of shifting cultivation (locally called *jhum*). The quality of forest also depleted during this period. Normally farmers have been farming on hill slopes by clearing forests and preparing the cleared land for rain-fed mixed cropping systems for 1-2 years in Mizoram. They leave the land as fallows and return after 8-10 years to cultivate it the same way for 1-2 years. However, they continue to cultivate wet land rice on the terraced lowlands years after year. The farmers cultivate wet land rice on terraced lowlands called wet rice cultivation (WRC).

89. The project intends to implement agricultural interventions by taking into account climate change and its impact on food production and livelihoods and proven and emerging climate resilient best practices. These include: (i) use of remote sensing capacities to facilitate Village Councils to identify lands appropriate for cultivation and to avoid using steeply sloping lands for *jhum* cultivation, as is prevalent currently; (ii) introduction of fertility management practices using both biological measures and also possibly through the introduction of “nano-nutrient delivery systems”; (iii) use of traditional knowledge

in erosion control for ensuring extension of cultivation period from currently one year to at least three years; and (iv) use of better agronomic practices to introduce agroforestry, linear planting, cereal and pulse cultivation to build synergy between crops to maintain soil health on one hand and improved farmer income on the other.

Sub-component 1.1 – Better *Jhum* and Conservation

90. Capacity building**:** The project will train PMU staff who in turn will train all the district level /Block/Circle level staff to explain the project concept, project components and step-wise implementation modalities including the process of village level micro-plan preparation. Village level workers will be trained thereafter. The project will initially conduct a workshop at the district level by inviting all the Chairpersons and Secretaries of Village Councils (VCs) in the project area to orient them on project goal and activities with deliberations on the impact of the project. Subsequently a meeting of the Village Assembly will be held to deliberate on village's interest to participate in the project with view to comply with free prior informed consent requirements. Based on the willingness of the community, the project implementation will proceed. The project will identify a Lead Farmer from each village and train them in better agronomic practices. These Lead Farmers will be the focal points for implementing village level activities and will be supported by Block/Circle level line department officers and village level workers.

91. Land Use Planning: The project will engage Mizoram Remote Sensing Application Centre (MiRSAC) to assist in the preparation of land use maps and land suitability maps for the four project districts. The project will also prepare land suitability classification maps for each village to enable the project to identify clusters for development of value chains and also crops/plantation suitable to the area. Based on the land use maps and also land suitability classification maps, Village Councils and Site Allotment Advisory Boards (SAAB) will be trained to: (i) identify lands suitable for growing various crops based on the slope, altitude and soil texture, and to allocate land based on this scientific information for *jhum*, settled agriculture and village forest conservation; (ii) fix boundaries for land allocated for settled agriculture; and (iii) decide on the crops to be cultivated to ensure development of economies of scale required for accessing markets.

92. Better *Jhum*: *Jhum* system has two phases: (i) crop production phase; and (ii) fallow phase. The fallow phase is also known as *jhum* cycle in Nagaland. The duration of both, cultivated and *jhum* fallow varies according to the fertility and productivity status of the land. Usually in *jhum* system many crops of different duration, such as rice, chillies, ginger, vegetables, etc. are grown in the same piece of land and in an inter-spread (non-linear) manner. The project will focus on improving current *jhum* and improved management of *jhum* fallows, which will give two-fold results. First, it will increase the productivity and second it will lengthen *jhum* cycle, resulting in increased fallows. The project will promote FIGs to take up activities related to current *jhum* improvement and fallow *jhum* management. Each FIG will comprise of 10-20 farmers and each member of the FIG will be connected to 20 *jhum* families and these 20 households will be the associates of FIG members. The project will train FIG members and provide project support for implementation of activities.

93. *Current Jhum Improvemen*t**:** FIGs comprising farmers will be encouraged to earmark the ridge and steep slopes for permanent tree farming, and side slopes for crop farming along with trees, including fruit trees. All *jhum* farmers will be covered and each *jhum* farmer will get support for about 25% of their *jhum* plot (estimated at 0.25 ha per *jhum* farmer). The project will support construction of low cost bunds and trenches and water harvesting structures that will improve the availability of moisture. Planting of the leguminous crops on contour bunds, such as *Flemingia macrophylla, Flemingia semilata, Tephrosia candida*, and *Gliricidia maculate* will contribute to improved soil fertility and moisture conservation through leaf fall and mulch. This help in stabilizing and improving productivity. Crops/commodities such as, rice, maize, sesame, cowpea, vegetables and other pulses will also be promoted for consumption purposes to add to dietary diversity.

94. The project will promote linear manner planting (proper row and plant spacing) to increase the possibility of using farm implements and to control weed growth. Mulching using local materials, use of nano-nutrients, and planting leguminous plants and the upper edge of the bunds and cereals on the lower edge of the bund to improve farm productivity and income of the farmers will be promoted. The project support wll be spread over 3 years to ensure continued cultivation on the same plot with better practices. The project will support current *jhum* improvement in total 54,400 ha out, of which direct project support will be for 13,600 ha covering some 54,400 households.

95. *Fallow Jhum Management*: Fallow *jhum* management gives benefits for both, in-situ and downstream areas. The emphasis will be to grow the soil erosion controlling and nutrient building species rather than allowing the scrubby growth during the fallow periods. The project will support low cost contour bunding, including log wood bunding, trenching, creating terraces using vegetative strips of fast growing tree species and grasses, such as Gliricidia, *Tephrosia, Flemingia*, and vetiver / lemongrass. The project will also support seeding the fallows with both, annual and perennial legume cover crops, such as the perennial pigeon pea, *Sesbania speciosa*, *Trifolium alexandrinum*, *Indigo feratinctoria,* and this is expected to stabilize the land and improve soil fertility. The project will support in total 13,600 ha covering 54,400 households. Each household will get support for 0.25 Ha for fallow management.

96. Village Forest Conservation: The village forests remain the vital community asset for protecting water sources, supply of non-timber forest produce (NTFP), and controlling forest fires. Only the dry wood is allowed to be removed from the village forests and no commercialization is allowed for the NTFPs. The project will support the restoration / conservation of village forests, which will involve re-demarcating the village forest boundaries, constructing contours, construction of check dams, protection of water sources, and protection of water sources, raising nurseries and supplying planting material of locally preferred species. Non-structural vegetative measures will also be promoted to recharge springs in the village forests after mapping of the geology, vegetation and data on water availability.[34] The project will support raising nursery and planting of locally preferred species such as, *Parkia timoriana, Michella champaka*, Gamar (*Gmelina arborea*), *Bombax ceiba*, etc. Village Councils will implement this activity. This activity will cover 5,440 ha (20 ha per village).

Sub-component 1.2 – Support to settled agriculture

97. The project does not directly promote settled agriculture. Many farmers have made the transition from *jhum* only system to *jhum* and settled agriculture mixed system. The project will support two aspects related to settled agriculture: (i) the existing settled agriculture comprising terrace rice cultivation in terraces and orchards and plantations in sloping uplands; and (ii) the landless households - households that have access to *jhum* land but not to land with tenurial security.

98. Support to existing terrace rice cultivation*:* The project will support farmers undertaking terraced rice cultivation. The main aim of this will be to increase soil fertility, productivity and cropping intensity, and stabilize productivity. The project will form FIGs and train them on improved crop husbandry. The project will also promote additional measures for improving soil fertility by growing *Sesbaniarostrata and Azollapinnata* under rice cultivation systems.[35] This apart, developing supplementary irrigation system such as lift irrigation, water harvesting ponds for rice cultivation in low land areas will also be supported. The project will select short duration improved local paddy varieties in consultation with KVKs/ATARI. In addition, the project will also support introduction of second crop (pulses/ginger/ onion) after rice cultivation, rice-fish cultivation and fish farming in ponds in each of the selected villages. The project will support 10,880 households covering 2,720 ha. Each household with terrace rice cultivation will get support for 0.25 Ha.

[34]ICIMOD -2016- Spring recharge interventions in Nepal
[35]Effects of Sesbaniarostrata and Azollamicrophylla incorporation on transformation of applied zinc and copper in lateritic rice soils with different flooding regimes, B. Mandal, K. Bhattacharya. P. K. Mete and L. N. Mandal. Biology and Fertility of Soils, May 1997, Volume 24, Issue 4, pp 394–39

99. Support to upland settled agriculture: The project will support existing settled agriculture in uplands by providing them with quality planting material for horticulture crops, such as banana, orange and pineapple, and spices such as black pepper, turmeric and Mizo-chilli to improve the farm productivity and income of the farmers in the short and medium term. High value timber tree species, such as *Mesua ferra*, *Duabanga grandiflora* and / or *Duabanga meluccana*, and *Cedrela toona* will be introduced in the system to add to the farmers' income. The results of agri-horti-silvicultural systems and other systems piloted by ICAR in the northeast region will be expanded.[36]The project will also support construction of water harvesting ponds and other measures. The possibility of two crops of decent productivity with first crop of lowland rice and an upland crop (e.g. onion, garlic, field pea, lentil, and other legumes) after rice will be explored through proper crop planning using water balance analysis and improved agronomic practices.[37] The project will support 5,440 households covering 2,720 ha. Each household with upland settled agriculture will get support for 0.5 Ha.

100. Support to the landless*:* The project will the poorest households to access land with tenurial rights. Households that are without tenurial land rights in each village will be identified and a FIG will be formed. The selection criteria will include household that: (i) have participated in *jhuming* for the last three years continuously; (ii) do not have temporary pass and land settlement certificate for any land other than residential plot; (iii) do not have any member working in the government sector; and (iv) households that are dependent on wage labour for 75% of their income. A FIG in each village comprising about 10-20 members will be established and supported by the Lead Farmer. A land parcel will be identified using the land use maps and temporary pass will be issued for at least 0.5 ha per member. This allocation will be made not individually but for a group as a whole. FIGs will be provided training on better agronomic practices and supported will be provided for soil and water conservation works in these selected areas. Measures such as contour bunds, contour trenches and construction of water harvesting ponds. The project will support promotion of integrated farming systems in these lands. The project will support 10,880 households covering 5,440 ha.

ii. Component 2: Value Chain and Market Access

101. *Jhum* improvement, settled agriculture and value chain and market access are clearly interlinked. Many farmers have both *jhum* and settled agriculture (mainly plantations, and lowland rice). The shift is mainly on account of labour shortage for taking up labour intensive *jhum* cultivation, disinterest of you to take up *jhum* cultivation and also the need to cultivate high value crops to generate cash income. The beneficiaries under Value Chain and Market access will be a subset of beneficiaries under *jhum* improvement and settled agriculture. Livestock support will also target a subset farmers undertaking *jhum* to increase their income so as to reduce their dependence on *jhum*.

102. A cluster approach for promotion of select value chain commodities will be adopted wherein on an average four villages form a cluster, which ensures economies of scale in terms availability of a minimum of a truck load of produce for market players to get into business partnership with value chain farmers. Cluster ensures collective procurement of agriculture inputs and business development services i.e. transportation and logistics services to make these services economical.

Sub-component 2.1 – Value chain development

103. Production Support: The project will support activities for enhancing production of: (i) Turmeric and Mizo-chilli in Kolasib district; (ii) Mizo-chilli and Turmeric in Mamit district; (iii) Mizo-chilli and Ginger in Serchhip district; and (iv) Mizo-chilli and Ginger in Champhai district. Non-availability of quality planting

[36] A.K. Singh et all 2012, Natural Resources Management for sustainable hill agriculture – need for a paradigm shift
[37] Singh V P, Singh RK, Sastri ASRAS, Baghel SS, Chaudhary JL.1999. Rice growing environments in Eastern India: An agro-climatic analysis. Indira Gandhi Agril. Univ. and the International Rice Research Institute. Pub. Pp 76.

material remains an issue. By supplying improved planting material, it is assumed that the productivity of these crops will increase by 30 to 50%.[38]

104. The project will identify 30 clusters (each cluster of about 4 villages) and support engagement of two CRP in each cluster to support the FIGs. The cluster selection for production support will depend on the suitability (soil, climate, water, etc.) of the area to produce these crops and access to roads. Interested farmers in these clusters will have to allocate a separate plot of about 0.5 ha either in current *jhum* or in fallow *jhum* to grow these selected crops. Appropriate training for the CRPs and FIGs will be provided by the project. The project will support promotion of FIGs of up to 20 farmers per group in respect of commodities/crops shortlisted for each district. The project will support 7,200 households covering 3,600 ha under spice production.

105. The project plans to introduce an innovative modality for digital delivery of extension and monitoring of production practices, input use and expected production. This can be accessed by market players across the world to support their procurement decisions reducing the need for face to face interaction required to access market players and increase the reliability quotient and enable the farmers to make a quick progression into organic certification.

106. Marketing Support: The major constraints to value chain development of traditional spice, and agricultural and horticultural crops are related to marketing. These include: (i) limited aggregation for achieving economies of scale in cost effective collection, transportation and storage; (ii) insufficient investment in post-harvest management practices, including primary processing to add value and to reduce volume for transportation; (iii) inadequate data on marketable quantity to feed into supply chain, (iv) inadequate linkage with premium markets on account of issues related to compliance of certification and quality standards; and (v) limited access to market players from outside the Mizoram state.[39]

107. The project's marketing efforts will be directed towards both the project promoted commodities (Mizo-Chilli, Ginger and Turmeric), and also other commodities and crops promoted under *jhum* improvement and settled agriculture, including , orange and passion fruit which are grown in sufficient quantities, to make them viable for market entry. The project will support aggregation and primary processing activities and will support market linkages. In addition, the project will also support next level of processing of spices such as extraction of oleoresins, capsanoids, natural plant based dyes, etc and value addition to bamboo.

108. In order to facilitate production based on market needs, the project will support establishment of a marketing unit within the horticulture department. The marketing unit will establish contacts with agencies, such as Sresta Organics, Patanjali, and other agencies to develop contract farming modalities. . Collaboration with IDH India and its Sustainable Spice Initiative will be formalized to attract private sector participation into marketing of farm produce. The project will support construction of common facility /collection centres, participation in trade fairs and exhibitions, and will also organize buyer-seller meets. The project will also prepare plans to attract private sector rom outside the state to establish processing and value addition of select crops. The project will also support progression of farmers into organic production.

109. Livestock Support: The project will train a CAHW, in all the 272 project villages. With women having a major role in livestock, about 50% CAHWs will be women and remaining will be men folk committed to serve the community and stay in the village. The project envisages immunizing the pigs and poultry in the project area and the pigs will also be de-wormed on a limited scale during the first three years of the project. The project will focus mainly on the pig sub-sector by developing support services related to

[38] ICAR NE Hill Complex- http://www.icarneh.ernet.in)

[39] Livelihood based Agri-business and Market studies for North East Rural Livelihoods Project, MART, 2011

breed improvement, feed improvement, and animal health. The project will demonstrate and promote feed crops cultivation (e.g. sweet potato, tapioca, colocasia, cow-pea, maize, azolla, etc.) in the backyard and create awareness among the farmers about the nutrient requirement of pigs. The project will encourage existing retail outlets to sell fish meal, soya bean meal and oil cakes and mineral and vitamin mixture. Small feed grinding units will be established to utilise locally produced maize, dried cassava, etc.

110. The project will support establishment of 64 small pig breeding units (6:1 unit) to be operated by progressive/ experienced farmers/CAHWs. In addition, the project will bear 50% cost of 25,000 improved piglets to 25,000 households. The project will also demonstrate/promote improved pig housing and compost production from pig manure. Existing artificial insemination services for pigs will be expanded by strengthening the existing boar stations (4) under DAHV and introducing cold chain facilities in each veterinary hospital of the project areas. The project will support other livestock related activities such as cattle, goat rearing and aquaculture. The project will aim to raise awareness of the quality threats among the pig slaughterers, retailers and transporters through information campaign and imparting training on hygienic slaughtering including provision of slaughter slabs, handling, displaying and selling of pork.

111. Innovation Fund: Several societies, associations, cooperatives, public sector companies, producer companies, local agro-enterprise and innovators operate in the state. These agencies and individuals operate in an environment of limited scale, inadequate capital and inability to access latest technologies and large scale markets. This apart, in order to realise the potential of the agricultural and allied sectors, a higher scale of operations is required to enter external markets on competitive terms and/or fetch a premium price for products produced in the states. The project's value chain support will facilitate expansion of production and marketing, and is envisaged to generate a new set of entrepreneurs with market linkages. In addition, higher level investment is required to establish extraction of oleoresins, capsanoids and tumerons. These need to be funded in a sub-project mode. Accoringly an innovation fund (IF) is proposed as a funding mechanism through which agencies from the public, private or social sectors would work with FOCUS to implement specific sub-projects involving innovative approaches that support the overall objectives of the project.

112. Project states being hilly regions, face high transportation costs for movement of agriculture commodities due to access difficulties on account of longer rainy periods, landslides, and land sinking. Limited entrepreneurship and marketing opportunities coupled with low volume high cost of transport and limited risk-taking ability constrain agri-business development. The IF is envisaged to overcome these constraints by supporting potential agencies who can offer innovative solutions to project target communities. Such sub-projects should, ideally, have potential to be scaled up, by FOCUS or other actors, so as to reach a larger number of households. Sub-projects funded by the IF will be established in strategic locations of project districts. Preference will be given to agencies/individuals planning to establish facilities within the project locations. Agencies/business entities registered in the state of Mizoram and Nagaland respectively will be preferred. In the event an outside agency intends to apply for IF, such agencies will be required to have a local partner. Funding pattern will be maximum 75% grant from FOCUS and minimum 25% contribution from applicant or beneficiary. The Fund would have two windows- one for local youth preferably setting up new enterprises where the grant element will be 75% and second for all other applicants from the region or outside with relatively lower grant element. Applicants bringing higher contribution would be preferred.

113. The project will prioritize the needs of youth while approving sub-projects funded by the Innovation Fund. Sub-projects of youth taking up enterprise related to aggregation and value addition will be funded on a priority and capacity building aspects will be built into this. In addition, the project will actively identify agencies that have capacity to submit sub-projects that train youth in specific vocations and provide funding for enterprise establishment coupled with technical backstopping.

Sub-component 2.2 - Market access infrastructure

114. A major constraint for the development of market-orientated agriculture is poor road access to production areas. Although almost all villages are now connected by all-weather roads, these tend to run along the ridges where settlements are located. Much of the land with good potential for the development of plantation and other permanent crops are in valley bottoms and on the lesser steep slopes. However, such areas often have no road access, making it difficult to supply inputs and extract crops. Farm link roads are therefore a major priority of the government. However, many of the roads that have been built, either by DoA or using village labour funded via MGNREGS. These have been constructed without proper survey and design leading to poor quality, high gradient and largely unpaved; these are not resilient to intense monsoon seasons or extreme events exacerbated by climate change. Rural roads, therefore, often get washed away, buried, or become impassable depending on conditions.

115. The farm link roads to be built under the project will be of better quality, with proper side and cross drainage and climate resilient measures to connect to high potential agriculture areas, horticulture clusters and mithun villages. The project will rehabilitate and improve a total of around 200 km of earth road (with proper side slopes and cross drainage and base course) using the funding facilities available under CSS and upgrade 200 km of existing earth roads with base course to PMGSY and PWD gravel road standards using IFAD funds. These roads would be built with all climate resilient features such as protection of slopes, grass-turfing, adequate number of drainage crossings, side drains, etc.

iii. Component 3: Project Management and Knowledge Services

116. The Department of Agriculture will establish a society under the Chairmanship of the Chief Secretary, named Society for Climate Resilient Agriculture in Mizoram (SCRAM) which will be the lead implementing agency for the project. State budget allocations for the project and IFAD loan proceeds will flow through the Agricultural department. The Secretary, Agriculture will be co-chair of the society and the Director, Department of Agriculture will be the Mission Director. GoM will appoint a Joint Director level Officer from the technical department on a fulltime basis as the Chief Executive Officer and secretary of the society. The details regarding project management and implementation are described in Appendix 5.

117. Knowledge Management: The project will develop a Knowledge Management strategy and action plan. This will include internal learning through regular progress review meetings, and participatory M&E at the community level, Information will be shared at the village level via a village notice board, posters and leaflets. Knowledge will also be shared with external stakeholders and the wider development community through the generation of knowledge products. A project website will be established as a knowledge sharing tool, with information on good practices and innovations shared with NITI Ayog, DEA and Ministry of DoNER and also displayed on the IFAD Asia website.

118. Capacity Building and Knowledge Sharing: The project will be working on both *jhum* improvement and settled agriculture. In order to generate concurrent impact data and to demonstrate the effectiveness of these approaches, the project will engage the ICAR, Regional Centre in Barapani and the Regional Agriculture Technology Application Research Institute (ATARI). Both these institutions come under the Deputy Director General (Extension), ICAR, GoI. An agreement will be signed between GoN and ICAR detailing the terms of engagement.

119. The project with assistance from ICAR will aim to be a platform for learning for the other states in NER wherever *jhum* is being practiced. The project has allocated USD 260,000 to generate knowledge on the evolution and sustainability of upland farming systems and their capacity to respond to climate change.

120. Technical Assistance: IFAD will provide a grant of about USD 450,000 to GoM for identified areas of technical assistance for the project. The major activities envisaged in this include; (i) preparation of training materials and conducting training of Veterinary Officers in animal production related issues

covering pigs, cattle, goats and poultry; (ii) preparation of training materials and conducting ToT in implementing Sloping Agricultural Land Technology (SALT); (iii) preparation of training materials and conducting ToT related to terrace rice cultivation; (iv) preparation of training materials and conducting TOT for establishment of private nurseries of high quality planting materials; (v) engagement of Specialist Consultants in Highland farming systems, Agro-forestry, soil and water conservation, organic certification, animal production and to formulate policy reforms related to Agricultural Produce Marketing Committee Act; (vi) prepare a long term weather data based agro-climatic atlas for Mizoram; (vii) development of a computerised MIS and the support and training of MIS staff in its operation; and (viii) support for project monitoring and evaluation including baseline survey and end-line survey with impact assessment. GoM has agreed to engage Food and Agriculture Organization of United Nations (FAO) to implement these activities in view of its well established expertise in these fields. A FAO engaged consultant has joined the mission and is in the process of preparing a technical proposal including budget. FAO will submit the technical proposal to the state government which will review and submit to IFAD for approval. Thereafter GoN will enter into a TA Agreement which among other things will provide details on the activities, work plan, payment modalities and reporting requirements.

E. Lessons learned and adherence to IFAD policies

121. A number of lessons have been learned from past and current projects regarding what has worked well, and what could be done better in future. Details of relevant lessons are in Annex 3. These lessons include:

122. Targeting: Overall, the intervention paradigm with disadvantaged groups is valid as IFAD-funded projects that focus on particularly disadvantaged groups among the rural poor, and include the scheduled tribes, scheduled castes, women and the landless as their target group. The targeting of disadvantaged groups in remote areas combined with a ”saturation approach” is relevant to the design of the project. This approach of combining geographical targeting and saturation approach have been effectively used in all the IFAD project designs in India. This project combines both these aspects to avoid portfolio dispersion at the sub-state level to achieve greater management efficiencies.

123. Leveraging government resources through Parallel financing and Convergence: Strengthening the linkages with public programmes and collaboration with sub-state and local government entities (also known as “convergence”) with public programmes is particularly relevant in a Middle Income Country like India where government investments for developmental activities are big and where IFAD finances play a catalytic role. All projects approved since the 2010 CPE have embedded this aspect in the design (ILSP, JTELP, LAMP, OPELIP, APDMP). The convergence approach has enhanced the policy engagement opportunities at different level from central to state government and boosted the scaling-up landscape. This project design has attempted to take the convergence approach to a new level by seeking flow of funds from the Centrally Sponsored Schemes (CSS) to the project implementing agency so that these funds are used in conjunction with the IFAD funds to achieve better results and to have larger coverage.

124. Focus on Rain-fed agriculture: IFAD projects in India have generated valuable body of knowledge to raise agricultural productivity and to improve viability of rain-fed agriculture. A particularly relevant example is of private sector partnership between cotton farmers of Vidarbha (in CAIM project) with Better Cotton Initiative; promotion of SRI and SWI techniques for enhancing production of rice and wheat; large scale adoption of the Broad Bed Furrow technique for soil and water conservation, etc. IFAD projects have also focussed both on diversifying crops by promoting high value, short duration crops as well as on off farm activities to help farmers deal with the weather shocks.

125. Settled Agriculture: NERCORMP results indicate that unproductive *jhum* fallows have been converted to commercial plantations, including agro-horticultural systems, resulting in productive use of land, higher incomes, reversal of resource degradation and improved local environment. Consequently,

jhum cultivation per household decreased to an average of 1.2 acre in 2016 from the baseline (2011) of nearly 2.1 ha. End line survey (2016) showed that the area under *jhum* decreased from 61 percent at baseline in 2011 to about 33 percent in 2016 due to *jhum* land development interventions of the project.[40]This project intends to focus on improving current *jhum* and improved management of *jhum* fallows through soil fertility improvement measures, better agronomic practices and tree and horticultural crops.

126. Soil and water conservation: Increase in water availability and control of soil erosion through physical and biological measures have been tested successfully in the tribal areas of Orissa and Jharkhand under OTELP and JTDP. The project will also invest in soil and water conservation activities especially suited to hill areas taking into account results of various pilot projects of the Indian Council of Agricultural Research.

127. Extension service delivery: The concept of village level extension service modality including provision of vaccination and first aid service coupled with a system of payment for services delivered has been well established by the TRWEP in Maharashtra and Madhya Pradesh states. This modality will be implemented in this project by including Lead Farmers for delivery of extension messages related to *jhum* improvement and settled agriculture and also CAHWs for delivery of animal husbandry related extension messages and also for carrying out vaccination and first aid for livestock. These grassroots level workers would be provided with structured training coupled with technical supervision by the staff of line departments.

128. Market access: The experience of TRWEP and CAIM in Maharashtra and PTSLP in Tamil Nadu shows considerable enhancement of impact at the household level when livelihood activities are taken up in a value chain mode. This project design lays significant stress on market access and value chain development. A detailed value chain analysis study was done prior to the project design and the interest of key private sector players has been explored.

129. Adherence to IFAD policies. The project is fully in line with IFAD's Strategic Framework (2016-2025), and adheres to IFAD policies for targeting and gender mainstreaming, environment and natural resource management, climate change and social, environmental and climate assessment, nutrition sensitive agriculture, and scaling up. The environmental and social category is considered to be B, while the climate risk classification is deemed to be Moderate. The approach used will be aligned with IFAD's Policy on Engagement with Indigenous Peoples: (i) cultural heritage and identity; (ii) free, prior, informed consent; (iii) community driven development; (iv) equitable access to land and resources; (v) building on indigenous knowledge; (vi) environmental issues and climate change; (vii) access to markets; (viii) empowerment; and (ix) gender equality.

130. Adherence to COSOP 2011-2017: FOCUS is fully aligned to the RB-COSOP 2011-2015 which has been extended to 2017. The two strategic objectives of the RB-COSOP namely, increased access to agricultural technologies and natural resources, as well as to financial services and markets are very relevant for the design of the project.

III. Project implementation

A. Approach

131. Two broad principles would govern the management structure for this project. They include: (i) alignment to the existing government structure; and (ii) flexibility to make changes based on the requirements that may arise during implementation. The project would be aligned to the existing government structure by making the APC's Office as the state level nodal agency in Nagaland and the

[40]Project Completion Report, NERCORMP-II, para 87, page 19

Department of Agriculture as the state level nodal agency in Mizoram. The state level Project Management Unit would be located within the Society for Climate Resilient Agriculture to be established in both the states. The Chief Secretary of the respective states would be the Chairperson of the Society and the Project Steering Committee. The APC in Nagaland and the Secretary Agriculture in Mizoram would be the Chairperson of the Project Management Committee. The APC in Nagaland and the Director of Agriculture in Mizoram would be the Mission Director of the project. The Deputy Commissioners/District Collectors of the project districts would chair the District Project Coordination Committee.

132. Support Agencies: The project would be supported by the government structure at the district level and block/circle level. This strategy is adopted as there are no agencies with rural development expertise available within both the states. The agencies available are mostly rights based and social service oriented organizations. However, the project would implement its activities in coordination with the community based organizations such as Village Councils, SHGs, FIGs, Women Societies, Site Allotment Advisory Boards, Village Development Boards and JRMCs, many of which are traditional community level institutions

133. Period of Implementation: *Jhum* improvement requires a long term approach to enhance the *jhum* cycle and the project would be implemented over a six year period. Given the large number of villages (650 villages in Nagaland and 272 villages in Mizoram), in order that the benefits of the project reach to all the project villages, planning will be made to start up activities in all the villages. It is planned to undertake most of the preparatory activities during the pre-project period itself. During the first year of the project, activities related to capacity building, human resource engagement and launch of project activities in all the villages will be taken up. This strategy of front loading of the activities is planned to ensure that the project completes largely all the activities prior to the end of fifth project year and the impact on *jhum* intensification and transformation can be adequately assessed.

B. Organizational Framework

1. Executing Agencies

134. At the central level, the Department of Economic Affairs (DEA) would be the nodal agency for the project. At the state level, the APC's Office in Nagaland and the Department of Agriculture in Mizoram will be the nodal agency. In order to implement this project, both GoN has established a Society named Society for Climate Resilient Agriculture in Nagaland under the APC's Office. GoM would establish a Society named Society for Climate Resilient Agriculture in Mizoram under the Department of Agriculture. This strategy of establishing a separate Society allows it to bring in persons of repute as members of the Governing Council as well as facilitates fund management. This Society would be registered under the Societies Registration Act and would have its own bye laws and financial rules.

135. The society in Nagaland has been registered with the Chief Secretary as the Chairperson and the APC as the Vice Chair. In case of Mizoram, the Chief Secretary would be the Chairperson and the Secretary, Agriculture would be the co-chair. In addition, The Governing Council of the society would have the Principal Chief Conservator of Forests, Secretaries of Planning and Programme Implementation, Horticulture, Finance, Animal Husbandry and Veterinary Services, Soil and Water conservation and Rural Development and the Deputy Commissioners of project districts as the members. The Governing Council may co-opt additional members based on requirement. An officer from the Indian Administrative Service has been appointed as the Chief Executive Officer of the Society in Nagaland. A Joint Director or above level officer from the technical department would be appointed on a fulltime basis as the Chief Executive Officer of the Society in Mizoram. This person will be the Secretary of the Society and the SPD.

136. The Governing Council of the Society would be responsible for: (i) ensuring legal compliance and preparing, reviewing and approving overall policies of the Society including administrative, human resource and financial policies; (ii) providing direction and guidance for project implementation; (iii)

facilitating coordination and convergence between the project and other government programmes; (iv) reviewing and approving overall AWP&B of the project; and(v) reviewing implementation performance of the project.

2. Management Structure

137. The details of the project management structure and implementation arrangements are provided in Appendix 5 separately for Nagaland and Mizoram.

138. The state level Project Management Unit (PMU) would be housed within the Society for Climate Resilient Agriculture of each state vested with the project management responsibility. The Chief Executive Officer/Secretary of the Society would be the SPD. The SPD would be reporting to the APC in Nagaland and to the Secretary Agriculture / Director Agriculture in Mizoram. State budget allocations for the project, including parallel financing funds from Centrally Sponsored Schemes (CSSs), IFAD loan proceeds, IFAD grant, GoN counterpart funds for IFAD loan and the state share for CSS funding, would flow through the APC's office in Nagaland. All funds with the exception of CSS and state share for CSS funding will flow through the Agriculture Department in Mizoram by creating a separate line item in their respective annual budget.

139. PMU would be responsible for: (i) establishing District Management Units (DMUs) in each project district within the District Agriculture Office and recruiting staff for PMU and DMUs; (ii) conceptualizing, supervising and monitoring project activities and their progress towards achieving physical, financial and outcome related targets; (iii) organizing project coordination meeting; (iv) preparing and submitting AWP&B after consolidating AWP&Bs of districts and 18 month procurement plan for review by IFAD; (v) incorporating the budget requirements of the project into the overall budget of the state and ensuring flow of funds to the Society; (vi) ensuring release of funds to the DMUs and line departments for implementing project activities; (vii) evaluating bids, and finalizing and executing contracts with service providers and suppliers of goods and services for implementing various project activities; (viii) operating Project Accounts for timely release of funds to the districts, line departments and other partners; (ix) receiving statement of expenditure and supporting documents related to fund release and keeping an account of fund release and utilization; (x) preparing overall project financial statements; (xi) preparing and submitting withdrawal applications to GoI/CAAA for onward transmission to IFAD; (xii) preparing and submitting progress reports semi-annually and annually to IFAD; (xiii) establishing an effective MIS and M&E system to track project progress; (xiv) undertaking knowledge management activities; (xv) preparing RIMS data for submission to IFAD; (xvi) ensuring preparation and submission of annual audit reports and financial statements to IFAD and ensuring compliance to the audit observations; and (xvii) liaising with the State administration and line agencies to ensure coordination and convergence to facilitate project implementation. Overall, PMU will be responsible for compliance to the stipulation of the Financing Agreement signed between GoI and IFAD.

140. The society would be provided with full time senior technical staff of the rank of Deputy Directors on deputation. In addition, a Finance and Accounts Specialist, a Manager - Planning and M&E, a Manager – Knowledge Management, a Manager – Gender and Community Institutions, a Finance and Accounts Officer and other support staff would be engaged on contract basis. Staff appointments, except those on deputation, would be fixed term contracts of at least three years and the candidates would be recruited from the open-market based on professional competence and experience. The society while recruiting staff will give preference to women subject to other things being equal.

141. **District Management Units:** The project would establish a DMU in each district within the District Agriculture Office. The District Agriculture Officer would be the District Project Manager. A small team of professionals would be recruited to facilitate project implementation. DMUs would function as an outpost of society. DMU would be authorised to release funds based the sanctioned AWP&B.

142. The DMU would be responsible for: (i) coordinating with the Circle level officers and the FIGs to prepare AWP&B for the circle/block and incorporating the same into the district AWP&B; (ii) obtaining required sanctions for implementing activities; (iii) releasing funds to the FIGs and other implementation partners; (v) receiving utilization certificates from the FIGs and other implementation partners and reconciling their accounts; (vi) collecting, collating and analysing MIS and M&E data for the district for onward submission to PMU and for providing feedback to implementation partners; (vii) ensuring convergence between project activities and activities of other line departments in the project villages; (viii) conducting audit of books of accounts of FIGs and other implementation partners on a sample basis and submitting reports; (ix) maintaining books of accounts related to project expenditure of the district and prompt settlement of advances with PMU; and (x) ensuring compliance to audit observations.

143. A technical team comprising officers of mid-level seniority drawn from the Departments of Agriculture, Horticulture, Animal Husbandry and Soil and Water Conservation would be attached full time for this project. In addition, the project would also engage professionals at the state level on a contract basis. The project would also engage a Planning and Monitoring Officer, a Finance and Accounts Officer and the required junior professionals at the district level on a contract basis.

144. The project would fund capacity building of PMU and DMU staff, development of a computerised accounting system and a Management Information System. The project would allocate funds for engaging Specialist Organizations / Experts to help the project management in conceptualising various project interventions and to provide expert technical advice. The project would also fund contracting of specialist agencies for conducting baseline, impact evaluation and other surveys, and for preparation of a Project Completion Report.

3. Coordination

145. The Governing Council of the society in both the states would also function as the state level Project Steering Committee (PSC). The Chief Secretary of the respective state would be the Chairperson of the PSC. The PSC would meet once in six months to review progress, provide overall guidance and policy support and to facilitate inter-departmental coordination specifically with regard to convergence. All the members of the Governing Council will be the members of the PSC. PSC will invite representatives from the National Bank for Agriculture and Rural Development (NABARD), Civil Society and Technical Experts of repute to participate in the PSC meetings. The SPD would be the member secretary of the PSC. PSC would be largely responsible for policy decisions with regard to statutory obligations and also for approving AWP&B before incorporation into the state budget.

146. The project in both the states would also establish a Project Management Committee (PMC) headed by the APC in Nagaland and the Secretary, Agriculture in Mizoram. The Directors of the relevant technical departments would be the members and the Chief Executive Officer of the Society would the Secretary. The PMC would meet quarterly and would be largely responsible for resolving implementation issues, interdepartmental coordination and allocation of funds under convergence and centrally sponsored schemes.

147. The project would also establish a District Project Coordination Committee (DPCC) in each project district. The DPCC would meet quarterly to discuss the project implementation progress, constraints and remedies. The most important function of this committee would be to ensure flow of MGNREGS funds to the Village Councils/Village Development Boards for implementing Land and Water Resource Development activities. The DPCC would be chaired by the Deputy Commissioner / District Collector of the respective project district and the District Project Manager would be the Vice Chairperson. The members of the DPCC would important district level officers. Based on the need, representatives of NABARD and Lead Bank would also be invited to participate in the DPCC meetings. A representative from PMU may attend any of the DPCC meetings if and when required.

148. A Block Project Coordination Committee (BPCC) would be established in each Block of the project area. The BPCC will meet bimonthly to discuss approval and review of the MGNREGS activities and their convergence with project activities. This committee would be chaired by the Block Development Officer and the Circle/Block Agriculture Officer would be the Member-Secretary. The members of BPCC would include: (i) Chairpersons of all project Village Councils; and (ii) All Block/Circle level officers.

4. Implementation Arrangements

149. The project would use a multi-pronged approach to implement project activities. The grassroots level implementation partners include community based organizations operating the villages and those that would be promoted under the project. These include the JRMCS, Site Allotment Advisory Committees, FIGs, SHGs and Societies. These community based organizations would be supported by Lead Farmers, CRPs and CAHWs. The project intends to identify and support these community level workers through training and establishment of demonstrations. Block/Circle level officers of the line departments would be the main link between the community level workers and the DMU for planning, implementation facilitation and supervision.

150. Capacity building: Capacity would be built at three levels. The project would engage FAO to prepare training curriculum and training materials and to train the trainers using a ToT modality. Once the trainers are trained, the project would train all the technical staff at the district and sub-district level. Thereafter, the project would identify the community level workers, build their capacity and support them in establishing demonstrations. These community level workers would be the focal points in the villages for implementing project activities

151. Land use Planning: The project would use the Remote Sensing Centres in each state to prepare land use maps and land suitability maps. These maps would be the basic documents for the community to plan *jhum* cultivation and other settled agriculture related activities taking into account the slope and other parameters. These maps would also facilitate the community to identify the boundaries of the community forests /community and to take up conservation related activities. These maps would also be used to identify the soil and water conservation activities in the community forests. The project would train the Lead farmers and members of community based organizations to use the land use maps.

152. *Jhum* Improvement and settled agriculture: Lead farmers would be the focal point for this intervention. Lead farmers would promote FIGs comprising members of *jhum* cultivating households. The FIGs would be the main vehicles for implementing this activity. These FIGs would be provided with project support for implementing activities related to soil fertility improvement, nursery establishment, soil and water conservation activities, and cultivation of plantation and tree crops.

153. Value chain Development- Production Support: The project would identify and train CRPs to act as focal points to start cultivation of identified crops in a cluster. CRPs would be provided with project support for nursery establishment and to deliver extension messages related to Good Agriculture Practices to the community. The project would introduce digital delivery of extension and using this software, a data base would be developed to facilitate the procurers from outside the state to get information on area under cultivation, expected yield and package of practices used. CRPs would also be responsible digital delivery of extension and also for entering data into the database.

154. Value chain development – Marketing Support: The project would support marketing support related activities such as buyer seller meets, trade fairs, exhibitions, etc. This activity would be implemented by the marketing unit to be established in the Horticulture Department in Mizoram and State Agriculture Marketing Board in Nagaland. These units would invite entrepreneurs from outside the state and link them up with local persons to establish a system of aggregation of produce.

155. Livestock Support: CAHWs would be the focal points for implementing this activity, supported by the Veterinary Field Assistants of the Animal Husbandry and Veterinary Department. These trained animal

health workers would provide universal vaccination services. The officials of PMU and DMU would implement the livestock related activities including demonstration using the CAHWs.

156. Market Access: The project would implement the market access activities using contractors. The community based organizations would be used to identify the infrastructure needs and the locations. Based on these initial assessments, PMU would engage contractors for construction of these roads under the supervision of Consulting Engineers.

157. Innovation Fund: PMU would take the lead in implementing this activity by seeking proposals from experienced agencies that have implemented innovative activities. The proposals received would be appraised by the PMU and selected proposals would be funded by the project.

158. Knowledge Generation and Sharing: The project would engage ICAR in both the states to generate knowledge on various aspects of upland agriculture through action research using local institutions. The knowledge generated would be shared through documentation and regional level workshops.

159. Technical Assistance: The project would engage FAO to provide technical assistance in both the states. It would involve training of trainers in new technologies related to soil and water conservation and settled agriculture including value chain promotion. Technical assistance would also cover provision for handholding and also M&E related functions.

C. Planning, M&E, learning and knowledge management

160. Planning: The AWP&B is the key planning document for FOCUS and will serve as the instrument for identifying specific targets and activities and in relating these to project outcomes and objectives. Each year a draft AWP&B will be consolidated by the PMU with inputs from DMUs. Each DMU will consolidate proposals for activities that have come from project villages. The draft AWBP would then be approved by the PSC before submission to IFAD for its concurrence. If required, the PMU may propose adjustments or revision in the AWP&B during the project year. The approved AWP&B would be used as a key document when reviewing performance and progress during the supervision missions.

161. Monitoring and evaluation**:** The project's M&E system will measure performance against the project logframe as well as showing the contribution of project outcomes to the government's strategic objectives for the agricultural and rural sector. The M&E system will also provide evidence of the results in terms of IFAD's objectives at the country level, with data disaggregated by gender and by age to show impact on women and youth. The M&E system will also be a learning tool to provide information for critical reflection on project strategies and operations. It would support decision-making at various levels and be a basis for results-based management. More details on M&E are in Appendix 6.

162. Outline of a project M&E framework: The M&E framework is a system to collect, analyse and report on data at three different levels of project implementation: (i) outputs; (ii) outcomes; and (iii) impact.

163. Output monitoring will measure the progress of activities and achievement of outputs against annual targets in AWP&B for each project component. Information on the progress of the annual work plan will be measured against indicators in the plan, such as number of people trained, and area covered by various *jhum* development works. This can be linked to the financial expenditure on the concerned activities, and data may be stored and reported via a computerised MIS. Data would be collected by DMUs from partners involved in project implementation and directly from village level institutions. If needed information may come from the registers and accounts kept by community organisations.

164. Outcome monitoring measures the immediate changes coming about as a result of project interventions. In FOCUS this would include:

- Numbers of villages implementing land use plans.

- Number of farmers trained and adopting improved practices - such as planting high value trees on *jhum* land, using green manure on wet rice, and vaccination of livestock.
- Area under improved *jhum*, fallow management, terrace rice cultivation, upland orchards/plantation and livestock.
- Volumes of planting materials supplied by project-supported nurseries.
- Number of farmers linked to a spice value chain.

165. Information on indicators such as adoption and production are not easy for implementation staff to collect from every household, so M&E staff in the PMU (hiring enumerators if needed) unit would conduct Annual Outcome Surveys (AOS), interviewing a sample of 400 to 800 farmers/households to gather data on indicators such as those listed above. An AOS may also be carried out on a thematic basis in order to focus on a specific area of project intervention, such as the spice value chain.

166. Related to outcome monitoring is process monitoring, which involves monitoring the processes leading to outputs and outcomes. Specific areas where progress monitoring will be useful include: provision of animal health services by CAHW and the functioning of FPOs. Information on these may be gathered using Participatory M&E tools, as well as from the records of community organisations and service providers. Such tools are also useful in getting feedback from participating households on the delivery of project outputs and in empowering communities to take ownership of key processes.

167. Impact evaluation is the process which will assess achievement of the overall goal of the project. The main tool for impact evaluation will be baseline and end-of-project surveys. These surveys will be the responsibility of FAO. They will be conducted by engaging a reputed agency with specific expertise in such assessments. In addition biological surveys will be carried out into the vegetation in *jhum* fallows, and economic studies of farm households to calculate increases in farm income and household labour inputs.

168. RIMS indicators: The Results and Impact Monitoring System of IFAD generates annual report tables on a number of first and second level results indicators that correspond to the output and outcome indicators. IFAD has recently revised its list of these indicators, some which will apply to this project. Prior to mid-term review, the project will report on only the first level results (corresponding to outputs), but after the mid-term report it reports on second level indicators (corresponding to outcomes).

169. Management Information System (MIS): Project will establish an MIS system in the first year of project implementation. The MIS would generate, monthly, quarterly and annual progress reports on physical and financial progress and on project outputs and outcomes - and may have a GIS interface so that key data can be shown on maps. FAO will engage an agency to provide assistance in the process of drawing up a system specification and also also in developing a computerized management information system. It is likely that the system will need to be modified in the light of practical experience and emerging needs. Much of MIS data entered by the staff of partner line agencies, DMU staff including Block and Circle level officers.

170. As a part of computerized MIS, use of tablet computers for field data collection and monitoring will be piloted. If tablet computers are used down to the village level, then VCs, AFA, VFA and CAHW may all enter data. A major part of the job for the MIS staff at the district level will be helping these people enter accurate and complete data, and checking on data quality. FAO will employ a specialist to monitor the performance of the system, and take a lead in adapting and refining the system so that it works better and meets the needs of project management.

171. Reporting: The project will develop a reporting system, with some reports used internally and for reporting to its partner agencies within the states, and others to external stakeholders –GoN/GoM and IFAD. Progress reports for GoN/GoM and IFAD will be produced at six-monthly intervals.

172. Learning and Knowledge Management: The project will develop a Knowledge Management strategy and action plan. This will include internal learning through regular progress review meetings, and participatory M&E at the community level, Information will be shared at the village level via a village notice board, posters and leaflets. Knowledge will also be shared with external stakeholders and the wider development community through generation of knowledge products, such as newsletters, briefs, training materials, technical manuals, booklets, posters, videos, etc. The project will also aim to be a platform for learning for the other states in NER wherever *jhum* is being practiced. A project website will be established as a knowledge sharing tool, with information on good practices and innovations shared with NITI Ayog, DEA and Ministry of DoNER and also displayed on the IFAD Asia website.

173. Capacity building and knowledge sharing: This project is a part of a two state programme and ICAR will be engaged by the two states to conduct specific studies and to organize periodic learning events in the region to facilitate cross learning in the region, undertake documentation and dissemination. The project has allocated USD 250,000 for Mizoram and USD 260,00 for Nagaland to generate knowledge on the evolution and sustainability of upland farming systems and their capacity to respond to climate change. The details of the activities to be undertaken by ICAR and ATARI have been detailed under the section on components of each state.

D. Financial management, procurement and governance

1. Financial Management Capacity

174. The observations mentioned in the 2010 PEFA (Public expenditure and financial accountability assessment), are outlined also in the latest available report of the “Comptroller and Auditor General of India on States Finances of Nagaland and Mizoram State”, related to the year ended 31 March 2013 to the year ended 31 March 2016 which provides insights into PFM (Public Financial Management) at State level.

175. Nagaland: The PFM issues include:(i) poor financial management and control of finances at all levels, delay in sanction resulted in delay in release of funds, incorrect reporting and submission of Utilization certificates, delay in release of funds from 1 to 14 months by the State; (ii) a rush of expenditure during the last quarter of 2015-16 and in some cases in the month of March 2016 in which expenditure of more than 50% of the total annual expenditure was incurred; (iii) inadequate monitoring and internal control mechanism which needs to be strengthened; (iv) untimely submission of utilization certificates; (v) failure in exercising the statutory checks prescribed under various rules resulting in fraudulent withdrawals; (vi) non-submission of quarterly progress reports; (vii) excess/inadmissible payment of financial assistance due to improper classification of land holding; (viii) excess payment to a contractor by arbitrarily increasing the rates of items of work; (ix) diversion of amounts received under Govt Scheme to private bank accounts; (x) expenditure incurred without prior approval; and (xi) payment made without actual supply/ procurement of equipment and some items were not sanctioned by the Competent Authority.

176. Mizoram: The PFM issues include:(i) limited efforts to mobilize additional revenues to contain the deficit, expand the tax-base and reduce tax administration costs; (ii) limited efforts to ensure timely release of central assistance by taking timely action on required conditions for disbursement; (iii) inadequate focus on expenditure management to bring qualitative improvement in the public spending; (iv) limited prudence in expenditure pattern to maintain resource gap within manageable limits of the fiscal capability of the State; (v) increase in market borrowed funds put at risk debt sustainability; (vi) lack of a performance based system of accountability should be put in place in State owned enterprises as to ensure profitability and improve efficiency in services - loss-making companies should be restructured; (vii) lack of an effective mechanism to ensure financial discipline and prepare realistic budget with inadequate budgetary control in all Government departments where savings/excess persisted in the last

few years; (viii) limited compliance to procedures as well as its own instructions to honour Public Finance accountability norms- the heads of departments should ensure that departmental accounts are prepared and submitted for audit; and (ix) non-reconciliation of state expenditure- in 2014-15 only 72.29% of the total expenditure was reconciled and similarly, only 23.79% of total revenues was reconciled in 2015-16.

177. APC/ DoA Financial Management: Based the discussions with the APC/ DoA staff and also with the Auditor General in both the States it was found that financial management practices in APC/DoA are performed in a basic and fragmented way. The main issues include: (i) weak budget preparation; (ii) inadequate internal control systems; (iii) incomplete accounting covering only a part of the activities; (iv) no control on the reliability and completeness of the information provided by DoA to the Accountant General Office; (v) high levels of cash transactions; (vi) lack of regular bank reconciliations. As a result of the above mentioned shortcomings, the inherent fiduciary risk associated with the public financial management system at State and the APC/ DoA level is considered ***high.***

178. Considering the weakness identified in the existing public entities, for project's implementation proposes an autonomous public Society governed by its by-laws, will be created. It will be staffed in its administrative/financial section with resources hired on the market. The use of the PFM is limited to external audit by the Auditor General (AG). The PIM will will detail the procedures to be used for project's administration.

2. Control risks

179. Overall, the proposed project will be operating in a rather high inherent risk environment due to the persistence of some weaknesses in the public sector financial management systems as outlined in the PEFA analysis. The proposed financial management arrangements for the project incorporate a number of measures intended to reduce such risks to acceptable levels and ensure that: (i) the programme funds are used for intended purposes in an efficient and effective way; (ii) reliable and timely financial reports are prepared; and (iii) programme assets and resources are safeguarded from unauthorized or wasteful use. After mitigation, the overall programme fiduciary risk remains **high.**

Table 1: Summary of FM risks and mitigating actions

Summary of Programme Fiduciary Risk Assessment at Design			
	Initial Risk Assessment	**Proposed Mitigation**	**Final Risk Assessment**
Inherent Risk			
1. TI Index	**M** Index: **40** in 2016 (ranked **79** out of 176 surveyed countries)	**-**	**M**
2. RSP Score	**M** Score: **4.00** (2016)[41]	**-**	**M**
Control Risks			
1. Organization and Staffing	**H**	• The PMU currently does not exist in Mizoram where the society is to be formed. In Nagaland the society has been formed but so far the finance and accounts team is not recruited. To ensure to get deputation of adequate Govt Staff supplemented by contracted staff • Ensure the recruitment process of contracted staff provides the project with qualified and experienced human resources • Comprehensive, user-friendly PIM	**M**
2. Budgeting	**H**	• A separate line item for the project will have to be ensured in the State budget.	**M**

[41] http://www.ifad.org/operations/pbas/

Summary of Programme Fiduciary Risk Assessment at Design			
	Initial Risk Assessment	**Proposed Mitigation**	**Final Risk Assessment**
		• The project budget will be prepared annually be way of a AWP&B which will be compiled at the PMU based on inputs from the districts and the Cos	
3. Funds flow and Disbursement Arrangements	**H**	• Ensure timely release of budget to the Society project account • Support early release of the DA advance in RBI to the State • Ensure timely release of counterpart funding • The initial contribution of the Govt as endowment fund will act as a buffer and will be used in case of delay/ irregularity in release of funds.	**H**
4. Internal Controls	**H**	• Internal control mechanism has to be set up by disaggregation of duties, monthly reconciliations, reporting and quarterly internal audit of the project activities • Periodic physical verification of assets	**H**
5. Accounting Systems, Policies & Procedures	**H**	• Use of accounting software for the project is required. The current Govt. procedures uses manual accounting systems • The hiring of a Finance and Accounts Manager and the Accounts Officer from the market and training them in the use of the software should mitigate reporting risks • Regular back-ups of accounting records and reports	**M**
6. Reporting and monitoring	**H**	• Project Implementation Manual (PIM) to detail reporting and monitoring requirements and rules • To ensure finance staff contracted in the market has the means to fulfil IFAD reporting requirements	**H**
7. Internal Audit	**H**	• An internal auditor will be engaged for the internal audit role • Hiring of a dedicated staff to follow up on the implementation of internal audit recommendations • Project management to act on internal audit findings and recommendations	**H**
8. External Audit	**M**	• The AG/ CA firm will be appointed to conduct the audit of the project. • AGs office will be requested to do the 'certification audit' of the project • The project to ensure timely preparation of PFS for enabling timely submission of acceptable reports, timely submission of annual audits and informative management letters	**M**
Programme Fiduciary Risk @ Design	**H**		**H**

3. Financial Management and disbursement arrangements

180. Finance unit organization of the Society at central and district level: The APC's Office in Nagaland and the DoA in Mizoram will be the Lead Programme Agency. A society under the Societies Registration Act, 1860 has been registered in Nagaland and a society is to be registered in Mizoram which will implement the project. The society in Nagaland is named as Society for Climate Resilient Agriculture in Nagaland (SoCRAN) and the proposed name in Mizoram is Society for Climate Resilient Agriculture in

Mizoram (SCRAM) which will implement the project in the respective state. The Society will have a Project Management Unit within the society in each state and District Management Units in the districts where the project will be implemented.

181. A Finance & Accounts Specialist (FAS) and a Finance and Accounts Officer (AO) shall be recruited by the project at the PMU for the project period. The incumbents will have a sound knowledge of accounting systems and preparation of financial statements. Computer literacy and experience in using an accounting software will be essential. They will be responsible for accounting, reporting and management of all disbursements to the districts and claims from IFAD and the Government. The FAS shall be responsible for the preparation of the project's consolidated financial statements, review of financial reports and getting audit completed within the stipulated time. The ToR for the FAS and the F&AO will be provided in the PIM. At the district level, an Accounts Officer shall be recruited by the project who will be in charge for the accounting and record keeping of all financial transactions at the district level and will be responsible for reporting to the PMU, management of all disbursements to the communities and claims to the PMU.

182. Budgeting: The PMU, after consultation with its district offices, shall prepare its annual budget linking all the planned activities at the head office and district level to the cost categories outlined in the schedule II of the Financing Agreement. The annual budget of the project will be included into the budget of the Directorate of Agriculture by creating a separate line in the State Government's budget. IFAD will provide an initial advance to the Government. The advance will serve as part of the counterpart funding from the Government. The Government will deposit a sum of INR 150 million towards as the endowment grant to the proposed society. The endowment is meant to be a buffer fund available with the society in case there are delays in release of funds or if funds are blocked in advances, the liquidation of which is delayed. The endowment fund will ideally be invested by the society in term deposits and it will be utilized only in case, regular funds as budgeted, are not available; as soon as the budgeted funds are available the endowment fund should be reinstated to the original amount by repaying the amount spent. The endowment may be used by the Govt as part of its counterpart funds during the last stages of the project period, if the financial situation of the state so demands.

183. Disbursement arrangements and Flow of Funds: The loan and grant funds from IFAD will be designated in USD and not SDR as has been the practice hitherto. DEA has provided its concurrence on the matter as per letter D.O. No 10/7/2016-FB-VII dated 14 June 2017. Two Designated Account in USD, one for each state, will be opened by the Government at Reserve Bank of India (RBI) in which funds will flow from IFAD. In India, generally the Government pre-finances IFAD funded projects and the amount of initial advance is managed by the CAAA. The advance funding from IFAD to the each Designated Account is fixed at USD 3 million. This is equivalent to about six months of projected allocation. Considering the weak fund position in Nagaland and Mizoram states, it is proposed that the two State Governments firm up the budget requirements for the domestic counterpart funding in accordance with extant rules and procedures on the subject.

184. Nagaland will transfer the estimated budget chargeable to the identified missions / centrally sponsored schemes (CSS) including state share to the Society in a timely manner in two instalments. It has been agreed upon that funds of 4 CSSs (RKVY, ATMA, PMKSY and MOVCD) in respect of the project districts will be deposited with the societies for project implementation. The society will utilize the amount in accordance with the AWP&B which will be dovetailed in accordance with such CSSs, account for such expenditure and report the same separately to the GoI. In case of Mizoram, the budget related to CSSs will flow directly to the respective line department. However, implementation planning will be undertaken jointly.

185. The societies will submit WAs for the IFAD financed eligible expenditures as per the procedures and formats agreed with IFAD to the Office of CAA&A, Ministry of Finance, GoI. A separate bank account

for the societies shall be opened at the PMU and all the districts. Since money will also flow to the proposed community groups, they will also be required to open separate bank accounts. The funds from the Societies account both from the PMU and the DMUs.

186. Disbursements to the district offices shall be made by the PMU. The funds from the district offices shall be advanced/disbursed to the communities through the FIGs/community organizations or directly depending on the activities. These organizations shall be required to provide utilization certificate for each quarter based on which further releases shall be made. The districts shall provide expenditure statements to the PMU every month based on which the PMU shall prepare and submit withdrawal applications every quarter after consolidating the actual expenditure incurred at the PMU and districts. The counterpart funds, other than salaries to the Govt staff, (which will be paid directly by the Govt), will also be made available by the respective Government to the PMU account from which expenditure will be incurred. Thus, there will be a single project account in all implementing units from which all funds would be spent. Details of expenditure incurred directly (salaries and allowances) towards the project will be provided, to enable consolidation and reporting of total expenditure of the project.

187. Internal controls: Procedures and record maintenance at all levels will be based on procedures of the government as well as other specific project's procedures documented in the PIM. The PIM shall include specific provisions in respect of internal controls, PFS preparation procedure, financial reporting arrangements between the districts and the PMU, contract management, financial reporting and audit requirements. The FAS shall play a pivotal role for the effective implementation of the overall internal control system. As far as possible all transactions will be by way of and through bank (cheques and direct transfers). There will be stringent limitations on cash transactions and it will be used only in exceptional cases with prior permission of the Competent Authority.

188. Accounting systems, policies, procedures and financial reporting: The project will follow a double entry cash system of accounting. The accounts will be computerized at all levels (PMUs and DMUs). The F&AOs at the DMUs will submit monthly reports based on which the FAS at the PMU shall be responsible for the preparation of consolidated quarterly financial reports, templates of which will be provided in the PIM. The FAS shall be also responsible for the preparation of the annual financial statements of the project which will be subject to external audit. The half yearly reports prepared by the FAS shall be submitted to the attention of the Project Steering Committee and forwarded to IFAD.

189. The financial statements of the project shall be prepared in accordance with the requirements of International Public Sector Accounting Standards-Cash (IPSAS). The PMUs shall prepare and deliver to IFAD such financial statements within three months of the end of each Fiscal Year. The aforesaid statements duly audited should be delivered to IFAD within six months of the end of each Fiscal Year.

190. Internal Audit**:** The Societies will appoint an independent Chartered Accountant or a firm of Chartered Accountants to undertake internal audit at all implementing levels (PMU/ DMUs/ COs) from the first year of its operations. The internal auditors will, besides the financial audit, review the systems of internal control and suggest improvements, if required, thereto. The internal audit should also include statutory compliances. The terms of reference for the internal audit are included in the Project Implementation Manual. The quality of internal audit reports submitted by the internal auditors in the first year of implementation will be reviewed by the Review Mission/ IFAD ICO and if these reports are found to lack quality, the PMUs may be requested to make alternate arrangements, acceptable to IFAD, for conducting the internal audit in later years.

191. External Financial Audit: The AGs office in Nagaland is not adequately staffed and it is possible that their performing the audit might delay submission of the report beyond the stipulated period of six months from the end of the fiscal year. It is therefore proposed that the Society in Nagaland shall appoint an external firm of Chartered Accountants to audit the accounts of the PMU and all district offices. However in Mizoram, it is proposed that the GoM shall engage the AG's office at Aizawl to perform the audit of the

project. This shall include the audit of the state level office and all district offices. The GoM is requested to write to the AG's office requesting them to undertake the audit of the project for which concurrence of the CAG, New Delhi will be required. The audit shall be in accordance with Article 9 of the IFAD's General conditions and the IFAD's *Guidelines on Project Audits (for Borrowers' Use)*. In Nagaland, since an independent auditor will be appointed, the appointment of the auditor shall be through a fair, transparent and competitive process. The terms of reference of the auditor shall follow IFAD approved Audit Terms of Reference. The auditors shall adopt the International Standards of Auditing while auditing and reporting on the Project Accounts. In case of Mizoram, the AG Mizoram may use national standards and not be obliged to use international ones. The TORs for the statutory audit by AG Mizoram will be reviewed by IFAD and the Fund may eventually request the availability of auditors to do some specific activities beyond the basic, statutory, ones.

192. The audit report shall contain a clear expression of the auditor's opinion regarding the financial statements. It should include a financial statements audit, a compliance audit and should include a Management Letter. It should also include a section on the project's compliance with loan covenants, particularly those dealing with financial matters. The auditor shall review the project accounts including the financial statements and the SOEs and give an opinion on the same. The audit of the Designated Account will be done by the Office of the Comptroller and Auditor General. Besides this, the AG office at Nagaland will perform a "certification audit" for external funded projects.

193. The audited statement of accounts along with the audit report and the Management Letter shall be furnished by the project to IFAD within six months of the end of each Fiscal Year. The project shall submit the reply to the management letter of the auditors within one month of receipt thereof.

194. The Project shall maintain an Audit Log in respect of the audit observations and get it validated by the auditor during the subsequent audit or earlier.

195. Taxes**:** The proceeds of the IFAD financing is not to be used to pay taxes which will be part of the contribution of GoI and the State Governments to the project. Social security benefits, if any, (employee's portion) and income tax (employee deductions) are eligible for IFAD financing. GST has become effective from July 2017. The project shall use a reimbursement percentage which takes into account the approximate tax applicable to the expenditure category.

196. **Recommendations for project's preparedness to be implemented before the loan negotiations**

Action	**Responsibility**
1 – **Organization** – To develop detailed TORs for the FAS and the AO to be contracted from the market. Ensure high level of qualification and experience for the FAM, a more junior profile for the AOs	IFAD – TORs prepared
2 – **Budgeting** – Ensure separate line item for the project under the APC/ DoA budget in the States of Nagaland and Mizoram.	DoA, Planning & Finance Secretaries, GoN/ GoM
3 – **Funds flow** – Obtain DEA clearance that (i) funding will be in USD and not SDR. (ii) the funds received from IFAD will be transferred to the GoM as soon as it is received from IFAD (iii) make arrangements for opening a Designated account at RBI. Ensure that the endowment fund of INR. 150 million is made available to the society on its registration; INR 20.00 million immediately after registration and the balance during 2018-19.	IFAD-ICO, GoN/ GoM
4 – **Internal Control** – Outline the fiduciary content of the PIM based on the formulation report.	IFAD, Mission team-completed
5 – **Accounting/ Reporting** – Set-up Chart of Accounts and reporting formats based on the cost components/ categories. Approach the software vendor for procurement of accounting software and customization during the second detailed design mission.	IFAD, Mission team and GoN/ GoM-Draft chart of accounts prepared
6 – **Internal Audit** – Prepare TOR of the internal auditor	IFAD, Mission Team-

	ToR prepared
7 – **External Audit** – Obtain DEA/ CAG concurrence for the appointment of AG-Mizoram to perform the audit and prepare the ToR for the same	IFAD ICO – Mission team

4. Procurement arrangements

197. Procurement of goods, works and services under FOCUS financed from resources provided or administered by IFAD will be undertaken in accordance with IFAD's Procurement Guidelines and Handbook (dated September 2010) and as amended from time to time as an exception to the provisions of the General Conditions. As the project will be directly implementing Central Sector Scheme funds in Nagaland, to maintain uniformity in processes and procedures, IFAD Procurement Guidelines will also apply for the procurement from CSS funds in Nagaland. In respect of Mizoram, procurements under CSS funding will follow the government procurement guidelines.

198. The nodal agencies at state level have limited prior experience in managing externally aided projects. This apart, there is inadequate staff capacity in these agencies to deal with the procurements. The CAG reports of both the states also indicate inherent risks in procurement. The lead implementing agency is yet to be created and capacity is to be built. Considering the complexities involved and capacity, the procurement risk assessment is **high**.

199. It is proposed to establish the following risk mitigation measures to address the High Risk assessment:

a) Engaging one Procurement Consultant on a retainership basis from outside the State with the experience and skill sets of procurement and compliance to established procurement norms of international financial institutions. As the Procurement Consultant will be engaged from the market, it will be ensured that some of the Government staff should also be involved as counterpart staff to address the issues of attrition and continuity of capacity.

b) Appropriate and regular on site and combined procurement training of selected procurement staff in "IFAD Procurement Guidelines" to enable efficient and effective project procurement actions.

c) Procurement manual prepared consistent with IFAD Procurement Guidelines and Procurement Handbook which will require IFAD's concurrence. Any changes/amendments /modifications in the approved Procurement Manual also requires IFAD's no objection. The manual could be a stand-alone document or included in the Project Implementation Manual.

d) Procurement plan for the initial 18 months of project implementation listing out all procurement activities to be taken up by the project consolidated at the State level to be prepared and submitted along with the first AWP&B. For the subsequent years of implementation, procurement covering the 12 month period will be sufficient. The procurement plan will be updated at least semi-annually or as required to reflect the actual project implementation needs. All procurement plans and its revisions will have to be approved by IFAD. Any procurement undertaken which is not as per the approved plan will not be eligible for IFAD financing.

e) Putting in place an effective contract management system which includes all contracts and its administration. The Contract Management forms will be submitted to IFAD as part of the Withdrawal Applications for IFAD loan assistance.

f) Use of model Bidding Documents and contracts approved by IFAD and included in the Procurement Manual/PIM; and maintain throughout the period of implementation of the Project, a full procurement documentation and record keeping system.

g) During Supervision Missions, the post review procurements will be reviewed on a sample basis selected from the procurement plan, from the stage of preparation of bid documents till contract award and amendments to contract to identify areas of performance improvement.

200. After putting in place the above risk mitigation measures fully and effectively, the residual risk assessment is Medium.

201. Good governance framework: All procurement for goods, works and services financed from resources funded or administered by IFAD require bidding documents and the contracts to include a provision requiring suppliers, contractors and consultants, ensure compliance with IFAD zero tolerance anti-corruption policy and to permit IFAD to inspect their accounts, records and other documents relating to the bid submission and contract performance, and to have them audited by IFAD-appointed auditors.

202. As part of the e-governance policy and framework, PMU of FOCUS in each State will disclose the following minimum documents either in its Project Website or Directorate of Agriculture Website: (i) procurement plan and its revisions; (ii) procurement manual; (iii) invitation for bids for goods and works for all NCB contracts; (iv) request for expression of interest for selection/hiring of consulting services, (v) contract awards of goods, works and all consultancy services, (vi) list of contracts following Direct Contracting or Single Source Selection (SSS); (vii) short list of consultants; (viii) contract award of all consultancy services; and (ix) action taken report on the complaints received. In addition, the PMU will also publish any information required under the provisions of suo-motu disclosure as specified by the Right to Information Act and the decisions of the State Information Commissioners applicable to project implementation.

203. Other details**:** The prior review modalities and thresholds and the post review of procurement actions are provided in Appendix 6.

E. Supervision

204. The project will be directly supervised by IFAD. During the start-up phase of the project, IFAD will attend the state level start up workshop in each state and participate in the discussions on the project approach, strategy and implementation arrangements. IFAD will engage specialists depending upon the need. Special attention will be provided to establish a robust financial management and procurement system with training of the finance and procurement staff. Other implementation support during the first year will include assistance to prepare standard bidding documents, standard design, evaluation and contracting procedures and contract management systems particularly for agricultural link road construction. It is envisaged that the first supervision mission will take place towards the end of the first year of operations. It will include specialists in water conservation, agronomy, livestock and financial management, and will review project targets and, if needed, recommend adjustments.

F. Risk identification and mitigation

205. There are a number of risks associated with the project. Key risks from those identified in the logframe are summarised in the table below. Overall the risk profile of the project is medium to low and the project has incorporated adequate risk mitigation strategies. There is high ownership of the project within the states. The respective state governments have taken a number of steps to ensure timely and quality implementation. Accordingly the Special Purpose Vehicle for implementing the project has been formed and registered, the Mission Director and Project Director have been appointed. Additionally, in Nagaland the state government has already appointed a number of technical staff.

Table 2: Risks and Risk Mitigation

Risk (R) / Assumption (A)	Risk before mitigation	Risk reduction Approach	Residual Risks
Goal level:			
Economic growth and social stability (A);	Low		
Growth of the non-farm sector means that fewer households than anticipated participate in project activities (R)	Medium	If needed, cover additional districts and include non-farm activities	Low
Long history of insurgent groups in Nagaland putting		Project to transfer funds directly to the community groups	Medium to Low

Risk (R) / Assumption (A)	Risk before mitigation	Risk reduction Approach	Residual Risks
pressure on the government to comply with their demand for funds (R)	Medium	and these community groups will be able to tackle the insurgent groups	
Development Objective level:			
Extreme climatic events (R)	Low	Project interventions increase productivity and resilience of crops to climate change. Focus on livestock, horticulture and agroforestry which are more resilient.	Very low
Climate change and/or better non-farm opportunities makes farming unattractive (R)	Low		
Improved *jhum* management: component level risks:			
Farmers find it worthwhile to adopt improved methods for *jhum* cultivation and settled agriculture (A)	Medium	Improved methods based on proven practices which are already adopted in some locations	Medium to low
Farmers are prepared to replicate project pilots and demonstrations using own resources (A)	Medium-High	Careful monitoring of results of demonstrations with profitable technologies disseminated via training and extension efforts in each village.	Medium to low
Reduced levels of income from settled agriculture due to lack of appropriate knowledge and investment in improved productivity (R)	Medium	Project support through training and provision of materials and technology will demonstrate profitability of settled agriculture	Low
Lack of a sharing pattern between land owners and share croppers in Nagaland for long term tree crops and orchard/plantation cultivation in *jhum* system will disincentivise *jhum* farmers who are share croppers. (R)	Medium	GoN has agreed to consult the community institutions and develop a system of sharing between the land owners and share croppers for long term tree crops, orchards and plantations	Low
Market access and value chain: component level risks:			
High transaction cost due to small volume and remote location (R)	High	Build production clusters and aggregation centres, with improved road communications.	Low
Policy changes discourage market engagement (R)	Low	Marketing units in Mizoram to provide policy advice in line with GoI pro-market strategies	Very low
Expansion of pig and poultry production constrained by competition from other states (R)	Low	Increased efficiency and lower feed costs makes local production of pigs and poultry more competitive.	Very low
Breeding animals/day-old chicks available (A)	Medium	Village level production of breeding pigs and chicks	Low
Govt supports role of CAHW in health care (A).	Medium-low	Strong links with state agencies reassures government	Low
Overall weak Financial Management (budgeting, accounting, reporting, internal controls, internal/external audit) may result in suspension of disbursements and consequent interruption of implementation activities	High	Hiring of qualified staff, training and implementation support should facilitate the performance of good Financial Management. Finance and Accounts Specialist and a Finance and Accounts Officer on a contractual basis will be hired from the market (refer to para 139)	Medium to Low

IV. Project costs, financing, benefits and sustainability

A. Project costs

206. Key assumptions used in estimating the project costs both for Mizoram and Nagaland are (i) price contingencies assumed at 4.7% and applied on all items, except for Grant and subsidies category financed by IFAD and physical contingencies at 7.5% on civil work items; (ii) exchange rate at INR 68 per USD that is expected to prevail from the project start; (iii) taxes and duties as prevailing in July 2017 and broadly at 15% on works, consultancies, equipment and vehicles; (iv) a six year implementation phase and the project starting in April 2018, (v) all unit costs were input in local currency unit, i.e. INR; (vi) cost tables are set in fiscal year basis and (vii) taxes, mostly excluded from IFAD financing rules[42].

207. The project costs estimated separately for Mizoram and Nagaland will be USD 79.31 million and USD 89.16 million respectively and totalling USD 168.47 million. Project costs are organized into three major components: (i) Improved *Jhum* cultivation; (ii) Market access and value chain development and (iv) Project management as summarised in Table- 3 below and detailed in "*Appendix-9: Project Costs and Financing*".

[42] While estimating taxes, the provisions contained in the new GST-2017 introduced by GOI have been broadly taken into consideration

Table 3: Project Cost Summary (amount in million)

		Mizoram		Nagaland		Total	
Project components		INR	USD	INR	USD	INR	USD
1	Improved jhum management	1,378.92	20.28	1,943.32	28.58	3,322.24	48.86
2	Value chain and market access	3,024.24	44.47	2,658.01	39.09	5,682.25	83.56
3	Project management	551.07	8.11	985.23	14.49	1,536.30	22.60
Total baseline costs		4,954.23	72.86	5,586.56	82.16	10,540.79	155.02
Physical contingencies		59.06	0.87	45.11	0.66	104.17	1.53
Price contingencies		379.74	5.58	431.08	6.34	810.82	11.92
Total Project costs		5,393.03	79.31	6,062.75	89.16	11,455.78	168.47

B. Project financing plan

208. The project will be financed by multiple financiers, namely IFAD, respective governments, parallel financing through Central Sector Schemes specifically set out for Tribal Development (CSS) and convergence funds from GoI and in addition to beneficiary contribution in the form of locally available materials and labour. IFAD would provide a loan of USD 35.25 million to Mizoram and USD 40.25 million to Nagaland out of the 2016-18 PBAS allocation for India. In addition IFAD would also finance a Grant of USD 1.00 million, that is, USD 0.45 million to Mizoram and USD 0.55 million to Nagaland for FAO Technical Assistance support. The GoM and GoN financing would be largely in the form of part of staff costs and operating costs and taxes.

209. Project financing, separately for Nagaland and Mizoram by financiers and components are summarised in Tables 4 and 5 below and also a combined Table (Table 6) showing financing plan. IFAD will provide the loan on Blend Terms, with interest on the principal amount outstanding at a fixed rate of 1.25% per annum, plus a service charge of 0.75% per annum. The loan would have a maturity period of 25 years, including a grace period of five years starting from the date of approval by the Executive Board of IFAD.

Table 4: Project financing plans by Components by Financiers (Nagaland State)

India
FOCUS_Nagaland State

Components by Financiers (US$ '000)	he Government		IFAD Loan		IFAD Grant		Parallel finance (CSS)		Parallel Finance,GON		Beneficiaries		Convergence		Total	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
A. Improved Jhum Cultivation																
1. Better Jhum and Conservation	5,966.6	24.1	14,317.9	57.9	-	-	3,149.2	12.7	349.9	1.4	945.1	3.8	-	-	24,728.7	27.7
2. Support to settled agriculture	289.0	4.3	6,076.6	90.4	-	-	-	-	-	-	353.9	5.3	-	-	6,719.5	7.5
Subtotal	6,255.6	19.9	20,394.5	64.9	-	-	3,149.2	10.0	349.9	1.1	1,299.1	4.1	-	-	31,448.2	35.3
B. Market access and value chain development																
1. Value chain development	836.4	5.1	9,049.2	55.3	-	-	3,495.7	21.3	390.0	2.4	2,602.1	15.9	-	-	16,373.4	18.4
2. Market Access Infrastructure	874.1	3.5	4,340.8	17.4	-	-	5,880.0	23.6	727.5	2.9	-	-	13,134.8	52.6	24,957.3	28.0
Subtotal	1,710.5	4.1	13,390.0	32.4	-	-	9,375.7	22.7	1,117.5	2.7	2,602.1	6.3	13,134.8	31.8	41,330.7	46.4
C. Project Management																
1. Project Management	9,363.3	57.2	6,466.0	39.5	550.0	3.4	-	-	-	-	-	-	-	-	16,379.2	18.4
Total PROJECT COSTS	17,329.3	19.4	40,250.4	45.1	550.0	0.6	12,524.9	14.0	1,467.5	1.6	3,901.2	4.4	13,134.8	14.7	89,158.1	100.0

Table 5: Project financing plans by Components by Financiers (Mizoram State)

India
FOCUS_Mizoram State

Components by Financiers (US$ '000)	GOVT		IFAD Loan		IFAD Grant		Parallel finance (CSS)		Parallel Finance,GOM		Beneficiaries		Convergence		Total		Duties &
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Taxes
A. Improved Jhum Cultivation																	
1. Better Jhum and Conservation	2,932.5	15.8	8,795.0	47.3	-	-	6,165.4	33.2	685.0	3.7	-	-	-	-	18,577.9	23.4	214.5
2. Support to settled agriculture	238.5	6.5	3,220.8	88.0	-	-	-	-	-	-	198.7	5.4	-	-	3,658.0	4.6	103.4
Subtotal	3,171.0	14.3	12,015.8	54.0	-	-	6,165.4	27.7	685.0	3.1	198.7	0.9	-	-	22,235.9	28.0	317.9
B. Market access and value chain development																	
1. Value chain development	1,819.6	12.2	7,680.7	51.4	-	-	2,938.0	19.7	327.2	2.2	2,172.0	14.5	-	-	14,937.5	18.8	614.4
2. Market Access Infrastructure	2,496.1	7.6	10,564.1	32.0	-	-	5,880.0	17.8	965.0	2.9	-	-	13,134.8	39.8	33,040.0	41.7	2,311.9
Subtotal	4,315.7	9.0	18,244.8	38.0	-	-	8,818.0	18.4	1,292.2	2.7	2,172.0	4.5	13,134.8	27.4	47,977.6	60.5	2,926.4
C. Project Management																	
1. Project Management	3,653.6	40.2	4,992.1	54.9	450.0	4.9	-	-	-	-	-	-	-	-	9,095.7	11.5	653.1
Total PROJECT COSTS	11,140.3	14.0	35,252.7	44.4	450.0	0.6	14,983.4	18.9	1,977.3	2.5	2,370.7	3.0	13,134.8	16.6	79,309.2	100.0	3,897.4

Table 6:Project financing by Components and Financiers (Combined)

							Parallel financing									
	Govt		IFAD Loan		IFAD grant		CSS*		State Govt		Beneficiary		Convergence**		Total	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
Project costs-Mizoram	*11,140.3*	*14.0*	*35,252.7*	*44.4*	*450.0*	*0.6*	*14,983.4*	*18.9*	*1,977.3*	*2.5*	*2,370.7*	*3.0*	*13,134.8*	*16.6*	*79,309.2*	*100.0*
Project costs-Nagalnd	*17,329.3*	*19.4*	*40,250.4*	*45.1*	*550.0*	*0.6*	*12,524.9*	*14.0*	*1,467.5*	*1.6*	*3,901.2*	*4.4*	*13,134.8*	*14.7*	*89,158.1*	*100.0*
Total	**28,469.6**	***16.9***	**75,503.1**	***44.8***	**1,000.0**	***0.6***	**27,508.3**	***16.3***	**3,444.8**	***2.0***	**6,271.9**	***3.7***	**26,269.6**	***15.6***	**168,467.3**	***100.0***

210. **Retro-active financing**: Facilities for financing certain key activities from 10 June 2017 until entry into force of the IFAD financing will be provided as retroactive financing as an exception to the general conditions. Accordingly the facilities for retro-active financing have been requested by the respective governments of Mizoram and Nagaland from the period June 10, 2017 onwards. These proposed expenditures will fall under two expenditure categories, namely (i) Goods, services and inputs and (ii) Training and capacity building. The estimated total expenditure would be about USD 250,000 for Mizoram and USD 300,000 for Nagaland. The respective state government would pre-finance these expenditures. These expenditures would be reimbursed when withdrawal applications are submitted adhering to the financing agreements.

C. Summary benefits and economic analysis

Nagaland State

211. Benefits and Beneficiaries: The Project will benefit a total of about 137,000 households. The beneficiaries include mostly Tribal households including disadvantaged households. Women-headed and poor households will be especially targeted under the programme. Table-7below gives an estimate of the cumulative number of beneficiaries by year.

Table 7: Number of Benefited Households, cumulative - Nagaland

Subproject households	*Project year cumulative*						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	*Cumulative*
Food crops jhum agriculture hh a/	*45,500*	*91,000*	*91,000*	*91,000*	*91,000*	*91,000*	*91,000*
Spices & orchards jhum households b/		*45,500*	*91,000*	*91,000*	*91,000*	*91,000*	*91,000*
Community Forestry households c/	*42,000*	*84,000*	*137,000*	*137,000*	*137,000*	*137,000*	*137,000*
Livestock households	*0*	*7500*	*15000*	*22,500*	*30,000*	*30,000*	*30,000*
Processing units households d/	*0*	*0*	*0*	*14,700*	*29,400*	*42,000*	*42,000*
Farm to market link road households e/	*0*	*9350*	*18,700*	*28,050*	*37,400*	*37,400*	*37,400*
Total outreach (# of households)	***45,500***	***91,000***	***137,000***	***137,000***	***137,000***	***137,000***	***137,000***

a/ includes jhum households, wet land paddy households and upland farming households
a/ These households concentrated in 50 spices clusters;
b/ All 650 villages covered by community forestry programme
c/ concentrated in 200 spices villages and 210 households per village;
d/ assumed at 187 households/km of road provided with better CD structure .

212. Household incomes: The immediate benefits from the programme are increased productivity-through the introduction of better management practices and improved farming practices. This response is expressed in incremental household income of INR 24,008 per household in year 6 and 36,600 at full development. These incomes are the resultant impact of the project interventions and do not include any other sources of incomes. Broadly, there are hardly any demands on incremental labour inputs which, is 53 person-days per household at present and this is marginally increased to 56 person-days.

213. Economic analysis: Key assumptions as mentioned earlier were used in the economic and financial analysis of the Programme. The analysis included all incremental costs and incremental benefits that are quantifiable and associated with the project's investments in development. Current calculations show that the Nagaland state project yields an Economic Rate of Return (IRR) of 29%, a benefit-cost ratio of 1.78 and the Net Present Value of INR 6,593 million at a discount rate of 10% as shown in Table below:

Table 8:Sensitivity of NPV, IRR and BCR to varying scenarios - Nagaland

Indicators	Base case	Cost Increased by		Benefits down by	
		10%	20%	10%	20%
NPV-Benefit & cost streams discounted at 10% INR million	6,593	5,747	4,901	5,088	3,583
IRR-Net incremental benefits stream for a 20 year period	29%	25%	22%	25%	21%
BCR-Cash flows discounted at 10%	1.78	1.62	1.48	1.60	1.42

214. Sensitivity analysis was also undertaken to assess how varying the assumptions change the economic parameters. This analysis shows that the project investments are robust and sound and

even under varying adverse conditions including the simultaneous increases in costs and decreases in benefits. A switching value analysis demonstrates that the costs would have to increase by 78% or benefits would have to decrease by 44% for the NPV to be zero.

Mizoram State

215. Benefits and Beneficiaries: The Project will benefit a total of about 64,500 households. The beneficiaries include mostly Tribal households including disadvantaged households. Women-headed and poor households will be especially targeted under the programme. Economic and financial analysis of the project is provided in Appendix-10.Table-9 below gives an estimate of the cumulative number of beneficiaries by year.

Table 9:Number of Benefited Households, cumulative - Mizoram

Subproject households	Project year						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Cumulative
Food crops &rice+fish agriculture hh	*28,240*	*61,520*	*64,500*	*64,500*	*64,500*	*64,500*	*64,500*
Spices & orchards households a/	*600*	*5,600*	*10,600*	*12,040*	*12,040*	*12,040*	*12,040*
Forestry village households b/	*2,370*	*30,810*	*64,500*	*64,500*	*64,500*	*64,500*	*64,500*
Livestock & fishery households	*5,136*	*12,448*	*19,488*	*26,528*	*26,528*	*26,528*	*26,528*
Processing units households c/	*0*	*0*	*0*	*9,450*	*18,900*	*28,350*	*28,350*
Farm to market link road households d/	*0*	*6,800*	*13,600*	*20,400*	*27,200*	*27,200*	*27,200*
Total outreach (# of households)	***27,200***	***54,200***	***64,500***	***64,500***	***64,500***	***64,500***	***64,500***

a/ These households concentrated in 120 spices clusters; b/ All 272 villages covered by village forestry programme
c/ concentrated in spices villages; d/ assumed at 136 households/km of gravelled road

216. Household incomes: The immediate benefits from the programme are increased productivity-through the introduction of better management practices and improved farming practices. This response is expressed in incremental household income of INR 17,690 per household in year 6 and INR 28,190 at full development. These incomes are the resultant impact of the project interventions and do not include any other sources of incomes. Broadly, there are no demands on incremental labour inputs which is 68 person-days per household per year.

217. Economic analysis: Following key assumptions were used in the economic and financial analysis of the Programme- (i) the benefits have been estimated over a 20 year timeframe using a discount rate of 10%; (ii) the benefits that have been included in computing the economic and financial analysis included only those benefits which could be realistically quantified; (iii) use of a SCF of 0.85 for output and 0.84for most of the inputs, and (iv) average financial wage rate of INR 270/person-day. The analysis included all incremental costs and incremental benefits that are quantifiable and associated with the project's investments in development.

218. Project performance indicators: Current calculations show that the Mizoram state project yields an Economic Rate of Return (IRR) of 25%, a benefit-cost ratio of 1.51 and the Net Present Value of INR 3,141 million at a discount rate of 10%.

Table 10: Sensitivity of NPV, IRR and BCR to varying scenarios - Mizoram

Indicators	Base case	Cost Increases by		Benefits down by	
		10%	20%	10%	20%
NPV-Benefit & cost streams discounted at 10% INR million[43]	3141	2527	1913	2213	1284
IRR-Net incremental benefits stream for a 20 year period [44]	25%	21%	18%	21%	16%
BCR-Cash flows discounted at 10%[45]	1.51	1.37	1.31	1.36	1.21

[43] The NPV is a very concise performance indicator of an investment project: it represents the present amount of the net benefits (i.e. incremental benefits less incremental costs) flow generated by the investment expressed in AFA (a single value with the same unit of measurement used in the accounting tables). The Net Present Value is the sum of a 20 year discounted net cash flows.

[44] IRR is defined as the discount rate that zeroes out the net present value of flows of costs and net present value of flows of benefits of an investment. The IRR was computed using incremental net benefits streams for 20 year period. As IRR rankings can be misleading, and given that the informational requirements for computing a proper NPV and IRR are the same except for the discount rate, it is always worth calculating the NPV of a project. There are many reasons in favour of the NPV decision rule (see Lev, 2007).

[45] BCR is independent of the size of the investment and it does not generate ambiguous cases and for this reason it can complement the NPV in ranking projects where budget constraints apply. Being a ratio, the indicator does not consider the

219. Sensitivity analysis was also undertaken to assess how varying the assumptions change the economic parameters. This analysis shows that the project investments are robust and sound and even under varying adverse conditions including the simultaneous increases in costs and decreases in benefits. A switching value[46] analysis demonstrates that the costs would have to increase by 51% or benefits would have to decrease by 34% for the NPV to be zero.

220. **Other benefits**

221. Environmental and other benefits: Overall, the project is environmentally favourable with the planting and maintenance of 15,720 ha village forests along with water development facilities, 7,600 ha of *jhum* plots planted with annual and perennial spices, 59,700 ha of *jhum* fallow land planted with annual and perennial legumes to enhance soil fertility, some 127,000 ha of *jhum* and low land treated with soil and water conservation measures such as contour bunds and trenches, 15,190 ha wetland treated with soil fertility enhancement measures etc. These measures would enhance organic carbon contents of soil. Farm-to-market roads are improved using the existing road alignments and no felling or clearing of existing jungles or excavation of new road alignments proposed. More over the road improvement work include adoption of climate resilient features such as protection of side slopes, construction of cross-drainage structures and side drains, etc.

222. An attempt was made to use FAO's EX-ACT software in assessing the greenhouse gas emissions in two project area states and the results are shown in Annex-H, Appendix-10. Accordingly tCO_2eq is –(-2.5) for biomass and (-1.0) for soils per year per ha in case of Mizoram and tCO_2eq is (-1.9) for biomass and (-1.0) for soils per year/ha for Nagaland.

H. Sustainability

223. The project interventions should be sustainable. Improved agricultural practices, if found by farmers to be useful and profitable will be sustained provided inputs and markets are available. The project interventions in the market access and value chain component will aim to ensure this.

224. In particular the project seeks to build capacity at the village level, not just in terms of the capacity of farmers to produce, but in local service providers - such as Lead Farmers, CRPs and CAHWs. In addition the project will establish village level suppliers of inputs - plant nurseries and animal feed mills, along with poultry and pig breeding farms. All of these will be operated by local people and make a profit from providing these inputs - and so will be sustainable after the project is completed. The project will also establish systems for the continuing provision of crop and vegetable seeds through community seed systems.

225. Marketing systems will very largely be in the private sector, with the project helping producers make links with agribusiness and marketing companies, as well as establishing local aggregation and primary processing enterprises. There are a number of examples in both states of such enterprises continuing to operate after direct support has been ended.

226. Government will have some continuing responsibilities. Road maintenance will be needed - but village and farm link roads are largely the responsibility of Village Councils who will mobilise resources to keep roads open. The provision of livestock vaccine is a continuing GoI responsibility which will be sustained after the end of the project.

I. Assurances

227. GoM shall issue a notification nominating the Department of Agriculture as the lead implementing and nodal agency and the Department of Agriculture to register a new society under the

total amount of net benefits and therefore the ranking can reward more projects that contribute less to the overall increase in public welfare

[46] Switching values are yet another measure of sensitivity analysis They demonstrate by how much a variable would have to fall (if it is a benefit) or rise (if it is a cost) to make it not worth undertaking an option.

Chair of the Chief Secretary. GoN has already completed activities related to registration of the society.

228. GoM to appoint a Joint Director or above level officer from the technical department as the Chief Executive Officer of the society.

229. GoN and GoM shall approve release INR 150 million (INR 15 crores) as endowment grant of which INR 20 million (INR 2crores) to be released immediately after the society formation to undertake the start-up activities and make budgetary allocation in the budget of 2018-19 for the balance INR130 million (INR 13 crores) which will be released in two instalments.

230. GoN and GoM to initiate steps to include budgetary requirements for 2018-19 into the state budget by creating a separate budget line in the budget of the APC's Office/Department of Agriculture.

231. GoN and GoM to release about 20% of the MGNREGA funds for the project districts as convergence funds for this project to be implemented by the Rural Development Department using the already prevalent procedures of implementation.

232. GoN and GoM to start the process of deputation of regular government staff to the society, engagement of contractual staff for the society and also engagement of staff for the districts and blocks/circles.