Investing in rural people

Republic of the Union of Myanmar

Western States Agribusiness Project

Final project design report

Main report and appendices

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Currency equivalents

Currency Unit	=	Myanmar Kyat (MMK)
US$1.0	=	MMK 1,120

Weights and measures

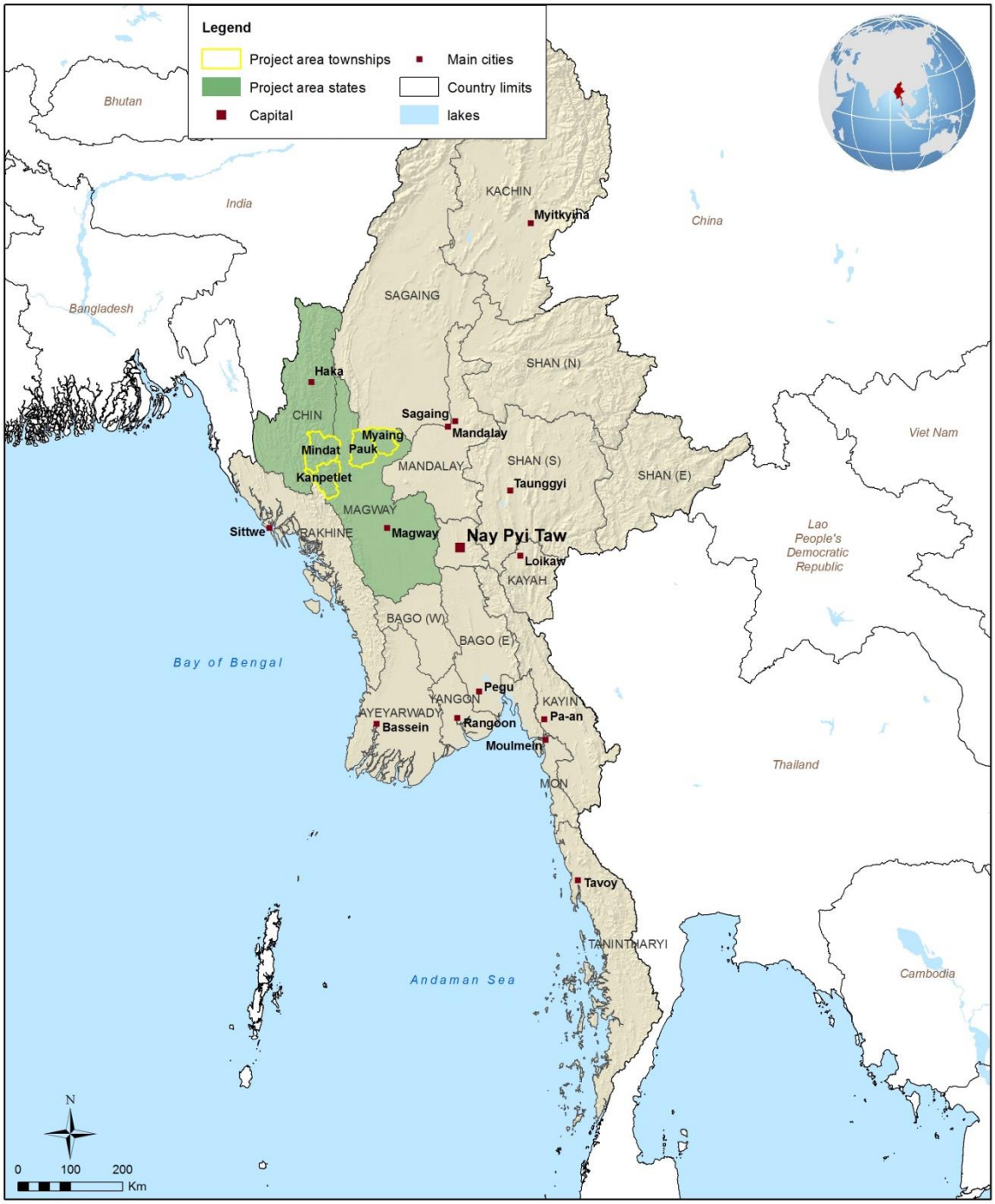
1 kilogram	=	1,000 g
1 kilogram	=	2.204 lb.
1 kilometre	=	0.62 mile
1 square metre	=	10.76 square feet
1 acre	=	0.405 hectare
1 hectare	=	2.47 acres

Abbreviations and acronyms

ABF	Agri-Business Fund
AED	Agriculture Extension Department
AIT	Agriculture Information Technology
AMD	Agriculture Mechanization Department
ASEAN	Association of South East Asian Nations
AWP&B	Annual Work Plan and Budget
CB	Cooperative Bank
CBM	Central Bank of Myanmar
CBs	Commercial Banks
CIG	Common Interest Group
COSOP	Country Strategic Opportunities Programme
CPPP	Constant Purchasing Power Parity
DA	Designated Account
DALMS	Department of Agricultural Land Management and Statistics
DAR	Department of Agriculture Research
DoA	Department of Agriculture
DRD	Department of Rural Development
EB	Executive Board
EIRR	Economic Internal Rate of Return
FARM	Fostering Agricultural Revitalization in Myanmar
FESR	Framework for Economic and Social Reform
FIND	Financial Inclusion for National Development
FM	Financial Management
FPIC	Free, Prior, Informed Consent
FPL	Food Poverty Line
FTE	Full Time Employment
GAP	Good Agricultural Practices
GDP	Gross Domestic Product
GIZ	Gesellschaft für Internationale Zusammenarbeit
GoM	Government of Myanmar
GRET	Groupe de Recherche et d'Echange Technique
HACCP	Hazard Analysis Critical Control Point
HDI	Human Development Index
HDR	Human Development Report
HH	Household
HPI	Human Poverty Index
ID	Irrigation Department
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
IHLCA	Integrated Household Living Conditions Assessment
IPSAS	International Public Sector Accounting Standards
ISO	International Standardisation Organization
IWUMD	Irrigation and Water Utilization Management Department
JICA	Japanese International Cooperation Agency
KC	Knowledge Centre
KM	Knowledge Management
LIFT	Livelihoods and Food Security Trust Fund
MADB	Myanmar Agriculture Development Bank
MAP	Making Access Possible
M&E	Monitoring and Evaluation
MEB	Myanmar Economic Bank
MDG	Millennium Development Goal
MFI	Microfinance Institution
MMA	Myanmar Microfinance Association
MMK	Myanmar Kyat

MoALI	Ministry of Agriculture, Livestock and Irrigation
MoBA	Ministry of Border Affairs
MoECF	Ministry of Environmental Conservation and Forestry
MoLFRD	Ministry of Livestock, Fisheries and Rural Development
MoNPED	Ministry of Planning and Economic Development
MoPF	Ministry of Planning and Finance
MPA	Multidimensional Poverty Assessment
MSME	Micro, Small and Medium Enterprise
NCDP	National Comprehensive Development Plan
NGO	Non-Governmental Organization
NMTPF	National Medium Term Priority Framework
NPSC	National Project Steering Committee
OAG	Office of Auditor General
O&M	Operation and Maintenance
PARDAP	Poverty Alleviation and Rural Development Action Plan
PMU	Project Management Unit
PDR	Project Design Report
PIM	Project Implementation Manual
PIO	Project Implementation Office
PFI	Participating Financial Institution
PPP	Public Private Partnership
PPPP	Public Private Producers Partnership
RBF	Rural Business Fund
RIMS	Results and Impact Management System
RSC	Rice Specialized Companies
RU	Refinancing Unit
SADC	Specialised Agriculture Development Company
SALT	Sloping Agricultural Land Technology
SCG	Savings and Credit Group
SDR	Special Drawing Rights
SDG	Sustainable Development Goal
SECAP	Social, Environmental and Climate Assessment Procedures
SoE	Statement of Expenditure
SLRD	Settlements and Land Records Department
SME	Small and Medium Enterprises
SO	Strategic Objective
SP	Service Provider
SPCC	State Project Coordination Committee
TA	Technical Assistance
UMFCCI	Union of Myanmar Federation of Chambers of Commerce and Industry
UN	United Nations
UNCDF	United Nations Capital Development Fund
UNDP	United Nations Development Programme
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNOPS	United Nations Office for Project Services
USD	United States Dollar
VG	Village Group
VT	Village Tract
WA	Withdrawal Application
WASH	Water, Sanitation and Hygiene
WB	World Bank
WP	Working Paper
WSAP	Western States Agribusiness Project
WUA	Water Users' Association
WUG	Water Users' Group

Map of the Project area



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.

IFAD

Map compiled by IFAD | 17-06-2016

Executive Summary[1]

Overview

Guided by the COSOP, the IFAD country programme is supporting the Government of Myanmar to create a model for agricultural modernisation and rural transformation in each agro-ecological zone of the country. The first investment – the FARM project – created the model for agricultural development, service delivery and enterprise growth in the central dry zone; this model has been scaled up by the World Bank and the Asian Development Bank across the entire dry zone. The second investment – the ESAP – establishes the model for agribusiness development and community agroforestry, and creating farming and employment opportunities for ethnic groups, indigenous people, ex-combatants, and returning migrants, across the eastern hilly zone. The third investment – the WSAP – creates the model for climate resilient agricultural transformation from subsistence to commercial livelihoods, across the western upland areas and forests. It is expected that the fourth investment, to be financed under the 2019-21 PBAS cycle, will address constraints and opportunities in the delta region. With these four projects, IFAD will have fulfilled its COSOP objective of helping the Government to create optimal models for modernising agriculture across all agro-ecological zones of Myanmar.

Goal and Objective

The project's goal is to improve the social and economic status of rural households in an climate resilient manner in northern Magway region and southern Chin state. Its objective is to increase household incomes, food security and nutrition quality. Its investments focus on commodities and services that have comparative advantage, market demand and growth potential.

Rationale

The project's rationale has four dimensions: (i) to provide a systemic structural response to the challenges and opportunities for rural transformation in southern Chin and northern Magway; (ii) to create a model for the environmentally sustainable modernisation of agriculture in degraded sloping areas which generates economic benefits for poor households; (iii) to rehabilitate productive infrastructure in ways that maximise the sustainable use and output of the natural resource base; (iv) to forge pathways for communities to transition from subsistence to commercial livelihoods through access to inputs, knowledge and services. Elements of livelihoods support and nutrition-sensitive agriculture will be incorporated, to address important segments of local communities as appropriate.

Project Area

The project is located in southern Chin state and northern Magway region, which share a common river basin. These areas have among the highest concentrations of poverty in Myanmar. While the two areas are neighboring, their development contexts differ significantly. Chin is located in the hilly border area between Myanmar, India and Bangladesh. The people are of the Chin ethnic group and its 53 officially recognised sub-groups. Southern Chin is home to some of the most remote and isolated communities in the country. Magway is located in the lowland central dry zone, and its population is mostly of the Bamar ethnic group. Magway region is poor and food-insecure, and has been subject to a series of natural calamities and substantial losses of harvest in recent years.

Target Groups

The project's target groups consist of: (i) small and medium size farming households in upland and lowland areas; (ii) livestock producers; and (iii) non-farming and landless households. Women and women-led households will be prioritised, and youth, as the primary agents of change at community level, will be the focus of activities involving technological innovation and commercialisation.

[1] The project design process was led by Mr Omer Zafar (country programme manager), Ms Enika Basu (programme officer) and Ms Audrey Nepveu (lead technical advisor, water & rural infrastructure). The final design mission included Mr Karim Merchant (team leader), Mr Jens Kristensen (agribusiness), Mr Zahid Shakeel (infrastructure), Mr Majid Benabdellah (economist), Mr Seifu Mehari (institutions), Ms Thiri Wai (programme facilitator), and Mr Aung Hlaing (country representative).

Components

Component 1: Infrastructure. The project will finance strategic investments in productive and social infrastructure.

Sub-component 1.1. Productive Infrastructure. The project will finance: (i) rehabilitation of irrigation schemes to ensure adequate and reliable supply of water to farms; (ii) rural access roads linking farms to markets; (iii) irrigation technology for home gardens to ensure food security and nutritional diversity; and, (iv) land consolidation on a pilot basis. These investments will generate opportunities for increased incomes, reduce on-farm and off-farm production costs, and improve food security for communities and households. They will improve water management, reduce water conveyance and application losses by 30-40%, improve drainage and reduce siltation, and conserve groundwater.

Sub-component 1.2. Social Infrastructure. The project will invest in social infrastructure facilities mainly at household level, particularly targeting the needs of women and the poorest households. Domestic water supply, rainwater harvesting, and renewable energy solutions will be eligible for support. Scheme selection will be participatory, sensitive to cultural considerations, and subject to social, technical, financial and environmental feasibility. The ownership, management, operation and maintenance of all facilities constructed will be carefully articulated to ensure sustainability.

Sub-component. 1.3 Capacity Building. The project will build the capacities of the IWUMD and DRD of MoALI (responsible for productive and social infrastructure respectively) through the provision of technical assistance, strengthening of staffing and office facilities, awareness of water, sanitation and hygiene issues, awareness of nutrition diversity, and capacity development in social mobilisation.

Component 2: Services. The project will invest in agriculture modernisation and enabling services to optimise resource management, productivity and benefits in areas of infrastructure investment.

Sub-component 2.1. Agricultural Modernisation. The project will invest in a range of agriculture, livestock and technical services to modernise production and trigger improvements in food security and nutrition, livelihoods, and economic returns. Service delivery to farming households will include land titling, technology transfer, skills improvement, access to inputs and supplies, access to markets and information, contractual linkages, and access to financial resources. Climate resilient *sloping agricultural land technology* (SALT) will be promoted. Service delivery to the landless will focus on technical and business management skills, micro-enterprise development and private sector linkages.

Sub-component 2.2. Financial Services. Building on FARM experiences, the project will support financial inclusion for small farmers, livestock owners and the landless, ensuring equal access for ethnic groups and women. It will invest in: (i) savings and credit groups, promoting financial literacy; (ii) a Rural Business Fund to support micro-enterprises; (iii) an Agribusiness Fund to support agribusinesses to establish processing facilities in the project area; (iv) a line of credit to refinance project-related agriculture, livestock and enterprise lending operations of licensed financial institutions.

Sub-component 2.3: Policy engagement. The project will contribute to an evidence-based and inclusive policy framework for rural development in Myanmar, specifically related to the project's implementation experiences. It will focus on: (i) transition from shifting to sedentary agriculture and associated customary land laws; (ii) re-categorisation of high-value commercial crops from non-timber forest product to agricultural or industrial crops; (iii) agricultural service delivery and market linkages.

Management and Implementation

The Ministry of Agriculture, Livestock and Irrigation will be the project executing agency, while the Department of Rural Development (DRD) will be the project focal department. The project will be governed by a National Project Steering Committee and two Project Coordination Committees (one in each location). It will be managed by a central Project Management Unit, established within DRD, and two decentralised Project Implementation Offices (one in each location).

The project will be implemented by state-level MoALI, implementing partners, and the private sector. Two Implementing Partners have been identified as cost-sharing to lead social mobilisation, community interface, and policy engagement. Infrastructure will be implemented by IWUMD and DRD, in collaboration with private sector engineering firms and contractors as required. Agricultural modernisation will be implemented by MoALI Knowledge Centres, brokering services and markets for

the target groups, in collaboration with producers' associations and community organisations. Financial services will be implemented by licensed financial institutions.

Costs and Financing

The total project cost, including duties, taxes and contingencies, is estimated at US$ 20.3 million over a six-year implementation period. It will be financed by an IFAD loan of US$ 9.0 million, an IFAD grant of US$ 4.0 million, Government contribution of US$ 1.0 million, beneficiary/private sector contribution of US$ 0.8 million, and implementing partners' cost-sharing of US$ 1.0 million. The financing gap of US$ 4.5 million may be sourced through cofinancing identified during implementation or through a subsequent PBAS cycle.

Benefits

The project is expected to directly benefit 76,810 households, of which 10,190 in Chin and 66,620 in Magway, composed of 390,410 rural women and men. An additional 4,730 FTE jobs will be created and will indirectly benefit a large number of households. The estimated project cost per beneficiary household is US$ 327.

Project benefits will be generated from improved infrastructure, land tenure, agricultural technology, market access, enterprise growth and financial services. The main beneficiaries will be small farming households, landless/tenant households, and off-farm households. The key results will be increased incomes, incremental jobs, improved food security and nutrition, and secured climate resilience.

The project's EIRR over 20 years is estimated at 32%.

Risks

The main risks are governance risk, expropriation risk, fiduciary risk and capacity risk. These are mitigated by a robust project governance framework, a set of legal assurances to be negotiated with Government, substantial technical assistance and capacity building, and the underlying business relationships to be fostered.

Logical Framework

	Indicators			Means of verification			Assumptions
	Name	**Baseline**	**End Target**	**Source**	**Frequency**	**Responsibility**	
Goal: Improve the social and economic status of rural households in an climate resilient manner in northern Magway and southern Chin	▪ Decline in poverty rate in project area by at least 10% by PY6 ▪ % of beneficiary households with increased adaptive capacity to climate change and shocks	Chin: 73% (2012) Magway: 27% (2012) 0	Chin: 63% Magway: 17% 70% (53,500 HHs)	National statistics RIMS Surveys Outcome surveys	Project start, Mid-term and end project	PMU	Public sector policies continue to support sustainable smallholder agriculture and small and medium agribusinesses
Development Objective: Increase household incomes, food security and nutrition quality	▪ % of all direct beneficiary HHs with an income increase of 20% in real terms by project end ▪ % of targeted beneficiary HHs with improved quality of diet	Approx. MMK 2,771,000p.a. (Chin upland) Approx. MMK 322,000 p.a. (Magway lowland) 0	60% (6,000 HHs in Chin) 70% (46,000 HHs in Magway)	National and regional statistics RIMS survey Annual outcome surveys Project thematic surveys	Project start, Mid-term and end	PMU DoA UNICEF data	Project beneficiaries are willing to adopt transferred knowledge Successful partnership with UNICEF's nutrition programme
Outcomes **Outcome 1:** Improved access to productive and social infrastructure	▪ No. of acres with access to year round water for supplemental irrigation ▪ No. of HH benefitting from access to domestic water supply	Baseline will be determined at project inception	6,280 acres 6,000 HHs	IWUMD, DRD records Project M&E	Annual	PMU IWUMD DRD	Close collaboration between IWUMD and DRD
Outputs: 1.1 Irrigated areas are expanded in a climate resilient way	▪ No. of small and medium irrigation schemes established in Chin ▪ No. of small irrigation and medium schemes established in Magway	- -	38 28	Project M&E IWUMD, DRD records	Annual	PMU	Timely availability of necessary equipment for infrastructure work

	Indicators			Means of verification			Assumptions
	Name	**Baseline**	**End Target**	**Source**	**Frequency**	**Responsibility**	
1.2 Social infrastructure expanded	▪ No. of domestic water supply systems established ▪ No. of rainwater harvesting systems installed	- -	53 26	Project M&E DRD records	Annual	PMU	
Outcome 2: Technological, financial and policy environment for small farmers and agribusinesses is enhanced	▪ No. of HHs with modern & climate resilient agricultural practises in upland rainfed areas ▪ No. of HHs with increased yields (upland and lowland) ▪ No. of HHs benefiting from incremental jobs created through project supported SMEs	- - -	42,509 HHs 74,225 HHs 5,000HHs	Project M&E DoA records	Annual	PMU DoA	Beneficiaries willing to adopt transferred knowledge; Private sector participation
Outputs: 2.1 Improved access for farmers to knowledge, technology and services	▪ No. of KCs established in selected locations of Chin and Magway ▪ No. of HHs receiving services from the KCs	- -	50 76,810 HHs	Project M&E DoA records	Annual	PMU DoA	Beneficiaries willing to adopt transferred knowledge; Private sector participation
2.2 Sustainable improvement in land management practices and technologies	▪ No. of acres are under sustainable land management systems	-	87,540 acres	Project M&E DALMS records	Annual	PMU DALMS	Close collaboration between CBOs, DALMS and project implementing partners
2.3 Improved access to financial services for small farmers and agribusinesses	▪ No. of credits groups formed ▪ No. of investments supported through the RBF and ABF	- -	500 1,320	Project M&E MFI records	Annual	PMU	
2.4 Strengthening policy development for climate smart agriculture	▪ No. of technical policy review notes produced	-	4	Project M&E	Annual from PY3	PMU	

I. Strategic context and rationale

A. Country and rural development context

1. **Country Economic Background.** Myanmar is the largest country in Southeast Asia, bordering China, Lao PDR, Thailand, India and Bangladesh. The Bay of Bengal lies to the west and the Andaman Sea to the south. There are three distinct topographical areas – the western ranges, the central plains and the eastern hills. The Ayeyarwady delta region and the Sittaung and Thanlwin basins make up the central plains with extensive alluvial lowlands and a lengthy dry season.

2. Myanmar's population in 2015 is estimated at 51.5 million, with a density of 76 per sq. km and an annual growth rate of 1%. About 67% of the population is rural, compared with 73% in 1995, indicating slow urbanisation. It is ethnically diverse, with 8 major ethnic groups, 135 sub-groups and 108 ethno-linguistic groups. The population is estimated to be 68% Burmese, 9% Shan, 7% Karen, 4% Rakhine, 3% Chinese, 2% Indian, 2% Mon, and 5% Kachin and Kayah.

3. Myanmar's GDP in 2015 amounted to over USD 64.9 billion. Its GNI per capita was estimated at USD 1,280 in 2014. The GDP growth increased from 4.8 % in 2011 to 6.6% in 2015 while the inflation rate was reportedly 11% at the end of 2015. Agriculture accounted for 37.1% of the GDP, industry 21.3% and services 41.6% in 2015. The economic outlook for 2016 and 2017 remains positive, with expectations that continuing progress on regulatory and legal reforms, rapid growth in telecommunications and the launch of several special economic zones, will further attract foreign investment. Although exports increased over the last five years, amounting to USD 9 billion in 2014, imports increased even more over the previous three years, leading to an annual trade deficit of USD 3 billion in 2014. In the space of just a few years almost every aspect of life has been affected by fundamental economic reforms aimed at increasing openness and empowerment. Increased gas production and exports, and stronger performance in non-gas sectors as the economy opened up, also contributed to this overall economic growth.

4. **Rural Poverty and Food Insecurity**. Myanmar is one of the poorest nations in South-East Asia, and the 2015 Human Development Report ranks it 148th among 188 nations rated, with an HDI of 0.536. Since 2011, with the launch of Myanmar's first Poverty Alleviation and Rural Development Action Plan, there has been a renewed focus on poverty alleviation in the country. Since 2004, there has also been more systematic monitoring of poverty with an Integrated Household Living Condition Assessment (IHLCA) carried out by UNDP in consultation with the Government in 2004-05 and in 2009-2010. Most recently, the 2014 Myanmar Population and Housing Census was published in 2015 by the Department of Population.

5. The IHLCA series indicate a general improvement in poverty levels between 2005 and 2010 in the incidence of those living below the poverty line (from 32% to 26%) and the food poverty line (from 10% to 5%). Food insecurity is closely correlated with poverty, and is categorised in four dimensions: food availability, food access, food utilization, and stability of access. While Myanmar produces enough rice to meet its consumption needs, there are major problems with access to food for vulnerable groups across the country. There are also discrepancies across and within states and regions with respect to food deficits, as illustrated in the table below. Tables 1 and 2 below provide an overview of rural and urban poverty and food poverty by state/regional level.

Table 1: Poverty Profile

State, Region and Union	Urban (%)	Rural (%)	Total (%)
Kachin	23.4	30.6	28.6
Kaya	2.3	16.3	11.4
Kayin	16.8	17.5	17.4
Chin	52.1	80.0	73.3
Sagaing	16.0	14.9	15.1
Tanintharyi	16.7	37.5	32.6
Bago	19.0	18.2	18.3
- Bago (E)	20.9	20.1	20.2
- Bago (W)	15.6	15.9	15.9
Magwe	15.8	28.2	27.0
Mandalay	14.1	31.6	26.6
Mon	17.8	16.0	16.3
Rakhine	22.1	49.1	43.5
Yangon	11.9	28.7	16.1
Shan	14.1	39.2	33.1
- Shan (S)	8.3	31.2	25.2
- Shan (N)	16.3	43.1	37.4
- Shan (E)	28.6	52.3	46.4
Ayeyardwady	23.1	33.9	32.2
Union	**15.7**	**29.2**	**25.6**

(IHLCA, 2010)

Table 2: Food Poverty Profile

State, Region and Union	Urban (%)	Rural (%)	Total (%)
Kachin	2.5	5.0	4.3
Kaya	0.0	1.9	1.2
Kayin	0.0	2.1	1.7
Chin	6.4	30.8	25.0
Sagaing	2.5	1.1	1.3
Tanintharyi	4.5	11.1	9.6
Bago	3.4	1.4	1.7
- Bago (E)	4.9	2.4	2.8
- Bago (W)	0.7	0.3	0.3
Magwe	2.1	3.8	3.6
Mandalay	2.3	6.5	5.3
Mon	2.4	3.8	3.6
Rakhine	4.4	11.5	10.0
Yangon	1.6	4.8	2.4
Shan	3.5	10.8	9.0
- Shan (S)	3.6	9.8	8.2
- Shan (N)	3.4	11.6	9.9
- Shan (E)	3.5	10.9	9.1
Ayeyardwady	3.8	6.5	6.7
Union	**2.5**	**5.6**	**4.8**

(IHLCA, 2010)

6. The rural poor typically consist of those with access to small and marginal landholdings, usually below 2 ha (almost 5 acres) and the landless (between 5% and 53% of the rural population in different parts of the country). The rural poor suffer from inadequate food, nutrition and essential non-food items. Rural poverty is linked to resource endowments; poor agricultural households farm on average less than 2 ha of land, while non-poor households farm an average of 3 ha. Fewer poor agricultural households (9%) own farm equipment than better-off ones (19%).

7. The headcount index of food poverty is generally higher in rural than urban areas. Poor infrastructure, restrictions on movement of food commodities and restrictive market policies prevent the transport of food commodities from surplus to deficit areas. Constraints affecting the ability of farming households to feed themselves include inadequate access to land and services. Households relying on market purchase to obtain food depend on having sufficient income, the existence of markets and the efficiency of markets to deliver food at affordable prices. In summary, there is still widespread chronic and acute food insecurity resulting from poorly functioning markets, poor transportation infrastructure and lack of non-farm employment opportunities. Joint efforts from the GoM and the international community have led to a gradual limitation of hindering factors and reduction of food insecurity, although unequally across the country.

8. **Nutrition insecurity**. Nutrition issues are now being addressed in a more coherent manner in the National Comprehensive Development Plan (2011-2030) preceded by a full review of the Ministry of Health's report on National Plan for Action on Food and Nutrition (2011-2015). There has been a clear downward trend in child malnutrition in Myanmar (by over 25%) since 1991. However, according to most estimates the prevalence of underweight is 22.6%, prevalence of stunting in 35.1%, indicating that one in three children in Myanmar still suffer from nutrition insecurity. There are important regional differences. Undernourishment in children is more common in Rakhine and Chin states as compared to other states. It is most common among children of the poorest households. Moreover, most children in rural areas are underweight and stunted compared to children in urban areas.

9. **Climate change.** The Myanmar Initial National Communication (INC) to the U.N. Framework Convention on Climate Change (UNFCCC) reported that the average number of rainy days per annum prior to 1977 used to be around 144, but it has subsequently reduced to about 103. In the period 1988 to 2000, the monsoon duration shortened by about three weeks in the northern part and by one week in other parts of Myanmar compared to the 1951-2000 average. El Nino years are witnessing decreased annual rainfall, with heavy rains in some areas and droughts in others. According to the National Adaptation Action Plan (NAPA 2012), over the last six decades (1951 to 2007), the temperature in Myanmar has increased on average by ~0.08°C per decade. This is reflected in fewer cold days and more frequent hot days. From 1951 to 2000, approximately 15 heat waves occurred per year. The most extensive heat wave (covering up to 60% of the country) occurred

in 1998 during an El Niño year. The impacts of climate change are taking heavy toll on smallholder farmers as their livelihoods are being threatened by floods, droughts, pest infestations and cyclones.

10. **Agriculture.** Myanmar is an agricultural country well-endowed with land, a generally favourable climate and plentiful water resources for agricultural production. The agriculture sector constitutes the core of the economy, representing 38% of GDP, employs 70% of the labour force, and contributes over 16% of export earnings. In a normal year, the country produces enough food to supply its people and exports the surplus. Of the 67.7 million ha in Myanmar, the cultivable land represents 26%, of which only 70% are farmed. Nonetheless, the importance of primary agricultural production in terms of GDP share is declining. In 1995, agricultural output accounted for 45% of GDP; by 2014 it had shrunk to 30%. At the same time, the share of the livestock and fisheries sector increased from 7% to 9%.

11. Over the past two decades, the Government has focused on achieving rice self-sufficiency through improved extension services, introduction of improved high yielding varieties of rice, and delivery of improved seeds and fertilizers. There has been a heavy emphasis on rice production, including priority placed on government agriculture bank loans for paddy production and priority given to paddy by extension. However, since 2011 there has been a trend towards agricultural policy liberalization across a broad range of commodities, culminating in the spate of reforms and new legislation. In May 2016 the law requiring all farmers to cultivate rice in the lowland has been abolished, but Government still encourages farmers to maximise rice production during the monsoon. If irrigation water is assured farmers are encouraged to cultivate high value crops during summer.

12. Investment in agriculture, however, remains constrained by limited access to inputs, particularly quality seeds and fertiliser. Furthermore, agriculture is also constrained by weak extension services. Agricultural extension is provided by the Agriculture Extension Department (AED). Extension staff remains inadequate in number and quality. Field extensionists rotate quickly and do not stay more than 3-4 years in one location. There is little orientation towards farmers' problems, and insufficient budgetary resources prevent field visits and sharing of knowledge. Of particular concern is the absence of operational interaction between the Department of Agriculture Research (DAR) and extension. Most extension messages are centrally designed and mechanically implemented by field staff over a diverse range of agro-ecological and socio-economic conditions, without proper consideration of farmers' needs and limitations, or market requirements.

13. Agricultural production is further hampered by unsustainable levels of post-harvest losses resulting from absence of farm roads, limited awareness of systematic post-harvest handling practices, and lack of cold/dry storage facilities. Processing facilities that help reduce waste and add value locally are still lacking for most crops, and/or are located very far from production centres.

14. Despite these constraints, Myanmar is one of the largest countries in Southeast Asia in terms of land area. It has at present 30 million acres of cultivated land, 14 million acres of unused cultivable land, 83 million acres of forest and other lands (including freshwater resources) that account for 41 million acres. The cropping intensity of the cultivated land is presently around 183%. Considering the water resources presently available, an increase of the cropping intensity to at least 230% (i.e. 47% increase) is possible with appropriate investments. Furthermore, productivity increases of more than 50% for various crops cultivated is an attainable objective in the medium term. Combined with the 14 million acres of unused cultivable land, this reflects enormous potential for agricultural development.

15. **Land.** Landlessness is a significant phenomenon and cause of poverty and vulnerability. The LIFT Baseline Study (2012) of 4,000 households in 3 agro-ecological zones found that some 50% of households nationally are landless - the proportion of landless varies from average 26% in hilly areas to 72% in the delta/coastal areas. The 2010 Agriculture Census found that of those households with access to land, 5% of the landholdings owned less than 0.4 ha, a decline of 47.6% in farm size since the 2003 Census. This suggests that further households are functionally landless.

16. Until 2012 all land belonged to the state. Under the policy of state ownership, farmers were given the right to cultivate the land but they could not sell, divide or mortgage it. In March 2012, the legislature enacted a new Farmland Law[2] that repealed the previous acts governing land, and set out amended rules for "the right to work on farmland" whilst retaining Government ownership of all land as per the 2008 Constitution. The new law reintroduces the concept of private ownership through land use certificates, i.e. land tenure rights, which can now be sold, traded, or mortgaged. The law

[2] Source*: Farmland Law enacted by the Pyidaungsu Hluttaw under Order n° 11/2012 dated March 30th, 2012.*

provides for farmland management bodies to be formed at various administrative levels; lower level bodies (from state/region downwards) shall be “constituted by the Central Farmland Management Body” thus allowing the Government to retain overall control of land tenure rights as well as their transfer, mortgage or inheritance.

17. The Vacant, Fallow and Virgin Land Law, also passed in 2012, allows Government to classify land as 'vacant, fallow or wasteland' (especially fallows and lowlands without official land titles) and lease it to domestic and international entities and individuals for up to 30 years. This could potentially place smallholders at risk of losing their land, as many do not yet possess land use certificates, or in the case they have land titles, have not been able to "permanently cultivate" their entire landholding due to high input costs. Moreover, community-managed resources such as community forests, waterways, fishponds are equally susceptible to confiscation despite being crucial to local livelihoods.

18. A particular case is that of Chin and Shan States, which follow their own customary land laws which are not recorded nor registered, and are not protected by laws of Myanmar. Customary tenure would most often be a characteristic of shifting cultivation, which includes in the very tenure a large area of fallow land. This is however rapidly changing, with the Government's land records department trying to mainstream land tenure and ownership procedures. The Government is presently preparing a new National Land Use Policy, led by the Ministry of Environmental Conservation and Forestry. Many civil society groups and development partners supported the drafting of the policy in its consecutive versions. The result is that the new 2016 draft of the National Land Use Policy has several sections that aim to protect and recognize customary tenure. As the policy is meant to feed into the preparation of the new Land Resource Law, it is an important stepping stone for the recognition of customary communal tenure and development of legal procedures for the protection.

19. **Irrigation.** The country’s total renewable water resource is estimated at 1,168 km^3 but only a small proportion of this is used for irrigation. In 2015, the MoALI estimated that 2.17 million hectares (or 16.2 % of the cropped area) were irrigated from dams and pumping stations. This figure, however, is increasing, as new dams, tube-wells and pumping stations are built. Before 1988 only 540,752 hectares were irrigated from dams; by 2015 that figure had grown to 1.2 million hectares Of the 2.17 million hectares currently irrigated, approximately 215,000 hectares are served by pumped systems (from rivers and tube-wells) while the remaining 1.96 million hectares are served by dams. There is room to improve irrigation efficiency, which is currently estimated at about 25 %, according to the IWUMD of MoALI, which is responsible for the design, construction and maintenance of irrigation canals and other structures down to tertiary level. Water management along the tertiary canals is the mainly under the responsibility of informal water users’ groups, incorporating village water committees. With the often-scattered nature of farmers’ irrigated fields and the currently inadequate system for collection, most farmers do not pay water taxes. Overall, the national policy, strategy and institutional framework that defines the rights, responsibilities and obligations of irrigation users, needs to be strengthened, to support increasing efficiency[3].

20. **Agricultural labour.** At least half of rural households depend on wage labour for all or part of their livelihoods. Landless farmers and farm workers, and families not engaged in agriculture fall into this category, but so do many land-poor families. In surveys conducted by Harvard Kennedy School[4], farmers reported that opportunities for wage labour, either in agriculture or in nearby towns, were scarce. The ability to migrate has put a floor under real wages and it appears that wage-earning opportunities may have declined as lower crop prices and “expensive” wages cause farmers to cut back on labour-intensive transplanting and weeding, even though this reduces yield. Farmers with larger landholdings reported that they planned to hire less labour as they reduced acreage or the intensity of cultivation. Significantly, virtually all farmers – even ones with larger holdings – said they would engage in wage employment if it were locally available at prevailing wage rates. During the mission, these conclusions were confirmed at all villages visited, and current rates for agricultural and other manual labour varied between 2,000 MMK (US$ 1.8) and 5,000 MMK (US$ 4.5) per day for men and up to 25% less for women. Work is available at the farms during agricultural seasons and in construction. Rural adult men and women reported in the focussed group discussions that they are able to find an average of 20-60 days of work annually.

[3] *Crop and Food security Assessment Mission – Special Report* (March 2016). FAO/WFP

[4] *"Assessment of the Myanmar Agricultural Economy",* IDE, for the Harvard Kennedy School (2009)

21. **Ethnic groups.** Myanmar is an ethnically diverse country with over 135 ethnic groups speaking more than 100 different languages and dialects unevenly distributed throughout the country. The largest and the most socio-economically well-off ethnic group, Bamar, forms around 70% of the population. This ethnic group forms the majority in the central lowlands and the delta, while the other ethnic groups form the majority in the border states.

22. While the data from 2010 estimates the national poverty headcount at 26%, rates are far higher among many of the ethnic groups[5]. It is noteworthy that three out of the four poorest areas are ethnic states. The incidence of poverty in Chin state alone is almost three times the national average. This suggests a vicious cycle whereby years of conflict have held back development feeding into a sense of relative deprivation.

23. The contrast between relatively benign conditions in the few urbanised areas, which are mostly occupied by ethnic Bamar communities, and in outlying regions, which tend to be inhabited mainly by other ethnic groups, is evident. Yangon has an electrification rate of 67% while in rural areas the average is only 16%. Poverty is twice as high in rural areas, which account for nearly 85% of total poverty. In the countryside 75% of children end their education during primary school while in urban areas 63% of primary-school children progress to secondary school. These kinds of deprivation in rural areas inhabited mostly by ethnic groups have resulted in destabilising tensions in many states.

24. **Gender.** Buddhist customary law and the 2008 Constitution provide equal rights to women and men. However, women are not well represented in the political and higher level administrative sphere outside the traditional areas of social services, health and education. At the local levels (districts, townships, villages) there are few women representatives, particularly in key decision-making bodies. The prevailing cultural disposition is towards a stereotypical gender division of roles, with women closely associated with domestic activities, although they are quite dominant in decision-making and often own assets. Systems for collecting gender-disaggregated data and monitoring women's welfare and gender are poorly developed and narrowly focused on reproductive functions.

25. However, there has been considerable progress in recent years to mainstream gender equality. The Department of Social Welfare is the focal point for gender and in 2013 prepared a "National Strategic Plan for the Advancement of Women 2013-2022". A key objective is to see women contribute increasingly to current decentralisation reforms in order to play a greater role in decision-making at the local level as well as in productive sectors. The Myanmar National Committee for Women's Affairs is a national mechanism for the promotion of women's rights, a UN-led Gender Theme Group was formed in 2009 to mainstream gender in humanitarian and development operations, and a Gender Equality Network is a leading network of civil society, national and international NGOs, UN agencies and technical resource persons on gender issues. The Women's Organizations Network of Myanmar was formed in 2008 to coordinate local and national women groups and organizations, and now has a network of over 29 local women groups and organizations.

26. In the rural areas women play an important role in a wide range of income generating activities and are primarily engaged in agriculture, the informal sector and as migrant labourers in factories and as housekeepers in neighbouring countries. In agriculture women are equally involved in farm-based activities, as men. Moreover, women, more than men, are involved in home-based agricultural activities and small scale vegetable and livestock production. Women are generally unpaid family workers balancing both home and economic activities. Although women in rural areas appear to have equal decision-making power in the household, women are not usually participants in village level institutions and planning processes[6]. By tradition, women generally do not speak at village meetings and do not contribute to public space in rural areas. Women do not generally own productive assets such as land users' certificates and many miss out on agriculture technology and extension work.

27. **Policy, strategy and institutional context**. Emerging from 50 years of isolation in 2010, Myanmar embarked on a comprehensive programme of political and economic reforms that aims to introduce elements of popular representation in the political sphere, foster economic growth and inclusive social development, improve the business environment, attract foreign investment and reduce poverty. The EU lifted its economic sanctions in April 2013 and the USA has suspended its bilateral sanctions. Myanmar is now fully re-engaged in ASEAN and it took the rotating chair of

[5] *Ministry of National Planning and Economic Development and UNDP, 2011, IHLCA-Poverty Profile*
[6] *Chin State's Comprehensive 5-year Development Plan and Annual Planning, 2016-2021.*

ASEAN for the first time in 2014. South-east Asian investment in the country is also increasing rapidly. The major multilateral and bilateral institutions have established operations in the country.

28. The new government's reform agenda is articulated around the adoption of an open market economy; improvement of socio-economic conditions and reduction of rural-urban gaps; protection of social and economic rights; development of infrastructure and delivery of basic services, including for ethnic groups; improvement of health and education standards; protection of human rights and freedoms; respect for the rule of law and an independent and transparent judiciary; respect for the role of media; good governance and public scrutiny of executive and legislative bodies; institutional capacity-building and human resource development; government's accountability, responsiveness and inclusiveness; and decentralization. Many of these policy priorities are likely to impact on the rural sector, particularly in terms of safeguarding fundamental rights, including those of farmers.

29. The lack of public sector capacity to implement policy decisions has been a major constraint to these social, economic and political reforms. There is a need to continue building capacity at all levels of governance, from central government agencies to institutions at state, regional and township levels. There is also a need to translate policy decisions into sectoral plans and strategies to be implemented by public institutions. Development partners have helped Government to set up a number of Working Groups to assist with drafting and implementing these policies, strategies, and development plans. IFAD is a core member of the Agriculture and Rural Development Sectoral Working Group. Other constraints faced by the public sector include lack of modern operating procedures and excessively centralized decision making processes.

30. There are several agencies responsible for agriculture and rural development, of which two have a direct bearing on the sector: (i) Ministry of Agriculture, Livestock and Irrigation (MoALI) responsible for crops, livestock, irrigation, credit and mechanisation; and rural development; and (ii) Ministry of Environmental Conservation and Forestry (MoECAF). Following Myanmar's decades of isolation, MoALI (like other Ministries) is assessed as being weak in terms of technical capacities, fiduciary processes, farmer outreach and budgetary allocations. Its experiences with participatory approaches involving poor communities, small farmers and landless tenants are limited. While it has had little exposure to effective project management and execution in compliance with international standards, this is changing through the support provided by IFAD and partners in recent years. Its coordination, monitoring and reporting capacities are limited but improving.

31. The Nay Pyi Taw Accord for Effective Development Cooperation agreed between Government and Development Partners (in early 2013), promotes transparency, collaboration and local ownership and management of development efforts. The Accord establishes a coordination structure between Government and partners to ensure that development assistance supports the implementation of strategies defined nationally. Rural development and poverty reduction are priorities in Government's agenda. The Poverty Alleviation and Rural Development Action Plan (PARDAP) provides a coherent approach to rural development in coordinating Government efforts and those of partners, civil society and the private sector.

32. **Decentralisation.** The Government's decentralisation policy is guided by the President's Office, in consultation with state and regional governments, to implement the Framework for Economic and Social Reform at sub-national level. Whilst newly elected and more representative sub-national governance has started to open up political space and illustrate commitment to people-centred development, the immediate gains remain limited. Chief Executive and Ministers at state and regional levels are centrally appointed (by the President). The regional parliaments face capacity constraints, and appear to be administrative units of the central Government. State and regional budgets are small and prepared in a way that preserves central influence. Overall, the actual reach of administrative responsibilities, confusion over executive structures, the small size and central oversight of the budget, and the lack of capacity and human resources, all mean that Myanmar is still in the nascent stages of achieving its goals of decentralisation.

33. However, there are many areas of promise and potential in the sub-national reforms, which are in their early stages. The emergence of new local political and institutional space is already increasing the awareness and interest of diverse groups in further decentralisation. Increasingly, civil society organizations already openly discuss sub-national governance issues. There is increasing consensus among central government and parliament, state/region governments, political parties, and civil society that further decentralisation reforms to states and regions are needed.

34. **National Rural Poverty Reduction Strategy.** Although Myanmar does not have a poverty reduction strategy per se, a set of national development plans have served that purpose in support of MDG Goal 1 (poverty reduction). In addition to the PARDAP, Government is implementing the long-term National Comprehensive Development Plan (NCDP) and Framework for Economic and Social Reform (FESR) 2012-2030. The NCDP, FESR and PARDAP provide the umbrella for the agricultural sector; however, they do not detail actions tackling poverty reduction and targeting ethnic groups, women and the landless, and their implementation is constrained by insufficient financial and human resources. The PARDAP, NCDP and FESR underpin the 5th National Economic and Social Development Plan 2011/12-2015/16 which covers infrastructure development, rural development, border areas, poverty reduction and good economic foundations.

35. **Financial institutions**. The financial sector is small and underdeveloped, and access to financial services is very limited. The sector consists of four state-owned banks and 20 private banks. Only 2.5% of outstanding loans are extended to primary agriculture. At the beginning of 2015, there were 1,625 credit cooperative societies established under the Ministry of Cooperatives, and 169 licensed MFIs. These MFIs include: (i) 5 INGO/MFIs; (ii) 24 NGO/MFIs; (iii) 107 local private companies (including 71 cooperative societies); (iv) 28 foreign companies; and (v) 4 joint ventures. There is one small state-owned insurance company and 12 private insurance companies, but none of them cater for the agriculture sector. Payment systems are undeveloped; ATMs were introduced in 2013 while credit cards were introduced in late 2012.

36. Starting from this low base, however, the financial sector has been growing rapidly in recent years, with strong expansion in the number of branches and ATMs, deposits, loans, foreign exchange transactions, fund transfers, and remittance flows. It is clear that the genuinely private banks are now the most dynamic participants in the financial system; the 22 private and semi-government banks together have recently outstripped the four state banks in terms of total financial assets.

37. Myanmar's formal financial system remains small by most international standards. Decades of state ownership and policy shocks imposed on the system have contributed to a lack of confidence in banks as institutions capable of protecting financial assets. Rural areas have limited access to banking services, and bank lending to agriculture is largely restricted to the Myanmar Agricultural Development Bank (MADB), which covers only a small share of the financing needs of farmers. The sector also lacks appropriate loan products addressing farmers' seasonal requirements, including post-harvest operations. Similarly, products for capital investment in perennial crops, equipment and machinery, and SMEs are currently scarcely available.

38. Banks are limited not only in their outreach, but also in their provision of financial services. While there is a cap of around 13% per annum on lending rates, average deposit rates are very close to the stipulated minimum of 8%. The difficulty in obtaining credit is due to the miniscule deposit base, small spread and conservative lending approach. Collateral-based lending, using land as preferred collateral, inevitably restricts lending to those with land holdings and excludes all others. However, the authorities have recently expanded collateral options to include key agricultural export goods.

39. Growth of the financial system is also constrained by weaknesses in basic institutional systems and infrastructure. The system lacks an automated payments clearance system, a money market system for modern liquidity management, and an electronic real-time data system connecting banks with branch networks and with the Central Bank of Myanmar (CBM). To address these shortcomings, a number of initiatives are now being implemented and the overall policy, regulatory and supervision framework is gradually taking shape, moving towards consistency with international norms.

40. The CBM has the role of the regulator and supervisor of the banking sector. It is no longer under the control of MoPF, but has become an independent institution with its governor being at par with the level of Ministers. The legal framework for the banking sector has come under revision in the last three years. A new Micro Finance Law was enacted in November 2011, a new Foreign Exchange Management Law in August 2012, and a revised Central Bank of Myanmar Law in July 2013. The key banking laws encompass the Financial Institutions of Myanmar Law (FIML), and CBM rules and regulations have been revised. Furthermore, in September 2014 CBM took the remaining key step of IMF Article VIII obligations, namely the issuance of a comprehensive set of regulations for the Foreign Exchange Management Law. The Financial Institutions of Myanmar Law 1990 was replaced by a new Banks and Financial Institutions law, which was enacted by Parliament in January 2016. This law and

its associated rules and regulations will profoundly re-shape the framework conditions under which the banks operate, develop and innovate.

41. *Myanmar Agricultural Development Bank*. The MADB is owned by MoALI. While it is the major source of institutional credit for small farmers, it caters to only one-third of the farming population. In 2015, it claimed to have 1.4 million active borrowers, an outstanding loan portfolio of USD 84 million, and 1.7 million savers with deposits of USD 87 million. Historically, rice farmers are given top priority, they received 75% of total loans implying a high covariant risk. Seasonal loans (monsoon, pre-monsoon and winter loans) make up the bulk of its lending and are uncollateralized, with joint-liability from 5-10 group members. Because of limited funds, loan sizes can be as low as USD 25-50 per ha, compared with an estimated production cost of USD 250-475 per ha, forcing farmers to fill the gap by borrowing from moneylenders at 10%-20% interest per month. MADB loan durations cover only the production cycle, and not the post-harvest period when commodity market prices can increase rapidly and substantially. Limited loan duration and lack of storage facilities force smallholders to sell output at harvest when prices are at their lowest.

42. The leading INGO/MFIs (PACT, GRET, Save the Children, World Vision) have reached over 500,000 active borrowers with an aggregate loan portfolio of over USD 63 million; PACT accounts for the majority. Geographical distribution of their operations is concentrated in the south and south-east.

B. Rationale

Challenges

43. The mountainous southern Chin state encompasses the watershed that feeds the main river Yaw and subsidiary streams that run through the northern Magway region; as such, they are part of a common river basin. The extensive shifting cultivation practiced in southern Chin is leading to soil erosion and causing increased siltation and high intensity river and stream flow in downstream northern Magway communities. In addition to land degradation in both states, climate change impacts of erratic rainfall, intra and inter-annual drought, and record temperature highs are further undermining farm productivity and the livelihood options of the rural poor. There is scope to address the underlying factors such as access to resources, land tenure, biophysical elements, climate change adaptation, and knowledge in order to develop sustainable and profitable smallholder agriculture.

44. *Northern Magway*. Located within the central dry zone, northern Magway suffers from limited rainfall, volatile rainfall patterns, frequent droughts, and poor and shallow soils. Climate data demonstrates a clear trend towards increasing climate variability, with increasing temperatures, drier seasons, more intense rainfall, and the unpredictable distribution of rainfall. This trend is aggravating the negative impact on the geophysical environment caused by greater concentration and density of population. Population pressure is also leading to clearing of forest for agricultural land, causing deforestation and degradation of existing forest areas. While the majority of the rural population is engaged in agriculture, most smallholders are poor and unable to access appropriate production packages and technologies. They rely on local seed, depleted soils, and limited inputs, and consequently agricultural productivity is low. The increasing and combined impact of these challenges on vulnerable households is of serious concern.

45. Lowland irrigation infrastructure is suffering from insufficient maintenance over the years due to limited budgetary resources. Irrigation systems based on check/storage dams and weirs show sedimentation within the dams and along the main and secondary canals in the absence of proper silt traps, outlet structures are dilapidated, and tertiary canals are poorly developed. Irrigation schemes based on springs show significant water losses across the delivery system. However, schemes with relatively capable WUAs carrying out maintenance work continue to operate to some extent.

46. The prevailing free-ranging practices of livestock husbandry are placing additional pressure on ecosystems, further reducing its resilience against climate change. The over-use of natural grazing areas, and its effects on availability of water and fodder resources, is manifested in the reported deteriorating trends of livestock health and animal trade. The growing difficulties of herders in animal breeding are affecting meat production and consequently incomes and asset accumulation.

47. *Southern Chin*. Located within the hilly/mountainous zone, southern Chin is characterised by low population density and limited livelihoods opportunities. The majority of rural households practice subsistence agriculture, primarily in the form of shifting cultivation, focused on low value cereals.

Evolving land tenure systems and lack of access to financing currently prevent small farmers from adopting productive and remunerative farming systems which include high value crops. The increasing concentration of human settlement around roads and basic services in recent years is damaging the sustainability of shifting cultivation, decreasing soil fertility and reducing productivity, and trapping vulnerable households in poverty. These losses are recognised by the indigenous communities who are now asking for opportunities for permanent agriculture in order to alleviate the palpable losses attributed to shifting cultivation without proper fallow periods. Furthermore, despite abundant forage resources, livestock are mainly kept for household subsistence requirements.

48. The climate data for Chin shows intense rain and exposure to strong winds. Farmer report increasing temperature, erratic rainfall and late onset of monsoon rains, intense rainfall leading to soil erosion and landslides, drying up of natural springs (exacerbated by deforestation), intra-seasonal drought, increasing forest fires, and flooding in some areas.

Opportunities

49. While recognising these challenges, northern Magway and southern Chin present some clear and immediate opportunities to improve and modernise agriculture in a climate resilient manner.

50. *Northern Magway*. Irrigation development presents a significant opportunity for agricultural modernisation. Limited investments in rehabilitation of dams/weirs, de-silting and maintenance of canals, improved water harvesting, and pumped irrigation (from rivers) where feasible, combined with capacity building of IWUMD and WUAs, can substantially improve water availability and management. This will significantly improve the productivity of paddy, allow for secure double cropping, and increase the cultivation of cash crops based on market demand.

51. The expansion of sloping agricultural land technologies (SALT) in upland areas is another opportunity that is relatively simple, applicable, low cost and environmentally friendly. It is already applied in Myanmar (and elsewhere in Asia) by small farmers with few tools and limited capital, and generates profitability from year one. Expanding SALT application will increase resilience to climate variation and reduce soil erosion and landslides. This will involve contour planting, use of leguminous shrubs/trees, bands of mixed cropping (including fodder) between contours, climate resilient planting materials, mechanised timely planting and precision placement of fertilisers, soil ridging for better water retention and reduced run-off. NGO experiences in Magway itself have shown that introduction of SALT has had a positive impact on the geophysical environment while simultaneously increasing household incomes. Collaboration with APR grant recipients such as the World Agroforestry Centre and ICIMOD will strengthen the technical basis of SALT application.

52. Investments in livestock extension and veterinary services will raise productivity substantially. The production of quality fodder for own consumption and sale would enable stall fattening, rather than the current practice of free ranging which has an adverse effect on the resource base. Modern livestock production can substantially increase household incomes, which is particularly important for landless households.

53. *Southern Chin*. In southern Chin, the primary opportunities revolve around the promotion of SALT combined with high value cropping under permanent agriculture conditions. It should be noted that the process of small farmers adopting sedentary agriculture is already taking place. Over the past 10 years, small farmers have established 5,000 acres of high value crops (primarily elephant foot yam, ginger, turmeric and tree crops including coffee, orange and macadamia). The demand for elephant foot yam from southern Chin (considered a specialty product) for the export market far exceeds supply, and agribusiness has demonstrated eagerness to expand contractual arrangements with the Chin elephant yam producers' association to source substantially greater supply. This high value sedentary cultivation is within mixed cropping systems similar to SALT which reduces soil erosion and increase soil fertility. Elephant foot yam generates gross revenue of USD 2,555/acre/year for small farmers; expansion of cultivation is restricted by the relatively high investment cost (some USD 350/acre) mainly for planting materials. There is scope and market for IFAD to invest in further expansion of high value sedentary cultivation in a climate resilient manner, by facilitating access to financing and planting materials, and promoting contractual linkages with agribusinesses. It should be noted that current market demand and growth projections for elephant foot yam are far greater than the amount of incremental production the project can stimulate even at full development.

54. Multiple land tenure systems are currently practised in southern Chin. Project support for expansion of sedentary agriculture will target households having valid land operation (such as land title, contractual use of land, perpetual land lease contracts). The project will engage an NGO to facilitate contractual linkages as applicable to the prevailing land tenure systems. IFAD's Land Desk is providing valuable support to optimise project sensitivity and response to land tenure issues, including indigenous land use traditions.

55. With respect to livestock, there is opportunity to expand modern fattening practices for cattle and goats through collection of naturally-available forage (combined with produced fodder where feasible) and stall feeding, without negative impact on the ecosystem. In this context, the re-domestication and fattening of *Bos Gaurus*, and the expansion/improvement of goat production, offer the best opportunities for income generation in the livestock sub-sector.

Summary

56. The project will provide a systemic structural response to the challenges and opportunities by: (i) creating a model for the environmentally sustainable modernisation of agriculture in degraded sloping areas which generates economic benefits for poor households; (ii) rehabilitating productive infrastructure in ways that maximise the sustainable use and output of the natural resource base; (iii) forging pathways for communities to transition from subsistence to commercial livelihoods through access to inputs, knowledge and services. Elements of livelihoods support and nutrition-sensitive agriculture will be incorporated, to address important segments of local communities as appropriate.

II. Project description

A. Project area and target group

57. **Project area.** The project will be located in northern Magway region and southern Chin State, which share a common river basin. These areas have among the highest concentrations of poverty in Myanmar. While the two areas are neighboring, their development contexts differ significantly.

58. Chin State is located in the hilly border area between Myanmar, India and Bangladesh. The people are of the Chin ethnic group and its 53 officially recognised sub-groups. Chin state is one of the least developed areas of Myanmar, and southern Chin is home to some of the most remote and isolated communities in the country. The most recent income survey (ILHCA, 2010) found a rural poverty incidence of 80% and rural food poverty incidence of 31% (compared with 5% nation-wide). The average landholding size is around 3 acres per farming household. Farmers have historically practised shifting cultivation, but are increasingly adopting sedentary agriculture in response to changes in human settlement patterns, localised population pressure on land, and emerging market signals. Chin is targeted by the project due to high poverty rates, relative isolation of the population, and vulnerability to land degradation resulting from increasingly unsustainable shifting cultivation.

59. Magway is located in Myanmar's lowland central dry zone, and its population is mostly of the Bamar ethnic group. While Magway region is poor, it is relatively less disadvantaged than Chin state. It has been subject to a series of natural calamities and substantial losses of harvest in recent years. The rural poverty incidence is 28%, and 41% of households are moderately or severely food-insecure (as classified by WFP). Magway is targeted by the project due to its vulnerability to climate change, especially increasing droughts, desertification, storms and floods.

60. Based on Government-IFAD consultations at union, region and state levels, the project will be implemented in four townships: (i) Mindat and Kanpalet townships of Mindat district in southern Chin state; (ii) Pauk and Myaing townships of Pakkoku district in northern Magway region. These areas contain 880 villages, approx.98,500 households, and 461,000 people (Census 2015; Table 3). During implementation, based on the emerging experiences and availability of financing, project activities may be scaled up to adjacent townships, such as Yesagyo Township.

Table 3: Target Area

Region/state		Households			Population		
Township	Villages	Urban	Rural	Total	Urban	Rural	Total
Magway							
Pauk	235	1 655	37 310	38 965	7 286	164 228	171 514
Myaing	329	1 831	51 810	53 641	7 706	218 065	225 771
subtotal	564	3 486	89 120	92 606	14 992	382 293	397 285
Chin							
Mindat	192	2 302	6 220	8 522	11 505	31 095	42 600
Kanpalet	124	770	3 207	3 977	4 159	17 334	21 493
subtotal	316	3 072	9 427	12 499	15 664	48 429	64 093
Total	880	6 558	98 547	105 105	30 656	430 722	461 378

61. **Target groups.** The project will target all rural households in the project areas. As such, it will target 98,500 households consisting of 430,700 women, men and youth across 880 villages in the four selected townships. Of the targeted households, it is expected that about 76,800 HHs will participate and benefit from project activities. Through economic multiplier effects and institutional strengthening spillover, the project will provide broader benefits to additional townships in Chin and Magway.

62. Specifically, the project's target groups consist of:

(i) small and medium size farming households in upland and lowland areas;

(ii) livestock producers;

(iii) non-farming and landless households.

63. Women and women-led households will be prioritised in line with the project gender strategy. Youth, as the primary agents of change at community level, will be the focus of activities involving technological innovation and commercialisation. Furthermore, efforts will be made to engage unemployed youth as labour force for investments in productive and social infrastructure.

64. **Targeting.** The project's targeting strategy is based on: (i) *geographical targeting* of two areas with among the highest concentrations of poverty in Myanmar, yet with concrete opportunities for economic growth and poverty reduction; furthermore, project interventions in introducing soil and water conservation for land under shifting cultivation in Chin and permanent cultivation in Magway will be geographical targeted upstream to reduce soil erosion leading to siltation of waterways, dams, irrigation systems and drainage systems; (ii) *enabling environment* generated by renewed focus on border area development, and progress in decentralisation of political and economic administration which provide an ideal opportunity to invest in regional development; (iii) *direct targeting* of infrastructure and services to small farmers, women growing home gardens, landless households and forest communities, supported by land tenure facilitation; (iv) *self-targeting* through responsiveness to the priorities, financial and labour capacities and livelihood strategies of the various segments of the target group; (v) *social and gender* inclusion through specific measures to ensure that investments respond to the priorities and capacities of ethnic groups, poor households, women and youth.

65. **Women's empowerment**. In the project area, women play a fundamental role in a range of economic activities, particularly in horticulture, livestock production, and casual wage labour (both on- and off-farm). Furthermore, women are more inclined than men to establish home-based micro-enterprises, such as food processing and handicraft production. Women are responsible for feeding the family, and almost all women in the project area cultivate home gardens of varying sizes to try to ensure household food supply. Although rural women appear to have equal decision-making power within the household, they are under-represented in community institutions and planning processes. Women do not own productive assets such as land titles, and often miss out on agriculture technology and extension work.

66. To address these issues, the project will actively promote gender mainstreaming and women's participation in decision making and all investments. In addition, a set of specific activities will be geared to the needs and aspirations of women. These include irrigation technology for home gardens, training on home gardening for household food security and dietary diversification for improving the household nutrition base, promotion of women's groups at community level to engage in planning,

execution, operation and maintenance of village development investments (eg drinking water supply, solar electrification), and to select representation to governing boards of Knowledge Centres (KCs).

67. Other measures of gender mainstreaming will include: (i) separate consultations with women to identify their concerns, needs and preferences, ensuring that their voices are taken into consideration and addressed; (ii) women's access to group technical training and other capacity building, with a target of at least 35% women's participation; (iii) at least 35% women's representation on KC boards, with training provided in leadership, public speaking and participatory decision-making; (iv) priority targeting of women-headed households for distribution of start-up packs in Chin state; (v) allocation of 50% of the Rural Business Fund for women-owned micro-enterprises; (vi) at least 70% women participation in livestock production training; (vii) gender mainstreaming training for all KC managers; (viii) inclusion of gender mainstreaming staff in project management; (ix) disaggregation of M&E data and analysis by gender; and, (x) gender-balanced project management and implementation teams.

68. **Ethnicity:** Southern Chin is populated entirely by indigenous ethnic groups such as the Nyaga, the Da Yin Du, the Mong, the Dai and the Oppu, each of whom have their own distinct language and culture. Project management, implementation teams, and service providers will consult frequently and extensively with representatives of these diverse ethnic groups, learn from their traditional knowledge, share information on new technologies and methods, and jointly define investments. Efforts will be made to ensure that all activities are demand driven, culturally sensitive, socially appropriate, suited to local traditions, environmentally sustainable, and consistent with evolving land tenure systems. Interaction with bilingual community facilitators (many of whom trained by NGOs) will ensure broader dialogue with indigenous communities. Best practices of engagement with indigenous groups in Myanmar will be carefully applied during implementation.

69. The project will establish safeguards to ensure that its investments are culturally sensitive and do not have negative impacts on the livelihoods and practices of ethnic groups. A timely, meaningful and culturally-sensitive consultation process will be undertaken with all participating ethnic groups, to ensure free, prior and informed consent (FPIC) on activities, implementation schedules, management and operation roles, risk mitigation, results and sustainability. Ethnic peoples' aspirations, needs, and preferred options will be sought and addressed to enhance benefits or mitigate negative impacts. All project interface with ethnic groups will be in ethnic languages, and M&E data will be disaggregated by ethnicity.

B. Development objective and impact indicators

70. **Goal and Objective.** The project's goal is to improve the social and economic status of rural households in an climate resilient manner in northern Magway region and southern Chin state. Its objective is to increase household incomes, food security and nutrition quality. Its investments focus on commodities and services that have comparative advantage, market demand and growth potential. Its scaling up objective is to create optimal models of commercialised agricultural modernisation and enterprise growth that are adapted to climate change and strengthen resilience of ethnic groups and vulnerable households across the hilly/mountainous areas and central dry zone of Myanmar.

C. Outcomes/Components

71. The project's two outcomes are: (i) access to productive and social infrastructure is improved; and (ii) the technological, financial and policy environment for small farmers and agribusinesses is enhanced.

Components

72. **Component 1: Infrastructure *(US$ 6.3 million)***. The project will finance strategic investments in productive and social infrastructure, through three sub-components. Each infrastructure investment will be identified on the basis of a fully participatory and consultative process, involving consultation sessions with all cross-sections of communities. Special focus would be given to poor, women headed households and ethnic groups. All schemes will be inclusive, and will address any equity issues, particularly for marginalized communities and households.

73. **Sub-component 1.1. Productive Infrastructure *(US$ 3.9 million)*.** Productive infrastructure investments will generate opportunities for increased incomes, reduce on-farm and off-farm production costs, and improve food security for targeted communities and households. The project will

finance: (i) rehabilitation of irrigation schemes to ensure adequate and reliable supply of water to farms; (ii) rural access roads linking farms to markets; (iii) irrigation technology for home gardens to ensure both food security and nutritional diversity; and, (iv) land consolidation on a pilot basis. The proposed infrastructure schemes will not have negative environmental impacts due to their characteristics and small sizes. On the contrary, irrigation investments will considerably improve water management, reduce water conveyance and application losses by 30-40%, improve drainage and reduce siltation, and conserve groundwater. These investments will be framed within a wide watershed management approach to ensure long-term water availability and secure sustainability.

74. **Irrigation Rehabilitation.** Many existing facilities are characterised by poor operating conditions due to insufficient funding and capacity, resulting in substantial water losses along the systems (source diversion, storage, conveyance, on-farm application). In Chin state, the mountainous topography constrains irrigation development, and most cultivation is rainfed. In Magway region, increasing climate variability is further aggravating water stress/scarcity conditions prevailing across the central dry zone. The project will rehabilitate existing irrigation schemes which currently operate in sub-optimal conditions; and will develop a few new schemes where socially desirable and technically, environmentally and financially feasible.

75. Early during project implementation, a water budget analysis will be undertaken on the wider watershed cutting across Chin and Magway to assess the water balance of the project areas, prior to selection of irrigation works. The analysis will assess climate risks, determine the resilience of existing infrastructure to climate shocks, and define required enhancements to engineering norms. A second study will be commissioned to finalise crop options for small farmers in light of nutrition, food security and market considerations. Technical assistance will be procured for these studies as appropriate.

76. In *southern Chin state*, agriculture is mostly rainfed and few irrigation schemes exist. The irrigation schemes in the project townships – Mindat and Kanpalet – are based on: (i) streams running in valleys that irrigate lowland areas; and (ii) natural springs flowing out of mountains at certain locations. Water is tapped at source and conveyed to farms mostly through pipes, and rarely through open canals. The project will invest in 25 irrigation schemes in Chin state (15 in Mindat and 10 in Kanpalet). On average, each irrigation scheme is expected to irrigate about 15 acres of land. The implementation of 25 schemes would irrigate a total of about 375 acres of land.

77. The project will also invest in small scale community irrigation schemes that irrigate smaller plots of land (4 to 14 acres). Farmers currently build earth canals and rudimentary diversion structures themselves to divert stream water, with little or no technical support from ID. Such structures are vulnerable – they are often washed away during floods, as no protective measures are adopted; and farm lands are inundated in case of high flows, as they lack drainage facilities. The project will fund 13 such small schemes on pilot basis, of which 8 in Mindat and 5 in Kanpalet. Each of these schemes are expected to irrigate some 15 acres of land, for an aggregate command area of 195 acres.

78. In *northern Magway region*, irrigation practices and types of water sources are more diversified. Climatically, the zone has two periods – wet season and dry season – with mean annual rainfall ranging from 500 to 1000 mm, lower than in the rest of the country. Existing irrigation infrastructure taps both ground water and surface water through various means. Typical scheme characteristics and project investments are outlined below. As all project irrigation investments in Magway region focus on rehabilitation of existing schemes, no riparian water issues are expected to emerge.

79. *Diversion structure/weir based irrigation schemes*. These schemes, prevalent in Pauk township, are mainly built and managed by farmers, while two schemes are built and managed by ID. Water is diverted from Yaw and Kyaw streams through poorly constructed weirs/diversion arrangements, with minimal control structures at inlet, into main canals and conveyed to farms. The diversion structures do not comply with sound engineering norms and are vulnerable to regular high floods and silt deposits. Rehabilitation of these schemes on sound engineering principles will generate sustained benefits for small farmers through reliable irrigation. Design considerations for the proposed schemes would include silt traps for avoiding/curtailing silt deposits in the canals and downstream network. The project will rehabilitate 5 existing schemes, and is expected to provide reliable irrigation to 2,640 acres of land, as well as bringing about 600 acres of rainfed land under irrigation.

80. *Pumping based irrigation schemes*. These schemes divert water from streams through intake canals, and pump it into a main canal downstream, for on-farm supply through distribution canals and temporary outlets. They are not built to modern engineering standards, and incur significant water

losses. The project will rehabilitate an existing pumping based irrigation scheme that covers 830 acres of land cultivated by about 700 households across 6 villages; and an 530 acres of rainfed land will be brought under irrigation.

81. *Spring based irrigation schemes*. In Pauk township, some villages use natural springs to irrigate farmland. These schemes are few, and irrigate about 300-500 acres of land. Water is tapped at daylight point (outlet) and conveyed to farms through small open canals with temporary earthen outlets. The project will improve 5 existing schemes by including control structures (valves) along the systems to check losses at source point, conveyance and field application.

82. *Artesian / tube well based irrigation schemes*. Groundwater is extracted for irrigation by diesel tubewells or free-flowing artesian wells. While these schemes were gradually initiated some 15 years ago, their numbers have grown substantially in recent years. Despite the advantages of year-round irrigation water availability at low cost, these schemes are poorly constructed and unsustainable. The project will rehabilitate 15 existing schemes and introduce mechanisms to conserve water resources, reduce groundwater depletion, and improve system efficiencies.

83. *Storage dams based irrigation schemes*. The irrigation systems in Myaing township are largely based on storage dams. These dams are built and managed by either the ID or communities. The ID built some 10 small earthen dams in the 1990s, with varying storage capacity and height, of which only 5 are currently functional, though not to designed capacity. There is huge potential for irrigating large areas (about 3,800 acres) if these dams are fully operational. The ID lacks the skills, expertise and funding required to retrofit and rehabilitate existing dams, and welcomes project investment in rehabilitation works to international best practice, complemented by capacity building. The department would subsequently scale up these activities to the extent feasible. In this context, the project will fund the rehabilitation of 3 dams, based on the findings and recommendations of a 'rapid appraisal study' completed by international TA in October 2016. Final selection of dams and downstream infrastructure will be based on feasibility assessments undertaken by contracted engineering firms, community demand and prioritisation, and cost-benefit considerations. Any investment in dam rehabilitation would be in full with IFAD's SECAP guidelines.

84. *Micro-dams:* There are more than 50 community (micro) dams, each irrigating 30-70 acres. Most are not functioning to design capacity due to silting, insufficient inflows, weak embankments and high seepage losses. The project will rehabilitate 5 community dams on pilot basis, covering about 300 acres as well as an additional 135 acres of previously rainfed land.

85. *Participatory water management.* In order to ensure effective participatory water management, the project will organise the formation of water user groups (WUGs) where they do not exist, and will strengthen existing WUGs by promoting a formal organizational structure (with office bearers meeting regularly on key issues). In consultation with IWUMD and existing informal WUGs, the project will develop a training curricula for WUGs on the O&M of irrigation infrastructure. The training will cover periodic and routine maintenance, water distribution and conservation, and record keeping, and will support WUGs in developing their own maintenance plans.

86. **Rural Access Roads.** The project will fund a few rural access roads where they are essential for relevant commodity value chains. These will be located in areas where road access is fundamental for maximising the efficiency and impact of project value chain investments. A total of 25 miles in Chin state and 10 miles in Magway region will be financed. Consistent with its ongoing access road programmes, DRD will be responsible for any major repairs, while existing community organisations will be responsible for normal maintenance. Synergies will be created with other road development programmes of DRD and partner organisations.

87. **Home Garden Irrigation.** The project will invest in small plastic storage tank-based irrigation technology for home gardens. This activity will be targeted to women to support the cultivation of home gardens during the dry season. The focus will be on promoting diversification of crops and improving yields, to enhance nutritional diversity as well as food security for poor households. The project will finance 100 such irrigation systems, operated and maintained by communities.

88. **Land Consolidation.** The project will fund land consolidation activities on pilot scale in Magway region, adapting the model applied under the FARM project to the specific characteristics of northern Magway. About 50 acres of land will be consolidated in the first phase, and this activity may be scaled up based on results and farmer demand.

89. **Sub-component 1.2. Social Infrastructure *(US$ 1.5 million)***. In consultation with DRD and partners, the project will invest in social infrastructure facilities mainly at household level, particularly targeting needs of women and the poorest households. Domestic water supply, rainwater harvesting, and renewable energy solutions (particularly solar home systems) will be eligible for support. Scheme selection will be participatory and demand-driven, sensitive to cultural considerations, and subject to social, technical, financial and environmental feasibility. Schemes design and construction will adhere to standard engineering norms, will comply with DRD specifications, and will include beneficiary involvement and contribution. The ownership, management, operation and maintenance of all facilities constructed will be carefully articulated to ensure sustainability.

90. **Domestic Water Supply**. In *Chin state*, about 66% of households have access to an improved water source – water is typically available to most households through taps connected to a central water tank sourced from natural springs. Water availability declines significantly over the dry season, and becomes scarce for 3-4 months. Water collection in the dry season adds significantly to women's workload. Water scarcity also limits the options for vegetable cultivation in home gardens, reducing household food availability and nutritional balance. The project will invest in 28 water supply schemes (15 in Mindat and 13 in Kanpalet) derived from natural springs, benefitting about 700 households.

91. Conversely, *Magway region* faces water scarcity and problems of salinity in shallow ground water. Communities rely on deep tubewells installed by DRD, or rainwater harvesting ponds. While household access to improved sources of water supply is estimated at 75%, only 4% of households have tap water within their premises. The project will finance 25 water supply schemes (5 in Pauk and 20 in Myaing) which have been prioritised by DRD. All project investments in domestic water supply will generate positive effects on household health, sanitation, food security, nutritional balance, and women's workloads.

92. **Rainwater Harvesting.** In Magway, rainwater harvesting ponds are common and provide free water to poorer households that are unable to cover the costs of tubewell-sourced water. They are built by communities and DRD, and vary in shape, size and construction depending on topography, catchment area and space available. These ponds are used for multiple purposes – mainly for domestic and livestock consumption, but also for supplementary irrigation. The project will finance the construction of 26 rainwater harvesting ponds (6 in Pauk and 20 in Myaing) which will serve 6,300 households across 50 villages.

93. **Alternative Energy Solutions.** Access to electricity in Myanmar is very low, and only 15% of rural households across the country have grid-based electric connections. It is estimated that currently only 8% of rural households in Chin and 12% in Magway are connected to grid-based electricity. The National Electrification Plan envisages a low cost roll-out plan (off-grid) for remote rural areas; the provision of solar home systems is a solution being considered in this context. The project will take the lead by investing in 750 solar home systems, of which 200 in Chin and 550 in Magway. The ease and speed of installation of these systems would represent a 'quick win' for project, with significant impact on household quality of life, particularly for women and children. The eligibility criteria for these systems will be developed by communities in a participatory manner, with priority for women headed households and the poorest households. A beneficiary contribution would be applied, in consistency with DRD's ongoing solar home system programmes.

94. *Participatory infrastructure management.* Implementing partners and DRD will ensure that all social infrastructure is selected, implemented, and managed on participatory and consultative basis. Schemes completed by DRD will continue to be handed over to communities for O&M. For domestic water supply, existing O&M arrangements are demonstrating to be working (proper maintenance, user charges agreed on participatory basis), and will be strengthened in hygiene awareness, chlorination and water conservation. For solar panels under individual household ownership, the project will organise relevant training (battery maintenance, shock proof wiring, correct placing and orientation of panels). Qualified social mobilizers with relevant experience will support training activities.

95. **Sub-component. 1.3 Capacity Building *(US$ 0.9 million)*.** Productive infrastructure will be implemented by IWUMD, and social infrastructure by DRD. Both have adequate presence in the project areas, and their township offices and staff have experience in implementing similar small-scale works. However, knowledge and experience gaps remain with respect to more complex projects, and both departments lack a sufficient number of junior professionals (engineers, surveyors, etc.) to

handle incremental development activities. The project will build the capacities of IWUMD and DRD accordingly.

96. *Technical assistance.* The project will strengthen the technical knowledge and skills of IWUMD at local level. It will support IWUMD/Magway through the provision of technical assistance by an external service provider (such as engineering consulting firm) for the design of specific irrigation interventions. These may include river/stream diversion structures, pipe irrigation and dam rehabilitation activities. The model of external TA provision to IWUMD under the FARM project will be scaled up in this context.

97. *Staff/office strengthening.* The project will support IWUMD and DRD with additional junior engineers, training and exposure visits, as well as engineering equipment (total station, levelling instruments, backhoe, etc.), office equipment (computers, printers, photocopiers) and motorcycles. This facilitate efficient implementation of project activities and other development operations.

98. *Water, sanitation and hygiene (WASH):* The project will raise awareness and provide training to both DRD and beneficiary communities on the importance of sanitation and hygiene related to domestic water supply schemes. The construction of every domestic water supply scheme will be accompanied by information on the importance of WASH. This will complement the activities aimed at dietary diversification (such as home gardens) to improve households' nutrition base.

99. *Nutrition awareness.* The project will partner with UNICEF for nutrition education in the project area, working especially through existing or new women's groups. In Magway, where livestock is more prevalent, the project will emphasize integrated homestead food production linking livestock with gardening to increase overall dietary diversity.

100. *Social mobilisation.* The project will provide technical assistance and support for strengthening the social aspects of infrastructure development, particularly consultative planning, participatory water management, operation and maintenance responsibilities, and environmental awareness.

101. **Component 2: Services *(US$ 11.1 million)*.** The project will invest in a set of enabling services, organised in three sub-components: (i) agricultural modernisation; (ii) financial services; and (iii) policy engagement. The provision of services will aim to optimise resource management, productivity and economic benefits in locations of infrastructure investments.

102. **Sub-component 2.1. Agricultural Modernisation *(US$ 8.5 million)*.** The project will invest in agriculture, livestock and technical services to modernise production and trigger improvements in food security and nutrition, livelihoods, and economic returns to households. Service delivery to farming households will include technology transfer, skills improvement, access to inputs and supplies, access to markets and information, facilitation of contractual linkages (such as forward contracts and contract farming), and access to financial resources. Service delivery to landless households will focus on technical and business management skills, micro-enterprise development, fostering links with private sector actors (suppliers, traders, processors), and support for business planning and loan application.

103. *Knowledge Centres (KCs).* The project will scale up the successful experience of service delivery under the FARM project (ref. section II.D. on *Lessons Learned*) by establishing approximately 50 KCs across the project area, of which 23 in Chin and 27 in Magway. The final number of KCs and their locations will be determined during the course of implementation, in consultation with the district and township level administrations. KCs will serve as focal points for improving capacities and access to markets and services of small farmers and non-farming households. They will broker services such as knowledge exchange, technology transfer, financial services, input supply, regional branding, value chain integration, contract farming, business services and market information. They will support water users' groups, savings and credit groups, and other community organisations; and will organise trials, demonstrations and farmers' field schools. Farmers will be able to access agricultural and livestock services and modern climate smart technologies.

104. KCs will provide services to landless households engaged in micro/small on-farm and off-farm enterprises. Advise will be offered on linking income generating activities with improved nutritional values of indigenous, locally available crops, and neglected/underutilised species. The identification and provision of KC services will be demand driven, based on a list of services offered. The list will be prepared and updated periodically based on research findings, on-farm demonstration results, farmers' experiences, private sector involvement, and market considerations. It will be publicised through regular awareness-raising activities.

105. The ownership, governance and management arrangements for the KCs established under FARM have proved to be effective, and will be scaled up under WSAP. Hence, KCs will be owned by MoALI and governed by an elected, gender-balanced Board representing the ethnic groups and socio-economic categories of the rural population. They will be managed by MoALI-seconded extension officers trained for this purpose. These extensionists will broker the services demanded by KC members, utilising existing capacities in the public, private and civil society sectors. KCs will operate based on medium-term strategic plans and annual work plans and budgets. The project will finance construction and initial operation of the premises, while MoALI will cover the salaries of seconded personnel. KCs will be equipped with basic office facilities and an energy source (preferably renewable). The KC manager will obtain a motorcycle and mobile phone on hire purchase basis. In the medium term, it is envisaged that KCs will operate on cost recovery basis, being responsive to contextualised demands from households, and providing services that famers and the private sector are willing to pay for. Implementing partners will initially support KC management and operations, lead value chain analyses, promote market linkages, and help broker contractual arrangements with agribusiness. Options for KC cost-recovery based on PPPP business models will be tested and applied accordingly.

106. *Soil and water conservation.* KCs in Magway will focus on both rainfed upland and irrigated lowland crops. In the uplands, training and demonstrations will combine practical mechanised land preparation techniques, such as applying a green cover crop to improve water infiltration, thereby increasing moisture retention and soil fertility whilst minimising run-off. It is envisaged that some 14,300 small farmers will adopt this technology on 90,300 acres under mixed cropping, and another 4,600 small farmers will adopt it on 28,900 acres under mono-cropping. This will reduce soil erosion by 50% (ref. WP2 for detailed calculations). Furthermore, leguminous trees used as field boundaries, together with high-yielding plum varieties (for kernel or fruit production), will be applied as wind breakers/field contour bands, and pruning by-products (fruit trees) will be used for fuel, fodder and green fertiliser. It is envisaged that 1,590 small farmers will adopt this practise on 10,000 acres of land. On-farm adaptation trials and demonstrations will be conducted early during implementation to test water/soil conserving land preparation techniques and appropriate seeder/fertiliser drills, soil ridgers, soil rippers and groundnut decortication machines. This activity will be executed on PPP basis, involving relevant MoALI departments (DOA, DAR, AMD). Equipment for compost production will also be considered. These soil and water conservation measures will: (i) increase water infiltration and reduce soil erosion by around 50%[7]; (ii) reduce the loss of soil nutrition by 90%; (iii) reduce the siltation of waterways, irrigation dams and distribution systems.

107. In the lowlands, KC activities will include capacity building of WUGs for participatory water management and maintenance, promotion of high value crops, and systems of rice intensification combined with mechanical weeding to reduce water use and increase yields. Where feasible, micro-irrigation systems for non-rice crops will also be introduced. About 7,150 acres of land will benefit from improved irrigation, of which 3,175 are incremental with a cropping intensity of 230%.

108. *Agriculture information technology (AIT).* To ensure that KCs are able to provide the latest information to farmers, the project will partner with a private company to deliver mobile phone-based AIT services and information. The system is simple to use and interactive, and will allow KC managers to provide a wide variety of information including real-time marketing information; options for farmers to link with buyers and input suppliers; crop and livestock advisory services based on drop-down menus; illustrated training modules for important crops; post-harvest processing; soil and water conservation; and livestock management. KC managers will also be able to provide customised information related to early climate warnings and changes in the regulations related to agriculture.

109. *Sloping agricultural land technology (SALT) and starter packs.* In southern Chin state, KCs will operate a starter pack scheme to facilitate the ongoing move from shifting cultivation to permanent agriculture, focused on high value crops within a SALT approach. This will ease the negative environmental effects of shifting cultivation under increasingly shorter fallow periods, while providing immediate economic benefits to farming households. SALT will be promoted particularly in areas prone to erosion under current shifting cultivation practices. A starter pack will include a location-specific mix of planting materials for cultivation of up to one acre of land as a resilient and highly productive agro-ecological farming system using SALT practices. The mix will include timber and

[7] Dry Zone Food Security Project, FAO-MYA/96/006

fodder trees, horticulture, leguminous shrubs, herbs, medicinal plants, orchid vines, fungi, household food crops and high value crops for the market and also other inputs such as required quantities of fertilizers.

110. The starter packs will include planting materials, and associated training, for contour bands to anchor soil, increase water infiltration and soil fertility, and reduce erosion. Specifically, the packs will consist of: (i) mature planting material for a quarter-acre of elephant foot yam (already successfully cultivated high value crop with comparative advantage, strong market demand, and substantial growth potential), generating yields and income in the first year; (ii) improved seed for half an acre of upland rice, millet, maize and pulses; and (iii) a mix of planting material for a quarter-acre of contour bands/ hedged growth and trees for fruits/nuts.

111. The starter pack will rapidly generate outputs in the form of high value crops, food, fodder, medicine and timber for household consumption and the market. All high value crops included in the starter pack have a demonstrated trend of rising demand and prices in recent years. In particular, global trade in elephant foot yam is assessed at US$ 1.3 billion annually, and is projected to grow by 25% p.a. over the next decade, reaching US$ 12 billion in 2026. The long-term growth prospects for coffee (speciality), macadamia and avocado are also substantial.

112. The starter pack will provide opportunities for income diversification by testing and introducing optimal propagation methods for other indigenous and new high value crops already being cultivated by households (e.g. *dendrobium orchid*, *panax pseudo ginseng*, and 56 other medicinal plants of which 34 already under cultivation). A plant mix study in southern Chin undertaken during the WSAP design process identified 15 species for contour bands/ hedged growth, 16 species of timber, fruit and nut trees, and 23 species of food and high value crops. The packs will also strike a balance between dietary requirements and opportunities for increasing incomes through high value crops. An emphasis on home gardening linked to the social infrastructure investments will converge in this activity, aimed at dietary diversification and adequate nutrition through selection of appropriate crops and seeds.

113. The starter pack scheme will initially operate on grant basis, and subsequently on credit basis. A number of households will be eligible for receiving starter packs, phased annually. The first year a household receives a starter pack, it will be on grant basis; in subsequent years, the same household will obtain starter packs on credit basis (through a savings/credit group or financial institution). The scheme will support 4,000 interested households to engage in permanent agriculture on 12,000 acres previously under shifting cultivation. It is envisaged that an additional 1,250 households will adopt permanent agriculture on 3,750 acres using starter packs on exclusively credit basis (without the initial grant). The project will ensure that poor households, the youth and women are pro-actively included in the starter pack scheme.

114. The starter pack scheme will require a substantial volume of quality planting materials. The implementing partners will engage the technical services of the Department of Forestry to train existing farmers, associations (such as the existing elephant foot yam association), or entrepreneurs on the management of seedling nurseries. Support willl be provided in the areas of mobilisation, site preparation, nursery management, commercialisation, and transport. The parameters and standard operating procedures are detailed in Appendix 4.

115. The environmental benefits of this activity are substantial. The transfer of 15,750 acres from shifting sultivation to permanent agriculture which will be induced by the scheme will free up shifting cultivation pressure on 78,750 acres with an average five years of fallow. This implies that 63,000 acres will return to natural vegetation/forest, increasing carbon stock and reducing soil erosion. Finally, some 9,500 farmers operating 23,000 acres of shifting cultivation will benefit from improved agricultural knowledge, improved seed for conventional crops, and improved marketing.

116. *Land titling in Chin state:* The expansion of sedentary agriculture in southern Chin state is constrained by the prevailing land tenure system and the lack of access to financing, particularly with respect to poorer households purchasing or leasing land for this purpose. However, dialogue with key stakeholders confirmed strong interest by landless households, who are currently practicing shifting cultivation, to lease or purchase land for sedentary agriculture; and of landowners to lease or sell land accordingly. This is already occurring where landless households can access financing. The Land Law (2012) recognises the purchase of land outright through land ownership registration (Form 7), or through hire purchase agreements and issuance of temporary ownership certificates (by DALMS

under a MoALI decree) under paragraph 116 of the Land Law. The temporary form is converted into a Form 7 (ownership title) upon conclusion of the hire purchase arrangement.

117. In this context, to be eligible for receiving the initial starter pack, a household will have to either demonstrate land ownership or enter into a hire-purchase (lease) agreement (the pack will serve as guarantee of instalments to the landowner). In light of prevailing customary land ownership practices, the transformation to the mainstream regulatory and legal framework under the project will be facilitated by the implementing partners that will work with community-based organisations trusted by farmers to intermediate land tenure arrangements, link interested farmers and landowners, provide legal advice and service, and interface with the DALMS for land surveys and registration certificates. This activity will include: (i) raising awareness at village level on options to become a land owner for permanent agriculture; (ii) negotiating land available for sale, suitable for SALT, with landowners; (iii) helping to prepare and negotiate hire purchase contracts; (iv) interfacing with DALMS to undertake land surveys; (v) obtaining consent from neighbours as required; (vi) ensuring contract signature under FPIC conditions; and (vii) interfacing with DALMS to obtain temporary ownership certificates.

118. *Livestock sub-sector*. Livestock producers are an important target group. In both Magway and Chin, KCs will promote improved livestock production through training of para-veterinarians, routine vaccination, improved fodder production and improved stall feeding regimes and practices. This is expected to increase production, animal off-take (particularly in Magway), and financial returns, while reducing environmental pressure on grazing areas. The service of para-veterinarians will be 100% privatised and based on cost recovery. KC support for the fattening of cattle and the domestication and breeding/fattening of *Bos Gaurus* in Chin, and of goats in Magway, combined with general husbandry/veterinarian services, will generate a sufficient business foundation for para-veterinarians. The promotion of fattening will be fully integrated with existing processors, exporters and markets. It is expected that up to 40 farmers' groups will adopt breeding and fattening activities for *Bos Gaurus* cattle, and some 1,200 households will adopt goat fattening, with a total annual throughput of 150,000 animals ready for meat production.

119. *Technical and market linkages*. KCs will develop links with DAR's Agriculture Research Institute for adaptation and dissemination of new technologies, and with state seed farms and farmers already engaged in seed multiplication. In Chin state the project will assist in establishing a seed farm at the Agriculture Institute in Mindat, while in Magway region it will work with the four existing seed farms. The project will encourage linkages between these seed farms and village-based seed production that will be supported by KCs. To promote nascent PPP models, private sector actors will be encouraged (through the agribusiness fund) to establish a tissue culture laboratory for multiplying planting material for yams, medicinal orchids, ginseng, potatoes and other high value crops; supported by seed multiplication under contract farming arrangements. The project will also explore ways to improve the commercialisation of small farmers' output in domestic, regional and international markets through: (i) regional branding where feasible; (ii) promotion of linkages among producers and processors; (iii) export promotion in compliance with international food safety and quality standards (such as AseanGAP, GlobalGAP, HACCP); and (iv) specific market studies/value chain analyses as entry points for new domestic, regional and international markets. Real-time market information services will be organized through AIT mobile phone technology.

120. **Sub-component 2.2. Financial Services *(US$ 2.5 million).*** The project will support financial inclusion for small farmers, livestock owners and the landless in the project area, and will ensure equal access for ethnic groups and women. It will invest in four specific activities of which two are being implemented very successfully under the FARM project, the third is now being operationalised under FARM, and the fourth is an instrument applied by IFAD-financed projects globally. The activities are described below.

121. **Savings and credit groups (SCGs).** The project will scale up the successful experiences of SCGs under FARM. SCG governance and management modalities, standard operating procedures, and applicable rules and regulations are contained in WP3.

122. Financial literacy training will be the foundation for group formation. Service providers will be contracted to provide training to community members on basic finance, book-keeping, credit and business management; and will subsequently encourage interested youth, women and men to form SCGs, in coordination with KCs. The group formation process will include training, signature of an agreement by all members, election of officials (chairperson, vice chairperson, accountant, treasurer),

and opening of a bank account. Once formed, SCGs will be trained in roles and responsibilities of officials, project procedures and services, and most importantly financial management of savings and credit operations and financial reporting. Exposure visits to FARM SCGs will be organised. Savings mobilisation will be an entry point for introducing financial services, and group members will be able to take loans for coping activities such as food, medicine, travel, house repairs, animal feed, and seeds.

123. **Rural Business Fund (RBF).** The project will scale up the successful experiences of the RBF under FARM. The RBF's governance and management modalities, standard operating procedures, and applicable rules and regulations are contained in WP3.

124. The RBF will provide matching grants for micro-enterprises owned by individuals. These grants will typically cover up to 75% of a micro-enterprise investment of a maximum USD 5,000, while beneficiaries will cover at least 25% as well as any amount in excess of USD 5,000. The beneficiary's 25% contribution can be either equity or debt financing from a third party. The RBF will operate based on periodic public calls for proposals, to be assessed according to defined eligibility criteria by an independent grant committee. RBF governance and management modalities will ensure proper operation and minimise the risk of elite capture.

125. The RBF will also provide grants to SCGs as a form of seed capital. These funds will be used for group investments in microenterprises, on revolving fund basis. The revolving fund mechanism will ensure that a number of enterprises can be created and expanded. The revolving fund mechanism also ensures the RBF sustainability at SCG level, as long as borrowed funds are repaid.

126. Enterprises eligible for RBF funding may include medicinal orchid production, mushroom cultivation, goat fattening, *Bos Gaurus* domestication, agro-processing, and off-farm services. To be eligible, proposals will have to provide viable business plans demonstrating comparative advantage, market demand, growth potential, and job creation. Beneficiaries will be required to undergo related vocational training and accounting training. Women and the youth will be prioritised.

127. **Agribusiness Fund (ABF).** The ABF's governance and management modalities, standard operating procedures, and applicable rules and regulations are presently being finalised under the FARM project. The project will scale up this activity, once it is operational under FARM.

128. The ABF will provide strategic matching grants, identified through value chain analysis, to agribusinesses interested in setting up production/processing facilities in the project area that create incremental backward/forward linkages or provide services to small farmers or livestock producers, and that generate incremental employment opportunities. Eligible investments may include processing facilities for high value crops, tissue culture propagation of yam and orchids, production and multiplication of planting materials, slaughter houses, dry meat processing, mobile veterinary clinics, oil extraction mills, and tractor hire services. At an appropriate stage, and following careful assessment of feasibility, the ABF may be transformed into a public-private-producers-partnership (PPPP) fund. Preliminary discussions with a range of private agribusinesses confirmed the substantial scale of potential contracts with small farmers that can be triggered by the ABF.

129. Competitive ABF grants will typically cover up to 40% of the agribusiness investment cost of maximum USD 400,000, while the agribusiness will finance at least 60% as as well as any amount in excess of the USD 400,000. The ABF will operate based on periodic calls for proposals issued by the project. Proposals will be assessed against defined criteria by project management and a reputable auditor, reviewed by an independent grant committee, approved by the National Project Steering Committee, and cleared by IFAD. The aim is to support around 70 SMEs during project implementation. Proposed commodities will have to demonstrate comparative advantage, market demand and growth potential in order for proposals to be considered. Robust technical assistance will be provided to build the ABF's due diligence and operational capabilities.

130. **Refinancing**. Myanmar's formal financial sector is small and underdeveloped, with one of the lowest levels of penetration of financial services in the world, and with a ratio of credit to GDP of only 12%. Access to basic financial services is very low, which is a major obstacle to economic growth. Myanmar's financial institutions are small and unsophisticated; the 23 private commercial banks have on average only US$ 25 million in capital each. The microfinance industry as similarly small, MFIs provide microloans to less than 2% of the population, the majority of which in urban areas in the southeast and delta regions. The sector is further constrained by the limited set of financial products

offered – mainly savings and deposits instruments and short-term loans[8]. Conversely, 18% of the population has outstanding loans with the informal financial sector (ie unregulated credit providers) amounting to approx. US$ 4.75 billion at exhorbitant interest rates (from 3% to 8% per month). This can be used as a proxy for latent demand for credit.

131. Loans to the agriculture sector represent only 2.5% of all outstanding loans. The MADB, which is virtually the only source of formal credit for farmers, has an outstanding loan portfolio of only US 84 million, mainly for seasonal loans (five months duration) for rice production. Moreover, access to financial services and market penetration of formal financial institutions are lower in Chin and Magway than the national average, and the incidence of unregulated borrowing higher. Many farmers and landless households in these areas are trapped in a vicious cycle of indebtedness and poverty.

132. The project will address these problems in two ways. First, it will provide a slightly discounted line of credit (near-market rates) to refinance project-related agriculture, livestock and enterprise lending operations of licensed financial institutions (INGO/MFIs, commercial banks, MADB). Eligible financial institutions will be those that are interested to participate, are financially sound, comply with best industry practices in a transparent manner, view rural and agricultural lending operations as part of their growth strategy, and intend to apply their own commercial terms and conditions to onlending. Such support to financial institutions will be based on a clear exit strategy founded on their medium term business plans demonstrating sustained and increased rural lending operations. The credit line will be managed by a reputable private sector audit firm selected through a competitive process and contracted on performance basis.

133. Secondly, the project will support participating financial institutions to establish service delivery in southern Chin and northern Magway by cost-sharing local service points (fixed and mobile) and by offering capacity building and technical assistance to help them develop savings and lending products appropriate for the agriculture and rural sectors[9]. It is important to note that these forms of support are complementary to private sector efforts to expand formal financial services. They are also consistent with the policy operationalisation framework of the recently-approved Financial Sector Development Project (IDA/WB) and the partnership and financial inclusion agendas of the Sector Working Group.

134. **Sub-component 2.3: Policy engagement *(US$ 0.1 million)*.** The objective of this sub-component is to contribute to an evidence-based and inclusive policy framework for rural development in Myanmar, specifically related to the project's implementation experiences. There are currently three specific issues being addressed by the project, where there is an evident policy gap: (i) transition from shifting to sedentary agriculture and associated customary land laws; (ii) re-categorisation of high-value commercial crops from non-timber forest product to agricultural or industrial crops; and (iii) agricultural service delivery and market linkages. The project will support the formulation of policies and regulations necessary to enhance and sustain project investments, and to contribute to broader agricultural modernisation. Policy engagement will also aim at scaling-up successful approaches to other states and regions of the country, and will contribute to the project's exit strategy.

135. Policy engagement activities will be supported through: (i) provision of technical assistance to the Government to undertake analysis of operational experiences focusing on a spectrum of issues, including customary land tenure systems, transition from shifting to sedentary agriculture, production of high-value crops, pluralistic extension service models, commercial development of the livestock sector, introduction of SALT, and soil and water conservation; (ii) provision of technical assistance to MoALI to undertake evidence-based technical review of existing practices and policies, laws and regulations; (iii) support for inclusive stakeholder consultations at regional and national level (ensuring they reflects the views of rural women, youth, small farmers, ethnic groups, and the private sector) and consensus building on the proposed policy; and (iv) facilitating the drafting of relevant policies and implementation plans.

D. Lessons learned and adherence to IFAD policies

136. While Myanmar has been a member of IFAD since 1990, the first loan (FARM project) became operational in 2014. The design process of WSAP has been informed by experiences accumulated in the relatively short duration of the IFAD country programme, the Government's development activities,

[8] *Myanmar: Financial Sector Development Project*, PAD, IDA/WB, November 2016.

[9] There is keen interest particularly by reputable MFIs under the Myanmar Microfinance Association (MMA) and the PACT umbrella to increase rural outreach, spurred by the recently revised microfinance law.

and operations of partner institutions, including UNDP, UNOPS (LIFT), bilateral agencies, and NGOs which have extensive experience in working with ethnic groups. Key lessons of relevance to WSAP that emerge from these experiences are outlined below.

- *Cultural sensitivity*. Designing development activities in a multi-ethnic country such as Myanmar requires a culturally sensitive and 'do no harm' approach. This clearly emerges from work of non-govenmental organisations with various ethnic groups across the country, the generation of UNDP's township community development projects, and multiple UNOPS/LIFT operations.
- *Capacity building*. Following five decades of isolation, MoALI is relatively weak in terms of staff capacities, technical knowledge, project management, fiduciary compliance and outreach. In this context, MoALI greatly benefitted from a small capacity building grant financed by IFAD and executed by UNOPS in 2014-2015. The grant significantly developed MoALI capacity in project management, work planning, financial management, procurement and contracting, and M&E. It proved to be fundamental in enabling MoALI to improve the management of its development operations, including FARM. Based on this experience, it is considered best practice in APR to develop Ministerial statutory and fiduciary capabilities in advance of loan financing.
- *Services.* The pluralistic service delivery platform organised in the form of Knowledge Centres (KCs), which build on the structure and network of public extension services, has proved to be an early resounding success under the FARM project. The brokering functions of KCs have proved to be instrumental in modernising agriculture and stimulating rural business growth, within their first two years of operation. Six input supply companies and seven agribusinesses have established operations in FARM locations, using KCs as focal points for demonstrations, farmers' field schools, training and contract farming. Fifteen KCs have linked small farmers in lowland and upland areas to five private companies for contract farming of vegetables for IQF processing and export to Japan, chili for export to Thailand, rice grain production for export, and rice and maize seed multiplication for the domestic market. These have generated incremental net returns to households of between US$ 100 and US$ 1,000 per acre per annum. Almost 700 on-farm demonstrations have been conducted, with the participation of 12,500 small farmers, and there is increasing farmer adoption of the improved technologies demonstrated, such as mechanical seeding, input application, and GAP-compliant nursery activities. Services are also being provided by the public sector (Depts. of Agriculture, Research, Irrigation, Mechanisation, Land Records) to farmers through KCs. KCs now constitute a proven instrument of the COSOP strategy of commercialising smallholder agriculture and breaking the dependency-subsistence-poverty trap. The lessons of these experiences are carefully adopted in the design of WSAP.
- *Rural finance.* FARM's rural finance experiences, organised by KCs, have also been highly successful in only two years. Some 325 savings and credit groups consisting of 7,050 members (44% women) are utilising revolved savings and seed capital to invest in coping strategies that combat vulnerability and increase resilience, generating benefits for 28,200 household members. The rural business fund, which also operates on a revolving basis, has financed 320 group micro-enterprises operated by 2,600 poor landless households in high value cropping on home gardens, livestock activities, and off-farm products and services, with positive effects on incomes, food security and jobs. The operating procedures of the agribusiness fund, which will entice private sector entities to the project area, have been finalised. One MFI is using KCs to provide loans to farmers, independently of the project. The WSAP will build upon these experiences, and will scale up the SCG, RBF and ABF models accordingly.
- *Scaling up.* FARM's scaling up strategy has also proved to be successful. MoALI has adopted the KC concept as its operational modality for agriculture services and market linkages. This model is now being scaled up by (i) the Agricultural Development Support Project (IDA/WB, US$ 100 million) in Bago, Mandalay and Sagaing; and (ii) the Irrigated Agriculture Inclusive Development Project (ADB, US$ 83 million) across the central dry zone. Based on this lesson, WSAP adopts FARM's scaling up model.
- *Human capital*. Chin state in particular has experienced substantial out-migration of the labour force (particularly the youth) over the past decades, and faces seasonal shortages of labour. Experiences with the return of migrants and displaced people, such as those of CARE, confirm that access to economic and job opportunities is vital for successful reintegration.
- *Social capital*. Water users' groups, producers' associations, savings and credit groups, and

other self-help groups gradually improve the access of poor rural women and men to resources, services and opportunities. Development activities in the country, particularly those of JICA, UNOPS/LIFT and NGOs, demonstrate the importance of community organizations.

- *Participatory approaches*. While MoALI has increasing levels of technical capacity, it lacks the social mobilisation skills required to interact meaningfully with communities and ethnic groups. UNOPS/LIFT and NGO experiences demonstrate that the implementation of participatory approaches requires support from experienced partners with community engagement skills and track record.

137. **Compliance with IFAD policies.** WSAP is compliant with relevant IFAD policies, in particular: (i) its goal and objectives are aligned with the Strategic Framework 2016-2025 in terms of market-driven smallholder development and rural business growth; (ii) its targeting strategy is consistent with the Targeting Policy approach of inclusive targeting at community, household, and intra-household levels; (iii) its investments in rural economic growth are compliant with the Rural Finance Policy approach of inclusive financial systems to improve the access of the rural poor to a range of financial services; (iv) its participatory approach to land issues is consistent with the Land Tenure Policy focus on free, prior and informed consent; (v) its sensitivity to the culture, aspirations and needs of ethnic groups is aligned with the Policy on Engagement with Indigenous Peoples in respecting values and building upon strengths; (vi) its environmental assessment requirements for infrastructure comply with the SECAP guidelines; (vii) its attention to challenges and opportunities for rural women is based on the Gender Equality and Women's Empowerment Policy, and (viii) its fiduciary framework is compliant with the Policy on Preventing Fraud and Corruption.

138. The project is consistent with Myanmar's RB-COSOP 2014-2018 and its strategic goal, namely to contribute to reducing rural poverty, specifically of smallholders, the landless, ethnic groups and other marginalized groups. The COSOP defines three Strategic Objectives (SOs) for engagement. The SO1 aims *to empower rural women and men to access agricultural resources, technologies, services and markets*. The SO2 aims *to create business and employment opportunities for rural women and men*. The SO3 aims *to promote the social and economic empowerment of marginalized groups, particularly ethnic groups*. WSAP directly addresses SO3, and applies instruments of SO1 and SO2 tailored to needs and opportunities of ethnic groups.

III. Project implementation

A. Approach

139. In recent years, the Myanmar administration has been accumulating experience in managing and implementing externally-funded investments in the agriculture sector. The capacity building support provided by development partners such as IFAD, JICA, WB and others has been instrumental in this respect. The project will continue to build relevant capacities of public agencies – primarily the key departments of MoALI such as DRD, IWUMD, DA, DAR, DoP, DALMS – to modernise agriculture, improve land management, and deliver services to the farming community. The responsibilities of these agencies to implement project investments will be phased in line with their evolving capacities.

140. The national decentralisation process is at a relatively early stage, and state-level institutions involved with agriculture and rural development are weak. Development activities in remote rural areas and ethnic states have largely been implemented by NGOs operating in isolation and at limited scale. The major NGOs have by now gained valuable knowledge and experiences in engaging with ethnic communities in a culturally sensitive and consultative manner. The project will engage an implementing partner in each location to interface with communities, lead social mobilisation, build community organisations, organise investments, and help build relevant public sector capacities.

141. The private sector, particularly in remote rural areas, generally remains under-developed and concentrated. In particular, significant penetration in rural areas, widespread compliance with the rule of law, and the adoption of ethical business practices, are areas requiring strengthening on priority basis. The project contains a set of instruments carefully designed to entice increased private sector presence and operations in the project areas, on a legally-compliant, ethical and responsible basis.

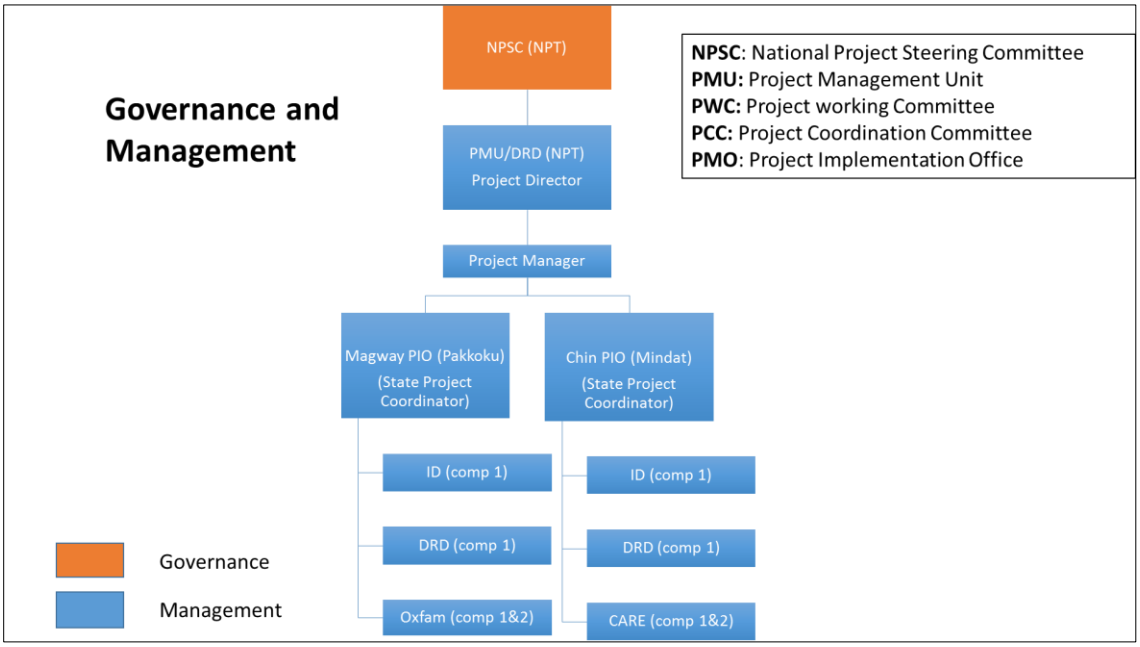
142. In light of the above, the project implementation approach is to: (i) strengthen state-level MoALI and other relevant agencies, and increase their responsibilities to implement activities in a sequenced

manner; (ii) engage with reputable NGOs to serve as lead technical agencies and to gradually devolve responsibilities to public agencies as their capacities mature; (iii) establish small state-level Project Implementation Offices (PIO) for coordinating implementation at state level and for monitoring and reporting on progress; (iv) establish a Project Management Unit (PMU) at DRD that will be integrated within DRD structures. It will be responsible for project implementation, fiduciary management, work planning and budgeting, monitoring and evaluation, and policy interface functions. It will manage contracts with implementing partners and public and private entities. The project contains a grant to support operational and fiduciary capacity building of relevant central and state-level public agencies to support effective project implementation.

B. Organizational framework

143. **Governance.** The project will be governed by a National Project Steering Committee (NPSC) at Union Level, and a Project Coordination Committee (PCC) each in Magway and Chin (ref. Figure 1).

Figure 1: Project Governance and Management Structure



144. The NPSC will be chaired by the MoALI Deputy Minister. Its membership will include senior representatives of relevant MoALI departments (Office of the Minister and Departments of Planning, Irrigation and Water Utilization Management, Rural Development, Agriculture, Agricultural Research, Livestock, Agricultural Land Management and Statistics) and representatives of MoPF and MoNREC. Representatives of the state-level MoALI will be represented in the NPSC to the extent feasible. The Committee will convene in Nay Pyi Taw. Its responsibilities will be to provide strategic and policy guidance, endorse consultants' selection, approve annual work plans/budgets, and oversee the external audit process.

145. The PCC will be constituted in each state/region at the district level. It will be co-chaired by the representatives of MoALI and the Ministry of Home Affairs. Membership will include representatives of relevant state-level Ministries and MoALI departments, Implementing Partners and representatives of community organizations. Its responsibilities will be to meet to provide overall guidance, approve annual work plans and budgets, endorse consultants' selection, review progress reports, and ensure coordination. The PCCs will convene in Mindat (Chin) and Pakkoku (Magway) on regular basis.

146. **Central level management.** The Department of Rural Development (DRD) will be the focal department of the project. It will be responsible and accountable for the performance and results of the project. A Project Management Unit (PMU) will be established within DRD and will be integrated with DRD structures. It will be responsible for project implementation, fiduciary management (including financial management, procurement and contracting, legal compliance), work planning and budgeting, and monitoring and evaluation, and progress reporting.

147. The PMU will be headed by a Project Director from the DRD appointed by MoALI. Daily operation of the PMU will be the responsibility of a Project Manager recruited from the market through a competitive process. The PMU will be staffed by: (i) relevant assigned officers from DRD, and other MoALI departments as required; and (ii) a set of consultants, recuited competitively on demand basis (agribusiness/value chains; rural finance; community development and gender; accounting; procurement, M&E). As per national guidelines, assigned MoALI staff will be remunerated on Government terms and conditions, while consultants will be remunerated at competitive market rates.

148. **Central financial management.** Project financial management will be administered by the existing Finance Unit of DRD. The DRD will assign a Finance Officer and accounts staff from its existing staff specifically for the project, who will work under the supervision of the unit's Finance Director. This DRD Finance Unit will be supported by two consultants within the PMU, namely a Finance Officer and an Accountant.

149. **State level management**. One Project Implementation Office (PIO) will be established in each state. In Chin state it will be located in Mindat, and in Magway region it will be located in Pakkoku. The PIO will be responsible for coordinating implementation at state level and for monitoring and reporting on progress. The PIO will be headed by a state Project Coordinator, to be assigned by DRD from its state-level personnel. The PIO will be staffed by assigned officers from relevant state MoALI departments (DRD, DoA) and relevant Ministries (such as MoNREC). The Project Coordinator will have the responsibility of coordinating with implementing partners.

150. The PIOs will be supported by Implementing Partners. The Implementing Partners will provide necessary technical staff to ensure quality of implementation. In each location, they will provide a Project Implementation Advisor for the duration of the project, and specific TA (for example in participatory irrigation management, agriculture value chains, enterprise development, rural finance, financial management, gender and community development, M&E).

151. **State financial management**. State-level financial management will be administered by the existing Finance Unit of state-level DRD. It will assign a Finance Officer and accounts staff from its existing personnel specifically for the project, who will work under the supervision of the unit's Finance head. This DRD Finance Unit will be supported by an Accountant within the PIO.

152. An institutional capacity assessment of relevant MoALI departments in southern Chin state and northern Magway region was undertaken as part of the design process. The assessment evaluated institutional structure and culture, and capacity to carry out administrative and technical functions. A capacity building plan has been formulated to address the institutional weaknesses identified and to enhance state-level MoALI's implementation capabilities (ref. WP 6). The project will invest in capacity building accordingly, through technical assistance, training, and exposure visits. This programme will cover all levels – state/regional/district level MoALI, PMU, PIOs, KCs and community organisations. It should be noted that project interface with ethnic communities will be intermediated by facilitators and technical specialists with local language capabilities. A project implementation manual will be developed, building on the manual prepared under FARM.

153. **Implementation**. The project will be implemented by central and state-level MoALI, implementing partners, and the private sector. Two Implementing Partners (IP) will be identified, as cost-sharing partners.

154. The PMU will enter into an agreement with each implementing partner for the purposes of the project. Should PMU and either implementing partner fail to reach a mutually acceptable agreement, alternative implementing partners will be identified by MoALI and IFAD. Implementing partners will be required to cost-share project activities in the respective locations. The agreements with implementing partners (and with all service providers) will be performance based.

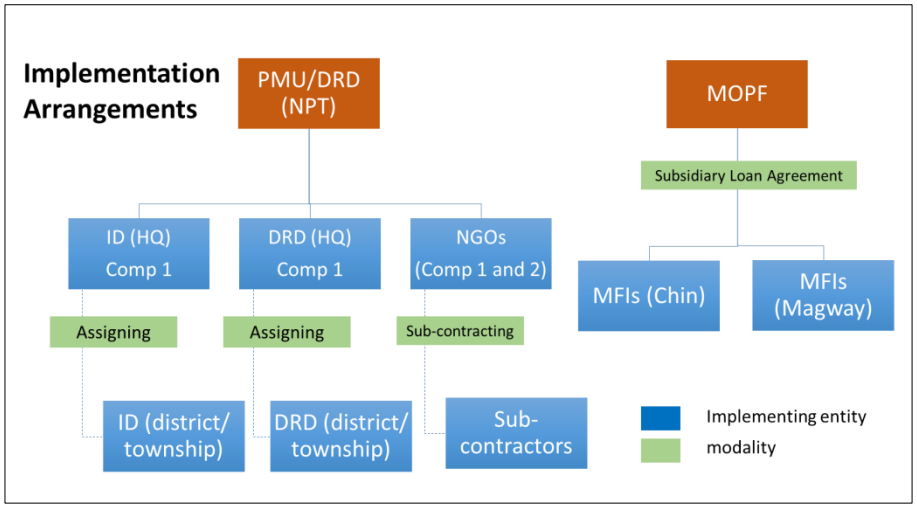
155. The specific responsibilities of the implementing partners will consist of: (i) social mobilisation for infrastructure; (ii) agricultural modernisation; (iii) rural financial services (apart from refinancing); and (iv) policy engagement. The implementing partners will initially lead these activities, and gradually devolve responsibilities to public sector agencies as capacities develop. The implementing partners will sub-contract service providers from the public and private sectors as required.

156. Specific implementation arrangements for project activities are outlined below (ref. Figure 2).

- *Sub-component 1.1: Productive Infrastructure*. Lead responsibility for irrigation development and pilot land consolidation is vested with IWUMD/MoALI. An engineering firm will be contracted to support design, verify construction norms and unit costs, supervise civil works, and provide TA. Lead responsibility for rural access roads and home garden irrigation technology is vested with DRD/ MoALI, with design support as required. Civil works will be undertaken by private sector firms. Supervision of all productive infrastructure schemes will be multi-level, involving IWUMD/DRD, PIOand community groups. Implementing partners will lead community mobilisation and the free, prior and informed consent (FPIC) process before the commencement of any civil work. Implementing partners, jointly with IWUMD, will also lead the formation of infrastructure O&M groups and water users' groups.
- *Sub-component 1.2: Social Infrastructure*. Lead responsibility for social infrastructure is vested with MoALI/DRD, with design support where required. Civil works will be undertaken by private contractors where required. Supervision of all social infrastructure schemes will be multi-level, involving DRD, PIOand community groups. Implementing partners will lead community mobilisation and the free, prior and informed consent (FPIC) process before the commencement of any civil work. Implementing partners, jointly with DRD, will also lead the formation of infrastructure O&M groups and mechanisms.

- *Sub-component 1.3: Capacity Building*. Lead responsibility is vested with the PMU and PIOs, operating through contracted engineering firms for capacity building of IWUMD/DRD in surveying, engineering design, BOQs, drawings, and costing. Implementing partners will lead activities related to WASH and nutrition (in partnership with UNICEF).
- *Sub-Component 2.1: Agricultural Modernisation*. Lead responsibility is vested with the MoALI extension service, in collaboration with implementing partners. KCs will be constructed by private sector contractors. Operational support for social mobilisation will be provided by implementing partners. Implementing partners will lead land tenure activities (in consultation with DALMS) and value chain analysis and development. The Department of Forestry and Yam Producers Association will be involved in the coordination and implementation of seedling nursery development.
- *Sub-Component 2.2: Financial Services.* Lead responsibility for formation and strengthening of SCGs is vested with Implementing Partners, under PMUand PIO oversight, with support from the Myanmar Microfinance Association. Lead responsibility for the rural business fund will be vested with the implementing partners, supported by the PIOs and relevant KCs. Lead responsibility for ABF is vested with the PMU, under MoPF oversight, supported by the PIOs and relevant KCs. Refinancing will be managed by an auditor while refinanced loans will be administered by licensed financial institutions (such as NGOs, PACT, MFIs, commercial banks, MADB) under subsidiary financing agreements with MoPF.
- *Sub-Component 2.3: Policy Engagement*. Lead responsibility is vested with the implementing partners, with support from competitively recruited technical assistance as appropriate.

Figure 2: Implementation Arrangements



157. **Partnerships.** The project will apply the partnership strategy outlined in the COSOP. Several kinds of partnership will be developed during implementation, as outlined below.

(i) *Structured co-financing partnerships* with implementing partners to cost-share relevant project activities, with financial institutions to co-finance lending operations, with agribusinesses to co-finance processing facilities, and with communities to co-finance infrastructure works.

(ii) *Private sector partnerships* with a range of value chain actors for value chain integration, such as input suppliers, traders, processors, transporters and exporters; with financial institutions for financial services; and with stakeholders for PPPP arrangements.

(iii) *Knowledge partnerships* with knowledge providers such as UNICEF, the World Agroforestry Centre and ICIMOD, with implementing partners, with operational service providers such as UNOPS, and with microfinance advisors such as PACT and MMA.

(iv) *Advocacy partnerships* with organisations that advocate for the rights of ethnic groups and indigenous peoples, for access of the poor to assets and services, for land tenure security, and for gender equality.

(v) *Policy partnerships* with Government agencies and development partners through sectoral working groups and similar platforms.

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

Planning

158. The annual work plan and budget (AWPB) will serve as the key management tool for planning, monitoring and reporting on implementation of activities. The AWPB will be based on project design, cost tables, and the project implementation manual, and informed by operational experiences and challenges. The logical framework will constitute the main reference for framing the AWPBs, to create clear linkages between proposed activities, budget requirements and expected outputs, outcomes and impacts. A participatory planning approach will be applied, to ensure that project investments reflect the needs and aspirations of target groups. The process will be led by the PIOs, jointly with the implementing partners, MoALI and community organisations; the outcomes will be consolidated into a project AWPB by the PMU at central level.

Monitoring and evaluation

159. The project's M&E system will be designed to provide reliable information to facilitate results-based management. The system will be aligned with the pioneering M&E system developed under

FARM, and will contribute to strengthening MoALI's ODA effectiveness monitoring system. The main objectives of the project's M&E system are to:

- *steer project implementation*: provide stakeholders with the information and analysis required to measure outputs and outcomes; assess effects on livelihoods of participating households; assess the relevance of the implementation strategy and processes; identify lags; and support overall decision-making to improve project performance;
- *support decision making:* provide implementers, beneficiaries and other stakeholders with the information and analysis needed to assess the economic returns generated by investments, by monitoring quantitative (yields, production, cost, margins, turnover, income) and qualitative outcomes (beneficiary satisfaction);
- *support policy-making*: provide Government with information to measure the contribution to the implementation of national MoALI strategies, and with data and analysis to facilitate evidence-based policy making.

160. The M&E system will have a three-tier structure: (i) output monitoring focusing on physical and financial inputs, activities and outputs; (ii) outcome monitoring focusing on the use of outputs and the measurement of benefits at household and community levels; and, (iii) impact assessment evaluating impact in comparison with objectives, including the state of natural resources. All M&E data, analysis, and reporting will be disaggregated by poverty status, gender, and ethnicity. Where appropriate, outcome and impact indicators will be disaggregated by poverty quintile. The project will also monitor processes in areas such as KC service delivery, the transition from shifting to sedentary cultivation, and the gradual adaptation of farming systems to climate change. Empirical studies will be undertaken at mid-term to assess production and productivity effects, degree of improved market access, impact on incomes of small farmers and the landless, and service delivery outcomes.

161. A management information system (MIS) will be established at the outset of implementation. It will provide information on the baseline status, physical and financial progress, procurement progress, outputs and outcomes, and other pertinent information. The system will be automated to generate regular periodic reports and annual progress reports. Information will flow from beneficiaries, service providers, implementing partners, township entities, MoALI, the PIOs, and the PMU.

Learning and knowledge management

162. The project's learning system will consist of state-level quarterly meetings and national bi-annual and annual review meetings, capturing information on progress, lessons and finding solutions for implementation constraints. A consolidated annual project review would be carried out towards the end of each fiscal year to assess physical and financial progress against annual targets and progress towards achievement of objectives.

163. *Mid-Term Review (MTR).* The Government and IFAD will jointly undertake a mid-term review at the end of the third year of implementation to review project achievements and constraints. In addition to its statutory tasks, the review will assess: (i) improvements in agriculture and livestock production and increases in the incomes of beneficiaries; (ii) quality of infrastructure works and sustainability of O&M arrangements; (iii) the performance of KCs and business relations brokered between farmers and agribusiness; (iv) progress of financial services and degree of outreach to small farmers and the landless; (v) policy impact; (vi) fiduciary compliance; (vii) effectiveness of institutional arrangements.

164. *Project Completion Review*. As the project reaches completion, the PMU will lead the drafting of a project completion report in compliance with IFAD's guidelines and requirements. IFAD will support Government to undertake this review.

165. *Knowledge management* will be systematic throughout the duration of the project. To enable effective knowledge management and knowledge sharing, results and lessons from the project will be documented systematically through specific studies and knowledge products commissioned by the PMU and/or PIOs. The M&E system will be a key source of knowledge. Innovations observed during implementation will be documented for possible scaling up. The MoALI and PMU will be responsible for sharing knowledge documents through dedicated websites, workshops and seminars.

D. Financial Management, Procurement and Governance

166. The financial management risk in Myanmar is deemed 'high' due to various factors, including limited experience with implementing externally-funded projects, particularly at local government level. The FM risk will be mitigated by strengthening the PMU finance team, centralising spending authority at the PMU level, and ensuring sufficient seniority of signatory powers for efficient flow of funds and accountability.

167. *Financial Management.* The PMU will be responsible for project FM. It will maintain separate project accounts, in accordance with Government accounting standards. It will be responsible for all aspects of project financial management, including budgeting, financial statements and reporting, withdrawal applications for IFAD disbursements, and coordinating audit processes.

168. *Flow of Funds*. The Financing Agreement will include provisions to ensure the efficient and traceable flows of funds. Designated accounts in USD will be opened to receive funds for WSAP, respectively for the IFAD loan and IFAD grant, and operational accounts in MMK. The designated accounts will operate on the imprest method. The authorised allocations for the IFAD loan and IFAD grant will be detailed in the Letter to the Borrower (LTB). The PMU will manage the conversion from USD to the operational account in MMK, applying the FIFO principle.

169. *Internal controls.* The internal control framework in place for FARM segregates roles and responsibilities in line with Government procedures, with supplementary control provisions specific to the project laid out in a dedicated manual, which will be updated to cover WSAP implementation.

170. *Financial reporting.* Project expenditure will be recorded using the accounting software currently used by the PMU, for which customisation and training was provided at start-up. Further customisation is foreseen to enhance the software's capability.

171. *Counterpart funds*. Counterpart funds will be provided to cover Government contribution, based on annual work plans and budgets. Counterpart funds and beneficiary contributions shall be valued and recorded in the project’s accounts, including in-kind contributions.

172. *Contract management*. Agreements with implementing partners and contracts with service providers executed at national and state levels will be managed by the PMU, to ensure efficient monitoring, payment and reporting processes.

173. *Taxes.* IFAD's General Conditions were amended in 2009 to allow IFAD financing to be used to finance taxes. For projects approved after April 2014, payment of taxes is permitted provided that: (a) the Government has informed IFAD in writing that it is impossible or impractical to exempt the project from all or certain taxes; and (b) the World Bank’s Country Financing Parameters would permit the financing of such taxes for a similar project. When financing of taxes is permitted under these criteria, an assessment is made taking into account: (a) experience in the country and FM performance; (b) whether taxes and duties constitute an excessively high share of project costs and are material; and (c) the government contribution to other costs, such as recurrent costs. Whenever possible, taxes and duties on imported goods will be excluded, based on the assumption that these taxes are easily identifiable and can be exempted in most countries. It was confirmed during the design that the WB's Country Financing Parameters permit the payment of tax, exemption requires parliamentary approval and is very difficult to obtain, identifying tax is not practical and the tax regime is low (5%). The payment of taxes with IFAD funds is therefore foreseen under the project.

174. *Retroactive Financing*. Eligible expenditures from the loan may be incurred after approval of the project by IFAD's Executive Board and before entry into force of the Financing Agreement, up to a maximum of SDR 100,000, for expenditures for: (i) capacity building for PMU/PIO staff and target groups; (ii) studies and field surveys; and, (iii) consultancy services. Retroactive expenditures are pre-financed by the Government and reimbursed by IFAD once the Financing Agreement has entered into force and disbursement conditions are met.

175. *Start-up advance*. After the Financing Agreement enters into force, and pending satisfaction of disbursement conditions, the Government may request an advance withdrawal facility for start-up expenditure. A start-up advance of up to USD 300,000 may be requested during loan negotiations for eligible expenditure related to: (i) capacity building for PMU/PIO staff and target groups; (ii) studies and field surveys; (iii) consultancy services; (iv) salaries of key PMU staff; and (v) office costs.

176. *Audit*. Oversight will be provided through independent external audits. OAG is expected to be appointed to audit the project financial statements, provided that timeliness and quality of submission meet IFAD's guidelines.

177. *Procurement.* Procurement will be carried out in compliance with IFAD procurement guidelines and handbook (published on IFAD's website). The PIM will detail procurement requirements and procedures. The procurement methods, prior review arrangements, cost and time estimates, and risk mitigation measures will be defined in the Letter to the Borrower and reflected in the procurement plan. Technical assistance will be provided to develop PMU and PIO procurement capacities.

E. Supervision

178. The project will be supervised by IFAD. A supervision and implementation support mission will be undertaken on annual basis. MoALI at central and state levels will participate in these missions.

179. Supervision and implementation support will be applied as a continuous process requiring on-going communication and engagement with central Government, state administrations, PMU and PIOs. It will encompass three functions: (i) fiduciary compliance covering legal conditions, financial management, procurement and contracting; (ii) supervision focusing on performance, progress towards objectives, activities and outputs, planning and budgeting, monitoring and reporting, governance and management, targeting and gender equality; and (iii) implementation support.

180. Implementation support will be applied at three levels: (i) *project level*: providing guidance for achievement of objectives, supporting flexibility in response to evolving conditions, creating systems for sustainable flow of benefits, resolving operational issues, generating lessons and best practices; (ii) *country level*: influencing policy based on operational experiences, documenting models for scaling up, and facilitating partnerships; (iii) *IFAD level*: generating knowledge and lessons, feeding lessons into new project design, and identifying innovative instruments.

181. *Project design will invariably be superseded by reality over time due to changing conditions, evolving experiences, political and economic changes, exogenous developments and force majeure*. Supervision and implementation support process will guide the project towards its strategic objectives and broader poverty reduction outcomes, while ensuring fiduciary compliance and transparency.

F. Risk identification and mitigation

182. Key project risks have been assessed and mitigation measures incorporated, as outlined below. The residual risk is either moderate or exogenous.

Table 4: Risk Mitigation Matrix

Risks	Possible Consequences	Mitigation Measures
Governance risk	Weak governance may undermine effective implementation. Decentralisation may proceed slowly and delay implementation.	1. intensive capacity building at central and state levels. 2. substantial TA, supervision and oversight. 3. devolution of fiduciary responsibilities to state level. 4. state/region empowerment in Financing Agreement.
Expropriation risk	Possible state expropriation of developed land from farmers.	1. irrigation development only where land tenure is secured. 2. agricultural modernisation only where land tenure is secured. 3. NGO to intermediate land tenure, facilitate land titling. 4. Project director from DALMS (responsible for land titling). 5. Legally-binding assurance in Financing Agreement.
Fiduciary risk	Possible financial mis-management or mis-procurement.	1. requirement to utilise compliant financial software. 2. comprehensive risk control framework. 3. comprehensive internal audit and external audit regimes. 4. IFAD review of all procurement actions.

Risks	Possible Consequences	Mitigation Measures
Commercial risk	Possible lack of market access for target groups	1. focus on commodities with market demand, growth potential. 2. inclusive vertical value chain integration. 3. contractual linkages between farmers, agribusiness, markets. 4. brokerage role of KCs and private sector competition.
Capacity risk	Low capacities may adversely affect service delivery.	1. intensive capacity building at all levels. 2. service delivery based on underlying business relationships. 3. commercially-driven orientation of all investments. 4. assurance in Financing Agreement on non-transfer of staff.
Civil works risk	Inadvertent negative impacts on local communities and the environment	1. social and environmental feasibility study for each scheme. 2. investment in small-scale infrastructure only. 3. climate smart technologies for all civil works. 4. SECAP with PTA and ECD oversight.
Environmental Risk	Potential negative impacts of the project on environment.	1. introduction of SALT 2. transition from shifting cultivation to sedentary agriculture. 3. domestication of NTFC to reduce forest exploitation. 4. promotion of biodiversity through NTFC and NUS. 5. fully participatory approach to investments. 7. full sensitivity to ethnic groups' culture and traditions. 8. SECAP and oversight.

IV. Project costs, financing, benefits and sustainability

A. Project costs

183. The total project costs, for a period of six years, are estimated at USD 20.3 million or MMK 24.7 billion. All costs have been estimated on the basis of prices prevailing in Myanmar in July 2016 and validated in November 2016. The base cost amounts to USD 18.7 million, equivalent to 91% of total costs. Physical and price contingencies of USD 1.8 million account for 9% of total costs. Investment costs represent 88% of base costs, while recurrent costs represent 12%. Project costs by component are presented in Table 5.

Table 5: Project Cost Summary

	(MMK Million)			(US $ '000)			% Foreign Exchange	% Total Base Costs
	Local	Foreign	Total	Local	Foreign	Total		
A. Infrastructure								
1. Irrigation Infrastructure	3 699	653	4 351	3 302	583	3 885	15	21
2. Social Infrastructure	1 390	245	1 635	1 241	219	1 460	15	8
3. Capacity building	792	262	1 054	708	234	942	25	5
Subtotal	5 881	1 160	7 041	5 251	1 036	6 287	16	34
B. Agricultural Services								
1. Agricultural Modernisation	6 950	2 542	9 492	6 205	2 270	8 475	27	46
2. Financial Services	316	2 474	2 790	282	2 209	2 491	89	13
3. Policy engagement	138	24	162	123	22	145	15	1
Subtotal	7 404	5 041	12 444	6 610	4 501	11 111	41	60
C. Project Management	984	227	1 211	879	203	1 082	19	6
Total BASELINE COSTS	14 269	6 428	20 697	12 740	5 739	18 479	31	100
Physical Contingencies	685	303	988	611	271	882	31	5
Price Contingencies	1 905	806	2 711	628	267	895	30	5
Total PROJECT COSTS	16 859	7 537	24 395	13 980	6 277	20 257	31	110

184. Taxes worth US$ 0.8 million are included in the costs of all investment and recurrent cost items, but will not be considered as Government contribution as they are not waived.

B. Project Financing

185. The project will be financed by an IFAD loan of USD 9.0 million (44% of total cost), an IFAD grant of USD 4.0 million (20%), Government contribution of USD 1.0 million (5%) for salaries and operational expenditures, beneficiary/private sector contribution of USD 0.8 million (4%), and implementing partners' cost-sharing of USD 1.0 million (5%). The financing gap of US$ 4.5 million may be sourced through cofinancing identified during implementation or a subsequent PBAS cycle.

Table 6: Project Financing (USD '000)

	The Government		IFAD Loan		IFAD Grant		implementing partners		Beneficiaries/Private sector		Financing Gap		Total		For.	Local (Excl.
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Exch.	Taxes)
A. Infrastructure																
1. Irrigation Infrastructure	0	-	3 573	83.2	278	6.5	-	-	327	7.6	117	2.7	4 294	21.2	644	3 650
2. Social Infrastructure	-0	-	146	9.1	627	39.0	-	-	453	28.1	383	23.8	1 610	7.9	241	1 368
3. Capacity building	-0	-	346	33.7	219	21.3	-	-	-	-	463	45.0	1 028	5.1	250	778
Subtotal	-0	-	4 065	58.6	1 124	16.2	-	-	780	11.2	963	13.9	6 932	34.2	1 136	5 796
B. Agricultural Services																
1. Agricultural Modernisation	796	8.6	1 148	12.4	2 854	30.8	1 050	11.3	-	-	3 427	37.0	9 275	45.8	2 498	6 777
2. Financial Services	0	-	2 708	100.0	-	-	-	-	-	-	-	-	2 708	13.4	2 397	311
3. Policy engagement	0	-	81	50.0	-	-	-	-	-	-	81	50.0	163	0.8	24	139
Subtotal	796	6.6	3 938	32.4	2 854	23.5	1 050	8.6	-	-	3 509	28.9	12 146	60.0	4 919	7 226
C. Project Management	198	16.8	981	83.2	-	-	-	-	-	-	-	-	1 179	5.8	222	957
Total PROJECT COSTS	994	4.9	8 984	44.4	3 978	19.6	1 050	5.2	780	3.8	4 471	22.1	20 257	100.0	6 277	13 980

C. Summary benefits and economic analysis

186. *Benefits and beneficiaries.* The project is expected to directly benefit 76,812 households, of which 10,189 in Chin and 66,623 in Magway, comprising 390,405 rural women and men (ref. Table 7). An additional 4,730 FTE jobs will be generated and benefit a large number of. While recent poverty data is not available for the project areas, data collected for EFA indicates that some 85% of the targeted population is living either below the established poverty line (MMK 380,000 p.a) or just above the poverty line and at risk of slipping back into poverty due to climate shocks. The estimated project cost per beneficiary household is US$ 327.

Table 7: Project Beneficaries

Location Activity	Landowing Households (#)	Tenant/landless Households (#)	Total Households (#)	Total People (#)
Chin				
SALT	1 250	4 000	5 250	26 775
Technology		4475	4 475	22 823
Irrigation	200	0	200	1 020
Enterprises	0	264	264	1 346
Subtotal	1 450	4 164	10 189	51 964
Magway				
Technology	50 955	13 545	64 500	277 350
Irrigation	1 067		1 067	4 588
Enterprises	158	898	1 056	4 541
Subtotal	52 180	14 443	66 623	338 443
Total	53 630	18 607	76 812	390 407

187. The project's principal benefits are expected to be generated from improved infrastructure, land tenure, agricultural technology, market access, enterprise growth, and financial services. Its main beneficiaries will be small farming households, landless/tenant households, and off-farm households. Its key benefits will be in the form of increased incomes, incremental jobs, improved food security, enhanced nutrition, and secured climate resilience.

188. The project is expected to generate 1,496 job opportunities in enterprises, of which 77% for women, as well as about 3,236 FTE (0.65 million labour days) of casual agricultural labour jobs (see detailes in Appendix 10) most likely for the landless (particularly youth), the unemployed, and returning migrants. These opportunities will be generated through increased land use intensity, improved husbandry practices, and the transition to high value cropping which is labour intensive.

Some employment opportunities will be lost through mechanisation, particularly of harvesting, offset by job creation in enterprise and agribusiness sectors.

Financial analysis

189. **Crop budgets**. The financial and economic analysis of the project is based on the crop budgets and farm models provided in WP2. Four sets of crop budgets have been prepared to reflect the different agro-ecological conditions in the project areas, indicate current production parameters and returns, and estimate incremental values generated as a result of project investments.

190. The yields and returns to all proposed crops are expected to increase in the 'with project' situation. For annual crops, the impact of improved practices will be immediate, as current input application and yeilds are very low; these improvements relate to new technology, new varieties, improved seeds, better inputs, improved land preparation, and modern crop management practices. For pluriannual crops (eg plum, avocado, macadamia) incremental yields will increase gradually, starting from year 3 and peaking in years 5-7. Horticultural crops show high financial returns in the 'with project' scenario. This is due to a several factors including good soil and climatic conditions, relatively low incidence of diseases at the proposed elevations. All financial indicators at the crop level (FIRR, NPV, ROI and BCR) denote financial feasibility.

191. **Farm models**. Four upland and one lowland farm models reflecting the predominant farming systems in the Chin and one upland and one low land model for Magway project areas have been developed to estimate the project's impact on production and returns. The main technologies that will be introduced under the crop models include use new crops, improved planting material with row cultivation, adoption of improved land management and water use, and best practices in pre-and-post handling of crops and their storage. All models estimate the impact of introduction of new technologies in agricultural activities and cropping patterns on farm incomes, and depict typical farming households that reflect the predominantly farming systems of the project area. It is evident that adoption of the models will contribute to a healthy return from the project investment (Appendix 10).

192. **Enterprise development.** A number of enterprise models have been constructed to reflect the typical enterprise scenario in the project areas, based on actual enterprise analysis supplemented with market analysis and engagement with entrepreneurs and other stakeholders (agribusinesses, producers' associations such as the Yam Producers' Association, Goat Producres' Association, etc.). The combined financial indicators of the enterprises modeled (Appendix 10) illustrate good 'with project' performance in terms ofFIRR, NPV, ROI and BCR.

Economic analysis

193. **Economic Internal Rate of Return (EIRR).** The project's EIRR over 20 years is estimated at 32% (Table 8). With an opportunity cost of capital (OCC) of 10%, the net present value (NPV) is positive (US$ 45.1 million) and the benefit-cost ratio is 1.25. The economic analysis demonstrates that the project makes economic sense. A 25 year economic life time of the project would generate a higher EIRR and a greater NPV. Increasing the OCC to 13% would still generate a positive NPV. The complete economic analysis is contained in WP2.

Table 8. EIRR Indicators (MMK '000)

Project EIRR	32%
NPV at OCC=10%	43 446
PV Benefits OCC= 10%	107 956
PV Costs OCC = 10%	151 402
Benefit-Cost Ratio	1,40

194. **Sensitivity analyses**: Seven possible scenarios are analysed. The project cost escalating by 10% and 20%; project benefits decrease by 10% and 20%; benefits delay by one year and 2 years; and 10% increase in the input prices. The results of the sensitivity analyses are summarized in Table 11. The sensitivity analyses show that the project economic benefits are resilient to cost escalations, benefits reductions, and delay in realizing benefits with EIRR remaining above 20% and Economic NPV above USD 10 million. The worst-case scenario is the 2-year delays in getting benefits once the investment is committed, but the project is still viable.

Table 9. Sensitivity Analysis

Sensitivity Scenario	EIRR	MMK 1000	USD 1000	BC Ratio
Base case (DR: 10%)	32%	43,446,100	38,791	1.40
10% cost escalation	25%	28,305,814	25,273	1.26
20% cost escalation	17%	13,165,528	11,755	1.12
10% benefit decrease	26%	32,650,424	29,152	1.27
20% benefit decrease	20%	21,854,748	19,513	1.17
1 year delay in implementation	20%	25,888,136	23,114	1.24
2 years delay in implementation	13%	10,048,068	8,971	1.09
10% increase in input prices	27%	35,889,127	32,044	1.31

D. Sustainability

195. The sustainability of project investments is embedded in its design. It is fundamentally based on the underlying business relationships between small farmers and market, and between enterprises and markets, that the project will generate. Global development experiences have clearly shown that profitable business relationships are the optimal instrument for sustainability of investments and for breaking the cycle of dependency and poverty.

196. In addition, WSAP sustainability is based on: (i) access to knowledge: KCs will be low cost facilities that will eventually operate on cost-recovery basis; they are expected to evolve into PPP ventures in the medium term; (ii) access to markets: upgraded commodity chains, contract farming and outgrower schemes will ensure smallholder access to markets that can be sustained based on underlying business relationships; (iii) access to land: the project will invest in securing land tenure and ownership particularly in Chin state; (iv) access to water: irrigation and drainage improvement, combined with participatory water management, will improve water distribution and O&M; (v) access to basic needs: social infrastructure will cover underlying needs related to food security, nutrition, and domestic water supply; (vi) access to finance: financial inclusion activities will link smallholders and landless micro-entrepreneurs with the formal financial sector; (vii) access to extension: use of MoALI extension officers as KC managers trained by the project will ensure continuity in delivery of services

197. *Scaling up potential:* Given the transient nature of the current agriculture sector regulatory framework in Myanmar, particularly in light of major political changes in 2015, there is an important window of opportunity for scaling-up of IFAD financed projects. The country programme is engaging in scaling-up in two ways: first, successful IFAD-pioneered models (such as KCs) are already being replicated and brought to scale in other parts of the country through financing by Government and partners (WB, ADB); second, policy engagement opens avenues for scaling up investments based on implementation experiences, fostering stakeholder alliances to capture policy proposals, building capacities for policy development, and promoting policy advocacy within national processes.

198. The WSAP is considered by Government as a model which will eventually be scaled up in border areas of Myanmar. The project is designed to expand, replicate, adapt and sustain successful investments. Through its investment tools, funds and forward-looking policy support, the project will create the pathways, drivers and spaces for scaling up. Investments will be unbundled to facilitate operation at scale of core activities.

199. *Exit strategy*. The project's exit strategy is to strengthen public institutions at central and state levels, to rely on a range of institutional service providers for implementation of activities, to foster profitable business relationships between producers and markets, and to improve the capabilities of the poor rural women and men.

200. **Assurances**. Three legally-binding assurances will be negotiated with Government in order to mitigate key risks, as outlined below:

- investments in infrastructure are targeted to small farmers, who should not be expropriated from their land thereafter;
- investments in agriculture and services will enable farmer self-determination in choice of cropping patterns; instructions on cropping and land classification should be eliminated;

- all target groups, particularly ethnic groups, will be supported to obtain proper identification documents enabling them to meet the requirements of financial institutions.

Appendix 1: Country and rural context background

1. Country Economic Background. Myanmar is the largest country in terms of land area in Southeast Asia with an area of 676 578 sq. km, bordering China to the north and east, Lao PDR and Thailand to the east and India and Bangladesh to the west. The Bay of Bengal lies to the west and the Andaman Sea to the south of the country, with a coastline of around 2 000 km. Myanmar consists of three topographic areas - the western ranges, the central plains and the eastern hill. The western ranges serve as a natural border between India and Myanmar. The Ayeyarwady Delta Region and the Sittaung and Thanlwin basins make up the Central Plain with extensive alluvial lowlands and a lengthy dry season. The Shan Plateau is the eastern mountain range with an average height 1 000 m above sea level.

2. Myanmar's population in 2014 was estimated at 51.5 million[10], with a population density of 76 per sq. km, an annual growth rate of 1% and an average life expectancy of 66.2 years. Around 70% of the population is rural (down from 73% in 1995 indicating a very slow trend of urbanization). It is an ethnically diverse country, with 8 major ethnic groups, 135 sub-groups and 108 different ethno-linguistic groups. The total population is estimated to be 68% Burmese, 9% Shan, 7% Kayin, 4% Rakhine, 3% Chinese, 2% Indian, 2% Mon, and 5% Kachin and Kayah. Myanmar is a Least Developed Country (LDC) and one of the poorest nations in South-East Asia - the 2013 Human Development Report ranks the country 150th among 187 nations with an index of 0.524 (average low HDI countries is 0.466 and South-East Asia average HDI is 0.683).

3. Myanmar is a low income country with a 2013 GDP of USD 53.14 million and a per capita 2013 GDP of USD 824. Its GDP growth rate was 6.8% while the inflation rate was 6%. In 2013, the agriculture sector accounted for 38% of GDP (down from 60% in 1995); the share for services was 41.7% (up from 30% in 1995), and that for industry/manufacture was 20.3% (up from 10% in 1995).

4. **Rural Poverty**. There is a strong co-relation between agriculture and poverty in Myanmar, and poverty is largely a rural phenomenon. Though there is no official poverty line in Myanmar, poverty and social deprivation are widespread in Myanmar. The Ministry of National Planning and Economic Development of Myanmar working with UNDP and a number of other UN agencies and INGOs, has carried out two Integrated Household Living Conditions Assessments in 2004-5 and in 2009-10. They provide a number of measures of poverty: (a) the food poverty line (FPL) or the amount of money necessary to pay for a consumption basket to meet the caloric requirements of household members; (b) the poverty line (PL) or the amount of money necessary to cover consumption expenditure to meet basic food and non-food needs; (c) the poverty gap index that measures the intensity of poverty; and (d) the share of poorest 20% in consumption. In 2005, an estimated 32% of the population lived below the poverty line - this had fallen to 26% five years later. Between 2005 and 2010, those living below the food poverty line had decreased from 10% to 5%. Results also showed improvements in other measures of poverty over these five years: the poverty gap ratio showed a reduction of 35% whilst the consumption share of the poorest quintile in national consumption increased from 11.2% to 12%. Health statistics also indicate high levels of deprivation, particularly for women. The Maternal Mortality Rate in 2010 was 200 per 100 000 live births and the estimated infant mortality rate (IMR) in 2010 was 44.8 per 1 000 live births. However, these aggregated national statistics mask significant regional and rural/urban differences. The poorest states, such as Chin (73% living below the poverty line), Shan East (51%) and North (52%), have much higher levels of poverty and social deprivation than areas such as Yangon, Kayin and Mon.

5. The rural poor typically comprise the landless (between 5% and 53% of the rural population in different parts of the country) and those with access to small and marginal landholdings, usually below 2 ha (almost 5 acres). These rural poor suffer from inadequate food, nutrition and essential non-food item. In 2010, 54% of poor household members worked in agriculture, compared to 49% for non-poor households. Rural poverty is largely a function of lack of resource endowments. Poor agricultural households on average farm less than 2 ha of land. The average farm size for non-poor households is significantly higher (3 ha). A smaller proportion of poor agricultural households (9%) own farm equipment than non-poor agricultural households (19%). There are also slight differences in access to agricultural credit between poor households (37%) and non-poor households (39%). Most of the

[10] 2014 Myanmar Census data as released in August 2014.

poorest either live in the central dry zone (where the soils are sandy, rainfall low and population density high) or in the hill tracts populated ethnic minorities; these are remote, inaccessible, have limited arable lands and are affected by conflicts.

6. The Multidimensional Poverty Index (MPI) developed by the Oxford Poverty and Human Development Initiative for the 20th anniversary of the Human Development Report, goes a step further beyond the traditional focus on income to reflect the multiple deprivations that a poor person faces with respect to education, health and living standard. This composite index uses 10 weighted indicators of the components of these three dimensions (see Figure 2 below) to assess the nature and intensity of poverty at the individual level; the MPI shows the combination of deprivations that affect a household at the same time. The MPI is a product of the incidence of poverty and the average intensity of deprivation; the MPI for Myanmar has been calculated as 154. The MPI measure of intensity of deprivation for Myanmar is 48.3, i.e. the average %age of deprivation experienced by people for the ten indicators of poverty used to calculate the MPI (Figure 2). One of the useful applications of the MPI is that it is possible to illustrate graphically the distribution of poverty within a country, for example, between rural and urban areas of Myanmar to show disparities. Figure 2 (below) illustrates the rural-urban divide: levels of deprivation (and hence poverty) for all of the components of the MPI are much higher in the rural areas than in the urban areas, indicating that the level of rural poverty in Myanmar is much higher across all the determinants of poverty.

7. **Food Insecurity.** The food security situation of a region or household can be assessed along a set of underlying factors or determinants: food availability, food access, food utilization, and stability of access to food. Gaps or deficiencies in any one of these conditions can precipitate short-term (transitory) or, for those households already experiencing marginal situations, longer-term (chronic) food insecurity that negatively impacts a household's well-being and ability to thrive. As such, especially following acute or rapid onset shocks – natural disasters, etc.

8. Nationally, Myanmar produces enough rice to meet its consumption needs. However the net national rice production is not an accurate indicator of food security and adequate nutrition at the household level, as there are severe problems with access to food for the most vulnerable groups in different areas of the country. Moreover, there are discrepancies between and within States and Regions with regard to food deficits in the country. Shan, Kachin and Chin States are the most food insecure, with a very high food poverty level of 40% in Chin State 21% in northern Shan State and 20% in eastern Shan State. The headcount index of food poverty is generally higher in States than in Regions and in rural than urban areas. Poor infrastructure, restrictions on the movements of food commodities and restrictive market policies prevent the transport of food commodities from surplus to deficit areas. Constraints that affect a farming household's ability to feed itself from its own production include inadequate access to land and lack of rural support services. Households relying on market purchases to obtain food depend on having sufficient income, the existence of markets and the efficiency with which markets function to deliver food at affordable prices. There is widespread chronic and acute lack of access to food resulting from poorly functioning markets, poor transportation infrastructure and lack of non-farm employment opportunities for skilled or unskilled labour.

9. **Agriculture**. Myanmar is an agricultural country richly endowed with land and water resources and favourable climates for agricultural production. The agriculture sector forms the core of the national economy. Nearly 70% of the population lives in the rural areas. Agriculture (including hunting and forestry) employs over 61% of the working population and contributes over 16% of export earnings. Overall Myanmar has a surplus of food production and supply. In a normal year, the country produces enough food to supply its people and exports the surplus. Of the 67.7 million ha in Myanmar, the cultivable land represents 17.6 million ha (26%), of which only about 70% are actually farmed (12.3 million ha) . The remaining land area is accounted for by reserved forests (18%), other woodland (25%) and others (31%).

10. Myanmar's share of agriculture in total GDP has remained quite high, indicating a lack of significant structural transformation of the economy over the past 40 years. While the abundance of land and water associated with low labour costs can allow for a rapid development of the sector, agricultural GDP growth has remained relatively low, in particular compared to GDP growth in industry and services that has accelerated in recent years. In 2010-11, total GDP growth was 5.5% and GDP growth in industry and services reached respectively 6.5% and 6.3% against only 4.1% in agriculture. Notwithstanding its large share in GDP and its importance for employment and livelihood, investment in agriculture has been almost non-existent (except by smallholders and foreign investors in ethnic

states) and agriculture appears to have been very much neglected in terms of public expenditures. A significant part of MoALI's budget has been allocated every year to irrigation infrastructure to the detriment of extension services or research and development.

11. Over the last two decades, rice cultivated area has nearly doubled (from 4.8 to 8 million ha including 6.8 million ha of monsoon paddy and 1.2 million ha of summer paddy) and its production almost tripled (32.5 million MT in 2010-11 at an average yield of 3.9 MT/ha). As for pulses, their sown area increased over the past two decades from 0.7 to 4.5 million ha with a production now reaching 5.24 million MT at an average yield of 1.28 MT/ha. As for oil crops, since 1995, sesame harvested area increased by 76% and its production tripled, groundnut harvested area increased by 72% and its production more than doubled. As for spices and condiments, chili production grew over the past two decades from 30 000 to 118 000 MT, onion from 171 000 to 1.1 million MT and garlic from 37 000 to 213 000 MT for a total harvested area of 88 000 ha for these three crops. Producers and other stakeholders of commodity chains are organized in thirteen private agricultural crops associations under the Union of Myanmar Federation for Chambers of Commerce and Industry (UMFCCI), including among others: paddy producers; rice and paddy traders; rice millers; pulses, beans and sesame seeds merchants; and onion, garlic and culinary crops producers and exporters.

12. Myanmar is one of the largest countries in Southeast Asia in terms of land area 167 million acres of land. The land include 30 million acres of cultivated land (with a cropping intensity of 183%) 14 million acres of unused cultivable land, 83 million acres of forest land and other lands accounts for 41 million acres including freshwater resources. The cropping intensity of the 30 million acres of cultivated land is presently around 183%. Within the present water resources availability, an increase of the cropping intensity to at least 230% (i.e. 47% increase) is possible with appropriate investments. Furthermore, an increase in the productivity of more than 50% for different crops cultivated is a reachable objective at medium-term. This potential together with the 14 million acres of unused cultivable land accounts for an enormous potential. All of Myanmar's neighbouring countries except for Laos and Cambodia has utilised their agriculture arable land 100%. Over the past 5 years Chinese import of agriculture produce and products experienced a steady growth of 21% per annum with an average annual incremental value of USD 3.7 billion. During the same period the import of India, Thailand and South Korea increased 7%, 13% and 13% valued at USD 325 million, USD 658 and USD 1.7 billion respectively.

13. Investment in agriculture has been impeded by limited access to agricultural inputs, particularly seeds and fertilizers. Domestic enterprises producing fertilizers are not profitable due to unreliable electricity supply and thus domestic supply remains far below demand, while imported fertilizers are often adulterated. Most farmers use low-quality seeds of mixed varieties saved from previous harvests or bought from other farmers, which produce, when milled, a high proportion of low-value broken rice. While the production of seeds and planting materials is almost the exclusive responsibility of the DoA, some Rice Specialized Companies (RSCs) are now initiating certified paddy seed production and distribution through contract farming arrangements in designated areas. RSCs provide seasonal loans and inputs to farmers that the latter pay back in-kind after harvest at prevailing market prices. Farmers benefit from a guaranteed market and better access to credit, resulting in increased crop productivity and improved product quality.

14. Another constraint for any agricultural investment lies with extension services. Agricultural extension services are provided by the Agriculture Extension Department (AED) of the DoA and specialized state economic enterprises. Extension staff is inadequate both in numbers and quality. During the fiscal year 2011-12, the AED included 428 field extension officers and 3 085 village managers. Field extensionists are rotating quite quickly and do not stay more than 3-4 years in the same location. Lack of budget also prevents field visits and hinders efficient and effective knowledge dissemination. In addition, both need a much better orientation towards farmer problems so that they can become more effective in helping farmers by understanding the practical as well as the theoretical background to their work. Of particular concern is also the absence of operational interaction between Department of Agriculture Research (DAR) and extension staff. Most extension messages are centrally designed by managers and mechanically implemented by field staff over a diverse range of agro-ecological and socio-economic conditions, without proper consideration of farmers' needs and limitations, or market requirements, resulting in a low adoption rate of technical recommendations.

15. Finally, agricultural productivity is also hampered by high post-harvest losses. Processing facilities that help reduce waste and raise profit are still lacking for most crops. Smallholder farmers

and private entrepreneurs are weak in the awareness of systematic postharvest handling practices in commercial application. Furthermore, in irrigated lands, the quasi-absence of farm roads also generates post-harvest losses.

16. Irrigation infrastructure has been significantly expanded since 1988, targeting mostly paddy-producing areas both in the Delta and in the Dry Central Zone (DCZ). A summer paddy programme, which is at the core of MoALI's activities, was introduced since 1992. The availability of irrigation water during the dry season has been instrumental to the extension of the summer paddy areas and to increased cropping intensities. Supplementary irrigation during the Monsoon period and improved drainage (which is particularly critical in the flood-prone Delta) gave a key contribution to the 30% increased the rice yields recorded over the last 10 years. The typical highly fragmented pattern of small bunded basins (0.25-0.30 acre) with irregular shape and at slightly different levels characterising rice production under rain fed conditions is the most widespread in the irrigated rice growing areas. Irrigation water is discharged from the plots nearest to the canal outlets to the lower plots in a plot-to plot water distribution and drainage system. The flow is controlled by the upstream users by temporarily lowering and raising the earth bunds. Practically rice is the only crop that can be cultivated under these flow and drainage conditions. In a recent effort to capitalise on the gravity irrigation schemes financed during the past decade, with a vision of modernising paddy rice cultivation, the MoALI has developed a number of model farms (covering an area of about 5 000 acres) with improved field roads and tertiary level irrigation and drainage networks, mainly in the Nay Pyi Taw Union Territory i.e. at the southernmost section of the DCZ. In these model farms a comprehensive approach to land development was tested, including land levelling, the realignment of plot boundaries and the reissuance of land titles in line with the provisions of the new Land Law. These model farms are proving effective in raising the farmers' interest in modernising their production method through e.g. rental of small combined harvesters.

17. The Irrigation Department and Water Utilization Management Department (IWUMD) is responsible for irrigation, including collecting water taxes. The IWUMD is responsible for constructing and maintaining irrigation facilities down to the tertiary level, while Water Users' Groups (WUGs) are responsible for building field ditches and for operations and maintenance (O&M) of the latter as well as of tertiary canals. The IWUMD is also responsible for carrying out hydrological, geological and topographical surveys, and for supplying irrigation by pumping water from rivers, streams and groundwater sources. A total of 166 WUGs have been established covering about 40% of the total irrigation network system. They are ciontrolled by the township agriculture supervision committee.

18. The government disseminates up-to-date information every two weeks on agricultural prices and market flows through radio broadcasting and television channels, as well as weekly or bi-weekly newspapers and journals distributed at township offices. Furthermore, the Myanmar Business Coalition, a local NGO established by traders and businessmen and created in the dry zone to better connect farmers to traders, identified information/communication gaps and established a market information system maintained by local traders and using FM radio stations. Myanmar Agri-Business journal from MoALI, the Farmers journal and Agro-cyclopedia journals (private newsletter) are providing farmers with updated seed technology, cultural practices, GAP systems, integrated pest and diseases management practices. Moreover, the Farmers channel from Myanmar Radio and Telecommunication (MRTV) also disseminates agricultural information for rural households.

19. **Land.** Landlessness is a significant phenomenon and cause of poverty and vulnerability. The LIFT Baseline Study (2012) of 4,000 households in 3 agro-ecological zones found that some 50% of households nationally are landless - the proportion of landless varies from average 26% in hilly areas to 72% in the delta/coastal areas. The 2010 Agriculture Census found that of those households with access to land, 5% of the landholdings owned less than 0.4 ha, a decline of 47.6% in farm size since the 2003 Census. This suggests that further households are functionally landless.

20. Until 2012 all land belonged to the state. Under the policy of state ownership, farmers were given the right to cultivate the land but they could not sell, divide or mortgage it. In March 2012, the legislature enacted a new Farmland Law11 that repealed the previous acts governing land, and set out amended rules for "the right to work on farmland" whilst retaining Government ownership of all land as per the 2008 Constitution. The new law reintroduces the concept of private ownership through land use certificates, i.e. land tenure rights, which can now be sold, traded, or mortgaged. The law

[11] Source*: Farmland Law enacted by the Pyidaungsu Hluttaw under Order n° 11/2012 dated March 30th, 2012.*

provides for farmland management bodies to be formed at various administrative levels; lower level bodies (from state/region downwards) shall be “constituted by the Central Farmland Management Body” thus allowing the Government to retain overall control of land tenure rights as well as their transfer, mortgage or inheritance.

21. The Vacant, Fallow and Virgin Land Law, also passed in 2012, allows Government to classify land as 'vacant, fallow or wasteland' (especially fallows and lowlands without official land titles) and lease it to domestic and international entities and individuals for up to 30 years. This could potentially place smallholders at risk of losing their land, as many do not yet possess land use certificates, or in the case they have land titles, have not been able to "permanently cultivate" their entire landholding due to high input costs. Moreover, community-managed resources such as community forests, waterways, fishponds are equally susceptible to confiscation despite being crucial to local livelihoods.

22. A particular case is that of Chin and Shan States, which follow their own customary land laws which are not recorded nor registered, and are not protected by laws of Myanmar. Customary tenure would most often be a characteristic of shifting cultivation, which includes in the very tenure a large area of fallow land. This is however rapidly changing, with the Government's land records department trying to mainstream land tenure and ownership procedures. The Government is presently preparing a new National Land Use Policy, led by the Ministry of Environmental Conservation and Forestry. Many civil society groups and development partners supported the drafting of the policy in its consecutive versions. The result is that the new 2016 draft of the National Land Use Policy has several sections that aim to protect and recognize customary tenure. As the policy is meant to feed into the preparation of the new Land Resource Law, it is an important stepping stone for the recognition of customary communal tenure and development of legal procedures for the protection.

23. **Landless**. A critical issue in the rural economy is landlessness. Landlessness in Myanmar includes landless poor and marginal farmers. It is related to household size and this relationship is particularly pronounced for the female-headed households. The Agriculture Census (2003) gave the proportion of rural households ‘not having access to land’ as between 35% and 53% of the rural population in different parts of the country (ranging from 20%) . These 2003 census figures are supported by a recent survey by the LIFT (2012) baseline study of 4 000 households in 3 agro-ecological zones which found that some 50% of households nationally are landless. The

24. The 2010 Agriculture Census found that nearly 50% of agricultural households, i.e. over 2.4 million households, had marginal landholdings of less than 2 ha. Even though the situation is gradually improving, ethnic minorities are still particularly vulnerable to forced relocation, destruction of livelihoods and confiscations of land and crops. In ethnic upland areas, landlessness is often worse, with for example more than 50% of landless households in 12 of the 19 townships in Kachin state, according to the Centre on Housing Rights and Evictions (COHRE) report. The high landlessness and, at the same time, availability of some 6.7 million ha of land seems paradoxical. Recent Government initiatives such as the new “Vacant, Fallow and Virgin Lands Management Law” combined with the economic, social and political reforms combined with a more “people-centred approach” to rural development aims at addressing the inability of the poor to resettle in some of these areas. These reforms will also address issues such as: (a) lack of finance not just for land development but also for infrastructure, health care and educational services; (b) lack of awareness about these opportunities; (c) Government restrictions on movement of people between different regions, especially for ethnic minorities; and (d) lack of desire to move away from familiar surroundings and traditional support mechanisms that provide considerable assistance to the poor in times of emergency. The landless make up 25.7% of those working in agriculture as wage labourers on land farmed by larger-scale farmers or work as casual labourers in non-agricultural activities. The proportion of the working population in poor households working as casual labourers and as migrants is almost twice the proportion in non-poor households. The landless have also little access to knowledge and information, not to mention access to finance. As a result of that situation, very few landless are able to start any income generating activities and mainly work as casual labourers.

25. **Out-migration**. Poverty also forces more people to seek casual work in order to survive; poverty also forces them to migrate to other parts of Myanmar and to neighbouring countries, such as Thailand and Malaysia in search of work. Out-migration, especially in Eastern States close to Thailand, poses a threat for the development of agriculture. Most households have at least one, but going up to three, member working permanently or seasonally abroad and sending remittances. This situation results in an overwhelming number of subsistence farming households due to: (a) insufficient

availability of casual labour to assist farmers on their entire land, and (b) high level of remittances sent from relatives working abroad compared to casual labour wages and profitability of crops currently farmed. In Eastern States, out-migration is also not counter-balanced by mechanization. In mountainous areas as well as in most States across the country, mechanization is still at an nascent stage (very few combined harvesters and other agricultural equipment). Mechanisation is also hampered by size and shape of land plots which do not favour the development of mechanized farming practices.

26. **Gender**. Although in theory under both Buddhist customary law and the 2008 Constitution, women and men are entitled to equal rights, the reality tells a different story. Less than 6% of parliamentary seats are currently held by women, but a woman has recently been appointed to the Cabinet as well as four women to key ministerial positions. Although previous Governments have enacted a series of five-year National Plans for economic and social development, none addressed gender equality. There was no evidence that the Government considered the effects of its programmes on women, especially rural women who were disproportionately affected by poverty and militarization. At local levels (districts, townships, villages), there were few women representatives, especially in the key decision-making bodies. Current reforms, which include decentralization and election of local government bodies, may see women playing a greater role in decision-making at the local level as well as in productive sectors, such as agriculture or business, rather than being confined to their former roles in service delivery in the traditional areas of health, education and welfare. It will also help address inequities such as the fact that although women make up 38% of the labour force, women's participation in decision-making bodies in the economic sector is low, under 20% amongst management, production and information and technology decision-makers. However, traditionally the role of women in the decision-making process in rural areas and in farming activities is quite dominant, with equal rights in land tenure and ownership of other family assets. Another exception is the teaching and academic professions, where women account for 62% of senior staff. In contrast, amongst the poor, a higher proportion of female household heads (37.6%) are illiterate than male household heads (16.1%).

27. **Financial institutions.** The financial sector is small and underdeveloped, and access to financial services is very limited. The sector consists of four state-owned banks and 20 private banks. Only 2.5% of outstanding loans are extended to primary agriculture. At the beginning of 2015, there were 1,625 credit cooperative societies established under the Ministry of Cooperatives, and 169 licensed MFIs. These MFIs include: (i) 5 INGO/MFIs; (ii) 24 NGO/MFIs; (iii) 107 local private companies (including 71 cooperative societies); (iv) 28 foreign companies; and (v) 4 joint ventures. There is one small state-owned insurance company and 12 private insurance companies, but none of them cater for the agriculture sector. Payment systems are undeveloped; ATMs were introduced in 2013 while credit cards were introduced in late 2012.

28. Starting from this low base, however, the financial sector has been growing rapidly in recent years, with strong expansion in the number of branches and ATMs, deposits, loans, foreign exchange transactions, fund transfers, and remittance flows. It is clear that the genuinely private banks are now the most dynamic participants in the financial system; the 22 private and semi-government banks together have recently outstripped the four state banks in terms of total financial assets.

29. Myanmar's formal financial system remains small by most international standards. Decades of state ownership and policy shocks imposed on the system have contributed to a lack of confidence in banks as institutions capable of protecting financial assets. Rural areas have limited access to banking services, and bank lending to agriculture is largely restricted to the Myanmar Agricultural Development Bank (MADB), which covers only a small share of the financing needs of farmers. The sector also lacks appropriate loan products addressing farmers' seasonal requirements, including post-harvest operations. Similarly, products for capital investment in perennial crops, equipment and machinery, and SMEs are currently scarcely available.

30. Banks are limited not only in their outreach, but also in their provision of financial services. While there is a cap of around 13% per annum on lending rates, average deposit rates are very close to the stipulated minimum of 8%. The difficulty in obtaining credit is due to the miniscule deposit base, small spread and conservative lending approach. Collateral-based lending, using land as preferred collateral, inevitably restricts lending to those with land holdings and excludes all others. However, the authorities have recently expanded collateral options to include key agricultural export goods.

31. Growth of the financial system is also constrained by weaknesses in basic institutional systems and infrastructure. The system lacks an automated payments clearance system, a money market system for modern liquidity management, and an electronic real-time data system connecting banks with branch networks and with the Central Bank of Myanmar (CBM). To address these shortcomings, a number of initiatives are now being implemented and the overall policy, regulatory and supervision framework is gradually taking shape, moving towards consistency with international norms.

32. The CBM has the role of the regulator and supervisor of the banking sector. It is no longer under the control of MoPF, but has become an independent institution with its governor being at par with the level of Ministers. The legal framework for the banking sector has come under revision in the last three years. A new Micro Finance Law was enacted in November 2011, a new Foreign Exchange Management Law in August 2012, and a revised Central Bank of Myanmar Law in July 2013. The key banking laws encompass the Financial Institutions of Myanmar Law (FIML), and CBM rules and regulations have been revised. Furthermore, in September 2014 CBM took the remaining key step of IMF Article VIII obligations, namely the issuance of a comprehensive set of regulations for the Foreign Exchange Management Law. The Financial Institutions of Myanmar Law 1990 was replaced by a new Banks and Financial Institutions law, which was enacted by Parliament in January 2016. This law and its associated rules and regulations will profoundly re-shape the framework conditions under which the banks operate, develop and innovate.

33. *Myanmar Agricultural Development Bank*. The MADB is owned by MoALI. While it is the major source of institutional credit for small farmers, it caters to only one-third of the farming population. In 2015, it claimed to have 1.4 million active borrowers, an outstanding loan portfolio of USD 84 million, and 1.7 million savers with deposits of USD 87 million. Historically, rice farmers are given top priority, they received 75% of total loans implying a high covariant risk. Seasonal loans (monsoon, pre-monsoon and winter loans) make up the bulk of its lending and are uncollateralized, with joint-liability from 5-10 group members. Because of limited funds, loan sizes can be as low as USD 25-50 per ha, compared with an estimated production cost of USD 250-475 per ha, forcing farmers to fill the gap by borrowing from moneylenders at 10%-20% interest per month. MADB loan durations cover only the production cycle, and not the post-harvest period when commodity market prices can increase rapidly and substantially. Limited loan duration and lack of storage facilities force smallholders to sell output at harvest when prices are at their lowest.

34. The leading INGO/MFIs (PACT, GRET, Save the Children, World Vision) have reached over 500,000 active borrowers with an aggregate loan portfolio of over USD 63 million; PACT accounts for the majority. Geographical distribution of their operations is concentrated in the south and south-east.

35. **Policy, strategy and institutional context**. Emerging from 50 years of isolation, Myanmar has embarked on a comprehensive programme of political and economic reforms that aims to introduce elements of popular representation in the political sphere, foster economic growth and inclusive social development, improve the business environment, attract foreign investment and reduce poverty. The EU lifted its economic sanctions in April 2013 and the USA has suspended its bilateral sanctions. ASEAN is now fully re-engaged, and South-east Asian investment in the country is increasing rapidly. The major multilateral and bilateral institutions are starting to establish operations in the country.

36. Government's reform agenda is articulated around the adoption of an open market economy; improvement of socio-economic conditions and reduction of rural-urban gaps; protection of social and economic rights; development of infrastructure and delivery of basic services, including for ethnic groups; improvement of health and education standards; protection of human rights and freedoms; respect for the rule of law and an independent and transparent judiciary; respect for the role of media; good governance and public scrutiny of executive and legislative bodies; institutional capacity-building and human resource development; government's accountability, responsiveness and inclusiveness; and decentralization. Many of these policy priorities are likely to impact on the rural sector, particularly in terms of safeguarding fundamental rights, including those of farmers.

37. Serious lack of capacity in the public sector to implement policy decisions is a major constraint to the success of these social, economic and political reforms. Thus there is an urgent need to build capacity at all levels of governance, ranging from central government agencies to institutions at state, regional and township levels. There is also a need to translate policy decisions, such as the poverty alleviation and rural development action plan, into sectoral plans and strategies to be

implemented by Government institutions. Development partners have helped Government to set up various Working Groups to assist with drafting and implementation of these policies, strategies, sectoral approaches, and development plans (IFAD is a core member of the Agriculture and Rural Development Sector Working Group). Other major constraints faced by the public sector include the lack of robust and up-to-date operating systems and procedures, and excessively centralized decision making processes.

38. The agriculture sector comprises four sub-sectors: crops, livestock, fisheries and forestry. There are seven principal agencies responsible for agricultural and rural development, of which three have a direct bearing on the agricultural sector : (i) Ministry of Agriculture Livestock and Irrigation (MoALI) responsible for crops, irrigation, agricultural credit and mechanization; (ii) Ministry of Environmental Conservation and Forestry (MoECAF). Following Myanmar's five decades of isolation, MoALI (like other Ministries) is widely assessed as being weak in terms of human capabilities, technical capacities, fiduciary processes, farmer outreach and budgetary allocations. Its experiences with participatory approaches involving poor communities, small farmers and landless tenants are limited. It has little exposure to effective project management and execution in compliance with international standards and the requirements of external partners; and its administrative processes are outdated. Its coordination capacities are minimal, and its eleven departments work in silos. Decision making lacks transparency and internal procedures are unclear. Monitoring is poor and data reporting is unreliable, resulting in inconsistent institutional actions.

39. The Nay Pyi Taw Accord for Effective Development Cooperation agreed between Government and Development Partners (in early 2013), promotes transparency, collaboration and local ownership and management of development efforts. The Accord establishes a coordination structure between Government and partners to ensure development assistance brings maximum benefits to Myanmar, by supporting the implementation of strategies defined by Myanmar.

40. *National Rural Poverty Reduction Strategy.* Although Myanmar does not have a poverty reduction strategy per se, the series of national development plans have served that purpose in support of Goal 1 (poverty reduction) of the Millennium Development Goals. Moreover, the Government has started to put in place a more coherent and coordinated approach to development; this includes the long term National Comprehensive Development Plan (NCDP) and the Framework for Economic and Social Reform (FESR). The FESR sets a direction for the continuing reform process in the country and articulates the broad goals of the reform process as well as its medium term objectives. It provides a bridge between reforms and Government's twenty-year NCDP, and focuses on a policy agenda for the next three years that will provide potential "quick wins" to be implemented to deliver tangible and sustainable benefits to the population. The NCDP, the FESR and the PARDAP thus provide the umbrella for the entire agricultural sector through the National Medium Term Priority Framework 2011-2014 (NMTPF) and the Country Programme Framework 2012-2016 (CPF) agreed by Government and FAO. The first priority is to increase agricultural production to ensure food security, which includes measures for poverty reduction, while the sixth is to improve rural livelihoods by helping communities to harness their physical, natural and human capital. The areas for action for the first priority outcome include ensuring food security in deficit regions through a number of measures including "empowerment of farmers to control over resources, access to opportunities and improved governance", promoting access to irrigation water and supporting sustainable livelihoods by expanding options for income and employment generation. Regrettably, the NMTPF and resulting CPF do not mention any targeting of assistance to disadvantaged groups.

41. The Government is a signatory to the Global Summit on the Millennium Declaration and has reiterated its commitment to reducing poverty to 16% by 2015, half the 2005 level. In this context, the PARDAP focuses on eight priority tasks: (i) agricultural production; (ii) livestock and fisheries; (iii) rural productivity and cottage industries; (iv) micro saving and credit enterprises; (v) rural cooperatives; (vi) rural socio-economy; (vii) rural energy; and (viii) environmental conservation. It targets investments in rural poverty reduction to meet the needs of the rural poor and landless, and aims to strengthen services, such as extension and research, that in the past showed limited responsiveness to farmers' needs. The PARDAP further guides the formulation of sectoral plans which will define explicit actions for tackling rural poverty and targeting disadvantaged groups. The strategic documents link national development plans and the reform agenda, and underpin the formulation of the Fifth National Economic and Social Development Plan 2011/12-2015/16; together these provide a vision for the country to become a peaceful, modern and developed nation. The immediate objectives set in this

plan include: (i) infrastructure development; (ii) development of border areas; (iii) development of rural areas; (iv) poverty alleviation; (v) supporting contributions to relevant SDGs; and, (vi) maintaining good economic foundations and financial conditions. This Plan, coordinated by the National Planning Department of MoNPED, will also guide the formulation of the rural development strategy and action plan by the Department of Rural Development of MOLFRD in coordination with other relevant agencies.

Appendix 2: Poverty, targeting and gender

I. The National Poverty Context

1. The Human Development Index (HDI) for the Republic of the Union of Myanmar is 0.536, placing Myanmar 148th out of 188 countries globally in terms of poverty in the 2015 Human Development Report (HDR). In 2011 with the launch of Myanmar's first Poverty Alleviation and Rural Development Action Plan there has been a renewed focus on poverty alleviation in the country. Since 2004 there has also been a more systematic monitoring of poverty with an Integrated Household Living Condition Assessment (IHLCA) carried out by UNDP in consultation with the Government in 2004-05 and in 2009-2010. Most recently, the 2014 Myanmar Population and Housing Census was published in 2015 by the Department of Population.

2. The IHLCA series provides a number of measures of poverty: (i) the food poverty line; (ii) the poverty line; (iii) the poverty gap index, which measures the intensity of poverty; and, (iv) the share of poorest 20% in consumption. The results indicate a general improvement in poverty levels between 2005 and 2010 in the incidence of those living below the poverty line (from 32% to 26%) and the food poverty line (from 10% to 5%). The data is disaggregated at the State/Regional level; Table 1 and 2 provide an overview of rural and urban poverty and food poverty by state/region.

Table 1: Poverty Profile

State, Region and Union	Urban	Rural	Total
Kachin	23.4	30.6	28.6
Kaya	2.3	16.3	11.4
Kayin	16.8	17.5	17.4
Chin	52.1	80	73.3
Sagaing	16	14.9	15.1
Tanintharyi	16.7	37.5	32.6
Bago	19	18.2	18.3
- Bago (E)	20.9	20.1	20.2
- Bago (W)	15.6	15.9	15.9
Magwe	15.8	28.2	27
Mandalay	14.1	31.6	26.6
Mon	17.8	16	16.3
Rakhine	22.1	49.1	43.5
Yangon	11.9	28.7	16.1
Shan	14.1	39.2	33.1
- Shan (S)	8.3	31.2	25.2
- Shan (N)	16.3	43.1	37.4
- Shan (E)	28.6	52.3	46.4
Ayeyardwady	23.1	33.9	32.2
Union	**15.7**	**29.2**	**25.6**

(IHLCA, 2010)

Table 2: Food Poverty Profile

State, Region and Union	Urban	Rural	Total
Kachin	2.5	5	4.3
Kaya	0	1.9	1.2
Kayin	0	2.1	1.7
Chin	6.4	30.8	25
Sagaing	2.5	1.1	1.3
Tanintharyi	4.5	11.1	9.6
Bago	3.4	1.4	1.7
- Bago (E)	4.9	2.4	2.8
- Bago (W)	0.7	0.3	0.3
Magwe	2.1	3.8	3.6
Mandalay	2.3	6.5	5.3
Mon	2.4	3.8	3.6
Rakhine	4.4	11.5	10
Yangon	1.6	4.8	2.4
Shan	3.5	10.8	9
- Shan (S)	3.6	9.8	8.2
- Shan (N)	3.4	11.6	9.9
- Shan (E)	3.5	10.9	9.1
Ayeyardwady	3.8	6.5	6.7
Union	**2.5**	**5.6**	**4.8**

(IHLCA, 2010)

3. In Myanmar, landlessness is a significant phenomenon and cause of poverty and vulnerability. The LIFT Baseline Study (2012) of 4,000 households in 3 agro-ecological zones[12] found that some 50% of households nationally are landless - the proportion of landless varies from average 26% in hilly areas to 72% in the delta/coastal areas. The 2010 Agriculture Census found that of those households with access to land, 5% of the landholdings owned less than 0.4ha, a decline of 47.6% in farm size since the 2003 Census. This suggests that further households are functionally landless.

4. At least half of rural households depend on wage labour for all or part of their livelihoods. Landless farmers and farm workers, and families not engaged in agriculture fall into this category, but so do many land-poor families. In surveys conducted by Harvard Kennedy School[13], farmers reported that opportunities for wage labour, either in agriculture or in nearby towns, were scarce. The ability to migrate has put a floor under real wages and it appears that wage-earning opportunities may have declined as lower crop prices and "expensive" wages cause farmers to cut back on labour-intensive transplanting and weeding, even though this reduces yield. Farmers with larger landholdings reported

[12] LIFT Baseline Survey Results, July 2012.

[13] *2009 - "Assessment of the Myanmar Agricultural Economy" IDE, for the Harvard Kennedy School*

that they planned to hire less labour as they reduced acreage or cultivation intensity. Significantly, virtually all farmers – even ones with larger holdings – said they would engage in wage employment if it were locally available at prevailing wage rates. During the WSAP Detailed Design Mission these conclusions were confirmed during all village dialogues and visits, with current rates for agricultural and other manual labour varied between 2,000 kyats and 5,000 kyats per day. Work is available on farms during agricultural peak seasons and at road/bridge/irrigation construction sites. Rural adult men and women reported in the focussed group discussions that they are able to find an average 20-60 days of work annually.

5. In terms of demographic correlation, the IHLCA shows significant association between poverty and household size: nationally poor households are larger (6.0) than non-poor households (4.7). The average household size, i.e., the number of individuals in a household, nationally is 5.2 with little difference in household size between rural areas and urban. In poor communities, both fertility and mortality are high; this is due to high levels of illiteracy, and lack of knowledge about health services, health care, and nutrition. The economic dependency ratio, i.e. the number of economic dependents compared to the number of economically active persons in the household, is 0.47 in rural areas at the national level. The surveys found no significant difference in the economic dependency ratio of poor and non-poor households, suggesting that that low returns or low remuneration are much more important determinants of poverty than unemployment or low participation rates in the labour force. Education of the household head, especially literacy, is an important determinant of poverty; illiteracy rates for poor household heads were close to double those of non-poor household heads. More than twice as many female households heads were illiterate than male ones. Poor households also have lower access to education, with a net enrolment rate for children from poor households of 80.1%.

6. The rural-urban divide is prominent in Myanmar with nearly 70% of the totapopulation and 85% of the poor located in rural areas, a trend similar to the project area. The rural poor typically comprise the landless (overall between 5% and 53% of the rural population in different states) and those with access to small and marginal landholdings, usually below 5 acres.

7. Recent reviews of the agricultural sector and extensive anecdotal evidence question the extent of poverty reduction recorded in the latest IHLCA survey. The IHLCA itself notes *"in light of conflicting results, caution is urged in the interpretation of the data on poverty levels and trends in particular on the magnitude of the decline in poverty".* In particular, the share of income spent on food has increased, the per capita rice production has dropped and the price of paddy and many pulses has fallen in real terms, diminishing the income of many farmers. In addition, many farmers are deeply in debt with a current debt burden that is often larger than their expected annual incomes. If they have high cost debts, many farmers use funds borrowed at lower interest rates to pay off the high-cost debt. Therefore, the new loan is not fully used for inputs and the cash flow from the subsequent crop is reduced. The landless did not borrow for production but they do typically borrow for consumption. In short high levels of indebtedness characterise both Myanmar farmers and the rural sector; a recent analysis suggests that, in fact, Myanmar is facing "a crisis of insolvency and illiquidity."[14]

8. In sum, the factors causing rural poverty are complex with a nuanced picture of some temporary gains for the landless through rising wages and migration but an overall decline in resource endowments, employment opportunities, production and high indebtedness preventing sustainable poverty reduction. The challenge is to establish means to balance the competing interests of small farmers and the landless and find a locally tailored mix of interventions to restructure farm debt combined with investments in rural and agricultural infrastructure and institutions. The decision on how to respond to these challenges represents not only an economic issue but also a policy issue on how to tackle competing interests and develop models that work. These issues have contributed to the targeting rationale of the project developed in this paper.

9. The main characteristics of poverty in Myanmar are presented in table 3 below:

[14] Myanmar Agriculture in 2011: Old Problems and New Challenges, Ash Centre, Harvard Kennedy School.

Table 3: Main Characteristics of Poverty in Myanmar

Who are the rural poor? ➢ smallholders owning < 2 acres of irrigated cultivable land and < 5 acres of rain-fed cultivable land; ➢ sharecroppers or tenants; ➢ landless households dependent on casual labour; ➢ forest and mountainous households; ➢ households with high dependency ratios (e.g. adult unable to work or disabled); ➢ women-headed households; ➢ young women and men living in extended households; ➢ ex-combatants and internally displaced persons; ➢ ethnic minorities; ➢ households in conflict areas.
Where are the rural poor? ➢ in rural areas with a greater ethnic group population, and especially in border states; ➢ in rural areas of high population density and very small holdings; ➢ concentrated in dispersed settlements with inadequate access to services; ➢ in remote mountainous, hilly or forest areas; ➢ often dependent on seasonal or long-term migration to urban areas or abroad.
Why are they poor? ➢ high vulnerability to shocks: price volatility, climate change, sudden loss of land, disasters, conflicts; ➢ inadequate access to knowledge and technology; ➢ poor quality and limited/improper application of inputs; ➢ very limited access to financial services; ➢ lack of access to land, markets or employment opportunities; ➢ limited access to local organizations; ➢ social and ethnicity considerations; ➢ absence of remitting family members.
What are their coping strategies? ➢ out-migration (overseas; in-country); ➢ high dependence on casual wage labour; ➢ borrowing from informal sources: family networks/relatives, local traders, pawnshops; ➢ decapitalisation.

Ethnic dimension of poverty in Myanmar

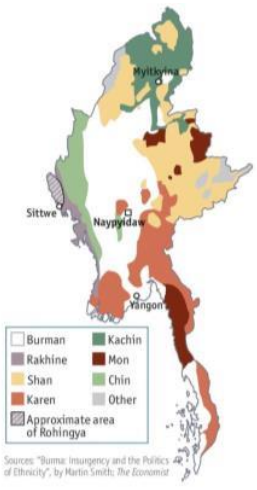
10. Myanmar is an ethnically diverse country. The largest and the most socio-economically well off ethnic group, Bamar, forms around 70% of the population in Myanmar. Altogether, there are over 135 ethnic groups speaking more than 100 different languages and dialects. Myanmar's diverse ethnic groups are unevenly distributed throughout the country. However, the Bamars, the dominant ethnic group, are the majority in the central lowlands while the ethnic minorities are the majority in the border States. The table and map below provides an overview of the different ethnic groups as %age share of Myanmar's total population.

Table 4: Officially designated ethnic groups in Myanmar

Major group	Number of sub-nationalities	% share of population (2003 estimates)
Kachin	12	1.5
Kayah	9	0.5
Kayin	11	6.4
Chin	52	2.1
Barmar	9	67.9
Mon		2.7
Rakhine	7	4.2
Shan	23	9.4
Others		5.4

Source: Office of Strategic Studies, Ministry of Defence, 2010

Map 1: Main ethnic groups in Myanmar



11. The ethnic minority groups have been marginalised and impoverished due to inequitable distribution of revenue from natural resources; Myanmar development is for decades dependent on these resources[15]. The resource rich ethnic states have been the primary sites of resource extraction, and this has led to years of conflict between the government and ethnic minority groups.

12. While the data from 2010 estimates the national poverty headcount at 26%, rates are far higher among many of the ethnic minority groups[16]. It is noteworthy that three out of the four poorest areas are ethnic minority states. The incidence of poverty in Chin State alone is almost three times the national average. This suggests a vicious cycle whereby years of conflict have held back development feeding into a sense of relative deprivation.

13. The startling contrast between relatively benign conditions in the few urbanised areas, which are mostly occupied by ethnic Barmar communities, and in the outlying regions, which tend to be inhabited mainly by other ethnic groups, is evident. Yangon has an electrification rate of 67% while in rural areas the average ratio is only 16%. Poverty is twice as high in rural areas, which account for nearly 85% of total poverty. In the countryside 75% of children end their education during primary school whereas in urban areas 63% of primary-school children progress to secondary school[17]. These kinds of deprivation in rural areas inhabited mostly by ethnic minority communities have resulted in destabilising tensions in many states.

14. The newly established government prioritises the development of rural poor border areas. A dedicated ministry has been established for ethnic affairs, and socio-economic development programming includes investment in the ethnic states. The IFAD strategy in Myanmar is to support these processes by geographic targeting of the investments. The WSAP investment will be implemented in two locations: northern Magway region and southern Chin state. Chin state is populated by 53 ethnic groups and has the highest poverty incidence rate in the country.

Gender dimension of poverty in Myanmar

15. In Myanmar women make up 50.3% of the total population. Myanmar has achieved gender parity in education with regard to enrolment ratios of girls and boys in primary and secondary education. Women in Myanmar enjoy equal rights in inheritance laws and equal marital property rights in the case of divorce. However, patriarchal cultural values related to women's roles and responsibilities still shape familial relationships, contribute to the gendered division of labour and limit women's participation in decision making at all levels. Gender-based violence, mostly against women, is widespread, particularly in conflict areas. Norms and practices emphasising women's dependence on men come to bear on women's economic rights and livelihood opportunities. For example, the notion of the male breadwinner has implications for income generation, access to and control over resources as well as wage inequality. In a recent study in rural Myanmar[18], men were considered to be 'more able' to manage assets and resources, and women's participation in decision-making regarding assets and resources was considered 'immoral'. The lesser value placed on education of girls is another example of traditional norms and practices that constitute disadvantages for women in terms of rights enjoyment and equal livelihood opportunities[19].

16. A gender assessment done by Save the Children[20] revealed that women are most affected by hunger and food insecurity as traditionally women have the duty of feeding the family. When they do not have sufficient food, women reduce the quantity and quality of the food they eat. As quoted in a recent study on women's participation in Myanmar, "despite laws and policies that document the right of women to social, economic, political and judicial equality, women in Myanmar remain profoundly under-represented in public life and government - at both local and central levels." The study on

15 *ADB, 2012, Myanmar in Transition: Opportunities and Challenges.*
16 *Ministry of National Planning and Economic Development and UNDP, 2011, IHLCA-Poverty Profile*
17 *ADB, 2012, Myanmar in Transition: Opportunities and Challenges.*
18 *UNDP Myanmar, 2011, Gender and Development Initiative (Myanmar), Gender-based Constraints in Rural Areas and Women's Empowerment in HDI of UNDP Myanmar, 2011.*
19 *Gender-based Constraints in Rural Areas and Women's Empowerment in HDI of UNDP Myanmar, 2011.*
20 *Gender and Development Initiative, Gender Issues Survey Report, In Food security project implemented in Mawlamyinegyun and Hlaing Bone areas by Save the Children in Myanmar, May 2010.*

women's participation in decision-making and leadership at the local level in Myanmar, conducted in 2011[21] found the most prevailing norm to be the male prerogative of leadership: "Ideas about leadership are set in the home, where men are commonly considered the household head. These ideas are then reinforced in public and religious life, where men dominate positions of power". The same study found that women's participation in local authorities was less than 3%. Following the general election in 2010, women's participation in parliament at both national and state/regional levels is less than 4%.

17. Nationally, 18.9% of households are female-headed households; this proportion is much higher in urban (25.1%) than rural areas (16.7%). In Myanmar, being a female-headed household does not appear to be related to poverty. The proportion of poor households headed by women is slightly lower than the proportion of non-poor households headed by women (18.3% compared to 19.1%). Accordingly, poverty incidence for female-headed households (29%) is comparable to poverty incidence of male-headed households (30%).[22] Myanmar ranks 90 out of 186 countries in the 2012 Gender Inequality Index[23] with an index of 0.492, the first year for which it was possible to calculate such an index due to inadequate data. This slight reduction from the HDI value would reflect women's lower adult literacy rate of 86.4% compared to that for men of 93.9%, and lower estimated earned incomes than for men - women can expect to earn two-thirds of the income of men. The average gender gap in adult literacy for Myanmar is 6.2%, however the gap is largest in Mandalay (9.7%) followed by Magwe (9.2%).

18. Women in Myanmar have been prominent participants of the labour force in a broad sense and claim an equal share of education opportunities, with women being well represented in tertiary education institutions. However, women are largely employed in the agricultural sector and in low-status, low-skilled positions, pointing to the hierarchical nature of gender relations. Traditionally working in the home, the worsening economic situation had brought women into paid employment, while maintaining the same level of household responsibility.

19. In the rural areas women play an important role in a wide range of income generating activities and are primarily engaged in agriculture, the informal sector and as migrant labourers in factories and as housekeepers in neighbouring countries. In agriculture women are equally involved in farm-based activities, as men. Moreover, women, more than men, are involved in home-based agricultural activities and small scale vegetable and livestock production. Women are generally unpaid family workers balancing both home and economic activities. Although women in rural areas appear to have equal decision-making power in the household, women are not usually participants in village level institutions and planning processes[24]. By tradition, women generally do not speak at village meetings and do not contribute to public space in rural areas. Women do not generally own productive assets such as land users' certificates and many miss out on agriculture technology and extension work.

20. *Gender policies and institutions.* Buddhist customary law and the 2008 Constitution provide equal rights to women and men. However, women are not well represented in the political and higher level administrative sphere outside of the traditional areas of social services, health and education. At local levels (districts, townships, villages), there were few women representatives, especially in the key decision-making bodies. The prevailing cultural disposition is towards a stereotypical gender division of roles with women closely associated with domestic activities. The five-year National Plans for economic and social development have not adequately addressed the issue of gender inequality with limited attention paid to the disproportionate burden of poverty and militarisation that falls on women. In addition, systems for collecting sex-disaggregated data and monitoring women's welfare and gender are poorly developed and narrowly focused on reproductive functions. In the 2014 gender inequality index, Myanmar ranks as 85th of 187 countries. The Myanmar government is a signatory to the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW), the Beijing Platform for Action, the International Conference on Population and Development and the Millennium Declaration.

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21 ActionAid, Care, Oxfam. (2011- internal document), If Given the Chance: Women's Participation in Public Life in Myanmar.

22 Poverty Profile 2007 IHLCA-I & 2011 IHLCA, Ministry of National Planning & Economic Development, and UNDP.

23 Human Development Report, 2011. UNDP.

24 Chin State's Comprehensive 5-year Development Plan and Annual Planning, 2016-2021.

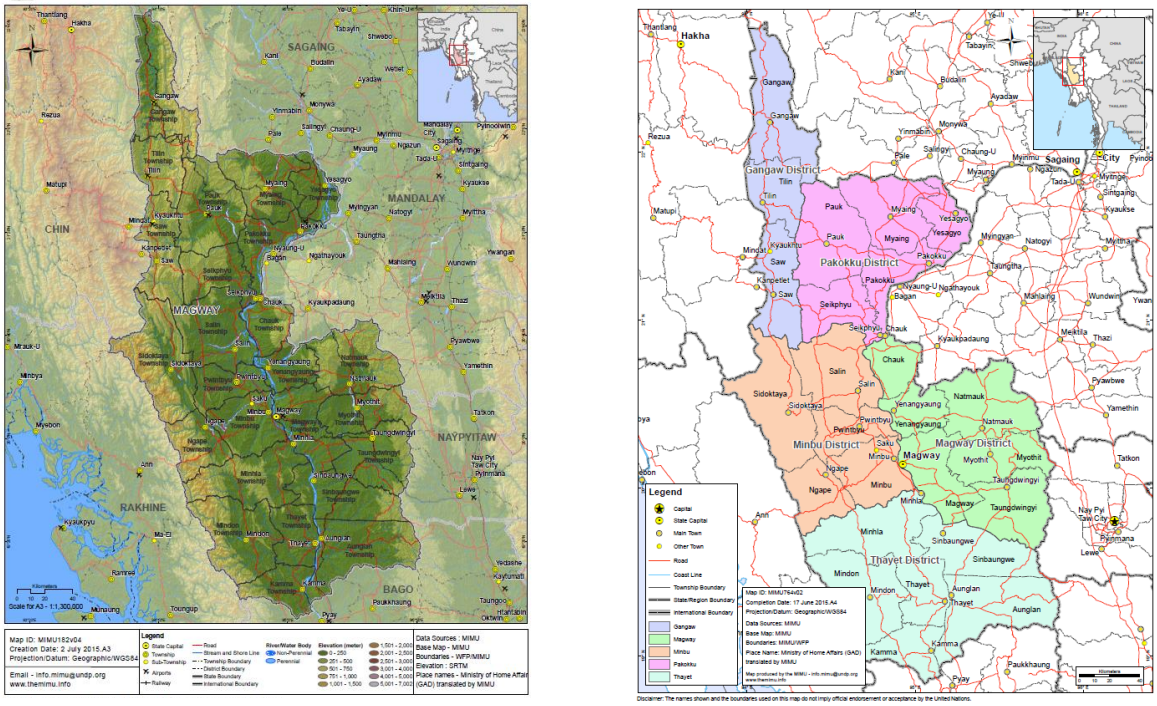
21. There has been some progress in recent years to mainstream gender. The Department of Social Welfare is the focal point for gender and in 2013 prepared a "National Strategic Plan for the Advancement of Women 2013-2022". A key objective is to see women play a greater part in current decentralisation reforms in order to play a greater role in decision-making at the local level as well as in productive sectors, such as agriculture or business. The Myanmar National Committee for Women's Affairs (MNCWA) is a national mechanism for the promotion of women's rights, a UN Gender Theme Group (GTG) was formed in 2009 to mainstream gender in the humanitarian and development interventions and a Gender Equality Network (GEN) is now a leading network of civil society, national and international non-government organizations (I/NGOs), UN agencies and technical resource persons on gender issues. Further, the Women Organizations Network of Myanmar (WON) was formed in 2008 to coordinate local and national women groups and organizations and now has a network of over 29 local women groups and organizations.

II. The Project Areas

22. The project will be located in northern Magway region and southern Chin state. Based on Government-IFAD consultations at union, region and state levels, it will be implemented in four townships: (i) Mindat and Kanpetlet townships in southern Chin state; and, (ii) Pauk and Myaing townships in northern Magway region. These areas, which contain 880 villages, are characterised by some of the highest poverty concentrations in Myanmar. Magway and Chin are neighbouring areas however their development contexts differ significantly, as is described in the below pages.

23. **Magway region** is selected as WSAP target area mainly because of its vulnerability to climate change, especially increasing droughts, desertification, storms and floods. Magway is located in the Myanmar's lowland Central Dry Zone, and its population is mostly of the Burmese ethnic majority. The Magway total population counted a total of 3,917,055 in the 2014 Census, and the land area is 44,800 square kilometres. Population density is 87 people per km2, which is above Myanmar average 76/km2. Rural households constitute 86% of overall Magway; the 14% urban households mostly live in the Region capital Magway city, and in the four district capitals. As shown in the below map the elevation of Magway is typically 0-250 meters and the landscape is characterized by the Ayeyarwady river which flows through the Region from north to south.

Map 3: Magway Region topography, districts and townships (MIMU 2015)



24. The Central Dry Zone has potential to agricultural activity as it is relatively well connected to markets of agricultural produce, its terrain is a lowland plain located between the Shan Highlands to

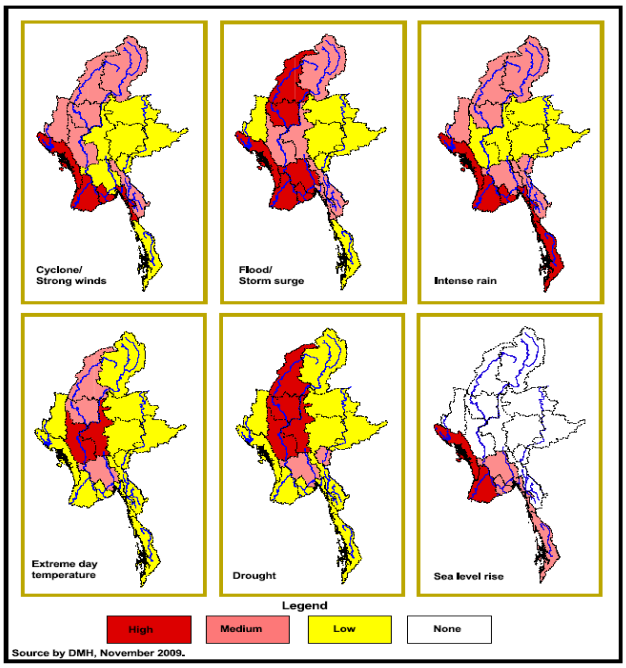
the east and the Chin Hills to the west, and the Ayeyarwady river passes through the area thus irrigated cultivation is possible. Due to the advance and retreat of tropical storms, the precipitation pattern in the dry zone includes early wet season (pre-monsoon) and a late wet season (post-monsoon). The pre-monsoon starts from April to June and post monsoon extends from September to October. This rainfall pattern favours a double cropping system for dry land farming, meaning that farmers can grow crops twice on the same plot each year, and in which a second crop is planted after the first crop is harvested. (MMR CSA Strategy 2015).

25. The Central Dry Zone region however is the main area in all Myanmar to be affected by desertification and droughts, with highest temperature peaks in the Magway Region. The annual rainfall is between 508 and 1,016 mm per annum with high variability and uneven distribution, and it is in the declining trend along with the average number of rainy days per year which usually range from 26-41 days. The undulating land, composed mainly of sandy loam with low fertility, is subjected to severe erosion under rains and winds. Average 21% of Dry Zone townships are affected by droughts every year, and the Zone in overall has suffered from a series of extreme droughts occurring at intervals of approximately 3 years. The droughts mostly occur in the early monsoon period causing a shortage of soil moisture adversely affecting crop productivity and leading to food shortages for both people and livestock. The most significant drought occurred in 2010, when extreme temperature rose to 47.2°C in Magway and rainfalls came in late, causing severe shortage of water in many parts of the region. Most of the wells dried up due to the depletion of underground water supply due to the late onset of the monsoon, and causing the scarcity of drinking water. (UNDP Dry Zone CCA Programme Description 2013, MMR CSA Strategy 2015).

26. In the recent years the Central Dry Zone has also been subject to a series of tropical storms, heavy rains and subsequent flash floods. The worst of the storms include the 2010 Cyclone Giri and 2011 Tropical Storm Two, which triggered heavy flooding in Dry Zone that caused massive losses in the agriculture sector and other sectors, and killed many people. Eleven days after the Tropical Storm Two, in the effected Dry Zone townships 161 people were reported dead or missing and 2,657 households were left homeless. (MMR CSA Strategy 2015).

27. The below map by Myanmar Department of Meteorology and Hydrology shows the overall climate change risks in Myanmar, where it should be noted that Magway is highly vulnerable to droughts, extreme day temperatures and vulnerable to cyclones and floods.

Map 4: Myanmar climate change vulnerability (MMR DMH)



28. The recently published Myanmar Population Census 2014 gives detailed information for the Magway household access to communication items, transport and electricity. Regarding communication, about 52% of Chin people have no radio, 62% have no television, and about 73% have no land-line or mobile telephone connection. 95% have no computer or internet. Regarding transportation, only 1.4 % of Magway households have a car, and less than 40 % have motorcycles. Bicycles are available to about 30 % and animal-pulled carts to 41%. As a measurement of access to electricity, the Census survey shows that 22.5% of Magway households use candles as source of lighting, 27% batteries, and 23% use electricity from the grid. About 22% have private electricity generators and solar panels.

Table 6: Magway household access to communication, transport, electricity (Census 2014)

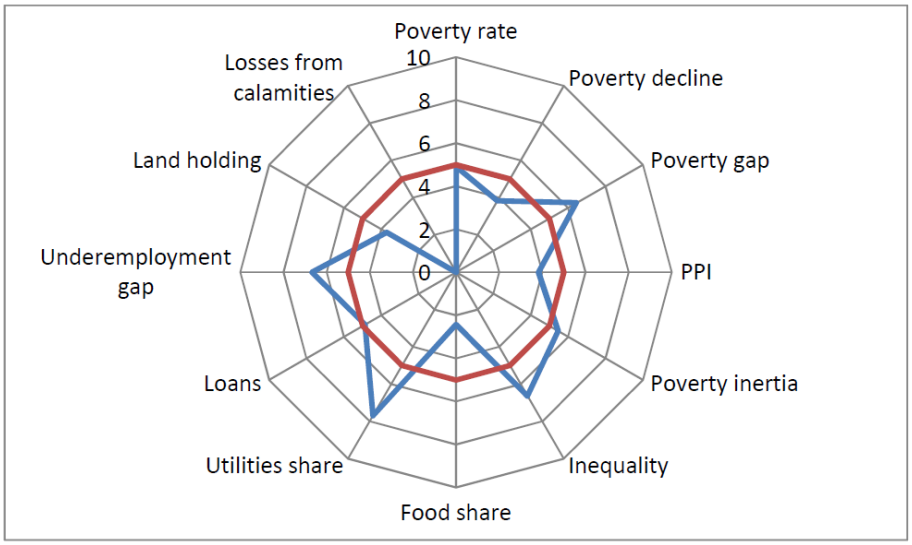
Communication items						
Radio	Television	Land line phone	Mobile phone	Computer	Internet at home	None of the items
47.9%	37.9%	3.5%	23.9%	1.2%	3.4%	30.3%

Transportation items						
Car/Truck/ Van	Motorcycle/ Moped	Bicycle	4-Wheel tractor	Canoe/Boat	Motor boat	Cart (bullock)
1.4%	38.8%	30.7%	0.9%	1.3%	0.5%	41.3%

Source of lighting						
Electricity	Kerosene	Candle	Battery	Generator (private)	Water mill (private)	Solar system
22.7%	0.4%	22.5%	26.8%	11.5%	0.8%	10.1%

29. The UNDP Myanmar report Regional Perspective on Poverty (2013) assessed each state and region in terms of 12 poverty indicators, ranking the areas from 0-10 where higher number indicates better condition. As shown in the below graph for Magway results: In comparison with Myanmar average conditions, Magway is among moderate performers in terms of poverty, poverty inertia, equality, employment and indebtedness. As described above, however the level of losses from calamities is the highest in the country, and as consequence of the harvest losses, the household expenditure food share is high, indicating vulnerability. (UNDP 2013).

Graph 3: Poverty indicators for Magway (UNDP 2013)

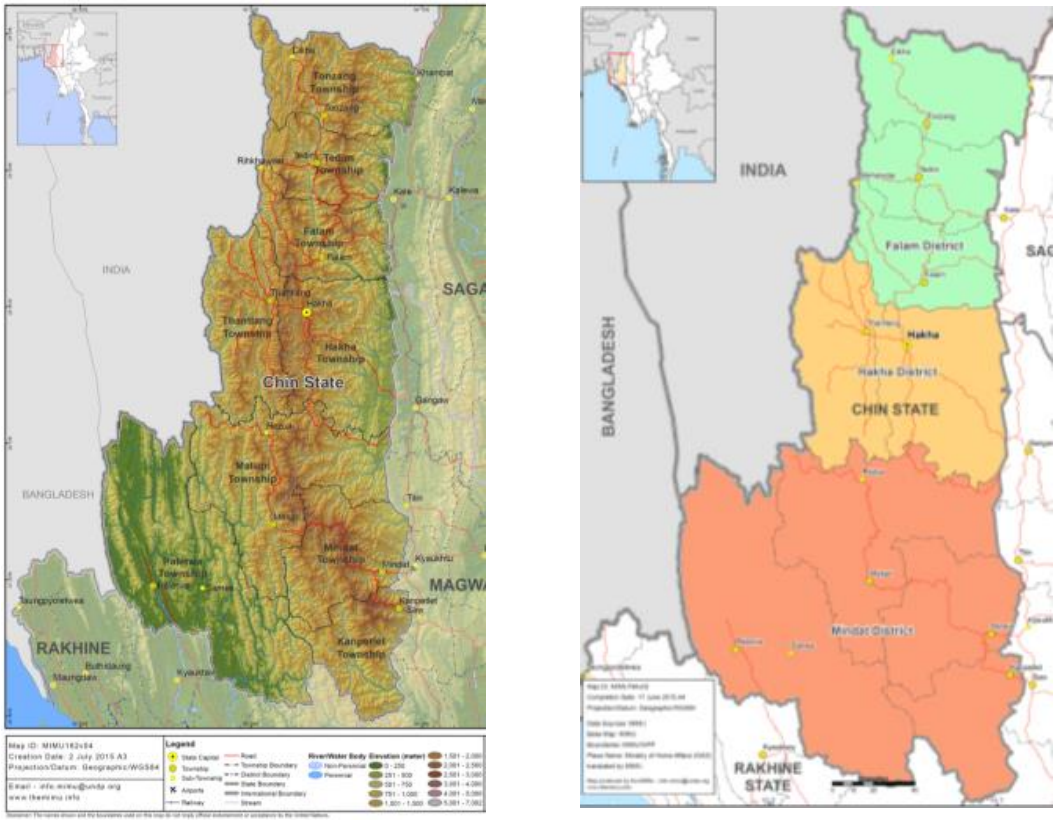


30. **Chin State** is targeted by WSAP due to its high poverty rates and isolation of the population. The State is located west of Magway, at the “Chin Hills” border area between Myanmar, India and Bangladesh. The Chin population counted a total of 478,690 in the Census 2014, and the land area of the State is 36,000 square kilometres. The population density is lowest of all Myanmar at 14 per km^2.

31. Rural people constitute 79%, and the remaining 21% live in the few urban towns including State capital Hakha, and district capitals Mindat and Falam. As shown in the below map, the Chin state is

characterized by a mountain range and has average elevations of 500-3000 meters except for the lowland Paletwa township.

Map 5: Chin State topography, townships and districts (MIMU 2015)



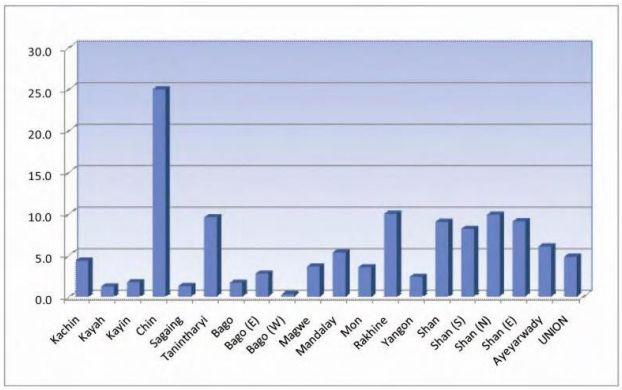
32. The climate is monsoonal in character; April and May are the hottest months, with average, daily maximum temperatures in excess of 30 degrees C; November to January are cold with minimum temperatures as low as minus 4.4 degrees C. Temperature has a significant effect on agricultural production. Cooler temperatures provide an opportunity to grow many vegetables, fruits and horticultural crops that will not grow in Myanmar's hotter, Dry Zone plains. But low temperatures can cause frost, which limits crops and prevents double cropping of crops like rice, which are particularly sensitive to frost in the flowering stage. The crops grown in Chin state are determined primarily by elevation. Of total crop production, 63% is cereals, including rice and maize for home consumption and millet for alcohol production – also for home consumption. Vegetables and high value crops are cultivated in smaller scale, for home consumption and as cash crops. The main cash crops with potential of increase include Elephant Yam, onion, chilli, garlic, ginger, potatoes, sunflower, beans, coffee and tea. (Chin 5-year Development Plan 2016-2021, MIID).

33. At present most households practice shifting cultivation, especially for the traditionally cultivated cereal crops rice, maize and millet. The practice has gradually become unsustainable due to increasing population density. The traditional system of agriculture is in decline – in the growing villages, land pressure has reduced the fallow periods from average 15 to only 2-4 years and thus soil quality is degrading, yields decreasing, and forest coverage and water sources deteriorating.This is leading to lowering of crop yields and more difficult access to water both for agriculture and household use.

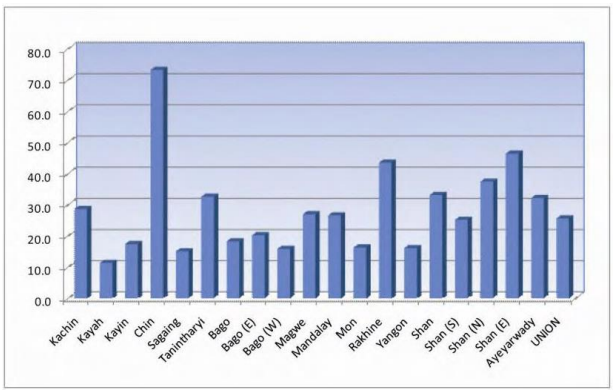
34. Chin State economic development has stagnated for decades. This is due to the above mentioned natural resource management issues, the State's remoteness and limited attention received from the Myanmar's political system and economic governance. This is shown by various reports including the MMR IHLCS, UN Household Poverty Profile Study, UNDP Regional Perspective on Poverty, MIID/DANIDA-supported Chin 5-year Development Plan 2016-2021 and Chin League for

Democracy report 2015. The civil rights of the Chin people as well as the economic development of the area have been disregarded, leaving the state to a static and isolated condition. The poverty incidence among Chin households has remained at critically high level of 73% at both 2005 and 2010 poverty surveys (MMR), against the Myanmar overall poverty reduction from 32% in 2005 to 26% in 2010. As shown in the below Graph 1 and Graph 2, the population of Chin is the poorest in Myanmar both in terms of food poverty and income poverty (MMR IHLCS 2010).

Graph 1: Food poverty incidence by States and Regions



Graph 2: Poverty incidence by States and Regions



Source: IHLCS 2010

35. The recently published Myanmar Population Census 2014 gives detailed information for the Chin household access to communication items, transport and electricity. Regarding communication, 80% of Chin people have no radio, 74% have no television, and about 80% have no land-line or mobile telephone connection. Virtually all Chin have no computer or internet. Regarding transportation of the households, there are nearly no cars among Chin state households and more than 70% of Chin households have no motorized transport at all, nor bicycles or animal-pulled carts. Regarding access to electricity, the Census survey shows that over 35% of Chin households still use candles or kerosene as their source of lighting, meanwhile only 15% have access to the electricity grid. About 30% have private electricity systems, including generators, water mills and solar panels.

Table 7: Chin household access to communication, transport, electricity (Census 2014)

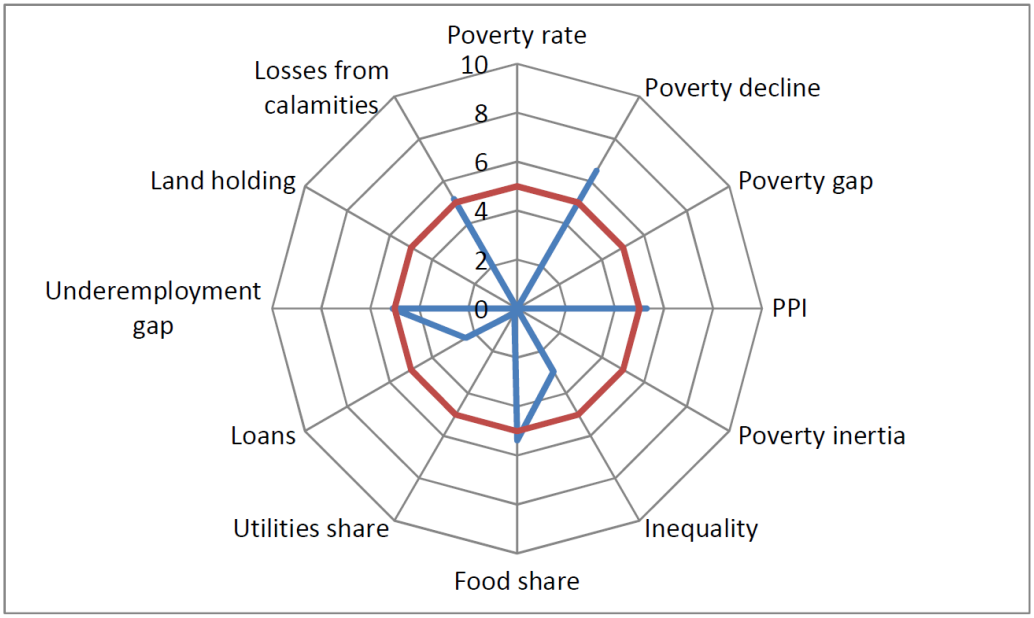
Communication items						
Radio	Television	Land line phone	Mobile phone	Computer	Internet at home	None of the items
20.3%	27.3%	5.0%	17.1%	2.2%	1.3%	57.9%

Transportation items						
Car/Truck/ Van	Motorcycle/ Moped	Bicycle	4-Wheel tractor	Canoe/Boat	Motor boat	Cart (bullock)
0.8%	28.1%	3.4%	0.3%	0.7%	1.3%	8.3%

Source of lighting						
Electricity	Kerosene	Candle	Battery	Generator (private)	Water mill (private)	Solar system
15.4%	5.9%	29.4%	9.1%	3.6%	12.0%	16.1%

36. The UNDP Myanmar report Regional Perspective on Poverty (2013) assessed each state and region in terms of 12 poverty indicators, ranking the areas from 0-10 where higher number indicates better condition. The below graph shows result for Chin State:

Graph 4: Poverty indicators for Chin (UNDP 2013)



37. Chin State has highest degree of poverty in Myanmar, and much of this is in the category of chronic poverty as visible from the poverty inertia rating. Chronic poverty is difficult to overcome, as people do not only lose skills and resources, but also hope and drive. In Chin State, the high and persistent poverty goes in line with a high indebtedness, including especially through informal lenders. Also, the very low median landholding is part of Chin's poverty problem: the Chin people have about 2 acres of land per household in average. In their limited land, most farmer households cultivate subsistence crops, mostly rice, maize and millet. (UNDP 2013).

38. **Ethnicity and traditions.** The people in Chin State are of Chin ethnic group and its 53 officially recognised sub-groups. These groups have their distinctive languages, which mainly are dialects or versions of Zomi, Kalemyo, Tamu, Asho, K'cho, Kuki, Lai, Mro or Khumi. The people also sometimes speak and/or understand Burmese as the official language of Myanmar. The families are patriarchal with divided roles between men and women. The village leaders are always men and men raise their voices in meetings and have better skills of the official Burmese language. The Chin people predominantly practice Christian religion, and churches are widespread in the State. Buddhism and Animism are also practiced to a lesser extent compared to Christianity.

39. The Chin people traditionally depend on agricultural production and practice shifting cultivation with long fallow periods. Many seasonal traditions and rituals are associated with the shifting cultivation in the hills. (See more: Sakhong 2003, In Search Of Chin Identity). Some change is taking place in the agricultural production systems, however the traditions are deeply rooted to the culture and introduction of permanent cultivation practices requires long efforts. (See more at SECAP).

40. Mün, Dai and M'Kang are the prevailing ethnic groups in Mindat township meanwhile Dai, Upu, Yindu and Nga-Ra are the groups in Kanpetlet Township. The Mun and M'Kang speak K'cho language; the Dai and Yindu speak Daai Chin language; and the Oo-Pu speak Chinbon language. The multitude of languages is especially addressed in the WSAP design, by engaging local "Knowledge Centre" specialists who facilitate the project activities at the village level.

41. The project will ensure that its activities are culturally sensitive and create positive impacts on the asset base and livelihoods of ethnic groups. It will hold meaningful consultation processes with representatives of ethnic groups throughout its implementation process. Efforts will be made to ascertain that ethnic groups are fully represented in the decentralised project implementation teams as well as with contractual service providers. Selection of project facilitators and trainers will require proficiency in local ethnic languages. All monitoring data, analysis and reporting will be disaggregated by ethnicity.

III. Targeting and Gender Mainstreaming Strategy

Targeting strategy

42. Targeting strategy of the WSAP is primarily based on geographic identification of beneficiary groups: following MMR-IFAD dialogue at central, state/region and township levels, WSAP is decided to be located in (i) northern Magway Region, where the households' vulnerability to climatic changes is highest in the country, especially for the increasing temperature levels and droughts, and (ii) southern Chin State with deteriorating traditional farming system, highest poverty levels in the country and population consisting solely of ethnic groups. The project sites include Mindat and Kanpetlet townships of Mindat district in southern Chin, and Myaing and Pauk townships of Pakkoku district in northern Magway. The targeted area contains 880 villages, 105,105 households and 461,378 people. Among these, 98,548 households and 430,722 people are of rural population (Census 2015). WSAP targets this rural population.

43. For Magway, the Pakkoku district is selected as the implementation site, as Pakkoku is considered core climate change vulnerable area in the Central Dry Zone. There the mean annual rainfall is less than 600 mm and the temperature peaks go beyond 45°C. In these locations the periodic droughts cause highest water stress both for agricultural and household use to the extent that each year some villages need to have water transports by emergency tankers. Also the recent tropical storms caused particularly severe effects in Pakkoku. (MMR CSA Strategy 2015). The below table illustrates the specific population supported by the WSAP interventions in Magway region.

Table 8: WSAP targeted population in Magway

Magway region Pakkoku district	
Pauk township 235 villages	**Myaing township 329 villages**
37,310 rural households 164,228 rural people	51,810 rural households 218,065 rural people
88,453 rural women 37,489 rural youth of 15-29 years	120,697 rural women 49,780 rural youth of 15-29 years
9,981 female-headed households	14,765 female-headed households

44. For Chin, the selected sites in the southern Chin State encompass the watershed that feeds the main river Yaw and subsidiary streams that run through the Northern Magway region. For these areas, the above explained unsustainable intensified shifting cultivation practice does not only lead to the mentioned decreased crop yields and soil deterioration, but also to destructive high intensity flows in downstream Chin and Northern Magway communities. The widespread land degradation visible in both Chin and Magway, alongside with climate change impacts of erratic rainfall, intra and inter-annual drought, and record temperature highs, are undermining farm productivity and livelihood options of the rural poor. Thus it is imperative that the underlying land tenure issues, biophysical constraints and climate change adaptation needs are addressed in these locations. In the below table, the specific beneficiary population in Chin is illustrated.

Table 9: WSAP targeted population in Chin

Chin state Mindat district	
Mindat township 192 villages	**Kanpetlet township 124 villages**
6,220 rural households 31,095 rural people	3,207 rural households 17,334 rural people
16,635 rural women 7000 rural youth of 15-29 years	9,049 rural women 3902 rural youth of 15-29 years
2,638 female-headed HHs	847 female-headed HHs

45. For Mindat and Kanpetlet in Chin, the target area consists of people with different ethnic backgrounds, and of landscapes with different elevations. The target groups and their details are mapped in the below table.

Table 10: Households, ethnicity, elevation and key crops in the Mindat and Kanpetlet administrative areas

Township	Admin Area	#villages	#tracts	#hhs	Ethnicity	Elevation (feet)	Key Crops
Mindat	1	38	6	789	Mün	3000	yam, coffee, tea
Mindat	2	27	6	842	Mün	5000	rice, maize
Mindat	3	30	6	1140	Mün	3000-4000	millet, coffee, rice, maize
Mindat	4	34	6	1225	Mün	4000-5000	coffee, rice, avocado, millet, yam, potato
Kanpetlet	5	27	5	803	Nga Ra, Mün	4500-6000	maize, millet
Kanpetlet	6	26	5	619	Yindu	5000	maize, millet
Kanpetlet	7	27	6	684	Oo-Pu	3000-4500	upland rice, paddy rice
Kanpetlet	8	24	5	464	Dai, Oo-Pu	4000-4500	upland rice, black seed pumpkin
Kanpetlet	9	15	5	424	Dai	4000-4500	upland rice
Mindat	10	12	5	538	Dai	3000	upland rice, yam
Mindat	11	9	4	463	Dai	3500-4000	upland rice, yam
Mindat	12	10	5	336	Mün	3000-4000	coffee, upland rice, yam
Mindat	13	16	6	660	M'Kang	3000-4000	yam, upland rice
Mindat	14	10	4	408	M'Kang	3000	yam, rice, coffee

Target groups and targeting methods in specific project activities

46. The target groups will consist of: (i) small and medium-sized farming households in upland and lowland areas; (ii) livestock producers; and, (iii) landless and non-farming households. Women and women-led households will be prioritised in line with the project gender strategy. Youth, as the primary agents of change at community level, will be the focus of activities involving technological innovation and commercialisation.

47. WSAP will provide a variety of services to all 86,000 rural households in the four townships. Through its economic multiplier effects, the numbers of indirect beneficiaries, particularly through rural job creation, will be substantial. Further, institutional capacity building will be implemented at the district level. Thus the project will have spillover effects through all townships within the targeted districts; populations of the four additional townships in Mindat and three in Magway will benefit from the improved institutional capacities of the administration. During implementation, the WSAP may also invest in scaling up of key instruments such as the Knowledge Centers in selected further townships of the districts. For the physical WSAP investments at end-beneficiary level, the outreach and targeting methods are foreseen as in the below matrix:

Components	Activities	Target Groups	Targeting Methods
1.1 Productive infrastructure	- Estimated 38 small and medium irrigation facilities in Chin	- Estimated 200 HHs in a command area of an estimated 570 acres	- **Self targeting** with village level participatory processes and criteria applied for the selection of schemes to be financed.
	- Small to medium scale irrigation systems in Magway, to service about 4000 acres of smallholder land.	- Estimated 3000 direct beneficiary households, all in climate change vulnerable villages that have suffered from series of calamities.	- **Geographic targeting** for the most vulnerable village clusters, identification based on field visits and consultation with communities and district and township Irrigation Departments.
	- Rural access roads, irrigation for home gardens, and land consolidation	- Estimated 1000 HHs, with irrigation systems specifically targeted for women	- **Self targeting** with village level participatory processes and criteria applied for the selection of schemes to be financed.
1.2 Social infrastructure	- Domestic water supply , renewable energy, rainwater harvesting ponds and	- Estimated 1,125 beneficiary households. Special focus at women and women-led households.	- **Self targeting** with village level participatory processes and criteria applied for the selection of schemes to be financed. **Geographic targeting** in Magway to support villages with most severe drought

	micro hydro-power.		impact.
2.1 Agri-cultural modernisation	- The training, planning and technical support service points "Knowledge Centres" (KC).	- Established in 23 locations of Chin and 27 of Magway, servicing 1500-2000 rural households each, total 86,000 households	- **Geographic targeting / Empowering measure.** KC locations based on criteria of demographic density, client accessibility, and intensity of water infrastructure investment. Empowering measure effective for all villagers around the KCs.
	- Starter packs in Chin and demonstrations in Magway	- Min. 10,000 direct beneficiary households, all poor or climate-vulnerable; In Magway expected 20,000 more indirect beneficiaries through replication.	- **Direct / self-targeting.** (i) All households in Chin are eligible to receive a starter pack from the Knowledge Center; Expected 60% adoption rate. (ii) Villages in Magway will identify suitable demonstration sites for climate adapted farming systems.
2.2 Financial services	- RBF co-investments total USD 1,320,000	- Min. 3,300 direct beneficiary households, including at least 50% of investment for only women's groups. Youth have preference as applicants. Indirect benefits expected at min. 3000 further households.	**Direct/ self-targeting** through competitive mechanism. Business plans developed and proposed to the fund by villagers, with TA from KCs.
	- Agribusiness co-investments total USD 1,600,000	- Min. 5,300 beneficiary households as part of the agribusiness supply chains and as employees.	**Self-targeting** through competitive mechanism. Business plans developed and proposed to the fund by enterprises; supply chain farmer groups identified by the enterprises and KCs.
	- Savings and Credit Groups	- Min. 9,000 loan client households in the 4 first years of the operation. Amount of SCG member households estimated 20,000 at the end of project.	**Self-targeting.** Villages establish savings and credit groups which are open for participation by all. Women and most vulnerable households are prioritized.
2.3 Policy engagement	- Best practice studies and advocacy - Policy initiatives	- Direct beneficiaries include Myanmar research units and universities, and policy making bodies at national and state/region levels. Indirect benefit to all Chin/Magway.	**Enabling measure** to support successful implementation of the WSAP instruments and their replication state/region-wide and eventually country-wide.

Gender mainstreaming

42. WSAP will actively promote gender mainstreaming and women's participation in all activities. Specific activities targeted to women will include supply of irrigation water to home gardens in Chin state, training on home gardening for household food security and nutrition purposes, and setting up of community women's groups to plan investments and select representation in governance of Knowledge Centres. A gender action plan will be developed as per the following outline and would seek to maintain women's access and participation across all components of the project, from extension to project investment funds. A gender aware approach would be a crucial focus of the project whereby women's position and roles would be recognized and acknowledged and women's economic empowerment would be realised through the development of pro-poor gendered economic opportunities.

Gender Action Plan

43. The purpose of the gender action plan would be to promote gender equality so that targeted women and men have equitable access to, and control over, resources (e.g., livelihood supports) provided by and benefits (e.g., food security) gained from the project. The gender action plan would ensure:

- *Gender equality concepts* are adequately introduced to project staff as well as women and men from project communities as much as possible during the project work.
- *Facilitation of women's/men's equal and meaningful participation* in the project activities and their voices heard in decision-making to be ensured by the project implementing partners.

- *Gender sensitive language is used in all documents* – resource and information, education, and communication materials, reports, etc.
- *Mechanisms and tools* are in place to ensure equitable access to and control over resources
- *Gender impact assessment* of the project are to be conducted along with periodic review and learning of the project.
- *Sex disaggregated data* is to be collected, analysed and used for ongoing project development and reporting - with both quantitative and qualitative information.
- *Gender sensitive organizational policies, practices and staff recruitment* for all levels (from management positions to field level positions). This includes ensuring that the project does not lose female extension workers when the position is upgraded under the project.

44. The gender action plan would be integrated into the components as outlined below:

45. **Component *1: Infrastructure.*** The project will invest in productive (irrigation) and social infrastructure organised in two sub-components.

Sub-*component* 1.1: Productive Infrastructure

46. The main activities under this sub-component will focus on rehabilitating existing irrigation schemes which currently operate in sub-optimal conditions, and developing a few new schemes where technically, environmentally and financially feasible. In Chin state the project will invest primarily in new irrigation facilities, consisting of relatively small schemes averaging 13 acres each. In Magway region, the project will invest in rehabilitation of stream/river diversion-based irrigation schemes, pumping based schemes, spring/artesian well based schemes and dam based schemes. Participatory processes and criteria will be applied for the selection of schemes to be financed by the project. Village Tract Facilitation Groups (VTFG), supported by an NGO, will lead the process of community mobilization and consultation. The project will ensure that:

(i) women constitute at least 35% of the VTFG members;

(ii) prior to the start of physical works, the contracted NGO will work with the Water User Groups (WUGs) to promote participatory water management in accordance with best practices. At least 35% of the membership of WUG must be women.

Sub-component 1.2: Social Infrastructure

47. Under this sub-component, the project will invest in social infrastructure facilities at household level. Eligible investments will include domestic water supply schemes, renewable energy solutions particularly solar home systems, water storage tanks for home gardening, rainwater harvesting ponds and micro/mini hydro-power facilities. In both Chin and Magway, most HHs have small home gardens that provide food for the family for around 6 months. These home gardens are cultivated exclusively by women. At extensive consultation with women, the mission was informed that with the availability of irrigation water year round, the home gardens would be able to ensure food security for the family throughout the year and would also give women the opportunity to have micro-enterprises based on home-gardening. Therefore, in view of this, these activities will **exclusively target women's** priorities and women headed HHs. Therefore, the project will ensure:

(i) Separate women's groups are established at village level to discuss the selection of type of investment and women/HHs that will benefit from the project investment;

(ii) For water storage tanks and rainwater harvesting ponds 100% of targeted beneficiaries are women who are cultivating home gardens;

(iii) Women-headed HHs are given priority in distribution of solar home systems.

Sub-component 1.3: Capacity Building

48. The project will strengthen technical knowledge and skills of the ID and DRD at local levels through the provision of technical assistance by an external service provider (such as engineering consulting firm). Considering the limited number of women staff in township and district level offices, project will ensure that:

(i) 100% of women engineering and community development staff in ID and DRD will be targeted for these capacity building trainings.

49. ***Component 2: Services.*** The project will invest in agriculture modernisation and enabling services, organised in three sub-components.

Sub-component 2.1 Agricultural Modernisation

50. The main activities pertained to under this output would support the establishment of Knowledge Centres (KCs) across the project areas. KCs will serve as focal points for building the capacities of small farmers in agricultural knowledge and technology, and connecting them with agribusinesses. KCs will provide services to landless households engaged in micro/small on-farm and off-farm enterprises. The following mechanisms would be adopted by the Project to ensure the active participation of women:

(i) gender equity training for KC managers;

(ii) separate consultations with women to identify their concerns, needs and preferences, ensuring that their voices are heard and addressed;

(iii) women will constitute at least 35% of KC board members, and will be trained in leadership skills and public speaking;

(iv) ensuring that women have access to group technical training and other skill building activities, with a target of 35% women in mixed gender groups;

(v) women will constitute at least 70% of participants in training on livestock;

(vi) women will constitute 100% of participants in training for home-garden and vegetable production trainings;

(vii) priority targeting of women headed HHs for distribution of starter packs in Chin state;

(viii) gender and poverty analysis should be part of value chain analysis so that specific interventions can be designed specifically for women and included in the gender action plan for the project.

Sub-component 2.2 Financial Services

51. The project will support financial inclusion for small farmers, livestock owners and the landless in the project areas. The project will do so through three primary tools: (i) savings and credit groups (ii) Rural Business Fund (RBF); (iii) Agribusiness Fund (ABF); (iv) Credit. In the implementation of these activities, the project will ensure that:

(i) at least 50% of participants in financial literacy trainings are women;

(ii) women applicants will constitute at least 50% of Rural Business Fund clients;

(iii) at least 35% of beneficiaries benefiting from incremental jobs created through the ABF funded processing units and agribusinesses are women.

Project management and implementation

52. The existing PMU for FARM project will also be the PMU for WSAP. The existing Community Development and Gender Specialist (CDGS) who will also be responsible for ensuring that targeting and gender mainstreaming is applied throughout WSAP activities. There would be one additional

CDGS at the two state-level PIOs respectively. With regard to project management specifically, the CDGSs will ensure that all terms of reference for service providers include the requirement that the latter set up gender-balanced teams that have prior experience with gender mainstreaming, and that contract deliverables reflect gender and inclusion targets and indicators. S/he will organise capacity building as appropriate for state level PIO staff and project implementers as required to improve project performance in extending project benefits to women and poorer groups.

Monitoring and Evaluation

53. All M&E data, analysis, and reporting would be disaggregated by gender. Sex disaggregated information will be used for all monitoring and reporting requirements. Progress reporting and evaluation formats should be designed to capture sex disaggregated data at all levels and to record progress against the baseline data. Project results and impacts will also be reported in sex-disaggregated form, with inclusion of gender outcomes indicators from the onset. Project staff responsible for data collection and monitoring should be trained in understanding and applying gender indicators. Detailed gender-sensitive indicators will need to be developed by the PMU for each state. A key role of the M&E team of the PMU will be to effectively integrate these indicators within the project's performance measurement framework and to ensure all personnel with M&E responsibilities have awareness and skills to measure against the gender-specific indicators

Ethnic group engagement safeguards framework

54. The Programme will abide by the following safeguards to ensure that the project activities are culturally sensitive and do not have any negative impact on livelihoods and practices of the ethnic people:

(i) At project inception, undertake a screening with the objective to (a) determine if the impacts on ethnic groups are significant; (b) identify the level of assessment and institutional resources required to address IP safeguard issues; and (c) determine information and consultation requirements;

(ii) undertake a social impact assessment which will be carried-out by the PIO, with the data/information used to prepare an ethnic groups development plan. The assessment will include a gender-sensitive assessment of the affected minorities' perceptions about the Programme and its impact on their social, economic, and cultural status;

(iii) meaningful and culturally-sensitive consultation process will be undertaken with all ethnic groups affected by the projects. They will be properly informed and consulted about the project, the scope, implementation schedule and activities, as well as expected impacts, both positive and negative, on the community and ethnic groups. Ethnic peoples' aspirations, needs, and preferred options for the projects will be sought and measures to enhance benefits or mitigate negative impacts will be considered and recorded;

(iv) PIO will ensure that at least two staff in the unit speak ethnic languages and relevant information and trainings to Programme beneficiaries are delivered in local ethnic languages; and

(v) all M&E data, analysis, and reporting will be disaggregated by ethnicity.

Annex 1. Gender checklist

Key Issue	Design Response
1. The project design report contains – and project implementation is based on - gender-disaggregated poverty data and an analysis of gender differences in the activities or sectors concerned, as well as an analysis of each project activity from the gender perspective to address any unintentional barriers to women's participation.	**Yes.** Gender differences are analyzed during poverty analysis and project activities are gender-sensitive. WSAP has taken into account women and men's roles, constrains and needs in designing the project activities.
2. The project design report articulates – or the project implements – actions with aim to: • Expand women's economic empowerment through access to and control over productive and household assets;	Yes. WSAP activities are designed to expand women's economic empowerment by facilitating women's access to technical training, business development skills and credit. A Gender Action Plan has been developed to ensure women's active participation in all project activities.
• Strengthen women's decision-making role in the household and community, and their representation in membership and leadership of local institutions;	Yes. The project through the KCs would build women's capacity through trainings specifically addressing need of women to enhance their decision making roles in groups.
• Achieve a reduced workload and an equitable workload balance between women and men.	Yes. Rural ethnic women experience extreme "time poverty" and the Project is highly conscious of the need to reduce women's labour demands. The project would facilitate separate consultation with women to ensure the project activities do not account for additional workload for women. Trainings and meetings would be organized in locations and timings suitable for women beneficiaries.
3. The project design report includes one paragraph in the targeting section that explains what the project would deliver from a gender perspective.	Yes. The WSAP Gender Action Plan, essentially guided by IFAD's Gender Equality and Women's Empowerment Policy, aims to enhance women's participation and role in agriculture production and marketing by increasing their access to resources and empowering them both technically and entrepreneurially.
4. The project design report describes the key elements for operationalizing the gender strategy, with respect to the relevant project components.	Yes, as detailed in the Gender Action Plan.
5. The design document describes - and the project implements - operational measures to ensure gender- equitable participation in, and benefit from, project activities. These would generally include**:**	Yes, as detailed in the Gender Action Plan.

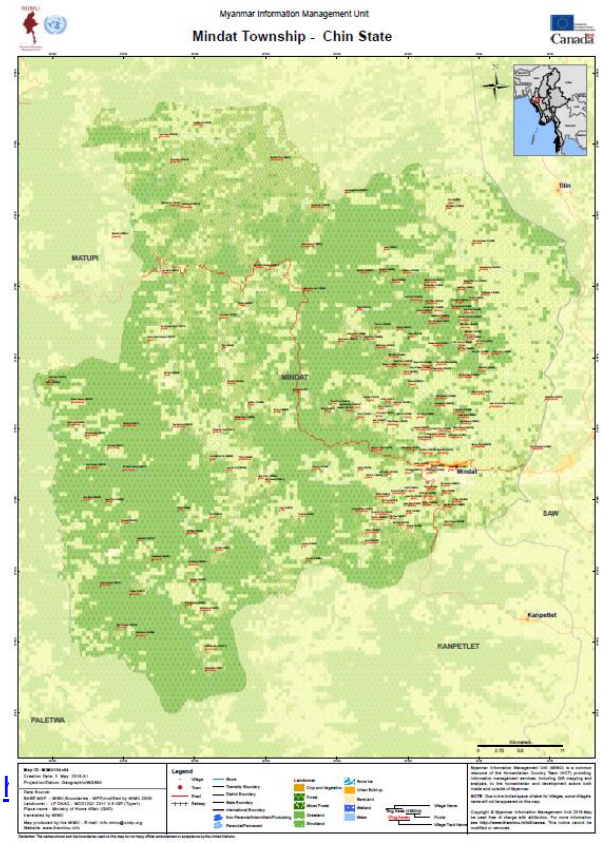
Key Issue	Design Response
5.1 Allocating adequate human and financial resources to implement the gender strategy	Yes.
5.2 Ensuring and supporting women's active participation in project-related activities, decision-making bodies and committees, including setting specific targets for participation	Yes.
5.3 Ensuring that project/programme management arrangements (composition of the project management unit/programme coordination unit, project terms of reference for staff and implementing partners, etc.) reflect attention to gender equality and women's empowerment concerns	Yes.
5.4 Ensuring direct project/programme outreach to women (for example through appropriate numbers and qualification of field staff), especially where women's mobility is limited	Yes.
5.5 Identifying opportunities to support strategic partnerships with government and others development organizations for networking and policy dialogue	Yes. WSAP would ensure proper and balanced representation of women and men and poor households, including women-headed households in decision-making/influencing bodies at village levels.
6. The project's logical framework, M&E, MIS and learning systems specify in design – and project M&E unit collects, analyses and interprets sex- and age-disaggregated performance and impact data, including specific indicators on gender equality and women's empowerment.	Yes. WSAP would adopt a gender-sensitive M&E system to address gender issues by reporting and analysing sex-disaggregated data throughout the project cycle.

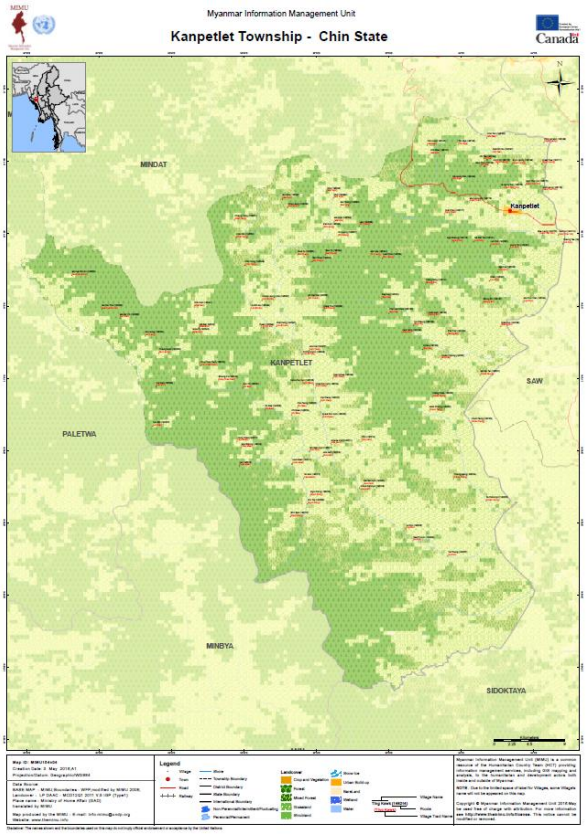
Annex 2. Targeting checklist

Key issue	Design response
1. Does the main target group - those expected to benefit most- correspond to IFAD's target group as defined by the Targeting Policy (poorer households and food insecure)?	**Yes.** WSAP targets poor, vulnerable and food insecure households in (i) Chin State ethnic communities, which are the poorest and most isolated in Myanmar, increasing land pressure deteriorating the traditional shifting farming system, and (ii) Magway Region villages in vulnerable condition both in terms of food and income security, due to periodic natural disasters.
2. Have target sub-groups been identified and described according to their different socio-economic characteristics, assets and livelihoods - with attention to gender and youth differences?	**Yes.** The socio-economic characteristics, asset ownership and poverty indicators have been described for all WSAP target groups in the section II of appendix 2. Further, the opportunities are mapped to support the young, women and women-led households in particular, in the section III of appendix 2.
3. Is evidence provided of interest in and likely uptake of the proposed activities by the identified target sub-groups? What is the evidence?	**Yes.** The section III of appendix 2 explains in detail the targeting strategy as well as evidence for likely uptake of proposed activities in each WSAP component and sub-component.
4. Does the design document describe a feasible and operational **targeting strategy** in line with the Targeting Policy, involving some or all of the following measures and methods*:*	
4.1 Geographic targeting *– based on poverty data or proxy indicators to identify, for area-based projects or programmes, geographic areas (and within these, communities) with high concentrations of poor people*	**Yes.** The target townships have been selected based on social, demographic, economic and climate change vulnerability criteria. See Appendix 2 for details.
4.2 Direct targeting - *when services or resources are to be channelled to specific individuals or households*	**Yes.** Direct targeting is applied generally through priority of women and women-led households and the rural youth. In particular for the sub-component 2.1 activity Starter Packs, direct targeting is fully applied. See appendix 2.
4.3 Self targeting – *when goods and services respond to the priority needs, resource endowments and livelihood strategies of target groups*	**Yes**. Investment priorities will be set by the beneficiaries through a participatory planning process, across four board areas targeting productive infrastructure development, improved household livelihoods, climate change resilience, and increased productivity and linkages to markets.
4.4 Empowering measures *- including information and communication, focused capacity- and confidence-building measures, organisational support, in order to empower and encourage the more active participation and inclusion in planning and decision making of people who traditionally have less voice and power*	**Yes.** Through WSAP activities, male and female beneficiaries will receive capacity building support for planning, modern farming systems, group formation and management, effective communication and gender awareness and receive technical support through Knowledge Centers, FFS and private sector led trainings. Provision has been made for specifically targeting women on garden production issues to ensure increased food safety. Ethnic people will be empowered to identify with their values, heritage, resources and traditional knowledge, meanwhile seeking for more sustainable farming solutions.

Key issue	Design response
4.5 Enabling measures *– to strengthen stakeholders' and partners' attitude and commitment to poverty targeting, gender equality and women's empowerment, including policy dialogue, awareness-raising and capacity-building*	**Yes.** WSAP will specifically target community-identified poor households, and women, including women-headed households, through minimum participation quotas and targeted capacity building programmes and will also conduct gender awareness training for project staff and supporting government agencies and service providers.
4.6 Attention to procedural measures- that could militate against participation by the intended target groups	**Yes.** Possible procedural constraints for women, youth and poor's access to and benefits from project activities have been analyzed and addressed in the design.

Annex 3: Map of four targeted townships with details of villages, roads and land use. Source: Myanmar Information Management Unit MIMU. Full resolution maps at





Appendix 3: Country performance and lessons learned

1. Myanmar became a member state of IFAD in 1990. Following two decades of inactivity, IFAD engagement in the country commenced in 2012 through a small grant of USD 0.3 million to build the capacity of the Department of Rural Development. Since then, IFAD operations have grown rapidly, guided by the RB-COSOP 2014-18. The thrust of the country strategy, as requested by Government, is to develop scalable models of agriculture modernisation across the three main agro-ecological zones – central dry zone, hilly/mountainous zone, and Ayeyarwady delta.

2. Two loan projects and two small grants were financed under the 2013-15 resource allocation cycle: (i) *Fostering Agricultural Revitalisation in Myanmar* (FARM), approved in April 2014, which is creating a scalable agricultural modernisation model for the central dry zone; (ii) the *Eastern States Agribusiness Project* (ESAP), approved in April 2015, which proposes a smallholder agriculture and community agroforestry model for the hilly/mountainous zone, to be scaled up across the eastern states; (iii) a grant to strengthen project management and fiduciary compliance capabilities of the Ministry of Agriculture and Irrigation (executed by UNOPS); and (iv) a grant to the Ministry of Livestock, Fisheries and Rural Development to pilot improved livestock production and services. Aggregate IFAD financing for these four operations amounts to USD 50 million.

3. Under the 2016-18 cycle, IFAD has allocated USD 38 million of highly concessional resources for Myanmar. Two projects are envisaged for this period, the first of is the present project under design and the second would be for covering the financing gap of the Eastern States Agribusiness Project.

4. The design process of WSAP has been informed by experiences accumulated in the relatively short duration of the IFAD country programme, the Government's development activities, and operations of partner institutions, including UNDP, UNOPS (LIFT), bilateral agencies, and non-governmental organisations which have extensive experience in working with ethnic groups. Key lessons of relevance to WSAP that emerge from these experiences are outlined below.

- *Cultural sensitivity*. Designing development activities in a multi-ethnic country such as Myanmar requires a culturally sensitive and 'do no harm' approach. This clearly emerges from work of various civil society and other non-governmental organisations with various ethnic groups across the country, the generation of UNDP's township community development projects, and multiple UNOPS/LIFT operations.
- *Capacity building*. Following five decades of isolation, MoALI is relatively weak in terms of staff capacities, technical knowledge, project management, fiduciary compliance and outreach. In this context, MoALI greatly benefitted from a small capacity building grant financed by IFAD and executed by UNOPS in 2014-2015. The grant significantly developed MoALI capacity in project management, work planning, financial management, procurement and contracting, and M&E. It proved to be fundamental in enabling MoALI to improve the management of its development operations, including FARM. Based on this experience, it is considered best practice in APR to develop Ministerial statutory and fiduciary capabilities in advance of loan financing.
- *Services.* The pluralistic service delivery platform organised in the form of Knowledge Centres (KCs), which build on the structure and network of public extension services, has proved to be an early resounding success under the FARM project. The brokering functions of KCs have proved to be instrumental in modernising agriculture and stimulating rural business growth, within their first two years of operation. Six input supply companies and seven agribusinesses have established operations in FARM locations, using KCs as focal points for demonstrations, farmers' field schools, training and contract farming. Fifteen KCs have linked small farmers in lowland and upland areas to five private companies for contract farming of vegetables for IQF processing and export to Japan, chili for export to Thailand, rice grain production for export, and rice and maize seed multiplication for the domestic market. These have generated incremental net returns to households of between US$ 100 and US$ 1,000 per acre per annum. Almost 700 on-farm demonstrations have been conducted, with the participation of 12,500 small farmers, and there is increasing farmer adoption of the improved technologies demonstrated, such as mechanical seeding, input application, and GAP-compliant nursery activities. Services are also being provided by the public sector (Depts. of Agriculture, Research, Irrigation, Mechanisation, Land Records) to farmers through KCs. KCs now constitute a proven instrument of the COSOP

strategy of commercialising smallholder agriculture and breaking the dependency-subsistence-poverty trap. The lessons of these experiences are carefully adopted in the design of WSAP.

- *Rural finance.* FARM's rural finance experiences, organised by KCs, have also been highly successful in only two years. Some 325 savings and credit groups consisting of 7,050 members (44% women) are utilising revolved savings and seed capital to invest in coping strategies that combat vulnerability and increase resilience, generating benefits for 28,200 household members. The rural business fund, which also operates on a revolving basis, has financed 320 group micro-enterprises operated by 2,600 poor landless households in high value cropping on home gardens, livestock activities, and off-farm products and services, with positive effects on incomes, food security and jobs. The operating procedures of the agribusiness fund, which will entice private sector entities to the project area, have been finalised. One MFI is using KCs to provide loans to farmers, independently of the project. The WSAP will build upon these experiences, and will scale up the SCG, RBF and ABF models accordingly.
- *Scaling up.* FARM's scaling up strategy has also proved to be successful. MoALI has adopted the KC concept as its operational modality for agriculture services and market linkages. This model is now being scaled up by (i) the Agricultural Development Support Project (IDA/WB, US$ 100 million) in Bago, Mandalay and Sagaing; and (ii) the Irrigated Agriculture Inclusive Development Project (ADB, US$ 83 million) across the central dry zone. Based on this lesson, WSAP adopts FARM's scaling up model.
- *Human capital*. Chin state in particular has experienced substantial out-migration of the labour force (particularly the youth) over the past decades, and faces seasonal shortages of labour. Experiences with the return of migrants and displaced people, such as those of CARE, confirm that access to economic and job opportunities is vital for successful reintegration.
- *Social capital*. Water users' groups, producers' associations, savings and credit groups, and other self-help groups gradually improve the access of poor rural women and men to resources, services and opportunities. Development activities in the country, particularly those of JICA, UNOPS/LIFT and NGOs, demonstrate the importance of community organizations.
- *Participatory approaches*. While MoALI has increasing levels of technical capacity, it lacks the social mobilisation skills required to interact meaningfully with communities and ethnic groups. UNOPS/LIFT and experiences of civil society organisations and other non-governmental organisations demonstrate that the implementation of participatory approaches requires support from experienced partners with community engagement skills and track record.

Appendix 4: Detailed project description

1. The project will adopt a modular approach consisting in a standard package of investments to be financed in each State, suitably adapted as required. Such an approach will facilitate the adaptation and scaling-up of the model in other regions across Myanmar. The project will benefit from lessons learned from the previous IFAD-financed projects.

2. The project's two outcomes are: (i) access to productive and social infrastructure is improved; and (ii) the technological, financial and policy environment for small farmers and agribusinesses is enhanced.

Component 1: Infrastructure.

3. The project will finance strategic investments in productive and social infrastructure, through three sub-components. Each infrastructure investment will be identified on the basis of a fully participatory and consultative process, involving consultation sessions with all cross-sections of communities. Special focus would be given to poor, women headed households and ethnic groups. All schemes will be inclusive, and will address any equity issues, particularly for marginalized communities and households.

4. The Project would fund infrastructure component costing US$ 6.9 million, broadly in three sub-components; (a) Productive Infrastructure (Irrigation); (b) Social Infrastructure; and (c) Capacity Building.

5. **Sub-component 1.1. Productive Infrastructure.** Productive infrastructure investments will generate opportunities for increased incomes, reduce on-farm and off-farm production costs, and improve food security for targeted communities and households. The project will finance: (i) rehabilitation of irrigation schemes to ensure adequate and reliable supply of water to farms; (ii) rural access roads linking farms to markets; (iii) irrigation technology for kitchen gardens to ensure both food security and nutritional diversity; and, (iv) land consolidation on a pilot basis. The proposed infrastructure schemes will not have negative environmental impacts due to their characteristics and small sizes. On the contrary, irrigation investments will considerably improve water management, reduce water conveyance and application losses by 30-40%, improve drainage and reduce siltation, and conserve groundwater. These investments will be framed within a wide watershed management approach to ensure long-term water availability and secure sustainability.

Chin State:

5. Irrigated agriculture is constrained by its mountainous topography. Chin State, located in the western part of Myanmar sharing borders with India and Bangladesh, is characterised with its mountainous terrain. Its mountain ranges run north to south throughout the length of the State with an average elevation of 5000 to 8000 feet. The agriculture in the state is mostly rain fed and a few irrigation schemes exist. The irrigation schemes in the project townships -Mindate and Kenpetlet- are based on; (i) streams running in the valley between mountains and meant to irrigate lowland areas; and (ii) natural springs flowing out of mountains at certain locations. The water is tapped at source and conveyed to farms mostly through pipes and rarely through open channels.

6. **Irrigation Schemes (> 15 acres).** The project will invest 25 irrigation schemes in Chin state with a total cost of US$ 0.575 million. Of these 15 schemes would be implemented in Mindat Township while another 10 would be implemented in Kanpetlet. As an average one irrigation scheme is expected to cost US$ 23,000 and would irrigate more than 15 acres of land. The implementation of 25 schemes would irrigate about 375 acres of land in total.

7. At district level, the Irrigation department has already identified 24 priority irrigation schemes to benefit around 8 villages. Total cost of these schemes is estimated at US$ 0.354 million and their implementation is expected to irrigate more than 318 acres of new land. The participatory approach would however be followed for the final selection of the schemes. Close consultation and agreement of beneficiary communities and respective village development committees would be a pre-requisite for implementing any irrigation scheme. Table-4 below gives the priority irrigation schemes with estimated costs as identified by ID at district level.

Table-4: Chin State: Priority Irrigation Schemes by township

Township / Village	Irrigation Schemes (No.)	Area to be Irrigated (Acres)	Estimated Cost (US$)
Kanpetlet	**8**	**201**	**128,205**
Auwt khout	3	30	51,282
Chinletmon	2	66	25,641
Jinthwe	3	105	51,282
Mindat	**16**	**117**	**226,496**
Lum Sum	5	30	42,735
Noen	3	36	38,462
Roung Loung	6	30	102,564
Seah	1	16	17,094
Sheat war Tar	1	5	25,641
Total	**24**	**318**	**354,701**

Source: Irrigation Department, Mindat

8. **Small scale community irrigation schemes (4 to 14 acres).** In Chin State, as a policy ID allocates funds only for those irrigation schemes that could irrigate at least 15 acres of land. This practice leaves behind many farmers whose cumulative farm area is less than 15 acres. Meetings with ID and representative of farmers revealed that there is huge potential for irrigating hundreds of acres of land if proper irrigation facilities are provided. It was however transpired that most of such land lies in flood prone area. The current practice is to build earthen canals by diverting stream water and building rudimentary diversion structures by farmers themselves with little or no technical support from ID. Such structures are largely vulnerable and are often washed away during floods as no protective measures are adopted. In addition; no drainage facilities are provided as an integral part of such irrigation practices; as a consequence, farm lands (and even crops) remain inundated in case of high flows.

9. However, with proper engineering designs and adopting simple protective measures, such development could be made safer, more effective and efficient for sustained benefits. The limited stream data on flows (peak and off peak) and its regimes, flood patterns and needed training works suggest a modest start by piloting few irrigation schemes with different technical solutions and implementation models before up-scaling.

10. The project will fund 13 such small schemes on pilot basis with a total cost of US$ 0.12 million. Of these, 8 will be implemented in Mindat township while another 5 will be piloted in Kanpetlet township. These schemes are expected to irrigate 15 acres of land.

11. Special measures would be taken to protect the diversion structures from flood. Different local technical solutions utilising indigenous knowledge will be tested. These include, but will not be limited to, protective embankments at critical locations; further reinforcement with bamboo pushing, crushed stone retaining walls etc. In addition, drainage canals would also be provided to dispose of additional water back to stream when needed. The alignment and location of such canals/ structures will also be pilot tested. Based on the successful model(s) or otherwise, ID will replicate or opt for alternate options.

12. These small scale irrigation schemes also offer a good opportunity for testing community driven development (CDD) approach; which is a relatively new idea in the Myanmar context. Discussions with village leaders shows that communities are willing to contribute in the form of labour provided the technical assistance is given by ID. As a usual practice in CDD, interventions are identified, executed and maintained by community members themselves. The procurement of material, labour and hiring of equipment are the responsibility of beneficiary communities while managing and utilising the finances transferred in advance to their representative(s).

13. It is expected that these models involving CDD approach and technical solutions shall be tested during initial years (preferably in the first year) allowing sufficient time for learning lessons and for

possible up-scaling. IFAD's initial implementation support missions shall closely monitor the results for such interventions and take necessary decisions based on the results achieved.

14. The existing irrigation development mechanism in Chin state ensures even distribution of irrigation water with consensus; through Village Development Committees that represents upstream/downstream farmers. Accordingly necessary resolution form upstream / downstream communities showing their satisfaction, necessary flow and acreage data; and documentation remain an integral part of each project proposal for subsequent approval at state level. The project will continue to implement the same process so that no downstream issues are ever raised.

Magway region

15. Magway region is more diversified in terms of irrigation practices and type of water sources. The region lies in dry zone, which is a part of central plain of Myanmar. It spreads across three divisions/regions (Sagaing, Mandalay and Magway). Climatically zone has two25 periods -the wet season and the dry season. The wet season lasts from May to October while the dry season is divided into "winter" (November to February) and "summer" (March to April). Mean annual rainfall in the Dry zone is lower than in the rest of the country, ranging from 500 to 1000 mm. The zone also typically experiences a brief dry spell during wet season in June/July.

16. The existing irrigation infrastructure taps both ground water and surface water while employing various means. Some of the main types are described as below:

17. **Diversion structure/weir based Irrigation schemes**: Agriculture in Puak township is benefitting from couple of such irrigation schemes. Most of these schemes are built and managed by the beneficiary communities while 2 schemes are built and managed by ID. Two main streams – Yaw and Kyaw - flowing across the township are the main source for irrigation and other domestic uses. The water is diverted from these streams through poorly constructed weirs/diversion arrangements, with little or no control structures at inlet. The water is then diverted into main canals and is brought to farm lands.

18. The diversion structures, built without complying sound engineering norms, often vulnerable to high floods and frequent silt deposits. The downstream canals are unlined and without proper cross drainage works to allow storm/flood water to pass through/across smoothly. Certain canal reaches are sometimes washed away during high monsoon and floods thus suspending water inflows to farms. During visits to such schemes, mission noticed one scheme was totally dysfunctional[26] while the other was functioning partly[27].

19. Rehabilitation of such irrigation schemes on sound engineering principles would generate sustained benefits to poor farmers in shape of reliable irrigation source and increased crop yields. Among others, design considerations in proposed schemes would include silt traps for avoiding/ curtailing silt deposits in the canals and downstream network. Efforts will be made to build synergies with other component (agriculture services) of the project with a view to have watershed management for avoiding soil erosion and curtail silt load in the run off.

20. Project will fund 5 such schemes with a total cost of US$ 0.6 million. It is expected that these schemes would benefit 2,640 acres of land while bringing about 600 acres of additional land under irrigated agriculture.

21. **Pumping based irrigation schemes:** These schemes are also based on diversion from stream/river but pumps are used to lift water for irrigating highland areas. The intake canal does not have proper water diversion arrangements/structures. Suction pipes for pumps offer no flexibility to cope with low and high flows variations. Main canal is mostly unlined and outlet structures are earthen. Despite heavy recurring expenditures (in the form of electricity charges); water losses are huge and evident all along the system as observed by the mission during field visit. The project will invest in rehabilitating one pumping based irrigation scheme with a total cost of US$ 0.06 million. This would benefit 6 villages, 692 households and would irrigate about 830 acres of land. In addition, about 530 acres of land would be brought under irrigation.

[25] (IWMI-2013): Water Resources Assessment of Dry Zone of Myanmar; Final Report for Component-1
[26] Pha Ah Nat Taung diversion weir: inlet structure and certain canal reaches were washed away during 2012 cyclone
[27] Weir near Lel Lan village: 10 out 13 villages were getting irrigation water. Supply to 3 villages was suspended due to chocked/silted up canal.

22. **Spring based irrigation schemes**: In Puak township, some villages also benefit from the natural springs to irrigate their farm lands. These schemes are few in number (7-10) and irrigate about 300-500 acres of land. The spring water is tapped at daylight point (outlet) and is conveyed to farms through small open channels with temporary earthen outlets. There is no control structure (valve) all along the system and already scarce water is subject to obvious losses at source point, conveyance and filed application. The project will fund 5 such schemes with a total cost of US$ 0.25 million.

23. **Artesian / tube well based irrigation schemes**: Ground water is abstracted for irrigation either by diesel operated tube wells or free flowing artesian wells. The such irrigation schemes started back in year 2000 from only one or two in village and increased slowly to a few up to 2010; but later witnessed a rapid increase to many dozens in a single village. The artesian wells' growth followed the same trend. The expansion was however limited to around two villages only that could offer favourable hydrogeological locations for water abstraction.

24. The project will invest in rehabilitating 15 such schemes with a total cost of US$ 0.45 million. This would help conserving scarce water resource, reducing ground water depletion rate, and improving system efficiencies. Reduced input costs (lesser labour etc.); adequate, timely and reliable water supplies to farm lands will ensure increased crop yields and in turn higher income opportunities.

25. **Storage dams based irrigation schemes**: The irrigation systems in Myaing township are largely based on storage dams. The dams have either been built and manage by ID or by communities. The ID built about 10 small earthen dams back in 1990s with varying storage capacity and heights. Mission was apprised by ID that only 5 out of ten dams are functional, though not to designed capacity; while other 5 are dysfunctional/ abandoned for one or multiple issues. Some of the reasons include; wrong site locations, small catchment area, inadequate storage capacity, reservoir leakage, limited inflows or downstream issues (inappropriate canal slopes, unlined conveyance channels, highlands etc.). However sub-optimal conditions or non-functioning of dams are not well understood owing to inadequate meteorological /inflow data, lack of catchment area information and non-availability of any design/feasibility studies readily.

26. There is huge potential for irrigating large area (about 3800 acres combined for 10 dams) if all of these dams are put fully into operation. ID currently lacks needed skill, expertise and investments to retrofit and rehabilitate existing dams. They however showed great interest in rehabilitating all or even fewer dams by the project while bringing international best practices and expertise. They are fully confident and optimistic to take up similar activities later at their own for up-scaling and replicating.

27. Project will fund rehabilitation of 3 dams based on the findings and recommendations of "Rapid Appraisal Study". Project has allocated a lump sum of US$ 0.54 million for 3 such irrigation schemes. Final selection of dams and downstream infrastructure would be done based on the prefeasibility/assessment studies performed by engineering firms (service provider); priority of communities, high impacts (benefits) against the estimated costs and IFAD's SECAP guidelines.

28. Similarly, there are more than 50 community (micro) dams, each irrigating about 30-70 acres as an average. Most of these dams are not functioning to the designed capacity due to silting up, lesser inflows, weak embankments, high seepage losses etc. During last 3 years ID has rehabilitated about 10 such dams which now benefiting more than 250 acres of land. Project will also rehabilitate 5 community dams on pilot scale with a total cost of US$ 0.15 million. The rehabilitation will irrigate about 300 acres of land. The rehabilitation will further bring about 135 acres of additional land under cultivation.

29. All of the irrigation facilities proposed in Magway region are rehabilitation of existing schemes as such there no riparian water issues do accordingly emerge.

30. *Participatory water management.* In order to ensure effective participatory water management, the project will organise the formation of water user groups (WUGs) where they do not exist, and will strengthen existing WUGs by promoting a formal organizational structure (with office bearers meeting regularly on key issues). In consultation with ID and existing informal WUGs, the project will develop a training curricula for WUGs on the O&M of irrigation infrastructure. The training will cover periodic and routine maintenance, water distribution and conservation, and record keeping, and will support WUGs in developing their own maintenance plans.

31. **Rural Access Roads.** The project will fund a few rural access roads where they are essential for relevant commodity value chains. These will be located in areas where road access is fundamental

for maximising the efficiency and impact of project value chain investments. A total of 25 miles in Chin state and 10 miles in Magway region will be financed. Consistent with its ongoing access road programmes, DRD will be responsible for any major repairs, while existing community organisations will be responsible for normal maintenance. Synergies will be created with other road development programmes of DRD and partner organisations.

32. **Home Garden Irrigation.** The project will invest in small plastic storage tank-based irrigation technology for home gardens. This activity will be targeted to women to support the cultivation of home gardens during the dry season. The focus will be on promoting diversification of crops and improving yields, to enhance nutritional diversity as well as food security for poor households. The project will finance 100 such irrigation systems, with a total cost of US$ 0.6 million, operated and maintained by communities.

33. **Land Consolidation.** The project will fund land consolidation activities on pilot scale in Magway region, adapting the model applied under the FARM project to the specific characteristics of northern Magway. About 50 acres of land will be consolidated in the first phase, with an allocation of US$ 90,000, and this activity may be scaled up based on results and farmer demand.

34. **Sub-component 1.2. Social Infrastructure**. In consultation with DRD and partners, the project will invest in social infrastructure facilities mainly at household level, particularly targeting the needs of women and the poorest households. Domestic water supply, rainwater harvesting, and renewable energy solutions (particularly solar home systems) will be eligible for support. Scheme selection will be participatory and demand-driven, sensitive to cultural considerations, and subject to social, technical, financial and environmental feasibility. Schemes design and construction will adhere to standard engineering norms, will comply with DRD specifications, and will include beneficiary involvement and contribution. The ownership, management, operation and maintenance of all facilities constructed will be carefully articulated to ensure sustainability.

35. **Domestic Water Supply.** In Chin State the access to improved water source is around 66% of total population and is 5% point higher than national average of 61%; *yet about 34% villages do not have access to improved water source and rely on poor quality water*. Typically water is available to most of the houses through taps connected to a central water tank sourced from natural spring through a network of pipes. The water availability however drastically reduces and becomes gradually scarce for 3-4 months during dry season. Accordingly women have to fetch water from long distances to meet their domestic needs. Table:6 below compares the access to water facilities by type of source for Chin state with national coverage at union level.

Table:6 Chin State: Access to Water Supply Facilities (% of total population)

State / Region	Water Source			
	Piped (Tap)	Tube Well / Borehole	Other Improved Sources*	Un-improved sources**
Chin State	65	-	1	34
National Average (Myanmar)	6	33	22	39

Source: Basic data: 2014 Census;

*include protected wells and springs, and ponds that have a treatment system

**include water sourced from unprotected wells/springs, pools/ponds/lakes etc.

36. The project will fund 28 water supply schemes with a total cost of US$ 0.64 million. Of these 15 schemes will be implemented in Mindat township while 13 schemes in Kanpetlet township. These schemes are expected to benefit 700 HHs once completed. All of these schemes have spring as prime water sources.

37. Magway region is characterised with water scarcity and salinity in shallow groundwater with regards to domestic water supply. The communities have to rely either on supply through deep tube wells installed by DRD or from rainwater harvesting ponds. The access to improved source of water supply in Magway region is estimated as 75% that is 14% point is above the national average. Yet

only 4% of HHs have tap water at their premises. Table:7 below compares the access to water facilities by type of source for Magway region with national coverage at union level.

Table:7 Magway Region: Access to Water Supply Facilities (% of total population)

State / Region	Water Source			
	Piped (Tap)	Tube Well / Borehole	Other Improved Sources*	Un-improved sources**
Magway Region	4	50	20	25
National Average (Myanmar)	6	33	22	39

Source: Basic data: 2014 Census

*include protected wells and springs, and ponds that have a treatment system

**include water sourced from unprotected wells/springs, pools/ponds/lakes etc.

38. The DRD at Magway has identified 25 urgently needed water supply schemes at estimated cost of US$ 0.53 million for Puak (5) and Myaing (25) townships. These schemes are based on deep tube wells and proposed to benefit 25 villages. The project will fund 25 drinking water supply schemes in Magway region and has allocated about US$ 0.575 million for implementation.

39. **Rainwater harvesting ponds.** In Magway rainwater harvesting pond is a common phenomenon. These vary in shape, size and construction depending upon topography, catchment area and space available. Both communities and DRD have constructed these ponds and are used for multiple purposes but largely for livestock and drinking. These are also used for indirect irrigation – as water slowly percolates and makes soil moistened even during dry season- and occasionally for direct (supplementary) irrigation. Project will fund 26 rainwater harvesting ponds in Magway region with a total cost of US$ 0.468 million.

40. **Solar Home Systems**. The access to electricity in Myanmar is very low and only 15% of total rural households are connected to grid-based electric connections. The percentage of households in Chin state is even lower, about half (8%) of national average. The situation in Magway is relatively better with 12% electricity coverage but lower than national average. There are huge numbers of households that are either without electricity or using alternate measures.

Table: 8 Percent of Rural Households by Main Source of Lighting

State / Region	Electricity	Kerosene	Candle	Solar system	Other*
Chin State	8	7	28	19	38
Magway Region	12	0	26	12	51
National (Myanmar)	15	11	26	12	37

Source: Basic data: 2014 Census; * Others include battery, generator and water mill etc.

41. The Myanmar National Electrification Plan (NEP) aims to achieve 100 percent electrification by year 2030. With the current low coverage; universal electrification challenge is huge and the task is even more challenging for remote areas where per household cost per grid connection is too high. NEP envisages a low cost role out plan (off-grid) for rural areas that are expected to connect at a later phase (closer to year 2030) and Chin state is one of such identified areas. Provision of solar home system (SHS) is one of those solutions.

42. Project will invest on 750 solar home systems (SHS) for both Chin and Magway areas. The total allocated cost is around US$ 0.15 million. Of these 200 will be erected in Chin state while 550 SHSs will be given in Magway region. SHSs will be one of the targeting interventions for project. The inherent speedy implementation will act as quick-win for project. Provision of SHSs will impact significantly on household daily activities particularly on women and for school going children while providing additional light hours for working/studying.

43. The eligibility criteria for SHSs will be developed by village committee in a participatory manner. Poorest of poor and women headed households would have priority apart from willingness to pay 10%

matching share as an average. The project is proposing matching community contribution to avoid conflicting implementation strategy28 for DRD.

44. *Participatory infrastructure management.* Implementing partners and DRD will ensure that all social infrastructure is selected, implemented, and managed on participatory and consultative basis. Schemes completed by DRD will continue to be handed over to communities for O&M. For domestic water supply, existing O&M arrangements are demonstrating to be working (proper maintenance, user charges agreed on participatory basis), and will be strengthened in hygiene awareness, chlorination and water conservation. For solar panels under individual household ownership, the project will organise relevant training (battery maintenance, shock proof wiring, correct placing and orientation of panels). Qualified social mobilizers with relevant experience will support training activities.

45. **Sub-component. 1.3 Capacity Building.** Productive infrastructure will be implemented by ID, while social infrastructure will be implemented by DRD. Both have adequate presence in the project areas, and their township offices and staff have experience in implementing similar small-scale works. However, knowledge and experience gaps remain with respect to more complex projects, and both departments lack a sufficient number of junior professionals (engineers, surveyors, etc.) to handle incremental development activities. The project will build the capacities of ID and DRD accordingly.

46. *Technical assistance.* The project will strengthen the technical knowledge and skills of ID at local level. It will support ID/Magway through the provision of technical assistance by an external service provider (such as engineering consulting firm) for the design of specific irrigation interventions. These may include river/stream diversion structures, pipe irrigation and dam rehabilitation activities. The model of external TA provision to ID under the FARM project will be scaled up in this context.

47. *Staff/office strengthening.* The project will support ID and DRD with additional junior engineers, training and exposure visits, as well as engineering equipment (total station, levelling instruments, backhoe, etc.), office equipment (computers, printers, photocopiers) and motorcycles. This facilitate smooth and efficient implementation of project activities and other development operations

48. *Water, sanitation and hygiene (WASH):* The project will raise awareness and provide training to both DRD and beneficiary communities on the importance of sanitation and hygiene related to domestic water supply schemes. The construction of every domestic water supply scheme will be accompanied by information on the importance of WASH. This will complement the activities aimed at dietary diversification (such as home gardens) to improve households' nutrition base.

49. *Nutrition awareness.* The project will partner with UNICEF for nutrition education in the project area, working especially through existing or new women's groups. In Magway, where livestock is more prevalent, the project will emphasize integrated homestead food production linking livestock with gardening to increase overall dietary diversity.

50. *Social mobilisation.* The project will provide technical assistance and support for strengthening the social aspects of infrastructure development, particularly consultative planning, participatory water management, operation and maintenance responsibilities, and environmental awareness.

Costs, Design & Quality Norms

51. Cost estimates will be based on standard rates as adopted and reflected in "Local Township Rates"29 2016 or updated. Such schedule rates are approved by regional/state governments following the recommendation of a "Rates Approval Committee" adequately representing various engineering departments and comprising of key state/regional departments. In case any item (or items) is not covered in Standard township rates and is required at site, then open market rates will be sought. In such case each item rate should be supported by at least three quotations from different vendors.

52. **Design and Quality norms:** All infrastructure activities would be designed based on standard norms following respective engineering specifications. The relevant design manuals available at ID and DRD design offices would be used as guidelines. For each scheme (productive and social infrastructure) separate project proposal would be developed and got approved by concerned ID/DRD officials within the existing government delegation of powers.

[28] DRD is implementing similar interventions with funding by state/other donors.
[29] For Chin: Mindat and Kanpetlet township rates; and For Magway: Myaing and Pauk township rates.

General Considerations

53. Climate resilient design will be done for each scheme and accordingly usual engineering designs will be modified as deemed necessary. The adaptive measure would involve modification and strengthening of designs with richer specifications, broader/larger or smaller section depending upon type and location of each scheme. Indigenous knowledge and proper site survey will help identifying traditional coping mechanisms and preliminary design parameters; which will be further refined at final infrastructure design stage. It is estimated that climate resilient adaptive measures would not cost more than 2-3% of total costs.

54. A separate project proposal will be prepared for each scheme. The project proposal will adequate cover the scheme information like brief description of scheme, area, socio-economic set up and beneficiary community, technical design, lay out plans, working drawings and detailed cost estimates. The estimates/ BOQs (Bill of Quantities) for each scheme will also cover labour and material costs with separate tables. Such break up will help assessing the temporary employment generated by each scheme and by infrastructure component as a whole. In addition maintenance plan will also become a part of this proposal that will facilitate post completion O&M of the project.

Component 2: Services.

55. The project will invest in agriculture modernisation and enabling services, organised in three sub-components: (i) agricultural modernisation; (ii) financial services; and (iii) policy engagement. The provision of services will aim to optimise resource management, productivity and economic benefits in locations of infrastructure investments.

56. **Sub-component 2.1 Agricultural Modernisation.** Will provide a broad cross-section of interventions encompassing agriculture, livestock and technical support services to ensure improved livelihoods and economic opportunities. This will be addressed by the project in the form of service delivery to farming households in the following areas: (i) technology transfer, skills improvement for productivity improvement; (ii) access to improved inputs and supplies; (iii) access to markets, market information and establishment of contractual linkages amongst value chain stakeholders (e.g. forward contracts and contract farming); and, (iv) access to financial resources through partner microfinance and/or rural finance institutions. Services will also be delivered to landless households, focusing on: (i) upgrading technical skills to develop rural micro-businesses; (ii) providing business management training; (iii) promoting market-based approaches; (iv) fostering links with other relevant actors (suppliers, traders, processors); and, (v) assisting to prepare business plans, loan applications and financial projections.

57. Based on extensive field dialogues, the demand for agricultural knowledge among rural agricultural HHs in the project area is enormous, but presently largely unmet. The areas of greatest articulated priority was for new appropriated technologies and inputs for both livestock and crops. Farmer access to agricultural knowledge is of paramount importance in order to adopt to climate change, reverse the negative environmental impact presently experienced by prevailing agriculture practises and at the same time increase agriculture productivity to reduce poverty.

58. **Knowledge Centres as a hub for promoting best practices.** It is envisaged that that the project will establish approximately 50 Knowledge Centres (KCs) across the project area (23 in Chin and 27 in Magway). KCs will serve as focal points for building the capacities of small farmer's agricultural knowledge and related technologies, and connecting them with agribusinesses. The KCs will broker services such as knowledge exchange, technology transfer, financial services, input supply, GAP certification, regional branding, value chain integration, contract farming and market information. They will support and strengthen water users' associations, savings and credit groups, and other community organisations; and will organise trials, demonstrations and farmers' field schools. Farmers will be able to access agricultural and livestock services and modern climate smart technologies.

59. KCs will provide services to landless households engaged in micro/small on-farm and off-farm enterprises. Advise will be offered on linking income generating activities with improved nutritional values of indigenous, locally available crops, and neglected/underutilised species. The identification and provision of KC services will be demand driven, based on a list of services offered. The list will be prepared and updated periodically based on research findings, on-farm demonstration results,

farmers' experiences, private sector involvement, and market considerations. It will be publicised through regular awareness-raising activities.

60. The ownership, governance and management arrangements for the KCs established under FARM have proved to be effective, and will be scaled up under WSAP. Hence, KCs will be owned by MoALI and governed by an elected, gender-balanced Board representing the ethnic groups and socio-economic categories of the rural population. They will be managed by MoALI-seconded extension officers trained for this purpose. These extensionists will broker the services demanded by KC members, utilising existing capacities in the public, private and civil society sectors. KCs will operate based on medium-term strategic plans and annual work plans and budgets. The project will finance construction and initial operation of the premises, while MoALI will cover the salaries of seconded personnel. KCs will be equipped with basic office facilities and an energy source (preferably renewable). The KC manager will obtain a motorcycle and mobile phone on hire purchase basis. In the medium term, it is envisaged that KCs will operate on cost recovery basis, being responsive to contextualised demands from households, and providing services that famers and the private sector are willing to pay for. Implementing partners will initially support KC management and operations, lead value chain analyses, promote market linkages, and help broker contractual arrangements with agribusiness. Options for KC cost-recovery based on PPPP business models will be tested and applied accordingly.

61. ***Soil and water conservation*.** In upland Magway, the KCs will focus on both rain-fed upland and irrigated lowland crops. In the upland areas, training and demonstrations will be combined with practical mechanised land preparation techniques, such as applying a green cover crop to improve water infiltration, thereby increasing moisture retention and soil fertility whilst minimising run-off. The project aims at 14,335 farming HHs adopting this technology over 90,330 acres under mixed cropping and another 4,585 HHs adopt it for mono cropping over 28,905 acres. The project support to introduction of green manure (cowpeas) on 119,235 acres which will reduce erosion from 216,412 Mt to Mt 111,485 Mt (79,632 Mt). The loss of soil nutrition before project intervention is estimated to be 671 Mt of N, 185 Mt of P2O5 and 45 Mt of K20 at a total value of USD 703,500/year. After the project it is estimated that the loss of nutrition be reduced by 50% i.e. 346 Mt N, 95 Mt P2O5 and 23 Mt of K20 at a cost of USD 351,750. Leguminous trees used as field boundaries, together with improved HV plum (either for kernel or fruit production) will be applied as wind breakers, and pruning by-products (fruit trees) will be used for fuel and fodder and green fertiliser (nitrogen-fixing trees). The aim is that 1,590 farming HHs adopt this practise over 10,000 acres of land. On-farm adaptation trials and demonstrations will be conducted early during implementation to test various water/soil conserving land preparation techniques – this will be undertaken in the spirit of a Public Private Partnership (PPP) approach involving the Departments of Agriculture, Agricultural Research and Agricultural Mechanisation in tandem with potential private sector dealers who will select appropriate seeder/fertiliser drills, soil ridger, soil ripper and groundnut decortication machine for testing prior to project start-up. In addition, equipment for compost production will also be considered.

62. In the lowlands, KC activities will include capacity building of WUAs for participatory water management and maintenance, promotion of high value crops, and system of rice intensification combined with mechanical weeding to reduce water use and increase yields. Where feasible, micro-irrigation systems for non-rice crops will also be introduced. The total area of improved land under irrigation is 7,150 of which 3,175 are incremental with a cropping intensity of 230% i.e. 15,080 acres per annum.

63. ***Agriculture information technology (AIT).*** To ensure that KCs are able to provide the latest information to farmers, the project will partner with a private company to deliver mobile phone-based AIT services and information. The system is simple to use and interactive, and will allow KC managers to provide a wide variety of information including real-time marketing information; options for farmers to link with buyers and input suppliers; crop and livestock advisory services based on drop-down menus; illustrated training modules for important crops; post-harvest processing; soil and water conservation; and livestock management. KC managers will also be able to provide customised information related to early climate warnings and changes in the regulations related to agriculture.

64. ***Sloping agricultural land technology (SALT) and starter packs***. Due to the very diverse needs of the project area, in the case of southern Chin State, a combination of an increasing population, climate change and shifting cultivation practises are creating negative environmental effects resulting in increasingly shorter fallow periods and a deteriorating natural resource base which

has contributed to the loss of 498 Km^2 of forest between 2001 and 2010. With this in mind, the KCs will operate a 'starter pack' scheme for farmers to facilitate a shift from current shifting cultivation practices to sedentary agriculture with a focus on high value crops to compensate for perceived income losses by providing immediate economic benefits to farming households in the process of cultivating the same piece of land on a permanent basis. The package is also aimed at providing opportunities for diversification of income through the testing of optimal propagation methods and introduction to farmers of other indigenous and new high value crops already cultivated by HHs in the project area (e.g. dendrobium orchid[30] and Panax pseudo ginseng[31] and 56 other potential medicinal plants registered by Ministry of Forestry of which 34 are already under cultivation).

65. The results from introduction of SALT will not only promote permanent agriculture but will also retire 63,000 acre back to natural vegetation increase carbon stock and contribute to reduced soil erosion. A study[32] measuring soil erosion on 15° and 30° sloping land in Shan (similar soil texture and structure as Chin), found that 1.76 Mt of soil per acre was eroded per year under upland maize/rice cultivation and 3.63 Mt of soil per acre from land being fallow after maize/rice. The erosion from land under forest cover amounted to 0.5 Mt per acre. Based on these finding it is estimate that before the project interventions the annual soil loss is 474.970 Mt (339,260 M^3) and after introducing SALT the erosion will drop to 226,835 Mt (162,026M^3) p.a. For each Mt of soil lost, it is estimated that 3.1 kg of N, 0.85 kg P_20_5 and 0.21 kg of K_20 will also be lost. This translates into annual loss of 1,472 Mt of N, 403 Mt of P^2O_5 and 100 Mt of K^20 with a total value of USD 1.51 million p.a. The nutritional loss will be reduced to 769 Mt N, 211 Mt P202 and 52 Mt K2O valued at USD 799,978.

66. IFAD commission a small study to identify the best mix of forest trees, shrubs and medicinal plants for inclusion in the SALT package. In Kanpetlet, the study found 34 indigenous spices and 49 cultivated crops suitable for the climate. However a market needs to be developed for most of the indigenous spices and for orchids (4) method of mass propagation is necessary for their commercial introduction. In Mindat, a total of 97 suitable plants were identified to be suitable to the geophysical conditions of which 32 were indigenous and 65 cultivated crops. Again, market for most of the indigenous crops has to be identified, and methods for mass propagation of orchids are needed for their commercialization. Interaction with wide numbers of stakeholder during final design mission revealed that most of the indigenous planting material can easily and legally be collected from the natural resource based with the exception of orchids. Orchids can only be cultivated if planting material is produced and a permit for their cultivation is obtained from the MoF. Both market development for indigenous crops and introduction of tissue propagation for orchids will be introduced by the project.

67. KCs will operate a starter pack scheme to facilitate the ongoing move from shifting cultivation to permanent agriculture, focused on high value crops within a SALT approach. This will ease the negative environmental effects of shifting cultivation under increasingly shorter fallow periods, while providing immediate economic benefits to farming households. SALT will be promoted particularly in areas prone to erosion under current shifting cultivation practices. A starter pack will include a location-specific mix of planting materials for cultivation of up to one acre of land as a resilient and highly productive agro-ecological farming system using SALT practices. The mix will include timber and fodder trees, horticulture, leguminous shrubs, herbs, medicinal plants, orchid vines, fungi, household food crops and high value crops for the market.

68. The starter packs will include planting materials, and associated training, for contour bands to anchor soil, increase water infiltration and soil fertility, and reduce erosion. Specifically, the packs will consist of: (i) mature planting material for a quarter-acre of elephant foot yam (already successfully cultivated high value crop with comparative advantage, strong market demand, and substantial growth potential), generating yields and income in the first year; (ii) improved seed for half an acre of upland rice, millet, maize and pulses; and (iii) a mix of planting material for a quarter-acre of contour bands/ hedged growth and trees for fruits/nuts.

69. The starter pack will rapidly generate outputs in the form of high value crops, food, fodder, medicine and timber for household consumption and the market. All high value crops included in the starter pack have a demonstrated trend of rising demand and prices in recent years. In particular,

[30] Domestic cultivation has begun with support from an earlier JICA project.
[31] Having a very strong commercial potential if propagation can be overcome
[32] A Study Carried out by Aung and Yi in 2003-2004 and financed by ASEAN-MAFF-JAPAN Project

global trade in elephant foot yam is assessed at US$ 1.3 billion annually, and is projected to grow by 25% p.a. over the next decade, reaching US$ 12 billion in 2026. The long-term growth prospects for coffee (speciality), macadamia and avocado are also substantial.

70. The starter pack scheme will initially operate on grant basis, and subsequently on credit basis. A number of households will be eligible for receiving starter packs, phased annually. The first year a household receives a starter pack, it will be on grant basis; in subsequent years, the same household will obtain starter packs on credit basis (through a savings/credit group or financial institution). The scheme will support 4,000 interested households to engage in permanent agriculture on 12,000 acres previously under shifting cultivation. It is envisaged that an additional 1,250 households will adopt permanent agriculture on 3,750 acres using starter packs on exclusively credit basis (without the initial grant). The project will ensure that poor households, the youth and women are pro-actively included in the starter pack scheme.

71. The starter pack scheme will require a substantial volume of quality planting materials. The implementing partners will engage the technical services of the Department of Forestry to train existing farmers, associations (such as the existing elephant foot yam association), or entrepreneurs on the management of seedling nurseries. Support willl be provided in the areas of mobilisation, site preparation, nursery management, commercialisation, and transport.

72. The environmental benefits of this activity are substantial. The transfer of 15,750 acres from shifting sultivation to permanent agriculture which will be induced by the scheme will free up shifting cultivation pressure on 78,750 with an average five years of fallow. This implies that 63,000 acres will return to natural vegetation/forest, increasing carbon stock and reducing soil erosion. Finally, some 9,500 farmers operating 23,000 acres of shifting cultivation will benefit from improved agricultural knowledge, improved seed for conventional crops, and improved marketing.

73. *Land titling in Chin state:* The expansion of sedentary agriculture in southern Chin state is constrained by the prevailing land tenure system and the lack of access to financing, particularly with respect to poorer households purchasing or leasing land for this purpose. However, dialogue with key stakeholders confirmed strong interest by landless households, who are currently practicing shifting cultivation, to lease or purchase land for sedentary agriculture; and of landowners to lease or sell land accordingly. This is already occurring where landless households can access financing. The Land Law (2012) recognises the purchase of land outright through land ownership registration (Form 7), or through hire purchase agreements and issuance of temporary ownership certificates (by DALMS under a MoALI decree) under paragraph 116 of the Land Law. The temporary form is converted into a Form 7 (ownership title) upon conclusion of the hire purchase arrangement.

74. In this context, to be eligible for receiving the initial starter pack, a household will have to either demonstrate land ownership or enter into a hire-purchase (lease) agreement (the pack will serve as guarantee of instalments to the landowner). In light of prevailing customary land ownership practices, the transformation to the mainstream regulatory and legal framework under the project will be facilitated by the implementing partners that will work with community-based organisations trusted by farmers to intermediate land tenure arrangements, link interested farmers and landowners, provide legal advice and service, and interface with the DALMS for land surveys and registration certificates. This activity will include: (i) raising awareness at village level on options to become a land owner for permanent agriculture; (ii) negotiating land available for sale, suitable for SALT, with landowners; (iii) helping to prepare and negotiate hire purchase contracts; (iv) interfacing with DALMS to undertake land surveys; (v) obtaining consent from neighbours as required; (vi) ensuring contract signature under FPIC conditions; and (vii) interfacing with DALMS to obtain temporary ownership certificates.

75. *Livestock sub-sector.* Livestock producers are an important target group for the project. In both project locations, KCs will promote improved livestock production through training of para-veterinarians, routine vaccination, improved fodder production and improved feeding regimes and practices. This is expected to increase production, animal off-take (particularly in Magway region), and financial returns, whilst reducing environmental pressure on the already poor carrying capacity of local grazing areas. The service of para-veterinarians will be 100% private and based on cost recovery. It is anticipated that KC support for fattening of cattle and domestication and breeding/fattening of Bos Gaurus in Chin State and goats in Magway region, together with general husbandry/veterinarian services will generate a sufficient business foundation for the para-veterinarians. Promotion of fattening will be fully integrated with existing markets/processors/exporters. It is anticipated up to 40

Farmers/Farmers Groups (FGs) will adopt breeding and fattening activities for Bos Gaurus cattle. A further target of 1,200 HHs/groups has been set for adopting goat fattening with a total annual throughput of 72,000 animals ready for meat production.

76. *Technical and market linkages*. KCs will develop links with DAR's Agriculture Research Institute for adaptation and dissemination of new technologies, and with state seed farms and farmers already engaged in seed multiplication. In Chin State, the project will assist in establishing a seed farm at the Agriculture Institute in Mindat; and in Magway region, the project will work with the four existing seed farms. The project will encourage linkages between the seed farms and village based seed production that will be set up by KCs. To promote nascent PPP models, private sector actors will be encouraged (through the agribusiness fund) to establish a tissue culture laboratory for multiplying planting material for yam, medicinal orchids, ginseng, potatoes and other high value crops – this will be supported by seed multiplication under contract farming arrangements. The project will also explore ways to improve the commercialisation of small farmers' production in domestic, regional and international markets through: (i) the promotion of linkages among producers and processors; and, (ii) export promotion activities such as compliance with international food safety and quality standards (MyanmarGAP, AseanGAP, GlobalGAP, HACCP, ISO, Forest Stewardship Council, International Foundation for Organic Agriculture), specific market studies/value chain analysis as an entry point for new domestic, regional and international markets. Real-time market information services will be organized through the earlier mentioned AIT mobile phone technology.

77. **Sub-component 2.2 Financial Services.** The project will support financial inclusion for small farmers, livestock owners and the landless in the project area, and will ensure equal access for ethnic groups and women. It will invest in four specific activities of which two are being implemented very successfully under the FARM project, the third is now being operationalised under FARM, and the fourth is an instrument applied by IFAD-financed projects globally. The activities are described below.

78. **Savings and credit groups (SCGs).** The project will scale up the successful experiences of SCGs under FARM. SCG governance and management modalities, standard operating procedures, and applicable rules and regulations are contained in WP3.

79. Financial literacy training will be the foundation for group formation. Service providers will be contracted to provide training to community members on basic finance, book-keeping, credit and business management; and will subsequently encourage interested youth, women and men to form SCGs, in coordination with KCs. The group formation process will include training, signature of an agreement by all members, election of officials (chairperson, vice chairperson, accountant, treasurer), and opening of a bank account. Once formed, SCGs will be trained in roles and responsibilities of officials, project procedures and services, and most importantly financial management of savings and credit operations and financial reporting. Exposure visits to FARM SCGs will be organised. Savings mobilisation will be an entry point for introducing financial services, and group members will be able to take loans for coping activities such as food, medicine, travel, house repairs, animal feed, and seeds.

80. **Rural Business Fund (RBF).** The project will scale up the successful experiences of the RBF under FARM. The RBF's governance and management modalities, standard operating procedures, and applicable rules and regulations are contained in WP3.

81. The RBF will provide matching grants for micro-enterprises owned by individuals. These grants will typically cover up to 75% of a micro-enterprise investment of a maximum USD 5,000, while beneficiaries will cover at least 25% as well as any amount in excess of USD 5,000. The beneficiary's 25% contribution can be either equity or debt financing from a third party. The RBF will operate based on periodic public calls for proposals, to be assessed according to defined eligibility criteria by an independent grant committee. RBF governance and management modalities will ensure proper operation and minimise the risk of elite capture.

82. The RBF will also provide grants to SCGs as a form of seed capital. These funds will be used for group investments in microenterprises, on revolving fund basis. The revolving fund mechanism will ensure that a number of enterprises can be created and expanded. The revolving fund mechanism also ensures the RBF sustainability at SCG level, as long as borrowed funds are repaid.

83. Enterprises eligible for RBF funding may include medicinal orchid production, mushroom cultivation, goat fattening, *Bos Gaurus* domestication, agro-processing, and off-farm services. To be eligible, proposals will have to provide viable business plans demonstrating comparative advantage,

market demand, growth potential, and job creation. Beneficiaries will be required to undergo related vocational training and accounting training. Women and the youth will be prioritised.

84. The RBF will operate based on periodic (quarterly) public calls for proposals issued by each Project Implementation Office. Proposals will be assessed against defined eligibility criteria (poverty level of the micro-entrepreneur, cost per job created, cost per any additional dollar of benefit) by each PIO, reviewed and approved by the PCC. Typical investments eligible for RBF financing would include fish production in tanks, poultry raising (chicken and ducks), small ruminants raising, and non-farm activities (e.g. furniture production, handicrafts, textiles). Agricultural services will also be promoted (equipment and machinery rental agency and repair shop, inputs agency). Proposals have to demonstrate comparative advantage, market demand and growth potential to be considered. The RBF grant facility will be disbursed in one single installment once the balance of funds necessary to finance the investment has been mobilized.

85. The RBF will be managed at the level of the PMU and executed by the PIO, on the basis of standard operating procedures consistent with IFAD"s Technical Note on Matching Grants and regional best practices.

86. **Agribusiness Fund (ABF).** The ABF's governance and management modalities, standard operating procedures, and applicable rules and regulations are presently being finalised under the FARM project. The project will scale up this activity, once it is operational under FARM.

87. The ABF will provide strategic matching grants, identified through value chain analysis, to agribusinesses interested in setting up production/processing facilities in the project area that create incremental backward/forward linkages or provide services to small farmers or livestock producers, and that generate incremental employment opportunities. Eligible investments may include processing facilities for high value crops, tissue culture propagation of yam and orchids, production and multiplication of planting materials, slaughter houses, dry meat processing, mobile veterinary clinics, oil extraction mills, and tractor hire services. At an appropriate stage, and following careful assessment of feasibility, the ABF may be transformed into a public-private-producers-partnership (PPPP) fund. Preliminary discussions with a range of private agribusinesses confirmed the substantial scale of potential contracts with small farmers that can be triggered by the ABF.

88. Competitive ABF grants will typically cover up to 40% of the agribusiness investment cost of maximum USD 400,000, while the agribusiness will finance at least 60% as as well as any amount in excess of the USD 400,000. The ABF will operate based on periodic calls for proposals issued by the project. Proposals will be assessed against defined criteria by project management and a reputable auditor, reviewed by an independent grant committee, approved by the National Project Steering Committee, and cleared by IFAD. The aim is to support around 70 SMEs during project implementation. Proposed commodities will have to demonstrate comparative advantage, market demand and growth potential in order for proposals to be considered. Robust technical assistance will be provided to build the ABF's due diligence and operational capabilities.

89. The ABF will operate based on periodic (semi-annual) calls for proposals issued by the each Project Implementation Office in line with the project planning for the development of irrigated land and specific schemes. Proposals will be assessed against defined criteria (number of smallholders contracted, increases in unit prices paid to farmers, volume of production purchased, number of jobs created, private investor’s financial and technical expertise and willingness to share knowledge and build up capacity of smallholders) by each PIO, reviewed by an independent Grant Committee, approved by the State PCC, and cleared by both the National Project Steering Committee and IFAD. ABF equity facility will be disbursed in one single installment at signature of the bylaws of the company based on the actual percentage held by the producers’ entity in its share capital while the ABF grant facility will be disbursed in two installments: the first upon signature of the bylaws and the second within 24 months of signature of the bylaws when the above-mentioned criteria have been met. Benefitting agribusinesses will be required to provide technical support to smallholders, particularly in production efficiency and quality control. It is expected that ABF operations will generate substantial quantifiable economic benefits for smallholders, rural employment opportunities, economic multiplier effects, and tax revenues for the State government. Producers’ entities will be periodically controlled by each PIO to ensure proper reimbursement of the equity grant.

90. **Refinancing**. Myanmar's formal financial sector is small and underdeveloped, with one of the lowest levels of penetration of financial services in the world, and with a ratio of credit to GDP of only

12%. Access to basic financial services is very low, which is a major obstacle to economic growth. Myanmar's financial institutions are small and unsophisticated; the 23 private commercial banks have on average only US$ 25 million in capital each. The microfinance industry as similarly small, MFIs provide microloans to less than 2% of the population, the majority of which in urban areas in the southeast and delta regions. The sector is further constrained by the limited set of financial products offered – mainly savings and deposits instruments and short-term loans[33]. Conversely, 18% of the population has outstanding loans with the informal financial sector (ie unregulated credit providers) amounting to approx. US$ 4.75 billion at exhorbitant interest rates (from 3% to 8% per month). This can be used as a proxy for latent demand for credit.

91. Loans to the agriculture sector represent only 2.5% of all outstanding loans. The MADB, which is virtually the only source of formal credit for farmers, has an outstanding loan portfolio of only US4 84 million, mainly for seasonal loans (five months duration) for rice production. Moreover, access to financial services and market penetration of formal financial institutions are lower in Chin and Magway than the national average, and the incidence of unregulated borrowing higher. Many farmers and landless households in these areas are trapped in a vicious cycle of indebtedness and poverty.

92. The project will address these problems in two ways. First, it will provide a slightly discounted line of credit (near-market rates) to refinance project-related agriculture, livestock and enterprise lending operations of licensed financial institutions (INGO/MFIs, commercial banks, MADB). Eligible financial institutions will be those that are interested to participate, are financially sound, comply with best industry practices in a transparent manner, view rural and agricultural lending operations as part of their growth strategy, and intend to apply their own commercial terms and conditions to onlending. Such support to financial institutions will be based on a clear exit strategy founded on their medium term business plans demonstrating sustained and increased rural lending operations.

93. The credit line will be managed by a reputable private sector audit firm selected through a competitive process and contracted on performance basis. The selected audit firm will manage the funds allocated under the project for on-lending to licensed Financial Institutions (FI) interested to establish outreach within the project area. It will call potential FIs to express their interest to participate in the refinance operation and shortlist those financial institutions that will use the refinancing facilities and funds to on-lend to rural clients. The NPSC will provide the final approval for those FIs to participate in the refinancing operation. The project will refinance eligible requests from the Participating Financial Institution (PFI) for on-lending to its rural clients. The PFI will return the refinancing funds at predetermined time according to the Subsidiary Loan agreement entered into with the Ministry of Planning and Finance. The cost of funds for credit line will consist of interest charged on IFAD loan 0.75% plus 1% for management fee.

94. Secondly, the project will support participating financial institutions to establish service delivery in southern Chin and northern Magway by cost-sharing local service points (fixed and mobile) and by offering capacity building and technical assistance to help them develop savings and lending products appropriate for the agriculture and rural sectors[34]. It is important to note that these forms of support are complementary to private sector efforts to expand formal financial services. They are also consistent with the policy operationalisation framework of the recently-approved Financial Sector Development Project (IDA/WB) and the partnership and financial inclusion agendas of the Sector Working Group.

95. **Sub-component 2.3: Policy engagement.** The objective of is to contribute to an evidence-based and inclusive policy framework for rural development in Myanmar, specifically related to the project's implementation experiences. There are currently three specific issues being addressed by the project, where there is an evident policy gap: (i) transition from shifting to sedentary agriculture and associated customary land laws; (ii) re-categorisation of high-value commercial crops from non-timber forest product to agricultural or industrial crops; and (iii) agricultural service delivery and market linkages. The project will support the formulation of policies and regulations necessary in these areas to enhance and sustain project investments, and to contribute to broader agricultural modernisation. Policy engagement will also aim at scaling-up successful approaches to other states and regions of the country, and will contribute to the project's exit strategy.

[33] *Myanmar: Financial Sector Development Project*, PAD, IDA/WB, November 2016.

[34] There is keen interest particularly by reputable MFIs under the Myanmar Microfinance Association (MMA) and the PACT umbrella to increase rural outreach, spurred by the recently revised microfinance law.

96. Policy engagement activities will be supported through: (i) provision of technical assistance to the Government to undertake analysis of operational experiences focusing on a spectrum of issues, including customary land tenure systems, transition from shifting to sedentary agriculture, production of high-value crops, pluralistic extension service models, commercial development of the livestock sector, introduction of SALT, and soil and water conservation; (ii) provision of technical assistance to MoALI to undertake evidence-based technical review of existing practices and policies, laws and regulations; (iii) support for inclusive stakeholder consultations at regional and national level (ensuring they reflects the views of rural women, youth, small farmers, ethnic groups, and the private sector) and consensus building on the proposed policy; and (iv) facilitating the drafting of relevant policies and implementation plans.

Appendix 5: Institutional aspects and implementation arrangements

1. Myanmar is starting to accumulate experience in managing and implementing externally-funded investments in the agriculture sector. While public sector capacity in the sector has historically been weak, it is gradually improving due to recent capacity building support provided by IFAD, JICA, WB and other partners. Development assistance in rural areas to date has largely focused on grant-based activities of NGOs operating at limited scale. The private sector, particularly in rural areas, generally remains under-developed and concentrated; widespread compliance with the rule of law and adoption of ethical business practices is considered to be a medium term prospect.

6. The national decentralisation process is at a relatively early stage, and state-level institutions involved with agriculture and rural development are weak. Development activities in remote rural areas and ethnic states have largely been implemented by NGOs operating in isolation and at limited scale. The major NGOs have by now gained valuable knowledge and experiences in engaging with ethnic communities in a culturally sensitive and consultative manner. The project will engage an implementing partner in each location to interface with communities, lead social mobilisation, build community organisations, organise investments, and help build relevant public sector capacities.

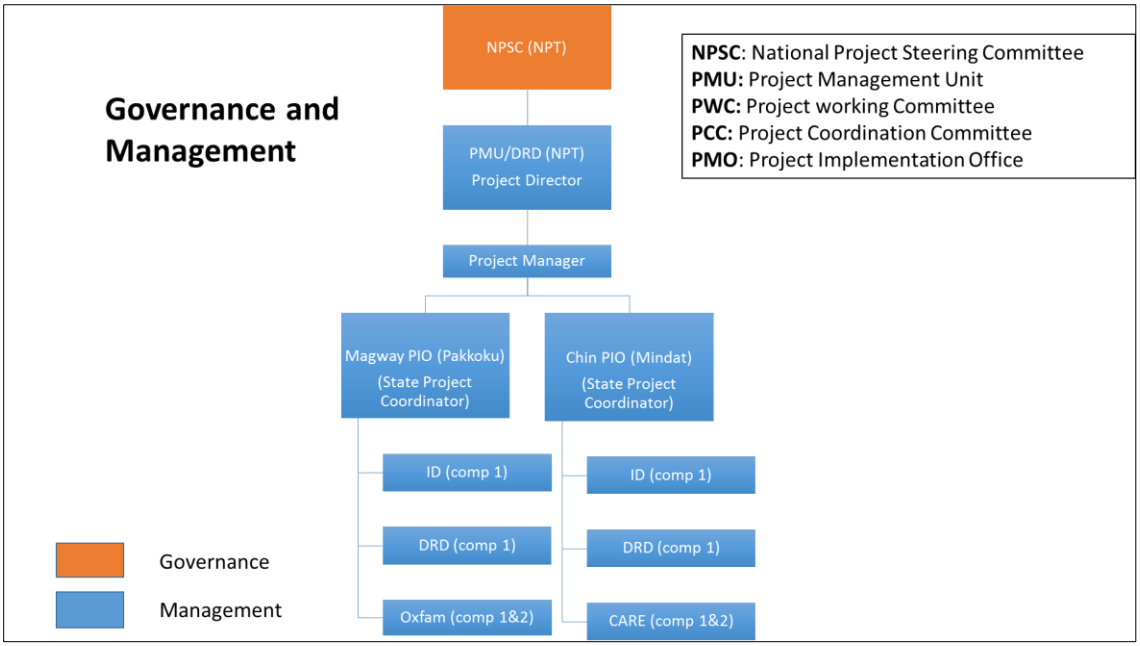
7. The private sector, particularly in remote rural areas, generally remains under-developed and concentrated. In particular, significant penetration in rural areas, widespread compliance with the rule of law, and the adoption of ethical business practices, are areas requiring strengthening on priority basis. The project contains a set of instruments carefully designed to entice increased private sector presence and operations in the project areas, on a legally-compliant, ethical and responsible basis.

8. In light of the above, the project implementation approach is to: (i) strengthen state-level MoALI and other relevant agencies, and increase their responsibilities to implement activities in a sequenced manner; (ii) engage with reputable NGOs as implementing partners to initially lead community development activities and to gradually devolve responsibilities to public agencies as their capacities mature; (iii) establish small state-level Project Implementation Offices (PIO) to manage, coordinate, and monitor activities; (iv) establish a Project Management Unit (PMU) within DRD and will be integrated with DRD structures. It will be responsible for implementation through contracts with implementing partners and public and private entities, and to discharge policy and interface functions. The project contains a grant to support operational and fiduciary capacity building.

Organizational Framework

9. **Governance.** The project will be governed by a National Project Steering Committee (NPSC) at Union Level, and a Project Coordination Committee (PCC) each in Magway and Chin (ref. Figure 1).

Figure 1: Project Governance and Management Structure



10. The NPSC will be chaired by the MoALI Deputy Minister. Its membership will include senior representatives of relevant MoALI departments (Office of the Minister and Departments of Planning, Irrigation, Rural Development, Agriculture, Agricultural Research, Livestock, Agricultural Land Management and Statistics) and representatives of MoPF and MoNREC. Representatives of the state-level MoALI will be represented in the NPSC to the extent feasible. The Committee will convene in Nay Pyi Taw. Its responsibilities will be to provide strategic and policy guidance, endorse consultants' selection, approve annual work plans/budgets, and oversee the external audit process. The PMU in Naypyitaw will act at the NPSC's secretary. The NPSC will convence in Naypyitaw at least once every quarter.

11. Its responsibilities will be to provide (i) strategic and policy guidance to the PMU and PIOs; (ii) ensuring efficiency and fiduciary compliance; (iii) endorse key staff selection; (iv) approve annual work plans and budgets; (v) oversee the external audit process, and (vi) conflict resolution.

12. The PCC will be the working unit of the Project in the respective states. It will provide guidance and oversight for the daily management of the project and ensure the achievemnet's of the project's objectives. The PCC will be constituted in each state/region at the district level. It will be co-chaired by the representatives of MoALI and the Ministry of Home Affairs. Membership will include representatives of relevant state-level Ministries and MoALI departments, Implementing Partners and representatives of community organizations. Its responsibilities will be to meet to provide overall guidance, approve annual work plans and budgets, endorse consultants' selection, review progress reports, and ensure coordination. The PCCs will convene in Mindat (Chin) and Pakkoku (Magway) on regular basis at least once a month.

13. At the village track level, the PIO would set up the Village Track Facilitation Group, that will be chaired by an elected leader of the community. The Village Track Facilitation Group will be key to ensure: (i) effective participatory approach for selection of targeted beneficiaries; (ii) effective focus on poorest households and inclusion of women and youth in project activities; (iii) effectiveness of various service recipient groups (farmers'CIGs, landless CIGs, WUGs, Coomin resources users' groups etc); (iv) reporting of reliable project progress implementation at village level.

14. **Central level management.** The Department of Rural Development (DRD) will be the focal department of the project. It will be responsible and accountable for the performance and results of the project. A Project Management Unit (PMU) will be established within DRD and will be integrated with DRD structures. It will be responsible for project implementation, fiduciary management

(including financial management, procurement and contracting, legal compliance), work planning and budgeting, and monitoring and evaluation, and progress reporting.

15. The PMU will be headed by a Project Director from the DRD appointed by MoALI. Daily operation of the PMU will be the responsibility of a Project Manager recruited from the market through a competitive process. The PMU will be staffed by: (i) relevant assigned officers from DRD, and other MoALI departments as required; and (ii) a set of consultants, recuited competitively on-demand basis (agribusiness/value chains; rural finance; community development and gender; accounting; procurement, M&E). As per national guidelines, assigned MoALI staff will be remunerated on Government terms and conditions, while consultants will be remunerated at competitive market rates.

16. **Central financial management.** Project financial management will be administered by the existing Finance Unit of DRD. The DRD will assign a Finance Officer and accounts staff from its existing staff specifically for the project, who will work under the supervision of the unit's Finance Director. This DRD Finance Unit will be supported by two consultants within the PMU, namely a Finance Officer and an Accountant.

17. **State level management**. One Project Implementation Office (PIO) will be established in each State. In Chin State, it will be located in Mindat and in Magway region, it will be located in Pakkoku. The PIO will be responsible for coordinating implementation at state level and for monitoring and reporting on progress. The PIO will be headed by a state Project Coordinator, to be assigned by DRD from its state-level. The PIO will be staffed by assigned officers from relevant state MoALI departments (DRD, DoA) and relevant Ministries (such as MoNREC). The Project Coordinator will have the responsibility of coordinating with implementing partners.

18. The PIOs will be supported by Implementing Partners. The Implementing Partners will provide necessary technical staff to ensure quality of implementation. In each state, it will provide a Project Implementation Advisor for the duration of the project, and specific TA (for example in participatory irrigation management, agriculture value chains, enterprise development, rural finance, financial management, gender and community development, M&E).

19. **State financial management**. State-level financial management will be administered by the existing Finance Unit of state-level DRD. It will assign a Finance Officer and accounts staff from its existing staff specifically for the project, who will work under the supervision of the unit's Finance head. This DRD Finance Unit will be supported by an Accountant within the PIO.

20. An institutional capacity assessment of relevant MoALI departments in southern Chin state and northern Magway region was undertaken as part of the design process. The assessment evaluated institutional structure and culture, and capacity to carry out administrative and technical functions. A capacity building plan has been formulated to address the institutional weaknesses identified and to enhance state-level MoALI's implementation capabilities (ref. WP 6). The project will invest in capacity building accordingly, through technical assistance, training, and exposure visits. This programme will cover all levels – state/regional/district level MoALI, PMU, PIOs, KCs and community organisations. It should be noted that project interface with ethnic communities will be intermediated by facilitators and technical specialists with local language capabilities. A project implementation manual will be developed, building on the manual prepared under FARM.

Institutional capacity building

21. An institutional capacity assessment of relevant MoALI departments in southern Chin state and northern Magway region was undertaken as part of the design process. The assessment evaluated institutional structure and culture, and capacity to carry out administrative and technical functions. A capacity building plan has been formulated to address the institutional weaknesses identified and to enhance state-level MoALI's implementation capabilities (ref. WP 4). The project will invest in capacity building accordingly, through technical assistance, training, and exposure visits. This programme will cover all levels – state/regional/district level MoALI, PMU, PIOs, KCs and community organisations. It should be noted that project interface with ethnic communities will be intermediated by facilitators and technical specialists with local language capabilities. A project implementation manual will be developed, building on the manual prepared under FARM.

Implementation Arrangements

22. The project will be implemented by state-level MoALI, implementing partners, and the private sector. Two Implementing Partners (IP) will be identified, as cost-sharing partners.

23. The PMU will enter into an agreement with each implementing partner for the purposes of the project. Should PMU and either implementing partner fail to reach a mutually acceptable agreement, alternative implementing partners will be identified by MoALI and IFAD. Implementing partners will be required to cost-share project activities in the respective locations. The agreements with implementing partners (and with all service providers) will be performance based.

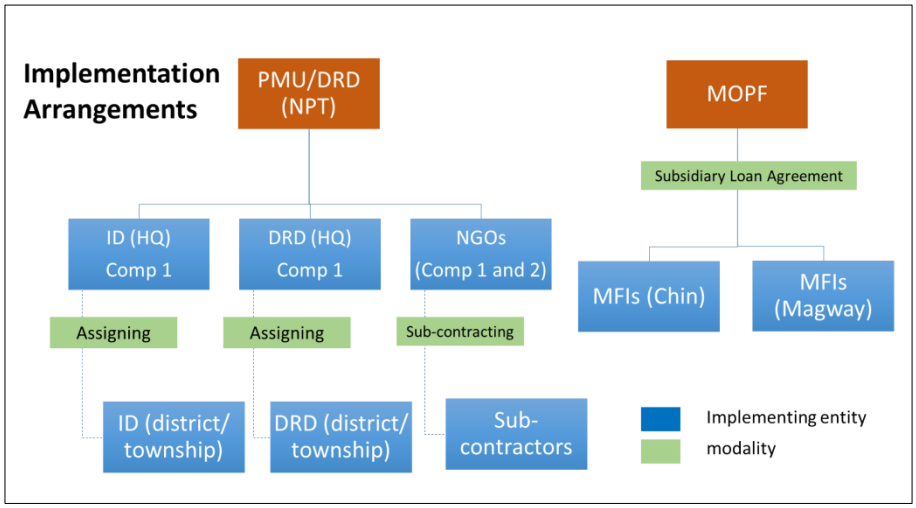
24. The specific responsibilities of the implementing partners will consist of: (i) social mobilisation for infrastructure; (ii) agricultural modernisation; (iii) rural financial services (apart from refinancing); and (iv) policy engagement. The implementing partners will initially lead these activities, and gradually devolve responsibilities to public sector agencies as capacities develop. The implementing partners will sub-contract service providers from the public and private sectors as required.

25. Specific implementation arrangements for project activities are outlined below (ref. Figure 2).

- *Sub-component 1.1: Productive Infrastructure.* Lead responsibility for irrigation development and pilot land consolidation is vested with ID/MoALI. An engineering firm will be contracted to support design, verify construction norms and unit costs, supervise civil works, and provide TA. Lead responsibility for rural access roads and home garden irrigation technology is vested with DRD/ MoALI, with design support as required. Civil works will be undertaken by private sector firms. Supervision of all productive infrastructure schemes will be multi-level, involving ID/DRD, PIOand community groups. Implementing partners will lead community mobilisation and the free, prior and informed consent (FPIC) process before the commencement of any civil work. Implementing partners, jointly with ID, will also lead the formation of infrastructure O&M groups and water users' groups.
- *Sub-component 1.2: Social Infrastructure*. Lead responsibility for social infrastructure is vested with MoALI/DRD, with design support where required. Civil works will be undertaken by private contractors where required. Supervision of all social infrastructure schemes will be multi-level, involving DRD, PIOand community groups. Implementing partners will lead community mobilisation and the free, prior and informed consent (FPIC) process before the commencement of any civil work. Implementing partners, jointly with DRD, will also lead the formation of infrastructure O&M groups and mechanisms.

- *Sub-component 1.3: Capacity Building*. Lead responsibility is vested with the PMU and PIOs, operating through contracted engineering firms for capacity building of ID/DRD in surveying, engineering design, BOQs, drawings, and costing. Implementing partners will lead activities related to WASH and nutrition (in partnership with UNICEF).
- *Sub-Component 2.1: Agricultural Modernisation*. Lead responsibility is vested with the MoALI extension service, in collaboration with implementing partners. KCs will be constructed by private sector contractors. Operational support for social mobilisation will be provided by implementing partners. Implementing partners will lead land tenure activities (in consultation with DALMS) and value chain analysis and development. The Department of Forestry and Yam Producers Association will be involved in the coordination and implementation of seedling nursery development.
- *Sub-Component 2.2: Financial Services.* Lead responsibility for formation and strengthening of SCGs is vested with Implementing Partners, under PMUand PIO oversight, with support from the Myanmar Microfinance Association. Lead responsibility for the rural business fund will be vested with the implementing partners, supported by the PIOs and relevant KCs. Lead responsibility for ABF is vested with the PMU, under MoPF oversight, supported by the PIOs and relevant KCs. Refinancing will be managed by an auditor while refinanced loans will be administered by licensed financial institutions (NGOs, PACT, MFIs, commercial banks, MADB) under subsidiary financing agreements with MOPF.
- *Sub-Component 2.3: Policy Engagement*. Lead responsibility is vested with the implementing partners, with support from competitively recruited technical assistance as appropriate.

Figure 2: Implementation Arrangements



26. **Partnerships.** The project will apply the partnership strategy outlined in the COSOP. Several kinds of partnership will be developed during implementation, as outlined below.

i. *Structured co-financing partnerships* with implementing partners to cost-share relevant project activities, with financial institutions to co-finance lending operations, with agribusinesses to co-finance processing facilities, and with communities to co-finance infrastructure works.

ii. *Private sector partnerships* with a range of value chain actors for value chain integration, such as input suppliers, traders, processors, transporters and exporters; with financial institutions for financial services; and with stakeholders for PPPP arrangements.

iii. *Knowledge partnerships* with knowledge providers such as UNICEF, the World Agroforestry Centre and ICIMOD, with implementing partners, with operational service providers such as UNOPS, and with microfinance advisors such as PACT and MMA.

iv. *Advocacy partnerships* with organisations that advocate for the rights of ethnic groups and indigenous peoples, for access of the poor to assets and services, for land tenure security, and for gender equality.

v. *Policy partnerships* with Government agencies and development partners through sectoral working groups and similar platforms.

Component 1: Infrastructure

27. IWUMD and DRD of MoALI shall be the key implementing agencies for infrastructure component. The IWUMD will execute irrigation facilities and peco / micro hydro schemes. While DRD would be responsible for implementing for implementing drinking water, rain water harvesting, rural access roads and storage tanks for kitchen gardening. Respective township offices would be physically executing the infrastructure schemes at site. Respective township office will be responsible for surveying, designing and implementing of schemes. Township officers/engineers shall prepare detailed bill of quantities (BOQ), cost estimate based on standard township rates, prepare layout plans and necessary drawings, and executes the scheme at site. IWUMD and DRD are expected to have close coordination with beneficiary communities directly and/or through social mobilisation partners throughout the project cycle.

28. Table:1below illustrates the implementation responsibility of IWUMD and DRD by type of infrastructure schemes.

Table:1 Implementation Responsibility by Type of Scheme

Scheme Type	Implementing Department
Irrigation	IWUMD
Land Consolidation (pilot scale)	
Peco /micro-hydro power	
Domestic Water Supply	DRD
Rural Access Roads	
Solar Home System	
Storage tanks for home gardening	
Rain Water Harvesting Ponds	

29. The implementing partners (IP) will be responsible for ensuring through consultation and participation in the selection and design of infrastructure works. The IP will undertake a number of consultation sessions with communities by proactively involving all cross sections of the beneficiary village. Special focus would be given to poor, women headed households and ethnic minorities. The IP will ensure that each scheme would be inclusive having wider benefits and adequately address equity issues, if any, particularly for marginalised communities/households.

30. The IP will also be responsible for ensuring the establishment of effective participatory water management systems, and formation and/or strengthening of water user groups (WUGs). The IP will develop training curricula for WUGs (in consultation with IWUMD) for maintaining existing/ rehabilitated irrigation infrastructure. The curricula should include material (implications, challenges and best practices etc.) focussing on the farmers who are likely to change cultivation practices - from rain-fed shifting cultivation to irrigated-cultivation. The training will cover periodic and routine O&M of main canal/distributaries and control structures; water conservation at conveyance and at downstream network; and on record keeping. IP will further take the lead in informing farmers about crops requiring less water, adopting appropriate crop patterns for optimal use of water available at farm inlet.

31. The implementing partners will work with the Village Track Facilitation groups for O&M and cost-recovery mechanisms of drinking water supply schemes. The IP will also be responsible for dissemination of information relating to health and hygiene awareness to communities and beneficiary households in collaboration with UNICEF.

32. External serviced providers (engineering consulting firm) will be responsible for providing technical and engineering backstopping to ID Magway and Chin. The service provider will be expected to carry out the tasks including: identification of key irrigation infrastructure to be rehabilitated with particular focus on weir and dam based irrigation schemes; detail engineering design, preparing of working drawings and bill of quantities, engineering estimates, bidding documents and supporting IWUMD in evaluating contractors' bids.

33. Private sector contractors will be engaged by both DRD and IWUMD for executing higher value[35] (cost) infrastructure schemes. These contractors will be selected based on an open and transparent competitive bidding process.

34. Water user groups (WUGs) / Village Track Groups (VTG) will be responsible for identifying a need based scheme(s) that ensure wider benefits. They will support implementing partners in actual execution of schemes by monitoring the quality of work, ensuring provision of local material and labour (at market price) if required. Village development committee will resolve any conflict, if arises, during implementation. For each scheme, village development committee will submit a written request to IWUMD/DRD signed by beneficiary households for allocating necessary budget for the scheme. WUGs and VTGs shall jointly be responsible for post completion operation and maintenance of scheme while ensuring and putting in place a contextually feasible cost recovery mechanism.

[35] While following their respective existing norms/rules

- *Sub-component 1.1: Productive Infrastructure.* Lead responsibility for irrigation development and pilot land consolidation is vested with IWUMD/MoALI. An engineering firm will be contracted to support design, verify construction norms and unit costs, supervise civil works, and provide TA. Lead responsibility for rural access roads and home garden irrigation technology is vested with DRD/ MoALI, with design support as required. Civil works will be undertaken by private sector firms. Supervision of all productive infrastructure schemes will be multi-level, involving IWUMD/DRD, PIOs, and community groups.
- *Sub-component 1.2: Social Infrastructure*. Lead responsibility for social infrastructure is vested with MoALI/DRD, with design support where required. Civil works will be undertaken by private contractors where required. Supervision of all social infrastructure schemes will be multi-level, involving DRD, PIOs, and community groups.
- *Sub-component 1.3: Capacity Building*. Lead responsibility is vested with the PMU and PIOs, operating through contracted engineering firms for capacity building of IWUMD/DRD in surveying, engineering design, BOQs, drawings, and costing. Implementing partners will lead activities related to WASH and nutrition (in partnership with UNICEF).

Component 2: Services

35. The component would be managed by the Project Implementation Office (PIO) established in Chin and Magway. In Chin and Mahway the PIOs will be supported by implementing partners (IPs). The IPs will provide management, financial and technical support to implementation of the component. The IPs will provide a technical expert to support the KC activities with particular focus on the introduction of SALT in the uplands of Magway and in Chin. They will also provide technical expert for livestock development in Magway.

36. A Participatory Land Use Planning (PLUP) team will be set up by the PIO/IP especially to support in support the process of participator consultation for the pilot land consolidation in Magway and for the land hire purchase scheme to be piloted in Chin state. In Chin, the PLUP team will also support the landlords/custodians obtaining Form 7.

37. A rural financial specialist will also be part of the PIO who will provide training to households engaged in savings and credits groups, Rural Business Fund activities and households which want to benefit from any rural finance related activities promoted by the project. Terms of references for these positions will be prepared during the development of the PIM.

- *Sub-Component 2.1: Agricultural Modernisation*. Lead responsibility is vested with the MoALI extension service. KCs will be constructed by private sector contractors. Operational support for social mobilisation will be provided by implementing partners. Implementing partners will lead land tenure activities (in consultation with DALMS) and value chain analysis and development. The Department of Forestry and Yam Producers Association will be involved in the coordination and implementation of seedling nursery development.
- *Sub-Component 2.2: Financial Services*. Lead responsibility for SCGs is vested with KCs, under PMU and PIO oversight, with support from the Myanmar Microfinance Association. Lead responsibility for RBF and ABF is vested with the PMU, under MoPF oversight, supported by the PIOs and relevant KCs. Refinancing will be managed by an auditor while refinanced loans will be administered by licensed financial institutions (NGOs, PACT, MFIs, commercial banks, MADB) under subsidiary financing agreements with MOPF.
- *Sub-Component 2.3: Policy Engagement*. Lead responsibility is vested with the implementing partners, with support from competitively recruited technical assistance as appropriate.

Appendix 6: Planning, M&E and learning and knowledge management

Community-based Planning

1. Annual Work Plan and Budget (AWPB) would be the key management tool for planning, monitoring and reporting on implementation of activities. The AWPBs would be based on the design report, cost tables, project implementation manual and informed by operational experiences and supervision mission reports. The Project Logical Framework should be used as the main reference for formulating the AWPB, to create clear linkages between proposed activities and budget requirements and expected outputs, outcomes and impacts (annual targets vs. achievements).

2. The WSAP would follow a participatory planning approach in the targeted areas to ensure that the project's interventions would best reflect the needs of the target groups and the local context. The participatory planning approach would be led by the Project Implementation Office at the state level and the outcome of this participatory planning would be integrated into the Annual Work Plan and Budget (AWPB) to be consolidated by the PMU at the central level.

3. Building on participatory planning processes undertaken in FARM and other IFAD-supported projects/programmes in other countries, the planning process would be based on consultations with beneficiaries at the village level. Furthermore, a Participatory Monitoring and Evaluation (PME) system would also be established at the village level to track and rate progress against village plan targets, monitor their progress and identify implementation issues. These two approaches are aimed at achieving community empowerment and ownership and ensuring transparency during Programme implementation. The participatory planning and monitoring activities would be led by the PIOs, with support of service providers.

Project M&E structure

4. The Monitoring and Evaluation (M&E) system of WSAP will be designed to provide reliable information to facilitate a results-based management of the Project. The M&E system would be aligned to on-going projects of IFAD and will also contribute to strengthening MoALI's ODA effectiveness monitoring system. The main objectives of the project's M&E system are to:

- *steer project implementation*: provide project stakeholders with the information and analysis required to measure project outputs and outcomes; assess project effects on the livelihoods of participating households; assess the relevance of the project's implementation strategy and processes; identify lags; and support overall decision-making to improve project performance;
- *support economic decision making:* provide information to the implementing agency, participating beneficiaries and other stakeholders, with the information and analysis needed to assess the return brought by project investments, especially for developing profitable activities and to adapt their strategies accordingly, by monitoring both quantitative (yields and production, margins, credit management) and qualitative results (members'/clients' satisfaction);
- *support policy-making*: the M&E system would provide government with information to measure project's contribution to the implementation of overall MoALI national strategies, and provide data and analysis to government towards evidence-based policy making.

5. The M&E system would have three levels of monitoring: output, outcomes and impact and would provide information by poverty status, gender, and ethnicity. Where appropriate, outcome and impact indicators would be disaggregated by poverty quintile.

- *Output monitoring* would measure the progress of activities and achievement of outputs against targets in the AWP&B for each Project component. The output measures would be directly associated with output targets and indicators as expressed in the project logical framework. Physical and financial progress reports would be the primary outputs of this exercise. Data would be collected by district project working teams, service providers and Knowledge Centre managers. The data would be collated first at the

district level, then consolidated for the state at the PIO and finally for aggregation at the PMU in NPT.

- *Outcome monitoring* would measure the changes coming about as a result of Project and programme interventions. This would entail annually measuring and assessing whether the project is moving towards achieving its objectives. Annual outcome surveys would be undertaken to measure these changes, which shall also collect data for 2nd level RIMS indicators. The surveys would be coordinated by PMU, cover separate random samples, and would monitor the changes in the phased cohorts of beneficiaries. Information on the effectiveness of trainings would be assessed via Knowledge, Attitude and Practice (KAP) surveys carried out each year by state-level M&E officers.

- *Impact evaluation:* shall assess the contribution of WSAP in achieving the overall goal of the Programme. It would consist of baseline, mid-term and end-of-project surveys. Commissioning of these surveys shall be coordinated by PMU, and contracted to an external service provider. Information to be collected would include the impact level indicators of IFAD's Results and Impact Monitoring System (RIMS) as identified in the project logframe.

6. Apart from the three levels of monitoring, the project would also monitor processes. This would involve monitoring the processes leading to outputs and outcomes. Specific areas where progress monitoring would applied include the provision of technical services, election of KC governing bodies, awarding of matching grants. Information on these may be gathered via PIO, as well as from service provider records.

7. Furthermore, special studies would be undertaken at mid-term review to assess: (i) improvement in production and productivity (both agriculture and livestock productivity); (ii) improvement in market access and income of smallholder farmers; and (iii) use and benefits of KCs; and (iv) delivery systems and implementation methodology/approaches adopted by service providers. Other studies would be undertaken as deemed necessary by the PMU and MoALI.

8. The M&E data would be collected through the following mechanisms:

- *Management Information System-generated:* data would be collected using semester reporting forms. The forms consist of mainly output indicators. In addition, information on outcome, when appropriate, would also be collected in the forms. These reporting forms would be composed differently depending on levels of management.

- For village level, the forms would be designed in simple spreadsheet formats, to be compiled quarterly. Village-level forms would be sent to district project offices for data compiling at the district level. At state-level PIO, M&E staff would compile the reporting forms from villages to formulate the district reporting forms in spreadsheet format. Part of this data compilation would be carried out by using macros to generate results automatically. State-level data will then be sent to PMU for data analysis at the project level. The PMU shall then compile the consolidated data into the MIS system.

- *RIMS+ impacts surveys:* The RIMS+ impact surveys are conducted at baseline, mid-term and project completion. The RIMS+ impact surveys would be conducted in line with the IFAD's RIMS Impact Survey Guidelines (2014), which lays out a framework and practical guidance for conducting these surveys for all IFAD-supported projects. Additional adjustments to the standardised RIMS impact survey questionnaires and processes would be made to reflect the characteristics of the project area and activities. The RIMS surveys would be adapted to include data related to extra indicators from the project logframe. They would also be structured to capture project flow-on benefits and non-project influences on project results.

- *Other data collection tools:* relying on the RIMS impact surveys as the key data collection mechanism to inform outcome and impact of the program may prove to be insufficient. As RIMS impact surveys are largely a quantitative data collection tools based on household questionnaires, it is likely that some important outcome or impacts of the project might not be well captured. Some additional data collection tools are thus needed. These tools would be tailored to specific interventions. The PMU would determine the need for such additional data collection for qualitative analysis of progress

(such as effectiveness of processes and beneficiary satisfaction) and develop the necessary tools for data collection.

Management Information System (MIS)

9. An MIS shall be established in the first year of project implementation. The system would provide information on physical and financial progress, procurement plans and progress as well as on baseline conditions, outputs and outcomes and other pertinent information. These would be automated to generate regular periodic reports (monthly and quarterly) and annual progress reports. For IFAD corporate reporting, semi-annual and Annual Progress Reports are required.

- *Quarterly Progress Reports* would be generated from the project MIS at district level. Information in the report would contain component-wise physical and financial progress against annual targets. This report would form the basis for quarterly progress review at district levels.
- *Semi-annual and Annual Progress Reports* would be prepared from information compiled by the PMU on component-wise physical and financial progress, and loan category wise progress from the project MIS. It would contain summarised information from villages visited by M&E staff, findings from PME, annual outcome surveys and any other surveys. They would show progress towards development objectives, and also problems that are not adequately addressed, degree of responsiveness of the staff of different support agencies, usefulness of training, performance of service providers, successes and failures, gender equality and knowledge management.

Implementation arrangement

10. Staffing: The M&E Officer at the PMU, who is the Project's lead M&E staff, shall be based at the NPT office; and shall be supported by M&E officers at each PIO. The PMU M&E Officer shall develop the overall framework for project M&E in accordance to the project design document M&E plan and coordinate with national surveys and studies. The M&E officer will also be responsible for project generated knowledge management and will gather and analysing project information and effectively communicate results to project beneficiaries, management, the donor community and other relevant stakeholders. The M&E officer would be responsible for managing and coordinating monitoring of activities and outputs, and for working with field NGOs and contracted Service Providers on participatory M&E, process monitoring and KM.

11. Technical assistance for: a) PME and b) impact studies. The M&E Officer at PMU and PIO would be responsible for procuring these services in consultation with the Project Directors and Manager. The aim of technical assistance is to bring expert and specialist knowledge into the project to improve the adoption of M&E practices and knowledge that would be imparted through training, and to improve the feedback loops to district officials, as well as to enhance the quality of surveys.

Learning

12. The Project learning system comprises of provincial level quarterly meetings (based on MIS-generated reports) and national bi-annual and annual review meetings, capturing information on progress, lessons and finding solutions for implementation constraints.

- *Annual Project Review.* A consolidated Annual Project Review would be carried out towards the end of each fiscal year. It would assess performance in the achievement of physical and financial progress against annual targets. Furthermore, reviews of progress towards development objectives as reflected in the Outcome Surveys would be done to assess success and failures and reasons thereof and lessons learned.
- *Mid-Term Reviews (MTR).* The Government and IFAD would jointly undertake a mid-term review by the third year of the project lifecycle to review project achievements and implementation constraints. In particular, it would review the following: (i) achievement and improvements in agriculture and livestock production systems and increase in income of beneficiaries; (ii) quality of infrastructure works; (iii) the performance of KCs; (iv) progress achieved with the RBF and ABF competitive funds; (v) policy impact if any; (vi) impact of other project activities; (vii) financial and procurement management; and

(viii) effectiveness of the institutional arrangement of the project. A mutually agreed action plan would be prepared based on the MTR findings.

- *Project Completion Review*. As the project reaches completion, the PMU would lead the drafting of a Project Completion Report. IFAD and the Government would then carry out a Project Completion Review based on the information in the Report.

Knowledge Management

13. Knowledge management would be done systematically throughout the entire duration of the project. To enable effective knowledge management and sharing, results and lessons from the project would be documented systematically through special studies and knowledge products commissioned by the PMU or PIO. The M&E system would be one of the most important sources of knowledge. In addition, innovations observed during the implementation process would also be documented. The MoALI and project M&E staff would also take the responsibility for disseminating knowledge documents through dedicated websites and occasional workshops and seminars. Furthermore, PMU and PIO M&E staff shall liaise with the media to ensure that project's activities would be frequently covered in local newspapers and radio broadcasting programmes. A knowledge management strategy would be developed in detail at the project start-up.

14. Simultaneously, MoALI would communicate lessons learned from the project implementation, and from other IFAD-supported projects, within government and donor community by hosting workshops and publishing analytical reports. The Department of Planning at MoALI shall play a leading role in promoting learning and managing innovation processes, based on the lessons learned from the project's field experience by documenting and disseminating the findings within the programme and with other interested parties. This aspect would be key for scaling-up successful interventions. Country portfolio reviews and project workshops would invite a wide range of stakeholders to reflect on lessons learned through Programme's activities. The programme would also present the results of analytical studies at appropriate fora such as the Agricultural Sector Working Group.

Appendix 7: Financial management and disbursement arrangements

I. Financial Management Arrangements

A. Summary of Financial Management Assessment

1. The overall FM risk is rated as 'high'. Main risks that need to be addressed are the limited experience of staff at all levels of Government in managing donor funded projects and the substantial volume of 'soft' expenditures envisaged in the project, which could increase the potential risk of funds not being used for the intended purposes.

2. In terms of strengths and weaknesses, at Union level the Executing Agency (MoALI) has experience of implementing an IFAD-funded project, FARM, with similar modalities. The capacity of the PMU in terms of staffing and financial reporting would have to be enhanced to integrate WSAP, but there is scope for building on lessons learned during FARM implementation, and for aligning procedures.

3. The main weaknesses are that (i) experience in implementing donor-funded projects is very limited at state and local government (LG) level; (ii) accounting procedures are all manual; (iii) there would be serious difficulties in aligning LG budget processes to IFAD's for AWPB approval and timing; (iv) risk of significant delays in financial approvals due to lengthy LG authorisation processes and physical distance, in particular in Chin State; (v) expected difficulties in timely recording and coding of expenditure; these would lead to major consolidation problems in preparing financial statements, interim reports and withdrawal applications (WAs), which in turn would negatively impact on disbursement and fund-flows.

4. Measures proposed to mitigate these risks include (i) centralising spending authorities for WSAP at Union level, to ensure efficiency and coherent financial processes and reporting; implementing entities and service providers will be contracted by the PMU to execute project activities; (ii) strengthening the existing PMU of ongoing FARM project within MoALI to manage WSAP activities, with incremental staff and a strengthened finance team; (iii) sustained support and guidance from IFAD in order to assist on specific policies and procedures of IFAD-funded projects, detailed in an acceptable financial management manual; (iv) interim financial reporting (semi-annual); and (v) annual audit of WSAP accounts and statements of expenditure, in line with IFAD's requirements.

B. Project financial profile

5. The WSAP programme was costed in 2016 prices and is expected to be implemented over a period of six years. Total project costs will be USD 20.3 million, of which an IFAD loan and grant will cover 64%, and Government will cover 5%, mostly in kind in the form of salaries and operating costs. Contributions from implementing partners and beneficiaries are estimated to amount to 4% of project financing. The most significant expenditure categories for IFAD financing will be civil works, equipment, studies, training and local services, inputs, credit, contractual staff and operating costs

	The Government		IFAD Loan		IFAD Grant		implementing partners		Beneficiaries/Private sector		Financing Gap		Total		For. Exch.	Local (Excl. Taxes)
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%		
I. Investment Costs																
A. Civil Works	20	0.6	3 266	91.4	44	1.2	-	-	127	3.6	117	3.3	3 574	17.6	559	3 016
B. Vehicles	-	-	255	100.0	-	-	-	-	-	-	-	-	255	1.3	62	193
C. Equipment	-0	-	1 508	33.6	909	20.2	-	-	652	14.5	1 420	31.6	4 488	22.2	683	3 805
D. consultancies	0	-	448	16.0	1 489	53.2	-	-	-	-	861	30.8	2 799	13.8	2 042	757
E. Studies	0	-	449	34.0	303	22.9	-	-	-	-	570	43.1	1 323	6.5	143	1 180
F. Training	0	-	397	65.8	-	-	-	-	-	-	207	34.2	604	3.0	81	522
G. goods, services and inputs	9	0.3	131	5.2	1 232	48.7	1 050	41.5	-	-	109	4.3	2 530	12.5	285	2 245
H. Credit	-	-	2 276	100.0	-	-	-	-	-	-	-	-	2 276	11.2	2 276	-
Total Investment Costs	29	0.2	8 729	48.9	3 978	22.3	1 050	5.9	780	4.4	3 283	18.4	17 848	88.1	6 130	11 717
II. Recurrent Costs																
A. Salaries of Government Staff /a	416	100.0	-	-	-	-	-	-	-	-	-	-	416	2.1	-	416
B. Salaries of Contractual Project Staff	-	-	112	19.4	-	-	-	-	-	-	463	80.6	575	2.8	-	575
C. Staff Allowances	-	-	40	5.2	-	-	-	-	-	-	725	94.8	765	3.8	3	762
D. Operating Costs	549	84.1	104	15.9	-	-	-	-	-	-	-	-	652	3.2	143	509
Total Recurrent Costs	965	40.1	256	10.6	-	-	-	-	-	-	1 189	49.3	2 409	11.9	146	2 263
Total PROJECT COSTS	994	4.9	8 984	44.4	3 978	19.6	1 050	5.2	780	3.8	4 471	22.1	20 257	100.0	6 277	13 980

C. Implementing and participating organizations with FM responsibilities

6. The project will be implemented in four districts in two state/regions (Magway and Chin), under the oversight of MoALI at Union level and its PMU. Service providers contracted by MoALI will have a key role in implementing soft activities. Works will be executed by district MoALI departments (ID, DRD), under contract with the PMU at Union level.

7. The Project Management Unit (PMU) of FARM project will also serve as the coordination unit for WSAP and will be expanded with incremental staff. At regional level, coordination of activities will be decentralised to two Project Implementation Offices (PIOs) in Pakkoku (Magway) and Mindat (Chin), under the regional and state Ministers, MoALI respectively. Each PIO will have a project manager, agribusiness specialist, water use specialist/engineer, procurement and dedicated finance staff liaising with the PMU finance team. Technical specialists will be contracted on a needs basis and project staff will be recruited on a competitive basis compliant to requirements. Staff contracts will have a probationary period in compliance with the labour law, renewable subject to satisfactory performance. Technical assistance and capacity building will be provided. Each PIO will be equipped with the required vehicles and technical equipment.

II. FM Assessment

A. Inherent risks: PFM environment, entity, project design

8. Myanmar is one of the least developed countries in South East Asia and is in the midst of transition. Since political and economic reforms were launched in 2011, the country has undergone a major transformation. Growth has accelerated, and medium-term economic growth is projected to average 8.2 percent per year (source: WB).

9. According to Transparency International, corruption is widespread. The country currently ranks 147th out of 16736 in TI's Corruption Perceptions Index, which positions the country in the high inherent risk bracket. The strengthening of transparency and oversight since 2011 as part of PFM reforms is likely to have contributed to the modest improvement in Myanmar's TI score which increased from 15 in 2012 to the current 22.

10. The Government's political and economic reform program have had major implications for public financial management (PFM). In 2011, the new Government embarked on a range of political and economic reforms aimed at attaining national reconciliation, good governance, and economic development. Key economic reforms include adoption of a more liberal exchange rate policy, relaxation of trade restrictions, rationalization of tax rates, the banking system and fiscal decentralization.

11. The Public Financial Management Performance Report (PEFA) prepared in 2013, in collaboration with the WB and other donors, was the first comprehensive review of Myanmar's PFM system. There had been no recent history of development partner engagement on PFM reform and little was understood about the status of the Government's reform agenda.

12. Based on information drawn from the PEFA with regard to management of public finances, two major catalysts for reform have been at play since 2011. Firstly, the operationalization of the Parliament and establishment of the Public Accounts Committee and the Planning and Finance Committee have resulted in enhanced external scrutiny and oversight over the budget by the Parliament, while the public airing of budget debates on television and the publication of the budget law in national newspapers has enhanced budget transparency. Second, the constitutional requirement for separation of regional and state budgets from the Union has required rapid deconcentration of budgeting and planning functions to support bottom up planning and budgeting processes in states and regions. In order to coordinate state/region budgets with the Union budget, the Government has established the Financial Commission and the National Planning Commission.

13. Myanmar's PFM system is highly informal. It is not fully clear which regulations are legally in force (so ministries have adopted different approaches, e.g., using old colonial regulations from India as guidelines). Myanmar's system does focus narrowly on control but not on accountability:

[36] 1 = least corrupt

regulation focuses on detailed transaction control and avoiding budget overruns rather than accountability for the efficient delivery of service. There is little visibility for how controls are applied in practice between different levels of the administration and with the parliament. Reliance is placed on the OAG rather than internal standard setting and review. The Financial Regulations focus on control at the transaction level whereas a large amount of supplementation and virement takes place. The effect is to provide a framework of control and practice, but to leave the system open to abuse by those who would seek to make use of that vulnerability.

14. Accounting is currently maintained on a simple cash based double entry system. Most payments are discharged through MEB by the use of check or transfer. The use of physical cash is limited although most departments have small imprests and advances are made for special purposes such as extended travel.

15. End-of-year financial statements are produced on a similar basis to those produced in-year, but with supplementary clearance arrangements. In the last few years they have been finalized within 6 months of the end of the year. But the statements largely serve the purpose of providing some discipline ensuring consolidation and reconciliation. They provide limited information as a basis for active financial management and both their form and distribution are difficult to interpret and contribute little to fiscal transparency. International accounting standards, even for cash based systems, are not fully met and there are no clear notes attached to the statements explaining the basis on which they have been produced or giving supplementary information about important issues such as guarantees and contingent liabilities. Neither in-year nor end-of-year statements are given wide circulation.

16. The first ROSC Accounting and Auditing assessment in Myanmar is in preparation at the request of the Government of Myanmar. It has the following objectives: (i) to articulate the ingredients of a sound financial reporting institutional framework; (ii) to assess how well current Myanmar accounting and auditing practices are aligned with international good practice and identify any key gaps and (iii) to make practical recommendations on how Myanmar can achieve increased alignment with international good practice over the medium term.

17. The Office of the Auditor General (OAG), despite its relatively recent origins, is having a significantly positive impact on the management of public finances in Myanmar. The OAG is a semi-independent body reporting to the Parliament through the President's Office. The OAG has purview over all the public sector, except for the Ministry of Defense. The OAG is also the entity responsible for setting accounting and auditing policy for the public sector. The

18. The Office of the Auditor General of the Union (OAG) intends to transition government accounting into compliance with international accounting standards. This would see the core central government agencies being required to prepare their financial statements in compliance with International Public Sector Accounting Standards (IPSAS), initially on a cash basis[37]. This transition will have major implications requiring significant capacity building for preparers, auditors and regulators and will require a prioritized and sequenced roadmap for core public sector agencies as well as end state-owned enterprises.

19. OAG has adopted INTOSAI audit standards and conducts mostly financial audits with some procurement and performance audits. The OAG has yet to submit an audit report to the Parliament – under the Parliamentary form of government which started functioning from 2011 onward. A formal response is provided by ministries to the audit findings within 1 month of receiving the audit opinion, but there seems to be little evidence of systematic follow-up.

[37] This is seen as an initial step in the transition to full compliance with IPSAS on an accruals basis at some stage in the future. OAG informed the MOPF on July 13, 2016 its intention to transition the government accounting from Cash to Accrual basis in compliance with the Union Auditor General Act.

B. Project Control Risks

Summary of FM Risks and mitigating actions

Nature of risk	Initial FM risk	Risk mitigation	Residual risk
A. Inherent Risks			
	H		**M**
B. Project Control Risks			
1.Organization & Staffing • Insufficient staff capacity to manage multi-project PMU • Disconnect between Government and PMU processes		• Existing PMU staff capacities to be increased with training, implementation support and additional personnel • Assignment of MoALI finance director with FM oversight role	**M**
2.Budgeting • Weak integration of project AWPB with Government budget processes • Complexity of multi-project AWPB preparation	**H**	• Early AWPB preparation to ensure integration with Government budget • Implementation support for multi-project AWPB preparation	**H**
3. Funds Flow & Disbursements • Delays in reporting from NGOs and implementing entities disrupt disbursement and negatively impact liquidity	**H**	• Finance team strengthened; dedicated contract management staff	**H**
4. Internal Control • Lengthy payment approval processes cause delays in payments to contractors and service providers • Disconnect between PIM and MoALI systems • Suppliers are paid through encashed MEB cheques	**H**	• Accountability for payment approvals at MoALI management level • PIM revised to ensure integration with MoALI systems • Payments through cheques in supplier's name	**H**
5. Accounting Systems, Policies & Procedures • Government and beneficiary contributions are not recorded • IFAD funds are used to cover tax, breaching financing covenants • Discrepancies between PMU accounting records (software) and those of MoALI	**H**	• Implementation support to be provided to assist in establishing procedures for calculating counterpart and beneficiary contributions; PIM to be updated accordingly • Exception to IFAD rules for ineligibility of tax to be applied, subject to EB approval • Monthly reconciliations, MoALI books to project records	**H**
6.Reporting & Monitoring • Automated system used by PMU does not support efficient financial reporting • Duplication of reporting processes (e.g. Government reporting	**H**	• Options for customising accounting software currently used by PMU to be considered	**H**
7.Internal Audit • IFAD-funded projects are not included in IA's work-plan • IA capacity is weak and adds little value	**H**	• WSAP included in MoALI IA annual work-planning • Explore capacity building options for IA	**H**
8. Auditing • Audit reports are received late and do not meet IFAD's standards	H	• TORs agreed between OAG and IFAD at least one month prior to fiscal year end • Translated version of audit report to be certified by OAG	M
OVERALL FM RISK	**H**		**H**
* H=High, M=Medium, L=Low			

III. Financial Management and Disbursement Arrangements

C. Organization and staffing

20. FM capacity, qualification and experience varies among MOALI departments. Most finance directors are Myanmar CPA qualified and have more than ten years of experience in the accounting

field. There is no documented training policy, however most finance staff receive training at different levels, often provided by OAG. In the states targeted by the project, none of the departments have experience in managing ODA, and English knowledge is quite limited.

21. The PMU will be responsible for project FM. It will maintain separate project accounts, in accordance with Government accounting standards. It will be responsible for all aspects of project financial management, including budgeting, financial statements and reporting, withdrawal applications for IFAD disbursements, and coordinating audit processes.

22. Any department at state level managing advances and reporting on expenditures during project implementation will assign a finance staff from within its finance/accounts section, supported by a contractual, for recording and reporting expenditure made from the operating account. The PIO finance staff will liaise with the PMU finance team at Union level, which will provide training in coding by IFAD categories.

23. All finance staff involved in implementing the project will be made aware of the accounting, recording and reporting requirements through training on the FM manual, to be conducted by the PMU finance team. IFAD will provide an overview of FM and disbursement requirements when the project becomes effective.

D. Budgeting

24. Budget is to be prepared by each PIO based on its annual work-plan, in sufficient detail to include costing information by component, expenditure category and source of donor funds. The budget should be reviewed by the management of the state-level implementing entity before submission to the PMU for consolidation.

25. The consolidated budget will be endorsed by the project steering committee before submission to IFAD for no objection, and inclusion in the Ministry's annual budget processes. The AWPB must be completed in time to allow its submission as part of the Ministry's budget, in line with Government processes.

26. The annual budget will be reviewed at least semi-annually and revised if necessary, with IFAD's approval. Reporting on the use of funds against work plan will be included in interim financial reports prepared by the project and submitted to IFAD bi-annually, and will also form part of the audited annual financial statements.

27. Budgeting processes will be documented in detail in the FM Manual which forms part of the PIM.

E. Fund-flows and disbursement

28. For the project, the PMU will open two designated accounts (DAs) in USD at the Myanmar Economic Bank (MEB), one each for the IFAD loan and IFAD grant, from which funds will flow to corresponding bank accounts in MMK for project operations.

29. Each implementing entity receiving funds from the PMU will maintain an operating account to be used exclusively for project expenditure, for their incremental operating costs and other activities under the concerned component. Funds transferred shall be considered as advance and appear as reconciling item in the DA reconciliation statement. The mechanism for reporting the use of funds shall be included in the FM Manual. Funds will flow from the relevant project account in MMK at Union level to the implementing entity's segregated project account.

30. Procedures and controls on withdrawal from DA and operating accounts shall be documented in the FM Manual. The fund flow arrangements are outlined in annex 1.

31. Disbursement methods will be transaction-based and will involve advances and direct payments. Reimbursements will also be available. Supporting documentation required for documenting eligible expenditures paid from the DAs are summary sheets with records and statements of expenditures. Direct payments are documented by records. The frequency of reporting expenditure paid from the DAs shall be based on approximately 30% of the DA advance or on a basis not exceeding a quarter. The DAs will have ceilings based on 6 month forecast of expenditure.

32. Transfers to implementing entities will be considered as advances, with monthly reporting on the use of funds, and these accounts will appear as reconciling items on the DA reconciliation statement to the extent they have not been accounted for.

33. The direct payment disbursement methodology may be used for payments USD 100,000 equivalent.

34. A start-up advance may be provided once the financing agreement has become effective, to facilitate implementation readiness activity pending satisfaction of the disbursement conditions specified in the financing agreement. The ceiling of the start-up advance will not normally exceed USD 300,000 and will be agreed at negotiations.

35. Statement of Expenditure (SOE). The SOE procedure may be used for reimbursement of eligible expenditure and liquidation of advances to the special account(s). The SOE ceiling is US$ 50,000 equivalent and the threshold applies to the value of the contract. SOE records, including the full set of supporting documentation, will be filed in a manner to facilitate ready review by supervision and audit missions.

36. Disbursement procedures and other instructions will be detailed in the Letter to the Borrower, which will be issued when the financing becomes effective.

F.Internal controls

37. In Myanmar public sector, financial authorisation and payment procedures are in place. Roles are segregated and controls are robust, however procedures are not fully documented. Accounting and internal controls for the project will be documented in a project FM Manual to provide the PMU finance team and departmental finance staff with guidance in carrying out their day to day work.

38. Procedures governing travel and advances to staff, including timeframes for liquidation, will be documented in detail in the FM Manual, as will procedures for the operation of a petty cash facility.

G. Accounting

39. Project accounting will be on cash basis, with additional systems designed to monitor advances, commitments and safeguard of assets. Appropriate accounting policies on receipts, expenditure, foreign exchange, assets, advances, commitments and procedures for accounting for government and beneficiary contributions shall be determined and detailed in the FM Manual and indicated in the notes accompanying the annual financial statements. The 2013 PEFA report indicated that manual records are quite accurate in Myanmar PFM systems. However, an appropriate, multi-project, accounting software will be used by the PMU to enhance process efficiency and to facilitate financial reporting and monitoring. Accounting is expected to be maintained on a daily basis, and procedures for month-end bank reconciliations will be specified in the FM Manual.

40. Contract information will be kept updated by the PMU contract managers in contract registers as required by IFAD. Contract Monitoring Forms will be used by the contract managers and finance team to track payment of instalments. Procedures for contract management and models of forms will be included in the FM Manual.

H. Financial reporting

41. Government reporting is monthly and prepared in accordance with the Myanmar Generally Accepted Accounting Principles (GAAP). Monthly reports are prepared manually, to a format defined by MoPF. Additionally, for monitoring and disbursement purposes, IFAD requires reporting by project component, expenditure category and financing source. An accounting software used by the PMU for recording project expenditure will generate SOEs, financial statements and semi-annual financial reports in the format required by IFAD. Options will be considered for customising the software to adapt it to Government reporting requirements, avoid duplication of effort and enhance reliability of reporting. Requirements for financial reporting will be detailed in the FM Manual.

42. Efficient coordination with the different implementing entities will be required for contract management, cash forecasting, imprest monitoring and reporting purposes. The PMU management will be required to coordinate closely with the implementing entities involved. Submission of IFRs

should be no later than 45 days after each semester end. The format of IFR will be integrated in the FM Manual.

I. Internal Audit

43. The internal audit function is quite weak in Myanmar, having only recently been established in line ministries. Lack of internal audit does not give assurance to senior management in ministries that financial systems and processes (not just individual transactions) are being conducted effectively and adequately enforced, although OAG in some respects fills the gaps through its bi-annual reviews and to some degree provides internal as well as external audit services.

44. Opportunities will be sought during WSAP implementation for including the project in the annual work-planning of MoALI's Internal Audit unit. IA capacity building initiatives may also be explored.

J. External Audit

45. Annual audit of the project's accounts will be provided by the supreme audit institution, the Union Office of the Auditor General (OAG), based on agreed TORs. Audit reports and management letters will be submitted to IFAD no later than six months after the end of each fiscal year. Any special audit requirements may be foreseen for contracts with implementing entities and service providers or in connection with rural finance activities, will be discussed with OAG, for inclusion in the TOR or out-sourcing to a private audit firm.

IV. Supervision Plan (FM)

46. FM performance and risk will be assessed throughout project life as part of supervision processes and FM arrangements may be adjusted accordingly. Supervision missions will be conducted at least once a year, with additional implementation support missions as required. At least one additional implementation support mission will be fielded within the first six months of programme implementation.

Appendix 8: Procurement

Introduction

1. The Government of Myanmar, is progressively undertaking a major political and economic reform program embarking on a range of political and economic reforms aimed at attaining national reconciliation, good governance, and economic development. To date key economic reforms undertaken include adoption of a more liberal exchange rate policy, relaxation of trade restrictions, rationalization of tax rates, and fiscal decentralization. In this note, procurement was recently decentralized from a central control environment by the Ministry of Commerce and delegated to spending bodies giving them authority to increase the use of open competitive tender. Each spending body was left to develop its own detailed procedures and systems. Given the lack of reforms in the public procurement system which encompasses an integrated procurement law supported by regulations and procedures, the decentralization of procurement currently does not ensure that spending bodies observe at least a minimum level of controls. In many cases, the minimum requirements are either not defined or not clear or outdated.

2. The Office of the Auditor General (OAG) has not produced reports on compliances of any of these minimum requirements (even where they are defined), given the variations in the effectiveness of the procedures and control regime implemented by individual spending bodies. There is also a lack of statistical information such as the value of procurement processed through different procurement method to be used in the mission analysis. This is also supported by the unavailability of internal audit, in many spending bodies to provide adequate assurances that the financial systems and procurement processes (not just individual transactions) are being conducted effectively, efficiently and economically and if the rules, regulations procedures are being adequately complied or enforced. The Office of the Auditor General (OAG) acknowledges significant problems in procurement at all levels due to the lack of assurances, which exposes the control system to risks and unevenness of application. The challenge remains of achieving an appropriate level of assurance without undermining the beneficial aspects of delegation systems which shares the similar common principle such as value for money, fair treatment, non-discrimination, integrity, transparency and competition and social and economic development as subscribed by the IFAD Procurement Guidelines.

3. Based on a broad rule of law assessment produced in June 2012 by the Perseus Strategies and New Perimeter, in partnership with the Jacob Blaustein Institute for the Advancement of Human Rights, and the World Bank Public Financial Management Performance Report, the current PFM system is stated to be practice-based and operates without benefit of foundational laws (such as an organic budget law, procurement law, or public information law) or up to date regulations. These practices can be traced back to colonial documents (when Burma was a part of India), which contain guidelines for many but not all of the practices observed, however with one over-arching document: the Constitution of 2008. While there has been considerable decentralization of fiscal authority to ministries, states/regions, and state economic enterprises, this is however without all the controls and standards that would not allow the top down approach to reinforce the bottom up approach in a positive way. Ministries hold significant powers, which enable them to determine their own procurement systems, but are not always subject to clear laws and procedures for implementing their budgets and reporting on the results of their spending. Myanmar current ranking with regards perceived corruption based on 2014 TI index, is 156 over 174 countries with a perceived level of public sector corruption score of 21 which has been marginally improved from 15 (on a scale of 0(highly corrupt) to 100 (very clean).

4. As part of its reform agenda, Myanmar's parliament approved an anticorruption law in June 2013, one year after the bill was first proposed and reviewed by legislature. The law was enacted by the Union Assembly parliament in August 7, 2013 and took effect on September 17, 2013. Myanmar has also signed UN anti-corruption framework on 20 December 2012 by ratifying the UNCAC. While this is said, it has still to establish an independent anti-corruption agency and judiciary.

5. On 08 January 2014, the Government of Myanmar issued a Directive on execution of works by contract (No.31/252-contract/ah-pha-ya(2014), as a measure to introduce a minimal form of standards for tenders of civil work. The work on this directive was coordinated and spearheaded by the Ministry

of Construction. This directive is not a comprehensive procurement law but rather an attempt to introduce some minimal standards for procurement of civil and the execution of the contract.

6. The Public Financial Management Performance Report produced by the World Bank summarizes the inherent country fiduciary risk as “high’’ which includes an overall “high” procurement risk due to the lack of: (i) legal framework for public procurement; (ii) procedures and processes (iii) weak governance environment; (iv) limited experience and capacity and (v) redress mechanism.

7. The current assessment of the procurement capacity of the Ministry of Agriculture, Livestock and Irrigation (MoALI), the Lead Agency and the Provincial Agriculture and Irrigation Department of Chin and Magway for carrying out procurement under WSAP is described under Annex 1. Annex 2 summarizes the WB Analysis against the 6 PEFA dimensions.

8. During the course of the mission, the mission was able to establish that currently the State Department of Agriculture and Department of Irrigation, in both Chin and Magway have either fairly limited exposure or in most cases no exposure to procurement standards other than purchases for small items through shopping or direct quotations. Large procurement is undertaken by the Union Ministries of MOIA with limited delegated authorities to the State Departments.

9. The current level of delegated authorities provide the State Departments and units between USD 5,000 and USD 40 in delegated authority to procure and award. Due to size and the transaction limit, purchases and invoice are split into smaller units to avoid seeking approvals from the Union Ministry which can take between 2 week to 4 months to obtain.

10. All State Level Procurement that are undertaken are reviewed against the established standard approved price of goods based on a survey of which is done yearly to establish the standard price list for major commodities and goods by each State. The mission was unable to validate adherence nor compliance to the established process given the lack of supporting documentation made available to the mission.

Arrangements for Procurement under WSAP

11. Procurement of goods, works and services financed from resources provided or administered by IFAD will be undertaken in accordance with IFAD’s Procurement Guidelines and Handbook (dated September 2010, or as amended from time to time as an exception to the provisions of the General Conditions.

12. WSAP will develop a Procurement Manual that will establish minimal standards and define the division of responsibilities of PMU and PIO, while the Project Implementation Manual would establish delegation of authorities for the commitment of resources which include procurement approval threshold. The procurement of goods, works and services will be handled by the state level PIO; however, they may request PMU support for consolidated or international purchases. Substantial technical assistance will be provided to develop state level and PIO procurement capacities.

13. As a risk mitigation measure, the State PIO would include one procurement and contract management specialist, who would be supported by the PMU Procurement Officer. Resources have also been allocated to ensure adequate capacity building of these specialist and also to provide training and support to the Departments during the course of the Project Implementation.

14. International Competitive Bidding (ICB) shall be undertaken in accordance with the rules and regulation for ICB as established by the World Bank in line with the provisions of the IFAD Procurement Guidelines.

15. National Competitive Bidding, Shopping and Direct Contracting. Goods and Civil works and goods procured using NCB, Shopping and Direct Contracting will follow the procedures and processes defined in the Project Procurement Manual and the Project Implementation Manual approved by Project Steering Committee and the IFAD. The procedures would be adapted and adopted in accordance with the provisions of IFAD Procurement Guidelines and the Procurement Handbook with the following emphasis to mitigate risk ensuring compliance to the provisions of the Procurement Guidelines.

(a) **Registration of Bidders**. It is general agreement that Registration of Bidders as a condition for bidding is not a good practice and the World Bank does not accept it for ICB. However, it is a very common practice in Countries to have registration previous to bidding as a due diligence process for

screening bidders legal and fiscal capacity. It is also usual (in some countries) to use registration as a means for prequalification, especially for civil works which would be introduced in ESAP.

(b) **Open Bid - National Competitive Bidding.** Procedural rules play an important role particularly when it comes to open competitive bidding. The Project will impose through the Project Implementation Manual (PIM) the use of well-formulated bidding documents which will result in bid submissions that are free from qualifications. The PIM would expand and articulate the following rules and procedures defined for the implementation of WSAP:

(i) ***Effective Advertisement***: Advertisement should be broad enough (using the appropriate media), giving enough time to bidders for preparing their bid. To the extent possible, bidding opportunities should also be advertised electronically. The minimum requirement should be: (i) Mandatory publication in one local newspaper in addition to the official gazette (if existent); (ii) Web-page: if the borrower (or the Country) has a web-page, all bidding opportunities should be advertised; (iii) advertisement in United Nations Development Business or other electronic means.

(ii) ***Eligibility***: Eligibility criteria and procedures should not deny bidders access to a bidding process or an award for reasons which are not related to their qualification to carry out the contract. Consequently the procedures should: (i) Be based on the ability of bidders to carry out the contract and should not include additional restrictions (not related to such ability); (ii) No restrictions to foreign bidders; (iii) Local blacklisting for fraud and corruption carried out with due process and with rights for accused firms to defend themselves could be assessed by IFAD and accepted.

(iii) ***Qualification of Bidders***: The procedures should define post qualification as the preferred rule. Prequalification should be restricted to civil works specially for large or complex contracts or for special cases with due justification. The review of bidders qualification should be conducted by examining whether the bidder does or does not meet qualification criteria and not by using a point system reflecting the bidders' qualification. Conducting a pre-selection instead of a pre-qualification should not be accepted, i.e., pre-qualification means that all candidates who have been determined to be qualified should be invited to bid whereas pre-selection means that the government agency is free to invite any of those candidates but does not have to invite all of them. No bidder should be disqualified due to bureaucratic or non-substantial reasons.

(iv) ***Standard Bidding Documents & Standard Contract***: Standard Bidding Documents are of paramount importance for transparency, speed of the process, increase competition and creation of capacity (standardization of procedures). The SBD to be used in all local open bidding processes would be described in the PIM and it should include: (i).Time to submit bid: minimum 30 days; (ii). Bids may be submitted by post or by hand; (iii) Budget: could be disclosed (if local legislation so requires); (iv). Clear instructions on how to buy bidding documents indicating address and price to buy the bidding documents. However, bidders who decide to submit a bid without having bought the bidding documents should not be disqualified, submitting their bids under their own risk; (v) Clarifications to bidding documents should be in writing only; (vi) Amendments to bidding documents should be advertised with the same procedure used for advertisement of bidding documents; (vii) Bid Forms should be similar to those used for ICB, however, with the flexibility required; (viii) Number of Envelopes: use the same procedure for ICB (one envelope); (ix) Evaluation Criteria: the bid evaluation criteria should be non-discriminatory. It should be disclosed and rigorously quantified in monetary terms to define the "lowest evaluated bidder". This allows to indisputably identify the lowest evaluated responsive bid. Quantifying bid evaluation criteria in monetary terms is the only method that leads to transparent evaluation and that allows bidders to submit an effective protest to the awarding authority.

(v) ***Language (bidding documents and contract)****:* the language of commercial use in the country along with English translations.

(vi) ***Bid Prices (and Payments):*** the PIM defines for the bidding documents, the price (and payments) conditions: (i) the currency to be used (local or any internationally used); (ii) for countries with high inflation price adjustment for contracts; (iii) for countries with stable currency, price adjustment for contracts longer than 12 months; (iv) the method of payment; (v)

the currency of payment (similar as for the bid prices); (vi) automatic payment of interest in case of late payments, and (vii) no price adjustment formulas used in the bid evaluation.

(vii) ***Bid & Performance security:*** the PIM would prescribe the generally accepted practice used in the local market (securities issued by banks or by sureties). Alternative methods (like automatic penalty to bidders failing to honor a bid) in lieu of bid securities could be accepted. Retention of payment could also be used instead of performance security.

(viii) ***Liquidated damages:*** should be similar to the ICB document.

(ix) ***Complaints & Settlement of disputes:*** Modern procurement regulations attempt to provide to losing bidders an effective way to submit protests pertaining to contract award. More generally, the private partner in a government contract must be proactive in implementing competitive mechanisms and, in fact, should be a guardian of those mechanisms exactly in the same manner as government agencies. The goal in the protest handling system is:

- Complaints should be accepted at any time. Those received before bids are submitted should be addressed before bid opening. All others should be taken into account but the response should be announced only after award is recommended.

- The PIM and the Procurement Manual would outline an administrative process for dealing with complaints including an independent reviewer for the answers provided by the procuring entity

- The protests should be submitted to an independent entity and not simply to the contracting agency's supervisor. Specifically, tender committees can only carry administrative reviews. Their membership does not allow for arbitration or quasi-arbitration of the dispute and therefore an independent protest mechanism should be provided in order to review award disputes before the contract award is final;

- When protests are submitted before award they may lead to revisit the award of the contract; when protests are submitted after the award, their only consequence should be the bidder's entitlement to compensatory damages for the cost of bid preparation.

- Contracts should include a system for Settlement of Disputes. The use of a Dispute Resolution Board is encouraged before disputes be submitted to arbitration or to courts.

(c) ***Bid Opening***: Public bid opening of all bids, and recording of the opening in minutes signed by all bidders in attendance is required. In addition: (i) late bids should be rejected; (ii) procedures for bid opening should be the same as those used for ICB; (iii) minutes should follow the same procedure as for ICB, and (iv) safeguard of price envelope (when two envelopes are used).

(d) ***Confidentiality***: After bid opening and until contract award, all information about bids and their evaluation should be confidential. For transparency reasons, the evaluation report and all non-proprietary information could be made available to the public after an award recommendation has been published.

(e) ***Evaluation of Bids***: Bids should be evaluated by an independent evaluation committee defined in the PIM at the level of each PIO and the PMU depending on the type of procurement, taking special consideration for: (i) Clarification of bids: should follow the same procedures used for ICB; (ii) Responsiveness: should follow the same procedures used for ICB; (iii) Qualification of the bidder should be conducted separately from the evaluation of its bid; (iv) Lowest evaluated cost criteria: The award should be made to the bidder having submitted the lowest evaluated responsive bid; (v) Use of a point system to evaluate bids: scoring is an indirect way to express the outcome of post-qualification or of the technical analysis of the bid a point system should not be accepted. We recognize that a point system may better suited for complex systems, however, it would be extremely exceptional that such procurement would not follow ICB, and (vi) Rejection of all bids: borrower may reject all bids if: a/ all bids are not responsive; b/ the price offered by the lowest bidder is substantially higher than the confirmed good estimate for the contract, or c/ the process was not competitive, i.e., only few bids (less than 3) were offered although several bidders could be interested in bidding.

(f) ***Domestic preference***: IFAD could accept domestic preference in national bidding, provided it is defined by law and following quantified conditions on how to take it into consideration in bid evaluation. IFAD would not accept the use of non-quantified bid evaluation criteria, such as the scope of the lots or the value of the products to be domestically subcontracted, as those criteria would affect the predictability of the evaluation, or use of any other form of non-quantified preference.

(g) ***Award Criteria***: The award should be made to the bidder having submitted the lowest evaluated responsive bid. Award of contract should be without negotiations to avoid bidders not submitting their best bid at the time of bid submission and would affect the perception of transparency, one of the main benefits deriving from public bidding.

16. **Reserved Invitations – Private Bidding or "shopping":** Procurement procedures other than open competitive bidding must be restricted and contained within appropriate limits. Restricted bidding is appropriate for small value contracts, and situations in which there is only a very small number of potential candidates. Consequently, very specific thresholds should be defined below which this method of procurement could be applied. In addition the following minimum requirements should apply:

(a) Number of invitees & criteria for choosing:

(i) Minimum of 3 proposals received. However, the process should be open to whoever wants to bid, even if not invited.

(ii) Invited firms should not be repeated, if possible. Except if other firms do not exist

(b) Standard request for bids. Simplified document asking proposals by letter, by fax or using electronic means.

(c) Evaluation.

(i) Minimum price or

(ii) Combination of price and delivery time, in which case delivery time would be evaluated in monetary terms added to price. Minimum overall evaluated price would result in award.

17. **Direct Contracting**: This should be used only in exceptional cases with due justification to be kept on records. Conditions justifying the use of direct contracting are elaborated in the PIM and the Procurement Manual.

18. **Local Consultants Selection Process**: The PIM shall elaborate the provision as prescribed in the Procurement Handbook in term of selection of consultants in line with the Provisions of IFAD Procurement Guidelines. However, for assignments below a certain threshold and for contracts where enough capacity exists in the country compatible with the complexity of the assignment, the short-list may comprise entirely national consultants. In this case this minimum requirements should prevail:

(a) **Registration**: The same conditions described for bidder for goods and works above should be complied with.

(b) **Advertising**: Borrowers should advertise the assignment for expression of interest by firms. The advertisement should include:

(i) Mandatory publication in one local newspaper in addition to official gazette (if existent).

(ii) Web-page: if the borrower (or the Country) has a web-page the bidding opportunities should be advertised including UN Development Business or other electronic means.

(c) **Short-List**: Borrowers should use a short-list of 3 to 6 firms to request proposals. This short-list may result from comparing qualifications and experience among firms that have expressed interest. Borrowers could use a prequalification process for preparation of the short-list if:

(i) the local law so requires

(ii) the prequalification exercise is used for the preparation of a short list, i.e., the process is not for open competition.

(d) **Standard RFP & Standard Contract**: The standard RFP would be described and included in the PIM similar to that used for Selection of consultants by the World Bank.

(e) **Language (RFP and Contract): the language of commercial use in the country.**

(f) **Selection Process: Short-list; QCBS (other methods when justified) elaborated in the PIM.**

(g) **Award criteria**: highest combined score (preferably using the following range between 70% to 90% for the technical score and 30% to 10% for the price).

19. 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 anticorruption 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.

20. As provided in appendix I, paragraph 1 of IFAD's Procurement Guidelines, IFAD review of and no objection to the Recipient's procurement plans is compulsory and the 18-month procurement plans submitted by the Recipient must include as a minimum:

(a) A brief description of each procurement activity to be undertaken during the period and name of the implementing agency responsible for the procurement.

(b) The estimate value of each procurement activity;

(c) The method of procurement to be adopted for each procurement activity and;

(d) The method of review IFAD will undertake for each procurement activity indicating either post review or prior review.

21. Any changes/amendments to the procurement plan are subject to IFAD's No Objection.

Procurement Methods Thresholds

22. International Competitive Bidding (ICB) is the default procurement method for:

(a) Goods estimated to cost above USD 200,000

(b) Civil works estimated to cost above USD 1,000,000

(c) Services estimated to cost above USD 100,000

Procurement of Goods and Works.

23. Method of procurement should be established as per the following thresholds:

(a) Goods

(i) National Competitive Bidding (NCB) for contract values greater than USD 25,000 and less USD 200 000.

(ii) National shopping for contracts less than USD 25,000 up to USD 1,000,

(iii) Direct contracting for contracts below USD 1,000

(b) Works

(i) National Competitive Bidding (NCB) for contract values greater than USD 50,000 and less USD 1,000 000.

(ii) National shopping for contracts less than USD 50,000

24. The Irrigation Department shall be contracted to undertake design services and the implementation of land consolidation works, the construction irrigation system and structures which include farm roads with the oversight and support of an independent design quality and supervision intermediary. The detail of the implementation would be elaborated in the PIM.

25. ***Consultancy and Services***. Consulting services will include project management TA, implementation support TA for different components, conducting studies, mobilization/establishment of community groups, technical training and strengthening of community groups, and M&E. Services would be provided by consulting firms and individual consultants.

(a) Each contract for the selection of consultancy services estimated to cost USD 50,000 equivalent or above, shall be selected in accordance with the IFAD Procurement Guidelines following any one of the selection methods listed below:

  (i) Quality and Cost Based Selection

  (ii) Fixed Budget Selection

  (iii) Least Cost Selection

(b) Each contract for the selection of consultancy services estimated to cost below USD50,000 equivalent, shall be selected in accordance with the IFAD Procurement Guidelines following any one of the selection methods listed below:

  (i) Quality and Cost Based Selection

  (ii) Fixed Budget Selection

  (iii) Least Cost Selection

  (iv) Selection Based on Consultants Qualification

26. Selection of individual consultants. Individual consultants are selected on the basis of their qualifications for the assignment. They shall be selected through comparison of qualifications of at least three candidates among those who have expressed interest in the assignment or have been approached directly by the Borrower. Individuals employed by Borrowers shall meet all relevant qualifications and shall be fully capable of carrying out the assignment. Capability is judged on the basis of academic background, experience and, as appropriate, knowledge of the local conditions, such as local language, culture, administrative system, and government organization.

27. Consultancy Services and Individuals consultants may be selected on a sole-source basis with due justification in exceptional cases such as: (a) tasks that are a continuation of previous work carried out by the consultant for which he/she was selected competitively; (b) assignments lasting less than six months; (c) emergency situations resulting from natural disasters; and (d) when the individual consultant or consulting firm is the only consultant qualified for the assignment.

Review of Procurement Decisions by IFAD

28. IFAD will undertake to review the provisions for the procurement of good, works and services to ensure that the procurement process is carried out in conformity with its Procurement Guidelines. For the purposes of IFAD's Procurement Guidelines, the following procurement decisions shall be subject to prior review by the Fund for the award of any contract for goods, equipment, materials, works, consultancy and services under ESAP.

(a) Procurement of goods, materials and works

  (i) Prequalification documents and shortlist when prequalification is undertaken;

  (ii) Bid Documents for goods, materials and works;

  (iii) Evaluation Report and Recommendation for Award;

  (iv) Contract and amendments.

(b) Procurement of consultancy services and services

  (i) Prequalification documents and shortlist when prequalification is undertaken;

  (ii) Request for Proposal;

  (iii) Technical Evaluation Report;

  (iv) Combined (technical and financial) Evaluation Report and Recommendation for Award

(v) Contract and amendments.

29. All contracts to be issued to the Irrigation Department for the design services and the implementation of land consolidation works, the construction irrigation system and structures which include farm roads with the oversight and support of an independent design quality and supervision intermediary. IFAD prior review process ensures the process and reviews have been undertaken by the intermediary and free and prior informed consents have been obtained from the farmers.

30. **Prior or Post Review**. Except as IFAD may otherwise agree, the prior or post which applies to various procurement of good, works and consultant recruitments shall be defined as follows:

Procurement Method	Prior or Post	Comments
Procurement of Goods and Works		
ICB Works and Goods	Prior	All Contracts
Civil Works by Irrigation Department	Prior	All Contracts
NCB Works and Goods	Prior	Except procurement valued below USD 25,000
Shopping for works (quotations)	Post	
Shopping for goods (quotations)	Post	
Direct Works	Prior	All Contracts
Direct Goods	Prior	Except procurement valued below USD 1,000
Recruitment of Consulting Firms		
Quality and Cost-Based Selection (QCBS)	Prior	Except procurement valued below USD 25,000
Fixed Budged Selection (FBS)	Prior	Except procurement valued below USD 25,000
Least Cost Selection (LCS)	Prior	Except procurement valued below USD 25,000
Selection Based of Consultants Qualification	Prior	Except procurement valued below USD 25,000
Sole Source Selection (SSS)	Prior	All contracts
Recruitment of Individual Consultants		
Individual Consultants	Prior	Except procurement valued below USD 10,000

GOVERNANCE AND ANTI-CORRUPTION (GAC)

31. Anticorruption measures will include: (a) necessary measures undertaken to create and sustain a corruption-free environment for activities under the Project; (b) institute, maintain and ensure compliance with internal procedures and controls for activities under the Project, following international best practice standards for the purpose of preventing corruption, money laundering activities, and the financing of terrorists, and shall require all relevant ministries and agencies to refrain from engaging in any such activities; (c) compliance with requirements of IFAD's Policy on Preventing Fraud and Corruption in Its Activities and Operations (2005, as amended to date); (d) ensure that the Good Governance Framework is implemented in a timely manner. is actively engaged to allow potential Project beneficiaries and other stakeholders to channel and address any complaints they may have on the implementation of the Project.

ANNEX 1.

UNION MINISTRY OF AGRICULTURE AND IRRIGRATION AND STATE DEPARTMENT OF IRRIGATION AND AGRICULTURE

CAPACITY ASSESSMENT

Part A. General Agency Resource Assessment	**Response**
A.1. Is there a procurement department?	There are no organizational units with direct responsibility for establishing procurement standards. The Ministry of Commerce had this responsibility in the past, which was superseded by the Presidential Order issued by the President's Office on 2nd June, 2011. The MOIA has no specific procurement department but rather this function is undertaken by the Administration Unit of specific Departments within MOIA. There is a Procurement Review Committee at the level of the Ministry, chaired by the Minister or the Vice Minister. Similarly in the State department of Agriculture and Irrigation, there no procurement departments nor are units responsible for procurement. All major procurement is primarily undertaken by the Union Ministry with limited delegation of authority for the granted to the State Departments. On 08 January 2014, the Government of Myanmar issued a Directive on execution of works by contract (No.31/252-contract/ah-pha-ya(2014), as a measure to introduce a minimal form of standards for tenders of civil work. The work on this directive was coordinated and spearheaded by the Ministry of Construction. This directive is not a comprehensive procurement law but rather an attempt to introduce some minimal standards for procurement of civil and the execution of the contract.
A.2. What procurement does it undertake?	The Ministry undertakes all kinds of public procurement related to goods, works and services. However reliable information not is available on the total percentage volumes. No statistics are available at the Union Ministry and the State Departments.
A.3. Are the staff provided with written job descriptions?	Administrative Unit staff do not specific job descriptions which define role and responsibilities on procurement. There is no specific procurement unit with MOAI for the Departments of Irrigation and Agriculture. This is also representative of the State Departments of Agriculture and Irrigation.
A.4. How many years' experience does the head of the procurement unit have in a direct procurement role?	N/A – No specific individual appointed as head of procurement unit. Administrative Unit head acts as head of procurement unit but role not specifically defined.
A.5. How many staff in the procurement department are:	N/A As there no dedicated units or section in the Union Ministry nor in the State Departments.
i. Full Time?	N/A
ii. Part Time?	N/A
iii. Seconded?	N/A-
A.7. Does the staff that will be involved with the procurement have sufficient English language skills	Yes most officers within departments have sufficient proficiency in English. It may be mentioned here that the whole procurement document in terms of bidding document, specification, public procurement law and

	rules are currently non-existent. Most communication and internal documents are in Myanmar language. On 08 January 2014, the Government of Myanmar issued a Directive on execution of works by contract (No.31/252-contract/ah-pha-ya(2014), as a measure to introduce a minimal form of standards for tenders of civil work. The work on this directive was coordinated and spearheaded by the Ministry of Construction. This directive is not a comprehensive procurement law but rather an attempt to introduce some minimal standards for procurement of civil and the execution of the contract.
A.8. Is the number and qualifications of the staff sufficient to undertake the additional procurement that will be required under the proposed project?	Currently staffing is nonexistent. The Project would be undertaking a ring fenced approach which ensures separation of functions, roles and responsibilities and it would have central procurement officer in the PCO selected from the open competitive market and two procurement and contract management specialist in the State PIOs also selected from the open competitive market.
A.9. Does the unit have adequate facilities such as PCs, internet connections, photocopy facilities, printers etc. to undertake the expected procurement?	No. The procurement under the proposed project will be undertaken by the Project Implementation Office (PIO). The PCO and PIO will be equipped with adequate facilities such as PCs, Internet Connections, photocopy facilities, printers etc. for smooth implementation of procurement.
A.10. Is there a procurement training program?	Currently none. However the Project and Ministry would benefit from WB initiatives in this regard. The Project will be supported by a TA and IFAD periodically to build capacities of the Departments within MOAI. The Procurement and Contract Management Specialist would be also receive CIPS certification training to enhace their capacities in procurement and procurement management.
Part B. Agency Procurement Processes, Goods and Works	
B1. Are there individual procurement plans prepared for each department and consolidated by the Ministry	No, there are no consolidated procurement plans prepared. No evidence presented on individual procurement plans for Department of Agriculture or Department of Irrigation. Most closed tenders or purchases are done through state enterprises.
B.2. If the above is yes, what where the major challenges?	Please refer to PEFA and analysis ratings listed below.
B.3. Is there a procurement process manual for goods and works?	No comprehensive manual exists. On 08 January 2014, the Government of Myanmar issued a Directive on execution of works by contract (No.31/252-contract/ah-pha-ya(2014), as a measure to introduce a minimal form of standards for tenders of civil work. The work on this directive was coordinated and spearheaded by the Ministry of Construction. This directive is not a comprehensive procurement law but rather an attempt to introduce some minimal standards for procurement of civil and the execution of the contract.
B.4. If there is a manual is it up to date and does it cover foreign assisted procurement?	No. The Manual for civil works and materials are for government financed projects.

B.5. Is there a systematic process to identify procurement requirements (1 year or more)	No
B.6. Who drafts the specifications?	N/A. Possibly the Technical Units with the Ministry
B.7. Who approves the specification?	N/A. Heads of Departments
B.8. Are there standard bidding documents in use and have they been approved for use on IFAD funded projects?	No. Specific standard bidding documents would be developed and included in the Project Implementation Manual. The Directive on execution of works by contract (No.31/252-contract/ah-pha-ya(2014), as a measure to introduce a minimal form of standards for tenders of civil work does not include standard bidding documents.
B.9. Who drafts the bidding documents?	N/A
B.10. Who manages the sale of the document?	N/A
B.11. Are all queries from bidders replied to in writing?	N/A.
B.12. Is there a minimum period for preparation of bids and if yes how long?	N/A
B.13. Does the bidding document state the date and time of opening and how close is it to the deadline for submission?	N/A
B.14. Is the opening public?	N/A
B.15. Can late bids be accepted?	N/A
B.16. Can bids be rejected at bid opening?	N/A
B.17. Are minutes taken?	N/A
B.18. Who may have a copy of the minutes?	N/A
B.19. Are the minutes free of charge?	N/A
B.20. Who undertakes the evaluation (individual(s), permanent committee, ad-hoc committee)?	N/A
B.21. What are the qualifications of the evaluators in respect to procurement and the goods and works under evaluation?	N/A
B.22. Is the decision of the evaluators final or is the evaluation subject to additional approvals?	N/A
B.23. Using at least three real examples how long between the issue of the invitation for bids and contact effectiveness?	N/A
B.24. Are there processes in place for the collection and clearance of cargo through ports of entry?	N/A.
B.25. Are there established goods receiving procedures?	N/A
B.26. Are all goods received recorded as assets or inventory in a register or similar?	N/A
B.27.Is the agency/ procurement department familiar with letters of credit?	N/A

B.28. Does the procurement department register and track warranty and latent defects liability periods?	N/A
Part C. Agency Procurement Processes, Consulting Services	
C.1. Has the agency undertaken foreign assisted procurement of consulting services recently (last 12 months, or last 36 months)?	No. There were consulting service procured under a technical assistance grant funded by JICA and Korean Government but these services were procured by JICA and Korean Government directly. The consultants provided technical assistance to MOAI in the procurement of agricultural equipment also funded by JICA and the Korean Government under tied financing. The procurement was advertised undertaken in Japan and Korea in accordance with the procurement guidelines as applicable to JICA and Korean financing.
C.2. If the above is yes what where the major challenges?	N/A
C.3. Is there a procurement process manual for consulting services procurement?	N/A
C.4. Is the manual up to date and does it cover foreign assisted projects?	N/A
C.5. Who identifies the need for consulting services requirements?	N/A
C.6. Who drafts the ToR?	N/A
C.7. Do the ToR followed a standard format such as background, tasks, inputs, objectives and outputs?	N/A
C.8. Who prepares the request for proposals?	N/A
C.9. Are assignments advertised and expressions of interest called for?	N/A
C.10. Is a consultants' selection committee formed with appropriate individuals in terms of	N/A
C.11. What criteria is used to evaluate EOIs?	N/A
C.13. Do firms have to pay for the proposal document?	N/A
C.14. Does the evaluative criteria follow a pre-determined structure and is it detailed in the RFP?	N/A
C.15. Are pre-proposal visits and meetings arranged?	N/A
C.16. Are minutes prepared and circulated after pre-proposal meetings?	N/A
C.17. To who are minutes distributed?	N/A
C.18. Are all queries from consultants answered to in writing?	N/A
C.19. Are the financial and technical proposals in separate envelopes?	N/A
C.20. Are proposal securities required?	N/A
C.21. Are technical proposals opened in public?	N/A
C.22. Do the financial proposals remain sealed until technical evaluation is completed?	N/A

C.23. Are minutes of technical opening distributed?	N/A
C.24. Who determines the final technical ranking and how?	N/A
C.25. Are the technical scores published and sent to all firms?	N/A
C.26. Is the financial proposal opening public?	N/A
C.27. Are there minutes taken and distributed of financial proposal opening?	N/A
C.28. How is the financial evaluation completed?	N/A
C.29. Are face to face contract negotiations held?	N/A
C.30. How long after financial evaluation is the selected firm to negotiate?	N/A
C.31. What is the usual basis for negotiation?	N/A
C.32. Are minutes of negotiation taken and signed?	N/A
C.33. How long after negotiations until the contract is signed?	N/A
C.34. Are advance payments made?	N/A
C.35. Is there an evaluation system for measuring the outputs of consultants?	N/A
Part D. Process Oversight and Control	
D.1. Is there a standard statement of ethics and are those involved in procurement required to formally commit to it?	N/A
D.2. Are those involved with procurement required to declare any potential conflict of interest and remove themselves from the procurement process?	N/A
D.3. Is the commencement of procurement dependent on external approvals (formal or de-facto) outside of the budgeting process?	N/A
D.4. Who approves procurement transactions and do they have procurement experience and qualifications?	N/A
D.5. Which of the following actions require approval outside of the procurement unit or a permanent evaluation committee and who grants the approval?	N/A
a) Bidding document, invitation to pre-qualify or request for proposal	N/A
b) Advertisement of an invitation for bids, pre-qualification or call for expressions of interest	N/A
c) Evaluation reports	N/A
d) Notice of award	N/A
e) Invitation to consultants to negotiate	N/A
f) Contracts	N/A
D.6. Is contractual performance systematically monitored and reported	N/A

upon?	
D.7. Does the agency monitor and track its contractual payment obligations?	N/A
D.8. On average how long is it between receiving a firm's invoice and making payment?	N/A
D.9. What is the standard period for payment included in contracts?	N/A
D.10. When payment is made late are the beneficiaries paid interest?	N/A
D.11. Are payments authorized by the same individuals empowered to approve invitation documents, evaluations and contracts?	N/A
D.12. Is there a written auditable trail of procurement decisions attributable to individuals and committees?	N/A
D.13. Are procurement decisions and disputes supported by written narratives such as minutes of evaluation, minutes of negotiation, notices of default/withheld payment?	N/A
D.14. Is there a formal non-judicial mechanism for dealing with complaints?	N/A
D.15. Is a complaints resolution mechanism described in national procurement documents?	N/A
Part E. Records Keeping	
E.1. Is there a referencing system for procurement files?	N/A
E.2. Are original contracts secured in a fire and theft proof location?	N/A
E.3. Are copies of bids or proposals retained with the evaluation?	N/A
E.4. Are copies of the original advertisements retained with the pre-contract papers?	N/A
E.5. Is there a single contract file with a copy of the contract and all subsequent contractual correspondence?	N/A
E.6. Are copies of invoices included with contract papers?	N/A
E.7. For what period are records kept?	N/A

N/A = Not Available for review or not provided for review or not applicable.
Details of the procedures and processes would be outlined in the PIM in reference to this evaluation.

Annex 2.

PEFA – Procurement Analysis Summary

Dimension	Analysis	Indicated Score	Framework Definition	Evidence Used
(i) Transparency, comprehensiveness and competition in the legal and regulatory framework	There is no centralized framework. Each ministry has delegated powers to make its own arrangements within a general requirement to exercise open competitive tendering as the default method.	D	The legal framework meets one or none of the requirements listed in the PEFA framework.	The Order issued by the President's Office on 2nd June, 2011. Discussion with MFR and four line ministries
(ii) Use of competitive procurement methods	There is no central collection of data about the different procurement methods used and spending bodies do not keep records in this form.	D	Reliable data is not available.	
(iii) Public access to complete, reliable and timely procurement information	Some information is given and some tenders are advertised, but there is no framework for ensuring systematic supply of information and transparency.	D	The Government lacks a system to generate substantial and reliable coverage of key procurement information and does not make key procurement information available to the public.	Discussion with MFR and four line ministries
(iv) Existence of an independent administrative procurement complaints system	There is no independent procurement complaints review body.	D	There is no independent procurement complaints review body.	
Overall Score		D		

Appendix 9: Project cost and financing

I. ASSUMPTIONS

1. **Project objective and duration.** The Western States Agribusiness Project (WSAP) aims to improve people's lives, based on a participatory and integrated approach for crop and animal production, post-harvest handling and enabling market access for the sale of agricultural products in a resilient environment, especially for landless, ethnic groups and vulnerable households. The project implementation period is estimated at six years and would be implemented over the period 2018 to 2023.

2. **Unit costs.** The estimated cost call for the following remarks: i) even when quantities and unit costs are specified in the detailed tables, it is primarily a means for calculating envelopes by activities. Only the total amount is to be considered, provided that during project mid-term review, some of these amounts are be adjusted. The detailed estimate of quantities must be seen as indicative; ii) although costs are estimated, change can be done during the implementation of project annual budgets, and iii) despite the flexibility required by the implementation of a participatory approach, the amount of IFAD financing is not reviewable because it is set during the final project conception, and especially with the signing of the Loan Agreement. Only the use of this allocation among different categories of disbursement as set in the Loan Agreement may be amended if necessary, subject to agreement of IFAD following a justified request from the Government.

3. Project costs have been estimated in US dollars (USD) by applying a fixed exchange rate of USD 1= MMK 1120 which is assumed to remain stable through the 6-year implementation period. Unit costs were collected within the southern Chin State and northern Magway region in July 2016 and updated/validated in November 2016. Major unit costs used in the project costs are presented in the following table.

Table 1: Main unit costs

Item	Unit	Unit costs (MMK/unit)
Civil works:		
- Irrigation Schemes	Unit	23000
- Small scale community irrigation scheme		10000
- Domestic Water Supply	Unit	23000
- Rain Water Harvesting	miles	18000
- Rural roads	Unit	12000
- Rehabilitation of small dams	Unit	180000
- Stream/Weir Based Schemes	Unit	120000
- Micro-Hydro Power Schemes		18000
Vehicles and Equipment:		
- Backhoe Loader/ Excavator (Magway)	Unit	50000
- Computers & Other Electronic Equipment	Unit	300
- Equipment for the seed farm	Unit	40000
- Mechanization of SALT farms	Equipment/unit	2000
- Vehicle (4WD-DD)	Vehicle	57000
- National Technical assistance (TA)	Month	2500
- International TA	Month	25000
- Workshop	Lump sum	5000
- Accounting Software	Unit	2000
- Mid Term Review	Study	40000
- Capitalisation of RBF/ABF	Lump sum	95000/130000
Recurrent costs:		
- PIO	Year	15600-21600
- Field allowances	Year	54 000
- Vehicles O&M	Year	15 000
- Equipment maintenance	Year	2 000
- PIO Office Costs	Year	2 400

4. **Physical and price contingencies**. Physical contingencies aim to cover uncertainties related to quantities and units costs. These are estimated at about 5 % for different investments and recurrent costs. Price contingencies aims to cover expected price increase between project preparation and project start up as well as throughout the 6-year project implementation period. Each cost item

contains a local currency and a foreign exchange content on which projected local and international inflation rates have been applied respectively. Local inflation rates have been assumed to remain constant, corresponding to the average local inflation rate in Myanmar between 2018 and 2023 of 4% per year, which is in line with the target of the Ministry of planning (4-5%). Table 2 below depicts assumptions related to price contingencies.

Table 2: Hypotheses of inflation and exchange rates

	Up to Negotiation	Up to Project Start	2017	2018	2019	2020	2021	2022
Inflation (in %'s) /a								
Annual rates :								
Local	0,0	2,4	4,0	4,0	4,0	4,0	4,0	4,0
Foreign	0,0	1,0	1,5	1,5	1,5	1,5	1,5	1,5
Compounded rates :								
Local	0,0	2,4	4,4	8,6	13,0	17,5	22,2	27,1
Foreign	0,0	1,0	1,8	3,3	4,8	6,4	8,0	9,6
Exchange rates (Local/Foreign) /b								
Price Contingencies :								
Rates actually used	1 120,0	1 120,0	1 149,6	1 177,9	1 206,9	1 236,7	1 267,1	1 298,3

[a] Yearly values are within Each Project year;
[b] Yearly values are at Project Year Midpoints

5. Financial contingencies are related to inflation and variation in exchange rates between the Myanmar local currency (MMK) and the U.S. dollar (USD). Provisions for inflation are based on estimates of inflation in local currency and the World Bank and the International Monetary Fund forecasts regarding international inflation. These forecasts are based on the value index of manufactured exports of the 5 most industrialised nations (G-5) for the period 2018-2023. The inflation rate in Myanmar is in 2016 estimated at 9%.this rate will be reduced in the future because of the future improvement of macroeconomic aggregates by the Myanmar Government and the openness of the economy to private and public investments. Therefore, an assumption of an inflation rate of 7% was made for the six years of the project. To capture the international inflation rate, the Manufactures Unit Index (MUI) has been considered as a proxy for international inflation for imported goods as usual practice. The international inflation rate is estimated at 1.5 % within project years.

6. **Taxes and Foreign exchange.** Taxes are interpreted as the percentage of base costs that represents these fees. Taxes have been estimated using data from the Customs and Indirect Taxes. Duties and taxes are composed of customs duties and VAT where applicable. Customs duties are applied to the CIF price, while the VAT is applied to the price inclusive of customs duties. The level of taxes in the total cost is estimated by dividing the total taxes by the total cost inclusive of taxes. The Value Added Tax (VAT) applies to virtually all expenditure categories except technical assistance (TA), matching grant, and staff allowances. Most costs items include taxes, which account for 60% for vehicles (import tariffs), 6 % for salaries (average), 5% for civil works, equipment and material, and studies, training & local services. For WSAP, local VAT and import taxes are considered in the unit prices of items but excluded from the contribution of the Government of Myanmar (GOM) to project costs (see financing tables). Salaries are inclusive of income tax and no tax on international TA while 0% of income tax is incorporated in the cost of national TA. The estimated level of currency in unit costs was made based on information collected in the field, and similar projects in Myanmar. The foreign exchange part is needed because financial contingencies apply differently to the part of foreign exchange costs and the local currency, and thus it impacts the computation of project economic costs.

7. Table 3 below shows the key assumptions used to calculate the cost of the project:

Table 3: Assumptions on physical contingencies, foreign currency and taxes (%).

Expenditure category	Physical contingencies	Duties and taxes	% Foreign exchange
Civil works	5	5	15
Vehicles	5	60	60
Equipment/materials	5	5	15
International TA	5	0	20
National TA	5	0	0
Salaries/allowances	0	5/0	0
O&M	5	5	15

II. PROJECT COSTS

8. The total project costs, for a period of six years, are estimated at USD 20.3 million or MMK 24.2 billion. All costs have been estimated on the basis of prices prevailing in Myanmar in July 2016 and validated in November 2016. The base cost amount to USD 18.5 million or MMK 20.7 billion, equivalent to 92 % of total costs. Physical and price contingencies account, with USD 1.6 million for about 9% of base costs or 8% of total costs. Investment costs represent, with USD 14.1 million, or 70% of total project costs and 76% of total base costs. Operating costs accounting for only 22% (USD 4.4 million). Project costs by component are presented in the table below. A complete set of summary tables and detailed costs tables are attached in Annexes 1 to 10.

9. The main component of the project cost is that related to “Agricultural Services” with USD 8.5 million or 46% of total costs. This component includes three sub-components: Agricultural Modernization” (27% of total project costs); Financial Services (12% of total project costs), and Policy engagement (1%). The second component relates to “Infrastructure” with USD 6.8 million or 34% of total costs. This component includes three sub-components: “Irrigation Infrastructure" (19% of total costs); “Social Infrastructure” (10%); and “Capacity building” (5%). The third component is related to “project Management”, that include inter alia M&E and Knowledge Management and represents 18% of total costs.

10. The total project cost is divided into USD 3.9 million dollars in foreign currency (or 19.4% of total costs) and USD 16.2 million in local currency (80.6%).Taxes are included in the costs of all investment and recurrent cost items when applied (0%, 5%, 6%, and 60%) and account for USD 0.7 million for investment costs (USD 0.23 million for equipment, USD 0.16 Million for civil works, USD 0.14 Million for vehicles and “Studies, training & local services” each, and USD 0.06 Millions for “agricultural & other inputs”). Recurrent costs represent USD 0.21 Million (salaries and other operating costs).

Table 4: Components Project Cost Summary

	(MMK Million)			(US $ '000)			% Foreign Exchange	% Total Base Costs
	Local	Foreign	Total	Local	Foreign	Total		
A. Infrastructure								
1. Irrigation Infrastructure	3 699	653	4 351	3 302	583	3 885	15	21
2. Social Infrastructure	1 390	245	1 635	1 241	219	1 460	15	8
3. Capacity building	792	262	1 054	708	234	942	25	5
Subtotal	5 881	1 160	7 041	5 251	1 036	6 287	16	34
B. Agricultural Services								
1. Agricultural Modernisation	6 950	2 542	9 492	6 205	2 270	8 475	27	46
2. Financial Services	316	2 474	2 790	282	2 209	2 491	89	13
3. Policy engagement	138	24	162	123	22	145	15	1
Subtotal	7 404	5 041	12 444	6 610	4 501	11 111	41	60
C. Project Management	984	227	1 211	879	203	1 082	19	6
Total BASELINE COSTS	14 269	6 428	20 697	12 740	5 739	18 479	31	100
Physical Contingencies	685	303	988	611	271	882	31	5
Price Contingencies	1 905	806	2 711	628	267	895	30	5
Total PROJECT COSTS	16 859	7 537	24 395	13 980	6 277	20 257	31	110

11. **Project Financiers.** The project will be financed by an IFAD loan of USD 9.0 million (44% of total cost), an IFAD grant of USD 4.0 million (20%), Government contribution of USD 1.0 million (5%) for salaries and operational expenditures, beneficiary/private sector contribution of USD 0.8 million (4%), and implementing partners' cost-sharing of USD USD 1.0 million (5%). The financing gap of US$ 4.5 million may be sourced through cofinancing identified during implementation or through a subsequent PBAS cycle.

Table 5: Components by Financiers (US $ '000)

	The Government		IFAD Loan		IFAD Grant		implementing partners		Beneficiaries/Private sector		Financing Gap		Total		For. Exch.	Local (Excl. Taxes)
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%		
A. Infrastructure																
1. Irrigation Infrastructure	0	-	3 573	83.2	278	6.5	-	-	327	7.6	117	2.7	4 294	21.2	644	3 650
2. Social Infrastructure	-0	-	146	9.1	627	39.0	-	-	453	28.1	383	23.8	1 610	7.9	241	1 368
3. Capacity building	-0	-	346	33.7	219	21.3	-	-	-	-	463	45.0	1 028	5.1	250	778
Subtotal	-0	-	4 065	58.6	1 124	16.2	-	-	780	11.2	963	13.9	6 932	34.2	1 136	5 796
B. Agricultural Services																
1. Agricultural Modernisation	796	8.6	1 148	12.4	2 854	30.8	1 050	11.3	-	-	3 427	37.0	9 275	45.8	2 498	6 777
2. Financial Services	0	-	2 708	100.0	-	-	-	-	-	-	-	-	2 708	13.4	2 397	311
3. Policy engagement	0	-	81	50.0	-	-	-	-	-	-	81	50.0	163	0.8	24	139
Subtotal	796	6.6	3 938	32.4	2 854	23.5	1 050	8.6	-	-	3 509	28.9	12 146	60.0	4 919	7 226
C. Project Management	198	16.8	981	83.2	-	-	-	-	-	-	-	-	1 179	5.8	222	957
Total PROJECT COSTS	994	4.9	8 984	44.4	3 978	19.6	1 050	5.2	780	3.8	4 471	22.1	20 257	100.0	6 277	13 980

12. The Central and State Government of Myanmar will make a contribution of USD around 1 million or 5% of total costs. This contribution will cover Project support staff salaries, and Operational expenditures such as electricity, annual operating costs, the rehabilitation or upgrade of premises, initial furniture for project offices, secretary and project support staff salaries, PIO office costs, office rental in southern Chin State and northern Magway region. Beneficiaries including private sector will participate to Small scale community irrigation schemes, irrigation schemes (> 15acres), rehabilitation of community dams and downstream irrigation system, kitchen gardening (water storage tanks), the acquisition of Domestic Water Supply, Solar Home System, Rainwater Harvesting, Land Consolidation, Pico-Hydro Power Schemes, Social Mobilisation, some activities related to the Support to Farming Households and agriculture institutions (starter package for SALT, Planting and weeding contour hedgerows, etc.), and the development of MSMEs. This participation is estimated at USD 0.5 million, equivalent to 2.5% of total project costs.

13. **Categories of expenditure**. The most important investment expenditure categories civil works and equipment at USD 8.06 million of total base costs. These categories represent respectively 25.4%, 17%, 15.7% of total base costs. Credit and Agricultural & Other Inputs account each for around 7% of total costs. In terms of recurring costs, salaries are the most important category even its share of the total cost is only 12% with about USD 2.1 million, followed by other operating costs with 8% of total base costs, and staff allowances with 3% of base costs of the project. Table 6 summarises the expenditure accounts project cost summary.

Table 6: Disbursement Accounts by Financiers (US $ '000)

	The Government		IFAD Loan		IFAD Grant		partners		sector		Financing Gap		Total		For. Exch.	(Excl. Taxes)
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%		
I. Investment Costs																
A. Civil Works	20	0.6	3 266	91.4	44	1.2	-	-	127	3.6	117	3.3	3 574	17.6	559	3 016
B. Vehicles	-	-	255	100.0	-	-	-	-	-	-	-	-	255	1.3	62	193
C. Equipment	-0	-	1 508	33.6	909	20.2	-	-	652	14.5	1 420	31.6	4 488	22.2	683	3 805
D. consultancies	0	-	448	16.0	1 489	53.2	-	-	-	-	861	30.8	2 799	13.8	2 042	757
E. Studies	0	-	449	34.0	303	22.9	-	-	-	-	570	43.1	1 323	6.5	143	1 180
F. Training	0	-	397	65.8	-	-	-	-	-	-	207	34.2	604	3.0	81	522
G. goods, services and inputs	9	0.3	131	5.2	1 232	48.7	1 050	41.5	-	-	109	4.3	2 530	12.5	285	2 245
H. Credit	-	-	2 276	100.0	-	-	-	-	-	-	-	-	2 276	11.2	2 276	-
Total Investment Costs	29	0.2	8 729	48.9	3 978	22.3	1 050	5.9	780	4.4	3 283	18.4	17 848	88.1	6 130	11 717
II. Recurrent Costs																
A. Salaries of Government Staff /a	416	100.0	-	-	-	-	-	-	-	-	-	-	416	2.1	-	416
B. Salaries of Contractual Project Staff	-	-	112	19.4	-	-	-	-	-	-	463	80.6	575	2.8	-	575
C. Staff Allow ances	-	-	40	5.2	-	-	-	-	-	-	725	94.8	765	3.8	3	762
D. Operating Costs	549	84.1	104	15.9	-	-	-	-	-	-	-	-	652	3.2	143	509
Total Recurrent Costs	965	40.1	256	10.6	-	-	-	-	-	-	1 189	49.3	2 409	11.9	146	2 263
Total PROJECT COSTS	994	4.9	8 984	44.4	3 978	19.6	1 050	5.2	780	3.8	4 471	22.1	20 257	100.0	6 277	13 980

Appendix 10: Economic and Financial Analysis

Introduction

1. The financial and economic analysis was undertaken to assess the financial and economic impacts of the **Western State Agribusiness Project (WASP)** at farmers' level, agri-based Small and Micro-enterprises (SME) level, and on the society as a whole. Both the financial and the economic analyses are based on the crop budgets and assumptions provided in Working Paper 3. These crop budgets consist of detailed annual expenses for seeds, inputs, land preparation and labour as well as estimated average yields for various crops and production conditions. In summary, 4 sets of crop budgets have been worked out, each reflecting different agro-ecological conditions in the Chin state and Magway region and currently observed performances by farmers under realistic conditions in these regions.

2. Crops are grown in these four different regions corresponding to different amelioration proposed by the project: i) Upland Chin: maize, upland and lowland rice, millet, beans, yam, orchard, and upland potato. In the "with project" situation, orchard on couture bands was introduced; ii) Improved irrigation Chin: monsoon rice, summer rice, and potato; iii) Upland Magway: Groundnut38, Pigeonpeas, Cowpea, Onions, Potato, Perimeter Plum and A. Lebbeck, coffee, and Macadamia; and iv) improved Irrigation in Magway: Monsoon rice, and Summer rice.

Data base and WP and WOP Situations used for the FEA

3. The crop budgets were set on the per acre basis. This analysis is based on crop productivity, different input costs at the crop level, by comparing the WP with the WOP situations. For Chin state, the WOP relates to shifting cultivation while WP corresponds to Slopping Agricultural Land Technology (SALT) system, while for avocado, coffee, and Macadamia the WOP situation is assumed with maize cultivation. For low land rice, productivity is set for three levels of input use (high, medium and low). For Magway region, some crops are introduced as farmers' actual practices (potato and onion as vegetables). Other crops are introduced by comparing WOP (farmers own seed/low inputs) with the WP (improved seed / high inputs) as it is the case of groundnut, peas, medium and monsoon rice, and onion. For plum in Magway the WOP is assumed to be maize cultivation.

4. **Purpose** of the financial economic analysis of the project is to: (i) evaluate the financial viability of the improved farm production models and SME models, and also to demonstrate that these models are viable livelihood and business options for the targeted households; and (ii) demonstrate the financial and economic viability of the proposed project activities and the whole project.

Project targets

The project is targeting to support 385,855 acres of crops with 74,454 producer families, 1,320 SMEs and 25 mile of farm roads. The potential for improving existing crops, availability of lands and water, and willingness of the target groups were basis to set these targets. Their distribution by crops / cropping systems is presented in the table below for Chin:

Table 2**Table 1: Project Targeted land areas and households: Chin**

Upland Crops for Chin (all in acres)	Hire Purchase	Own funds and debt financed permanent land	Total

[38] Different combinations of groundnut and Pigeonpeas are included in different periods of the year (May-November/August-November) or mono/mix crops but are all improved with the situation WP.

	SALT starter pack	Permanent	SALT Farmer Own Financing and Debt	Permanent	
Maize	1,000	1,500	310	500	3,310
U Rice	1,000	1,500	310	500	3,310
Millet		3,000		1,000	4,000
Beans - separate		1,000		2,075	3,075
Yam	1,000		320		1,320
Orchard Avocado/couture band	1,000			500	1,500
Macadamia		500			500
Permanent upland potato		300		100	400
Coffee on contour band		200	300		500
Total effective extent[1]	4,000	8,000	1,240	4,675	17,915
Un-supported Extent in the farm[2]	0	0	3,631	7,630	11,261
Physical Extent reached by the project[3] [1+2]	4,000	8,000	4,871	12,305	29,176
Total HH benefited [4]	1,333	2,667	1,624	4,102	9,726

[1] This is the extent which receives supports from the project per farm (or HH). The total is 17,915 acers. For each farm, the project supported extent will be a part of the total farm land. This part is typically about ½ of the total farm land. It is expected that the un-supported land will also use similar technologies.

[2] This is the balance and un-supported extent of the land in the farm. The production and income of this portion of land has not been accounted for the financial and economic analysis.

[3] This is the physical extent of the farm and a portion of this is the effective land that receives project supports.

[4] The average size of the farm per HH is 3 acres.

5. In Chin, the project will reach to 29,176 acres of land that would be operated by 9,726 farming households. Out that extent of land, 17,915 acers of land will receive direct project supports. In addition, the project will support 200 acres of up-land rice land owned by 200 households. In Magway, the project will support 367,740 acres of land owned by 64,516 farming households (Table 2) with 5.7 acres of average extent per farm. Both areas together will support 74,242 targeted households.

Table 2: Project targets: Magway

Upland Crop for Magway (all in ac)	May- Nov (ac)	Aug-Nov (ac)	Other (ac)	Total acres	Total HHs
Groundnut: mono, improved	50,000			50,000	8,772
Groundnut: mono+ GC+ improved		20,900		20,900	3,667
Groundnut: mix, improved	110,000			110,000	19,298
Groundnut: mono+ GC+ improved		61,400		61,400	10,772
Pigeon-peas: mix, improved	5,000	5,000		10,000	1,754
Cowpea: green manure/fodder	93,990			93,990	16,489
Onion			4,370	4,370	767
Potato			1,000	1,000	175
Perimeter Plum +A. Lebbeck			10,000	10,000	1,754
Rice	3,240	2,840		6,080	1,067
Total	262,230	90,140	15,370	367,740	64,516

6. **Approach and the methodology**: The project approach is to facilitate farming activities enhance the overall productivity of up-land and low-land farming model. In addition, several SMEs will be supported by

debt financing to help process farm produce. The EFA was structured to capture the incremental benefits of different farm models. The financial and economic viability of the crop production models, farm models and SME models was analysed with the cost-benefit analysis method. The crops represent seasonal and perennial and therefore a combination of Return on Investment (ROI) and return to labour method for seasonal crops and the net present values (NPV) methods discounted at appropriate rates and the internal rate of return (IRR) for perennial crops are used as the financial and economic parameters to assess the viability. In addition to these three models, producers' incremental benefits were analysed using a farm model structure.

Assumptions of Financial Analysis

7. The financial analysis of the Project is based on prices and costs collected by the detailed Design mission in 2016. The main assumptions of the analyses are the following.

a. The selected crops and particularly SME models would represent all crops and SMEs that would demand project support and be supported by the project.

b. For all activities which used labour, a financial rural daily wage rate of MMK 3000 (USD 2.68) per person-day was assumed. There is no difference in the wager for men and women. The same wage rate was used to value household family labour too because of the availability of wage labour opportunities in the project areas. In the transformation process of financial value to economic value, the opportunity cost of labour is computed using the Standard Conversion Factor of 0.9 taking into account the imperfections in the rural labour market.

c. The foreign exchange rate used in the analysis was MMK 1120 per 1 USD.

d. Total labour demand for farm operations has been included into the farm budget analyses. Having allocated labour in establishing and maintaining on-farm operations, the usual practice is to utilise the additional family labour units in wage labour employment. Such labour units were estimated and included in the household sustainability analyses and potential income sources for the family. A part of that wage income was assumed to be used to repay the loans that would be provided to finance material cost of crop cultivations.

e. With training, extension, technology support, input services, credit, and improved farm roads in the production areas and in other common areas the target beneficiaries are capable of undertaking improved production practices and achieving the production levels that are assumed in this analysis to represent the "with project" (WP) situation. However, on average 80% of the production areas have been assumed to adopt technical packages at the full development. The adoption rate is low at 60% at the initial years and gradually increase to 80%.

f. Average size of the farm is three acres (ac), which is one Chin-ac.

g. Maize cultivation was assumed to be replaced with crops under SALT that are supported by the project. The cost and benefit flows of maize were used to represent the "without project" (WOP) situation in all crop models.

h. For the SMEs, the WOP situation was represented by 40% of the cost of labour. The basis of this assumption is that the labour of SMEs will be employed as wage labour otherwise if not used for SMEs. As such it is the opportunity cost of labour that was used as the WOP situation. All SMEs are new business ventures. Therefore, the WOP scenario would be well represented by taking the opportunity cost of labour that is used for SME production.

i. The strategic infrastructure, mainly roads, that is supported by the project will facilitate the efficient transaction of farm products. The benefits of roads were assumed as savings

of vehicle operating cost in transporting of all type of goods, public transport and transporting farm products; and

j. Average size of a targeted household has been assumed at six members and out of them two members contribute to the family labour force.

PRODUCTION Models

8. The financial and economic analyses used three types of production models: one-acre crop production models or crop budget analysis; three-acre farm models of typical crop combinations estimating incremental that the producers would be getting; and representative SME models. The incremental net benefits (difference between the WOP and WP cash flows) of products were estimated and by aggregating them over the project targets, the full benefits of the project were estimated. Typical examples of these three models were analysed and presented below.

9. The analysis of each model includes (i) total incremental productivity and production of the commodities, (ii) farm model analysis indicating the producer level incremental net incomes per year and for 20-year period; (iii) SALT starter pack and debt financing requirements; and (iv) employment generation. The NPV, financial internal rate of return (FIRR) and benefit-cost ratio of the production benefits per unit of production over a period of 20-yaers with a 13% discount rate is also presented. The production models for Chin and Magway are separately presented. The details of the analyses are found in the Appendices and also in the excel sheets of the FEA.

Crop production models - Chin

10. Up-land crops: The target group of farmers in Chin uses hire-purchase land and own land for crop production. The target group is further divided as adopter of SALT with a starter package as a grant of MMK 290,080 which help establishing ¼ ac equivalent SALT belt, and non-SALT adopters. Table 3 summarises the composition of the four farm models and the extent of each crop in the farm. Out of the 3-acre farm, the project would support for one acre with direct support.

Table 3: Composition of the Farm Models in Chin (extent of each crop in the model is in acres)

Farm Model 1: With or without SALT + Hire Purchase

Maize with SALT	0.25
U Rice with SALT	0.25
Yam with SALT	0.25
Avocado with SALT	0.25
Macadamia without SALT	2
Total Farm Size - Model 1 (ac)	3

Farm Model 2: Without SALT + Hire Purchase

Maize	0.67
U Rice	0.67
Millet	0.66
Beans	0.5
Macadamia	0.25
Coffee	0.25
Total Farm Size - Model 1 (ac)	3

Farm Model 3: With or without SALT + Own Land

Maize with SALT	0.25
U Rice with SALT	0.25
Yam with SALT	0.5
Potato without SALT	1.5
Coffee with SALT	0.5
Total Farm Size - Model 1	3

Farm Model 4: Without SALT + Own Land

Maize	0.67
U Rice	0.67
Millet	0.66
Avocado	0.75
Beans	0.25
Total Farm Size - Model 1	3

11. The project will provide a financing package to establish each of these crop models. The package includes grants for establishing SALT and short and long-term credit financing covering the initial material cost of the crop model. The short-term loan will have to be repaid after the cropping season which is typically about 4-5 months. The long-term loan has a two years' grace period and a 5-year repayment period. All these loans will have a 13% annual interest rate. The producers will finance the balances after grants and debt financing.

12. The financial viability of all the crop budgets for the crops listed in the four farm models in Table 3 was analysed for both the cases: before and after providing the project financing package.

14. Appendix Table 1 provides summary for all the crop models (excel file on financial analysis have all the details). The return to labour for the annual crops and the Financial Internal Rate of Return for 20-year period were used to estimate the financial viability of the crops of the farms. All crops are financially viable. The Appendix Table shows that the start-up package and debt financing are required to meet the financing gap of the establishment cost of crops. The analysis also shows that both the long-term and short-term credit could be fully paid including the 13% interest with the incremental cash flows of each crop model.

15. Low-land paddy: Limited lowlands are presently being cultivated in Chin, however the rehabilitation of irrigation schemes under component 1 will avail 200 acres of lowland under irrigation for the HH owning the land. An estimated 212 farmers (mostly landlords) will benefit from the development of the irrigated lowland, each having an average of 0.94 acre of land. The anticipated cropping pattern will produce a cropping intensity of 280%. The crop budget analysis shows a profitability of 119% ROI including the full labour cost and 207% ROI with net of labour cost.

Crop production models – Magway

16. Up-land: The main crops in Magway are groundnut (87%) and pigeons-peas (12%). With the project, the share of groundnut in the farm cropping pattern system will be about 80% of the total cultivated area which is estimated to 367,740 acres. The other crops include plum orchard about 3% and onions for about 1% of the total land. It is anticipated that the project interventions will affect 367,740 acres. The cropping intensity will increase by about 111% through the introduction of green cover crop and perimeter crops as wind breakers. Other improved practices will include new varieties with spreading trait providing better soil cover, balanced fertiliser and expanded use of mechanisation. The financial viability through a crop budget analysis has been estimated for all the crops with different situations that are presented in Table 2. The financial viability of the crop budgets is presented in Appendix Table 1 and all the crops included in the targeted farms are financially viable. The average size of the farm in Magway is 5.7 acres and the project assistance by way of debt financing is provided for about one or two acres as demanded.

17. There is no grant funding support for Magway crops and it is only the credit financing that would be provided for the crops. However, the financial viability results presented in Appendix Table show a notable increase in the profitability due to a combination of cropping intensity and adoption of good practices. The cropping intensity will increase by 111% through the introduction of green cover crop and perimeter crops as wind breakers. Other improved practices will include new varieties with spreading trait providing better soil cover, balanced fertiliser and expanded use of mechanisation. All crops are financially viable.

Low-Land paddy: The total monsoon and summer rice area that is supported by the project would be 6,080 acres under irrigation facilities. A total of 1,067 HHs cultivate this extent of paddy lands in summer and monsoon seasons. The crop budget analysis, presented in

18. Appendix Table 1, shows a profitability of paddy cultivation. The main anticipated driver for increase rice productivity is introduction of System of Rice Intensification (SRI) in conjunction with mechanical weeding. Irrigation facilities that would be supported by the project would also contribute to the increase in the net income of paddy farming. The cost of these operations was included in the analysis.

Farm Models - Chin

19. The incremental income of each farm model that is presented in Table 3 was estimated and summarised in Table 4. It shows the incremental incomes for the families who would be targeted by the project. These farm model to represent each of the crop model was developed on the basis of a typical farming system of the producers that exist in the project areas in Chin.

Table 4: Farm model structure and incremental financial values - Chin

	Hire Purchase (HP)		Own Land (no HP)	
Type of land use →	SALT	No SALT	SALT	No SALT
Indicator	F Model 1[1]	F Model 2	F Model 3	F Model 4
WP NPV per HH (MMK 1000)	15,595	3,568	35,624	50,526
Incremental NPV per HH (MMK 1000)	12,122	2,137	24,367	25,760
% Increase	78%	60%	68%	51%
Income at full development (MMK 1000 / HH/Year)	5,919	1,082	2,241	1,841
Income at FD: net of labour (MMK 1000 / HH/Year)	8,095	2,276	2,890	2,668
Income at FD: net of labour (US $ / HH / Yr)	7,228	2,032	2,581	2,382
Daily Income at FD: net of labour (US $ / HH /day)	20	6	7	7
IRR of Incremental Cash Flow	29%	29%	>50%	109%

[1] Description and composition of the Farm model 1 to 4 is presented in Table 3. Model 1: With SALT (macadamia in the contour) and Hire Purchase land; Model 2: Without SALT and Hire Purchase; Model 3: With SALT and Own Land; Model 4: Without SALT and Own Land

20. Results of the farm model analyses indicates that all the models have financial gains after the project interventions with increment being more than 50%. The net income with project without including the cost of labour, since almost all are family labour, indicates a substantial income gain. The average net daily income of these farm models is estimated to be USD 20 per producer family per day at the maximum and USD 6 at the minimum. The analysis indicates that the farm models with SALT technology brings substantially higher income.

21. The debt requirement per farm model was also analysed. This is to finance the material cost of the farm budget. The credit is provided only once per farm and thus the total provision is MMK 4,617.4 million, the total for project years 2 to 6 as presented in Table 5. The annual total value of SALT starter pack that is provided at the rate of MMK 290,080 per acre is shown in the table. The pack is provided only once per farm. The grand total value of the starter pack is MMK 3,721.8 million. Table 5 also shows the total labour use for the initial years. Taking labour use as the indicator for employment generation, the project assisted farms will generate 208,240 additional person-years of labour which translate to 1,041 persons of incremental full-time farm employment in a year at full development, with the assumption that labour will be employed for 200 days per year.

Table 5: Demand for project supported credit and incremental labour use - Chin

Financing package	Project Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
Debt (MMK mn)	451.4	451.4	1,805.7	1,430.2	476.7

SALT Starter Pack (MMK mn)	92.8	110.2	406.1	417.7	278.5
Incremental Labour (PD)	17,786	35,932	109,525	184,341	208,240

Farm Models - Magway

22. A farm model to represent each of the crop model was developed on the basis of a typical farming system of the producers that exist in the project area in Magway. Average size of the farm model is 5.7 acres per farm. The farm models presented in Table 6 demonstrate the increase in the financial values for the producers. The farm model income is an aggregation of the income of the main crop (ground nut) and the crops listed under combined crops (pigeon-peas, cowpea, onion and plum). Results of the farm model analyses indicates that all the models have financial gains after the project interventions with increment being more than 65%. The net income with project including the cost of labour, since most farmers use wage labour in addition to the family labour to cultivate the 5.7-acre farm, indicates a substantial income gain. The average net daily income of these farm models is estimated to be USD 32 per producer family per day at the maximum and USD 9.8 at the minimum.

Table 6: Farm model structure and incremental financial values – Magway

Upland Crop for Magway (all income are per farm)	WP net income	Incremental net income	% of increase	WP net income (USD/HH/Yr)	WP net income (USD/HH/day)
	(MMK1000/HH/Yr)				
Model 1: Groundnut: mono, improved + combined with (Pigeon-peas, Cowpea, Onion and perimeter plum & Lebbeck)	10,855	5,882	54%	8,654	23.7
Model 2: Groundnut: mono + GC+ improved + combined with the same	13,207	6,720	51%	10,528	28.8
Model 3: Groundnut: mix, improved + combined with the same	11,007	5,817	53%	8,774	24.0
Model 4: Groundnut: mono+ GC+ improved + combined with the same	10,472	5,716	55%	8,349	22.9
Model 5: Potato	4,374	4,340	95%	3,487	9.6

23. The project is providing credit facilities in the Magway to finance the material cost of the farm budget. The total credit that is required to meet the total demand is presented in Table 7. The credit is provided only once per farm and thus the total provision is MMK 45,208 million, the total for project years 2 to 5 as presented below. Table 7 also shows the total labour use for the initial years. The project assisted farms will generate 439,125 additional person-years of labour which translate to 2,195 persons of incremental full-time farm employment in a year at full development, with the assumption that labour will be employed for 200 days per year.

Table 7: Demand for project supported credit and incremental labour use - Magway

Indicator	Project Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
Debt (MMK mn)	124.4	124.4	373.2	621.9	
Incremental Labour use (PD)	30,728	61,456	187,967	431,025	439,125

Agribusiness Development and SMEs

The project supports a number of SMEs and agribusiness development investments. It is difficult to estimate with any accuracy the future financial and economic performance of the supporting income generating activities, SMEs and value chain investments. The models identified are proxies based on the potential of each zone, and mission interviews in the field with small scale investments by rural entrepreneurs and other value chain stakeholders that would allow a better access by project beneficiaries to markets. The typical models that were analysed include (i) Vet paraprofessionals providing private veterinarian services; (ii) goat kid fattening; (iii) seed processing; and (iv) yam drying. The project is providing credit facilities for the SMEs. The financial viability of each of the SME is estimated and presented in

Crop Budget: 1 ac / Season	Index!A1							
Total Project Tartget (ac):	1000							
Chin Upland Paddy with SALT - Financial	**Unit**	**Unit Value**	**SALT (WP)**		**Shifting Cultivation (WOP)**		**Incremental**	
			Physical	Value MMK/ac	Physical	Value MMK/ac	Physical	Value MMK/ac
Yield (20% higher Yd under SALT)	kg	245	1,800	441,000	640	156,800	1,160	284,200
Seed	kg	600	25	15,000	40	24,000		
Land Hire (1 ac is hired for SALT; hiring cost capitalised for crop season)	MMK/ac	421,875	0.42	175,781				
Compost	kg	75	500	37,500	-	-		
Neemcide	Ltr	1,500	10	15,000	-	-		
Labour Use								
Land Preparation	Pd	3,000	15	45,000				
Felling Forest	pd	3,000	-	-	15	45,000		
Burning Felled trees	pd	3,000	-	-	10	30,000		
Second burning and seeding	pd	3,000	-	-	10	30,000		
Seeding	pd	3,000	5	15,000	1	3,000		
1st Weeding	pd	3,000	15	45,000	10	30,000		
2nd Weeding	pd	3,000	15	45,000	10	30,000		
Harvesting	pd	3,000	20	60,000	10	30,000		
Treshing	pd	3,000	15	45,000	10	30,000		
Transport to home	pd	3,000	20	60,000	10	30,000		
Cost and Revenue								
Material cost	MMK/ac			243,281		24,000	-	219,281
Labour cost	MMK/ac			315,000		258,000	-	57,000
Total Cost	MMK/ac			558,281		282,000	-	276,281
Total Gross Revenue	MMK/ac			441,000		156,800	-	284,200
Total Net Revenue	MMK/ac			- 117,281		- 125,200	-	7,919
Number of Labour Days	pd/ac		105		86		19	-
Total Net Revenue, net of labour	MMK/ac			197,719		132,800	-	64,919
Return to Labour	MMK/pd			1,883		1,544	-	339

Project financing:	Units	Value
SALT Starter package	MMK	290,080
Debt for working capital	MMK	243,281
Annual Interest	%	13%
Period of the Loan	months	5
Interest for the repay-period	%	5%
Interest payment for 6 monts	MMK	13,178
Total repayment	MMK	256,459

Crop Budget: 1 ac / Season	Index!A1							
Total Project Tartget (ac):	3000							
Chin Millet - Financial	**Unit**	**Unit Value**	**WP**		**Shifting Cultivation (WOP)**		**Incremental**	
			Physical	Value MMK/ac	Physical	Value MMK/ac	Physical	Value MMK/ac
Yield	kg	350	1,000	350,000	550	192,500	450	157,500
Seed	kg	400	7	2,800	10	4,000		
Land Hire (1 ac is hired; hiring cost capitalised for crop season)	MMK/ac	421,875	0.25	105,469				
Compost	kg	75	300	22,500	-	-		
Neemcide	Ltr	1,500	10	15,000	-	-		
Labour Use								
Land Preparation	Pd	3,000	15	45,000				
Felling Forest	pd	3,000	-	-	15	45,000		
Burning Felled trees	pd	3,000	-	-	10	30,000		
Second burning and seeding	pd	3,000	-	-	10	30,000		
Seeding	pd	3,000	5	15,000	5	15,000		
1st Weeding	pd	3,000	15	45,000	10	30,000		
2nd Weeding	pd	3,000	15	45,000	10	30,000		
Harvesting	pd	3,000	15	45,000	10	30,000		
Treshing	pd	3,000	15	45,000	10	30,000		
Transport to home	pd	3,000	15	45,000	10	30,000		
Cost and Revenue								
Material cost	MMK/ac			145,769		4,000	-	141,769
Labour cost	MMK/ac			285,000		270,000	-	15,000
Total Cost	MMK/ac			430,769		274,000	-	156,769
Total Gross Revenue	MMK/ac			350,000		192,500	-	157,500
Total Net Revenue	MMK/ac			- 80,769		- 81,500	-	731
Number of Labour Days	pd/ac		95		90		5	-
Total Net Revenue, net of labour	MMK/ac			204,231		188,500	-	15,731
Return to Labour	MMK/pd			2,150		2,094	-	55

Debt financing:	Units	Value
Debt for working capital	MMK	145,769
Annual Interest	%	13%
Period of the Loan	months	3
Interest for the repay-period	%	3%
Interest payment for 6 monts	MMK	4,737
Total repayment	MMK	150,506

Total Project Tartget (ac):	1000							
Chin White Bean, Own Funds+Debt - Financial	**Unit**	**Unit Value**	**WP**		**Shifting Cultivation (WOP)**		**Incremental**	
			Physical	Value MMK/ac	Physical	Value MMK/ac	Physical	Value MMK/ac
Yield	kg	565	780	440,700	500	282,500	280	158,200
Seed	kg	600	15	9,000	10	6,000		
Land Hire (1 ac is hired; hiring cost capitalised for crop season)	MMK/ac	421,875	0.21	87,891				
Compost	kg	75	500	37,500	-	-		
Neemcide	Ltr	1,500	5	7,500	-	-		
Labour Use								
Land Preparation	Pd	3,000	15	45,000				
Felling Forest	pd	3,000	-	-	10	30,000		
Burning Felled trees	pd	3,000	-	-	5	15,000		
Second burning and seeding	pd	3,000	-	-	10	30,000		
Seeding	pd	3,000	5	15,000	5	15,000		
1st Weeding	pd	3,000	10	30,000	10	30,000		
2nd Weeding	pd	3,000	10	30,000	10	30,000		
Harvesting	pd	3,000	15	45,000	10	30,000		
Treshing	pd	3,000	15	45,000	10	30,000		
Transport to home	pd	3,000	15	45,000	10	30,000		
Cost and Revenue								
Material cost	MMK/ac			141,891		6,000	-	135,891
Labour cost	MMK/ac			255,000		240,000	-	15,000
Total Cost	MMK/ac			396,891		246,000	-	150,891
Total Gross Revenue	MMK/ac			440,700		282,500	-	158,200
Total Net Revenue	MMK/ac			43,809		36,500	-	7,309
Number of Labour Days	pd/ac		85		80		5	-
Total Net Revenue, net of labour	MMK/ac			298,809		276,500	-	22,309
Return to Labour	MMK/pd			3,515		3,456	-	59

Project financing:	Units	Value
Debt for working capital	MMK	141,891
Annual Interest	%	13%
Period of the Loan	months	3
Interest for the repay-period	%	3%
Interest payment for 6 monts	MMK	3,843
Total repayment	MMK	145,733

Crop Budget: 1 ac / Season	Index!A1							
Total Project Tartget (ac):	1000							
Chin Yam with SALT - Financial	**Unit**	**Unit Value**	**SALT (WP)**		**Shifting Cultivation (WOP)**		Increment	
			Physical (Kg)	Value MMK/ac	Physical	Value MMK/ac	Physical	Value MMK/ac
Yield (dry)	kg	4,500	800	3,600,000	715	3,217,500	85	382,500
Planting material	kg	3,500	105	367,500	105	367,500	-	-
Land Hire (1 ac is hired; hiring cost capitalised for crop season)	MMK/ac	421,875	1.00	421,875				
Compost	kg	150	500	75,000	-	-		
Neemcide	Ltr	1,500	10	15,000	-	-		
Labour Use								
Land Preparation	Pd	3,000	15	45,000			15	45,000
Felling Forest	pd	3,000	-	-	20	60,000		
Burning Felled trees	pd	3,000	-	-	10	30,000		
Second burning and seeding	pd	3,000	-	-	10	30,000		
Seeding	pd	3,000	5	15,000			5	15,000
1st Weeding	pd	3,000	10	30,000	15	45,000	- 5	- 15,000
2nd Weeding	pd	3,000	10	30,000	15	45,000	- 5	- 15,000
3th Weeding	pd	3,000	10	30,000	16	48,000	- 6	- 18,000
Drying	Pd	3,000	6	18,000	6	18,000	-	-
Transport to home		4,500		4,500	2	9,000		- 4,500
Total Labour								
Cost and Revenue								
Material cost	MMK/ac			883,875		367,500	-	516,375
Labour cost	MMK/ac			168,000		258,000	-	- 90,000
Total Cost	MMK/ac			1,051,875		625,500	-	426,375
Total Gross Revenue	MMK/ac			3,600,000		3,217,500	-	382,500
Total Net Revenue	MMK/ac			2,548,125		2,592,000	-	- 43,875
Number of Labour Days	pd/ac		56		94		- 38	-
Total Net Revenue, net of labour	MMK/ac			2,548,125		2,592,000	-	- 43,875
Return to Labour	MMK/pd			45,502		27,574	-	17,928

Project financing:	Units	Value
Debt for working capital	MMK	883,875
Annual Interest	%	13%
Period of the Loan	months	3
Interest for the repay-period	%	3%
Interest payment for 6 monts	MMK	23,938
Total repayment	MMK	907,813

Crop Budget: 1 acres, 20-year period										
Chin Avocado with SALT - Financial	IndexIA1									
Project target (ac)	1000									
		Price	**Without**	**With Project**						
Yields and inputs	**Unit**	**MMK**	**Project**	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**
Sales of avocado	Kg	450	-	-			1512	3,661	4,788	5,670
Yd of maize (shifting cultivation)	Kg		690							
Sales of maize (shifting cultivation)	MMK	280	193,200							
Investments	MMK		-				-	-	-	
Land Preparation	Acre	120,000		1						
Land Hire (1 ac is hired; hiring cost capitalised for crop season)	MMK/ac	421,875		421,875	421,875	421,875	421,875	421,875	421,875	421,875
Saplings	pc	500		126						
Planting	Acre	15,000		1						
Manure	Mt	5,600		10						
Total Investment	MMK/ac			675,875	421,875	421,875	421,875	421,875	421,875	421,875
Operating costs										
Compost	Kg	15			5000	5000	5000	5000	5000	5000
Neemcide	Lt	7,500		10	10	10	10	10	10	10
Intregrated Pest Management	pd	3,000		5	5	5	5	5	5	5
Pruning	pd	3,000			15	15	15	15	15	15
Weeding	pd	3,000					-	8	8	8
Harvesting plus transport	pd	3,000					25	25	25	25
Total Labour			5	5	20	20	45	53	53	53
Incremenantal Labout				-	15	15	40	48	48	48
Cost										
Material cost	MMK		55,650	750,875	571,875	571,875	571,875	571,875	571,875	571,875
Labour cost	MMK		15,000	15,000	60,000	60,000	135,000	159,000	159,000	159,000
Total Cost	MMK		70,650	765,875	631,875	631,875	706,875	730,875	730,875	730,875
Revenue										
Sales of Avocado	MMK		-	-	-	-	680,400	1,647,430	2,154,600	2,551,500
FINANCIAL BUDGET (MMK)				**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**
Gross Income										
Sales of Avocado (maize = WOP)	MMK		193,200	-	-	-	680,400	1,647,430	2,154,600	2,551,500
Investments	MMK									
Material cost	MMK		55,650	750,875	571,875	571,875	571,875	571,875	571,875	571,875
Labour cost	MMK		15,000	15,000	60,000	60,000	135,000	159,000	159,000	159,000
Total Production Cost	MMK		70,650	765,875	631,875	631,875	706,875	730,875	730,875	730,875
Net Income	MMK		122,550	-765,875	-631,875	-631,875	-26,475	916,555	1,423,725	1,820,625
Cash flows for farm-gate financial analysis	MMK									
Incremental cost	MMK			695,225	561,225	561,225	636,225	660,225	660,225	660,225
Incremental benefits	MMK			-193,200	-193,200	-193,200	487,200	1,454,230	1,961,400	2,358,300
Incremental net benefits	MMK			-888,425	-754,425	-754,425	-149,025	794,005	1,301,175	1,698,075

Crop model profitability at the Farm-gate: before project financing:	
Discount rate	13%
IRR	**31%**
Incremental PV-benefit (MMK)	8,713,079
Incremental NPV-benefits (MMK)	4,205,052
Incremental PV-cost (MMK)	4,508,027
B/C ratio	1.93
Switching Value of Benefits	-48%
Return to family labour at full development (MMK/md)	37,008

Project Financing at the farm-gate for cultivation			WoP	WP						
				Yr : 1	Yr : 2	Yr : 3	Yr : 4	Yr : 5	Yr : 6	Yr : 7
Current crop extent	ac		1	1						
Incremental Net income	MMK			(598,345)	(754,425)	(754,425)	(149,025)	794,005	1,301,175	1,698,075
Start-up Grant for SALT	MMK			290,080						
Total establishment material cost				385,795						
Total Capital Expenditure Loan				385,795						
Years for having the loan for Capital Expenditure						1	2	3	4	5
Annual interest rate (%)	13%									
Loan repayment period (yrs)	5									
Interest payment (%) - Capital Expenditure Loan	MMK					(50,153)	(42,414)	(33,668)	(23,786)	(12,619)
Payment of principal - Capital expenditure loan	MMK					(59,534)	(67,273)	(76,019)	(85,901)	(97,068)
Total payment for the Capital expenditure loan	MMK					(109,687)	(109,687)	(109,687)	(109,687)	(109,687)
Incremental Cashflows for Financial analysis (after project financing)										
Incremental cost	MMK			695,225	561,225	670,912	745,912	769,912	769,912	769,912
Incremental benefits	MMK			482,675	-193,200	-193,200	487,200	1,454,230	1,961,400	2,358,300
Incremental benefits	MMK			(212,550)	(754,425)	(864,112)	(258,712)	684,318	1,191,488	1,588,388

Crop model profitability - after project financing:	
Discount rate	13%
IRR	**38%**
Incremental PV-benefit (USD)	9,311,198
Incremental NPV-benefits (USD)	4,501,037
Incremental PV-cost (USD)	4,810,161
B/C ratio	1.94

Crop Budget: 1 acres, 20-year period										
Chin Macadamia - Financial	Index!A1									
Project target (ac)	500									
			Without	**With Project**						
Yields and inputs	**Unit**	**Price MMK**	**Project**	**Proj Yr 1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Yr 7**
Sales of Macadamia (nut in shell 10% moist)	mt	3,000,000	-	-			0.13	0.26	0.39	0.52
Yd of maize (shifting cultivation)	Kg		690.0							
Sales of maize (shifting cultivation)	MMK	280	193,200							
Investments	MMK						-	-	-	
Land Preparation	Acre	120,000		1						
Land Hire (1 ac is hired; hiring cost capitalised for crop season)	MMK/ac	421,875		421,875	421,875	421,875	421,875	421,875	421,875	421,875
Saplings	pc	5,000		130						
Planting	Acre	15,000		3						
Manure	Mt	15,000		10						
Total Investment	MMK/ac			1,386,875	421,875	421,875	421,875	421,875	421,875	421,875
Operating costs										
Compost/mulching	Units	15		5000	5000	5000	5000	5000	5000	5000
Neemcide	Lt	7,500		10	10	10	10	10	10	10
Intregrated Pest Management	pd	3,000		5	5	10	15	15	15	15
Pruning	pd	3,000		15	15	15	15	15	15	15
Weeding	pd	3,000		4	4	8	10	10	15	20
Harvesting, transport and processing	pd	3,000			4	8	8	10	25	25
Total Labour	pd		5	24	28	41	48	50	70	75
Incremental Labour	pd			19	23	36	43	45	65	70
Cost										
Material cost	MMK		55,650	1,386,875	421,875	421,875	421,875	421,875	421,875	421,875
Labour cost	MMK		15,000	72,000	84,000	123,000	144,000	150,000	210,000	225,000
Total Cost	MMK		70,650	1,458,875	505,875	544,875	565,875	571,875	631,875	646,875
Revenue										
FINANCIAL BUDGET (MMK)				**Proj Yr 1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Yr 7**
Gross Income										
Sales of Macadamia (maize = WOP)	MMK		193,200	-	-	-	390,000	780,000	1,170,000	1,560,000
Investments	MMK									
Material cost	MMK		55,650	1,386,875	421,875	421,875	421,875	421,875	421,875	421,875
Labour cost	MMK		15,000	72,000	84,000	123,000	144,000	150,000	210,000	225,000
Total Production Cost	MMK		70,650	1,458,875	505,875	544,875	565,875	571,875	631,875	646,875
Net Income	MMK		122,550	-1,458,875	-505,875	-544,875	-175,875	208,125	538,125	913,125
Cash flows for farm-gate financial analysis	MMK									
Incremental cost	MMK			1,388,225	435,225	474,225	495,225	501,225	561,225	576,225
Incremental benefits	MMK			-193,200	-193,200	-193,200	196,800	586,800	976,800	1,366,800
Incremental net benefits	MMK			-1,581,425	-628,425	-667,425	-298,425	85,575	415,575	790,575

Crop model profitability at the Farm-gate: before project financing:	
Discount rate	13%
IRR	**28%**
Incremental PV-benefit (MMK)	10,238,676
Incremental NPV-benefits (MMK)	5,750,960
Incremental PV-cost (MMK)	4,487,716
B/C ratio	2.28
Switching Value of Benefits	-56%
Return to family labour at full development (MMK/md)	39,072

Project Financing at the farm-gate for cultivation			WoP	WP						
				Yr : 1	Yr : 2	Yr : 3	Yr : 4	Yr : 5	Yr : 6	Yr : 7
Current crop extent	ac		1	1						
Incremental Net income	MMK			-1,581,425	-628,425	-667,425	-298,425	85,575	415,575	790,575
Start-up Grant for SALT	MMK			0						
Total establishment material cost				1,386,875						
Total Capital Expenditure Loan				1,386,875						
Years for having the loan for Capital Expenditure						1	2	3	4	5
Annual interest rate (%)	13%									
Loan repayment period (yrs)	5									
Interest payment (%) - Capital Expenditure Loan	MMK					(180,294)	(152,472)	(121,033)	(85,507)	(45,363)
Payment of principal - Capital expenditure loan	MMK					(214,015)	(241,837)	(273,276)	(308,802)	(348,946)
Total payment for the Capital expenditure loan	MMK					(394,309)	(394,309)	(394,309)	(394,309)	(394,309)
Incremental Cashflows for Financial analysis (after project financing)										
Incremental cost	USD			1,388,225	435,225	868,534	889,534	895,534	955,534	970,534
Incremental benefits	USD			1,193,675	-193,200	-193,200	196,800	586,800	976,800	1,366,800
Incremental benefits	USD			-194,550	-628,425	-1,061,734	-692,734	-308,734	21,266	396,266

Crop model profitability - after project financing:	
Discount rate	13%
IRR	**32%**
Incremental PV-benefit (USD)	11,465,999
Incremental NPV-benefits (USD)	5,892,156
Incremental PV-cost (USD)	5,573,843
B/C ratio	2.06

Crop Budget: 1 ac / Season	Index!A1							
Project Target (ac)	300							
Chin Permanent Upland Potato - Financial	**Unit**	**Unit Value**	**SALT (WP)**		**Shifting Cultivation (WOP)**		**Incremental**	
			Physical	Value MMK/ac	Physical	Value MMK/ac	Physical	Value MMK/ac
Yield	kg	350	8,000	2,800,000	5,250	1,837,500	2,750	962,500
Seed	kg	750	1,415	1,061,250	1,415	1,061,250	-	-
Land Hire (1 ac is hired; hiring cost capitalised for crop season)	MMK/ac	421,875	0.42	175,781				
Compost	kg	150	500	75,000				
Neemcide	Ltr	1,500	10	15,000				
Labour Use								
Land Preparation	Pd	3,000	15	45,000				
Felling Forest	pd	3,000			15	45,000	- 15	- 45,000
Burning Felled trees	pd	3,000			10	30,000	- 10	- 30,000
Second burning and seeding	pd	3,000			10	30,000	- 10	- 30,000
Seeding	pd	3,000	5	15,000	5	15,000	-	-
1st Weeding	pd	3,000	10	30,000	10	30,000	-	-
2nd Weeding	pd	3,000	10	30,000	10	30,000	-	-
Harvesting	pd	3,000	50	150,000	10	30,000	40	120,000
Transport to home	pd	4,000	40	160,000	10	40,000	30	120,000
Cost and Revenue								
Material cost	MMK/ac			1,327,031		1,061,250	-	265,781
Labour cost	MMK/ac			430,000		250,000	-	180,000
Total Cost	MMK/ac			1,757,031		1,311,250	-	445,781
Total Gross Revenue	MMK/ac			2,800,000		1,837,500	-	962,500
Total Net Revenue	MMK/ac			1,042,969		526,250	-	516,719
Number of Labour Days	pd/ac		130		80		50	-
Total Net Revenue, net of labour	MMK/ac			1,432,969		766,250	-	666,719
Return to Labour	MMK/pd			11,023		9,578	-	1,445

Debt financing:	Units	Value
Debt for working capital	MMK	1,327,031
Annual Interest	%	13%
Period of the Loan	months	5
Interest for the repay-period	%	5%
Interest payment for 6 monts	MMK	71,881
Total repayment	MMK	1,398,912

Crop Budget: 1 acres, 20-year period										
Chin Coffee - Financial	Index!A1									
Project target (ac)	200									
		Price	**Without**	**With Project**						
Yields and inputs	**Unit**	**MMK**	**Project**	**Project Yr1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Yr 7**
Sales of dry coffee beans	Kg	3000	-	-		150	250	400	600	600
Yd of maize (shifting cultivation)	Kg		690							
Sales of maize (shifting cultivation)	MMK	280	193,200							
Investments	MMK						-	-	-	
Land Preparation	Acre	120,000		1						
Land Hire (1 ac is hired; hiring cost capitalised for crop season)	MMK/ac	421,875		421,875	421,875	421,875	421,875	421,875	421,875	421,875
Saplings	pc	500		700						
Planting	Acre	15,000		3						
Manure	Mt	15,000		10						
Total Investment	MMK/ac			1,086,875	421,875	421,875	421,875	421,875	421,875	421,875
Operating costs										
Compost/mulching	1	15		10000	10000	10000	10000	10000	10000	10000
Neemcide	Lt	7500		10	10	10	10	10	10	10
Intregrated Pest Management	pd	3000		4	4	6	10	12	12	12
Pruning	pd	3000		4	4	6	8	10	10	10
Weeding	pd	3000		4	4	6	8	10	10	10
Harvesting, transport and processing	pd	3000		4	4	8	16	20	20	20
Total Labour	pd	3000	5	16	16	26	42	52	52	52
Incremental Labour	pd			11	11	21	37	47	47	47
Cost										
Material cost	MMK		55,650	1,086,875	421,875	421,875	421,875	421,875	421,875	421,875
Labour cost	MMK		15,000	48,000	48,000	78,000	126,000	156,000	156,000	156,000
Total Cost	MMK		70,650	1,134,875	469,875	499,875	547,875	577,875	577,875	577,875
Revenue										
FINANCIAL BUDGET (MMK)				**Proj Yr 1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Yr 7**
Gross Income										
Sales of Coffee (maize = WOP)	MMK		193,200	-	-	450,000	750,000	1,200,000	1,800,000	1,800,000
Investments	MMK									
Material cost	MMK		55,650	1,086,875	421,875	421,875	421,875	421,875	421,875	421,875
Labour cost	MMK		15,000	48,000	48,000	78,000	126,000	156,000	156,000	156,000
Total Production Cost	MMK		70,650	1,134,875	469,875	499,875	547,875	577,875	577,875	577,875
Net Income	MMK		122,550	-1,134,875	-469,875	-49,875	202,125	622,125	1,222,125	1,222,125
Cash flows for farm-gate financial analysis	MMK									
Incremental cost	MMK			1,064,225	399,225	429,225	477,225	507,225	507,225	507,225
Incremental benefits	MMK			-193,200	-193,200	256,800	556,800	1,006,800	1,606,800	1,606,800
Incremental net benefits	MMK			-1,257,425	-592,425	-172,425	79,575	499,575	1,099,575	1,099,575

Crop model profitability at the Farm-gate: before project financing:	
Discount rate	13%
IRR	**26%**
Incremental PV-benefit (MMK)	6,379,528
Incremental NPV-benefits (MMK)	2,480,515
Incremental PV-cost (MMK)	3,899,013
B/C ratio	1.64
Switching Value of Benefits	-39%
Return to family labour at full development (MMK/md)	80,340

Project Financing at the farm-gate for cultivation			WoP	WP						
				Yr : 1	Yr : 2	Yr : 3	Yr : 4	Yr : 5	Yr : 6	Yr : 7
Current crop extent	ac		1	1						
Incremental Net income	MMK			-1,257,425	-592,425	-172,425	79,575	499,575	1,099,575	1,099,575
Start-up Grant for SALT	MMK			0						
Total establishment material cost				1,086,875						
Total Capital Expenditure Loan				1,086,875						
Years for having the loan for Capital Expenditure						1	2	3	4	5
Annual interest rate (%)	13%									
Loan repayment period (yrs)	5									
Interest payment (%) - Capital Expenditure Loan	MMK					(141,294)	(119,490)	(94,852)	(67,011)	(35,550)
Payment of principal - Capital expenditure loan	MMK					(167,721)	(189,524)	(214,162)	(242,004)	(273,464)
Total payment for the Capital expenditure loan	MMK					(309,014)	(309,014)	(309,014)	(309,014)	(309,014)
Incremental Cashflows for Financial analysis (after project financing)										
Incremental cost	MMK			1,064,225	399,225	738,239	786,239	816,239	816,239	816,239
Incremental benefits	MMK			893,675	-193,200	256,800	556,800	1,006,800	1,606,800	1,606,800
Incremental benefits	MMK			-170,550	-592,425	-481,439	-229,439	190,561	790,561	790,561

Crop model profitability - after project financing:	
Discount rate	13%
IRR	**33%**
Incremental PV-benefit (USD)	7,341,364
Incremental NPV-benefits (USD)	2,591,169
Incremental PV-cost (USD)	4,750,195
B/C ratio	1.55

Crop Budget: 1 ac / Season	Index!A1							
Target - Ac	50,000							
Magway -Ground Nut: May-Nov, Mono, improved - Financial	**Unit**	**Unit Value**	**GN: Mon+Improved - WP**		**GN: May-Nov+Mono+Low - WOP**		**Incremental**	
			Physical	Value MMK/ac	Physical	Value MMK/ac	Physical	Value MMK/ac
Yield	kg	920	610	561,200	550	506,000	60	55,200
Seed	kg	1150	66	75,900	66	75,900	0	0
Cultivation with Oxen	anim day	5000	6	30,000	6	30,000	0	0
Fertilizer - 15-15-15-	bag 50 kg	600	12.5	7,500	12.5	7,500	0	0
Fertilizer urea 1/	kg	440	7	3,080	6.25	2,750	0.75	330
Manure	ox cart	5000	5	25,000	5	25,000	0	0
Labour Use								
Ox operator	pd	3000	5	15,000	5	15,000	0	0
Planting	pd	3000	4	12,000	3	9,000	1	3000
Fertilizing	pd	3000	1	3,000	1	3,000	0	0
Weeding, three times	pd	3000	9	27,000	9	27,000	0	0
Harvest and post harvest	pd	3000	28	84,000	28	84,000	0	0
Cost and Revenue								
Material cost	MMK/ac			141,480		141,150	-	330
Labour cost	MMK/ac			141,000		138,000	-	3,000
Total Cost	MMK/ac			282,480		279,150	-	3,330
Total Gross Revenue	MMK/ac			561,200		506,000	-	55,200
Total Net Revenue	MMK/ac			278,720		226,850	-	51,870
Number of Labour Days	pd/ac		47		46		1	-
Total Net Revenue, net of labour	MMK/ac			419,720		364,850	-	54,870
Return to Labour	MMK/pd			8,930		7,932	-	999

Debt financing:	Units	Value
Debt for working capital	MMK	141,480
Annual Interest	%	13%
Period of the Loan	months	6
Interest for the repay-period	%	7%
Interest payment for 6 monts	MMK	9,196
Total repayment	MMK	150,676

Crop Budget: 1 ac / Season	Index!A1							
Target Ac	93990							
Magway Cowpea - Financial	Unit	Unit Value MMK	May-July (WP) Physical	May-July (WP) Value MMK/ac	Wage Labour (WOP) Physical	Wage Labour (WOP) Value MMK/Season	**Incremental** Physical	**Incremental** Value MMK/ac
Yield	kg	900	125	112,500				
Seed	kg	1,100	15	16,500				
Fertilizer - 15-15-15-	bag 50 kg	600	-	-				
Fertilizer urea	kg	440	-	-				
Manure	ox cart	5,000		-				
Cultivation Ox charge	oxd	5,000	3	15,000				
Labour Use								
Ox operator	pd	3,000	3	9000				
Planting	pd	3,000	1.0	3,000				
Fertilizing	pd	3,000	-	-				
Weeding, three times	pd	3,000	-	-				
Harvest and post harvest	pd	3,000	10	30,000				
Total Labour		3,000	14		12	36,000		
Cost and Revenue								
Material cost	MMK/ac			31,500		-	-	31,500
Labour cost	MMK/ac			42,000			-	42,000
Total Cost	MMK/ac			73,500		-	-	73,500
Total Gross Revenue	MMK/ac			112,500		36,000	-	76,500
Total Net Revenue	MMK/ac			39,000		36,000	-	3,000
Number of Labour Days	pd/ac		14		12		2	-
Total Net Revenue, net of labour	MMK/ac			81,000		36,000	-	45,000
Return to Labour	MMK/pd			5,786		3,000	-	2,786

Debt financing:	Units	Value
Debt for working capital	MMK	31,500
Annual Interest	%	13%
Period of the Loan	months	4
Interest for the repay-period	%	4%
Interest payment for 6 monts	MMK	1,365
Total repayment	MMK	32,865

Crop Budget: 1 ac / Season	Index!A1							
Target Ac	5000							
Megway Pigonpea: May-Nov - Financial	Unit	Unit Value (MMK/ac)	Improved Seed: May-Nov (WP)		Farmer own Seed: May-Nov (WOP)		Increment	
			Physical	Value MMK/ac	Physical	Value MMK/ac	Physical	Value MMK/ac
Yield	kg	920	490	450,800	460	423,200	30	27,600
Seed	kg	1,150	5	5,750	3	3,450	2	2,300
Cultivation with Oxen	anim day	5,000	6	30,000	6	30,000	-	-
Fertilizer - 15-15-15-	bag 50 kg	600	25	15,000	12.5	7,500	13	7,500
Fertilizer urea	kg	440	13	5,500	12.5	5,500	-	-
Manure	ox cart	5,000	8	40,000	8	40,000	-	-
Pesticide	Ltr	10,000	1	10,000	1	10,000	-	-
Labour Use								
Ox operator	pd	3,000	5	15,000	5	15,000	-	-
Planting	pd	3,000	3	9,000	3	9,000	-	-
Fertilizing	pd	3,000	1	3,000	1	3,000	-	-
Weeding, three times	pd	3,000	10	30,000	10	30,000	-	-
Harvest and post harvest	pd	3,000	16	48,000	14	42,000	2	6,000
Cost and Revenue								
Material cost	MMK/ac			106,250		96,450	-	9,800
Labour cost	MMK/ac			105,000		99,000	-	6,000
Total Cost	MMK/ac			211,250		195,450	-	15,800
Total Gross Revenue	MMK/ac			450,800		423,200	-	27,600
Total Net Revenue	MMK/ac			239,550		227,750	-	11,800
Number of Labour Days	pd/ac		35		33		2	-
Total Net Revenue, net of labour	MMK/ac			344,550		326,750	-	17,800
Return to Labour	MMK/pd			9,844		9,902	-	- 57

Debt financing:	Units	Value
Debt for working capital	MMK	106,250
Annual Interest	%	13%
Period of the Loan	months	8
Interest for the repay-period	%	9%
Interest payment for 6 monts	MMK	9,208
Total repayment	MMK	115,458

Crop Budget: 1 ac / Season	Index!A1							
Project Target (ac)	1,000							
Magway Potato - Financial	**Unit**	**Unit Value**	**WP**		**Shifting Cultivation (WOP)**		**Incremental**	
			Physical	Value MMK/ac	Physical	Value MMK/ac	Physical	Value MMK/ac
Yield	kg	350	7,000	2,450,000	5,500	1,925,000	1,500	525,000
Seed	kg	750	1,415	1,061,250	1,415	1,061,250	-	-
Compost	kg	150	500	75,000				
Neemcide	Ltr	1,500	10	15,000				
Labour Use								
Land Preparation	Pd	3,000	15	45,000				
Felling Forest	pd	3,000			15	45,000	- 15	- 45,000
Burning Felled trees	pd	3,000			10	30,000	- 10	- 30,000
Second burning and seeding	pd	3,000			10	30,000	- 10	- 30,000
Seeding	pd	3,000	5	15,000	5	15,000	-	-
1st Weeding	pd	3,000	10	30,000	10	30,000	-	-
2nd Weeding	pd	3,000	10	30,000	10	30,000	-	-
Harvesting	pd	3,000	50	150,000	10	30,000	40	120,000
Transport to home	pd	4,000	40	160,000	10	40,000	30	120,000
Cost and Revenue								
Material cost	MMK/ac			1,151,250		1,061,250	-	90,000
Labour cost	MMK/ac			430,000		250,000	-	180,000
Total Cost	MMK/ac			1,581,250		1,311,250	-	270,000
Total Gross Revenue	MMK/ac			2,450,000		1,925,000	-	525,000
Total Net Revenue	MMK/ac			868,750		613,750	-	255,000
Number of Labour Days	pd/ac		130		80		50	-
Total Net Revenue, net of labour	MMK/ac			1,258,750		853,750	-	405,000
Return to Labour	MMK/pd			9,683		10,672	-	- 989

Debt financing:	Units	Value						
Debt for working capital	MMK	1,151,250		-				
Annual Interest	%	13%						
Period of the Loan	months	5						
Interest for the repay-period	%	5%						
Interest payment for 6 monts	MMK	62,359						
Total repayment	MMK	1,213,609						

Crop Budget: 1 ac / Season	Index!A1							
Project Target (ac)	4,370							
Megaway - Onion, Financial	Unit	Unit Value	Irrigated Local Variety (WOP)		Irrigated Improved Variety (WP)		**Incremental**	
			Physical	Value MMK/ac	Physical	Value MMK/ac	Physical	Value MMK/ac
Yield	kg	580	1,540	893,200	1,750	1,015,000	210	121,800
Seed	kg	10,000	2.5	25,000	2.5	87,500	-	62,500
Land Preparation (pl & harrow)	acre	25,000	2	50,000	2	50,000	-	-
Fertilizer - Compound	bag 50 kg	30,000	1.5	45,000	2	60,000	1	15,000
Fertilizer - Urea	bag 50 kg	22,000	1.5	33,000	2	44,000	1	11,000
Pest Control	acre	10,000	2	20,000	3	30,000	1	10,000
Labour Use								
Cultivation (incl charges above)	pd	3,000	2	6,000	2	6,000	-	-
Nursery and planting	pd	3,000	10	30,000	10	30,000	-	-
Fertilizing	pd	3,000	2	6,000	2	6,000	-	-
Pest Control	pd	3,000	2	6,000	2	6,000	-	-
Weeding	pd	3,000	20	60,000	20	60,000	-	-
Harvest	pd	3,000	35	105,000	40	120,000	5	15,000
Transport to buyer (hire cost)	kg	4,000		4,000		4,000	-	-
Cost and Revenue								
Material cost	MMK/ac			173,000		271,500	-	98,500
Labour cost	MMK/ac			217,000		232,000	-	15,000
Total Cost	MMK/ac			390,000		503,500	-	113,500
Total Gross Revenue	MMK/ac			893,200		1,015,000	-	121,800
Total Net Revenue	MMK/ac			503,200		511,500	-	8,300
Number of Labour Days	pd/ac		71		76		5	-
Total Net Revenue, net of labour	MMK/ac			716,200		739,500	-	23,300
Return to Labour	MMK/pd			10,087		9,730	-	- 357

Debt financing:	Units	Value
Debt for working capital	MMK	173,000
Annual Interest	%	13%
Period of the Loan	months	5
Interest for the repay-period	%	5%
Interest payment for 6 monts	MMK	9,371
Total repayment	MMK	182,371

Crop Budget: 1 ac / Season	Index!A1									
Project Target (ac)	10,000									
Plum and A. Lebbeck perimeter Production										
		Price	**Without**	**With Project**						
Yields and inputs	**Unit**	**MMK**	**Project**	**Yr 1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Yr 7**
Sales of plum	kg DM	235		-			325	650	1,080	1,080
Sale of A. Lebbeck dry pruning	kg DM	150			250	450	450	450	450	450
Yd of maize (shifting cultivation)	Kg	280	690							
Sales of maize (shifting cultivation)	MMK		193,200							
Investments	MMK						-	-	-	
Land Preparation	Acre	150		1						
Plum Saplings	pc	700		32						
A. Lebbeck Seedlings	Pc	45		128						
Planting	Acre	15,000		3						
Manure	Mt	5,600		10						
Operating costs										
Compost	500	75			500	500	500	500	500	500
Neemcide	Lt	1500			5	5	5	5	5	5
Intregrated Pest Management	pd	3000			1	1	1	1	1	1
Plum pruning	pd	3000			2	2	2	2	2	2
Weeding	pd	3000			1	1	1	1	1	1
Harvesting Plum	pd	3000					1	2	3	3
Harvesting A. Lebbeck	pd	3000			1	2	2	2	2	2
Total			5		4	4	5	6	7	7
Incremental Labour	pd			-5	-1	-1	-	1	2	2
FINANCIAL BUDGET (MMK)				**Yr 1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Yr 7**
Sales of Plum	MMK			-	-	-	76,375	152,750	253,800	253,800
Sales of A. Lebbeck	MMK				37,500	-	-	112,500	202,500	202,500
Total Sale	MMK				37,500	-	76,375	265,250	456,300	456,300
Investments	MMK				-	-	-		-	-
Plum input costs	MMK			123,550	45,005	45,005	45,005	45,005	45,005	45,005
Lebbeck input cost	MMK			5,760	0	0	0	0	0	0
Plum labour cost				-	12,000	12,000	15,000	18,000	21,000	21,000
Lebbeck labour cost	MMK			-	3,000	6,000	6,000	6,000	6,000	6,000
Investments	MMK									
Material cost	MMK		55,650	129,310	45,005	45,005	45,005	45,005	45,005	45,005
Labour cost	MMK		15,000	-	15,000	18,000	21,000	24,000	27,000	27,000
Total Production Cost	MMK		70,650	129,310	60,005	63,005	66,005	69,005	72,005	72,005
Gross Income	MMK		193,200	0	37,500	67,500	143,875	220,250	321,300	321,300
Cash flows for farm-gate financial analysis	MMK		122,550							
Incremental cost	MMK			58,660	-10,645	-7,645	-4,645	-1,645	1,355	1,355
Incremental benefits	MMK			-193,200	-155,700	-125,700	-49,325	27,050	128,100	128,100
Incremental net benefits	MMK			-251,860	-145,055	-118,055	-44,680	28,695	126,745	126,745

Crop model profitability at the Farm-gate: before project financing:	
Discount rate	13%
IRR	**13%**
Incremental PV-benefit (MMK)	53,717
Incremental NPV-benefits (MMK)	14,430
Incremental PV-cost (MMK)	39,288
B/C ratio	1.37
Switching Value of Benefits	-27%
Return to family labour at full development (MMK/md)	1

Project Financing at the farm-gate for cultivation			WoP	WP						
				Yr : 1	Yr : 2	Yr : 3	Yr : 4	Yr : 5	Yr : 6	Yr : 7
Current crop extent	ac		1	1						
Incremental Net income	MMK			-251,860	-145,055	-118,055	-44,680	28,695	126,745	126,745
Start-up Grant for SALT	MMK			0						
Total establishment material cost				129,310						
Total Capital Expenditure Loan				129,310						
Years for having the loan for Capital Expenditure						1	2	3	4	5
Annual interest rate (%)	13%									
Loan repayment period (yrs)	5									
Interest payment (%) - Capital Expenditure Loan	MMK					(16,810)	(14,216)	(11,285)	(7,973)	(4,230)
Payment of principal - Capital expenditure loan	MMK					(19,954)	(22,548)	(25,480)	(28,792)	(32,535)
Total payment for the Capital expenditure loan	MMK					(36,765)	(36,765)	(36,765)	(36,765)	(36,765)
Incremental Cashflows for Financial analysis (after project financing)										
Incremental cost	MMK			58,660	(10,645)	29,120	32,120	35,120	38,120	38,120
Incremental benefits	MMK			-63,890	-155,700	-125,700	-49,325	27,050	128,100	128,100
Incremental benefits	MMK			-122,550	-145,055	-154,820	-81,445	-8,070	89,980	89,980

Crop model profitability - after project financing:	
Discount rate	13%
IRR	**14%**
Incremental PV-benefit (MMK)	168,151
Incremental NPV-benefits (MMK)	27,595
Incremental PV-cost (MMK)	140,556
B/C ratio	1.20

24. Appendix Table 2 and Table 8 summarises the results. All models have benefit cost ratio of more than one and more than 10% switching vales further indicating the financial viability. The WOP scenario for SMEs is assumed as the opportunity cost of 40% of the labour units that are used for SMEs. The NPV and the financial IRR confirm that all three SMEs are financially viable to receive the project support.

Table 8: Micro-Enterprises and their financial viability indicators (all indicators are for one unit of SME)

Micro-Enterprises	Number of MEs	Incremental net benefit at FD (MMK 1000)	Net Present Value (13% DR & 20-years) (MMK 1000)	Financial IRR for 20-years
Vet paraprofessionals	30	1,177	1,526	17%
Goat kid fattening	1200	782	2,343	28%
Seed processing	20	1,706	3,251	31%
Yam drying	70	952	3,000	50%

The project would be providing credit facilities to establish the SMEs. The analysis in

Crop Budget: 1 ac / Season	Index!A1							
Total Project Tartget (ac):	1000							
Chin Upland Paddy with SALT - Financial	**Unit**	**Unit Value**	**SALT (WP)**		**Shifting Cultivation (WOP)**		**Incremental**	
			Physical	Value MMK/ac	Physical	Value MMK/ac	Physical	Value MMK/ac
Yield (20% higher Yd under SALT)	kg	245	1,800	441,000	640	156,800	1,160	284,200
Seed	kg	600	25	15,000	40	24,000		
Land Hire (1 ac is hired for SALT; hiring cost capitalised for crop season)	MMK/ac	421,875	0.42	175,781				
Compost	kg	75	500	37,500	-	-		
Neemcide	Ltr	1,500	10	15,000	-	-		
Labour Use								
Land Preparation	Pd	3,000	15	45,000				
Felling Forest	pd	3,000	-	-	15	45,000		
Burning Felled trees	pd	3,000	-	-	10	30,000		
Second burning and seeding	pd	3,000	-	-	10	30,000		
Seeding	pd	3,000	5	15,000	1	3,000		
1st Weeding	pd	3,000	15	45,000	10	30,000		
2nd Weeding	pd	3,000	15	45,000	10	30,000		
Harvesting	pd	3,000	20	60,000	10	30,000		
Treshing	pd	3,000	15	45,000	10	30,000		
Transport to home	pd	3,000	20	60,000	10	30,000		
Cost and Revenue								
Material cost	MMK/ac			243,281		24,000	-	219,281
Labour cost	MMK/ac			315,000		258,000	-	57,000
Total Cost	MMK/ac			558,281		282,000	-	276,281
Total Gross Revenue	MMK/ac			441,000		156,800	-	284,200
Total Net Revenue	MMK/ac			- 117,281		- 125,200	-	7,919
Number of Labour Days	pd/ac		105		86		19	-
Total Net Revenue, net of labour	MMK/ac			197,719		132,800	-	64,919
Return to Labour	MMK/pd			1,883		1,544	-	339

Project financing:	Units	Value
SALT Starter package	MMK	290,080
Debt for working capital	MMK	243,281
Annual Interest	%	13%
Period of the Loan	months	5
Interest for the repay-period	%	5%
Interest payment for 6 monts	MMK	13,178
Total repayment	MMK	256,459

Crop Budget: 1 ac / Season	Index!A1							
Total Project Tartget (ac):	3000							
Chin Millet - Financial	**Unit**	**Unit Value**	**WP**		**Shifting Cultivation (WOP)**		**Incremental**	
			Physical	Value MMK/ac	Physical	Value MMK/ac	Physical	Value MMK/ac
Yield	kg	350	1,000	350,000	550	192,500	450	157,500
Seed	kg	400	7	2,800	10	4,000		
Land Hire (1 ac is hired; hiring cost capitalised for crop season)	MMK/ac	421,875	0.25	105,469				
Compost	kg	75	300	22,500	-	-		
Neemcide	Ltr	1,500	10	15,000	-	-		
Labour Use								
Land Preparation	Pd	3,000	15	45,000				
Felling Forest	pd	3,000	-	-	15	45,000		
Burning Felled trees	pd	3,000	-	-	10	30,000		
Second burning and seeding	pd	3,000	-	-	10	30,000		
Seeding	pd	3,000	5	15,000	5	15,000		
1st Weeding	pd	3,000	15	45,000	10	30,000		
2nd Weeding	pd	3,000	15	45,000	10	30,000		
Harvesting	pd	3,000	15	45,000	10	30,000		
Treshing	pd	3,000	15	45,000	10	30,000		
Transport to home	pd	3,000	15	45,000	10	30,000		
Cost and Revenue								
Material cost	MMK/ac			145,769		4,000	-	141,769
Labour cost	MMK/ac			285,000		270,000	-	15,000
Total Cost	MMK/ac			430,769		274,000	-	156,769
Total Gross Revenue	MMK/ac			350,000		192,500	-	157,500
Total Net Revenue	MMK/ac			- 80,769		- 81,500	-	731
Number of Labour Days	pd/ac		95		90		5	-
Total Net Revenue, net of labour	MMK/ac			204,231		188,500	-	15,731
Return to Labour	MMK/pd			2,150		2,094	-	55

Debt financing:	Units	Value
Debt for working capital	MMK	145,769
Annual Interest	%	13%
Period of the Loan	months	3
Interest for the repay-period	%	3%
Interest payment for 6 monts	MMK	4,737
Total repayment	MMK	150,506

Total Project Tartget (ac):	1000							
Chin White Bean, Own Funds+Debt - Financial	**Unit**	**Unit Value**	**WP**		**Shifting Cultivation (WOP)**		**Incremental**	
			Physical	Value MMK/ac	Physical	Value MMK/ac	Physical	Value MMK/ac
Yield	kg	565	780	440,700	500	282,500	280	158,200
Seed	kg	600	15	9,000	10	6,000		
Land Hire (1 ac is hired; hiring cost capitalised for crop season)	MMK/ac	421,875	0.21	87,891				
Compost	kg	75	500	37,500	-	-		
Neemcide	Ltr	1,500	5	7,500	-	-		
Labour Use								
Land Preparation	Pd	3,000	15	45,000				
Felling Forest	pd	3,000	-	-	10	30,000		
Burning Felled trees	pd	3,000	-	-	5	15,000		
Second burning and seeding	pd	3,000	-	-	10	30,000		
Seeding	pd	3,000	5	15,000	5	15,000		
1st Weeding	pd	3,000	10	30,000	10	30,000		
2nd Weeding	pd	3,000	10	30,000	10	30,000		
Harvesting	pd	3,000	15	45,000	10	30,000		
Treshing	pd	3,000	15	45,000	10	30,000		
Transport to home	pd	3,000	15	45,000	10	30,000		
Cost and Revenue								
Material cost	MMK/ac			141,891		6,000	-	135,891
Labour cost	MMK/ac			255,000		240,000	-	15,000
Total Cost	MMK/ac			396,891		246,000	-	150,891
Total Gross Revenue	MMK/ac			440,700		282,500	-	158,200
Total Net Revenue	MMK/ac			43,809		36,500	-	7,309
Number of Labour Days	pd/ac		85		80		5	-
Total Net Revenue, net of labour	MMK/ac			298,809		276,500	-	22,309
Return to Labour	MMK/pd			3,515		3,456	-	59

Project financing:	Units	Value
Debt for working capital	MMK	141,891
Annual Interest	%	13%
Period of the Loan	months	3
Interest for the repay-period	%	3%
Interest payment for 6 monts	MMK	3,843
Total repayment	MMK	145,733

Crop Budget: 1 ac / Season	Index!A1							
Total Project Tartget (ac):	1000							
Chin Yam with SALT - Financial	**Unit**	**Unit Value**	**SALT (WP)**		**Shifting Cultivation (WOP)**		Increment	
			Physical (Kg)	Value MMK/ac	Physical	Value MMK/ac	Physical	Value MMK/ac
Yield (dry)	kg	4,500	800	3,600,000	715	3,217,500	85	382,500
Planting material	kg	3,500	105	367,500	105	367,500	-	-
Land Hire (1 ac is hired; hiring cost capitalised for crop season)	MMK/ac	421,875	1.00	421,875				
Compost	kg	150	500	75,000	-	-		
Neemcide	Ltr	1,500	10	15,000	-	-		
Labour Use								
Land Preparation	Pd	3,000	15	45,000			15	45,000
Felling Forest	pd	3,000	-	-	20	60,000		
Burning Felled trees	pd	3,000	-	-	10	30,000		
Second burning and seeding	pd	3,000	-	-	10	30,000		
Seeding	pd	3,000	5	15,000			5	15,000
1st Weeding	pd	3,000	10	30,000	15	45,000	- 5	- 15,000
2nd Weeding	pd	3,000	10	30,000	15	45,000	- 5	- 15,000
3th Weeding	pd	3,000	10	30,000	16	48,000	- 6	- 18,000
Drying	Pd	3,000	6	18,000	6	18,000	-	-
Transport to home		4,500		4,500	2	9,000		- 4,500
Total Labour								
Cost and Revenue								
Material cost	MMK/ac			883,875		367,500	-	516,375
Labour cost	MMK/ac			168,000		258,000	-	- 90,000
Total Cost	MMK/ac			1,051,875		625,500	-	426,375
Total Gross Revenue	MMK/ac			3,600,000		3,217,500	-	382,500
Total Net Revenue	MMK/ac			2,548,125		2,592,000	-	- 43,875
Number of Labour Days	pd/ac		56		94		- 38	-
Total Net Revenue, net of labour	MMK/ac			2,548,125		2,592,000	-	- 43,875
Return to Labour	MMK/pd			45,502		27,574	-	17,928

Project financing:	Units	Value
Debt for working capital	MMK	883,875
Annual Interest	%	13%
Period of the Loan	months	3
Interest for the repay-period	%	3%
Interest payment for 6 monts	MMK	23,938
Total repayment	MMK	907,813

Crop Budget: 1 acres, 20-year period										
Chin Avocado with SALT - Financial	IndexIA1									
Project target (ac)	1000									
		Price	**Without**	**With Project**						
Yields and inputs	**Unit**	**MMK**	**Project**	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**
Sales of avocado	Kg	450	-	-			1512	3,661	4,788	5,670
Yd of maize (shifting cultivation)	Kg		690							
Sales of maize (shifting cultivation)	MMK	280	193,200							
Investments	MMK		-				-	-	-	
Land Preparation	Acre	120,000		1						
Land Hire (1 ac is hired; hiring cost capitalised for crop season)	MMK/ac	421,875		421,875	421,875	421,875	421,875	421,875	421,875	421,875
Saplings	pc	500		126						
Planting	Acre	15,000		1						
Manure	Mt	5,600		10						
Total Investment	MMK/ac			675,875	421,875	421,875	421,875	421,875	421,875	421,875
Operating costs										
Compost	Kg	15			5000	5000	5000	5000	5000	5000
Neemcide	Lt	7,500		10	10	10	10	10	10	10
Intregrated Pest Management	pd	3,000		5	5	5	5	5	5	5
Pruning	pd	3,000			15	15	15	15	15	15
Weeding	pd	3,000					-	-	8	8	8
Harvesting plus transport	pd	3,000						25	25	25	25
Total Labour			5	5	20	20	45	53	53	53
Incremenantal Labout				-	15	15	40	48	48	48
Cost										
Material cost	MMK		55,650	750,875	571,875	571,875	571,875	571,875	571,875	571,875
Labour cost	MMK		15,000	15,000	60,000	60,000	135,000	159,000	159,000	159,000
Total Cost	MMK		70,650	765,875	631,875	631,875	706,875	730,875	730,875	730,875
Revenue										
Sales of Avocado	MMK		-	-	-	-	680,400	1,647,430	2,154,600	2,551,500
FINANCIAL BUDGET (MMK)				**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**
Gross Income										
Sales of Avocado (maize = WOP)	MMK		193,200	-	-	-	680,400	1,647,430	2,154,600	2,551,500
Investments	MMK									
Material cost	MMK		55,650	750,875	571,875	571,875	571,875	571,875	571,875	571,875
Labour cost	MMK		15,000	15,000	60,000	60,000	135,000	159,000	159,000	159,000
Total Production Cost	MMK		70,650	765,875	631,875	631,875	706,875	730,875	730,875	730,875
Net Income	MMK		122,550	-765,875	-631,875	-631,875	-26,475	916,555	1,423,725	1,820,625
Cash flows for farm-gate financial analysis	MMK									
Incremental cost	MMK			695,225	561,225	561,225	636,225	660,225	660,225	660,225
Incremental benefits	MMK			-193,200	-193,200	-193,200	487,200	1,454,230	1,961,400	2,358,300
Incremental net benefits	MMK			-888,425	-754,425	-754,425	-149,025	794,005	1,301,175	1,698,075

Crop model profitability at the Farm-gate: before project financing:	
Discount rate	13%
IRR	**31%**
Incremental PV-benefit (MMK)	8,713,079
Incremental NPV-benefits (MMK)	4,205,052
Incremental PV-cost (MMK)	4,508,027
B/C ratio	1.93
Switching Value of Benefits	-48%
Return to family labour at full development (MMK/md)	37,008

Project Financing at the farm-gate for cultivation			WoP	WP						
				Yr : 1	Yr : 2	Yr : 3	Yr : 4	Yr : 5	Yr : 6	Yr : 7
Current crop extent	ac		1	1						
Incremental Net income	MMK			(598,345)	(754,425)	(754,425)	(149,025)	794,005	1,301,175	1,698,075
Start-up Grant for SALT	MMK			290,080						
Total establishment material cost				385,795						
Total Capital Expenditure Loan				385,795						
Years for having the loan for Capital Expenditure						1	2	3	4	5
Annual interest rate (%)	13%									
Loan repayment period (yrs)	5									
Interest payment (%) - Capital Expenditure Loan	MMK					(50,153)	(42,414)	(33,668)	(23,786)	(12,619)
Payment of principal - Capital expenditure loan	MMK					(59,534)	(67,273)	(76,019)	(85,901)	(97,068)
Total payment for the Capital expenditure loan	MMK					(109,687)	(109,687)	(109,687)	(109,687)	(109,687)
Incremental Cashflows for Financial analysis (after project financing)										
Incremental cost	MMK			695,225	561,225	670,912	745,912	769,912	769,912	769,912
Incremental benefits	MMK			482,675	-193,200	-193,200	487,200	1,454,230	1,961,400	2,358,300
Incremental benefits	MMK			(212,550)	(754,425)	(864,112)	(258,712)	684,318	1,191,488	1,588,388

Crop model profitability - after project financing:	
Discount rate	13%
IRR	**38%**
Incremental PV-benefit (USD)	9,311,198
Incremental NPV-benefits (USD)	4,501,037
Incremental PV-cost (USD)	4,810,161
B/C ratio	1.94

Crop Budget: 1 acres, 20-year period										
Chin Macadamia - Financial	Index!A1									
Project target (ac)	500									
		Price	**Without**	**With Project**						
Yields and inputs	**Unit**	**MMK**	**Project**	**Proj Yr 1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Yr 7**
Sales of Macadamia (nut in shell 10% moist)	mt	3,000,000	-	-			0.13	0.26	0.39	0.52
Yd of maize (shifting cultivation)	Kg		690.0							
Sales of maize (shifting cultivation)	MMK	280	193,200							
Investments	MMK						-	-	-	
Land Preparation	Acre	120,000		1						
Land Hire (1 ac is hired; hiring cost capitalised for crop season)	MMK/ac	421,875		421,875	421,875	421,875	421,875	421,875	421,875	421,875
Saplings	pc	5,000		130						
Planting	Acre	15,000		3						
Manure	Mt	15,000		10						
Total Investment	MMK/ac			1,386,875	421,875	421,875	421,875	421,875	421,875	421,875
Operating costs										
Compost/mulching	Units	15		5000	5000	5000	5000	5000	5000	5000
Neemcide	Lt	7,500		10	10	10	10	10	10	10
Intregrated Pest Management	pd	3,000		5	5	10	15	15	15	15
Pruning	pd	3,000		15	15	15	15	15	15	15
Weeding	pd	3,000		4	4	8	10	10	15	20
Harvesting, transport and processing	pd	3,000			4	8	8	10	25	25
Total Labour	pd		5	24	28	41	48	50	70	75
Incremental Labour	pd			19	23	36	43	45	65	70
Cost										
Material cost	MMK		55,650	1,386,875	421,875	421,875	421,875	421,875	421,875	421,875
Labour cost	MMK		15,000	72,000	84,000	123,000	144,000	150,000	210,000	225,000
Total Cost	MMK		70,650	1,458,875	505,875	544,875	565,875	571,875	631,875	646,875
Revenue										
FINANCIAL BUDGET (MMK)				**Proj Yr 1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Yr 7**
Gross Income										
Sales of Macadamia (maize = WOP)	MMK		193,200	-	-	-	390,000	780,000	1,170,000	1,560,000
Investments	MMK									
Material cost	MMK		55,650	1,386,875	421,875	421,875	421,875	421,875	421,875	421,875
Labour cost	MMK		15,000	72,000	84,000	123,000	144,000	150,000	210,000	225,000
Total Production Cost	MMK		70,650	1,458,875	505,875	544,875	565,875	571,875	631,875	646,875
Net Income	MMK		122,550	-1,458,875	-505,875	-544,875	-175,875	208,125	538,125	913,125
Cash flows for farm-gate financial analysis	MMK									
Incremental cost	MMK			1,388,225	435,225	474,225	495,225	501,225	561,225	576,225
Incremental benefits	MMK			-193,200	-193,200	-193,200	196,800	586,800	976,800	1,366,800
Incremental net benefits	MMK			-1,581,425	-628,425	-667,425	-298,425	85,575	415,575	790,575

Crop model profitability at the Farm-gate: before project financing:	
Discount rate	13%
IRR	**28%**
Incremental PV-benefit (MMK)	10,238,676
Incremental NPV-benefits (MMK)	5,750,960
Incremental PV-cost (MMK)	4,487,716
B/C ratio	2.28
Switching Value of Benefits	-56%
Return to family labour at full development (MMK/md)	39,072

Project Financing at the farm-gate for cultivation			WoP	WP						
				Yr : 1	Yr : 2	Yr : 3	Yr : 4	Yr : 5	Yr : 6	Yr : 7
Current crop extent	ac		1	1						
Incremental Net income	MMK			-1,581,425	-628,425	-667,425	-298,425	85,575	415,575	790,575
Start-up Grant for SALT	MMK			0						
Total establishment material cost				1,386,875						
Total Capital Expenditure Loan				1,386,875						
Years for having the loan for Capital Expenditure						1	2	3	4	5
Annual interest rate (%)	13%									
Loan repayment period (yrs)	5									
Interest payment (%) - Capital Expenditure Loan	MMK					(180,294)	(152,472)	(121,033)	(85,507)	(45,363)
Payment of principal - Capital expenditure loan	MMK					(214,015)	(241,837)	(273,276)	(308,802)	(348,946)
Total payment for the Capital expenditure loan	MMK					(394,309)	(394,309)	(394,309)	(394,309)	(394,309)
Incremental Cashflows for Financial analysis (after project financing)										
Incremental cost	USD			1,388,225	435,225	868,534	889,534	895,534	955,534	970,534
Incremental benefits	USD			1,193,675	-193,200	-193,200	196,800	586,800	976,800	1,366,800
Incremental benefits	USD			-194,550	-628,425	-1,061,734	-692,734	-308,734	21,266	396,266

Crop model profitability - after project financing:	
Discount rate	13%
IRR	**32%**
Incremental PV-benefit (USD)	11,465,999
Incremental NPV-benefits (USD)	5,892,156
Incremental PV-cost (USD)	5,573,843
B/C ratio	2.06

Crop Budget: 1 ac / Season	Index!A1							
Project Target (ac)	300							
Chin Permanent Upland Potato - Financial	**Unit**	**Unit Value**	**SALT (WP)**		**Shifting Cultivation (WOP)**		**Incremental**	
			Physical	Value MMK/ac	Physical	Value MMK/ac	Physical	Value MMK/ac
Yield	kg	350	8,000	2,800,000	5,250	1,837,500	2,750	962,500
Seed	kg	750	1,415	1,061,250	1,415	1,061,250	-	-
Land Hire (1 ac is hired; hiring cost capitalised for crop season)	MMK/ac	421,875	0.42	175,781				
Compost	kg	150	500	75,000				
Neemcide	Ltr	1,500	10	15,000				
Labour Use								
Land Preparation	Pd	3,000	15	45,000				
Felling Forest	pd	3,000			15	45,000	- 15	- 45,000
Burning Felled trees	pd	3,000			10	30,000	- 10	- 30,000
Second burning and seeding	pd	3,000			10	30,000	- 10	- 30,000
Seeding	pd	3,000	5	15,000	5	15,000	-	-
1st Weeding	pd	3,000	10	30,000	10	30,000	-	-
2nd Weeding	pd	3,000	10	30,000	10	30,000	-	-
Harvesting	pd	3,000	50	150,000	10	30,000	40	120,000
Transport to home	pd	4,000	40	160,000	10	40,000	30	120,000
Cost and Revenue								
Material cost	MMK/ac			1,327,031		1,061,250	-	265,781
Labour cost	MMK/ac			430,000		250,000	-	180,000
Total Cost	MMK/ac			1,757,031		1,311,250	-	445,781
Total Gross Revenue	MMK/ac			2,800,000		1,837,500	-	962,500
Total Net Revenue	MMK/ac			1,042,969		526,250	-	516,719
Number of Labour Days	pd/ac		130		80		50	-
Total Net Revenue, net of labour	MMK/ac			1,432,969		766,250	-	666,719
Return to Labour	MMK/pd			11,023		9,578	-	1,445

Debt financing:	Units	Value
Debt for working capital	MMK	1,327,031
Annual Interest	%	13%
Period of the Loan	months	5
Interest for the repay-period	%	5%
Interest payment for 6 monts	MMK	71,881
Total repayment	MMK	1,398,912

Crop Budget: 1 acres, 20-year period										
Chin Coffee - Financial	Index!A1									
Project target (ac)	200									
		Price	**Without**	**With Project**						
Yields and inputs	**Unit**	**MMK**	**Project**	**Project Yr1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Yr 7**
Sales of dry coffee beans	Kg	3000	-	-		150	250	400	600	600
Yd of maize (shifting cultivation)	Kg		690							
Sales of maize (shifting cultivation)	MMK	280	193,200							
Investments	MMK						-	-	-	
Land Preparation	Acre	120,000		1						
Land Hire (1 ac is hired; hiring cost capitalised for crop season)	MMK/ac	421,875		421,875	421,875	421,875	421,875	421,875	421,875	421,875
Saplings	pc	500		700						
Planting	Acre	15,000		3						
Manure	Mt	15,000		10						
Total Investment	MMK/ac			1,086,875	421,875	421,875	421,875	421,875	421,875	421,875
Operating costs										
Compost/mulching	1	15		10000	10000	10000	10000	10000	10000	10000
Neemcide	Lt	7500		10	10	10	10	10	10	10
Intregrated Pest Management	pd	3000		4	4	6	10	12	12	12
Pruning	pd	3000		4	4	6	8	10	10	10
Weeding	pd	3000		4	4	6	8	10	10	10
Harvesting, transport and processing	pd	3000		4	4	8	16	20	20	20
Total Labour	pd	3000	5	16	16	26	42	52	52	52
Incremental Labour	pd			11	11	21	37	47	47	47
Cost										
Material cost	MMK		55,650	1,086,875	421,875	421,875	421,875	421,875	421,875	421,875
Labour cost	MMK		15,000	48,000	48,000	78,000	126,000	156,000	156,000	156,000
Total Cost	MMK		70,650	1,134,875	469,875	499,875	547,875	577,875	577,875	577,875
Revenue										
FINANCIAL BUDGET (MMK)				**Proj Yr 1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Yr 7**
Gross Income										
Sales of Coffee (maize = WOP)	MMK		193,200	-	-	450,000	750,000	1,200,000	1,800,000	1,800,000
Investments	MMK									
Material cost	MMK		55,650	1,086,875	421,875	421,875	421,875	421,875	421,875	421,875
Labour cost	MMK		15,000	48,000	48,000	78,000	126,000	156,000	156,000	156,000
Total Production Cost	MMK		70,650	1,134,875	469,875	499,875	547,875	577,875	577,875	577,875
Net Income	MMK		122,550	-1,134,875	-469,875	-49,875	202,125	622,125	1,222,125	1,222,125
Cash flows for farm-gate financial analysis	MMK									
Incremental cost	MMK			1,064,225	399,225	429,225	477,225	507,225	507,225	507,225
Incremental benefits	MMK			-193,200	-193,200	256,800	556,800	1,006,800	1,606,800	1,606,800
Incremental net benefits	MMK			-1,257,425	-592,425	-172,425	79,575	499,575	1,099,575	1,099,575

Crop model profitability at the Farm-gate: before project financing:	
Discount rate	13%
IRR	**26%**
Incremental PV-benefit (MMK)	6,379,528
Incremental NPV-benefits (MMK)	2,480,515
Incremental PV-cost (MMK)	3,899,013
B/C ratio	1.64
Switching Value of Benefits	-39%
Return to family labour at full development (MMK/md)	80,340

Project Financing at the farm-gate for cultivation			WoP	WP						
				Yr : 1	Yr : 2	Yr : 3	Yr : 4	Yr : 5	Yr : 6	Yr : 7
Current crop extent	ac		1	1						
Incremental Net income	MMK			-1,257,425	-592,425	-172,425	79,575	499,575	1,099,575	1,099,575
Start-up Grant for SALT	MMK			0						
Total establishment material cost				1,086,875						
Total Capital Expenditure Loan				1,086,875						
Years for having the loan for Capital Expenditure						1	2	3	4	5
Annual interest rate (%)	13%									
Loan repayment period (yrs)	5									
Interest payment (%) - Capital Expenditure Loan	MMK					(141,294)	(119,490)	(94,852)	(67,011)	(35,550)
Payment of principal - Capital expenditure loan	MMK					(167,721)	(189,524)	(214,162)	(242,004)	(273,464)
Total payment for the Capital expenditure loan	MMK					(309,014)	(309,014)	(309,014)	(309,014)	(309,014)
Incremental Cashflows for Financial analysis (after project financing)										
Incremental cost	MMK			1,064,225	399,225	738,239	786,239	816,239	816,239	816,239
Incremental benefits	MMK			893,675	-193,200	256,800	556,800	1,006,800	1,606,800	1,606,800
Incremental benefits	MMK			-170,550	-592,425	-481,439	-229,439	190,561	790,561	790,561

Crop model profitability - after project financing:	
Discount rate	13%
IRR	**33%**
Incremental PV-benefit (USD)	7,341,364
Incremental NPV-benefits (USD)	2,591,169
Incremental PV-cost (USD)	4,750,195
B/C ratio	1.55

Crop Budget: 1 ac / Season	Index!A1							
Target - Ac	50,000							
Magway -Ground Nut: May-Nov, Mono, improved - Financial	**Unit**	**Unit Value**	**GN: Mon+Improved - WP**		**GN: May-Nov+Mono+Low - WOP**		**Incremental**	
			Physical	Value MMK/ac	Physical	Value MMK/ac	Physical	Value MMK/ac
Yield	kg	920	610	561,200	550	506,000	60	55,200
Seed	kg	1150	66	75,900	66	75,900	0	0
Cultivation with Oxen	anim day	5000	6	30,000	6	30,000	0	0
Fertilizer - 15-15-15-	bag 50 kg	600	12.5	7,500	12.5	7,500	0	0
Fertilizer urea 1/	kg	440	7	3,080	6.25	2,750	0.75	330
Manure	ox cart	5000	5	25,000	5	25,000	0	0
Labour Use								
Ox operator	pd	3000	5	15,000	5	15,000	0	0
Planting	pd	3000	4	12,000	3	9,000	1	3000
Fertilizing	pd	3000	1	3,000	1	3,000	0	0
Weeding, three times	pd	3000	9	27,000	9	27,000	0	0
Harvest and post harvest	pd	3000	28	84,000	28	84,000	0	0
Cost and Revenue								
Material cost	MMK/ac			141,480		141,150	-	330
Labour cost	MMK/ac			141,000		138,000	-	3,000
Total Cost	MMK/ac			282,480		279,150	-	3,330
Total Gross Revenue	MMK/ac			561,200		506,000	-	55,200
Total Net Revenue	MMK/ac			278,720		226,850	-	51,870
Number of Labour Days	pd/ac		47		46		1	-
Total Net Revenue, net of labour	MMK/ac			419,720		364,850	-	54,870
Return to Labour	MMK/pd			8,930		7,932	-	999

Debt financing:	Units	Value
Debt for working capital	MMK	141,480
Annual Interest	%	13%
Period of the Loan	months	6
Interest for the repay-period	%	7%
Interest payment for 6 monts	MMK	9,196
Total repayment	MMK	150,676

Crop Budget: 1 ac / Season	Index!A1							
Target Ac	93990							
Magway Cowpea - Financial	Unit	Unit Value MMK	May-July (WP) Physical	May-July (WP) Value MMK/ac	Wage Labour (WOP) Physical	Wage Labour (WOP) Value MMK/Season	**Incremental** Physical	**Incremental** Value MMK/ac
Yield	kg	900	125	112,500				
Seed	kg	1,100	15	16,500				
Fertilizer - 15-15-15-	bag 50 kg	600	-	-				
Fertilizer urea	kg	440	-	-				
Manure	ox cart	5,000		-				
Cultivation Ox charge	oxd	5,000	3	15,000				
Labour Use								
Ox operator	pd	3,000	3	9000				
Planting	pd	3,000	1.0	3,000				
Fertilizing	pd	3,000	-	-				
Weeding, three times	pd	3,000	-	-				
Harvest and post harvest	pd	3,000	10	30,000				
Total Labour		3,000	14		12	36,000		
Cost and Revenue								
Material cost	MMK/ac			31,500		-	-	31,500
Labour cost	MMK/ac			42,000			-	42,000
Total Cost	MMK/ac			73,500		-	-	73,500
Total Gross Revenue	MMK/ac			112,500		36,000	-	76,500
Total Net Revenue	MMK/ac			39,000		36,000	-	3,000
Number of Labour Days	pd/ac		14		12		2	-
Total Net Revenue, net of labour	MMK/ac			81,000		36,000	-	45,000
Return to Labour	MMK/pd			5,786		3,000	-	2,786

Debt financing:	Units	Value
Debt for working capital	MMK	31,500
Annual Interest	%	13%
Period of the Loan	months	4
Interest for the repay-period	%	4%
Interest payment for 6 monts	MMK	1,365
Total repayment	MMK	32,865

Crop Budget: 1 ac / Season	Index!A1							
Target Ac	5000							
Megway Pigonpea: May-Nov - Financial	Unit	Unit Value (MMK/ac)	Improved Seed: May-Nov (WP)		Farmer own Seed: May-Nov (WOP)		Increment	
			Physical	Value MMK/ac	Physical	Value MMK/ac	Physical	Value MMK/ac
Yield	kg	920	490	450,800	460	423,200	30	27,600
Seed	kg	1,150	5	5,750	3	3,450	2	2,300
Cultivation with Oxen	anim day	5,000	6	30,000	6	30,000	-	-
Fertilizer - 15-15-15-	bag 50 kg	600	25	15,000	12.5	7,500	13	7,500
Fertilizer urea	kg	440	13	5,500	12.5	5,500	-	-
Manure	ox cart	5,000	8	40,000	8	40,000	-	-
Pesticide	Ltr	10,000	1	10,000	1	10,000	-	-
Labour Use								
Ox operator	pd	3,000	5	15,000	5	15,000	-	-
Planting	pd	3,000	3	9,000	3	9,000	-	-
Fertilizing	pd	3,000	1	3,000	1	3,000	-	-
Weeding, three times	pd	3,000	10	30,000	10	30,000	-	-
Harvest and post harvest	pd	3,000	16	48,000	14	42,000	2	6,000
Cost and Revenue								
Material cost	MMK/ac			106,250		96,450	-	9,800
Labour cost	MMK/ac			105,000		99,000	-	6,000
Total Cost	MMK/ac			211,250		195,450	-	15,800
Total Gross Revenue	MMK/ac			450,800		423,200	-	27,600
Total Net Revenue	MMK/ac			239,550		227,750	-	11,800
Number of Labour Days	pd/ac		35		33		2	-
Total Net Revenue, net of labour	MMK/ac			344,550		326,750	-	17,800
Return to Labour	MMK/pd			9,844		9,902	-	- 57

Debt financing:	Units	Value
Debt for working capital	MMK	106,250
Annual Interest	%	13%
Period of the Loan	months	8
Interest for the repay-period	%	9%
Interest payment for 6 monts	MMK	9,208
Total repayment	MMK	115,458

Crop Budget: 1 ac / Season	Index!A1							
Project Target (ac)	1,000							
Magway Potato - Financial	**Unit**	**Unit Value**	**WP**		**Shifting Cultivation (WOP)**		**Incremental**	
			Physical	Value MMK/ac	Physical	Value MMK/ac	Physical	Value MMK/ac
Yield	kg	350	7,000	2,450,000	5,500	1,925,000	1,500	525,000
Seed	kg	750	1,415	1,061,250	1,415	1,061,250	-	-
Compost	kg	150	500	75,000				
Neemcide	Ltr	1,500	10	15,000				
Labour Use								
Land Preparation	Pd	3,000	15	45,000				
Felling Forest	pd	3,000			15	45,000	- 15	- 45,000
Burning Felled trees	pd	3,000			10	30,000	- 10	- 30,000
Second burning and seeding	pd	3,000			10	30,000	- 10	- 30,000
Seeding	pd	3,000	5	15,000	5	15,000	-	-
1st Weeding	pd	3,000	10	30,000	10	30,000	-	-
2nd Weeding	pd	3,000	10	30,000	10	30,000	-	-
Harvesting	pd	3,000	50	150,000	10	30,000	40	120,000
Transport to home	pd	4,000	40	160,000	10	40,000	30	120,000
Cost and Revenue								
Material cost	MMK/ac			1,151,250		1,061,250	-	90,000
Labour cost	MMK/ac			430,000		250,000	-	180,000
Total Cost	MMK/ac			1,581,250		1,311,250	-	270,000
Total Gross Revenue	MMK/ac			2,450,000		1,925,000	-	525,000
Total Net Revenue	MMK/ac			868,750		613,750	-	255,000
Number of Labour Days	pd/ac		130		80		50	-
Total Net Revenue, net of labour	MMK/ac			1,258,750		853,750	-	405,000
Return to Labour	MMK/pd			9,683		10,672	-	- 989

Debt financing:	Units	Value						
Debt for working capital	MMK	1,151,250		-				
Annual Interest	%	13%						
Period of the Loan	months	5						
Interest for the repay-period	%	5%						
Interest payment for 6 monts	MMK	62,359						
Total repayment	MMK	1,213,609						

Crop Budget: 1 ac / Season	Index!A1							
Project Target (ac)	4,370							
Megaway - Onion, Financial	Unit	Unit Value	Irrigated Local Variety (WOP)		Irrigated Improved Variety (WP)		**Incremental**	
			Physical	Value MMK/ac	Physical	Value MMK/ac	Physical	Value MMK/ac
Yield	kg	580	1,540	893,200	1,750	1,015,000	210	121,800
Seed	kg	10,000	2.5	25,000	2.5	87,500	-	62,500
Land Preparation (pl & harrow)	acre	25,000	2	50,000	2	50,000	-	-
Fertilizer - Compound	bag 50 kg	30,000	1.5	45,000	2	60,000	1	15,000
Fertilizer - Urea	bag 50 kg	22,000	1.5	33,000	2	44,000	1	11,000
Pest Control	acre	10,000	2	20,000	3	30,000	1	10,000
Labour Use								
Cultivation (incl charges above)	pd	3,000	2	6,000	2	6,000	-	-
Nursery and planting	pd	3,000	10	30,000	10	30,000	-	-
Fertilizing	pd	3,000	2	6,000	2	6,000	-	-
Pest Control	pd	3,000	2	6,000	2	6,000	-	-
Weeding	pd	3,000	20	60,000	20	60,000	-	-
Harvest	pd	3,000	35	105,000	40	120,000	5	15,000
Transport to buyer (hire cost)	kg	4,000		4,000		4,000	-	-
Cost and Revenue								
Material cost	MMK/ac			173,000		271,500	-	98,500
Labour cost	MMK/ac			217,000		232,000	-	15,000
Total Cost	MMK/ac			390,000		503,500	-	113,500
Total Gross Revenue	MMK/ac			893,200		1,015,000	-	121,800
Total Net Revenue	MMK/ac			503,200		511,500	-	8,300
Number of Labour Days	pd/ac		71		76		5	-
Total Net Revenue, net of labour	MMK/ac			716,200		739,500	-	23,300
Return to Labour	MMK/pd			10,087		9,730	-	- 357

Debt financing:	Units	Value
Debt for working capital	MMK	173,000
Annual Interest	%	13%
Period of the Loan	months	5
Interest for the repay-period	%	5%
Interest payment for 6 monts	MMK	9,371
Total repayment	MMK	182,371

Crop Budget: 1 ac / Season	Index!A1									
Project Target (ac)	10,000									
Plum and A. Lebbeck perimeter Production										
		Price	**Without**	**With Project**						
Yields and inputs	**Unit**	**MMK**	**Project**	**Yr 1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Yr 7**
Sales of plum	kg DM	235		-			325	650	1,080	1,080
Sale of A. Lebbeck dry pruning	kg DM	150			250	450	450	450	450	450
Yd of maize (shifting cultivation)	Kg	280	690							
Sales of maize (shifting cultivation)	MMK		193,200							
Investments	MMK						-	-	-	
Land Preparation	Acre	150		1						
Plum Saplings	pc	700		32						
A. Lebbeck Seedlings	Pc	45		128						
Planting	Acre	15,000		3						
Manure	Mt	5,600		10						
Operating costs										
Compost	500	75			500	500	500	500	500	500
Neemcide	Lt	1500			5	5	5	5	5	5
Intregrated Pest Management	pd	3000			1	1	1	1	1	1
Plum pruning	pd	3000			2	2	2	2	2	2
Weeding	pd	3000			1	1	1	1	1	1
Harvesting Plum	pd	3000					1	2	3	3
Harvesting A. Lebbeck	pd	3000			1	2	2	2	2	2
Total			5		4	4	5	6	7	7
Incremental Labour	pd			-5	-1	-1	-	1	2	2
FINANCIAL BUDGET (MMK)				**Yr 1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Yr 7**
Sales of Plum	MMK			-	-	-	76,375	152,750	253,800	253,800
Sales of A. Lebbeck	MMK				37,500	-	-	112,500	202,500	202,500
Total Sale	MMK				37,500	-	76,375	265,250	456,300	456,300
Investments	MMK				-	-	-		-	-
Plum input costs	MMK			123,550	45,005	45,005	45,005	45,005	45,005	45,005
Lebbeck input cost	MMK			5,760	0	0	0	0	0	0
Plum labour cost				-	12,000	12,000	15,000	18,000	21,000	21,000
Lebbeck labour cost	MMK			-	3,000	6,000	6,000	6,000	6,000	6,000
Investments	MMK									
Material cost	MMK		55,650	129,310	45,005	45,005	45,005	45,005	45,005	45,005
Labour cost	MMK		15,000	-	15,000	18,000	21,000	24,000	27,000	27,000
Total Production Cost	MMK		70,650	129,310	60,005	63,005	66,005	69,005	72,005	72,005
Gross Income	MMK		193,200	0	37,500	67,500	143,875	220,250	321,300	321,300
Cash flows for farm-gate financial analysis	MMK		122,550							
Incremental cost	MMK			58,660	-10,645	-7,645	-4,645	-1,645	1,355	1,355
Incremental benefits	MMK			-193,200	-155,700	-125,700	-49,325	27,050	128,100	128,100
Incremental net benefits	MMK			-251,860	-145,055	-118,055	-44,680	28,695	126,745	126,745

Crop model profitability at the Farm-gate: before project financing:	
Discount rate	13%
IRR	**13%**
Incremental PV-benefit (MMK)	53,717
Incremental NPV-benefits (MMK)	14,430
Incremental PV-cost (MMK)	39,288
B/C ratio	1.37
Switching Value of Benefits	-27%
Return to family labour at full development (MMK/md)	1

Project Financing at the farm-gate for cultivation			WoP	WP						
				Yr : 1	Yr : 2	Yr : 3	Yr : 4	Yr : 5	Yr : 6	Yr : 7
Current crop extent	ac		1	1						
Incremental Net income	MMK			-251,860	-145,055	-118,055	-44,680	28,695	126,745	126,745
Start-up Grant for SALT	MMK			0						
Total establishment material cost				129,310						
Total Capital Expenditure Loan				129,310						
Years for having the loan for Capital Expenditure						1	2	3	4	5
Annual interest rate (%)	13%									
Loan repayment period (yrs)	5									
Interest payment (%) - Capital Expenditure Loan	MMK					(16,810)	(14,216)	(11,285)	(7,973)	(4,230)
Payment of principal - Capital expenditure loan	MMK					(19,954)	(22,548)	(25,480)	(28,792)	(32,535)
Total payment for the Capital expenditure loan	MMK					(36,765)	(36,765)	(36,765)	(36,765)	(36,765)
Incremental Cashflows for Financial analysis (after project financing)										
Incremental cost	MMK			58,660	(10,645)	29,120	32,120	35,120	38,120	38,120
Incremental benefits	MMK			-63,890	-155,700	-125,700	-49,325	27,050	128,100	128,100
Incremental benefits	MMK			-122,550	-145,055	-154,820	-81,445	-8,070	89,980	89,980

Crop model profitability - after project financing:	
Discount rate	13%
IRR	**14%**
Incremental PV-benefit (MMK)	168,151
Incremental NPV-benefits (MMK)	27,595
Incremental PV-cost (MMK)	140,556
B/C ratio	1.20

25. Appendix Table 2 shows that the long-term credit could be fully repaid including the 13% interest with the incremental cash flows of each SME model. The credit repayment schedules and the cash flows enabling the repayment in each model are presented in detail in **Error! Reference source not found.**.

26. Table 9 below shows the credit demand and the employment generation by each SME. Total 1320 SMEs will generate 1,496 person-years of additional jobs annually at the full development, and about 60% of them are female. The total credit needs during the first two ears are also summarised in the table. Credit is provided only once and as such the total requirement would be MMK 1,720 million which would be provided during the first two years.

Table 9: Total credit requirement and employment generation of the SME models

Micro-Enterprises	Number of MEs	Total Credit requirement (MMK 1000		Employment (PD at full dev.)	Full-time Jobs
		Project Yr 1	Yr 2		
Vet paraprofessionals	30	4,335	39,015		
Goat kid fattening	1200	134,880	1,213,920	216,200	1,081
Seed processing	20	15,994	143,946	20,000	100
Yam drying	70	16,800	151,200	63,000	315
Total	1320	172,009	336,294	299,2	416,081

Infrastructure model

The project supports renovation of 25 miles of farm roads in both Chin and Magway project areas in strategic locations. This is mainly to facilitate transporting of farm produces. These roads will facilitate the business activities of the SMEs as well. Table 10 summarises the incremental benefits accruing to the roads which is reducing the hauling cost all type of vehicles, save public transport cost and also reduce the cost of farm input and output transportation. Unit benefits value of these three types of savings were estimated using the estimated benefits of the Economic analysis of project design in the Philippines, conducted in 2017. The table below uses them to compute the benefits. It is expected that the volume of mainly primary products that would be transported and the passenger benefits would be about 40% in Chin and 60% in Magway in comparison to the benefits assumed in the Philippines estimates because of the less commercial nature of production and business.

SME - Goat Fattening	IndexIA1									
Target (Numbers)	1,200									
Goat Fattening										
Cost and Returns	Unit Value	Phy Units	Units	Value	Pr Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
Build up of Output/Sales	MMK					100%	100%	100%	100%	100%
Revenue										
Selling of fatten Goat	52,000	60	MMK 1000	3,058		3,058	3,058	3,058	3,058	3,058
Mortality rate			2%							
Investment										
Shelter	300,000	1	MMK 1000	300						
Feeders and drinkers	200,000	1	MMK 1000	200						
Starting Stock of animals	10,400	60	MMK 1000	624						
Total Investment cost				1,124	1,124	624	624	624	624	624
Operating Costs										
Weaned kids 10kg - 70 days	9,500	60	MMK 1000	570						
Feed (kg)	155	72	MMK 1000	11						
Health and vacinations per chick	1,500	2	MMK 1000	3						
Tractability chip	1,120	1	MMK 1000	1						
Other operating cost (handling, cleaning etc)	1,068	1	MMK 1000	1						
Water	1,120	1.0	MMK 1000	1						
Advisory service	52,000	1.0	MMK 1000	52						
Total operating cost			MMK 1000	639	639	639	639	639	639	639
Total Labour Cost	3,000	200	MMK 1000		600	600	600	600	600	600
Depreciation (5% of the capital cost is assumed)			MMK 1000		112	112	112	112	112	112
Total Cost			MMK 1000		2,476	1,976	1,976	1,976	1,976	1,976
Net revenue before Tax			MMK 1000		(2,476)	1,082	1,082	1,082	1,082	1,082
Tax rate	15%									
Deductabe tax			MMK 1000		0.0	162	162	162	162	162
Net Profit after tax			MMK 1000		(2,476)	919	919	919	919	919
WOP Opportunuty cost of Labour (50% of labour use)			MMK 1000		300	300	300	300	300	300
Incremental cost			MMK 1000		2,776	2,276	2,276	2,276	2,276	2,276
Incremental benefits			MMK 1000		0	3,058	3,058	3,058	3,058	3,058
Incremental net benefits			MMK 1000		(2,776)	782	782	782	782	782
IRR				28%						

SME model profitability: before project financing:	
Discount rate	13%
IRR	**28%**
Incremental PV-benefit (MMK)	18,773
Incremental NPV-benefits (MMK)	2,343
Incremental PV-cost (MMK)	16,430
B/C ratio	1.14
Switching Value of Benefits	-12%

Project Financing at the farm-gate for cultivation			WoP	WP						
				Yr : 1	Yr : 2	Yr : 3	Yr : 4	Yr : 5	Yr : 6	Yr : 7
Incremental Net income	MMK			-2,776	782	782	782	782	782	782
Start-up Grant	MMK			0						
Total establishment material cost				1,124						
Total Capital Expenditure Loan				1,124						
Years for having the loan for Capital Expenditure						1	2	3	4	5
Annual interest rate (%)	13%									
Loan repayment period (yrs)	5									
Interest payment (%) - Capital Expenditure Loan	MMK					(146)	(124)	(98)	(69)	(37)
Payment of principal - Capital expenditure loan	MMK					(173)	(196)	(221)	(250)	(283)
Total payment for the Capital expenditure loan	MMK					(320)	(320)	(320)	(320)	(320)
Incremental Cashflows for Financial analysis (after project financing)										
Incremental cost	MMK			0	2,776	2,595	2,595	2,595	2,595	2,595
Incremental benefits	MMK			1,124	0	3,058	3,058	3,058	3,058	3,058
Incremental benefits	MMK			1,124	-2,776	462	462	462	462	462

Crop model profitability - after project financing:	
Discount rate	13%
IRR	**44%**
Incremental PV-benefit (MMK)	17,373
Incremental NPV-benefits (MMK)	2,128
Incremental PV-cost (MMK)	15,245
B/C ratio	1.14

SME - Seed Processing	Index!A1									
Target (Numbers)	20									
Cost and Returns	Unit Value	Phy Units	Units	Value	Pr Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
Adoption rate	MMK					100%	100%	100%	100%	100%
Revenue										
Throughput (2 MT/hour) per day (5 hours)		10.0	mt							
Annual working day		200	days							
Annual throughput (mt)		2000	mt							
Cleaning price per MT	4,000		MMK 1000			8,000				
Total Revenue			MMK 1000			8,000	8,000	8,000	8,000	8,000
Investment										
Gravity seperator for seed cleaning	4,032,000	1								
Packaging and weghing	3,465,000	1								
Shipment	500,000									
Total Investment cost			MMK 1000		7,997					
Operating Costs										
Electricity KWH		7								
Cost of Electricity (MMK/KWH)	100									
Annual cost of electricity			MMK 1000			1,360	1,360	1,360	1,360	1,360
Labour for all operations per tone	3,000	1000	mt							
Cost of labour			MMK 1000			3,000	3,000	3,000	3,000	3,000
Transport of equipment, 20 movements per year	440,000		MMK 1000			440	440	440	440	440
Moving parts and maintenance	275,000		MMK 1000			275	275	275	275	275
Total Operating Cost			MMK 1000			5,075	5,075	5,075	5,075	5,075
Depreciation (5% of the capital cost is assumed)			MMK 1000			800	800	800	800	800
Total Cost			MMK 1000		7,997	5,875	5,875	5,875	5,875	5,875
Net revenue before Tax			MMK 1000		(7,997)	2,125	2,125	2,125	2,125	2,125
Tax rate	15%									
Deductabe tax			MMK 1000		0.0	319	319	319	319	319
Net Profit after tax			MMK 1000		(7,997)	1,807	1,807	1,807	1,807	1,807
Without Project Opportunuty cost of labour (40% - Current)			MMK 1000			900	900	900	900	900
Incremental cost			MMK 1000		7,997	6,294	6,294	6,294	6,294	6,294
Incremental benefits			MMK 1000		0	8,000	8,000	8,000	8,000	8,000
Incremental net benefits			MMK 1000		(7,997)	1,706	1,706	1,706	1,706	1,706
IRR				21%						

SME model profitability: before project financing:	
Discount rate	13%
IRR	**21%**
Incremental PV-benefit (MMK)	49,118
Incremental NPV-benefits (MMK)	3,399
Incremental PV-cost (MMK)	45,720
B/C ratio	1.07
Switching Value of Benefits	-7%

Project Financing at the farm-gate for cultivation			WoP	WP						
					Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
Incremental Net income	MMK				-7,997	1,706	1,706	1,706	1,706	1,706
Start-up Grant	MMK									
Total establishment material cost										
Total Capital Expenditure Loan				7,997						
Years for having the loan for Capital Expenditure						1	2	3	4	5
Annual interest rate (%)	13%									
Loan repayment period (yrs)	5									
Interest payment (%) - Capital Expenditure Loan	MMK					(1,040)	(879)	(698)	(493)	(262)
Payment of principal - Capital expenditure loan	MMK					(1,234)	(1,394)	(1,576)	(1,781)	(2,012)
Total payment for the Capital expenditure loan	MMK					(2,274)	(2,274)	(2,274)	(2,274)	(2,274)
Incremental Cashflows for Financial analysis (after project financing)										
Incremental cost	MMK				7,997	8,567	8,567	8,567	8,567	8,567
Incremental benefits	MMK				7,997	8,000	8,000	8,000	8,000	8,000
Incremental benefits	MMK				0	-567	-567	-567	-567	-567

Crop model profitability - after project financing:	
Discount rate	13%
IRR	**31%**
Incremental PV-benefit (MMK)	55,501
Incremental NPV-benefits (MMK)	3,251
Incremental PV-cost (MMK)	52,250
B/C ratio	1.06

SME - Yam Drying and Processing	Index!A1									
Target (Numbers)	70									
Cost and Returns	Unit Value	Phy Units	Units	Value	Pr Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
Adoption rate	MMK					100%	100%	100%	100%	100%
Revenue										
Yam drying period, days		150	days							
Fresh Yam/day kg		650	kg/day							
Price for drying Yam MMK/kg	10		MMK/kg							
Price for washing & slicing Yam MMK/ kg	32		MMK/kg							
Total Revenue						4,095	4,095	4,095	4,095	4,095
Investment										
Material for a building	2,400	1	MMK 1000							
Initial working capital			MMK 1000		720					
Total Investment cost			MMK 1000		2,400					
Operating Costs										
Labour for all operations	3,000	900	pd/day							
Cost of labour						2,700	2,700	2,700	2,700	2,700
Total Operating Cost			MMK 1000			2,700	2,700	2,700	2,700	2,700
Depreciation (5% of the capital cost is assumed)			MMK 1000			240	240	240	240	240
Total Cost			MMK 1000		3,120	2,940	2,940	2,940	2,940	2,940
Net revenue before Tax			MMK 1000		(3,120)	1,155	1,155	1,155	1,155	1,155
Tax rate	15%									
Deductabe tax			MMK 1000		0.0	173	173	173	173	173
Net Profit after tax			MMK 1000		(3,120)	982	982	982	982	982
Without Project Opportunuty cost of labour (10% of labour cost)			MMK 1000			270	270	270	270	270
Incremental cost			MMK 1000		3,120	3,143	3,143	3,143	3,143	3,143
Incremental benefits			MMK 1000		0	4,095	4,095	4,095	4,095	4,095
Incremental net benefits			MMK 1000		(3,120)	952	952	952	952	952
IRR				30%						

SME model profitability: before project financing:	
Discount rate	13%
IRR	**30%**
Incremental PV-benefit (MMK)	25,142
Incremental NPV-benefits (MMK)	3,082
Incremental PV-cost (MMK)	22,060
B/C ratio	1.14
Switching Value of Benefits	-12%

Project Financing at the farm-gate for cultivation			WoP	WP						
					Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
Incremental Net income	MMK				-3,120	952	952	952	952	952
Start-up Grant	MMK									
Total establishment material cost										
Total Capital Expenditure Loan				2,400						
Years for having the loan for Capital Expenditure						1	2	3	4	5
Annual interest rate (%)	13%									
Loan repayment period (yrs)	5									
Interest payment (%) - Capital Expenditure Loan	MMK					(312)	(264)	(209)	(148)	(79)
Payment of principal - Capital expenditure loan	MMK					(370)	(419)	(473)	(534)	(604)
Total payment for the Capital expenditure loan	MMK					(682)	(682)	(682)	(682)	(682)
Incremental Cashflows for Financial analysis (after project financing)										
Incremental cost	MMK				3,120	3,826	3,826	3,826	3,826	3,826
Incremental benefits	MMK				2,400	4,095	4,095	4,095	4,095	4,095
Incremental benefits	MMK				-720	269	269	269	269	269

Crop model profitability - after project financing:	
Discount rate	13%
IRR	**50%**
Incremental PV-benefit (MMK)	26,911
Incremental NPV-benefits (MMK)	3,000
Incremental PV-cost (MMK)	23,911
B/C ratio	1.13

27. Appendix Table 3 presents a table with detail in the financial analysis of the project supported roads. The financial assessment yield 15% IRR and MMK 32.4 million NPV at 13% DR for 20-year period. The benefits estimations should come down upto 5%, as the switching value estimates, before the benefit-cost ration become less than one.

Table 10: Benefit computation assumptions of supported farm roads – based on Philippines experience

Type of benefits	Units	WOP benefits		WP benefits		Increase
Freight Benefits						
Type of Freight:		Percent	VOC/mt/km	Percent	VOC/mt/km	mt/km
Small cars	MMK	60%	504.224	30%	151.2672	
Truck	MMK	40%	268.8	60%	80.64	
Vehicle Operating Cost (VOC) [Weighted Average]	MMK		410.05		101.83	308.23
Passenger Benefits						
Type of Passenger transport		Percent	VOC/passenger/km	Percent	VOC/passenger/km	VOC/passenger/km
Tricycle	MMK	30%	125.888	10%	37.856	
Small cars	MMK	60%	60.48	60%	18.144	
Truck	MMK	10%	32.256	30%	9.632	
VOC (Weighted Average)	MMK		77.28		17.56	59.72

Aggregated financial analysis of all Farm and SME models

28. Each farm model and SME model together with the infrastructure model were scaled up at their full target level to get the project level aggregated results of the financial viability analysis. The total investment cost of the project is MMK 24,726 million or US$ 22 million for a period of 6 years which includes MMK 1,306 million as grants. The total project cost without the grant and distributed over 6 years added to the total cost flow of the analysis. The annual distribution of the project cost is obtained from the COSTAB. The costs and benefits for a period of 20 years are considered which reflect about one production cycle of the three of the perennial crops. The undiscounted annual incremental net financial benefits at full project development are estimated at MMK 15,129 million or US$ 13.5 million. The FIRR of the project is 34% with a NPV of MMK 36,882 million or USD 32.9 million. The total cash flows are presented in Appendix Table 4 (IFAD summary sheet) for 10 years. The details are presented in nested Excel workbook (stored in life files of the project).

29. The total incremental employment generation in both farms and SMEs was estimated at 926,192 person-days. It is assumed that there are 200 working days per year and the total person-days needed for farm and non-farm activities were divided by 200 to obtain 4,630 the person-years of employment indicating that this number of people who were otherwise not fully employed got employment through out the year. This includes un-employed or partly employed family labour as well.

30. Economic Analysis

31. The economic analysis is carried out after making appropriate adjustments to financial benefits and costs. The adjustments include:

31.1 A standard conversion factor (SCF) of 0.85 is applied to both locally traded and non-traded items including the project supported roads for adjusting financial prices to economic prices. This will accommodate any possible market distortions. Slightly lower SCF is used instead of 0.9 since market imperfections could be expected in the project areas which is very remote, and market and public institutions are still evolving. The opportunity cost or the shadow wage rate of the un-skilled

labour is also derived using the same SCF. There is no difference in the shadow wage rate of male and female labour.

31.2 All imported items for SME activities are valued at 120% to reflect the foreign exchange parity.

31.3 The analysis used the economic project investment costs, which are generated by the COSTAB are net of duties, taxes and price contingencies, and grants but inclusive of physical contingencies.

31.4 The economic or social discount rate of 10%, which reflect the opportunity cost of capital for the national economy was used to discount all cash flows.

31.5 The Grants, which represent subsidies, provided to the farmers and the Taxes that were applied at 15% for the SMEs have been excluded since they represent transfer payments.

31.6 The analysis includes only direct and attributable benefits from the farming activities. Benefits from extension services, institutional improvements, and all indirect benefits such as environmental externalities from SALT and covers crops were not included in the analysis for want of detailed and verified information.

31.7 The financial and the economic prices of all commodities and all farming and SME inputs are presented in Appendix Table 5.

32. Results: The economic analysis yields in the base case an EIRR of 32% and the economic net present value of MMK 43,446 million for a period of 20 years under a discount rate of 10%. The benefit-cost ration with same discount rate is 1.40. These three indicators confirm that the project is worthy of receiving IFAD loan funds. The EFA framework and the results as per IFAD guideline are summarised in Appendix Table 6.

33. **Sensitivity analyses**: Seven possible scenarios are analysed. The project cost escalating by 10% and 20%; project benefits decrease by 10% and 20%; benefits delay by one year and 2 years; and 10% increase in the input prices. The results of the sensitivity analyses are summarized in Table 11. The sensitivity analyses show that the project economic benefits are resilient to cost escalations, benefits reductions, and delay in realizing benefits with EIRR remaining above 20% and Economic NPV above USD 10 million. The worst-case scenario is the 2-year delays in getting benefits once the investment is committed, but the project is still viable.

Table 11: Results of the sensitivity analyses of economic analysis

Sensitivity Scenario	EIRR	MMK 1000	USD 1000	BC Ratio
Base case (DR: 10%)	32%	43,446,100	38,791	1.40
10% cost escalation	25%	28,305,814	25,273	1.26
20% cost escalation	17%	13,165,528	11,755	1.12
10% benefit decrease	26%	32,650,424	29,152	1.27
20% benefit decrease	20%	21,854,748	19,513	1.17
1 year delay in implementation	20%	25,888,136	23,114	1.24
2 years delay in implementation	13%	10,048,068	8,971	1.09
10% increase in input prices	27%	35,889,127	32,044	1.31

34. Other Benefits

35. The EFA of the WASP is predominantly determined by the farm productions. The production of commodities are direct outputs from the respective farm models. In addition, the project investment creates several indirect benefits owing to improved agricultural extension services trough the NGO staff, better facilities for conducting training sessions, increased staff training, improvement of farmer

organizations, better veterinarian services and market support etc. Other community infrastructure facilities such as village roads will benefit the non-target groups with better access to agricultural markets and purchase of quality inputs. The linkages of financial institutions with the project target groups through credit provisions will also have long lasting benefits.

36. The project's training and capacity building interventions will also create certain benefits which have not been valued. These include the following: (i) At the end of the project, all participating households would have received training on the improved production practices, soil management, SALT, and land improvement practices and credit management; (ii) state and NGO extension staff of Chin and Magway would also have received training and their capacity strengthened to provide better services to the farmers in improving agricultural productivity and better land management; (ii) women from the poor and vulnerable households will be targeted for training and their capacity building and they would also participate in production and some of the agribusiness activities and institutional credit cultures. These are benefits that are associated with the implementation of the project.

Appendix Table 1 : Crop budgets, the financing package and profitability – Chin & Magway

Crop Budget: 1 ac / Season	Index!A1							
Total Project Tartget (ac):	1000							
Chin Maize with SALT: Financial	**Unit**	**Unit Value (MMK)**	**With Project**		**Shifting Cultivation (WOP)**		**Incremental**	
			Physical	Value MMK/ac	Physical	Value MMK/ac	Physical	Value MMK/ac
Yield (20% higher Yd under SALT)	kg	280	1,680	470,400	690	193,200	990	277,200
Seed	kg	450	7	3,150	10	4,500		
Land Hire (1 ac is hired for SALT+crop; hiring cost capitalised for the season)	MMK/ac	421,875	0.42	175,781				
Compost	kg	75	500	37,500				
Neemcide	Ltr	1,500	10	15,000				
Labour Use								
Land preparation	Pd	3,000	15	45,000				
Felling forest	pd	3,000			15	45,000		
Burning felled trees	pd	3,000			10	30,000		
Second burning and seeding	pd	3,000			10	30,000		
Seeding	pd	3,000	5	15,000				
1st Weeding	pd	3,000	10	30,000	10	30,000		
2nd Weeding	pd	3,000	10	30,000	10	30,000		
Harvesting	pd	3,000	15	45,000	10	30,000		
Treshing	pd	3,000	15	45,000	10	30,000		
Transport to home	pd	3,000	20	60,000	10	30,000		
Cost and Revenue								
Material cost	MMK/ac			231,431		4,500	-	226,931
Labour cost	MMK/ac			270,000		255,000	-	15,000
Total Cost	MMK/ac			501,431		259,500	-	241,931
Total Gross Revenue	MMK/ac			470,400		193,200	-	277,200
Total Net Revenue	MMK/ac			- 31,031		- 66,300	-	35,269
Number of Labour Days	pd/ac		90		85		5	-
Total Net Revenue, net of labour	MMK/ac			238,969		188,700	-	50,269
Return to Labour	MMK/pd			2,655		2,220	-	435

Project financing:	Units	Value
Start-up grant for SALT	MMK	290,080
Debt for working capital	MMK	231,431
Annual Interest	%	13%
Period of the Loan	months	5
Interest for the repay-period	%	5%
Interest payment for 6 monts	MMK	12,536
Total repayment	MMK	243,967

Crop Budget: 1 ac / Season	Index!A1							
Total Project Tartget (ac):	1000							
Chin Upland Paddy with SALT - Financial	**Unit**	**Unit Value**	**SALT (WP)**		**Shifting Cultivation (WOP)**		**Incremental**	
			Physical	Value MMK/ac	Physical	Value MMK/ac	Physical	Value MMK/ac
Yield (20% higher Yd under SALT)	kg	245	1,800	441,000	640	156,800	1,160	284,200
Seed	kg	600	25	15,000	40	24,000		
Land Hire (1 ac is hired for SALT; hiring cost capitalised for crop season)	MMK/ac	421,875	0.42	175,781				
Compost	kg	75	500	37,500	-	-		
Neemcide	Ltr	1,500	10	15,000	-	-		
Labour Use								
Land Preparation	Pd	3,000	15	45,000				
Felling Forest	pd	3,000	-	-	15	45,000		
Burning Felled trees	pd	3,000	-	-	10	30,000		
Second burning and seeding	pd	3,000	-	-	10	30,000		
Seeding	pd	3,000	5	15,000	1	3,000		
1st Weeding	pd	3,000	15	45,000	10	30,000		
2nd Weeding	pd	3,000	15	45,000	10	30,000		
Harvesting	pd	3,000	20	60,000	10	30,000		
Treshing	pd	3,000	15	45,000	10	30,000		
Transport to home	pd	3,000	20	60,000	10	30,000		
Cost and Revenue								
Material cost	MMK/ac			243,281		24,000	-	219,281
Labour cost	MMK/ac			315,000		258,000	-	57,000
Total Cost	MMK/ac			558,281		282,000	-	276,281
Total Gross Revenue	MMK/ac			441,000		156,800	-	284,200
Total Net Revenue	MMK/ac			- 117,281		- 125,200	-	7,919
Number of Labour Days	pd/ac		105		86		19	-
Total Net Revenue, net of labour	MMK/ac			197,719		132,800	-	64,919
Return to Labour	MMK/pd			1,883		1,544	-	339

Project financing:	Units	Value
SALT Starter package	MMK	290,080
Debt for working capital	MMK	243,281
Annual Interest	%	13%
Period of the Loan	months	5
Interest for the repay-period	%	5%
Interest payment for 6 monts	MMK	13,178
Total repayment	MMK	256,459

Crop Budget: 1 ac / Season	Index!A1							
Total Project Tartget (ac):	3000							
Chin Millet - Financial	**Unit**	**Unit Value**	**WP**		**Shifting Cultivation (WOP)**		**Incremental**	
			Physical	Value MMK/ac	Physical	Value MMK/ac	Physical	Value MMK/ac
Yield	kg	350	1,000	350,000	550	192,500	450	157,500
Seed	kg	400	7	2,800	10	4,000		
Land Hire (1 ac is hired; hiring cost capitalised for crop season)	MMK/ac	421,875	0.25	105,469				
Compost	kg	75	300	22,500	-	-		
Neemcide	Ltr	1,500	10	15,000	-	-		
Labour Use								
Land Preparation	Pd	3,000	15	45,000				
Felling Forest	pd	3,000	-	-	15	45,000		
Burning Felled trees	pd	3,000	-	-	10	30,000		
Second burning and seeding	pd	3,000	-	-	10	30,000		
Seeding	pd	3,000	5	15,000	5	15,000		
1st Weeding	pd	3,000	15	45,000	10	30,000		
2nd Weeding	pd	3,000	15	45,000	10	30,000		
Harvesting	pd	3,000	15	45,000	10	30,000		
Treshing	pd	3,000	15	45,000	10	30,000		
Transport to home	pd	3,000	15	45,000	10	30,000		
Cost and Revenue								
Material cost	MMK/ac			145,769		4,000	-	141,769
Labour cost	MMK/ac			285,000		270,000	-	15,000
Total Cost	MMK/ac			430,769		274,000	-	156,769
Total Gross Revenue	MMK/ac			350,000		192,500	-	157,500
Total Net Revenue	MMK/ac			- 80,769		- 81,500	-	731
Number of Labour Days	pd/ac		95		90		5	-
Total Net Revenue, net of labour	MMK/ac			204,231		188,500	-	15,731
Return to Labour	MMK/pd			2,150		2,094	-	55

Debt financing:	Units	Value
Debt for working capital	MMK	145,769
Annual Interest	%	13%
Period of the Loan	months	3
Interest for the repay-period	%	3%
Interest payment for 6 monts	MMK	4,737
Total repayment	MMK	150,506

Total Project Tartget (ac):	1000							
Chin White Bean, Own Funds+Debt - Financial	**Unit**	**Unit Value**	**WP**		**Shifting Cultivation (WOP)**		**Incremental**	
			Physical	Value MMK/ac	Physical	Value MMK/ac	Physical	Value MMK/ac
Yield	kg	565	780	440,700	500	282,500	280	158,200
Seed	kg	600	15	9,000	10	6,000		
Land Hire (1 ac is hired; hiring cost capitalised for crop season)	MMK/ac	421,875	0.21	87,891				
Compost	kg	75	500	37,500	-	-		
Neemcide	Ltr	1,500	5	7,500	-	-		
Labour Use								
Land Preparation	Pd	3,000	15	45,000				
Felling Forest	pd	3,000	-	-	10	30,000		
Burning Felled trees	pd	3,000	-	-	5	15,000		
Second burning and seeding	pd	3,000	-	-	10	30,000		
Seeding	pd	3,000	5	15,000	5	15,000		
1st Weeding	pd	3,000	10	30,000	10	30,000		
2nd Weeding	pd	3,000	10	30,000	10	30,000		
Harvesting	pd	3,000	15	45,000	10	30,000		
Treshing	pd	3,000	15	45,000	10	30,000		
Transport to home	pd	3,000	15	45,000	10	30,000		
Cost and Revenue								
Material cost	MMK/ac			141,891		6,000	-	135,891
Labour cost	MMK/ac			255,000		240,000	-	15,000
Total Cost	MMK/ac			396,891		246,000	-	150,891
Total Gross Revenue	MMK/ac			440,700		282,500	-	158,200
Total Net Revenue	MMK/ac			43,809		36,500	-	7,309
Number of Labour Days	pd/ac		85		80		5	-
Total Net Revenue, net of labour	MMK/ac			298,809		276,500	-	22,309
Return to Labour	MMK/pd			3,515		3,456	-	59

Project financing:	Units	Value
Debt for working capital	MMK	141,891
Annual Interest	%	13%
Period of the Loan	months	3
Interest for the repay-period	%	3%
Interest payment for 6 monts	MMK	3,843
Total repayment	MMK	145,733

Crop Budget: 1 ac / Season	Index!A1							
Total Project Tartget (ac):	1000							
Chin Yam with SALT - Financial	**Unit**	**Unit Value**	**SALT (WP)**		**Shifting Cultivation (WOP)**		Increment	
			Physical (Kg)	Value MMK/ac	Physical	Value MMK/ac	Physical	Value MMK/ac
Yield (dry)	kg	4,500	800	3,600,000	715	3,217,500	85	382,500
Planting material	kg	3,500	105	367,500	105	367,500	-	-
Land Hire (1 ac is hired; hiring cost capitalised for crop season)	MMK/ac	421,875	1.00	421,875				
Compost	kg	150	500	75,000	-	-		
Neemcide	Ltr	1,500	10	15,000	-	-		
Labour Use								
Land Preparation	Pd	3,000	15	45,000			15	45,000
Felling Forest	pd	3,000	-	-	20	60,000		
Burning Felled trees	pd	3,000	-	-	10	30,000		
Second burning and seeding	pd	3,000	-	-	10	30,000		
Seeding	pd	3,000	5	15,000			5	15,000
1st Weeding	pd	3,000	10	30,000	15	45,000	- 5	- 15,000
2nd Weeding	pd	3,000	10	30,000	15	45,000	- 5	- 15,000
3th Weeding	pd	3,000	10	30,000	16	48,000	- 6	- 18,000
Drying	Pd	3,000	6	18,000	6	18,000	-	-
Transport to home		4,500		4,500	2	9,000		- 4,500
Total Labour								
Cost and Revenue								
Material cost	MMK/ac			883,875		367,500	-	516,375
Labour cost	MMK/ac			168,000		258,000	-	- 90,000
Total Cost	MMK/ac			1,051,875		625,500	-	426,375
Total Gross Revenue	MMK/ac			3,600,000		3,217,500	-	382,500
Total Net Revenue	MMK/ac			2,548,125		2,592,000	-	- 43,875
Number of Labour Days	pd/ac		56		94		- 38	-
Total Net Revenue, net of labour	MMK/ac			2,548,125		2,592,000	-	- 43,875
Return to Labour	MMK/pd			45,502		27,574	-	17,928

Project financing:	Units	Value
Debt for working capital	MMK	883,875
Annual Interest	%	13%
Period of the Loan	months	3
Interest for the repay-period	%	3%
Interest payment for 6 monts	MMK	23,938
Total repayment	MMK	907,813

Crop Budget: 1 acres, 20-year period										
Chin Avocado with SALT - Financial	IndexIA1									
Project target (ac)	1000									
		Price	**Without**	**With Project**						
Yields and inputs	**Unit**	**MMK**	**Project**	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**
Sales of avocado	Kg	450	-	-			1512	3,661	4,788	5,670
Yd of maize (shifting cultivation)	Kg		690							
Sales of maize (shifting cultivation)	MMK	280	193,200							
Investments	MMK		-				-	-	-	
Land Preparation	Acre	120,000		1						
Land Hire (1 ac is hired; hiring cost capitalised for crop season)	MMK/ac	421,875		421,875	421,875	421,875	421,875	421,875	421,875	421,875
Saplings	pc	500		126						
Planting	Acre	15,000		1						
Manure	Mt	5,600		10						
Total Investment	MMK/ac			675,875	421,875	421,875	421,875	421,875	421,875	421,875
Operating costs										
Compost	Kg	15			5000	5000	5000	5000	5000	5000
Neemcide	Lt	7,500		10	10	10	10	10	10	10
Intregrated Pest Management	pd	3,000		5	5	5	5	5	5	5
Pruning	pd	3,000			15	15	15	15	15	15
Weeding	pd	3,000					-	8	8	8
Harvesting plus transport	pd	3,000					25	25	25	25
Total Labour			5	5	20	20	45	53	53	53
Incremenantal Labout				-	15	15	40	48	48	48
Cost										
Material cost	MMK		55,650	750,875	571,875	571,875	571,875	571,875	571,875	571,875
Labour cost	MMK		15,000	15,000	60,000	60,000	135,000	159,000	159,000	159,000
Total Cost	MMK		70,650	765,875	631,875	631,875	706,875	730,875	730,875	730,875
Revenue										
Sales of Avocado	MMK		-	-	-	-	680,400	1,647,430	2,154,600	2,551,500
FINANCIAL BUDGET (MMK)				**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**
Gross Income										
Sales of Avocado (maize = WOP)	MMK		193,200	-	-	-	680,400	1,647,430	2,154,600	2,551,500
Investments	MMK									
Material cost	MMK		55,650	750,875	571,875	571,875	571,875	571,875	571,875	571,875
Labour cost	MMK		15,000	15,000	60,000	60,000	135,000	159,000	159,000	159,000
Total Production Cost	MMK		70,650	765,875	631,875	631,875	706,875	730,875	730,875	730,875
Net Income	MMK		122,550	-765,875	-631,875	-631,875	-26,475	916,555	1,423,725	1,820,625
Cash flows for farm-gate financial analysis	MMK									
Incremental cost	MMK			695,225	561,225	561,225	636,225	660,225	660,225	660,225
Incremental benefits	MMK			-193,200	-193,200	-193,200	487,200	1,454,230	1,961,400	2,358,300
Incremental net benefits	MMK			-888,425	-754,425	-754,425	-149,025	794,005	1,301,175	1,698,075

Crop model profitability at the Farm-gate: before project financing:	
Discount rate	13%
IRR	**31%**
Incremental PV-benefit (MMK)	8,713,079
Incremental NPV-benefits (MMK)	4,205,052
Incremental PV-cost (MMK)	4,508,027
B/C ratio	1.93
Switching Value of Benefits	-48%
Return to family labour at full development (MMK/md)	37,008

Project Financing at the farm-gate for cultivation			WoP	WP						
				Yr : 1	Yr : 2	Yr : 3	Yr : 4	Yr : 5	Yr : 6	Yr : 7
Current crop extent	ac		1	1						
Incremental Net income	MMK			(598,345)	(754,425)	(754,425)	(149,025)	794,005	1,301,175	1,698,075
Start-up Grant for SALT	MMK			290,080						
Total establishment material cost				385,795						
Total Capital Expenditure Loan				385,795						
Years for having the loan for Capital Expenditure						1	2	3	4	5
Annual interest rate (%)	13%									
Loan repayment period (yrs)	5									
Interest payment (%) - Capital Expenditure Loan	MMK					(50,153)	(42,414)	(33,668)	(23,786)	(12,619)
Payment of principal - Capital expenditure loan	MMK					(59,534)	(67,273)	(76,019)	(85,901)	(97,068)
Total payment for the Capital expenditure loan	MMK					(109,687)	(109,687)	(109,687)	(109,687)	(109,687)
Incremental Cashflows for Financial analysis (after project financing)										
Incremental cost	MMK			695,225	561,225	670,912	745,912	769,912	769,912	769,912
Incremental benefits	MMK			482,675	-193,200	-193,200	487,200	1,454,230	1,961,400	2,358,300
Incremental benefits	MMK			(212,550)	(754,425)	(864,112)	(258,712)	684,318	1,191,488	1,588,388

Crop model profitability - after project financing:	
Discount rate	13%
IRR	**38%**
Incremental PV-benefit (USD)	9,311,198
Incremental NPV-benefits (USD)	4,501,037
Incremental PV-cost (USD)	4,810,161
B/C ratio	1.94

Crop Budget: 1 acres, 20-year period										
Chin Macadamia - Financial	Index!A1									
Project target (ac)	500									
		Price	**Without**	**With Project**						
Yields and inputs	**Unit**	**MMK**	**Project**	**Proj Yr 1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Yr 7**
Sales of Macadamia (nut in shell 10% moist)	mt	3,000,000	-	-			0.13	0.26	0.39	0.52
Yd of maize (shifting cultivation)	Kg		690.0							
Sales of maize (shifting cultivation)	MMK	280	193,200							
Investments	MMK						-	-	-	
Land Preparation	Acre	120,000		1						
Land Hire (1 ac is hired; hiring cost capitalised for crop season)	MMK/ac	421,875		421,875	421,875	421,875	421,875	421,875	421,875	421,875
Saplings	pc	5,000		130						
Planting	Acre	15,000		3						
Manure	Mt	15,000		10						
Total Investment	MMK/ac			1,386,875	421,875	421,875	421,875	421,875	421,875	421,875
Operating costs										
Compost/mulching	Units	15		5000	5000	5000	5000	5000	5000	5000
Neemcide	Lt	7,500		10	10	10	10	10	10	10
Intregrated Pest Management	pd	3,000		5	5	10	15	15	15	15
Pruning	pd	3,000		15	15	15	15	15	15	15
Weeding	pd	3,000		4	4	8	10	10	15	20
Harvesting, transport and processing	pd	3,000			4	8	8	10	25	25
Total Labour	pd		5	24	28	41	48	50	70	75
Incremental Labour	pd			19	23	36	43	45	65	70
Cost										
Material cost	MMK		55,650	1,386,875	421,875	421,875	421,875	421,875	421,875	421,875
Labour cost	MMK		15,000	72,000	84,000	123,000	144,000	150,000	210,000	225,000
Total Cost	MMK		70,650	1,458,875	505,875	544,875	565,875	571,875	631,875	646,875
Revenue										
FINANCIAL BUDGET (MMK)				**Proj Yr 1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Yr 7**
Gross Income										
Sales of Macadamia (maize = WOP)	MMK		193,200	-	-	-	390,000	780,000	1,170,000	1,560,000
Investments	MMK									
Material cost	MMK		55,650	1,386,875	421,875	421,875	421,875	421,875	421,875	421,875
Labour cost	MMK		15,000	72,000	84,000	123,000	144,000	150,000	210,000	225,000
Total Production Cost	MMK		70,650	1,458,875	505,875	544,875	565,875	571,875	631,875	646,875
Net Income	MMK		122,550	-1,458,875	-505,875	-544,875	-175,875	208,125	538,125	913,125
Cash flows for farm-gate financial analysis	MMK									
Incremental cost	MMK			1,388,225	435,225	474,225	495,225	501,225	561,225	576,225
Incremental benefits	MMK			-193,200	-193,200	-193,200	196,800	586,800	976,800	1,366,800
Incremental net benefits	MMK			-1,581,425	-628,425	-667,425	-298,425	85,575	415,575	790,575

Crop model profitability at the Farm-gate: before project financing:	
Discount rate	13%
IRR	**28%**
Incremental PV-benefit (MMK)	10,238,676
Incremental NPV-benefits (MMK)	5,750,960
Incremental PV-cost (MMK)	4,487,716
B/C ratio	2.28
Switching Value of Benefits	-56%
Return to family labour at full development (MMK/md)	39,072

Project Financing at the farm-gate for cultivation			WoP	WP						
				Yr : 1	Yr : 2	Yr : 3	Yr : 4	Yr : 5	Yr : 6	Yr : 7
Current crop extent	ac		1	1						
Incremental Net income	MMK			-1,581,425	-628,425	-667,425	-298,425	85,575	415,575	790,575
Start-up Grant for SALT	MMK			0						
Total establishment material cost				1,386,875						
Total Capital Expenditure Loan				1,386,875						
Years for having the loan for Capital Expenditure						1	2	3	4	5
Annual interest rate (%)	13%									
Loan repayment period (yrs)	5									
Interest payment (%) - Capital Expenditure Loan	MMK					(180,294)	(152,472)	(121,033)	(85,507)	(45,363)
Payment of principal - Capital expenditure loan	MMK					(214,015)	(241,837)	(273,276)	(308,802)	(348,946)
Total payment for the Capital expenditure loan	MMK					(394,309)	(394,309)	(394,309)	(394,309)	(394,309)
Incremental Cashflows for Financial analysis (after project financing)										
Incremental cost	USD			1,388,225	435,225	868,534	889,534	895,534	955,534	970,534
Incremental benefits	USD			1,193,675	-193,200	-193,200	196,800	586,800	976,800	1,366,800
Incremental benefits	USD			-194,550	-628,425	-1,061,734	-692,734	-308,734	21,266	396,266

Crop model profitability - after project financing:	
Discount rate	13%
IRR	**32%**
Incremental PV-benefit (USD)	11,465,999
Incremental NPV-benefits (USD)	5,892,156
Incremental PV-cost (USD)	5,573,843
B/C ratio	2.06

Crop Budget: 1 ac / Season	Index!A1							
Project Target (ac)	300							
Chin Permanent Upland Potato - Financial	**Unit**	**Unit Value**	**SALT (WP)**		**Shifting Cultivation (WOP)**		**Incremental**	
			Physical	Value MMK/ac	Physical	Value MMK/ac	Physical	Value MMK/ac
Yield	kg	350	8,000	2,800,000	5,250	1,837,500	2,750	962,500
Seed	kg	750	1,415	1,061,250	1,415	1,061,250	-	-
Land Hire (1 ac is hired; hiring cost capitalised for crop season)	MMK/ac	421,875	0.42	175,781				
Compost	kg	150	500	75,000				
Neemcide	Ltr	1,500	10	15,000				
Labour Use								
Land Preparation	Pd	3,000	15	45,000				
Felling Forest	pd	3,000			15	45,000	- 15	- 45,000
Burning Felled trees	pd	3,000			10	30,000	- 10	- 30,000
Second burning and seeding	pd	3,000			10	30,000	- 10	- 30,000
Seeding	pd	3,000	5	15,000	5	15,000	-	-
1st Weeding	pd	3,000	10	30,000	10	30,000	-	-
2nd Weeding	pd	3,000	10	30,000	10	30,000	-	-
Harvesting	pd	3,000	50	150,000	10	30,000	40	120,000
Transport to home	pd	4,000	40	160,000	10	40,000	30	120,000
Cost and Revenue								
Material cost	MMK/ac			1,327,031		1,061,250	-	265,781
Labour cost	MMK/ac			430,000		250,000	-	180,000
Total Cost	MMK/ac			1,757,031		1,311,250	-	445,781
Total Gross Revenue	MMK/ac			2,800,000		1,837,500	-	962,500
Total Net Revenue	MMK/ac			1,042,969		526,250	-	516,719
Number of Labour Days	pd/ac		130		80		50	-
Total Net Revenue, net of labour	MMK/ac			1,432,969		766,250	-	666,719
Return to Labour	MMK/pd			11,023		9,578	-	1,445

Debt financing:	Units	Value
Debt for working capital	MMK	1,327,031
Annual Interest	%	13%
Period of the Loan	months	5
Interest for the repay-period	%	5%
Interest payment for 6 monts	MMK	71,881
Total repayment	MMK	1,398,912

Crop Budget: 1 acres, 20-year period										
Chin Coffee - Financial	Index!A1									
Project target (ac)	200									
		Price	**Without**	**With Project**						
Yields and inputs	**Unit**	**MMK**	**Project**	**Project Yr1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Yr 7**
Sales of dry coffee beans	Kg	3000	-	-		150	250	400	600	600
Yd of maize (shifting cultivation)	Kg		690							
Sales of maize (shifting cultivation)	MMK	280	193,200							
Investments	MMK						-	-	-	
Land Preparation	Acre	120,000		1						
Land Hire (1 ac is hired; hiring cost capitalised for crop season)	MMK/ac	421,875		421,875	421,875	421,875	421,875	421,875	421,875	421,875
Saplings	pc	500		700						
Planting	Acre	15,000		3						
Manure	Mt	15,000		10						
Total Investment	MMK/ac			1,086,875	421,875	421,875	421,875	421,875	421,875	421,875
Operating costs										
Compost/mulching	1	15		10000	10000	10000	10000	10000	10000	10000
Neemcide	Lt	7500		10	10	10	10	10	10	10
Intregrated Pest Management	pd	3000		4	4	6	10	12	12	12
Pruning	pd	3000		4	4	6	8	10	10	10
Weeding	pd	3000		4	4	6	8	10	10	10
Harvesting, transport and processing	pd	3000		4	4	8	16	20	20	20
Total Labour	pd	3000	5	16	16	26	42	52	52	52
Incremental Labour	pd			11	11	21	37	47	47	47
Cost										
Material cost	MMK		55,650	1,086,875	421,875	421,875	421,875	421,875	421,875	421,875
Labour cost	MMK		15,000	48,000	48,000	78,000	126,000	156,000	156,000	156,000
Total Cost	MMK		70,650	1,134,875	469,875	499,875	547,875	577,875	577,875	577,875
Revenue										
FINANCIAL BUDGET (MMK)				**Proj Yr 1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Yr 7**
Gross Income										
Sales of Coffee (maize = WOP)	MMK		193,200	-	-	450,000	750,000	1,200,000	1,800,000	1,800,000
Investments	MMK									
Material cost	MMK		55,650	1,086,875	421,875	421,875	421,875	421,875	421,875	421,875
Labour cost	MMK		15,000	48,000	48,000	78,000	126,000	156,000	156,000	156,000
Total Production Cost	MMK		70,650	1,134,875	469,875	499,875	547,875	577,875	577,875	577,875
Net Income	MMK		122,550	-1,134,875	-469,875	-49,875	202,125	622,125	1,222,125	1,222,125
Cash flows for farm-gate financial analysis	MMK									
Incremental cost	MMK			1,064,225	399,225	429,225	477,225	507,225	507,225	507,225
Incremental benefits	MMK			-193,200	-193,200	256,800	556,800	1,006,800	1,606,800	1,606,800
Incremental net benefits	MMK			-1,257,425	-592,425	-172,425	79,575	499,575	1,099,575	1,099,575

Crop model profitability at the Farm-gate: before project financing:	
Discount rate	13%
IRR	**26%**
Incremental PV-benefit (MMK)	6,379,528
Incremental NPV-benefits (MMK)	2,480,515
Incremental PV-cost (MMK)	3,899,013
B/C ratio	1.64
Switching Value of Benefits	-39%
Return to family labour at full development (MMK/md)	80,340

Project Financing at the farm-gate for cultivation			WoP	WP						
				Yr : 1	Yr : 2	Yr : 3	Yr : 4	Yr : 5	Yr : 6	Yr : 7
Current crop extent	ac		1	1						
Incremental Net income	MMK			-1,257,425	-592,425	-172,425	79,575	499,575	1,099,575	1,099,575
Start-up Grant for SALT	MMK			0						
Total establishment material cost				1,086,875						
Total Capital Expenditure Loan				1,086,875						
Years for having the loan for Capital Expenditure						1	2	3	4	5
Annual interest rate (%)	13%									
Loan repayment period (yrs)	5									
Interest payment (%) - Capital Expenditure Loan	MMK					(141,294)	(119,490)	(94,852)	(67,011)	(35,550)
Payment of principal - Capital expenditure loan	MMK					(167,721)	(189,524)	(214,162)	(242,004)	(273,464)
Total payment for the Capital expenditure loan	MMK					(309,014)	(309,014)	(309,014)	(309,014)	(309,014)
Incremental Cashflows for Financial analysis (after project financing)										
Incremental cost	MMK			1,064,225	399,225	738,239	786,239	816,239	816,239	816,239
Incremental benefits	MMK			893,675	-193,200	256,800	556,800	1,006,800	1,606,800	1,606,800
Incremental benefits	MMK			-170,550	-592,425	-481,439	-229,439	190,561	790,561	790,561

Crop model profitability - after project financing:	
Discount rate	13%
IRR	**33%**
Incremental PV-benefit (USD)	7,341,364
Incremental NPV-benefits (USD)	2,591,169
Incremental PV-cost (USD)	4,750,195
B/C ratio	1.55

Crop Budget: 1 ac / Season	Index!A1							
Target - Ac	50,000							
Magway -Ground Nut: May-Nov, Mono, improved - Financial	**Unit**	**Unit Value**	**GN: Mon+Improved - WP**		**GN: May-Nov+Mono+Low - WOP**		**Incremental**	
			Physical	Value MMK/ac	Physical	Value MMK/ac	Physical	Value MMK/ac
Yield	kg	920	610	561,200	550	506,000	60	55,200
Seed	kg	1150	66	75,900	66	75,900	0	0
Cultivation with Oxen	anim day	5000	6	30,000	6	30,000	0	0
Fertilizer - 15-15-15-	bag 50 kg	600	12.5	7,500	12.5	7,500	0	0
Fertilizer urea 1/	kg	440	7	3,080	6.25	2,750	0.75	330
Manure	ox cart	5000	5	25,000	5	25,000	0	0
Labour Use								
Ox operator	pd	3000	5	15,000	5	15,000	0	0
Planting	pd	3000	4	12,000	3	9,000	1	3000
Fertilizing	pd	3000	1	3,000	1	3,000	0	0
Weeding, three times	pd	3000	9	27,000	9	27,000	0	0
Harvest and post harvest	pd	3000	28	84,000	28	84,000	0	0
Cost and Revenue								
Material cost	MMK/ac			141,480		141,150	-	330
Labour cost	MMK/ac			141,000		138,000	-	3,000
Total Cost	MMK/ac			282,480		279,150	-	3,330
Total Gross Revenue	MMK/ac			561,200		506,000	-	55,200
Total Net Revenue	MMK/ac			278,720		226,850	-	51,870
Number of Labour Days	pd/ac		47		46		1	-
Total Net Revenue, net of labour	MMK/ac			419,720		364,850	-	54,870
Return to Labour	MMK/pd			8,930		7,932	-	999

Debt financing:	Units	Value
Debt for working capital	MMK	141,480
Annual Interest	%	13%
Period of the Loan	months	6
Interest for the repay-period	%	7%
Interest payment for 6 monts	MMK	9,196
Total repayment	MMK	150,676

Crop Budget: 1 ac / Season	Index!A1							
Target Ac	93990							
Magway Cowpea - Financial	Unit	Unit Value	May-July (WP)		Wage Labour (WOP)		**Incremental**	
		MMK	Physical	Value MMK/ac	Physical	Value MMK/Season	Physical	Value MMK/ac
Yield	kg	900	125	112,500				
Seed	kg	1,100	15	16,500				
Fertilizer - 15-15-15-	bag 50 kg	600	-	-				
Fertilizer urea	kg	440	-	-				
Manure	ox cart	5,000		-				
Cultivation Ox charge	oxd	5,000	3	15,000				
Labour Use								
Ox operator	pd	3,000	3	9000				
Planting	pd	3,000	1.0	3,000				
Fertilizing	pd	3,000	-	-				
Weeding, three times	pd	3,000	-	-				
Harvest and post harvest	pd	3,000	10	30,000				
Total Labour		3,000	14		12	36,000		
Cost and Revenue								
Material cost	MMK/ac			31,500		-	-	31,500
Labour cost	MMK/ac			42,000			-	42,000
Total Cost	MMK/ac			73,500		-	-	73,500
Total Gross Revenue	MMK/ac			112,500		36,000	-	76,500
Total Net Revenue	MMK/ac			39,000		36,000	-	3,000
Number of Labour Days	pd/ac		14		12		2	-
Total Net Revenue, net of labour	MMK/ac			81,000		36,000	-	45,000
Return to Labour	MMK/pd			5,786		3,000	-	2,786

Debt financing:	Units	Value
Debt for working capital	MMK	31,500
Annual Interest	%	13%
Period of the Loan	months	4
Interest for the repay-period	%	4%
Interest payment for 6 monts	MMK	1,365
Total repayment	MMK	32,865

Crop Budget: 1 ac / Season	Index!A1							
Target Ac	5000							
Megway Pigonpea: May-Nov - Financial	Unit	Unit Value (MMK/ac)	Improved Seed: May-Nov (WP)		Farmer own Seed: May-Nov (WOP)		Increment	
			Physical	Value MMK/ac	Physical	Value MMK/ac	Physical	Value MMK/ac
Yield	kg	920	490	450,800	460	423,200	30	27,600
Seed	kg	1,150	5	5,750	3	3,450	2	2,300
Cultivation with Oxen	anim day	5,000	6	30,000	6	30,000	-	-
Fertilizer - 15-15-15-	bag 50 kg	600	25	15,000	12.5	7,500	13	7,500
Fertilizer urea	kg	440	13	5,500	12.5	5,500	-	-
Manure	ox cart	5,000	8	40,000	8	40,000	-	-
Pesticide	Ltr	10,000	1	10,000	1	10,000	-	-
Labour Use								
Ox operator	pd	3,000	5	15,000	5	15,000	-	-
Planting	pd	3,000	3	9,000	3	9,000	-	-
Fertilizing	pd	3,000	1	3,000	1	3,000	-	-
Weeding, three times	pd	3,000	10	30,000	10	30,000	-	-
Harvest and post harvest	pd	3,000	16	48,000	14	42,000	2	6,000
Cost and Revenue								
Material cost	MMK/ac			106,250		96,450	-	9,800
Labour cost	MMK/ac			105,000		99,000	-	6,000
Total Cost	MMK/ac			211,250		195,450	-	15,800
Total Gross Revenue	MMK/ac			450,800		423,200	-	27,600
Total Net Revenue	MMK/ac			239,550		227,750	-	11,800
Number of Labour Days	pd/ac		35		33		2	-
Total Net Revenue, net of labour	MMK/ac			344,550		326,750	-	17,800
Return to Labour	MMK/pd			9,844		9,902	-	- 57

Debt financing:	Units	Value
Debt for working capital	MMK	106,250
Annual Interest	%	13%
Period of the Loan	months	8
Interest for the repay-period	%	9%
Interest payment for 6 monts	MMK	9,208
Total repayment	MMK	115,458

Crop Budget: 1 ac / Season	Index!A1							
Project Target (ac)	1,000							
Magway Potato - Financial	**Unit**	**Unit Value**	**WP**		**Shifting Cultivation (WOP)**		**Incremental**	
			Physical	Value MMK/ac	Physical	Value MMK/ac	Physical	Value MMK/ac
Yield	kg	350	7,000	2,450,000	5,500	1,925,000	1,500	525,000
Seed	kg	750	1,415	1,061,250	1,415	1,061,250	-	-
Compost	kg	150	500	75,000				
Neemcide	Ltr	1,500	10	15,000				
Labour Use								
Land Preparation	Pd	3,000	15	45,000				
Felling Forest	pd	3,000			15	45,000	- 15	- 45,000
Burning Felled trees	pd	3,000			10	30,000	- 10	- 30,000
Second burning and seeding	pd	3,000			10	30,000	- 10	- 30,000
Seeding	pd	3,000	5	15,000	5	15,000	-	-
1st Weeding	pd	3,000	10	30,000	10	30,000	-	-
2nd Weeding	pd	3,000	10	30,000	10	30,000	-	-
Harvesting	pd	3,000	50	150,000	10	30,000	40	120,000
Transport to home	pd	4,000	40	160,000	10	40,000	30	120,000
Cost and Revenue								
Material cost	MMK/ac			1,151,250		1,061,250	-	90,000
Labour cost	MMK/ac			430,000		250,000	-	180,000
Total Cost	MMK/ac			1,581,250		1,311,250	-	270,000
Total Gross Revenue	MMK/ac			2,450,000		1,925,000	-	525,000
Total Net Revenue	MMK/ac			868,750		613,750	-	255,000
Number of Labour Days	pd/ac		130		80		50	-
Total Net Revenue, net of labour	MMK/ac			1,258,750		853,750	-	405,000
Return to Labour	MMK/pd			9,683		10,672	-	- 989

Debt financing:	Units	Value		
Debt for working capital	MMK	1,151,250	-	
Annual Interest	%	13%		
Period of the Loan	months	5		
Interest for the repay-period	%	5%		
Interest payment for 6 monts	MMK	62,359		
Total repayment	MMK	1,213,609		

Crop Budget: 1 ac / Season	Index!A1							
Project Target (ac)	4,370							
Megaway - Onion, Financial	Unit	Unit Value	Irrigated Local Variety (WOP)		Irrigated Improved Variety (WP)		**Incremental**	
			Physical	Value MMK/ac	Physical	Value MMK/ac	Physical	Value MMK/ac
Yield	kg	580	1,540	893,200	1,750	1,015,000	210	121,800
Seed	kg	10,000	2.5	25,000	2.5	87,500	-	62,500
Land Preparation (pl & harrow)	acre	25,000	2	50,000	2	50,000	-	-
Fertilizer - Compound	bag 50 kg	30,000	1.5	45,000	2	60,000	1	15,000
Fertilizer - Urea	bag 50 kg	22,000	1.5	33,000	2	44,000	1	11,000
Pest Control	acre	10,000	2	20,000	3	30,000	1	10,000
Labour Use								
Cultivation (incl charges above)	pd	3,000	2	6,000	2	6,000	-	-
Nursery and planting	pd	3,000	10	30,000	10	30,000	-	-
Fertilizing	pd	3,000	2	6,000	2	6,000	-	-
Pest Control	pd	3,000	2	6,000	2	6,000	-	-
Weeding	pd	3,000	20	60,000	20	60,000	-	-
Harvest	pd	3,000	35	105,000	40	120,000	5	15,000
Transport to buyer (hire cost)	kg	4,000		4,000		4,000	-	-
Cost and Revenue								
Material cost	MMK/ac			173,000		271,500	-	98,500
Labour cost	MMK/ac			217,000		232,000	-	15,000
Total Cost	MMK/ac			390,000		503,500	-	113,500
Total Gross Revenue	MMK/ac			893,200		1,015,000	-	121,800
Total Net Revenue	MMK/ac			503,200		511,500	-	8,300
Number of Labour Days	pd/ac		71		76		5	-
Total Net Revenue, net of labour	MMK/ac			716,200		739,500	-	23,300
Return to Labour	MMK/pd			10,087		9,730	-	- 357

Debt financing:	Units	Value
Debt for working capital	MMK	173,000
Annual Interest	%	13%
Period of the Loan	months	5
Interest for the repay-period	%	5%
Interest payment for 6 monts	MMK	9,371
Total repayment	MMK	182,371

Crop Budget: 1 ac / Season	Index!A1									
Project Target (ac)	10,000									
Plum and A. Lebbeck perimeter Production										
		Price	**Without**	**With Project**						
Yields and inputs	**Unit**	**MMK**	**Project**	**Yr 1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Yr 7**
Sales of plum	kg DM	235		-			325	650	1,080	1,080
Sale of A. Lebbeck dry pruning	kg DM	150			250	450	450	450	450	450
Yd of maize (shifting cultivation)	Kg	280	690							
Sales of maize (shifting cultivation)	MMK		193,200							
Investments	MMK						-	-	-	
Land Preparation	Acre	150		1						
Plum Saplings	pc	700		32						
A. Lebbeck Seedlings	Pc	45		128						
Planting	Acre	15,000		3						
Manure	Mt	5,600		10						
Operating costs										
Compost	500	75			500	500	500	500	500	500
Neemcide	Lt	1500			5	5	5	5	5	5
Intregrated Pest Management	pd	3000			1	1	1	1	1	1
Plum pruning	pd	3000			2	2	2	2	2	2
Weeding	pd	3000			1	1	1	1	1	1
Harvesting Plum	pd	3000					1	2	3	3
Harvesting A. Lebbeck	pd	3000			1	2	2	2	2	2
Total			5		4	4	5	6	7	7
Incremental Labour	pd			-5	-1	-1	-	1	2	2
FINANCIAL BUDGET (MMK)				**Yr 1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Yr 7**
Sales of Plum	MMK			-	-	-	76,375	152,750	253,800	253,800
Sales of A. Lebbeck	MMK				37,500	-	-	112,500	202,500	202,500
Total Sale	MMK				37,500	-	76,375	265,250	456,300	456,300
Investments	MMK				-	-	-		-	-
Plum input costs	MMK			123,550	45,005	45,005	45,005	45,005	45,005	45,005
Lebbeck input cost	MMK			5,760	0	0	0	0	0	0
Plum labour cost				-	12,000	12,000	15,000	18,000	21,000	21,000
Lebbeck labour cost	MMK			-	3,000	6,000	6,000	6,000	6,000	6,000
Investments	MMK									
Material cost	MMK		55,650	129,310	45,005	45,005	45,005	45,005	45,005	45,005
Labour cost	MMK		15,000	-	15,000	18,000	21,000	24,000	27,000	27,000
Total Production Cost	MMK		70,650	129,310	60,005	63,005	66,005	69,005	72,005	72,005
Gross Income	MMK		193,200	0	37,500	67,500	143,875	220,250	321,300	321,300
Cash flows for farm-gate financial analysis	MMK		122,550							
Incremental cost	MMK			58,660	-10,645	-7,645	-4,645	-1,645	1,355	1,355
Incremental benefits	MMK			-193,200	-155,700	-125,700	-49,325	27,050	128,100	128,100
Incremental net benefits	MMK			-251,860	-145,055	-118,055	-44,680	28,695	126,745	126,745

Crop model profitability at the Farm-gate: before project financing:	
Discount rate	13%
IRR	**13%**
Incremental PV-benefit (MMK)	53,717
Incremental NPV-benefits (MMK)	14,430
Incremental PV-cost (MMK)	39,288
B/C ratio	1.37
Switching Value of Benefits	-27%
Return to family labour at full development (MMK/md)	1

Project Financing at the farm-gate for cultivation			WoP	WP						
				Yr : 1	Yr : 2	Yr : 3	Yr : 4	Yr : 5	Yr : 6	Yr : 7
Current crop extent	ac		1	1						
Incremental Net income	MMK			-251,860	-145,055	-118,055	-44,680	28,695	126,745	126,745
Start-up Grant for SALT	MMK			0						
Total establishment material cost				129,310						
Total Capital Expenditure Loan				129,310						
Years for having the loan for Capital Expenditure						1	2	3	4	5
Annual interest rate (%)	13%									
Loan repayment period (yrs)	5									
Interest payment (%) - Capital Expenditure Loan	MMK					(16,810)	(14,216)	(11,285)	(7,973)	(4,230)
Payment of principal - Capital expenditure loan	MMK					(19,954)	(22,548)	(25,480)	(28,792)	(32,535)
Total payment for the Capital expenditure loan	MMK					(36,765)	(36,765)	(36,765)	(36,765)	(36,765)
Incremental Cashflows for Financial analysis (after project financing)										
Incremental cost	MMK			58,660	(10,645)	29,120	32,120	35,120	38,120	38,120
Incremental benefits	MMK			-63,890	-155,700	-125,700	-49,325	27,050	128,100	128,100
Incremental benefits	MMK			-122,550	-145,055	-154,820	-81,445	-8,070	89,980	89,980

Crop model profitability - after project financing:	
Discount rate	13%
IRR	**14%**
Incremental PV-benefit (MMK)	168,151
Incremental NPV-benefits (MMK)	27,595
Incremental PV-cost (MMK)	140,556
B/C ratio	1.20

Appendix Table 2 : SME budgets, credit needs and profitability

SME - Vet Para Professional	Index!A1									
Target (Numbers)	30									
Cost and Returns	Unit Value	Phy Units	Units	Value	Pr Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
Adoption rate	MMK					100%	100%	100%	100%	100%
Revenue										
Visiting 700 large animals p.a.	18,500	700	MMK 1000	12,950						
Visiting 170 goat fatting units p.a.	31,620	170	MMK 1000	5,375						
Visiting 115 broiler fatting units p.a.	6,502	180	MMK 1000	1,170						
Total Revenue				19,496	19,496	19,496	19,496	19,496	19,496	19,496
Investment										
Instruments /1	695,000	1	MMK 1000	695						
Motorcycle	750,000	1	MMK 1000	750						
Total Investment cost				1,445	1,445					
Operating Costs										
Medecine	1,900	4,000	MMK 1000	7,600						
AI straw	3,360	500	MMK 1000	1,680						
Tractability chip	1,120	3,400	MMK 1000	3,808						
Petrol	900	730	MMK 1000	657						
Salary	366,000	12	MMK 1000	4,392						
Total Operating Cost			MMK 1000	18,137	18,137	18,137	18,137	18,137	18,137	18,137
Depreciation (5% of the capital cost is assumed)			MMK 1000		145	145	145	145	145	145
Total Cost			MMK 1000		19,727	18,282	18,282	18,282	18,282	18,282
Net revenue before Tax			MMK 1000		(231)	1,214	1,214	1,214	1,214	1,214
Tax rate	15%									
Deductabe tax			MMK 1000		0.0	182	182	182	182	182
Net Profit after tax			MMK 1000		(231)	1,032	1,032	1,032	1,032	1,032
Without Project Opportunuty cost of the VET (40% - Current)			MMK 1000		7,798					
Incremental cost			MMK 1000		25,935	18,319	18,319	18,319	18,319	18,319
Incremental benefits			MMK 1000		19,496	19,496	19,496	19,496	19,496	19,496
Incremental net benefits			MMK 1000		(6,440)	1,177	1,177	1,177	1,177	1,177
IRR				17%						
SME model profitability: before project financing:										
Discount rate	13%									
IRR	**17%**									
Incremental PV-benefit (MMK)	136,953									
Incremental NPV-benefits (MMK)	1,526									
Incremental PV-cost (MMK)	135,427									
B/C ratio	1.01									
Switching Value of Benefits	-1%									

Project Financing at the farm-gate for cultivation			WoP	WP						
				Yr : 1	Yr : 2	Yr : 3	Yr : 4	Yr : 5	Yr : 6	Yr : 7
Incremental Net income	MMK			-6,440	1,177	1,177	1,177	1,177	1,177	1,177
Start-up Grant	MMK			0						
Total establishment material cost				1,445						
Total Capital Expenditure Loan				1,445						
Years for having the loan for Capital Expenditure						1	2	3	4	5
Annual interest rate (%)	13%									
Loan repayment period (yrs)	5									
Interest payment (%) - Capital Expenditure Loan	MMK					(188)	(159)	(126)	(89)	(47)
Payment of principal - Capital expenditure loan	MMK					(223)	(252)	(285)	(322)	(364)
Total payment for the Capital expenditure loan	MMK					(411)	(411)	(411)	(411)	(411)
Incremental Cashflows for Financial analysis (after project financing)										
Incremental cost	MMK			0	25,935	18,730	18,730	18,730	18,730	18,730
Incremental benefits	MMK			1,445	19,496	19,496	19,496	19,496	19,496	19,496
Incremental net benefits	MMK			1,445	-6,440	766	766	766	766	766
Crop model profitability - after project financing:										
Discount rate	13%									
IRR	**19%**									
Incremental PV-benefit (MMK)	120,979									
Incremental NPV-benefits (MMK)	1,407									
Incremental PV-cost (MMK)	119,572									
B/C ratio	1.01									

SME - Goat Fattening	IndexIA1									
Target (Numbers)	1,200									
Goat Fattening										
Cost and Returns	Unit Value	Phy Units	Units	Value	Pr Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
Build up of Output/Sales	MMK					100%	100%	100%	100%	100%
Revenue										
Selling of fatten Goat	52,000	60	MMK 1000	3,058		3,058	3,058	3,058	3,058	3,058
Mortality rate			2%							
Investment										
Shelter	300,000	1	MMK 1000	300						
Feeders and drinkers	200,000	1	MMK 1000	200						
Starting Stock of animals	10,400	60	MMK 1000	624						
Total Investment cost				1,124	1,124	624	624	624	624	624
Operating Costs										
Weaned kids 10kg - 70 days	9,500	60	MMK 1000	570						
Feed (kg)	155	72	MMK 1000	11						
Health and vacinations per chick	1,500	2	MMK 1000	3						
Tractability chip	1,120	1	MMK 1000	1						
Other operating cost (handling, cleaning etc)	1,068	1	MMK 1000	1						
Water	1,120	1.0	MMK 1000	1						
Advisory service	52,000	1.0	MMK 1000	52						
Total operating cost			MMK 1000	639	639	639	639	639	639	639
Total Labour Cost	3,000	200	MMK 1000		600	600	600	600	600	600
Depreciation (5% of the capital cost is assumed)			MMK 1000		112	112	112	112	112	112
Total Cost			MMK 1000		2,476	1,976	1,976	1,976	1,976	1,976
Net revenue before Tax			MMK 1000		(2,476)	1,082	1,082	1,082	1,082	1,082
Tax rate	15%									
Deductabe tax			MMK 1000		0.0	162	162	162	162	162
Net Profit after tax			MMK 1000		(2,476)	919	919	919	919	919
WOP Opportunuty cost of Labour (50% of labour use)			MMK 1000		300	300	300	300	300	300
Incremental cost			MMK 1000		2,776	2,276	2,276	2,276	2,276	2,276
Incremental benefits			MMK 1000		0	3,058	3,058	3,058	3,058	3,058
Incremental net benefits			MMK 1000		(2,776)	782	782	782	782	782
IRR				28%						

SME model profitability: before project financing:	
Discount rate	13%
IRR	**28%**
Incremental PV-benefit (MMK)	18,773
Incremental NPV-benefits (MMK)	2,343
Incremental PV-cost (MMK)	16,430
B/C ratio	1.14
Switching Value of Benefits	-12%

Project Financing at the farm-gate for cultivation			WoP	WP						
				Yr : 1	Yr : 2	Yr : 3	Yr : 4	Yr : 5	Yr : 6	Yr : 7
Incremental Net income	MMK			-2,776	782	782	782	782	782	782
Start-up Grant	MMK			0						
Total establishment material cost				1,124						
Total Capital Expenditure Loan				1,124						
Years for having the loan for Capital Expenditure						1	2	3	4	5
Annual interest rate (%)	13%									
Loan repayment period (yrs)	5									
Interest payment (%) - Capital Expenditure Loan	MMK					(146)	(124)	(98)	(69)	(37)
Payment of principal - Capital expenditure loan	MMK					(173)	(196)	(221)	(250)	(283)
Total payment for the Capital expenditure loan	MMK					(320)	(320)	(320)	(320)	(320)
Incremental Cashflows for Financial analysis (after project financing)										
Incremental cost	MMK			0	2,776	2,595	2,595	2,595	2,595	2,595
Incremental benefits	MMK			1,124	0	3,058	3,058	3,058	3,058	3,058
Incremental benefits	MMK			1,124	-2,776	462	462	462	462	462

Crop model profitability - after project financing:	
Discount rate	13%
IRR	**44%**
Incremental PV-benefit (MMK)	17,373
Incremental NPV-benefits (MMK)	2,128
Incremental PV-cost (MMK)	15,245
B/C ratio	1.14

SME - Seed Processing	Index!A1									
Target (Numbers)	20									
Cost and Returns	Unit Value	Phy Units	Units	Value	Pr Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
Adoption rate	MMK					100%	100%	100%	100%	100%
Revenue										
Throughput (2 MT/hour) per day (5 hours)		10.0	mt							
Annual working day		200	days							
Annual throughput (mt)		2000	mt							
Cleaning price per MT	4,000		MMK 1000			8,000				
Total Revenue			MMK 1000			8,000	8,000	8,000	8,000	8,000
Investment										
Gravity seperator for seed cleaning	4,032,000	1								
Packaging and weghing	3,465,000	1								
Shipment	500,000									
Total Investment cost			MMK 1000		7,997					
Operating Costs										
Electricity KWH		7								
Cost of Electricity (MMK/KWH)	100									
Annual cost of electricity			MMK 1000			1,360	1,360	1,360	1,360	1,360
Labour for all operations per tone	3,000	1000	mt							
Cost of labour			MMK 1000			3,000	3,000	3,000	3,000	3,000
Transport of equipment, 20 movements per year	440,000		MMK 1000			440	440	440	440	440
Moving parts and maintenance	275,000		MMK 1000			275	275	275	275	275
Total Operating Cost			MMK 1000			5,075	5,075	5,075	5,075	5,075
Depreciation (5% of the capital cost is assumed)			MMK 1000			800	800	800	800	800
Total Cost			MMK 1000		7,997	5,875	5,875	5,875	5,875	5,875
Net revenue before Tax			MMK 1000		(7,997)	2,125	2,125	2,125	2,125	2,125
Tax rate	15%									
Deductabe tax			MMK 1000		0.0	319	319	319	319	319
Net Profit after tax			MMK 1000		(7,997)	1,807	1,807	1,807	1,807	1,807
Without Project Opportunuty cost of labour (40% - Current)			MMK 1000			900	900	900	900	900
Incremental cost			MMK 1000		7,997	6,294	6,294	6,294	6,294	6,294
Incremental benefits			MMK 1000		0	8,000	8,000	8,000	8,000	8,000
Incremental net benefits			MMK 1000		(7,997)	1,706	1,706	1,706	1,706	1,706
IRR				21%						

SME model profitability: before project financing:	
Discount rate	13%
IRR	**21%**
Incremental PV-benefit (MMK)	49,118
Incremental NPV-benefits (MMK)	3,399
Incremental PV-cost (MMK)	45,720
B/C ratio	1.07
Switching Value of Benefits	-7%

Project Financing at the farm-gate for cultivation			WoP	WP						
					Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
Incremental Net income	MMK				-7,997	1,706	1,706	1,706	1,706	1,706
Start-up Grant	MMK									
Total establishment material cost										
Total Capital Expenditure Loan				7,997						
Years for having the loan for Capital Expenditure						1	2	3	4	5
Annual interest rate (%)	13%									
Loan repayment period (yrs)	5									
Interest payment (%) - Capital Expenditure Loan	MMK					(1,040)	(879)	(698)	(493)	(262)
Payment of principal - Capital expenditure loan	MMK					(1,234)	(1,394)	(1,576)	(1,781)	(2,012)
Total payment for the Capital expenditure loan	MMK					(2,274)	(2,274)	(2,274)	(2,274)	(2,274)
Incremental Cashflows for Financial analysis (after project financing)										
Incremental cost	MMK				7,997	8,567	8,567	8,567	8,567	8,567
Incremental benefits	MMK				7,997	8,000	8,000	8,000	8,000	8,000
Incremental benefits	MMK				0	-567	-567	-567	-567	-567
Crop model profitability - after project financing:										

Discount rate	13%
IRR	**31%**
Incremental PV-benefit (MMK)	55,501
Incremental NPV-benefits (MMK)	3,251
Incremental PV-cost (MMK)	52,250
B/C ratio	1.06

SME - Yam Drying and Processing	Index!A1									
Target (Numbers)	70									
Cost and Returns	Unit Value	Phy Units	Units	Value	Pr Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
Adoption rate	MMK					100%	100%	100%	100%	100%
Revenue										
Yam drying period, days		150	days							
Fresh Yam/day kg		650	kg/day							
Price for drying Yam MMK/kg	10		MMK/kg							
Price for washing & slicing Yam MMK/ kg	32		MMK/kg							
Total Revenue						4,095	4,095	4,095	4,095	4,095
Investment										
Material for a building	2,400	1	MMK 1000							
Initial working capital			MMK 1000		720					
Total Investment cost			MMK 1000		2,400					
Operating Costs										
Labour for all operations	3,000	900	pd/day							
Cost of labour						2,700	2,700	2,700	2,700	2,700
Total Operating Cost			MMK 1000			2,700	2,700	2,700	2,700	2,700
Depreciation (5% of the capital cost is assumed)			MMK 1000			240	240	240	240	240
Total Cost			MMK 1000		3,120	2,940	2,940	2,940	2,940	2,940
Net revenue before Tax			MMK 1000		(3,120)	1,155	1,155	1,155	1,155	1,155
Tax rate	15%									
Deductabe tax			MMK 1000		0.0	173	173	173	173	173
Net Profit after tax			MMK 1000		(3,120)	982	982	982	982	982
Without Project Opportunuty cost of labour (10% of labour cost)			MMK 1000			270	270	270	270	270
Incremental cost			MMK 1000		3,120	3,143	3,143	3,143	3,143	3,143
Incremental benefits			MMK 1000		0	4,095	4,095	4,095	4,095	4,095
Incremental net benefits			MMK 1000		(3,120)	952	952	952	952	952
IRR				30%						

SME model profitability: before project financing:	
Discount rate	13%
IRR	**30%**
Incremental PV-benefit (MMK)	25,142
Incremental NPV-benefits (MMK)	3,082
Incremental PV-cost (MMK)	22,060
B/C ratio	1.14
Switching Value of Benefits	-12%

Project Financing at the farm-gate for cultivation			WoP	WP						
					Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
Incremental Net income	MMK				-3,120	952	952	952	952	952
Start-up Grant	MMK									
Total establishment material cost										
Total Capital Expenditure Loan				2,400						
Years for having the loan for Capital Expenditure						1	2	3	4	5
Annual interest rate (%)	13%									
Loan repayment period (yrs)	5									
Interest payment (%) - Capital Expenditure Loan	MMK					(312)	(264)	(209)	(148)	(79)
Payment of principal - Capital expenditure loan	MMK					(370)	(419)	(473)	(534)	(604)
Total payment for the Capital expenditure loan	MMK					(682)	(682)	(682)	(682)	(682)
Incremental Cashflows for Financial analysis (after project financing)										
Incremental cost	MMK				3,120	3,826	3,826	3,826	3,826	3,826
Incremental benefits	MMK				2,400	4,095	4,095	4,095	4,095	4,095
Incremental benefits	MMK				-720	269	269	269	269	269

Crop model profitability - after project financing:	
Discount rate	13%
IRR	**50%**
Incremental PV-benefit (MMK)	26,911
Incremental NPV-benefits (MMK)	3,000
Incremental PV-cost (MMK)	23,911
B/C ratio	1.13

Appendix Table 3 : Infrastructure benefits

Cost and Benefits of Road Development (based on the analysis of RAPID Project, Philippines)	Index!A1						
Financial Prices							
COSTS	Units	Value	Proj Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
Targets							
Chin	miles		-	5	5	5	
Megway	miles			5	5		
Total	miles		-	10	10	5	
Cumulative targets	miles			10	20	25	25
Rehabilitation/Concreting of Existing FMR (COSTAB)	MMK 1000	13,440	-	134,400	268,800	336,000	
Subtotal Investment Costs	MMK 1000		0	134,400	268,800	336,000	0
Operation and Maintenance (5% of Road construction)	MMK 1000	5%		6,720	20,160	36,960	36,960
Total Investment and OM Costs			0	141,120	288,960	372,960	36,960
BENEFITS (Based on RAPID and scaled down to suite Chin and Magway)							
Savings from passenger transport cost							
Incremental Benefits - saving passenger vehicle operating cost (VOC)	MMK/mile/passenger	27.14					
Passengers travel per km	passengers/mile/Yr	168,024					
Passengers travel benefit - unit rate	MMK/mile/Yr	4,560,956					
Total passengers travel benefit	MMK 1000/Yr			45,610	91,219	114,024	114,024
Savings of cost of freight - Farm Products							
Incremental Freight Benefits - saving vehicle operating cost (VOC)	MMK /mt/mile	140.10					
Estimating the average volume of products freighted:							
Cropping extent potentially covered by roads	ha/mile	235					
Avg weight of crops from areas with project roads (wet weight)	mt/ha/Yr	20					
Average weight of crops transported in areas with project roads	mt/mile/Yr	4,691					
Freight benefit - unit rate	MMK/mile/Yr	657,210					
Total annual freight benefits	MMK1000/Yr			6,572	13,144	16,430	16,430
Total Benefits			0	52,182	104,363	130,454	130,454
NET INCREMENTAL BENEFITS			0	(88,938)	(184,597)	(242,506)	93,494
FINANCIAL FEASIBILITY INDICATORS							
Discount Rate (SDR)	13%						
NPV @ 0,13 (MMK 1000)	32,358						
IRR	15%						
NPVb	721,581						
NPVc	689,223						
B/C ratio	1.05						
Switching values Benefits	-4%						
Switching values Costs	5%						

Appendix Table 4: Project financial cost summary - IFAD Format

Republic of the Union of Myanmar: Western State Agribusiness Project												
Table A		**PRODUCTION - Farm Models**							**PRIVATE - PUBLIC BUSINESS MODELS**			
FINANCIAL ANALYSIS		Farm models' net incremental benefits (in MMK 1000)							SME Business models' net incremental benefits (MMK 1000)			
		Chin					Magway		Project Areas			
		Model 1: SALT + Land Hire Purchase	**Model 2: No SALT + Hire Purchase**	**Model 3: SALT + Own Land**	**Model 4: No SALT + Own Land**	**Low-land rice**	**Upland Crops Model**	**Low land rice model**	**Vet Para-Professional**	**Goat Kid Fattening**	**Seed Processing**	**Yam Drying**
		3 ac	3 ac	3 ac	3 ac	1 ac	5.7 ac	1 ac	SME	60 Goats/batch	2000 mt/yr	650 kg/day
	PY1	(3,040)	(314)	1,062	(99)	(19,319)	0	0	(19,319)	(333,104)	(15,994)	(21,840)
	PY2	(1,105)	(148)	1,386	1	(170,338)	509,543	53,958	(170,338)	(2,904,130)	(140,534)	(189,898)
	PY3	(2,291)	(43)	(830)	1	35,299	1,083,168	107,915	35,299	938,078	34,124	66,623
	PY4	(289)	20	1,731	(55)	35,299	3,201,622	323,746	35,299	938,078	34,124	66,623
	PY5	710	125	1,932	437	35,299	7,339,749	728,428	35,299	938,078	34,124	66,623
	PY6	389	275	(194)	1,543	35,299	7,973,222	728,428	35,299	938,078	34,124	66,623
	PY7	2,350	275	2,166	1,841	35,299	8,373,677	728,428	35,299	938,078	34,124	66,623
	PY8	4,686	275	2,232	1,841	35,299	8,938,794	728,428	35,299	938,078	34,124	66,623
	PY9	5,919	275	(194)	1,841	35,299	9,504,302	728,428	35,299	938,078	34,124	66,623
	PY10	7,030	275	2,241	1,841	35,299	9,945,527	728,428	35,299	938,078	34,124	66,623
NPV (MMK mn), 13%		**2**	**0.2**	**6**	**3**	**-18**	**23,942**	**2,102**	**-18**	**956**	**4**	**82**
NPV (USD 1000)		**2**	**0.2**	**5**	**3**	**-16**	**21,377**	**1,876**	**-16**	**854**	**4**	**74**
FIRR		**19%**	**20%**	**>50%**	**108%**	**10%**	**>50%**	**>50%**	**10%**	**23%**	**14%**	**26%**

RH = Rehabilitated crop

Fin DR = 13%

SALT= Slopping land technology which organically improve soil in the farm

Table B)	**PROJECT COSTS AND INDICATORS FOR LOGFRAME**					
TOTAL PROJECT COSTS (in million USD)	**22.1**	Base costs	**18.7**	PMU	1.08	
Beneficiaries	**446,723** people	74,454 Households		Groups (Coops)	1,320 enterprises	
Cost per beneficiary (IFAD Loan)	**49** USD x person		**297** USD x HH	**Adoption rates**	**80%**	
Infrastructure	8.1					
Agriculture services	12.7					

C)	MAIN ASSUMPTIONS & SHADOW PRICES					
FINANCIAL	**Output**	Av. Incremental	Price (in USD/mt)	**Input prices**	Price (USD)	
	Maize	78%	250	Fertilizer / kg	5	
	U Rice	78%	219	Compost/kg	0.07	
	Millet	60%	313	Neemcide	1.34	
	Beans	60%	504	Labour	2.68	
	Yam	51%	4,018			
	Avocado	51%	402			
	Macadamia	50%	2,679			
	Potato	95%	313			
	Coffee	68%	2,679			
	Ground nut	54%	821			
	Pigonpeas	55%	821			
	Cowpea	78%	804			
	Onion	60%	518			
	Plums	53%	210			
	Goat		46			
ECONOMIC	Official Exchange rate (OER)	1120		Discount rate (opportunity cost of capital)	13%	
	Shadow Exchange rate (SER)	1120		Social Discount rate	10%	
	Standard Conversion Factor	0.85		Output conversion factor: imported	1.2	
	Labour Conversion factor	0.85		Input Conversion factor	0.95	

Table D	BENEFICIARIES - CUMULATIVES, ADOPTION RATES AND PHASING								Adoption rates
		PY1	PY2	PY3	PY4	PY5	PY6	Total	88%
	% Beneficiaries started farming	0%	10%	10%	40%	30%	10%	100%	
Chin	**Model 1: SALT + Land Hire Purchase**	0	133	133	533	400	133	1,333	
	Adjusted (adoption rate)	*0%*	*60%*	*60%*	*60%*	*80%*	*80%*		*90%*
	Model 2: No SALT + Hire Purchase	0	267	267	1,067	800	267	2,667	
	Adjusted (adoption rate)	*0%*	*60%*	*60%*	*60%*	*80%*	*80%*		*95%*
	Model 3: SALT + Own Land	0	162	162	650	487	162	1,624	
	Adjusted (adoption rate)	*0%*	*60%*	*60%*	*60%*	*80%*	*80%*		*90%*
	Model 4: No SALT + Own Land	0	410	410	1,641	1,231	410	4,102	
	Adjusted (adoption rate)	*0%*	*60%*	*60%*	*60%*	*80%*	*80%*		*95%*
	Chin - Low-land rice	0	21	21	85	64	21	212	
	Adjusted (adoption rate)	*0%*	*60%*	*60%*	*60%*	*80%*	*80%*		*80%*
	Chin - Total Beneficiaries	0	994	994	3,975	2,981	994	9,938	
	Magway - adoption rate	**0%**	**60%**	**60%**	**60%**	**80%**	**80%**		*80%*
Magway	**Groundnut: mono, improved**	0	877	877	3,509	2,632	877	8772	
	Groundnut: mono+GC+improved	0	367	367	1,467	1,100	367	3667	
	Groundnut: mix, improved	0	1,930	1,930	7,719	5,789	1,930	19298	
	Groundnut: mono+GC+improved	0	1,077	1,077	4,309	3,232	1,077	10772	
	Pigonpeas: mix, improved	0	175	175	702	526	175	1754	
	Cowpea: green manure/fodder	0	1,649	1,649	6,596	4,947	1,649	16489	
	Onion	0	77	77	307	230	77	767	
	Potato	0	18	18	70	53	18	175	
	Perimeter Plum+A. Lebbeck	0	175	175	702	526	175	1754	
	Rice	0	107	107	427	320	107	1067	
	Magway - Total Beneficiaries	0	6,452	6,452	25,806	19,355	6,452	64,516	80%
	Grand Total Project Beneficiaries	0	7,445	7,445	29,782	22,336	7,445	74,454	

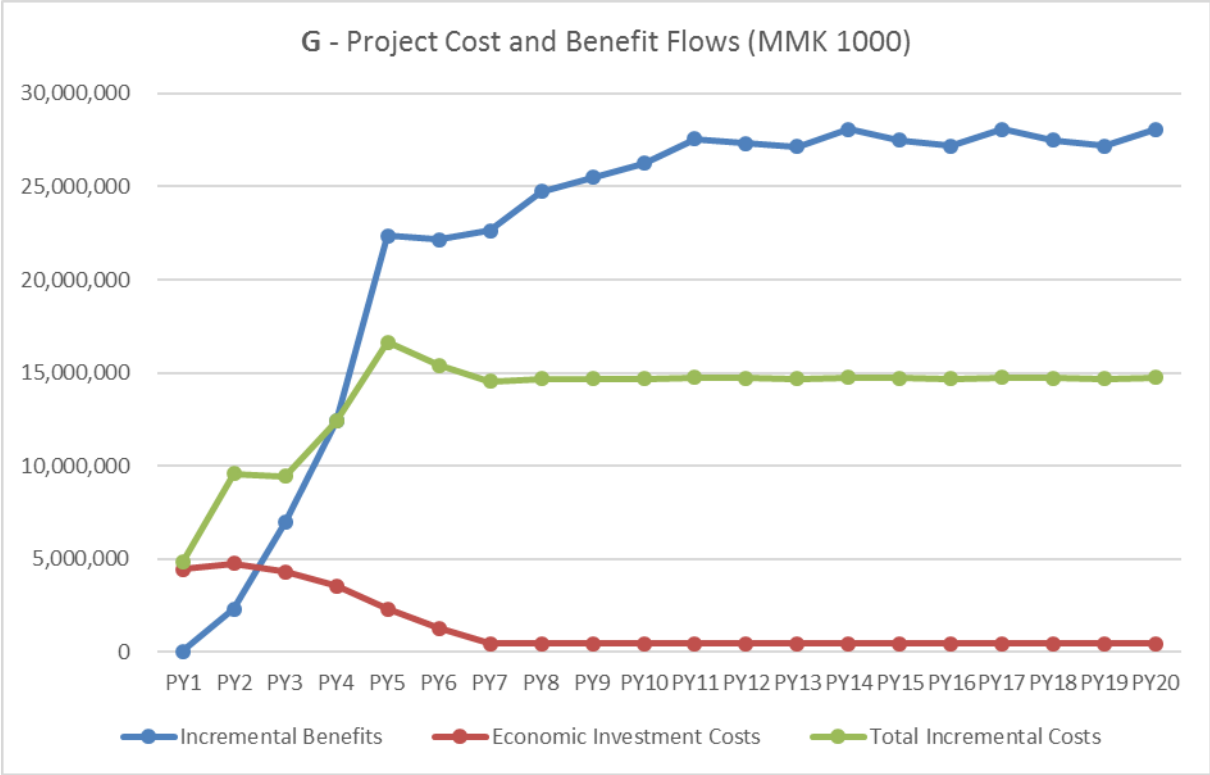
Appendix Table 5: Financial and Economic Prices

Refer to the EFA excel file

Appendix Table 6: Project economic cash flows (IFAD Format)

Republic of the Union of Myanmar: Western State Agribusiness Project

Table A		PRODUCTION - Farm Models								Services			NET INCREMENTAL COSTS (MMK 1000)			
		Farm-gate incremental economic benefits (in MMK 1000)				SME-gate incremental economic benefits (in MMK 1000)				Incremental						
		Chin all up-land crops	Low-land rice	Magway all up-land crops	Low land rice model	Vet Para-Professional	Goat Kid Fattening	Seed Processing	Yam Drying	Infra - Road	Incremental Benefits	NPV (US$ 1000)	Economic Investment Costs	Economic recurrent Costs	Total Incremental Costs	Net Cash Flow (Rs mn)
ECONOMIC ANALYSIS	PY1	0	0	0	0	49,714	0	0	0	0	49,714	38,791	4,455,358	385,011	*4,840,369*	**(4,790,654)**
	PY2	251,086	1,613	1,096,458	74,184	497,142	311,875	13,600	24,365	52,182	2,322,506		4,742,653	4,841,753	*9,584,405*	**(7,261,900)**
	PY3	502,172	3,226	2,212,041	148,369	497,142	3,118,752	136,000	243,653	104,363	6,965,718		4,302,914	5,143,949	*9,446,863*	**(2,481,144)**
	PY4	1,180,214	9,678	6,632,299	445,106	497,142	3,118,752	136,000	243,653	130,454	12,393,298		3,564,832	8,826,305	*12,391,137*	**2,161**
	PY5	2,248,330	16,129	14,986,487	1,001,489	497,142	3,118,752	136,000	243,653	130,454	22,378,436		2,330,032	14,305,255	*16,635,288*	**5,743,148**
	PY6	1,756,061	18,280	15,269,027	1,001,489	497,142	3,118,752	136,000	243,653	130,454	22,170,858		1,277,160	14,111,883	*15,389,043*	**6,781,815**
	PY7	1,850,156	18,280	15,630,069	1,001,489	497,142	3,118,752	136,000	243,653	130,454	22,625,994		465,578	14,070,424	*14,536,003*	**8,089,992**
	PY8	3,454,450	18,280	16,129,544	1,001,489	497,142	3,118,752	136,000	243,653	130,454	24,729,763		465,578	14,220,865	*14,686,443*	**10,043,319**
	PY9	3,738,522	18,280	16,627,820	1,001,489	497,142	3,118,752	136,000	243,653	130,454	25,512,112		465,578	14,214,665	*14,680,244*	**10,831,868**
	PY10	4,087,023	18,280	17,014,337	1,001,489	497,142	3,118,752	136,000	243,653	130,454	26,247,129		465,578	14,202,718	*14,668,297*	**11,578,832**
	PY11	5,416,442	18,280	17,014,337	1,001,489	497,142	3,118,752	136,000	243,653	130,454	27,576,547		465,578	14,292,342	*14,757,920*	**12,818,628**
	PY12	5,152,022	18,280	17,014,337	1,001,489	497,142	3,118,752	136,000	243,653	130,454	27,312,128		465,578	14,241,542	*14,707,121*	**12,605,007**
	PY13	4,976,424	18,280	17,014,337	1,001,489	497,142	3,118,752	136,000	243,653	130,454	27,136,530		465,578	14,206,798	*14,672,377*	**12,464,153**
	PY14	5,916,946	18,280	17,014,337	1,001,489	497,142	3,118,752	136,000	243,653	130,454	28,077,051		465,578	14,292,852	*14,758,430*	**13,318,621**
	PY15	5,353,982	18,280	17,014,337	1,001,489	497,142	3,118,752	136,000	243,653	130,454	27,514,088		465,578	14,241,542	*14,707,121*	**12,806,967**
	PY16	5,016,204	18,280	17,014,337	1,001,489	497,142	3,118,752	136,000	243,653	130,454	27,176,310		465,578	14,206,798	*14,672,377*	**12,503,933**
	PY17	5,916,946	18,280	17,014,337	1,001,489	497,142	3,118,752	136,000	243,653	130,454	28,077,051		465,578	14,292,852	*14,758,430*	**13,318,621**
	PY18	5,353,982	18,280	17,014,337	1,001,489	497,142	3,118,752	136,000	243,653	130,454	27,514,088		465,578	14,241,542	*14,707,121*	**12,806,967**
	PY19	5,016,204	18,280	17,014,337	1,001,489	497,142	3,118,752	136,000	243,653	130,454	27,176,310		465,578	14,206,798	*14,672,377*	**12,503,933**
	PY20	5,916,946	18,280	17,014,337	1,001,489	497,142	3,118,752	136,000	243,653	130,454	28,077,051		465,578	14,292,852	*14,758,430*	**13,318,621**
		NPV (@ 10% SDR): MMK 1000		43,446,100												
		NPV (@ 10% SDR): US$ 1000		38,791												
		EIRR		**32%**												



Note: The incremental net benefit flow does not have a smooth flow because of the nature of the incremental benefits of Elephant Yam in Chin areas. New yam yield every year and without project case yam yield every other year.

Appendix 11: Draft Project implementation manual

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Appendix 12: Compliance with IFAD policies

1. WSAP is compliant with all relevant IFAD policies, strategies and guidelines, and in particular it complies with: (i) Strategic Framework 2011-2015 in terms of market driven-smallholder development and non-farm rural business growth; (ii) its targeting strategy is consistent with the Targeting Policy approach of focusing on economically active poor rural women and men in farming and landless households; (iii) its investments in rural economic growth are compliant with the Rural Finance Policy focus on promoting inclusive financial systems aimed at improving access by the rural poor to a range of financial services; (iv) its participatory approach to land consolidation is consistent with the Land Tenure Policy's and Engagement with Indigenous Peoples Policy's focus on the principle of free, prior and informed consent (FPIC) and community driven development; (v) in compliance with the Gender Equality and Women's Empowerment Policy the design foresees the development of a gender mainstreaming strategy with the aim of increasing IFAD's impact on gender equality and strengthen women's empowerment in rural areas of Myanmar (vi) its focus on promoting PPPs for rural private sector development and contributing to national policy dialogue is in line with the Partnership Strategy (vii) its environmental impact assessment procedures for infrastructure investments are aligned with the Climate Change Policy on proper adaptation and mitigation measures. Other than that the project design is also compliant with the Policy on Preventing Fraud and Corruption through the establishment of a mutual accountability framework.

2. In addition, WSAP directly addresses the three strategic objectives included in the Myanmar COSOP and thus consistent with IFAD's country strategy for Myanmar i.e. (i) SO-1: empower rural women and men to access agriculture resources, technologies, services and markets; (ii) SO-2: create business and employment opportunities for rural women and men, and (iii) SO-3: promote social and economic empowerment of marginalized minorities.

Appendix 13: Contents of the Project Life File

All documents relating to the design of WSAP can be found at the following xdesk link:

https://xdesk.ifad.org/sites/APRop/Lists/MMR/Forms/Folder%20view.aspx?RootFolder=%2Fsites%2FAPRop%2FLists%2FMMR%2F2000000964&FolderCTID=0x012000AC4DFE19D271564F8314E092521124BA&View=%7B74228DB9%2D0D60%2D434F%2D9EEC%2D94593C41D154%7D