



FAO/GLOBAL ENVIRONMENT FACILITY PROJECT DOCUMENT



PROJECT TITLE: <i>FishAdapt: Strengthening the adaptive capacity and resilience of fisheries and aquaculture-dependent livelihoods in Myanmar</i> PROJECT SYMBOL: MYA/020/LDF	
Recipient Country: Republic of the Union of Myanmar	
Resource Partner: GEF	
FAO project ID: 628454 GEF/LDCF/SCCF Project ID: 5702	
Executing Partner(s): FAO	
Expected EOD (starting date): July 2016	
Expected NTE (End date): August 2019	
Contribution to FAO's Strategic Framework	a) <u>Strategic objective/Organizational Result: SO2</u> : Increase and improve provision of goods and services from agriculture, forestry and fisheries in a sustainable manner. b) <u>Blue Growth</u> . Sustainable management, healthy aquatic ecosystems and sustainable ocean-based economies. c) <u>Regional Result/Priority Area E</u> . Coping with the impact of climate change on agriculture and food and nutritional security. d) <u>Country Programming Framework Outcome: 7</u> . Preparedness for and mitigation of disasters and climate change.
GEF Focal Area/LDCF/SCCF:LDCF	
GEF/LDCF/SCCF Strategic Objectives: <i>CCA-1: Reduce vulnerability to the adverse impacts of climate change, including variability, at local, national, regional and global level</i> <i>CCA-2: Increase adaptive capacity to respond to the impacts of climate change, including vulnerability, at local, national, regional and global level</i> <i>CCA-3: Promote transfer and adoption of adaptation technology</i>	
Environmental Impact Assessment Category (insert $\sqrt{}$): C	
Financing Plan: GEF/LDCF/SCCF allocation: <u>Co-financing:</u> DOF (MLFRD) Myanmar Fisheries Federation(MFF) Worldfish Japan (JICA) Livelihoods and Food Security Trust Fund (LIFT) FAO Subtotal Co-financing: Total Budget:	USD 6,000,000 USD 4,885,000 USD 2,000,000 USD 200,000 USD 450,000 USD 5,500,000 USD 350,000 USD 12,885,000 USD 18,885,000

EXECUTIVE SUMMARY

The fisheries and aquaculture sector in Myanmar is critically important to the country's food and nutrition security and economy. Climate change is forecast to have a significant impact on the sector. For *capture fisheries* (marine and inland) these impacts include changes in sea surface temperature, higher inland water temperature, changes in ocean currents, changes in the frequency of El-Nino Southern Oscillation (ENSO) events, sea level rise and changing levels of rain and water availability. The *aquaculture* sector is also exposed to hazards such as salt-water intrusion, flooding of ponds, shortages in water supply, invasive species and ad hoc development planning altering local ecosystem dynamics and undermining their resilience, integrity and functionality. The fisheries sector and dependent livelihoods are also under stress from a range of other factors such as Illegal Unreported and Unregulated (IUU) fishing, overfishing and pollution. Myanmar is vulnerable to extreme climate events, which have caused significant loss of life, damage to infrastructure and also impacted fishers and fish farmers' livelihoods. In order to address these issues, Myanmar has developed its National Adaptation Plan of Action (NAPA) for climate change¹. In 2015, Myanmar also outlined a range of mitigation and adaptation actions under its Intended Nationally Determined Contributions (INDC).

At present, Myanmar faces significant challenges in addressing these issues and achieving sustainable management and utilisation of its aquatic resources. These include weak governance, organizational capacities, institutional arrangements, limited technical capacity and knowledge; and limited resources for the development and implementation of adaptation plans.

In order to address these issues and to support implementation of its NAPA, the government of Myanmar requested FAO (in collaboration with other GEF agencies government agencies, development partners, NGO's and civil society) to prepare this GEF – LDCF funded project. Specifically the project addresses three main barriers to climate change adaptation, including:

- Lack of climate resilient sector policies, and limited integration of fisheries specific climate responses into national policies
- Lack of capacity and resources within the sector to support communities in planning and responding to climate related stressors and fisheries and aquaculture adaptation to climate change impacts.
- Limited knowledge sharing and communication within the sector and with fisheries and aquaculture dependent communities, limited coordination and lack of real-time/working level understanding of climate change and its' impacts on fisheries, aquaculture and their livelihoods.

The project objective is to assist government to *enable inland and coastal fishery and aquaculture stakeholders to adapt to climate change by understanding and reducing vulnerabilities, piloting new practices and technologies, and sharing information*. Key areas of focus for the project will include strengthening of national, regional, and local regulatory frameworks and adaptive capacities, fisheries co-management measures, integrated mangrove fisheries and aquaculture, inland fisheries and small-scale aquaculture, and critical issues related to land and resource tenure.

These results will be achieved through four project components, as follows :-

- *Component 1:* Strengthen the National, Regional/ State and Township level regulatory and policy frameworks to facilitate the adaptive capacities of the fisheries and aquaculture sector

¹ 2012. Myanmar's National Adaptation Programme of Action (NAPA) to Climate Change Priority areas 1, 2, 3 and 4.

- *Component 2*: Enhanced critical adaptation practices demonstrated by fishers and fishing communities in vulnerable coastal and inland water regions of Myanmar
- *Component 3*: Develop and apply adaptation models to strengthen the resilience of Myanmar's aquaculture sector to the impacts of climate change.
- *Component 4*. Knowledge management, monitoring and evaluation, training and scaling up adaptation practices, lessons learned development and dissemination.

The project builds on existing government and partner programmes and emerging good practices. It adopts an *Ecosystem Approach to Fisheries Management (EAFM) and Aquaculture (EAA)*. EAFM provides practical approaches to implement sustainable development for fisheries by identifying and encouraging balance between ecological and human well-being through good governance. These will be applied to enhance the resilience of aquatic ecosystems to climate change impacts and fishing and fish farming activities. These approaches also reduce the underlying vulnerability of fishing and fish farming communities.

The project has conscientiously been designed to deliver local, national and global environment benefits, and specifically address the GEF LDCF objectives of:

- **CCA-1: *Reducing Vulnerability***: Reduce vulnerability to the adverse impacts of climate change, including variability, at local, national, regional, and global level. Achieved through all components and notably by *Components 2 and 3*, which aim to reduce climate change vulnerabilities at the community level.
- **CCA-2: *Increasing Adaptive Capacity***: Increase adaptive capacity to respond to the impacts of climate change, including variability, at local, national, regional, and global level. This will be achieved through *all project components*.
- **CCA-3: *Adaptation Technology Transfer***: Promote transfer and adoption of adaptation technology. Achieved through all components, but principally *Components 2 and 3*, which will develop and pilot adaptation technologies and practices, and *Component 4*, which will manage and disseminate good practice and lessons.

Specifically the project addresses Myanmar's NAPA priorities for its' Coastal Zone, including: (i) adaptation to climate change through Integrated Coastal Zone Management (ICZM), (ii) community-based mangrove reforestation for building climate-resilient ecosystems and rural livelihoods in degraded coastal areas in the Rakhine State, (iii) community based eco-friendly aquaculture systems (e.g. mud crab, clam, shrimp and tilapia) for enhancing the climate change resilience of rural livelihoods and supporting the recovery of mangrove forest ecosystems and (iv) small-scale aquaculture and mangrove buffer demonstration sites for transferring adaptation technologies to coastal communities. Under its INDC, the project also addresses the first priority level sector of resilience in the agriculture sector, developing early warning systems and forest preservation measures; the third priority level sector in coastal zone protection, and; the fourth priority level sector, which targets the energy, and industry sectors, as well as biodiversity preservation.

A national Climate Change Vulnerability Assessment to be delivered by the project will identify "at risk" ecosystems and dependent communities, in particular small-scale traditional fisheries and fish farming systems for specific action. Environmental sustainability will be ensured through positive impacts of the introduced climate change adaptation plans, fisheries management plans, technologies and approaches on a range of ecosystem services, which will be developed in local community user areas and in the longer term on larger areas through upscaling of best practices. Screening of any new CCA technologies and approaches developed by the project will be undertaken according to national legislation. Long term strengthening of

climate change adaptation knowledge sharing networks and environmental monitoring will be undertaken by ensuring these will operate within national mechanisms and resources by project completion.

In line with effective and comprehensive capacity development practices² to address individual, organizational and institutional capacities, the project will work at the national and region/state level on laws, policies and institutional strengthening, coordination and knowledge management. Community level adaption approaches and technologies will be carried out at in the Ayeyarawady Region, Yangon Region and Rakhine State. Small-scale inland aquaculture climate adaptation planning will also be carried out in a limited number of townships in the Central Dry Zone (CDZ).

The primary stakeholders of the project at community level are Fishers, Fish Farmers, and those with fishery and aquaculture dependent livelihoods and the private sector. Women and vulnerable groups will continue to be targeted to ensure their active engagement throughout the project cycle, including through gender-sensitive vulnerability assessments, adaptation actions and capacity building. The Department of Fisheries (MLFRD) will be the main institutional partner for the project, which will coordinate and collaborate with a wide range of other partners (including specifically MFF, LIFT, Worldfish, JICA), NGO's, government agencies, development partners and the private sector.

This four year project includes an LDCF Grant of US\$ 6,000,000 with additional co-financing of US\$ 12,385,000 (DOF - USD 4,885,000; MFF - USD 2,000,000; Worldfish - USD 200,000; Japan (JICA) - USD 450,000; LIFT - USD 5,000,000, and; FAO - USD 350,000).

² See www.fao.org/capacity-development

TABLE OF CONTENTS

CONTENTS

GLOSSARY OF ACRONYMS.....	8
SECTION 1 – PROJECT RELEVANCE.....	10
1.1 General context.....	10
1.1.1 General development context related to the project	10
1.1.2 Global Environmental Issues.....	14
1.1.3 Institutional and Policy Framework.....	19
1.2 Project Rationale (baseline, barriers and incremental reasoning)	26
1.2.1 Baseline Programs/Projects	26
1.2.2 Remaining barriers to address threats on CC vulnerabilities	30
1.2.3 Incremental/additional reasoning (added value of the project in particular the GEF/LDCF/SCCF financing).....	32
1.3. FAO’s comparative advantages.....	33
1.4 Participants and other stakeholders.....	34
1.5. Lessons learned from past and related work, including evaluations.....	37
1.6. Links to national development goals, strategies, plans, policy and legislation	38
1.6.1. Alignment with national development goals and policies	38
1.6.2 Alignment with NAPA, NAPs, NBSAP, NIPs, NAMA.....	38
1.6.3. Alignment with GEF focal area and/or LDCF/SCCF strategies	39
1.6.4. Alignment with FAO strategic framework	40
SECTION 2 – PROJECT FRAMEWORK AND EXPECTED RESULTS.....	41
2.1 PROJECT STRATEGY	41
2.2 PROJECT OBJECTIVES, OUTCOMES, AND OUTPUTS	42
2.2.1 Expected project outcomes	42
2.2.2 Expected project Components and Outputs	43
2.3 ADAPTATION BENEFITS.....	66
2.4 COST EFFECTIVENESS	67
2.5 INNOVATIVENESS	70
SECTION 3 – FEASIBILITY	72
3.1 ENVIRONMENTAL IMPACT ASSESSMENT	72
3.2 RISK MANAGEMENT	72
3.2.1 Risks and mitigation measures.....	72
3.2.2 Fiduciary risk analysis and mitigation measures	73
SECTION 4 – IMPLEMENTATION AND MANAGEMENT ARRANGEMENTS.....	74
4.1 INSTITUTIONAL ARRANGEMENTS	74
4.1.1 General institutional context and responsibilities.....	74
4.1.2 Coordination with other ongoing and planned related initiatives	74
4.2 IMPLEMENTATION ARRANGEMENTS	78

4.2.1	Roles and responsibilities of the executing partners	78
4.2.2	FAO's role and responsibilities, as the lead GEF agency	78
4.2.3	Project technical, coordination, and steering committees.....	81
4.3	FINANCIAL PLANNING AND MANAGEMENT	84
4.3.1	Financial plan	84
4.3.2	GEF/LDCF/SCCF inputs	88
4.3.3	Government inputs.....	88
4.3.4	FAO inputs.....	88
4.3.5	Other co-financiers inputs	91
4.3.6	Financial management of and reporting on GEF/LDCF/SCCF resources.....	91
4.4	PROCUREMENT	93
4.5	MONITORING AND REPORTING	93
4.5.1	Oversight and monitoring responsibilities	94
4.5.2	Indicators and information sources	94
4.5.3	Reporting schedule	94
4.5.4	Monitoring and evaluation plan summary.....	98
4.6	PROVISION FOR REVIEW AND EVALUATION	98
4.7	COMMUNICATION AND VISIBILITY	99
SECTION 5	SUSTAINABILITY OF RESULTS.....	100
5.1	SOCIAL SUSTAINABILITY	100
5.2	GENDER.....	100
5.3	ENVIRONMENTAL SUSTAINABILITY.....	102
5.4	FINANCIAL AND ECONOMIC SUSTAINABILITY.....	102
5.5	SUSTAINABILITY OF CAPACITIES DEVELOPED	102
5.6	APPROPRIATENESS OF TECHNOLOGY INTRODUCED.....	103
5.7	REPLICABILITY AND SCALING UP	104
APPENDICES	105
APPENDIX 1:	RESULTS MATRIX/ FAO/GEF RESULTS MATRIX	106
APPENDIX 2:	WORK PLAN (RESULTS BASED).....	119
APPENDIX 3:	RESULTS BUDGET	126
APPENDIX 4:	RISK MATRIX	134
APPENDIX 5:	PROCUREMENT PLAN	136
APPENDIX 6:	TERMS OF REFERENCE (TORS).....	137
APPENDIX 7:	ENVIRONMENTAL AND SOCIAL ASSESSMENT	146
APPENDIX 8:	PROJECTS AND PROGRAMMES RUN BY FAO MYANMAR.....	148

APPENDIX 9: GEF PROJECTS IN MYANMAR	152
APPENDIX 10: LIST OF POLICIES RELEVANT TO FISHADAPT	154
APPENDIX 11: COORDINATION WITH OTHER INITIATIVES BY THE FISHADAPT PROJECT	159
APPENDIX 12: SUMMARY OF PILOT SITES, DISTRICT, AND REGIONS FOR FISHADAPT PROJECT AND SUMMARY FINDINGS FROM COMMUNITY CONSULTATIONS.	170
APPENDIX 13: SUMMARY OF KEY FINDINGS OF DOF INDIVIDUAL CAPACITY ASSESSMENT FOR FISHADAPT PROJECT.	214
APPENDIX 14: SUMMARY OF DRAFT PROCESS FOR FISHADAPT WORKING WITH DOF OFFICERS AND PARTNERS.....	218
APPENDIX 15: DRAFT STEPS FOR INTRODUCING THE VILLAGE-BASED CO- MANAGEMENT APPROACH, KEY PROCESSES KEY ACTIONS.	222
APPENDIX 16: DETAILED DESCRIPTION OF MYANMAR FISHERIES AND AQUACULTURE SECTOR.....	223

GLOSSARY OF ACRONYMS

APFIC	Asia Pacific Fishery Commission
AWP/B	Annual Work Plan and Budget
BD	Biodiversity
BH	Budget Holder
BOBP-IGO	Bay of Bengal Programme Inter Governmental Organisation
BOBLME	Bay of Bengal Large Marine Ecosystem project
CBD	Convention on Biodiversity
CBO	Community Based Organisation
CC	Climate Change
CCA	Climate Change Adaptation
CCRF	Code of conduct for responsible fisheries
CD	Capacity Development
CEO	Chief Executing Officer (GEF)
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CPF	FAO Country Programme Framework
CPUE	Catch Per Unit Effort
CSA	Climate-Smart Agriculture
CTA	Chief Technical Adviser
DANIDA	Danish International Development Agency
DMH	Department of Meteorology and Hydrology
DEX	Direct Execution
DOA	Department of Agriculture
DOF	Department of Fisheries
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
DZ	Dry Zone
EAA	Ecosystem Approach to Aquaculture
EAFM	Ecosystem Approach to Fisheries Management
EEZ	Exclusive Economic Zone
ESFSP	Environmentally Sustainable Food Security Programme
ENSO	El Nino Southern Oscillation
EOP	End of Project
EP	Executing Partner
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FMP	Fisheries Management Plan
FPMIS	Field Project Management Information System
GEBs	Global Environmental Benefits
GEF	Global Environment Facility
GEFSEC	GEF Secretariat
GDP	Gross Domestic Production
HACCP	Hazard Analysis and Critical Control Points
HAB	Harmful Algal Bloom
IFAD	International Fund for Agricultural Development
IFT	Institute of Fisheries Technology (Yangon)
IHLCA	Integrated Households Living Condition Assessment
INDC	Intended Nationally Determined Contributions
IQT	Individual Transferrable Quota
IUU	Illegal Unreported and Unregulated

IUCN	International Union for the Conservation of Nature
ICZM	Integrated Coastal Zone Management
JICA	Japan International Cooperation Agency
KAP	Knowledge Attitudes and Practices
LDC	Least Developed Country
LDCF	Least Developed Country Fund
LIFT	Livelihoods and Food Security Trust Fund.
LTO	Lead Technical Officer
LUAC	Land Use Advisory Committees
LUMP	Land Use Management Plan
MIMU	Myanmar Information Management Unit
M&E	Monitoring and Evaluation
MERN	Myanmar Environment Rehabilitation-Conservation Network
MOECF	Ministry of Environmental Conservation and Forestry
MoAI	Ministry of Agriculture and Irrigation
MLFRD	Ministry of Livestock, Fisheries and Rural Development
MoNPED	Ministry of National Planning and Economic Development
MSN	Mangrove Service Network
MRC	Mekong River Commission
NACA	Network of Aquaculture Centres in Asia
NAPA	National Adaptation Plan of Action
NGO	Non-Governmental Organisation
nm	nautical mile
NPT	Naypyitaw
NRS	North Rakhine State
OIE	World Organisation for Animal Health
PD	Project Document
PIF	Project Identification Form (GEF)
PMU	Project Management Unit
PSC	Project Steering Committee
PY	Project Year
SEAFDEC	South East Asia Fisheries Development Centres
SIS	Small Indigenous Species
STAP	Scientific and Technical Advisory Panel
TAC	Total Allowable Catch
TCI	Investment Centre Division (FAO)
TOR	Terms of Reference
UN	United Nations
UNCBD	United Nations Convention on Biological Diversity
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNCT	United Nations Country Team
USD	United States Dollar
VA	Vulnerability Assessment
VFS	Village Fisheries Society
WB	World Bank
WFC	WorldFish
WFP	World Food Program

SECTION 1 – Project Relevance

1.1 General context

1.1.1 General development context related to the project

Myanmar, situated in South East Asia, has a population of around 51.4 million. It is divided into seven states and seven regions which are further sub-divided into Districts, Townships, Cities, Wards, Village tracts, and Villages (the smallest administrative unit). In terms of economic development, it has one of the lowest GDP's in the world, with the World Bank estimating its poverty rate at 37.5%. Since 2011, broad democratic reforms have begun to have a rapid impact and GDP growth was estimated at 8.7% in 2014. A significant challenge during this transitional period has been for the government to ensure that development is environmentally sustainable and inclusive³. Myanmar enjoys diverse climatic conditions including both subtropical and tropical zones, as well as low to high rainfall regions. As a result, the country produces a wide range of almost all crops, and livestock and fishery products

Figure 1 Map of Myanmar⁴.



³ 2010, Integrated Household Living Conditions Survey in Myanmar (2009-2010) - Poverty Profile. UNDP

⁴ 2015 Myanmar Information Management unit (www.mimu.org). Accessed 10/2015

Myanmar Fisheries and Aquaculture Sectors

Myanmar is endowed with abundant and diverse aquatic systems with 2,400km of coastline facing the Bay of Bengal and the Andaman Sea and it also has an extensive river and lake system⁵. These extensive aquatic resources allow for a fisheries and aquaculture sector that extend through its marine, coastal and inland areas.

According to the Union of Myanmar Fishery Sector statistics (2015), an estimated *one million people directly and three million people indirectly are involved in the fisheries and aquaculture sector* which is a critical contributor to Myanmar's food and nutrition security. The small-scale components of these sectors are significant given local dependence on them. Both aquaculture and capture fisheries make a significant contribution to GDP (approximately 9%). The sector also contributes to the livelihoods of rural people/coastal and inland fisheries and aquaculture sector, through fish processing, trading, and fishing boat manufacturing.

Fish, in particular, is an important staple in the diets of Myanmar people and often their only source of animal protein. In 2015, the estimated per capita consumption was 61 kg/capita/year (although lower estimates have been suggested⁶). This positions the fisheries and aquaculture sectors as an important component of the country's food and nutrition security efforts.

In the last ten years, fish production has seen steady growth across the fisheries subsectors (see Table 1.1). However, this increasing catch is putting more pressure on the natural aquatic resource base. During consultations with communities during the project preparation phase, illegal, unreported and unregulated (IUU) and overexploitation of resources were reported by fishers. The Government has had difficulties in finding lessees for recent fishery leases as the fisheries resources of the inland or coastal area for lease have degraded and, thus, are less attractive for leasing. It should be noted that analysis of the data collection systems in Myanmar suggests current reporting systems overestimate catch reporting and improved statistics will be supported by this and other projects⁷. In addition recent (unpublished⁸) surveys by the RV Nansen (2014 and 2015) as part of the BOBLME project and supported by Norway suggested a significant decline in marine fishery stock since the previous assessment.

Table 1.1 Myanmar fishery and aquaculture production by year (2003/4 - 2014/15)

Fishery Production (Source: DOF statistics) (1,000 metric tons)						
	Year	Total	Aqua- culture	Leasable Fisheries (inland)	Open Fisheries (inland)	Marine/ coastal Fisheries
1	2002-03	1595.87	252.01	109.53	180.61	1053.72
2	2003-04	1986.96	400.36	122.28	331.98	2232.34

⁵ The main rivers include: the Ayeyarawady River, stretching over 2,000 km and draining 58% of the country, the Sittaung (5.4%); the Thanlwin (18.4%); the Mekong (4.2%); the Rakhine (Arakan) coastal basin in the west, which drains into the Bay of Bengal, and; the Tanintharyi (Tenasserim) coastal basin in the south, which drains into the Andaman Sea. Prominent lakes include Inle Lake in Shan State, and Indawgyi Lake in Kachin State . 2015. Fishery statistics 2015. Union of Myanmar, Department of Fisheries. 2015. Fishery statistics 2015. Union of Myanmar, Department of Fisheries.

⁶ Some analysis suggests lower figures for example, 2014. Needham, S. & Funge-Smith, S. J. The consumption of fish and fish products in the Asia-Pacific region based on household surveys". FAO Regional Office for Asia and the Pacific, Bangkok, Thailand . RAP Publication 2015/12. 87pp

⁷ 2014. Review of fisheries data collection systems in Myanmar. BOBLME project. FAO RAP.

⁸ 2014, 2015. Survey of Myanmar waters by the RV Nansen. In preparation (FAO, GOM, GON)

3	2004-05	2217.47	485.22	136.79	366.75	1228.71
4	2005-06	2581.78	574.99	152.69	478.43	1375.67
5	2006-07	2859.86	616.35	170.10	548.09	1525.32
6	2007-08	3193.92	687.67	191.05	625.44	1689.76
7	2008-09	3542.19	775.25	209.72	689.71	1867.51
8	2009-10	3921.97	858.76	237.46	764.97	2060.78
9	2010-11	4163.46	830.48	250.04	913.12	2169.82
10	2011-12	4478.21	898.96	282.64	963.82	2332.79
11	2012-13	4716.22	929.38	290.00	1012.97	2483.87
12	2013-14	5047.53	964.26	304.44	1076.59	2702.24
12	2014-15	5316.95	999.63	315.36	1147.76	2854.20

Myanmar fisheries and aquaculture comprises four aquatic systems-based categories, ranging from small- to large-scale sectors: 1) inland aquaculture, 2) marine/coastal aquaculture, 3) inland capture fisheries (including leasable fisheries and open capture fisheries), and 4) marine/coastal capture fisheries (including inshore and offshore). A presentation of the sectors and their management contexts is provided in Appendix 16.

Small-scale fisheries and fishing communities

The project preparation phase assessments showed that in most of the coastal areas, fishing communities lack basic infrastructure and services. Electricity and freshwater supplies are absent in many areas. The local people of the Mergui Archipelago are an ethnic minority called the Moken who are a sea-dwelling people and still follow a traditional way of life. Many households in the Ayeyarwady Delta are heavily dependent upon fishing for subsistence and income generation. Landlessness is at a high level (50%) in the Delta, making households especially vulnerable to falling catches, as they have few non-fishery resources or alternatives to ensure their subsistence. Transportation in this region is mainly by small boats and canoes through the network of canals and streams. Cyclone Nargis destroyed many of the small coastal villages and an estimated 28,000 fishers were killed in the storm, highlighting the exposed nature of many of these coastal communities. Some larger towns exist in this area: Laputta and Bogale being important fishing towns. Dry season freshwater supplies are limited due to salt-water intrusion. Coastal fisheries are important in North Rakhine State (NRS). Geographically separated from the rest of the country by mountains in the east, the inhabitants of NRS share close cultural links with Bangladesh. NRS has one of the highest population densities in Myanmar. The economic and social indicators of NRS show the local population as being some of the most vulnerable in the country.

A recent poverty assessment survey⁹ of 22 000 rural households across Myanmar was undertaken to capture household socio-economic status, livelihoods, vulnerability, access to social assistance and opinions on the dimensions and causes of poverty and proposed interventions for poverty reduction. When compared with non-fishing households, fishing communities experienced significantly higher rates of vulnerability and lower rates of access to formal and informal social assistance compared with non-fishing communities, placing them in a particularly vulnerable position to be able to cope with additional environmental stressors.

More specifically, the survey indicated:

⁹ FAO. 2016. Report of the Workshops to present the initial research findings from a nation-wide survey and analysis on social protection and poverty dimensions in support of rural development and poverty reduction in Myanmar, Nay Pyi Taw and Yangon, Myanmar, 29–30 September 2015. FAO Fisheries and Aquaculture Report No. 1126. Rome, Italy.

- Considerable variability in poverty vulnerability between states and regions; households headed by women, households dependent on casual labour as their primary income source, landless households, households with disabled persons, and households in fishing communities had the highest levels of vulnerability.
- Among rural households, a large majority had accessed social assistance: loans accounted for most of the assistance. Poor households, households headed by women and households with low levels of social capital and participation were less likely to receive assistance of any kind, less likely to receive assistance from the Government or through insurance schemes, and more likely to receive assistance in the form of loans.
- Despite clear linkages between poverty reduction and natural resource management, knowledge and skills relating to the latter were low in rural communities. Participation in natural resource management was low, but awareness levels were higher, particularly for forest management.
- Some households had at least 10 percent of its income on debt repayments; this was linked to reduced investment in education and livelihoods. Debt repayments consumed 12 percent of household income; and many households were borrowing primarily from high-risk lenders.
- Rural communities had high levels of social capital; there were active traditional social organizations in many of the communities. The level of engagement at community level was strongly associated with access to social assistance from community organizations, but there were relatively low levels of participation in community events among women and persons with disabilities.
- Landlessness households were twice as vulnerable as landed households, and had higher rates of vulnerability in all areas except livelihood diversity.
- Most rural households were engaged in agriculture or related livelihoods but some reported casual labour as their main income source and a lack of a regular income was raised by many. Livelihood diversity was strongly linked to high economic status, low poverty rates, high levels of social capital, and high rates of children's school attendance.
- Households in fishing communities experience significantly higher rates of vulnerability when compared with non-fishing communities, higher rates of food insecurity and poorer asset profiles, especially for livelihood assets. Households in fishing communities also reported lower rates of both formal and informal access to social assistance compared to non-fishing communities both overall and for all categories of assistance apart from fisheries-specific crisis. Households in fishing communities were generally limited in their sources of assistance other than family, compared to non-fishing communities. Additionally, households in fishing communities were less likely to receive assistance from government sources and assistance was more likely to be in the form of loans rather than cash, service or training. In fishing communities, access to waterways and lack of control over markets and prices were significant factors described in relation to poverty.

Mangroves

Myanmar has the fourth largest expanse of mangrove areas in Southeast Asia. Myanmar mangrove forests are predominately in the Ayeyarwady, Tanintharyi and Rakhine state/divisions. Mangroves in Myanmar are classified as “Primary” and “Secondary”. Primary mangrove areas are protected under jurisdiction of the Ministry of Forestry and not available for aquaculture and are essentially forest reserves. Significant jurisdiction of secondary mangroves is devolved to the Department of Fisheries for availability to conversion for aquaculture. Mangrove forest cover in the Ayeyarwady Delta has declined for many decades due to the development of paddy cultivation and extraction of fuel wood, charcoal production and construction materials such as poles and thatches. There have been attempts to rehabilitate the mangrove forest, however, the complex natural and cultural ecology of mangroves makes mangrove rehabilitation difficult. Community-based mangrove forest management initiatives were also attempted in the past, yet they were thwarted by illegal encroachments from agricultural conversion, opening forests for aquaculture ponds and premature cutting of trees.

Mangroves can be effective pollutant sinks from land runoff, as they are efficient nitrogen and phosphorus accumulators. These nutrients can be incorporated for biomass production or stored within the plant for later use. In addition, the complex root systems of mangroves can colonize sediments and stabilize them to modify the foreshore and reduce re-suspension thus ensuring some protection for near shore habitats. The adoption of ecosystems based approaches and mangrove rehabilitation can provide very effective protection against climate induced damage such as erosive wave-action and cyclones on the shoreline¹⁰. Episodic heavy rainfall events can result in rapid land runoff where mangroves can also play an important role in trapping sediments before this runoff water reaches the open sea, protecting the coastal and marine ecosystems. Mangroves also play important nursery and feeding grounds for fish resources and are an efficient at carbon sequestration. The lack of effective conservation plans for mangrove ecosystems across the government’s line agencies hinder the resilience of fisheries sector, coastal ecosystems and coastal communities to climate change impacts.

1.1.2 Global Environmental Issues

Vulnerability to climate change impacts

The impacts of climate change, including variability, were reported¹¹ for Myanmar and include a general increase in temperatures across the whole country (~0.08°C per decade), most notably in the northern and central regions; a general increase in total rainfall over most regions, however, with notable decreases occurring in certain areas (e.g. Bago Region); a decrease in the duration of the south-west monsoon season as a result of a late onset and early departure times; and increases in the occurrence and severity of extreme weather events, including cyclones/strong winds, flood/storm surges, intense rains, extreme high temperatures and drought.

Climate change and variability will exacerbate the vulnerability of Myanmar’s marine/coastal fisheries and aquaculture sector. Increase in sea water temperature is a major trigger of disturbance of the marine/coastal ecosystem including acceleration of potential occurrences of harmful algal blooms (HAB), less availability of dissolved oxygen and changes to water PH levels, damages in coral reef systems and altered species composition of fish stocks, decrease in the production of pearl oyster and seaweed, etc., all of which threaten the marine/coastal and near-

¹⁰ Various sources including: Munang et al (2013). Climate change and Ecosystem-based Adaptation: a new pragmatic approach to buffering climate change impacts. Current Opinion in Environmental Sustainability 5:67–71 and

¹¹ Myanmar’s National Adaptation Programme of Action (NAPA) to Climate Change (2012), the FAO-Regional Integrated Multi-Hazard Early Warning System “Managing Climate Change Risks for Food Security in Myanmar” (2011) and Personal Communications with Myanmar Department of Fisheries.

coast inland fisheries and aquaculture sector. El Niño Southern Oscillation (ENSO) events cause changes in ocean currents, which also alter distribution of pelagic fish species and juvenile fish resources recruitment, affecting productivity of coastal and inland aquaculture. Sea level rise also threatens coastal fish breeding and nursery habitats composed of mangroves and coral reefs, and increases vulnerability to waves and storm surges, posing risks of near-coast inland fisheries and aquaculture inundation.

Climate variation and change also influence post-harvest/production of fish products through increased risks of fish disease and spoilage along the production chain. The profound damage on Myanmar's coastal zone by cyclones Nargis in 2003 and Giri in 2010 demonstrated the serious vulnerability of riparian and coastal fishing and aquaculture communities and the increasing risk facing these communities' production assets, infrastructure and health and safety.

Inland fisheries and aquaculture in Myanmar are impacted by a variety of factors such as air and water temperature, water levels, duration of floods, timing of the floods, regularity of flooding, fish migration and dry season refuges linked to climate variability and change impacts. In the inland areas, higher water temperature results in degradation of water quality, less availability of dissolved oxygen, changes in the range and abundance of pathogens, fish species composition, migration, spawning and peak abundance patterns. The inland aquaculture sector is also exposed to climate-induced hazards such as salt-water intrusion, flooding of ponds, shortages in water supply and altered local ecosystems.

Projections of climate change for Myanmar (DMH¹²) indicate further increases in temperature, in the risk of flooding, in the occurrence and intensity of extreme weather events, including cyclones/strong winds, flood/storm surge, intense rains, extreme high temperatures and drought, and in rainfall variability during the rainy season. In particular, the Myanmar NAPA outlines how the Coastal Zone Myanmar is particularly vulnerable to rising sea levels because of its highly populated, low-lying coastline. An increase in sea level will provide a higher base for storm surges and other extreme climate events. Therefore, sea-level rise and associated impacts will threaten coastal ecosystems, agricultural land and infrastructure (roads, property, and businesses). Certain low-lying coastal zones will be at risk of complete inundation resulting in a loss of agricultural and residential land. The extent of inundation will be largely determined by the slope of the land. For example, the low-lying Ayeyarwady Delta is particular at risk, as even a small rise in sea level will lead to a large portion of the Delta being inundated. Rising sea levels will also threaten water tables as saline water enters into freshwater ground water supplies.

The Myanmar NAPA summarises the projected Climate Change and Vulnerability for the country as follows (2001-2100)¹³:

- a general increase in temperature across the whole country, particularly from December – May with the Central and Northern regions experiencing the greatest increases;
- an increase in clear sky days exacerbating drought periods;
- an increase in rainfall variability during the rainy season including an increase across the whole country from March – November (particularly in Northern Myanmar), and decrease between December and February;

¹² NAPA Myanmar

¹³ NAPA Myanmar : Future changes of temperature and precipitation have been estimated for Myanmar using a number of global and regional climate models. For the purpose of this NAPA, the predictions from the model "Providing Regional Climates for Impacts Studies" (PRECIS) are reported. The model was conducted using 20 km x 20 km resolution, and operated by the South East Asia System Analysis Research and Training Regional Centre (SEA START RC) using A2 emissions scenario. The baseline information uses modelled data for the period 1971-2000. The model used data collected at seven stations, assumed to be representative of seven physiographic regions in Myanmar and is described fully in the NAPA.

- an increase in the risk of flooding resulting from a late onset and early withdrawal of monsoon events;
- an increase in the occurrence and intensity of extreme weather events, including cyclones/strong winds, flood/storm surge, intense rains, extreme high temperatures and drought.

As illustrated below, the NAPA document attempts to summarize estimates of temperature and rainfall change in Myanmar for the next 80 years (using data from the PRECIS model outlined in the NAPA). (Fig 2 and Fig 3).

Figure 2. Predicted temperature trends for the seven physiographic regions in Myanmar (From the Myanmar NAPA, PRECIS model).

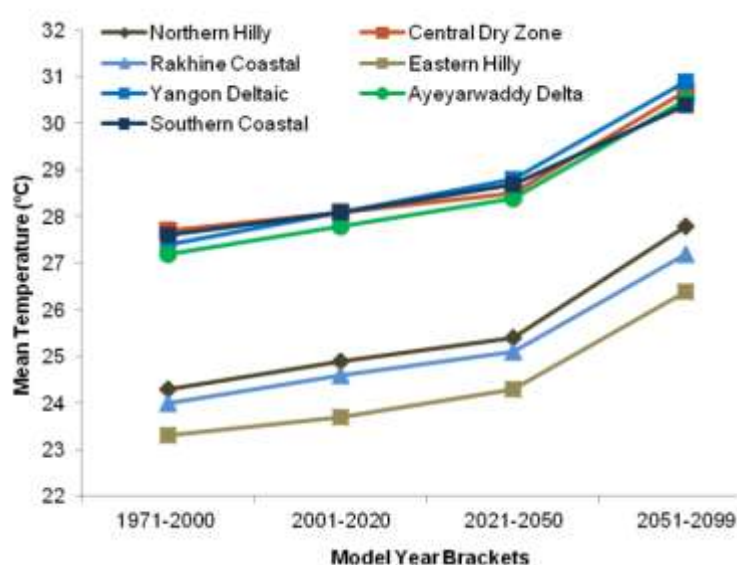
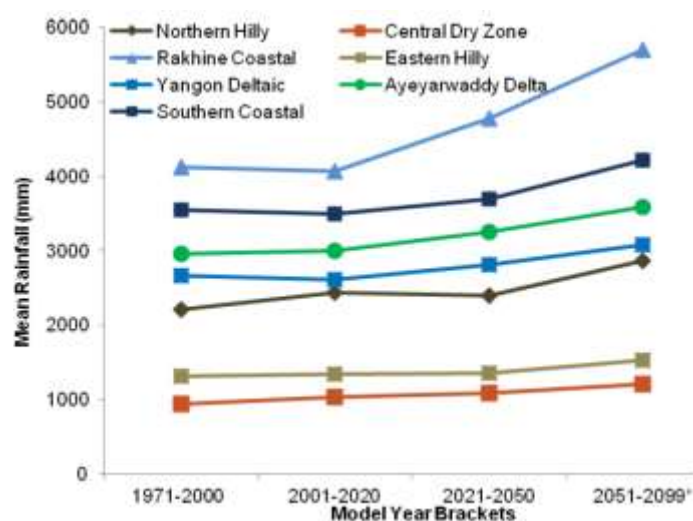


Figure 3 Predicted rainfall trends for the seven physiographic regions in Myanmar (From the Myanmar NAPA, PRECIS model).



The project focus areas in Ayeyarawady, Yangon, Rakhine and the CDZ are predicted to be impacted by increasing rainfall.

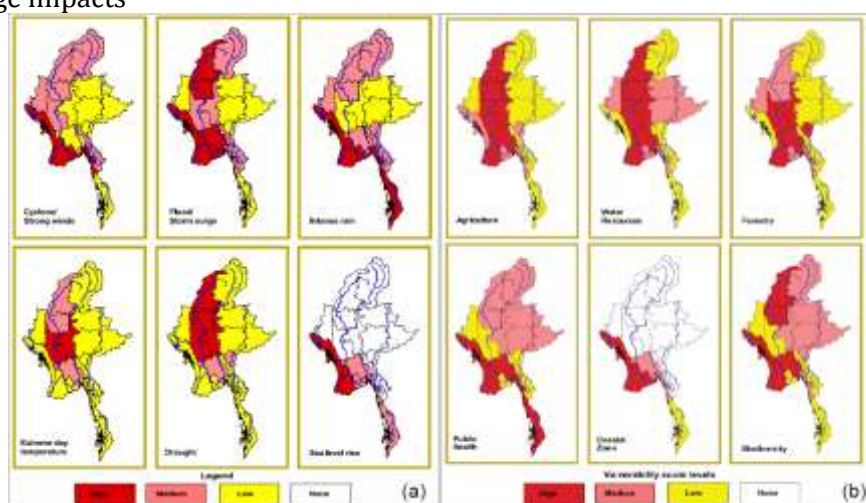
The Myanmar NAPA outlines how the most vulnerable communities occur in all three agro-ecological zones namely the Hilly, Dry and Coastal Zones and are made up of mainly community group members situated in areas of high risk from climate and disaster (Table 1.2, Fig 4). They participate in vulnerable livelihood strategies e.g. farmers, woodcutters, fisher folk, grocery merchants, casual workers, homemakers, NTFPs collectors and retailers. Furthermore, women and children situated in high impact areas (vulnerable areas and regions/states e.g. Table 1.2) e.g. hilly, coastal, river/lake side areas, as well as urban areas will be negatively affected.

Table 1.2. The areas and Regions/States that are most vulnerable to sea-level rise as well as climate change-related increases in occurrence and severity of extreme weather events.

Extreme weather event	Vulnerable areas and Regions/States
Drought	Central Dry Zone - Sagaing, Mandalay and Magway Regions ⁷¹ particularly agricultural land occurring in these areas.
Cyclone/strong winds	Coastal regions - Rakhine, Ayeyarwady and Yangon Regions/States.
Intense rain	Tanintharyi, Yangon, Rakhine, Ayeyarwady and Mon State/Region. These areas have the longest exposure to the south west monsoon flow. Lower Myanmar as well as north-western areas will also be affected.
Flood/storm surge	All low-land and flat Regions as well as rivers and associated valleys and basins. Areas in close proximity to the Ayeyarwady, Chindwin, Sittaung and Thanlwin river systems and coastal areas are particularly at risk to storm surges, hydrological floods, flash floods and river bank overflow associated with snow-melt.
Extreme high temperature	Relatively flat regions in the Central Dry Zone e.g. Mandalay and Magway.
Sea-level rise	Coastal zones, especially areas interspersed with tidal waterways e.g. the Ayeyarwady Delta. In certain areas, it is thought that low-lying coastal areas may face permanent inundation.

These predicted changes will only add to the serious challenges faced by Myanmar's fisheries and aquaculture sectors in ensuring the sustainable use of vulnerable marine and inland aquatic resources. The higher degree of natural variability and the possibility of unprecedented large-scale environmental changes, such as coral bleaching, could affect the aquatic systems profoundly, compounding existing pressures on fisheries and those dependent on them.

Figure 4. (a) Vulnerability of areas and Regions/States to climate change-related increases in intensity and severity of extreme weather events; and (b) the vulnerability of the main socio-economic sectors in Myanmar to extreme weather events as well as a range of other predicted climate change impacts



During project preparation, the likely impacts of the changes mentioned above are still uncertain and ***little is known at present about the specific vulnerabilities of the fishery sectors*** and their dependent communities in terms of impacts on livelihoods, human health and land and water resources.

However, the project preparation phase community consultation findings indicated that there was ***growing evidence of changes directly impacting the fisheries and aquaculture sector reported by communities***. These included:

- Physical/chemical impacts: salt-water intrusion; flooding of fishponds; shortages in water supply; poor water quality; reduced opportunities for fish farming.
- Ecological impacts: changes in species composition, excessive aquatic weeds and algae in fish ponds, which reduce fish growth and fish survival rates, more frequent harmful algal blooms, increased incidence of aquatic animal disease and parasites, changes in predator-prey relationships; and invasive species (Tilapia, African *Clarias gariepinus* catfish, etc.)
- Biological impacts: changes in timing and success of fish migration, spawning and abundance, changes in fish recruitment success, loss of coastal fish breeding and nursery habitats (mangroves, corals, etc.)

These indicators of ongoing change and the results of the predictive models demonstrate the urgency of assessing the vulnerability of the different fisheries and fishing/aquaculture communities to ongoing climate change and variability and taking steps to increase the resilience of those considered most vulnerable.

In a country already facing serious challenges in terms of poverty and food insecurity, with likely gender-specific differences, the country must be well prepared to minimize the risks to fisheries and fish production and to take advantage of any positive impacts that may arise from climate change.

Natural Disasters

Climate change has the potential to have major impacts on fishers and fish farmers through a range of threats to livelihoods and assets¹⁴. Myanmar's fisheries and aquaculture sector is vulnerable to disasters. Several recent experiences with natural disaster have led to significant loss of lives, damage to infrastructure and impact to fishers and fish farmers. Cyclone Nargis in 2008 was the most destructive cyclone in Myanmar's recorded history. The fisheries sector was faced with numerous challenges due to lack of capacity, highly vulnerable of communities, and lack of resilient practices in the region. By example, Cyclone Nargis destroyed 41 foreign vessels, 288 local vessels in offshore fisheries; 1,759 fishing boats in onshore fisheries; 17,876 fishers died and 9,612 are considered missing. It caused damage or collapse of 55 cold storage and processing plants. There was also damage to inland fisheries infrastructure with some 50% of inland fishery operations damaged or destroyed. It brought losses in leasable fisheries, tender fisheries, open and other fisheries and impacted 2,170 acre of fishponds, 36,175 acre of shrimp ponds, and 515 acre of crab ponds¹⁵. MLFRD and DoF recognise the need for both CC adaptation and effective DRM/DRR actions for the sector.

Table 1.3. Hazards profile of Myanmar¹⁶

¹⁴ Myanmar NAPA www.unfccc.int and DMH

¹⁵ MLFRD, *Status of Fisheries and Aquaculture and adaptation on climate change*, power point presentation. 2014

¹⁶ Relief and Resettlement Department, Union of Republic of Myanmar, *Hazard profile of Myanmar*, 2009.

Name of event	Description	Risk Rank ¹⁷
Cyclone	Increased intensity and frequency of cyclones. 1,250 formed in BOB, 90 hit	1
Earthquake	590 events fall in Myanmar and 15 times on above 7 Richter scale. Sagaing and Mandalay event in 2013, Tarlay in 2010 are flesh events	3
Fire	Above 10,000 cases happened between 1980 and 2000	7
Tsunami	2004 Indian ocean Tsunami caused 162boats damaged and 61 died	5
Drought and Dry season	Average temperature increased ~0.08 C per decade (1950-2010). Means temperature (32C -15C). Rainfall has increased average by 29 mm per decade (1950-2010). Monsoon period relatively shorter (180 days in 1970 to 100 days in 2000). Six regions in dry zone experienced decrease in annual rainfall. Average precipitation of dry zone is 740.56 mm.	8
Floods	Increased in occurrence of floods 25 major events (1900-2014)	4
Landslide	10Major landslide happened	9
Storm surge	Average surge high in Bathymetry type is 2 to 5 metres and long for 3 to 10 hours duration. Seasonal wave is about 0.3 m.	6
Conflict*	Long-term armed conflict happening over 60 years, following 1948 Independence. Communal conflicts have caused over 200,000 people to be displaced.	2

* Conflict entails civil unrest between community members over resource/access rights, between communities and armed conflicts between Government and Non-state Armed Groups.

Several climate related risks further threaten the sustainability of aquaculture and of marine and inland capture fisheries developments. Impacts occur because of both gradual warming and associated physical changes as well as from frequency, intensity and location of extreme events. In terms of physical and biological impacts, climate change is modifying the distribution of fresh water species. In general, warm and cold-water species are being displaced, and they are experiencing changes in size and productivity of their habitats. Temperature changes also affect fish physiological processes, resulting in both positive and negative effects on fisheries and aquaculture. Seasonality of particular biological processes such as reproduction, food webs, diseases and invasiveness of species are also affected.

The current vulnerability context--of the natural systems, sectors and dependent communities where these events occur--will play a large part in determining social and ecological vulnerability and resilience to these events. For example, overexploited fisheries resources may not be able to cope with the additional impacts. What this means for the ***sustained productivity, ecosystem resilience and long term future of Myanmar fisheries and aquaculture sectors in light of climate change is currently not well known – nor is it sufficiently considered or integrated into the national approaches advising the development of the fisheries sector.***

Additional and more specific barriers to be addressed by the project are outlined in Prodoc Section 1.2.2.

1.1.3 Institutional and Policy Framework

During the PPG phase of the project an initial rapid organizational capacity assessment was undertaken¹⁸. Fisheries and aquaculture are principally within the mandate of the Fisheries Department (DOF) under the Ministry of Livestock, Fisheries and Rural Development. The Ministry and DOF headquarters are in Naypyitaw (NPT) with offices in the regions and states

¹⁷ UNOCHA Myanmar, *Risk Assessment for Contingency Plan*, 2014.

¹⁸ 2015. FAO Institutional and Policy Analysis of the Department of Fisheries for the project Fishadapt. FAO Myanmar.

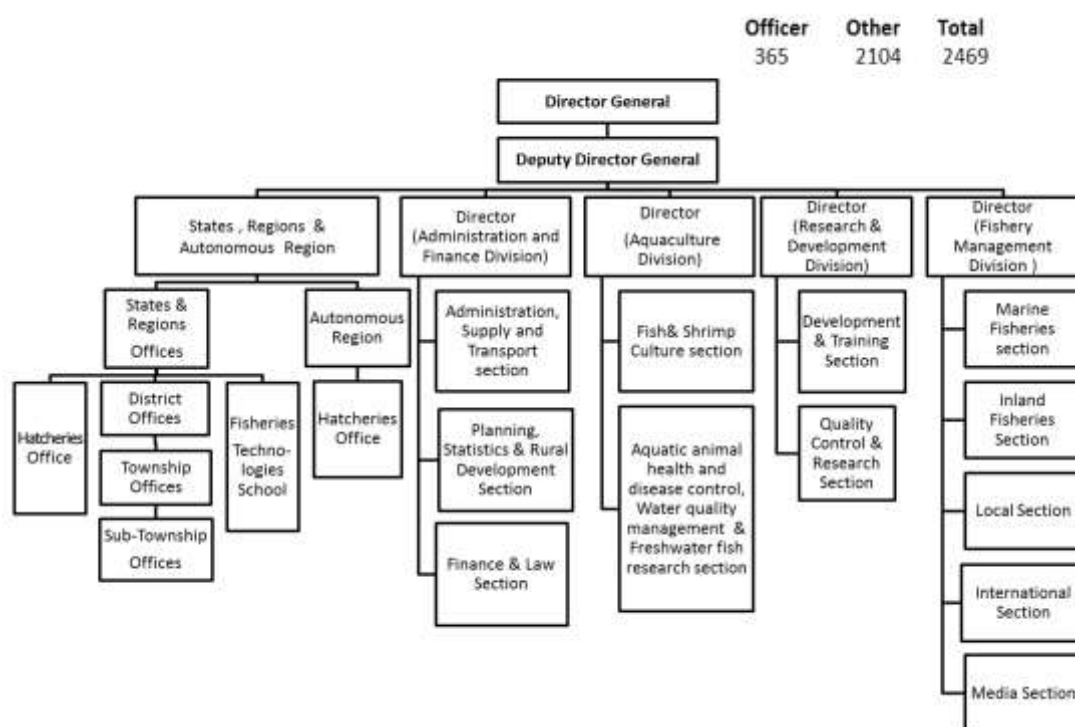
and Districts. The DOF has a staff of just over 2,000 (including officers), posted from Union to Region/State, District and Township level (Fig 5).

Department of Fisheries

DOF is organised into four directorates dealing with capture fisheries, aquaculture, research and development and administration. The responsibilities of DOF for development and management in fisheries are as follows:

- Conservation and rehabilitation of fishery resources;
- Promotion of fisheries researches and surveys;
- Collection and compilation of fishery statistics and information;
- Extension services;
- Supervision of fishery sectors; and
- Sustainability of fishery resources;

Figure 5. Organizational structure of the DOF 2015



The principal functions and activities of DOF are:

- The issuing of licenses for fisheries gear/vessels/sites and aquaculture sites/ventures;
- The evaluation of sites for aquaculture or fisheries;
- The production of fingerlings;
- The stocking of Open Water Fisheries (reservoirs, rivers and other water bodies e.g. community ponds);
- Advising the Minister of Livestock and Fisheries and the Divisional and State Government on fisheries and aquaculture matters;
- Regulating the proper conduct of fisheries and aquaculture (i.e. inspection of fishing gears/sites);
- Inspecting the fish trade;
- Auctioning of Leasable Freshwater Fisheries (This is a key income generating activity for the DOF);

- Administration of water bodies for aquaculture;
- The collection and communication of aquaculture knowledge; and
- Training and extension.

The DOF does not have a specific Climate Change unit although, through its staff work, deal with CC impacts at field level.

The DOF wish to develop capacity to address CC adaptation needs at all levels (see Appendix 13, DOF capacity assessment).

Myanmar Fisheries Federation (MFF)

In 1998, the Myanmar Fisheries Federation (MFF) was created from the Myanmar Fishery Association as part of the ASEAN Fisheries Federation. The organization has national and local coverage; most of the larger farmers are members of the local MFF branch. A Central Executive Committee plays a coordinating role. Annual meetings are held in Yangon bringing together the local MFF branches including fishery operators, fish farmers and related industry representatives. MFF is able to support applications made by its members to undertake fisheries and aquaculture activities. MFF also supports applications to the Livestock and Fisheries Bank for loan applications. Following Cyclone Nargis, MFF has worked with many small-scale coastal fishers in the livelihood recovery effort. The MFF has a membership of more than 34,500 fishers and fish farmers in village level fisheries associations.

MFF does have a Climate Change committee, but no dedicated or specific budget. Through its member networks MFF has identified a range of issues that may be related to CC such as high temperatures, saline water intrusion and exotic species spread.

Whilst MFF and its ***members recognise the threats presented by CC, but they do not have resources to address them.***

Institute of Fisheries Technology (IFT)

The mandate to strengthen individual capacities (i.e. knowledge, skills and competencies) under the DOF is carried out by its Fisheries, Research and Development Institute of Fisheries Technology (IFT) is based in Yangon. It was established through joint collaboration between the Government of Myanmar, UNDP, FAO and DANIDA under the “Institute for Fisheries Technology Project (1980-1983) and built on a 5 hectare site. It has a range of teaching rooms, practical labs and basic research facilities, a library and offices and residential accommodation. The IFT is run by the Government of Myanmar (DOF) under the Research and Development Division. It carries out regular training for DOF staff, fishers and the private sector. There is one Assistant Director, one fisheries officer and twenty staff. Training provided by IFT is broad, and includes: Fisheries Management, Fisheries Laws, Fishing Gears, Producer of Finance and Office responsibility, Resources Conservation, Inspection and Quality Control Training for Export Fisheries Products. It also offers GMP, HACCP courses to upgrade the skills and working knowledge of cold storage factory workers. The objectives of the IFT are outlined in its annual report and include:

- To teach and train advance fisheries technology for fisheries community
- To increase marine and fresh water fisheries product
- To upgrade livelihood of fisheries communities
- To anchor the success of fisheries management systems among the fisheries sector.
- Collaboration and cooperation with International and Regional Organization for research and development of long-term program.
- Training Activities of Institute of Fisheries Technology (IFT)

The IFT has trained 19,692 trainees in 227 training courses in 27 different topics since 1983.

The IFT currently has no courses related to Climate Change Adaptation, nor does it have a CC strategy or plan. The IFT does have an ongoing training programme, and with targeted project support can readily accommodate development and implementation of EAFM, CCA-VA and CC courses.

During the PPG phase consultation a survey of individual capacity development needs of DOF staff and a rapid SWOT analysis were carried out to inform the project design. Discussions with communities also focussed on their perceived needs (Appendix 13). DOF staff in the project pilot areas of Rakhine, Ayeyarwady and Yangon took part in a training needs assessment by survey questionnaire. Results developed identify that the majority of staff are educated to high school Diploma (4%), Bachelor (95%) or Masters (1%) level (though not specifically in fisheries). The top areas for existing and general work-related capacity development identified by staff included fisheries management (100%), the role of fisheries and aquaculture in income generation (90%) and the role of fisheries and aquaculture in food security/production (82%), with similar needs expressed by both men and women. Most staff (65%) also identified monitoring climate impacts on the sector as an important area where they required capacity development. With respect to training approaches required, most preferred workshops followed by hands on training, study tours and technical training.

The SWOT analysis of key issues relating to the project implementation carried out by DOF staff confirmed that the key areas of focus of the project were highly relevant, and included:

- Coordination is seen as important at many levels for project implementation. It does need to be strengthened, and to include stakeholders and partners.
- Organizational structures at all levels (e.g. DOF, households and communities) are an asset, though they need to be strengthened. DOF staff are enthusiastic for the project.
- Existing planning structures are in place (e.g. at township level) which can be strengthened. Assistance in implementation and adaptive management are required.
- CCA policies, plans and strategies for the sector need to be developed
- CCA capacity is missing in the sector (technical and human)
- Some planning does take place but this needs to be strengthened and informed by good data. There are some data but in general, this is also missing at different scales. Research is needed to strengthen the CCA science base, and to inform decision-making.
- Global and national level interest in CC issues is high
- A range of external threats include: Political situation; lack of technical knowledge; lack of awareness by decision makers; limited budget, and; issues around bureaucratic procedures and slow decision making by senior officials.

Universities with fisheries and aquaculture research or teaching

There are around 150 Universities and colleges in Myanmar. All are administered by the Ministry of Education, Ministry of Health or Ministry of Science and Technology. They are organised according to their field of study. Most national universities are in Yangon and

Mandalay. The Universities of Yangon and Mawlamyaing¹⁹ provide teaching and research in coastal aquaculture. These ***Universities provide limited/few aquaculture-related courses in their curriculum***, such as via the Department of Zoology of Yangon University and Department of Marine Science of the University of Mawlamyaing.

The Myanmar Marine University also provides courses on marine engineering.

Since 1998, most fishery business in Myanmar has been carried out by the private sector. Much of the state-owned infrastructure, e.g. fishing vessels, ice plants, processing plants, cold stores, fishmeal plants, canning plants etc. have been sold or leased out to private owners.

Regional and global institutions.

Myanmar is a member of FAO and is signatory to the FAO Code of Conduct for Responsible Fisheries (CCRF). Myanmar is a member of ASEAN. Myanmar is also a member of SEAFDEC, NACA, APFIC and a participating country in the FAO/GEF BOBLME project.

Policy and legal framework

A range of national policies and laws related to fisheries and aquaculture, DRM and climate change are relevant to the Fishadapt project (Appendix 10).

According to a recent review, fisheries legislation has a long history in Myanmar²⁰. The first consolidated rules governing fisheries were enacted in 1875, with the passage of the *Fishery Act* (Act VII of 1875). Prior to the *Fishery Act of 1875*, there were rules promulgated in 1864 and 1872 governing fishery administration, whose main purpose was for revenue generation.

In 1905, the *Fishery Act (Act III of 1905)* was enacted to repeal the earlier law. The 1905 law, however, only applied to Lower Myanmar, until 1912, when application of the *Fishery Act of 1905* Act was extended to Upper Myanmar. There were provisions in the *Fishery Act of 1905*, which specifically dealt with the “protection of fisheries” in Sections 11 to 14. Section 11, for instance, categorically prohibits the “use of any dynamite or other explosive substance in any fishery with intent thereby to destroy or facilitate the catching of fish” (Section 11, Burma Fishery Act (1905)). There were also corresponding penalties for violations under the Act contained in Sections 15 to 26. However, the focus of the legislation was largely on improving fishery revenue and little was done to modernise the fisheries industry. In 1911, in order to implement the provisions of the Fishery Act of 1905, new Rules, referred to Fishery Rule 1911, were promulgated and provided for, among others, “definition, classification and delimitation of the fisheries. The 1911 Rules also provided for disposal of fishing rights in leasable fisheries. The Fisheries Act of 1905 was amended by later pieces of legislation, including: the Burma Act VI(1909), Burma Act VIII (1928), Burma Act V (1934), the Government of Burma (Adaptation of Laws) Order (1937), and the Burma Laws (Adaptation) Act (1940), Burma Act XXVII (1940). Since the 1940s, no additional new laws were enacted until the late 1980s and early 1990s when six pieces of fisheries legislation, referred to above, were passed.

Since 2008, Myanmar has increasingly decentralised key policy and law making aspects to state and region levels. Since 2010, each state and region has had devolved responsibility for the development of local laws for the implementation of the above acts.

¹⁹Also spelt “Mawlamyine”

²⁰ 2011. A review of Myanmar fisheries legislation with particular reference to freshwater fisheries legislation. FAO/APFIC 2011

Currently, Myanmar has a broad policy framework, which states, ***“Our vision is to ensure a sufficiency of fish supplies not only for the present entire national people but also for future generations by conserving of the fisheries resources with sustainable fisheries at all times.”*** To support this vision it has four broad mission/policy statements of:

- Conservation and rehabilitation of fisheries resources;
- Promotion of fisheries researches and surveys;
- Collection and compilation of fishery statistics and information;
- Extension services;
- Supervision of fishery sectors;

Fisheries laws

Policy is implemented through laws and their objectives. The 1954 Fisheries Law (derived from the 1905 Fisheries Law) was repealed and substituted with the following laws relating to fisheries.

- Law relating to the fishing rights of foreign fishing vessels (1989)
- Aquaculture Fisheries Law (1989)
- Myanmar Marine fisheries Law (1990) and
- Freshwater Fisheries Law (1991)
- Law amending the law relating to the fishing rights of foreign fishing vessels (1993)
- Law amending the Myanmar Marine Fisheries Law (1993)

Each Region and State have developed their own law regarding fisheries and aquaculture. Those relevant to the project include Rakhine, Ayeyarwady, Yangon and Dry Zone. Under Section 49 of the 2008 Constitution, Myanmar is divided into the Union Territory and seven States and seven Regions, formerly called Divisions. Regions are predominantly Bamar (that is mainly inhabited by the dominant ethnic group). States, in essence, are regions, which are home to particular ethnic minorities. The administrative divisions are further subdivided into districts, which have further subdivided into townships, wards, and villages.

The Union legislature, called the Pyidaungsu Hluttaw, is bicameral and made up of two houses. The Upper House or House of Nationalities (Amyotha Hluttaw) is composed by 224 seats of which 168 are directly elected and 56 are appointed by the Armed Forces. The Lower House or House of Representatives (Pyithu Hluttaw) is made up of 440 seats. Article 188 of the 2008 Constitution stipulates the division of legislative authority between the Union Government and the Regions and States as follows: ***“The Region or State Hluttaw (Parliament) shall have the right to enact laws for the entire or any part of the Region or State related to matters prescribed in Schedule Two of the Region or State Hluttaw Legislative List.”***

Under Schedule One, all matters relating to marine fisheries fall under the legislative competence of the Pyidaungsu Hluttaw. Schedule Two identifies agriculture and livestock breeding, including freshwater fisheries, as falling within the legislative competence of the Regions and States. It follows from the operation of Schedules One and Two of the 2008 Constitution that the Law Relating to Fishing Rights of Foreign Fishing Vessels 1989, the Law Relating to Aquaculture 1989 and the Myanmar Marine Fisheries Law 1990 come under the legislative competence of the Union legislature (Pyidaungsu Hluttaw), whilst the Law Relating to Freshwater Fisheries comes under the legislative competence of the States and Regions.

As result of the 2008 Constitution, ***freshwater fisheries management issues are now exclusively within the legislative competence of the States and Regions.*** Consequently, any

modification of the law would have to be done through the State/Region legislature. It is therefore necessary to clearly understand the different procedures for the development and adoption of legislation at the Union level and at the State and Region levels.

Notifications

Under the Fishery Law, a number of notifications have been promulgated, including the following:

- The Fisheries notification on prohibition of fish importing' lists fish species that may not be imported, exported, sold or kept in captivity;
- Notification 2/92 protects spawners, breeders and fingerlings of freshwater fishes, specifying those species that it is forbidden to catch, export, kill or keep during the closed season;
- Notifications 8/94 controls trade in mud crabs under section No. 35 of the Aquaculture Law;
- Notification 9/94 defines the measuring systems for crabs, and sets limits;
- Notifications 2/95 and 3/95 prohibit trade in spawners, breeders and juveniles of marine and freshwater prawns, which cannot be caught, exported, sold, killed or kept in captivity in the closed season;
- Notification 5/2001 controls the import, export, culture, production, sale, propagation or possession of the African catfish (*Clarias gariepinus*) under Sections 35 and 20 of the Aquaculture Law;
- The Notification for control of endangered fish species lists all the species of aquatic animals and fish that are protected and included in the list of endangered species in the Convention on International Trade of Endangered Species (CITES);
- Notification 2/2001 protects the Whale shark (*Rhincodon typus*), which is a CITES listed species.

Aquaculture

The Law relating to Aquaculture No. 24/89 regulates the application for aquaculture leases and licences. In addition, the Marine Fisheries Law No 9/1990 and the Freshwater Fisheries Law No 1/1991 contain licensing requirements for aquaculture activities as well.

Land allocation for aquaculture has been a significant constraint on its development through preventing the change of use from paddy to fish pond, for example. The new National Land Use Policy consultation process is underway.

Additional legal frameworks at national level

In addition to the MLFRD two other key institutions have mandate, which covers fisheries, and aquaculture, which are the Ministry of Environment Conservation and Forestry (MOECAF) and the Ministry of Agriculture and Irrigation (MoA). In particular, operation of the Freshwater Fisheries Law interfaces mainly with the Forest Law 1992 and the Wildlife and Conservation of Natural Areas Law 1994.

The Forest Law applies to all "forest land", defined in Section 2(e) of the Law as "land including reserved forest and protected public forest." In practice, a large number of reserve forests are mangrove areas, which are also included in the definition of freshwater fisheries, and aquaculture areas under the Freshwater Fisheries Law and constitute important habitats for freshwater and brackish fish species, which are also regulated under the Freshwater Fisheries Law.

The Wildlife and Conservation of Natural Areas Law 1994 protects some species and areas which also covered by fisheries legislations.

Disaster Risk Management

Myanmar has signed the Hyogo Framework for Action (HFA) in 2005 and is also signatory country of the ASEAN Agreement on Disaster Management and Emergency Response (AADMER), which entered into force in 2009.

The Relief and Resettlement Department is the country focal for AADMER and has been undertaking DRR and DRM initiatives across the country. A National Natural Disaster Preparedness Central Committee (NNDPCC) was constituted in 2009 and reconstituted in 2013. The coordination relating to DRR theme has been undertaken by National Natural Disaster Management Working Committee (NNDMWG). In 2013, National Disaster Management Law was endorsed.

In response to its international commitment on DRR, the Myanmar Action Plan on DRR (MAPDRR) was published in 2009, and officially endorsed in 2012 by RRD. It provides institutional arrangements of DRR in Myanmar in commitment to the HFA (2005-2015) and AADMER. MAPDRR was a multi-hazard approach and covers the whole context of Myanmar. It has identified 64 projects under seven components. Among the projects, MAPDRR further process has identified and prioritized 21 projects to be delivered. The Standing Order of Disaster Management in 2009 outlined the responsibilities of different government ministries and departments in relation to disaster management. Multi hazards monitoring systems in the country has been conducting on flood and earthquake risk assessment in major cities. A national level emergency operation centre (EOC) has been established in 2014 to monitor the hazards and to support in effective emergency response in emergency.

RRD has developed National Disaster Management Courses to provide DRM capacity to government officials from 14 states and regions with the support of Myanmar DRRWG in 2013. National Youth Volunteer program was started in 2013 and 1,300 volunteers to date across 14 states and regions have engaged. Seasonal climate forecast for pre-monsoon and onset monsoon has been undertaken through Monsoon forums since 2007 and sub-national level forums have been started in Ayeyarwady and Mandalay regions. Myanmar government endorsed the country's first Social Protection Strategy in 2014 and DRR has also been counted as a cross cut theme for sustainable development. That strategy has been linked with DRR in building community resilience to disasters and climate change. Progress has been made on policies relating on land use and land ownership in 2013. Different collaboration mechanisms have been started with DRRWG, DPRE, EIE, etc. Implementation of different mechanisms related to AADMER also initiated such as ASEAN Safe School Initiatives (ASSI), ASEAN Committee on Disaster Management Civil Society Organizations Partnership Framework (ACPF).

Analysis of the DOF laws and policies and consultation with stakeholders indicates that ***only in very limited ways do the above frameworks for fisheries and aquaculture directly integrate CCA planning or actions. Disaster risk management is not incorporated into marine capture fisheries management, and issues specific to the sector have not been included in national disaster risk management planning; increasing the vulnerability of the coastal fishing communities as well as coastal fishing infrastructure.***

1.2 Project Rationale (baseline, barriers and incremental reasoning)

1.2.1 Baseline Programs/Projects

The ***government has a limited number of programmes supporting the inland and marine fisheries sector.*** DoF has established an appropriate legal framework and formulated and implemented various strategies for the sustainable development and management of marine fisheries. Fisheries management is pursued by licensing, prescribing exploitable species, designating environmental friendly fishing gears and methods, imposing closed areas and seasons, etc. Insufficient information on the impacts of climatic variables exists and that is required to support adaptive management (e.g. flexible closed seasons and moving marine protected areas). The introduction of a Monitoring, Control and Surveillance (MCS) programme for fishery management is another measure taken up recently by DoF. This programme should provide effective and efficient scientific data acquisition for resources evaluation and management of fisheries in Myanmar. It also provides the basis for effective monitoring and control of fisheries enforcement activities to ensure that only authorized or license-holding fishing vessels operate within the designated areas in the national EEZ.

Currently, no management plans exist for marine capture fisheries; however, the government is working to support the development of one particularly important but at-risk species, Hilsa. In addition, the Norwegian Nansen research vessel is currently planning a large-scale marine ecosystem survey in Myanmar, which will include information on the fish resources, water quality information and habitat mapping.

Fishing communities are located along the coast, and include significant numbers of poor and generally vulnerable people and a high proportion of people dependent on fisheries activities and aquatic products for income and food security. There is a need to understand how food and livelihood security of these coastal communities will be impacted by changes in fish productivity due to multiple drivers of change, including pollution, overfishing, and climate related changes impacting the fish populations.

Since March 2011, the Government of Myanmar has gone through policy reforms and political transition towards democracy, after which the country has attracted foreign and local private investments. Its attention to climate change issues stands at a nascent stage and the National Adaptation Programme of Action (NAPA) to Climate Change has only recently been submitted to the UNFCCC in May 2013. Myanmar is expecting rapid economic progress, including expansion of inland and coastal aquaculture, but has not fully integrated climate change risks into its development strategies

Within the context described above of the current situation with respect to fisheries and aquaculture in Myanmar, the government of Myanmar and development partners are supporting specific baseline programs and projects that are relevant to this additional LDCF investment in climate change adaptation.

This project is designed to be additional to these baseline projects and programs and to build on good practices developed. The key baseline activities include:

Department of Fisheries, Ministry of Livestock, Fisheries and Rural Development (MLFRD)

Myanmar's fishery sector action plan focuses on funding on key issues such as: increasing production of value added fishery products from aquaculture through improved infrastructure and technology investments; conserving fisheries resources for capture fisheries by restricting fishing in critical habitats and developing a fishery vessel monitoring system; establishing modern laboratories to support improved fisheries and aquaculture management. None of Myanmar's baseline funding for fisheries will be focused on understanding vulnerabilities to climate change and enabling the sector to respond in a proactive manner.

Within MLFRD the Department of Rural Development (DRD) Village development programme (VDP) will be implemented at national level. The VDP has allocated resources to each village to implement adopting participator rural appraisal to identify key issues.

These activities are estimated to contribute co-financing of approximately US\$ 4 885 000.

Myanmar Fisheries Federation (MFF).

MFF is a non-profit organization that encourages and promotes the fisheries and aquaculture business of Myanmar. Currently, their work does not include helping their members think about climate change adaptation. LDCF resources will complement this baseline association and networking work with inputs to enable an increased understanding of climate change adaptation challenges among fishers and aquaculture pond owners in Myanmar.

These activities are estimated to contribute co-financing of approximately US\$ 2,000 000.

Worldfish

ACIAR and AusAID Asia Division are financing a four-year project through the Worldfish project “Myanmar's Inland & Coastal Fisheries - Improving Research and Development of Myanmar's Inland and Coastal Fisheries (MYFish)”, running from September 2012 through August 2016. It establishes a partnership between WorldFish and four local Myanmar agencies and institutions: the Department of Fisheries (DoF) under the Ministry of Livestock and Fisheries, the Myanmar Fisheries Federation (MFF), Yangon University, and the Food Security Working Group (FSWG). This ACIAR project addresses the three constraints: (i) the lack of a comprehensive information base on fisheries; (ii) the lack of proven management approaches and technologies; (iii) and limited technical capacity to implement fisheries projects; by improving the management capacity for Myanmar's inland capture and culture fisheries, and by facilitating the emergence of co-management of fisheries and small-scale aquaculture.

Research objectives are to characterize and improve the fisheries sector in the northern (upstream) and southern (downstream) Ayeyarwady Delta areas and to assess the scope for fisheries development in the Central Dry Zone. The first objective of the ACIAR project is to conduct a thorough review of current fisheries practices in the Ayeyarwady Delta and Central Dry Zone. The second objective is to identify and test viable options for improving the fisheries operations in Myanmar, through pilot interventions to test proposed fisheries improvements.

The LDCF project will provide additional investments critical to linking this research to practical field level piloting and testing by fishers and fish farmers in order to inform and improve adaptation actions. This work will provide co-financing of USD 200 000

JICA

The government of Japan through the three-year project, “Small-scale Aquaculture Extension for Promotion of Livelihood of Rural Communities in Myanmar” is part of Japan's overall poverty alleviation development assistance in Myanmar. The aquaculture project built skills and capacity of operating small-scale rice-field fish culture in the targeted five townships in the three designated regions in the southern delta: Ayeyarwady and Bago Regions and Kayin State and Phase II of the project is planned to be implemented in the central dry zone, focusing on aquaculture. This LDCF investment will be designed to complement baseline investments like JICA's in aquaculture to provide additional climate change adaptation capacity and capabilities that are not part of traditional aquaculture support programs including the diversification of aquaculture species, climate proofing farm and cage siting, and promoting integrated systems to reduce vulnerabilities.

This initiative will provide co-financing of USD 450 000 (the total is 50,000 USD less than the original estimate as the project is closing in 2018).

The Livelihoods and Food Security Trust Fund (LIFT)

LIFT is a multi-donor fund established in Myanmar in 2009, initially set up to address food insecurity and income poverty in cyclone Giri-affected areas of Rakhine State in Myanmar and has also supported formulation of National Action Plan of Agriculture and Rural Development. The donors to LIFT are Australia, Denmark, The European Union, France, the Netherlands, New Zealand, Sweden, Switzerland, the United Kingdom, and the United States. UNOPS is the Fund Manager to administer the funds and provide monitoring and oversight for LIFT. LIFT's vision is to be an effective mechanism for channelling aid to local implementing partners to achieve its goal of improving the food and livelihood security of the poor and vulnerable in Myanmar.

LIFT has three relevant programmes for the Fishadapt from 2015 which increase the original estimate of co-finance to 5 MUSD. These are under the Delta 3, Dry Zone and Financial Inclusion projects. These development baseline investments will form a key part of this project's baseline program and include:

- Promoting Sustainable Growth of Aquaculture in Myanmar to Improve Food Security and Income for Communities in (ICLARM) the Ayeyarwady Delta and the Central Dry Zone (WorldFish US\$3,280,000)
- Natural Resource Management, Livelihood Resiliency and Sustainability Project in Kyaukpyu (Better Life US\$1,000,000)
- Agrifood Value Chain Development in Myanmar: Implications for Livelihoods of the Rural Poor (Michigan State University US\$ 720,000).

This fund and its projects will contribute co-financing of USD 5,00,000.

FAO

The FAO and the Government of Myanmar share a long history of cooperation in their respective pursuits to eradicate hunger, malnutrition and poverty through agricultural and rural development.

The 2012-2016 FAO Myanmar country program has identified seven priority outcomes covering a number of priority areas: food and agricultural production including fisheries and forestry sub-sectors, food security, food safety, human resource development, land use and land management, sustainable management of natural resources, preparedness for and mitigation of disasters and climate change. One such example is the Environmentally Sustainable Food Security Programme (ESFSP) "Support to the immediate rehabilitation of farming, coastal fisheries & aquaculture livelihoods in the cyclone Nargis-affected areas of Myanmar" (GCP/MYA/012/ITA), which was funded by the government of Italy and has been implemented since January 2010. The project aims at sustainable improvements in household food production, nutritional status and income-generating activities among households and communities that comprise landless, marginal and small-scale farmers and fishers in the cyclone-affected townships of Bogale, Labutta and Pyapon.

Relevant activities under this program, including an FAO Technical Cooperation Programme project "Implementation of the National Adaptation Plan of Action (NAPA) in the Fisheries and Aquaculture Sector of Myanmar", and under development the technical cooperation projects on

improving statistics and Tilapia culture will provide an estimated US\$ 200 000 in co-financing to the proposed project (increasing slightly on the original estimate). In addition the FAO TCP on statistics and Tilapia will provide co-financing to the project.

FAO will also provide technical backstopping to the project by staff from HQ and the Bangkok Regional Office.

In total, FAO co-financing will provide US\$ 350 000.

1.2.2 Remaining barriers to address threats on CC vulnerabilities

Despite the baseline programs and projects described above, there remain key barriers that prevent stakeholders from taking adequate action to reduce vulnerability to impacts of climate change and increase resilience in Myanmar's fisheries and aquaculture sector.

The following summarizes the logic underlying the design of this proposed LDCF investment, beginning with the key barriers preventing stakeholders from adapting to climate change in Myanmar's fishery and aquaculture sector. The main contributing issues and causes related to each barrier are then summarized along with the key measures to address these in order to enable stakeholders to overcome them.

Barrier 1. Lack of climate resilient sector policies, and limited integration of fisheries specific climate responses into national policies

During the project preparation phase, analysis of fisheries and aquaculture policies and laws in Myanmar showed that these do not include reference to climate change adaptation or resilience at any level. This includes laws and strategies at National (Union) and decentralised Subnational level (State/Region). Fisheries and aquaculture are not mentioned in other sector laws and policies.

This gap is recognised by the government and sector and is a key element of the project. Capacity to analyse and develop policies and laws will be strengthened in order to respond to the demands of the decentralised government arrangements.

There is also a lack of capacity to carry out policy monitoring, evaluation and feedback at all levels. There are no feedback systems on climate change impacts on fisheries and aquaculture within DoF, from national to local level.

Within the sectors there is limited capacity to carry out systematic analysis of the climate change related vulnerabilities in Myanmar

Weak coordination among relevant government agencies at all levels but also within the sector generally is recognised as a significant contributor to this barrier. Whilst some coordination mechanisms exist within government and MFF (at each administrative level) and within partners through Worldfish and LIFT for example, these do not systematically address Climate Change Adaptation.

National policies for fisheries and aquaculture need strengthening in relation to climate change adaptation to enable sector-specific actions as well as to ensure coordination with other sectors. Furthermore, the current reform process within Myanmar has led to decentralization of policy making to sub-national and township level where current capacity is weak. These issues are recognized by the government and, whilst initiatives to review and develop high level policy are underway, they do not focus on specific sectors such as fisheries and aquaculture.

The sector does not have the investment to develop the capacity in order to carry out policy – law consultations and mainstreaming.

This barrier is addressed principally through project component 1

Barrier 2. Lack of capacity and resources within the sector to support communities in planning and responding to climate related stressors and fisheries and aquaculture adaptation to climate change impacts.

Currently the institutional and organisational capacity (technical, policy, human and financial) within the fisheries and aquaculture sector to support communities in understanding, planning and adapting to climate change are weak. This includes government, Universities, NGOs and CBO's, private enterprise, markets and communities themselves.

At a technical level, the sector does not have the capacity or tools to carry out participatory, cross sectoral integrated, vulnerability assessment and planning with communities. The sector is unable to generate the necessary EAFM or EAA frameworks to support either fishery management planning or Aquaculture spatial planning in support of climate change adaptation. There is therefore no mechanism for the engagement of fishers, fish farmers or those with dependent livelihoods in sector planning in general. Without the development of these frameworks, climate change adaptation planning and implementation will not be effective.

Even with the required frameworks in place, the sector still does not have the appropriate adaptation technologies and approaches with which to respond to the impacts of climate change. Once specific needs have been identified at community level the technologies and approaches need to be developed, piloted and evaluated in a systematic way before scaling up.

The sector does not have the financial resources to undertake the piloting, development and up scaling of participatory (EAFM/CCA/VA) plans with communities including NGOs and CBO's, private enterprise and markets.

The project will address this barrier through Components 1, 2, 3 and 4 in developing this capacity and appropriate adaptation technologies and practices. It will carry out large-scale piloting and implementation of these plans in at least 120 communities in three States/Regions.

Barrier 3 Limited knowledge sharing and communication within the sector and with fisheries and aquaculture dependent communities lack understanding on the issues of climate change and their impacts on fisheries and aquaculture and its consequent effects on their livelihoods.

The fisheries and aquaculture sector of Myanmar currently has no documented experience in understanding climate change vulnerabilities and adaptation options specific to its situation. It has not yet generated lessons, studies, good practice and communication mechanisms to deliver such information to stakeholders.

Only limited mechanisms exist for the various stakeholders to share their information of climate change and adaptation technologies, practices and knowledge to promote resilience within the sector across the country. Specific mechanisms to provide this information services to communities are not present. There is therefore limited understanding of possible adaptive responses in the fisheries sector in Myanmar.

The sector has limited information and analytical capacity with respect to data collected in relation to climate change adaptation.

A key element of this barrier is a lack of broad environmental monitoring capacity (for CCA) within DOF and other responsible ministries as well as the private sector. There are not structures or mechanisms in place to identify potential indicators, monitor them or report findings and early warning. Whilst the mandate for hydro-meteorological monitoring lies with DMH, the mechanisms to collect and communicate fisheries and aquaculture sector specific information are not present. This will be addressed in Component 4.

1.2.3 Incremental/additional reasoning (added value of the project in particular the GEF/LDCF/SCCF financing)

Without the GEF project, the fisheries and aquaculture sector in Myanmar will remain vulnerable to and be unable to adapt to the impacts of climate change. More specifically, the communities that rely on fisheries and aquaculture, including those with dependent livelihoods and those that rely on fish for food and nutrition security, will be unable to plan for or to respond to climate change.

Without the project government and sector partners will remain unable to provide the broad support needed to the sector at all levels. There will be no coordinated climate change adaptation response within the sector and with other sectors. They will be unable to develop and implement participatory climate change adaptation plans and policies with fishing and fish farming communities. The sector will be unable to generate adaptation technologies and approaches in response to the community needs and vulnerability assessments. No knowledge generation systems or networks to disseminate and inform will be developed.

With the GEF project and the co-funding provided the sector will be able to address the key barriers identified and support achievement of the CCA objectives to meet its NAPA targets and reduce Myanmar's climate change vulnerability, increase its' adaptive capacity and improve the transfer of relevant adaptation technology. In particular, the project will:

1. Develop capacity at all levels to foster transformative fisheries and aquaculture sector adaptation and development not only within the MLFRD/DOF, but also among other relevant government and private agencies.
2. Enable climate change policy development and capacity building including national level vulnerability assessment of climate change risks facing the fisheries sector. The project will focus on the development of fisheries sector-specific adaptation policies and strategies, which fall outside the scope of other initiatives and will pay particular attention to the climate proofing of aquatic animal health and biosecurity frameworks.
3. Fishers and fish farmers' resource-tenure and access rights form a key theme within the project policy development activities. The project will strengthen coordination through existing and new networks and structures and work closely with other policy development initiatives. Appropriate priority government policies and strategies will be supported at relevant, national, state, and regional administrative levels across the country. Capacity of stakeholders at all levels and across the sector will be supported through a wide range of capacity building activities.
4. The project financing will strengthen the capacity of local communities including field level agents (DoF and other relevant agency) staff to the extent they can assess, plan and identify adaptive measures to reduce climate change risks. Promotion of appropriate technologies and approaches including information based on specific different sensitive ecological settings of the country that enhance fisheries and aquaculture productions and community livelihoods in the face of climate change impacts.
5. Develop and promote appropriate technologies and approaches including information based on specific different sensitive ecological settings of the country that enhance fisheries and aquaculture productions and community livelihoods in the face of climate change impacts.

The adaptation benefits provided by the project are summarised in *Section 2.3*

1.3. FAO's comparative advantages

FAO is the United Nations agency with competency in all areas of fisheries and aquaculture, and enjoys a worldwide reputation, including with its 191 member countries, for the quality and effectiveness with which it is fulfilling its mandate. Its Fisheries and Aquaculture Department provides technical inputs to the Committee on Fisheries (COFI) which is presently the only global inter-governmental forum where major international fisheries and aquaculture problems and issues are examined. COFI is also used as a forum in which global agreements and non-binding instruments are negotiated. FAO has a long and successful track record of building capacity and promoting regional collaboration in fisheries, through its country offices and also its technical/administrative support to RFMOs, including those under FAO's constitution including the Asian Pacific Fishery Commission, IOTC and others. FAO has also developed instruments setting global standards for fisheries management, fighting IUU and bycatch. It has also led work on implementing an ecosystem approach to fisheries and has produced codes of practices and standards related to product safety and responsible trade, including guidelines for the Eco labelling of fish and fishery products. FAO holds a leadership role in global fisheries information with the Coordinating Working Party on Fishery Statistics Secretariat for fishery statistical data standards, the Fishery Information Resources Monitoring System Secretariat which coordinates fisheries status and trends information sharing partnership, and chairs the iMarine initiative which promotes innovative distributed data infrastructure in support to the ecosystem approach to fisheries management and conservation of marine living resources.

FAO has long and deep experience in working in the fisheries and aquaculture sector development in the Asia Pacific Region and its strong leadership and scientific capacity in the thematic area are exemplified in Expert Workshop on Climate Change Implications for Fisheries and Aquaculture held in 2008. In recent years, FAO's Fisheries Department and the Regional Office for Asia and the Pacific have been instrumental in providing guidance for member countries in the areas of climate change adaptation and mitigation in the fisheries and aquaculture sector. FAO/Asia-Pacific Fishery Commission (APFIC) regional workshop: Implications of Climate Change on Fisheries and Aquaculture: Challenges for Adaptation and Mitigation in the Asia Pacific Region held in 2011 and a review work: the Fisheries and Aquaculture Sector in National Adaptation Programmes of Action: Importance, Vulnerabilities and Priorities published in 2011 and the "Assessing climate change vulnerability in fisheries and aquaculture: Available methodologies and their relevance for the sector" published in 2015, among many others, exemplify FAO's focus and commitment in assisting the countries achieving NAPA priorities in the fisheries and aquaculture sector in the region.

FAO has a long history of partnership with the Government of Myanmar in its quest to eradicate hunger, malnutrition and poverty through the development of the agriculture sector including the fisheries and aquaculture sector.

FAO's Regional Office for Asia and the Pacific, together with ACIAR and Network of Aquaculture Centres in Asia-Pacific (NACA), fielded an aquaculture and inland fisheries mission to Myanmar in 2002. FAO has supported the Government of Myanmar with immediate rehabilitation of farming, coastal fisheries and aquaculture livelihoods in the cyclone Nargis-affected areas of Bogale, Labutta and Pyapon townships from 2009 to 2013, which activities are integrated with Italy-funded Sustainable Small-Scale Fisheries and Aquaculture Livelihoods in Coastal Mangrove Ecosystems project. FAO also took lead in developing and is implementing GEF-funded Bay of Bengal Large Marine Ecosystem Project (BOBLME) from 2009 through 2014, covering trans-boundary marine/coastal areas of eight countries including Myanmar.

FAO has conducted highly successful initiatives on Small-scale fisheries and aquaculture and on resilience. (Section 1.5, below).

In addition, FAO has extensive experience facilitating capacity development processes including support to overcoming capacity gaps of countries and stakeholders in order to strengthen national capacities to address root causes of hunger, food security and malnutrition.

1.4 Participants and other stakeholders

The PPG phase of Fishadapt has consulted broadly and carried out an in-depth stakeholders' analysis of stakeholders at all level. The project will principally benefit small-scale fishers and fish farmer's vulnerable to climate change. Women and vulnerable groups will be targeted through specific strategies.

Table 1.4. Key stakeholders and their relationship to the project.

Key stakeholders	Mandate and Relevant Roles in the Project
Local and indigenous Community	
Fisher, fish farmers and those with dependent livelihoods including women and vulnerable groups	<p>Fishers and fish farmers and those with dependent livelihoods (including the private sector) will be involved in the project mainly through participation in climate change adaptation planning and co-management of the resource but also in other project activities.</p> <p>Their interest in the success of the project is that their income/livelihood will be made more resilient to the impacts of climate change through sustainable management of the resources and the new adaptation practices and technologies developed.</p> <p>They will influence the outputs of the project through their level of commitment and change in behaviour (i.e. participation in planning and management and compliance with strategies and plans developed regulations).</p> <p>Women will benefit from the project through targeted planning, capacity development and livelihood activities.</p> <p>Youth will be involved at community level as facilitators and will be trained and supported by the project.</p>
Secondary Stakeholders Government	
Ministry of Livestock, Fisheries and Rural Development (MLFRD):	<p>The Ministry of Livestock, Fisheries and rural Development has the mandate to develop rural areas and improve the socioeconomic well-being of the rural populace, and; to narrow down the development gap between urban and rural areas. Its policies relate to sustainable rural development, food security and food safety. It has a range of tasks relevant to these objectives.</p> <p>MLFRD hosts the Department of Rural Development, the Department of Livestock and Department of Fisheries, and the University of Veterinary Services.</p> <p>MLFRD, through the DOF (see below) is the partner Ministry for the project and will provide the main institutional home and particularly in regard to law and policy change. Staff of the Ministry will benefit through capacity development, policy/law development and national climate change planning. .</p>
Department of Rural	The Department for Rural Development has a broad mandate for the

Development (DRD)	development of the rural economy. The project will coordinate and collaborate with the Village Development programme (VDP) to ensure effective integration of fisheries and aquaculture adaptation planning in their programme. Staff from the DRD will benefit from cooperation with DOF and will be trained in fisheries and aquaculture CCA VA and planning.
Department of Fishery (DoF)	DoF is responsible for fisheries management and development. It is organized with four divisions: Aquaculture, Fisheries Revenue and Supervision, Fish Inspection and Quality Control Inspection and Administration and Finance. The project will be hosted in the DOF. Staff from the DOF will form part of the implementing team. The DOF staff will benefit through significant capacity development and the project's assistance to achieve their sustainable management objectives for the sector.
Institute of Fisheries Technology (IFF)	The mandate for Capacity Development (CD) under the DOF is carried out by its Fisheries, Research and Development Institute of Fisheries Technology (IFT) based in Yangon. It has a range of teaching rooms, practical labs and basic research facilities, a library and offices and residential accommodation. The IFT is run by the Government of Myanmar (DOF) under the Research and Development Division. It carries out regular training for DOF staff, fishers and the private sector. There is one Assistant Director, one fisheries officer and 20 staff who provide broad but relevant training. The IFT will benefit by being the main training partner for the project. Courses will be developed in a range of areas including policy mainstreaming and consultation, EAFM –CCA, EAA-CCA and the technical approaches developed by the project
Ministry of Environmental Conservation and Forestry (MoECF)	The Department of Forests is also a key stakeholder for fisheries sector, as it needs to collaborate and cooperate with fisheries sector in mangrove integrated aquaculture and mangrove conservation, which serves as spawning and feeding ground of aquatic organisms. MoECF also houses the GEF OFP, and with whom regular updates on project progress will be provided.
Ministry of Agriculture and Irrigation (MoAI)	There are collaborative activities the project will undertake with MoAI re: integrated paddy -fish farming, as well as dialogue and development of solutions on conflicts in inland fisheries and freshwater aquaculture. (Land and water use problems are often addressed in collaboration with Water Utilization Department and Land Record Department, and which is under MoAI).
Department of Meteorology and Hydrology (DoMH), Ministry of Transport	The DoMH is the NAPA focal point for Myanmar, and as such will serve an important advisor to the project's adaptation work.
Myanmar Fisheries Federation (MFF)	Founded in 1989, MFF represents the interests of member enterprises and associations of the fishery industry of Myanmar. MFF works closely with MLF, and is one of the highest national level NGO/NPO partnership in Myanmar--and the only one concerned with fisheries. MFF has sub-federations at all township, districts, state/region levels. It also includes sub-associations specialized in: (1) freshwater aquaculture; (2) offshore capture fisheries; (3) inland fisheries; (4) fish and fishery product export; (5) fish feed; (6) shrimp culture; (7) eel culture and export; and (8) crab culture and export.
Local universities	National Universities such as the Marine Science University and Yangon University play important roles in the fisheries sector with particular reference to aquaculture, fish seed production and sea-farming through research and education, and will continue to collaborate with the project.
Community Based	A range of CBO's, formal and non-formal have and will continue to play an important role in the project. These include village and community groups such

Organisations (CBO's)	<p>as fishers, small-scale processors and women's groups. Within each village, and in coordination with other stakeholders, the project will continue to work with existing NGOs and CBOs (e.g. Village Fisheries Societies), whether they be fisheries specific or not. Where feasible, Letters of Agreement or similar arrangements will be developed with relevant civil society groups (see Table 4.1 for specific and currently foreseen entry points) to assist project activity implementation, including but not limited to mobilization of fisheries management groups; the preparation of adaptation plans; improving sustainable practices for post-harvest fisheries; preparing plans for mangrove rehabilitation; and in selecting and introducing sustainable livelihood opportunities (e.g. resilient aquaculture).</p> <p>The project is designed to strengthen the capacity of the participating communities and supporting CBOs to jointly plan and manage community-based adaptation plans. Community mobilization and capacity development activities will—where possible--be undertaken by local NGO/CBOs and will work to strengthen the CBOs themselves. The project has coordinated partnerships with related initiatives (e.g. LIFT) which will also support. By example, management and monitoring training, trainings on the ecosystem approach to fisheries and aquaculture, trainings on the use of environmental monitoring systems and adapted gears and processes are foreseen and where the CBO will also facilitate fisher-to-fisher and farmer-to-farmer sharing of information across the communities. The role of women in CBOs is notably supported, and specific women's groups will be formed as appropriate.</p> <p>The community groups and CBOs are and will also remain an integral part of the policy and legal development consultation processes of the project, and will help ensure the project remains relevant, that local adaptation needs are accounted for, ownership of solutions is apparent, and that critical community inputs inform the shape of regional/state and local institutional frameworks.</p>
Agencies	
WorldFish Centre	As a member of the CGIAR Consortium, WorldFish is an international, non-profit research organization that aims to improve the livelihoods of the poor and vulnerable through generation of knowledge and capacity building. Worldfish is a co-financier and partner to FishAdapt, and its work in policy consultation, the development of good practice and lessons learned in the CDZ, research are advise are important to informing project implementation,
Network of Aquaculture Centres in Asia-Pacific (NACA)	NACA is an intergovernmental organization that promotes rural development through sustainable aquaculture in the region through capacity development, collaborative research and network building to share aquaculture related knowledge. Myanmar is one of its 18 member governments. FAO is a non-voting member of its Governing Council. NACA will support through the sharing of lessons learned.
Southeast Asian Fisheries Development Centre (SEAFDEC)	SEAFDEC is an autonomous inter-governmental body, with a mandate “to develop and manage the fisheries potential of the region by rational utilization of the resources for providing food security and safety to the people and alleviating poverty through transfer of new technologies, research and information dissemination activities.” Myanmar is one of the 11 member countries. SEAFDEC will support the project through capacity development and the sharing of lessons learned.
Food Security Working group (FSWG)	An umbrella group of national and international NGOs, relevant to proposed food-security consultations. Though their activities do not specifically target fisheries, the issue of climate change adaptation, fisheries and food security are important to them going forward. The FSWG will be involved in the project

	through coordination.
Livelihoods and Food Security Trust Fund (LIFT)	The Livelihoods and Food Security Trust Fund (LIFT) is a multi-donor fund established in 2009 to improve the lives and prospects of poor and vulnerable people in rural Myanmar. Donors to the fund include: Australia, Denmark, the European Union, France, Ireland, Italy, the Netherlands, New Zealand, Sweden, Switzerland, the United Kingdom and the United States of America. From the private sector, the Mitsubishi Corporation also contributes to the Fund. LIFT is managed by UNOPS, who administer the funds and provide oversight and monitoring. LIFT are involved in the project as a cofinance partner, and will provide coordination support and in the dissemination of project lessons learned and good practice.
National and International NGO's/iNGO's	Currently there are over 149 NGO's working in Myanmar. Specifically relevant to the Fishadapt project are the 50 who work in Agriculture and 54 who work in Livelihoods. These NGO's will benefit from working with the project, its capacity building, access to new adaption technologies and approaches, as well as potential mobilizing project resources to implement shared core activities and local capacity development.

1.5. Lessons learned from past and related work, including evaluations

The project benefits from FAO's ongoing global and regional programmes in fisheries and aquaculture.

The project is closely related to other fisheries and aquaculture development projects that have been planned and implemented by MLFRD and DOF with the assistance of FAO. These related projects and programmes have aimed at support to development of the sector. Many were in response to natural disasters such as the 2004 Asian tsunami and cyclone Nargis. All FAO project are evaluated and where appropriate lessons and technical guidance developed and shared.

The FAO response to Nargis covered all areas of the organisations mandate but also focussed on fisheries and aquaculture. FAO provided a wide range of support including damage and needs assessment, response planning. Long-term recovery planning, coordination, provision of livelihoods assets, capacity development, and technical advice. FAO adopted an integrated/ livelihoods approach to delivery. For the fisheries sector a range of technical advice was provided to support partners and government in sustainable management of the fisheries. For the fisheries and aquaculture sector a key project has been the Italian Government supported "Environmentally Sustainable Food Security Programme (ESFSP) component ***Sustainable small-scale fisheries and aquaculture livelihoods in coastal mangrove ecosystems*** (GCP/MYA/010/ITA). Whilst providing support over a wide range of issues it has developed the successful "Village-based Freshwater Fisheries Co-management Approach for an Open Fishery" in 20 Villages of Ayeyarwady Region. Lessons from the development of this approach have been instrumental in developing the EAFM/CCA approach adopted by the project.

On a broader level, FAO has also supported LIFT and investment planning (such as the Tat Lanh programme). A full list of recent relevant programmes and projects run by FAO in Myanmar is given in Appendix 8.

These projects have developed a range of technical advice for the sector including Safety at sea, fisheries Co management, statistics and aquaculture good practice.

At present, a number of development partners and agencies have shown a keen interest in the sustainable development of the fisheries and aquaculture sectors in Myanmar. These include UNDP, ADB, and JICA and a number of INGOs and NGOs (Appendix11).

FAO also has relevant programmes in the region, which generate lessons and good practice in relation to fisheries management and aquaculture. These include the BOBLME, Safety At Sea (Sweden), Nansen and work undertaken with BOBP-IGO

Regional partners such as the BOBP-IGO, SEAFDEC, NACA, and APFIC, MFF, IUCN/RAMSAR have all generated lessons relevant to the project and Myanmar

With respect to climate change fisheries and aquaculture, and DRM, Myanmar has participated and shared experiences in two regional meetings.

The global FAO Climate Change projects supported by Norway, Japan, and CCA further provide lessons coordination and information sharing.

1.6. Links to national development goals, strategies, plans, policy and legislation

1.6.1. Alignment with national development goals and policies

This LDCF project clearly supports the Government of Myanmar national development frameworks and national policies on Agriculture and Fisheries and Aquaculture. The relevant Policies and Strategies are listed in Appendix 10. These include at a strategic level the Millennium Development Goals which the government is signatory to and a number of Development strategies to support implementation. These include the National Sustainable Development strategy (2009) which has specific targets related to sustainable fisheries and aquaculture and management of natural resources, and the Fifth National Economic and Social Development Plan (2011/12-2015/16) provide targets on for agriculture, livestock, and fishery sectors. The National Strategy on Rural Development and Poverty Alleviation (2011) has priority areas related to fisheries production and environmental conservation.

The National Commission for Environmental Affairs (NCEA) has directed the work for conservation and protection of the environment. In addition, Myanmar has signed and ratified biodiversity conservation on climate change.

With respect to the commitments of the government of Myanmar to the CBD, the proposed GEF project is in line with the four priority areas which include (i) Buffering marine habitats and sustaining fish populations under climate change conditions through community-based MPA management and ecosystem sensitive fishery practices at the Sister Group Islands of the Myeik Archipelago, (ii) mainstreaming ecosystem-based climate change adaptation for buffering rural communities against climate change impacts into policy, planning and relevant projects in Ayeyarwady, Sagaing and Mandalay (iii) buffering marine habitats and sustaining fish populations under climate change conditions through community-based management and ecosystem sensitive fishery practices at Wetthay Chaing (bay) coastal area, and (iv) buffering marine habitats and sustaining fish populations under climate change conditions through community-based management and ecosystem sensitive fishery practices at the Thameehla Island, Ayeyarwady Region. The United Nations Development Assistance Framework (UNDAF) in Myanmar clearly sets out climate change as a key delivery area, and specific activities are mainstreamed through the framework. The FAO Country Programme framework supports the UNDAF in food security and agriculture (including fisheries and forestry).

1.6.2 Alignment with NAPA, NAPs, NBSAP, NIPs, NAMA

Myanmar ratified the UNFCCC and submitted its NAPA in 2013. Specifically the project addresses the NAPA priorities of Coastal Zone and Biodiversity, which directly concern the fisheries and aquaculture sector. With respect to the Coastal Zone sector, the proposed GEF project is consistent with all four priorities: (i) adaptation to climate change through Integrated Coastal Zone Management (ICZM), (ii) community-based mangrove reforestation for building climate-resilient ecosystems and rural livelihoods in degraded coastal areas in the Rakhine State, (iii) community based eco-friendly aquaculture systems (e.g. mud crab, clam, shrimp and tilapia) for enhancing the climate change resilience of rural livelihoods and supporting the recovery of mangrove forest ecosystems and (iv) small-scale aquaculture and mangrove buffers demonstration sites for transferring adaptation technologies to Mon and Tanintharyi coastal communities.

There is still no manifest source of national policy and strategies with regard to CCA on fisheries sector. However, Myanmar DOF is actively participating in the regional workshops on CCA inaugurated by FAO-RAP.

The development of the National Adaptation Plan (NAP) is fully supported by the project and a range of capacity building and enabling activities will be carried out to support this process.

Myanmar has also outlined its Intended Nationally Determined Contribution (INDC, 2015). This highlights how increasing climate-induced hazards, significant exposure, and vulnerabilities to climate change make climate change adaptation, resilience building, and disaster risk reduction (DRR) priorities for the country. The INDC is supportive of Myanmar's NAPA which identified short, medium and long-term priority actions in the sectors in: i) agriculture (the sector includes fisheries); ii) early warning systems; iii) forestry; iv) public health; v) water resources; vi) coastal zones; vii) energy and industry; and viii) biodiversity.

1.6.3. Alignment with GEF focal area and/or LDCF/SCCF strategies

The project is aligned to the LDCF goal to support developing countries to become climate resilient by promoting both immediate and longer-term adaptation measures in development policies, plans, programs, projects, and actions. It will reduce absolute economic losses at country level due to climate change, including variability.

Table 1.5. LDCF strategy areas, outcomes, and outputs supported by Fishadapt

LDCF/SCCF Objective	Expected LDCF/SCCF Outcomes and Indicators	Fishadapt outputs
CCA-1: Reducing Vulnerability: Reduce vulnerability to the adverse impacts of climate change, including variability, at local, national, regional and global level	Mainstreamed adaptation in broader development frameworks at country level and in targeted vulnerable areas	Adaption mainstreamed into fisheries and aquaculture sector policies, laws and strategies at national and local level.
	Outcome 1.2: Reduced vulnerability to climate change in development sectors	Vulnerability of fisheries and aquaculture sector to climate change reduced. Physical, natural and social capital strengthened in pilot regions (Ayeyarwady, Rakhine, Yangon and CDZ)
	Outcome 1.3: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas	Livelihoods of vulnerable fishing and fish farming communities strengthened.
CCA-2: Increasing Adaptive Capacity: Increase adaptive	Outcome 2.1: Increased knowledge and understanding of climate variability and change-induced	Vulnerability assessments for the fisheries and aquaculture sector carried out at national, state region

capacity to respond to the impacts of climate change, including variability, at local, national, regional and global level	threats at country level and in targeted vulnerable areas	and local level.
	Outcome 2.2: Strengthened adaptive capacity to reduce risks to climate-induced economic losses	Adaptive capacity of existing fisheries and aquaculture networks strengthened.
	Outcome 2.3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	Awareness of climate change risks and adaptation approaches in participating populations raised.
CCA-3: Adaptation Technology Transfer: Promote transfer and adoption of adaptation technology	Outcome 3.1: Successful demonstration, deployment, and transfer of relevant adaptation technology in targeted areas	Adaptation technologies and practices developed for fisheries and aquaculture.
	Outcome 3.2: Enhanced enabling environment to support adaptation-related technology transfer	Capacity development for sector at all levels in adaptation technology transfer.

1.6.4. Alignment with FAO strategic framework

The project is fully aligned to FAO's strategic framework and specifically Strategic Objective 2 (SO2) to Increase and improve provision of goods and services from agriculture, forestry and fisheries in a sustainable manner. The project is also aligned to FAO's Blue growth initiative.

The project is fully aligned to FAO's regional result/Priority Area E. *Coping with the impact of climate change on agriculture and food and nutritional security* and C. *Enhancing equitable, productive and sustainable natural resource management and utilization*.

The project is fully aligned to FAO Myanmar's Country Programming Framework Outcomes including:

- *Outcome 1.* Increased agricultural production to enhance food security,
- *Outcome 2.* Improved food safety and quality ,
- *Outcome 3.* Sustainable management of natural resources and the environment,
- *Outcome 4.* Land use and land management,
- *Outcome 5.* Human resource development and institutional capacity building,
- *Outcome 6.* Rural livelihoods improvement and
- *Outcome 7,* Preparedness for and mitigation of disasters and climate change.

SECTION 2 – PROJECT FRAMEWORK AND EXPECTED RESULTS

2.1 PROJECT STRATEGY

The project will support Myanmar in achieving its national development goals and especially those for fisheries and aquaculture and food security. The adaptation alternative provided by GEF will address climate change impacts in the fisheries and aquaculture sector in Myanmar systematically for the first time. Myanmar is a country dependent on fish and aquatic products for its food and nutrition security and economy but the sector is highly vulnerable to the impacts of climate change.

The project will be delivered through four components. These are summarized in attached results framework and work plan (Appendices 1 and 2). These will strengthen Policy and Governance and build capacity in planning at all levels and build adaptive capacity at local through to national level. Mechanisms to coordination in the sector and bring together key stakeholders to address the priorities identified in the NAPA priority areas including, 1) Agriculture, early warning, forestry, 2) Water resources, 3) Coastal Zone and 4) Biodiversity will be put in place.

The project will address the limited capacity in Myanmar to analyse vulnerability, to plan and implement interventions and to develop policy and governance at national, sub-national, and community levels in the fisheries and aquaculture sector. Participatory planning with the Government of Myanmar and stakeholders has led to the development of these fisheries and aquaculture sector adaptation interventions, which will contribute to the implementation of the national climate change strategy.

Ecosystem based approaches to fisheries management and aquaculture planning will form the basis for interventions ensuring community engagement in all elements of the project. These will build on the lessons learned through existing projects and programmes.

The project implementation will be designed adopting a collaborative “One-UN” and multi-donor delivery mechanism in support of the national frameworks for development, and will clearly strengthen national adaptation capacity within Myanmar.

2.2 PROJECT OBJECTIVES, OUTCOMES, AND OUTPUTS

The project objective is to enable inland and coastal fishery and aquaculture stakeholders to adapt to climate change by understanding and reducing vulnerabilities, piloting new practices and technologies, and sharing information

2.2.1 Expected project outcomes

The project objective is achieved through the following four Outcomes.

Outcome 1: Enhanced capacity of DoF, GoM and private sector stakeholders to address climate change issues through improved relevant national policies and strategies facilitating a climate resilient fisheries and aquaculture sector.

Under this Outcome, the following activities will be achieved:

- CCA will be mainstreamed into 14 State/region level and three Union level Fisheries and Aquaculture strategies and laws.
- Fisheries and Aquaculture CCA will be mainstreamed into three and other relevant sector laws, at national level.
- National, Region/State and district CC planning benefit from 15 CC vulnerability assessments for the sector benefit
- National Aquatic Animal Biosecurity framework updated for climate risks.
- 2,400 km of coast, 390,220 km² of sea and 4,000 km of rivers and watershed will be under fisheries and aquaculture policies, laws or strategies strengthened for CCA.
- Individual capacity of 3,500 Government (DOF, MLFRD, MOE, MOF, NGO, University and partners) staff will be developed in EAFM/EAA-CCA planning and implementation
- 15 Science based good practice documents in EAFM/EAA-CCA developed and available.
- Advocacy and awareness of CCA in fisheries and aquaculture reaches 3,000,000 stakeholders nationally.
- Fisheries and aquaculture networks, formal and informal groups strengthened for CCA coordination, planning, and information sharing.
- 150,000 stakeholders benefit from improved Climate Change impact monitoring, reporting, and EWS.

Outcome 2: Fishers in coastal and inland water regions of Myanmar increase their knowledge of, and reduce their vulnerability to, climate change, and disasters and develop/demonstrate critical adaptation practices and technologies.

Under this Outcome:

- 45,000 direct fisheries and community stakeholders in Rakhine, Ayeyarwady, Yangon and Dry Zone areas will (30% women and 25% youth) have access to improved CCA technologies and practices and reduced vulnerability to CC.
- 75 communities have reduced vulnerability to CC impact through Fisheries EAFM-CCA plans (developed and implemented)
- 75,000 stakeholders benefit from improved Climate Change impact monitoring, reporting, and EWS for fisheries.

Outcome 3. : Small-scale fish farmers in coastal and inland water regions of Myanmar increase their knowledge of and reduce their vulnerability to climate change, and develop and demonstrate critical adaptation practices and technologies.

Under this Outcome:

- 45,000 direct aquaculture stakeholders in Rakhine, Ayeyarwady, Yangon and Dry Zone areas (30% women and 25% youth) have access to improved CCA technologies and practices and reduced vulnerability to CC.
- 75 communities have reduced vulnerability to CC impact through Aquaculture EAA-CCA plans (developed and implemented)
- 75,000 stakeholders benefit from improved Climate Change impact monitoring, reporting, and EWS for Aquaculture.

Outcome 4: Enhanced understanding and access to adaptation practices and technologies enable stakeholders to manage information and scale up adaptation in the fisheries and aquaculture sector.

Under this Outcome:

- 15 Science based good practice documents in EAFM/EAA-CCA developed and available in Myanmar language for the fisheries and aquaculture sector.
- Advocacy and awareness of CCA in fisheries and aquaculture reaches 3,000,000 stakeholders nationally through systematic communication strategy.
- 369,000 stakeholders benefit from improved Climate Change impact monitoring, reporting and EWS
- Fisheries and aquaculture networks strengthened for CCA coordination, planning, and information sharing.
- 15 training courses developed (and 150 courses run) in Myanmar language for staff of government and partner agencies (DOF, MLFRD, MOE, MOF, NGO, University and partners) EAFM/EAA-CCA planning and implementation
- Lessons learned from the project identified and published

2.2.2 Expected project Components and Outputs

Component 1: Strengthen the national, regional, state and township level regulatory and policy frameworks to facilitate the adaptive capacities of the fisheries and aquaculture sector.

Component 1 will be delivered through six Outputs (Table 2.1)

Table 2.1 Component 1 Outputs and tentative activities

Output	Activities
1.1.1: National level climate change vulnerability assessments for fisheries and aquaculture sector carried out.	<p>1.1.1.1. Development of policy advice on sector vulnerability, impact and development of good practice/policy briefs – science based studies (for VA see UNFCCC approach)</p> <p>1.1.1.2. Individual and institutional capacity development in VA for partners and development of methodologies for Myanmar.</p> <p>1.1.1.3 Formal CC VA carried out, led by DOF. All levels and all regions/states/townships. Priorities for action identified for FI/AQ and</p>

	<p>action plan/strategy developed (with indicators). Community level and indigenous knowledge integrated. VA updated at least once during project life.</p> <p>1.1.1.4 Communication of findings and good practice to sectors, (link to networks in C4 and all other components). Myanmar language.</p>
1.1.2: Myanmar's National Policy on Fisheries Sector and supporting regulatory framework including national aquatic bio-security framework are strengthened.	<p>1.1.2.1. Inventory and review of relevant national policies, strategies and frameworks (for coherence and alignment to CCA/CCRF/EAFM/DRM etc.) including formal and informal.</p> <p>1.1.2.2. Individual and organizational capacity development for Policy makers (based on IA and 1.1 (link to 1.5) and development of consultation strategy and leaders etc.</p> <p>1.1.2.3. National sector CCA policy consultation supported to ensure full stakeholder engagement and develop consensus on areas of policy strengthening. (Potential for web based to be integrated)</p> <p>1.1.2.4. Strengthened Policy and regulatory frameworks developed /iterated (and piloted). These would be reviewed prior to project completion.</p>
1.1.3: Government Policies and Strategies on fisheries and aquaculture sector-specific implications for key land-use planning and resource tenure policies and adaptation options are in place, with special attention to support integrated management of mangrove areas with fisheries, aquaculture and other stakeholders	<p>1.1.3.1 . Inventory and review of integration of relevant national policies, strategies and frameworks (for coherence and alignment to SSF/A., EAA/EAFM/CZM/EBA CCA/CCRF/EAFM/DRM) including formal and informal.</p> <p>1.1.3.2. Capacity development for Policy makers on policy integration (based on IA and 1.1 , 1.2. (link to 1.5) and development of consultation strategy and leaders etc.</p> <p>1.1.3.3. National sector policy consultation supported to ensure full stakeholder engagement and develop consensus on areas of policy strengthening. (Potential for web based to be integrated)</p> <p>1.1.3.4. Strengthened Policy and regulatory frameworks developed /iterated (and piloted). This may be left at developing advice on policy change). These would be reviewed prior to project completion.</p>
1.1.4: Land and resource tenure policy, legal and regulatory framework strengthened to capacitate co-management in capture fisheries.	<p>1.1.4.1. Inventory and review, gap analysis. Land tenure and Forestry departments are responsible policies. EAFM integrated as baseline approach.</p> <p>1.1.4.2. Capacity development in policy development.</p> <p>1.1.4.3 Policy consultation and revision</p>
1.1.5: Institutional strengthening and capacity needs assessment for DoF, other relevant GoM agencies, and private sector & training program developed and applied.	<p>1.1.5.1. Formal Institutional Capacity Assessment completed for Fisheries and Aquaculture sector and related agencies/partners and in relation to CCA.</p> <p>1.1.5.2. Identification of Individual and Institutional Capacity Development Gaps to be addressed by FISHADAPT and development of CD programme with Partners.</p> <p>1.1.5.3 Implementation of Individual and institutional Capacity Development programme for FISHADAPT including effective learning approaches such as full training cycle management,</p> <p>1.1.5.4. Monitoring and evaluation of training programme</p>
1.1.6 A system to inform policy and planning through monitoring and assessment of the impacts of climate change on the fisheries and aquaculture sector at community, district, and national level piloted and	<p>1.1.6.1. CC Monitoring, communication and capacity and needs assessed, including special science based studies.</p> <p>1.1.6.2 CC Monitoring and assessment capacity developed within sector stakeholders and assessment carried out. (linked to C2 and 3)</p> <p>1.1.6.3. CC Monitoring system for sector piloted in 3 vulnerable Townships and approach finalized.</p> <p>1.1.6.4. Capacity of DoF and partner capacity developed and system scaled up in each State/region</p>

scaled up.	
------------	--

This component will be implemented in an integrated manner and strengthen the capacity of the sector to assess climate change vulnerability, develop, and implement national adaptation plans and policies and develop capacity amongst stakeholders.

The fisheries and aquaculture sector in Myanmar has a limited capacity to inform policy development and decision making due to a lack of understanding of the sector's vulnerability to climate change and disaster impacts, potential adaptation options and cost/benefit analysis capacities of potential interventions.

Myanmar's fishery sector has developed an action plan that focuses on development issues, such as increasing production of value added fishery products from aquaculture through improved infrastructure and technology investments; conserving fisheries resources for capture fisheries by restricting fishing in critical habitats and developing a fishery vessel monitoring system; establishing modern laboratories to support improved fisheries and aquaculture management. ***None of Myanmar's baseline funding for fisheries, however, is focused on understanding vulnerabilities to climate change and enabling the sector to respond in a proactive manner.*** In addition, projects and programmes funded by LIFT to address a wide range of post disaster and development issues do not address issues specific to the sector. Likewise, the UN-HABITAT and UNEP programme to implement the "Myanmar Climate Change Alliance Project (GCCA)", funded by EU, from September 2013 through 2016, have supported high-level policy development but not for the agriculture or fisheries sectors.

Analysis of national and sub national level policy and laws and consultation with stakeholders during the PPG phase indicated that Climate Change adaptation is not currently included as a priority in Myanmar's Fisheries Policy, although effective adaptation will be critical to enabling the achievement of the Policy's main objectives.

In addition, understanding vulnerabilities within the fisheries and aquaculture sector in Myanmar is in its nascent stages and is primarily limited to anecdotal information: people are perceiving climate change at work in ponds that are too hot for currently farmed fish species or through changes in fish stock distributions. Myanmar's first NAPA process shed some light on these changes; however, stakeholders have not yet assessed systematically how these changes may impact sector and why the sector may be vulnerable to these changes.

This project and the co-financing through DOF, MFF, IFT and the FAO TCP project "Implementation of the National Adaptation Plan of Action (NAPA) in the Fisheries and Aquaculture Sector" will provide additional support to climate change policy development and capacity building under this component.

Vulnerability Assessments (Output 1.1.1)

A national level vulnerability assessment (VA) of climate change risks facing the fisheries and aquaculture sector shall be undertaken and updated at least once prior to project completion. The VA will consult will be designed to examine all fisheries and aquaculture systems and their value chains but also focus on small-scale fisheries and aquaculture. Importantly a cross-sectoral consultative approach will be adopted to ensure all main stakeholders are engaged including women and vulnerable groups.

The assessment will be used to inform the Department of Fisheries as well as the national climate change coordination mechanism of Myanmar of the potential severity of sector impacts on key geographic areas, production systems and vulnerable fishing and fish farming communities.

The national vulnerability assessment will be informed by VA's carried out in each State and region (a total of 14 VA's) and by current good practice in the sector²¹. Initial piloting of the approach will be carried out in the pilot Regions/States, Districts/Communities for project (Components 2 and 3) in Rakhine, Ayeyarwady, and Yangon. VA consultation meetings will be held in selected Villages, Townships, Districts, States, and regions and at Union level. They will be further informed by and communicate findings through participatory consultation with stakeholders, with particular attention to gender-specific differences in vulnerabilities for better-targeted adaptation planning.

Individual capacity development of those undertaking the assessments, analyses and reporting will be carried out through short courses developed and delivered by IFT and partners on policy consultation. Follow up support to DOF will be provided.

The VA process will strengthen capacity with the Department of Fisheries, MFF, and IFT and build on the extensive existing livelihoods knowledge base developed by projects already under implementation, such as the Worldfish, LIFT and the Japanese funded small-scale aquaculture programme undertaken in collaboration with the World Bank, the EU, the World Fish Centre, and local universities. Relevant programmes and projects facilitated by FAO include the Italian project, Sustainable Small-Scale Fisheries and Aquaculture Livelihoods in Coastal Mangrove Ecosystems, and the FAO Technical Cooperation Programme project, Implementation of the National Adaptation Plan of Action (NAPA) in the Fisheries and Aquaculture Sector of Myanmar. The assessments will be used to inform future sector climate proofed development in line with the climate smart agriculture principles as well as climate proofing of current programmes under implementation in Myanmar. This assessment will also inform the other Components of this project.

Strengthening policy, law, strategy and institutional coordination for CCA (Output 1.1.2 - 1.1.6)

The Outputs related to national laws and policies for fisheries and aquaculture need strengthened in relation to climate change adaptation to enable sector-specific actions as well as to ensure coordination with other sectors. Furthermore, the current reform process within Myanmar has led to decentralization of policy making to sub-national and township level where current capacity is weak. These issues are recognized by the government and, whilst initiatives to review and develop high-level policy are underway, they do not focus on specific sectors such as fisheries and aquaculture.

The project will focus on the development and strengthening of fisheries sector-specific adaptation laws, policies and strategies and coordination mechanisms that fall outside the scope of other initiatives and will pay particular attention to the climate proofing of aquatic animal health biosecurity frameworks. Fishers and fish farmers resource-tenure and access rights will also form a key theme within the project policy development activities in line with the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security and the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication.

Key elements of the policy mainstreaming approach will be participatory policy consultations, which will be carried out in all Districts/States/Regions in order to inform and engage stakeholders.

²¹ 2013. Assessing climate change vulnerability in fisheries and aquaculture: Available methodologies and their relevance for the sector. FAO Fisheries and Aquaculture Technical Paper No. 597. Rome, Italy. 86 pp.

The project will develop a CCA mainstreaming strategy with objectives, which include participation and consultation all stakeholders. This will follow international good practice in mainstreaming^{22 23 24}through:

- Building awareness and capacity, strengthening of the science base for policy making on adaptation in the fisheries and aquaculture sector (informed through VA)
- Develop and disseminate targeted information and policy advice,
- Carry out pilot activities, demonstrations
- Mainstream and build on lessons learned.

The project will strengthen coordination through existing and new networks and structures and work closely with other policy development initiatives. In particular, the national MFF and Worldfish sponsored networks.

There will be a focus on engagement of women and marginalized groups. Policy and strategy development will be informed through linkages to research and technical advisory networks at regional and national levels, including the MyFish fisheries research network (WorldFish Centre) and national fisheries and aquaculture universities and government agencies.

Appropriate priority government laws, policies, and strategies will be supported at relevant, national, state, and regional administrative levels across the country. Policy/strategy support will also be provided in the districts, townships and villages involved in Component 2 of the project.

Policy and strategy development initiatives may also include piloting of activities such as the development and mainstreaming of local/community CCA/DRM contingency planning and early warning systems for fishing and fish farming communities. Networks and systems to monitor and assess the impacts of climate change, as identified by target communities, will be piloted, and scaled up (under component 4). Findings from these networks will be consolidated at relevant state, region, local levels and used to inform policy and planning and the design of specific project adaptation actions.

The project's fisheries and aquaculture policy development work will build on the previous good practice and lessons learned under the Government of Myanmar – FAO Sustainable Small-Scale Fisheries and Aquaculture Livelihoods in Coastal Mangrove Ecosystems project and the Japanese funded small-scale aquaculture programme, which support government policy and focus on the development of fisheries co-management, mangrove restoration and community management and the development of small-scale aquaculture.

Capacity of stakeholders at all levels and across the sector will be supported through a wide range of individual and organisational capacity development activities including on-the-job training, training of trainers, training visits and the strengthening of existing information sharing networks such as the existing WorldFish Centre-DoF research network. A full capacity and learning needs assessment will be conducted and a training program developed during the project preparation phase for implementation under the full project.

²² 2008. Huq and Ayers. Taking steps: mainstreaming national adaptation. IIED Briefing note.

²³ 2011. UNDP-UNEP. Mainstreaming Climate Change Adaptation into Development Planning: A Guide for Practitioners. www.unpei.org. UNDP-UNEP

²⁴ 2009. Integrating climate change adaptation into development co-operation: policy guidance. OECD. Paris

The project will also work with the Land Use Advisory Committees (LUAC) at all levels, including township to ensure integration with the fisheries and aquaculture climate change plans.

The project will strengthen the existing national Climate Change Monitoring system currently operated by DMH. It will work with partners in DMH and with WorldFish, DOF and IFT and MFF to pilot a system appropriate for Myanmar fisheries and aquaculture sector to enable relevant parameters to be monitored and reported to stakeholders through a community based EWS. The system will be developed and piloted within the first year in the project pilot areas in Rakhine, Ayeyarwady and Yangon. The Monitoring system will adopt a combination of biological physiochemical parameters and rely on community participation. The project will build on and adapt current examples of adoption of citizen science initiatives for monitoring species in the context of climate change adaptation, such as REDMAP²⁵. The system will be adopted by DOF and partners to enable long term monitoring. The monitoring and EWS system under this component is developed in synergy with those outlined in components 2 and 3.

The Project will support: i. Preparation of critical location-specific fishery habitat maps using GIS technologies; ii. Development of an aquaculture habitat monitoring system for the innovative technologies in collaboration with the target communities. For this purpose the project would train CBOs and supply small equipment's for environmental monitoring of the aquaculture farms/ fish habitats; iii. Implementation of innovative environmental monitoring system connecting to DRM, early warning and improved management of aquaculture and fisheries resources, such as introduction and adoption of simple monitoring tool for water quality and establishment of information platforms for the communities to obtain and exchange data and knowledge to improve resiliency; iv. Train DoF/community trainers on implementing local environmental monitoring systems (linked to the community EWS and DRM); and v. The project will establish linkages between community groups (men and women) with service providers at grassroots levels including disaster management committees and benefit the poor targeted communities through tapping available field level resources from public and private entities beyond the project life. Follow up monitoring includes the appropriate actions taken by the communities based on the environmental monitoring data (particularly water temperature, light penetration, pH, level of dissolved oxygen and salinity) from the demonstration sites. District and Township Fishery Officers will be tasked with coordinating and ensuring long-term operation of this information base.

Training on the use of small equipment, including thermometer, metal Secchi disc, pocket pH meter, pocket dissolved oxygen meter, pocket salinometer will be provided for 100 CBOs/OGs/CIGs [1] of 10 Townships to enable them to monitor water quality, such as environmental parameters of shrimp/fish habitats. This training will allow them to better manage the natural resources, assess risks or crises, plan and implement CC adaptation action in the fisheries, aquaculture and livelihood activities. Such training will also inform them about implications of environmental parameters, need to take timely actions to reduce loss of natural resources, and bring changes in farmer's management practices for water quality control and feeding management.

Women and vulnerable groups have been consulted during project formulation and will be actively engaged in the policy consultation processes. Gender sensitive consultation and communication approaches will be adopted implemented under the project gender strategy and

²⁵ For example for fisheries : Range Extension Database and Mapping Project (REDMAP) : <http://www.redmap.org.au/about/what-is-redmap/> and for ornithology <http://www.birds.cornell.edu/citscitoolkit/projects/find/projects-climate-change>.

in support of the national strategic plan for the advancement of women (2013-2022)²⁶. Fishadapt will also follow the FAO good practice developed for the integration of gender into fisheries and aquaculture project design and implementation²⁷.

Component 2: Enhanced critical adaptation practices demonstrated by fishers and fishing communities in vulnerable coastal and inland water regions of Myanmar.

Component 2 will be delivered through four outputs (Table 2.2)

Table 2.2. Component 2 Outputs and tentative activities

Output	Activities
2.1.1 Climate change vulnerability assessments undertaken in target fishing communities in coastal and inland regions are used to inform action plans and identify key adaptation actions	2.1.1.1. (linked to TNA and learning needs assessment as basis). EAFM based CC adaptation approach developed and piloted with partners (based on FAO – ITA project and EAFM). 2.1.1.2. Community consultations carried out in xxx townships (1 village per township) 2.1.1.3. Community adaptation needs for fisheries identified and agreed 2.1.1.4. Community needs used to inform policy consultations and science-based studies. (C1)
2.1.2: Community based climate change adaptation and disaster risk management plans developed for target inland and coastal fisheries, including mangrove-fisheries interactions.	2.1.2.1. Findings from 2.1 used to develop community specific action plans in 200 communities. a) Phased implementation, based on training /extension CD programme for DoF Township/District /NGO officers. b) Yangon c) Dry Zone d) Ayeyarwady e) Rakhine
2.1.3: Critical adaptation technologies and practices piloted with targeted groups (e.g. resource monitoring; fishing gear; post-harvest processing; safety at sea; vessel design, etc.)	2.1.3.1 Based on national, sector VA and Community VA/needs Critical adaptation technologies identified and piloted (EAFM-CCA- co management approach)(full sector- value chain, PH, etc.) in pilot regions. 2.1.3.2. EAFM/CCA/VA Training modules developed for each Technology and practice.
2.1.4: Community-based early warning system developed, including the use of ICT based information services to enable regular and early warning.	2.1.4.1. EWS needs identified (based on DRM assessment and community consultations) with partners. 2.1.4.2. Capacity development of partners and DRM. 2.1.4.3 Implementation of EWS with in 5 pilot sites (with DMH)

The government of Myanmar currently has no programmes or activities related to strengthening climate change adaptation planning and capacity in the fisheries and aquaculture sector.

Under the adaptation alternative scenario this component will work with the DOF and partners to target fishing communities, using good practices in participatory appraisal and risk analysis,

²⁶ 2012. Union of Myanmar National Strategy for the Advancement of Women 2012-2022. Government of Myanmar.

²⁷ 2012. FAO. RFLP Integrating gender into the design of fisheries projects.

to identify their vulnerability to climate change impacts, develop, and implement adaptation action plans and through agreed on appropriate priority adaptation actions.

The component will build on the successful fisheries co-management experiences of the Government of Myanmar-FAO ITA project and of the GoM-FAO Mangrove to further develop community-based climate change adaptation and disaster risk planning. It will adopt the EAFM approaches in order to reduce underlying vulnerability of communities.

The main activities will be undertaken in Ayeyarwady Region, Yangon Region and Rakhine State and the Dry Zone (Appendix 12).

The participatory process developed by the project will include 1) capacity building for staff and partners, 2) Vulnerability Assessment and planning adaptation actions with communities, 3) Implementation of agreed plans and 4) Support to knowledge sharing, coordination and networking at Community, Township, District and State/Region level. The project will work with DOF but also with other Departments, NGO's and private sector.

Community level Vulnerability assessment (VA) and adaptation plans (Output 2.1.1 and Output 2.1.2)

Using good practice in climate vulnerability assessment the component will develop and build capacity in the participatory climate vulnerability assessment techniques piloted during the PPG phase. This process will ensure gender-specific vulnerabilities throughout the production chain be identified. These assessments will be part of a new EAFM-CCA planning approach. They will be undertaken initially in the 9 pilot fishing communities identified during the PPG phase (Appendix 12). During this pilot phase the overall project strategy for working in these communities will be fully developed and finalised through a process of iteration and improvement.

During the scaling up of the project activities will be carried out in a phased manner including the Vulnerability assessment and in 120 Villages (and 60 townships) in Ayeyarwady, Rakhine, Yangon and Central Dry Zone by the end of the project. In the CDZ the project will work with the 10 JICA funded small-scale aquaculture project and Worldfish to develop VA and CCA plans for existing fish farming groups.

The project will work with the existing 20 fisheries management communities under the EFSP project in Ayeyarwady Region to develop VA and CCA plans.

The community level climate change vulnerability assessments for the fisheries sector in targeted coastal and inland regions will inform community based adaptation planning and identify adaptation actions.

Capacity development for DOF and partners (Output 2.1.3 and Output 2.1.4)

Significant capacity development activities will be organised and undertaken by Fishadapt with IFT and training partners to support DOF and MFF in project implementation. Systematic learning needs assessments will be carried out at all levels and building on the techniques piloted during the PPG phase. In addition, capacity needs assessment will be conducted to focus on strengthening institutional capacities such as coordination mechanisms as well as organizational capacities including strengthening fisheries and aquaculture networks, formal and formal groups.

Training modules will be developed (also under and in support of Component 1) for DOF and partner staff implementing the EAFM-CCA and EAA-CCA approach and also to inform decision

makers and lawmakers. EAFM based CC adaptation approach developed and piloted with partners (based on FAO – ITA project and EAFM).

Based on an in-depth organizational capacity assessment²⁸, it is proposed that this component will support the fisheries co-management groups developed under the ITA project that already have now access fishing leases. These communities will also develop and implement fisheries climate change adaptation and disaster management plans and further build their resilience.

These plans will be developed using best practice in community and stakeholder consultation, the ecosystem approach to fisheries and aquaculture, and support the participation of women and other vulnerable groups in the processes.

Effective capacity development approaches²⁹ are essential to enhance the impact and sustainability of the project results through deepening country ownership and leadership of the development process. The three dimensions of capacity development to be addressed are strengthening *individual capacities* (e.g. knowledge, skills, and competencies); *organizational capacities* (e.g. performance of organizations, cross-sectoral, multi-stakeholder coordination, / collaboration mechanisms) as well the *enabling environment* (e.g. sound regulatory and policy frameworks, institutional linkages and enhanced political commitment and will). A three-step process will be adopted including jointly assessing capacities with country stakeholders, designing appropriate interventions, and effectively tracking results. The project will integrate effective capacity development practices³⁰ to enhance capacities across the individual, organizational, and enabling environment. Describe in general terms what capacities are needed, whose capacities need strengthening, and how a capacity assessment will be carried out to further understand the strengths and gaps.³¹ Explain how CD results will be defined and monitored in the project, in terms of outcomes, outputs, and indicators.³² Describe how the results of the project will be embedded in national systems, institutions, and processes and will deepen country ownership and achieve more sustainable results.³³

Development of climate change adaptation good practice and implementation of CCA plans. (Output 2.1.2 and 2.1.3).

The participatory approaches developed by FAO and the government of Myanmar during the PPG phase have identified a range of potential adaptation needs in communities (Appendix 12). FAO has also identified a range of good practices related to climate change adaptation in the fisheries sector.

During the PPG phase, a range of issues were identified in the pilot communities, including socio-economic, environmental, climate related and with respect to the fisheries sectors. These are fully presented in Appendix 12 and relevant PPG reports.

The main livelihood problems for fishers are lack of investment for replacement of fishing gear and repairing fishing boats. The lack of financial support is the same for everyone (farmers, fish-farmers, fishers, and small-scale producers by both government and or private sector). For fishers their catch rate also down (less income for their household). They want to learn about new fishing technique and post-harvest technology to improve their livelihood. Now they are using traditional fishing method and practices. They wish to get loans with low interest rate or

²⁸ See FAO's Learning Module on Organizational Development and Analysis <http://www.fao.org/3/a-i3538e.pdf>

²⁹ See FAO Corporate Approach and Strategy <http://www.fao.org/capacity-development/en/>

³⁰ See [FAO's Good Capacity Development Practices](#)

³¹ See [FAO CD Learning Module 2 Chapter 2 "Analysing and Understanding the Context"](#)

³² See [FAO CD Learning Module 2 Chapter 3 „Tracking Capacity Development Results“](#)

³³ See [FAO Learning Module 2 Chapter 4 „Ensuring Sustainability“](#)

other support for fishing gear by NGOs and Government and government training programs on conservations and responsible fishing practices (especially to provide EAFM program and training are needed for the fishers. This village has opportunities to do fish and prawn culture, however, most of villagers have little to invest. The fishers are vulnerable to storms and natural disasters and need good EWS.

Table 2.3 Summary of Climate and natural disaster related issues from Pilot communities.

Hazard	Coping strategy	Solution
Malar Storm (1995)	Borrowing money from the relatives and friends.	Rebuilding the damaged houses with self-reliance system. EWS needed
Tsunami (1999)	Information sharing and collecting some money from the rich families other.	Repair the houses and raising the awareness about the disaster.
In 2000 Flood and broken embankment for two times	Moving to other high place	Establish village embankment with all villagers' participation.
Cyclone Nargis (in 2008)	Report to township administration office and Information sharing with others individuals, company, and NGOs.	Repairing houses and roofing .
Broken village embankment Soil erosion and breaking of embankment	To repair with community participation.	Repair the part of the village embankment by the labour supports of the villagers urgently.
Unusual rains	None	Replantation and conservation on mangrove. Awareness raising and plantation trees with stakeholders' participation and supports. Repairing the embankment.
Unusual river currents	None, don't fish	No solution
High temperature (in recent year and happen)	Mangrove trees plantation	Embankment constructed

The PPG assessments confirmed that overall fishers had a range of problems related to weak NR management and lack of fish to catch.

Table. 2.4. Issues for fishers in Pilot communities

Issue	Impact	Community suggestion
No new livelihoods or new livelihoods technologies	Fishers, fish farmers face no regular income loess food supply and storage	Provide livelihoods skills training; Create jobs opportunities for both women and men
Catching less fish (reduced amount) in all areas	Drop year on year in catch, reduced income and debt	Enforcement of laws, Demarcation of grounds Improve management
Conflict between fishing groups	Becoming worse year by year due to reduced catches, consequently decrease income,	Improve management (EAFM). Fishing gears- screening carefully by authorized org and enforcement

Difficult to find loans (In all villages)	Loans are needed to prepare for fishing season. They had to borrow money with high interest rate or take advanced money from collecting centres/ employers	Linkage NGOs or INGOs or Govt organisations that can lend money to them without interest or with low interest rate.
Market problems	Difficulty selling fish, poor process and less income	Training for processing technologies (processing, at the time of market glut) Linkage with the orgs that can help to get good market for fishers
Not sufficient ice	All the catch can't be sold with high price (some are rotten in the boat)	More Ice factories are needed.
Lack of fishery technology	Limited fishing technology ,means lower catches and fewer species.	Training from GOV or INGOs or NGOs) in new fishing technology including processing.
Lack of investment for fishing gear	Fishers need to replace gear when it is lost or destroyed. In the past they were able to save to do this but now they can't do this so they have to borrow leading to a debt cycle	Provide long-term low interest microfinance. Provide fishing gear and boats from NGOs and other organisation
Fishing area is being reduced by outsider and large business owners	Less income from fishing.	Review and develop government policy and laws To support low interest rate microcredit loans for food security and improve alternative livelihoods
Poor transportation access	Limited market access and delays with product taking a long time to reach market. Lower process for village products.	Improve communication and transportation facilities by the Govt., INGOs, with community participation;

A wide range of socio economic issues were found including Food insecurity (many villagers), lack of drinking water, land tenure, poor access to training and extension services, limited empowerment and participation of women, children dropping out of school, no regular employment and lack of loans. To deal with these the project will work with providers of socio economic and livelihood support to ensure they can be addressed as far as possible with partners and if necessary with the project.

The EAFM CCA approach will enable the communities to address these issues. Additional actions to specifically address adaptation that have been identified in the region and may be applicable could include for example, ensuring that fish refugia, breeding areas or protected areas in rivers and lakes are managed and designed to be resilient also to the impacts of climate change (such as drought, flooding, salt water intrusion).

- New fisheries management measure to address climate change impacts could include preventing fishing during climate induced droughts or changing the closed seasons to reflect changes in species or their life cycles;
- Managing water levels through increasing riverbank height or installing sluice gates to manage changes in water flow.

- For coastal communities, changes to the management of fisheries need to be agreed with communities and could include;
- Establishing co management regimes; and,
- Protecting vulnerable ecosystems and habitats that provide protection to extreme events.

Changes in the type of fishing gears used by fishers may be required as the species composition change as well as spatial zoning of fishing activities, including those of migratory fishers.

Protecting fisheries infrastructure (such as landing areas, ice making facilities, or markets) in vulnerable coastal areas may be needed.

Projected increases in the number and strength of tropical storms due to climate change mean that Innovative approaches to safer fishing are required.

In addition to the early warning systems being developed, community based actions could include development of safer vessels and climate proofed infrastructure (harbours, landing areas and anchorages).

As climate change affects the type, quantity and quality of fish harvested additional actions to reduce postharvest losses will be essential to maintain food availability and decrease the risk of food-borne diseases. Adoption of value chain analyses and improvements will further support adaptation planning and the development and diversification of at risk livelihoods and households.

The Policy and Strategies developed and strengthened under Component 1 will further support rights and access to leasable fishing. The project will facilitate the up scaling of climate smart fisheries management approaches and technologies to additional pilot communities in the Delta.

The GoM-FAO TCP mangrove project in Rakhine province has built significant capacity in community based management of sustainable mangrove-fisheries-aquaculture systems. Mangrove forests significantly reduce vulnerability for coastlines and communities to climate change and sea level rise through reducing and buffering impact from waves and tides. This LDCF-GEF project will work with the forestry and fisheries departments in further climate proofing existing communities.

Approaches used here will address coastal flooding from an ecosystem approach- coastal erosion may be addressed via active mangrove management and restoration, sand dune rehabilitation using native species, wetland restoration, agricultural land reclamation, and construction and rehabilitation of fringing coral reefs.

These habitats will provide important coastal habitats, reduce erosion, and maintain other ecosystem services. This will be done through the development and implementation of climate change adaptation and disaster risk management plans for the fisher and fish farming communities that rely on the ecosystem services provided by coral reef/seagrass/mangrove-fishery-aquaculture systems. The project will work with fishers, communities, local NGO, local universities, and government agencies to develop community-based early warning systems to jointly monitor and communicate changes in the environment.

The project will work with the WorldFish and local Universities. Relevant programmes and projects facilitated by FAO include the FAO-GEF/IW BOBLME SAP Implementation programme, which will build capacity in fisheries management. The FAO Technical Cooperation Programme project, Implementation of the National Adaptation Plan of Action (NAPA) in the Fisheries and

Aquaculture Sector will further support this component. The component will benefit from and coordinate with the activities under components 1, 3 and 4.

The project will support DOF staff to build partnerships at community, Township, District and region level. A tentative outline of the process for engagement of DOF staff is presented in Appendix 14 and the drafts steps for village based co-management approaches in Appendix 15.

Communities participating in the national Village Development Planning (VDP) of the Department of Rural Development will be targeted with support to planning and adaptation actions for the fisheries and aquaculture sector.

The project will work with NGO partners to support DOF staff at community level to deliver community based adaptation capacity development and livelihood inputs.

Community-based early warning and environmental monitoring system developed, including the use of ICT based information services to enable regular and early warning

During the PPG phase sound EWS systems for all communities was identified as a priority. Whilst the government has an existing EWS for communities, this does not address the specific issues relevant to the fisheries sector.

In coordination with Component 1 and 3 (and DMH and other partners), a specific EWS will be developed for fishers and fishing communities.

Needs will be identified (based on DRM assessment and community consultations) with partners.

The EWS will be piloted in 10 sites identified according to their vulnerability. Capacity building of partners and stakeholders in DRM will be undertaken. The pilot will include relevant government partner agencies such as DRD, DMH, and MOE.

Component 3: Develop and apply/mainstream adaptation models to strengthen the resilience of Myanmar's aquaculture sector to the impacts of climate change.

Component 3 will be delivered through 5 Outputs (Table 2.5)

Table 2.5. Outputs and tentative activities for component 3.

Outputs	Activities
3.1.1. Climate change vulnerability assessments carried out for aquaculture production systems in target coastal and inland regions in order to inform planning and develop adaptation actions.	3.1.1.1. CC VA methodology for small-scale aquaculture developed (based on EAA/CCA/VA) - policy level for all aquaculture 3.1.1.2. Capacity Development for partners 3.1.1.3 VA for Aquaculture completed
3.1.2: Climate-related risk reduction strategies and plans developed for target inland and coastal, aquaculture production systems and fish farming communities	3.1.2.1. Capacity development in approaches to CC risk reduction in aquaculture developed 3.1.2.2. CCA plans developed for 100 aquaculture farmer groups.
3.1.3: Critical adaptation technologies and practices piloted with targeted production systems and fish farming communities (e.g.	3.1.3.1 Based on national, sector VA and Community VA/needs Critical adaptation technologies identified and piloted (EAA-CCA-(full sector- inputs, value chain, PH,

Outputs	Activities
diversification of farmed species and production processes; stocks and strains with wider tolerance to environmental changes; storm resistant cage and pond construction).	etc.) 3.1.3.2. Climate proof Biosecurity framework developed.
3.1.4: Aquaculture-based early warning system developed, including the use of ICT based information services to enable regular and early warning.	3.1.4.1. EWS needs identified (based on DRM assessment and community consultations) 3.1.4.2. Capacity development of partners and DRM. 3.1.4.3 Implementation of EWS with responsible agency,
3.1.5: Pilot integrated mangrove-aquaculture and rainfed rice paddy-fish systems assessed and implemented.	3.1.5.1. Pilot integrated mangrove-aquaculture and rainfed rice paddy-fish systems assessed and implemented. The Small indigenous species (SIS)-systems are critical for many farmers

The aquaculture sector in Myanmar is significant in terms of production and its contribution to the economy. The aquaculture sector in Myanmar is particularly vulnerable to the impacts of climate change and disasters because of a lack of capacity in climate change adaptation planning and policy, limited focus on few species and few alternative production systems.

Weak national biosecurity frameworks further increase risk through climate related disease outbreaks. Development of small-scale aquaculture is a priority for the government and is currently being supported by a number of partners including the Japanese government and Worldfish.

Small-scale aquaculture provides an opportunity for climate resilient livelihood diversification to poor and food insecure households. Significant investment is made in the larger private sector owned farms but that for small-scale producers is limited. Both JICA and Worldfish are piloting these small-scale systems in the Central Dry Zone.

Under the adaptation alternative scenario this component adopt an ecosystem approach to aquaculture and CCA planning (EAA-CCA) and will work with target small-scale aquaculture farmers and communities to identify their vulnerability to climate change, develop adaptation action plans and identify and agree on appropriate priority adaptation actions.

The participatory approaches developed by FAO and the government of Myanmar during the PPG phase have identified a range of potential adaptation needs in communities (Appendix 12). FAO has also identified a range of good practices related to climate change adaptation in the aquaculture sector.

During the PPG phase, a range of issues were identified in the pilot communities, including socio-economic, environmental, climate related and with respect to the fisheries sectors. These are fully presented in Appendix 12 and relevant PPG reports. A key issue is the lack of land to expand. However, fish farmers are also hindered by a lack of access to loans and a desire for capacity development for new technologies. The EAA planning and CCA approach proposed by the project will address many of these issues. However, the project should work with authorities on the issue of tenure.

Community level EAA and Vulnerability assessment(VA) - adaptation plans Output 3.1.1 and 3.1.2)

Using good practice in climate vulnerability assessment the component will develop and build capacity in the participatory climate vulnerability assessment techniques piloted during the PPG phase. These assessments will be part of a new EAA-CCA planning approach. They will be undertaken initially in the pilot fishing communities identified during the PPG phase where small-scale aquaculture has been identified (Appendix12). During this pilot phase, the overall project strategy for working in these communities will be fully developed and finalised through a process of iteration and improvement.

During the scaling up of the project activities will be carried out in a phased manner including the Vulnerability Assessment and in the 120 Villages (and 60 townships) of Ayeyarwady, Rakhine, Yangon and Dry Zone by the end of the project.

The EAA-CCA planning will be integrated and carried out at Township District and Region level.

The community level climate change EAA-CCA vulnerability assessments for the Aquaculture sector in targeted coastal and inland regions will inform adaptation planning and identify adaptation actions.

When relevant, these assessments will be undertaken in tandem with activities under Output 2.1.1.

Capacity development in EAA-CCA planning (Output 3.1.3)

Significant Capacity development activities will be organised and undertaken by Fishadapt with IFT and training partners to support DOF and MFF in project implementation. Systematic Capacity needs assessments will be carried out at all levels and building on the techniques piloted during the PPG phase.

Training modules will be developed (also under and in support of Component 1) for DOF and partner staff implementing the EAA-CCA approach and also to inform decision makers and lawmakers. The EAA –CCA adaptation approach will developed and piloted with partners (based on FAO – ITA project and EAFM).

Development of climate change adaptation good practice and implementation of Aquaculture CCA plans. (Output 3.1.3)

The participatory approaches developed by FAO and the government of Myanmar during the PPG phase have identified a range of potential adaptation needs in communities. FAO has also identified a range of good practices related to climate change adaptation in the Aquaculture sector. These are summarised in Appendix. (12)

These community level EAA- climate change vulnerability assessments for the aquaculture sector in targeted coastal and inland regions will be used to inform adaptation planning actions.

Building on and supporting the policy and strategy development in Component 1, this component will further develop specific community level climate risk reduction strategies and plans with a focus on small-scale aquaculture producers and communities.

These are built on the good practices developed by the Japan-funded project in diversifying livelihoods at household level through the integration of low input low-risk polyculture approaches.

The LDCF project will build on these successful pilots with the integration of community level farmer groups and household climate adaptation planning and implementation.

Aquaculture adaptation actions identified and developed will be community and area specific. A wide range of such climate change adaptation practices for small-scale aquaculture exists. If appropriate for the local setting, these may be adapted or adopted by farmers

These practices and technologies include, for example, adoption of locally available saline tolerant species for culture in areas affected by salt intrusion. Improved aquaculture systems will enable farmers to adapt to climate related environmental change such as increased drought, floods, or sea level rise. For example, construction of aquaculture ponds with higher bunds will enable them to continue culture during periods of drought. Improvement of hatcheries to withstand additional climate change related drought and flood for example can be carried out through securing larger water reservoirs or wells and increasing pond dykes thus allowing operators to continue functioning during periods of climate related stress. Brood banks and improved management of broodstock will allow medium to long term planning and development of climate resilient aquaculture.

The community managed mangrove systems developed in Component 2 will be further strengthened through the integration of low risk low impact extensive aquaculture and ranching/penning technologies using for example mud crabs.

At a national level, this component will contribute to and build on climate adaptation policy and planning to reduce risk to the aquaculture sector. This work will involve support to the identification of diversified and locally appropriate integrated production systems and culture of species already present in Myanmar.

The project will work closely with Universities and Research institutions at both the national level and regional level to improve the production models and systems in Myanmar

Biosecurity framework.(Output 3.1.3 and also contributing to 3.1.4 EWS)

Risk to aquaculture from disease may increase due to climate change and the national biosecurity framework for aquatic animal health will be strengthened through capacity development and appropriate investments to ensure these are minimized.

Aquaculture experience higher cumulative mortalities and faster progression of diseases, which may be exacerbated by climate, change leading to selection of virulent pathogens that have the potential to spread. This can result in introduction and spread of more virulent pathogens to natural fisheries and aquaculture landscapes, threatening a significant part of the global supply of nutritious animal foods. Understanding the interaction between climate sensitive aquaculture landscapes along with their aquatic hosts and climate sensitive aquatic animal diseases, mapping of potential risks, identification of suitable adaptation/mitigation intervention strategies is important to plan responses. There is limited information as to how aquatic animal disease outbreak dynamics are mediated by climate driven changes and what impact this will have on the future of aquaculture growth in Myanmar. With OIE, FAO has extensive experience supporting countries in the development and implementation of biosecurity frameworks for aquatic animals. Fishadapt adopt good practice in biosecurity management and will address this through³⁴:

- Build capacity for science based import risk analysis and development of CCA biosecurity governance mechanisms.

³⁴CIAT-CGIAR submission –UNFCCC 2014

- Strengthening policy to implement CC adapted aquatic animal disease management and biosecurity frameworks and to prevent future disease losses associated with climate change.
- Identify diversified aquaculture production systems with lower risk of losses
- Identify suitable CC adaptation/mitigation strategies for the aquaculture sector.
- Identify potential breeding programs for climate adapted (for example salinity and heat-tolerant) breeds to address issues of seawater intrusion leading to salinity increases and rise in temperature.
- Support implementation of better management practices (BMPs) to address aquatic animal health risks specific for farming systems that are impacted by climate change. This will enable these farming systems to make suitable adjustments, to reduce underlying risk and become resilient.

The project will work with fish farmers, communities, local NGO, local universities and government agencies to develop and implement aquaculture-based monitoring and early warning systems to jointly monitor and communicate changes in the environment and farming systems.

This component will coordinate with OIE, NACA, WorldFish, and work with local Universities to develop capacity in DOF, MFF and partners in Aquatic Animal Health Risk and CC Vulnerability Assessment and to develop good practice for monitoring and controlling threats. At District level, diagnostic “mini-labs” and reporting of CC will be developed and piloted (in Districts identified under Output 3.1.3).

Relevant baseline programmes and projects include the Japan-funded programme and the FAO Technical Cooperation Programme projects in Animal Health³⁵.

3.1.4: Aquaculture-based early warning system developed, including the use of ICT based information services to enable regular and early warning.

During PPG, consultations with fish farmers (Appendix 11) appropriate early warning systems for fish farmers no potential disasters such as storms and periods of high/low or fluctuating temperatures were identified. Early warning of potential disease epizootics was also needed.

Due to limited access to knowledge and information awareness and capacity remains low among the local fish farmer’s communities to adapt aquaculture practices to CC. There are no local DRM systems and EWS in place for aquaculture communities.

In coordination with Component 1 and Component 2 (and DMH, Universities and other partners), a specific EWS will be developed for fish farmers and fish farming communities. Needs will be identified (based on DRM assessment and community consultations) with partners. The EWS will be piloted in 10 sites identified according to their vulnerability. Capacity building of partners and stakeholders in DRM will be undertaken. The pilot will include relevant government partner agencies such as DRD, DMH, and MOE.

An ICT based information dissemination systems at project sites will be developed through which the project communities will get technical messages on actions to be taken to address risks of CC on fisheries and aquaculture production systems

³⁵ FAO Fish health management. <http://www.fao.org/fishery/topic/16124/en> (Accessed August 2015)

3.1.5: Pilot integrated mangrove-aquaculture and rainfed rice paddy-fish systems assessed and implemented.

Mangrove Aquaculture-fisheries: The project PPG phase identified mangrove restoration as a priority for vulnerable communities (Appendix 11). Whilst greatly reduced in recent years, these habitats are viewed by communities as important for the ecosystem services they provide and the protection from erosion, storm surge, and cyclone.

The project will build upon the good practice developed by the GoM-FAO TCP mangrove project in Rakhine province, which has built significant capacity in community based management of sustainable mangrove-fisheries-aquaculture systems. This project will work with the forestry and fisheries departments and Universities in further climate proofing existing communities in Rakhine with respect to mangrove-fisheries and mangrove aquaculture pilots. Mangrove restoration and community based management will address coastal flooding from an ecosystem approach- coastal erosion may be addressed via active mangrove management and restoration, sand dune rehabilitation using native species, wetland restoration, agricultural land reclamation, and construction and rehabilitation of fringing coral reefs.

With patterns from MOF, MOE and DOF Mangrove restoration plans will also be developed and implemented for the 1 pilot area of the project. This will be done through the development and implementation of climate change adaptation and disaster risk management plans for the fisher and fish farming communities that rely on the ecosystem services provided by mangrove-fishery-aquaculture systems.

Rice-paddy fish: Rice-cum paddy culture has been carried out in Myanmar for many years and has a range of direct benefits such as improved income and improved nutrition. A range of less obvious benefits includes risk reduction through diversification of the farming system. These have a strong attraction to many farmers and their families. Fish can be sold directly, or may reduce the dependence of families on other livestock which can then be traded for income. In addition, fish from the rice fields may not be sold but the production may be used to feed relatives and those who assist in rice harvesting, a benefit which could almost be considered essential in families with a labour shortage. This diversification of production also improves resilience to climate change impacts. Land and water use problems between farmers and fishers can also be mitigated and solved.

The project will pilot methodologies for the use of rice-fish in five of the communities within the pilot districts using Farmer Field School (FFS) approaches. The finding will be developed into a good practice guide.

These activities will be undertaken in partnerships with partners such as WorldFish, DOF, MOA and Water Utilization Department and Land Record Department

Component 4: Knowledge management, monitoring and evaluation, training and scaling up adaptation practices, lessons learnt development and dissemination.

Component 4 will be delivered through six outputs.

Table 2.6 Component 4 outputs

Outputs	Activities
4.1: Cutting edge training modules and how -to" guidelines for fisheries and	4.1.1.1 Support to systematic CD and TNA assessment (linked to IA in C1) completed by key training partners of stakeholders, 4.1.1.2 Adaptation technologies and practices for development into training

aquaculture stakeholders developed.	modules. 4.1.1.3. Training programme piloted and then implemented by partners for (DOF/NGO and project partners). 4.1.1.4 Training programme follow up and evaluation along with dissemination.
4.2: Peer-to-peer learning program targeting fishers and fish farmers implemented to provide access to improved knowledge on climate variability, climate impacts, and adaptation options.	4.2.1.1 Based on CD/TNA assessments xx exchange programmes developed - MFF network strengthened for CCA - Worldfish/University networks strengthened for CCA - National and global networks engaged and informed (NAP-GSP) - Lessons learned developed and published. - Peer-to-peer/community-to-community exchanges organized.
4.3.: Information and knowledge sharing platform on aquatic animal disease and water quality concerning the fishery and aquaculture sector developed and in use	4.3.1 Review of existing networks. 4.3.2. Strengthening of existing networks and/or development of new one's 4.3.3. Development of DoF CCA/CC coordination unit.
4.4: Project monitoring system operating implemented providing systematic information on progress in meeting project outcome and output target.	4.4.1 Development of project M+E system 4.4.2 Project baseline n surveys 4.4.3. Project progress reports
4.5: Midterm review and final evaluation conducted	4.5.1 Mid Term review 4.5.2. Terminal evaluation
4.6: Project-related “best-practices” and “lessons-learned” published	4.6.1. Identification of best practice 4.6.2. Prepare and review best practice 4..6.3. Publish best practice

The fisheries and aquaculture sector of Myanmar currently has no documented experience in understanding climate change vulnerabilities and adaptation options specific to its situation. In addition, no mechanisms exist for the various stakeholders to share their information of change and technologies, practices and knowledge to promote resilience within the sector across the country. During PPG assessments, (Appendix 11) access to knowledge on adaptation, new practices, and technologies was identified as a key priority by communities. Government staff also identified knowledge management as a key area for capacity development.

Under this component, the project will develop and record lessons learned, elaborate cutting-edge training modules to train Government staff and other stakeholders in climate change adaptation and develop “how-to” guidelines. It will enhance understanding and access to improved knowledge on adaptation practices in fisheries and aquaculture sector at various levels and encourage peer-to-peer learning among fishers, fish farmers, poster-harvest workers and dependent communities.

The component will develop capacity and information systems within existing fisheries and aquaculture sector support facilities and institutions to address the emerging impacts of climate change on the sector.

A lasting integrated system directly relevant to the country M&E will be developed and implemented, including a knowledge sharing platform on aquatic animal disease and water quality monitoring. This project will support the established framework through furthering the communication and outreach activities through. Lessons learnt will be made widely available and shared through relevant technical and policy-level decision-making debates and fora as well as newsletters, a website and other means appropriate to the context.

Project Pilot Zones

The project will work at national level for the policy consultation (Component 1) and knowledge management components (Component 4). The NAPA and subsequent analyses during the PIF and PPG phase identified three key areas vulnerable to the impacts of climate change where piloting of the project community level work and scaling up at regional/state level would be most effective. The principle components to be piloted are those related to small-scale fisheries and aquaculture (Component 2 and Component 3). The regions/states include Ayeyarwady, Rakhine and Yangon and the small-scale aquaculture communities in the central dry zone (CDZ).

The project will operate principally in these regions during piloting of sub-national activities in order to develop good practice for upscaling at regional and national level. The baseline small-scale aquaculture activities in the Central Dry Zone (CDZ) will benefit from the CCA VA planning and the development and implementation of small-scale aquaculture adaptation practices and technologies. A more detailed description of the pilot areas and of the PPG consultations is outlined in *Annex 11* and in the PPG consultation reports.

At the same time, it is recognised that the project national level work on CCA VA, planning and knowledge management will both benefit from and contribute to the work in the pilot regions.

There will also be flexibility to work in other areas outside those should priority CC vulnerable ecosystems, fisheries and aquaculture systems be identified during the national vulnerability assessment.

During the first phase of project implementation, piloting and developing capacity in a limited number of villages (9) in Ayeyarwady, Rakhine and Yangon will be undertaken (Fig 6). Specifically these include:

- Yangon in Kyauktan Township. The communities of Mee Pya, Zwe Bar Kone Tan and Chaung Wa (Fig 7).
- Rakhine, in Myebon Township. Kyauk Maw Gyi, Ohn Taw and WaKauk Gyi villages (Fig 8)
- Ayeyarawady, in Ahmar Township. Ahmar 1 ward, Auk SeikKwin and Thamain Pale (Fig 9)

During this phase the full implementation, approach will be developed, piloted and refined (including community VA, CCA planning for the sector, CD courses and manuals, project monitoring and management). During this phase, CCA VA and plans would also be developed within the 10 communities of the EFSP project to allow lessons learned to be developed and shared.

The second phase of implementation will be the “scaling up “ of these pilots and approaches to a broader number of villages within these three regions (up to the target 120 villages). This scale up will be based on the detailed community, district and state/region level CC VA’s and consultation carried out during the first phase by trained DOF officers.

During the PPG inception, workshop³⁶ initial draft selection criteria were developed and discussed for the first nine pilot communities, along with areas of concern to be considered. These initial criteria were developed to allow the project consultations to get underway and consultations begin. The criteria were developed for the main fishery and aquaculture systems identified in the priority regions of Ayeyarwady, Rakhine, Yangon and CDZ. In addition, it was recommended that during project implementation these criteria be further developed and refined along with transparent decision making and consultation processes. These processes will ensure full participation of women and vulnerable groups. These broad criteria are outlined in Appendix 13.

Figure. 6 General Location of project initial pilot sites and pilot regions states in Yangon (Kyauktan Township), Rakhine (Myebon Township) and Ayeyarwady (Ah Mar Township).



³⁶ Report of the MLFRD-FAO project development inception workshops on fishadapt: strengthening the adaptive capacity and resilience of fisheries and aquaculture-dependent livelihoods in Myanmar. Nay Pyi Taw and Yangon, Myanmar 18 and 20 November, 2014

Figure 7. Location of Fishadapt pilot sites in Ayeyarwady region, Ayeyarwady Division Ahmer Township Ahmar 1 ward, Auk SeikKwin and Thmain Pale



Figure 8. Yangon region, location of pilot sites of Mee Pya, Zwe Bar Kone Tan and Chaung Wa.

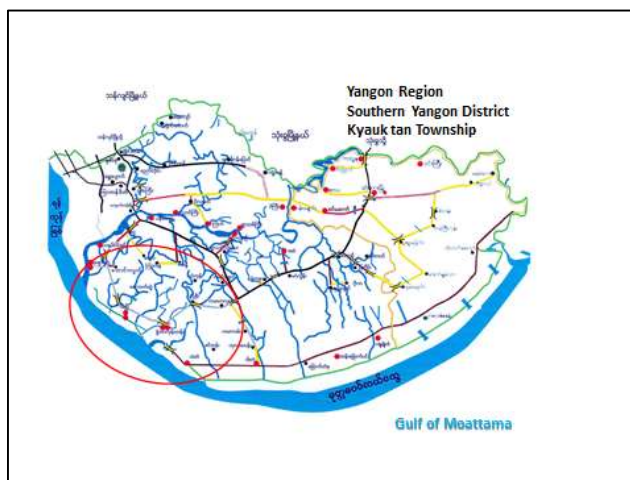


Figure 9. Map of Rakhine state showing location of Kyauk Maw Gyi, Ohn Taw and WaKauk Gyi villages.



During the PPG phase, consultations with partners confirmed the importance of the project and working with selected communities in the Central Dry Zone in Myanmar, which are recognised by the NAPA as vulnerable to the impacts of climate change. According to the 2013 FAO-LIFT Dry Zone Development Programme Scoping Report³⁷ the CDZ--comprising much of Magway, Mandalay and lower Sagaing divisions-- is one of the most food insecure areas in Myanmar (Fig 10). The government of Myanmar and partners such as LIFT, Worldfish and JICA have prioritised areas in Mandalay (Myingyan, Natogyi, Taungtha, Mahlaing) and Magway (Pakokku and Yesagyo) for the development of small-scale aquaculture in order to diversify and build resilience of small-scale farmers. The specific communities are yet to be identified. Fishadapt will continue to work with these partners from Year 1 to further identify 20 small-scale fish farming communities to undertake CCA planning under project implementation.

Figure 10 General Map indicating Central Dry Zone, Myanmar.

³⁷ 2013. FAO-LIFT . Dry Zone Development Programme Scoping Report – Annex 2: Seeds, Crops and Livestock



2.3 ADAPTATION BENEFITS

The adaptation benefits provided by the project include the following summarised from the AMAT tracking tool. These include:

CC Objective 1: Reduce the vulnerability of people, livelihoods, physical assets, and natural systems to the adverse effects of climate change.

The number of direct beneficiaries will be 90,000 with at least 30% women, 155 Vulnerability Assessments will be completed.

Outcome 1.1: Vulnerability of physical assets and natural systems reduced

The type and extent of assets strengthened and/or better managed to withstand the effects of climate change include 2,400 km coast, 390,220km² sea and 4,000 km rivers.

Outcome 1.2: Livelihoods and sources of income of vulnerable populations diversified and strengthened

The population benefiting from the adoption of diversified, climate-resilient livelihood options will be 369,000 indirect and direct beneficiaries (direct beneficiaries =- 90,000 plus their households) and at least 30% women.

Outcome 1.3: Climate-resilient technologies and practices adopted and scaled up

The project will reach 90,000 people with climate-resilient technologies/ practices (30% women)

Objective 2: Strengthen institutional and technical capacities for effective climate change adaptation

Outcome 2.1: Increased awareness of climate change impacts, vulnerability and adaptation

Public awareness activities by the project will reach 3 million people

Outcome 2.2: Access to improved climate information and early-warning systems enhanced at regional, national, sub-national, and local levels

At least 155 risk and vulnerability assessments and other relevant scientific and technical assessments carried out and updated. 3,000,000 people will have access to improved climate information services and climate related early warning information (at least 50% women).

Outcome 2.3: Institutional and technical capacities and human skills strengthened to identify, prioritize, implement, monitor, and evaluate adaptation strategies and measures

Training and capacity development will be provided to 3,500 people to enable them to identify, prioritize, implement, monitor, and evaluate adaptation strategies and measures (30% women). Capacities of 20 regional, national, and sub-national institution to identify, prioritize, implement, monitor, and evaluate adaptation strategies and measures will be strengthened.

Objective 3: Integrate climate change adaptation into relevant policies, plans and associated processes

Outcome 3.1: Institutional arrangements to lead, coordinate and support the integration of climate change adaptation into relevant policies, plans and associated processes established and strengthened

Institutional arrangements to lead coordinate and support the integration of climate change adaptation into relevant policies, plans, and associated processes in Myanmar will be strengthened.

Outcome 3.2: Policies, plans and associated processes developed and strengthened to identify, prioritize, and integrate adaptation strategies and measures

Three regional, national, and sector-wide policies, plans, and processes developed and strengthened to identify, prioritize, and integrate adaptation strategies and measures. Fourteen sub-national plans and processes developed and strengthened to identify, prioritize, and integrate adaptation strategies and measures.

Outcome 3.3: Systems and frameworks for the continuous monitoring, reporting and review of adaptation established and strengthened

Systems and frameworks for the continuous monitoring, reporting, and review of adaptation will be strengthened.

With respect to Gender, the PPG phase analysis has allowed the project design to integrate indicators into the results framework and monitoring and evaluation.

2.4 COST EFFECTIVENESS

The preparation phase of the project consulted broadly with stakeholders and analysed a range of alternative strategies to those adopted by the project.

The preparation phase of the project consulted broadly with stakeholders and analysed a range of alternative strategies to those adopted by the project. The project will put in place actions that will reduce future costs of adaptation by putting in place appropriate capacities, mechanisms, investments as outlined in the project document. Cost effectiveness/project outcome is detailed

below, and includes alternatives considered. Secondly, cost effectiveness is also achieved by working through existing government/ local community mechanisms rather than creating new ones. These include the existing MFF associations, Village Fisheries groups and the national VDC planning process.

Table 2.7. Alternative Strategies considered.

Outcome	Strategies adopted by the project	Alternatives that were considered
Outcome 1 Enhanced capacity of DoF, GoM and private sector stakeholders to address climate change issues through improved relevant national policies and strategies facilitating a climate resilient fisheries and aquaculture sector.	Policy Mainstreaming of CCA Sector vulnerability Assessment	Without an enabling policy framework for fisheries and aquaculture CCA planning and action the investments made by the project would be short term and without sustainability. Other alternatives considered were short term and often ad-hoc including leaving current policies unchanged. Without a systematic Vulnerability Assessment, the sector would be unable to identify vulnerable fisheries and aquaculture systems and project actions would be ad-hoc.
Outcome 2. Fishers in coastal and inland water regions of Myanmar increase their knowledge of and reduce their vulnerability to climate change, and disasters and develop/demonstrate critical adaptation practices and technologies	EAFM – CCA	Without the EAFM-CCA approach, fisheries and fisheries communities would be unable to identify and respond to climate change threats in a systematic manner. The alternative to the adoption of EAFM-CCA approaches was to leave current fisheries management and CCA planning approaches unchanged and ad-hoc.
Outcome 3. Small-scale fish farmers in coastal and inland water regions of Myanmar increase their knowledge of and reduce their vulnerability to climate change, and develop and demonstrate critical adaptation practices and technologies.	EAA - CCA	Without the EAA-CCA approach, aquaculture communities would be unable to identify and respond to climate change threats in a systematic manner. The alternative to the adoption of EAA-CCA approaches was to leave current fisheries management and CCA planning approaches unchanged and ad-hoc.
Outcome 4. Enhanced understanding and access to adaptation practices and technologies enable stakeholders to manage information and scale up adaptation in the fisheries and aquaculture sector.	Systematic Capacity development for key stakeholders Communication strategy	The alternative to the adoption of a systematic capacity development strategy was to develop ad-hoc responses to capacity development needs and where uncoordinated are unlikely to mobilize targeted address of the key/main barriers.

Cost-effectiveness analyses, as well as social and environmental assessments, of adaptation options identified during the project will be undertaken with the communities, local governments and fishers and fish farming groups as part of the adaptation process. Broadly speaking, it is cost effective to ensure resilience and adaptation within the fisheries sector as transitioning the fisheries-dependent communities to other livelihood sectors would require substantially greater capacity building and investment than to build on current capacities and livelihood strategies, especially for households with limited access to land and in the face of limited alternatives.

Within project adaptation work, cost-effectiveness is ensured by promoting approaches that have been considered costs effective in similar contexts, such as through mangrove

rehabilitation, livelihood diversification through increased ecosystem services (e.g. mangrove mud-crab fattening development), and improved fisheries management.

Fishadapt alternatives were informed by a cost-effectiveness study (Perez et al, 20013³⁸) in other countries, facing similar climate change risks in which the following consistent and common results were found across sites in Indonesia, Philippines and Vietnam:

- ecosystem-based approaches are more cost-effective than hard infrastructure investments. This is true for the case of mangrove reforestation (whenever applicable) when compared with sea walls, embankments, and breakwaters.
- where livelihood diversification was considered, it was found that this intervention, which can augment the income-earning capacities of households, is a cost-effective planned adaptation option.

The FAO's experience in Myanmar in 1) building capacity of communities and institutions to co-manage fisheries and aquaculture systems within mangrove ecosystems; 2) rendering post-harvest processes more efficient and diversified; and 3) reducing vulnerability through fisheries and non-fisheries livelihoods diversification, improved fishing operations safety and mangrove rehabilitation has proved cost-effective and financially sustainable as shown, for example, by the ability of the pilot Village Fisheries Societies to manage, both financially and biologically, the benefits derived from purchased fishing tender lots with resulting surpluses to create a revolving fund for its members.

All VFS were able to self-finance tender lots in the years following the pilot project. A similar project in the region that strengthened capacity among small-scale fishing communities and their supporting institutions in Cambodia, Indonesia, the Philippines, Sri Lanka, Timor-Leste and Viet Nam improved the livelihoods of fishers and their families while fostering more sustainable fisheries resources management practices. Among the results, the project saw its VFS offer far more professional services and resulted in higher savings and micro loan repayment rates and products such as life insurance were also made available to fishers for the very first time.

Additional examples of cost-effectiveness actions appropriate for the Myanmar context may be seen through the promotion of rice-fish farming as a supplement to traditional rice monocropping. Studies³⁹ in Bangladesh, Indonesia, and the Philippines have shown between 50 and 200% increases in net returns between rice only and rice-fish farming.

In addition, the use of "backyard" drinking water ponds are increasingly being used in the Delta region to grow fish, primarily for subsistence consumption. Anecdotal information indicates potential to increase the productivity of these resources if drinking water needs can be met⁴⁰.

Finally, as noted, there are a number of institutions, organizations and stakeholders that are engaged in fisheries and aquaculture related activities of differing scales and the project will work with these multiple players wherever possible, complementing and strengthening their efforts in a cost-effective manner, rather than attempting to start new initiatives or to compete with existing ones. Similarly, the project will work with and through existing multi-sectoral

³⁸ Maripaz L. Perez, Asa Jose U. Sajise, Jaimie Kim B. Arias, Paul Joseph B. Ramirez, Agus Heri Purnomo, Shaneil R. Dipasupil, Patrick A. Regoniel, Kim Anh T. Nguyen and Glaiza J. Zamora. 2013. Economic Analysis of Climate Change Adaptation Strategies in Selected Coastal Areas in Indonesia, Philippines and Vietnam. WorldFish Project report 2013-32.

³⁹ Halwart, M and Gupta, M. 2004. Culture of fish in rice fields. FAO and The WorldFish Center.

⁴⁰ Belton et al. 2015. Aquaculture in Transition: Value Chain Transformation, Fish and Food Security in Myanmar. sFeed the Future Research Report #4

platforms and processes in its work to ensure the inclusion of fisheries and aquaculture in broad-based, multi-sectoral planning and programmes.

2.5 INNOVATIVENESS

The project is unique in its approach to addressing climate change adaptation through the adoption of EAFM and EAA approaches at National State/Province and Community level in Myanmar.

The project is innovative in that it addresses Climate Change adaptation issues for fishing and fish farming communities in Myanmar. By taking a food security focus, integration of climate smart fisheries and aquaculture investments in the future will broaden food security opportunities in Myanmar. The project will incorporate uncertainty and variability explicitly into fisheries and aquaculture development and management, including the development of flexible spatial and temporal closures, and will develop participatory monitoring systems in the inland fisheries and aquaculture as an early warning mechanism. These activities will better prepare the sector to participate in national climate change and DRM discussions, including cross-sectoral water management in adaptation and GHG mitigation planning for sustainability and scaling up.

Myanmar has surprisingly robust and active federations and associations in the private sector. The involvement of the MFF in this project and its local-level affiliates has the promise of being an innovative way to really engage civil society in Myanmar, when civil society organizations in many areas of Myanmar are still in their nascent stages. Private sector involvement in the project formulation and implementation will be a critical ingredient to reaching sustainability goals. The project will engage with private sector fisheries enterprises through the project.

A wide range of innovative technologies and practices will be developed during implementation and based on more specific analysis of community needs using the EAFM and EAA - CCA approach. Practices for fisheries may include

- Identifying fish refugia, breeding areas or protected areas in rivers and lakes are managed and designed to be resilient also to the impacts of climate change (such as drought, flooding, salt water intrusion).
- New fisheries management measure to address climate change impacts could include preventing fishing during climate induced droughts or changing the closed seasons to reflect changes in species or their life cycles;
- Managing water levels through increasing riverbank height or installing sluice gates to manage changes in water flow.
- For coastal communities, changes to the management of fisheries need to be agreed with communities and could include establishing co management regime; and,
- Protecting vulnerable ecosystems and habitats that provide protection to extreme events.
- Changes in the type of fishing gears used by fishers may be required as the species composition change as well as spatial zoning of fishing activities, including those of migratory fishers.
- Protecting fisheries infrastructure (such as landing areas, ice making facilities, or markets) in vulnerable coastal areas may be needed.
- Projected increases in the number and strength of tropical storms due to climate change mean that Innovative approaches to safer fishing are required.

Practices for aquaculture will

- Adoption of locally available saline/heat tolerant species for culture in areas affected by salt intrusion and raised temperatures.

- Improved aquaculture systems using ponds with higher bunds will enable them to continue culture during periods of drought.
- Improvement of hatcheries to withstand additional climate change related drought and flood (larger water reservoirs or wells and increasing pond dykes).
- Brood banks and improved management of broodstock will allow medium to long term planning and development of climate resilient aquaculture.
- CCA and community managed mangrove systems with integration of low risk low impact extensive aquaculture and ranching/penning technologies using for example mud crabs.
- Climate resilient national biosecurity framework to prevent the transmission of aquatic animal epizootics.

SECTION 3 – FEASIBILITY

3.1 ENVIRONMENTAL IMPACT ASSESSMENT

The Project Objective is to enable inland and coastal fishery and aquaculture stakeholders to adapt to climate change by understanding and reducing vulnerabilities, piloting new practices and technologies, and sharing information.

The project adopts an Ecosystem approach to Fisheries management (EAFM) and Aquaculture (EAA). EAFM is the practical way to implement sustainable development for fisheries by finding a balance between ecological and human well-being through good governance. These will be applied to enhance the resilience of aquatic ecosystems to climate change impacts and fishing and fish farming activities. These approaches also reduce the underlying vulnerability of fishing and fish farming communities. A national Climate Change Vulnerability Assessment will identify “at risk” ecosystems and in particular small-scale traditional fisheries and fish farming systems for specific action. Environmental sustainability will be ensured through positive impacts the introduced climate change adaptation plans, fisheries management plans, technologies and approaches on a range of ecosystem services.

Sustainable management of natural resources and positive environmental benefits are a key element of the project. Analysis of the project shows that there are no negative environmental impacts. According to FAO’s EIA methodology, it can be categorised as **C**.

This project will work at the national level on policies and institutional strengthening and will demonstrate strengthened adaption at the community level in areas such as: the Ayeyarwady Region, Yangon Region, and Rakhine State with additional regions identified in relation to small-scale inland aquaculture development. Vulnerable groups such as the poor and women will be targeted.

The adoption of EAFM and EAA approaches can result in restriction of access for some stakeholders by community c-management groups. This is done in a participatory and consultative way. Fisheries Management plans for example may require a reduction in fishing capacity to ensure fishing effort is within sustainable limits for that fishery. Should this occur then the project will mitigate the impact through the planned development of alternative livelihood strategies that are an integral part of EAFM and EAA approaches.

3.2 RISK MANAGEMENT

3.2.1 Risks and mitigation measures

The key risks to the project are indicated along with their categorisation and mitigation measures in Table 3.1 below. These are outlined in more detail in Appendix 4, and the project results matrix.

Table 3.1. Project risks, their rating and mitigation measures (see also Appendix 4).

Risk type	Risk level (High, Medium, Low)	Mitigation measures
Local community in conflict and unable to participate in project fully (especially	L	The project will mitigate this through careful selection criteria developed and applied

in sensitive areas). Local community conflicts prevent project implementation teams working with and travelling to communities.		during the identification of pilot project demonstration sites. Full participatory consultation with community stakeholders, government, and local authorities to ensure management of expectations. Application of conflict sensitive principles (via LIFT).
Significant natural or human induced disasters or crises prevent planned programme delivery.	M/H	Mitigation will be through the development of a CCA/DRM strategy for the project and communities. If such events do occur then activities in that region will, after consultation and agreement with stakeholders, be rescheduled.
Extreme climate events affect livelihoods of stakeholders. (For example, higher surface water temperature may cause greater evaporation rate in aquaculture ponds, increasing mortality of fish culture, low market price due to muddy smell. (Soft-shell mud crab farming in pond water surface areas will be particularly vulnerable).	L	The project mitigates this risk through its support to the development of CC adaptation technologies and approaches. The project will build the capacity of farmers, communities and government to better deal with the ongoing climate variability including extremes and future climate change through adaptation practices
Communities, fishers, fish farmers and other key stakeholders do not adopt or implement the CC adaptation technologies, practice, laws and policies developed by the project.	M	<p>The project mitigates this risk through its planned capacity development programme, advocacy, and communications for the implementation of the EAFM/EAA/VA approaches and policy mainstreaming. Ownership will be built with stakeholders at all levels (fishers, communities, fish farmers, Government, and partners) and who will be encouraged and supported in piloting and developing the technologies and practices needed. Knowledge and good practice generated will be shared broadly through existing networks.</p> <p>The adoption of participatory community led methodologies will ensure full engagement of these stakeholders.</p>
Gender issues not adequately addressed and women not fully engaged with the project.	M	The project mitigates this risk through the development and monitoring of a gender strategy. FAO has extensive experience in the region and has developed good practice with gender in project design and implementation. Further, specific gender target will be set on project start up.

3.2.2 Fiduciary risk analysis and mitigation measures

Not relevant for the Fishadapt project as this is an FAO Direct Execution Project (DEX).

SECTION 4 – IMPLEMENTATION and MANAGEMENT ARRANGEMENTS

4.1 INSTITUTIONAL ARRANGEMENTS

4.1.1 General institutional context and responsibilities

The project will be implemented by FAO (under its Direct Execution arrangements (DEX)) and in close collaboration with the Department of Fisheries (DOF), Ministry of Livestock, Fisheries and Rural Development.

The project will be guided by a Project Steering Committee (PSC) made up of representatives from FAO, the government of Myanmar and key partners.

4.1.2 Coordination with other ongoing and planned related initiatives

The project will support government of Myanmar in coordination and delivery of its policies. The national programmatic and international aid and investment landscape in Myanmar is evolving rapidly and this will be tracked by the project to ensure that new partners can be integrated with coordination mechanisms. In addition, it will support coordinate coordination with a range of relevant and ongoing projects and programmes concerning the fisheries and aquaculture sector. These include:

Myanmar Climate Change Alliance Project (GCCA): funded by EU, from September 2013 through 2016. To achieve synergy, the proposed FAO/GEF LDCF project will focus on fisheries sector specific adaptation policy and strategies and pilot activities including fisheries focused Early Warning System, which falls outside the scope of UN-HABITAT project.

USAID: Winrock International has signed a MOU with the Ministry of Livestock and Fisheries to provide technical assistance under “Farmer to Farmer” program to support aquaculture development, including tilapia culture, in twelve locations.

BOBLME: This LDCF initiative will benefit from coordination with the implementation of the Bay of Bengal Large Marine Ecosystem Project (BOBLME) Strategic Action Programme (SAP), which will be implemented from 2016 following agreement between participating member countries. Myanmar is one of the eight countries involved the BOBLME. This seeks greater resilience of coastal communities through the implementation of the Strategic Action Programme, which is under consideration by member countries. To date BOBLME’s work with countries in the Bay of Bengal region has focused on the management of Hilsa, a key fisheries species in Myanmar and neighbouring countries. BOBLME has also been working to develop better regional understanding of climate driven processes in oceanography through partnership with the Indian Ocean Global Ocean Observing System (IOGOOS) and the UNESCO project entitled “Monsoon Onset Monitoring and its Social and Ecosystem Impacts.” It has contributed to generation of information on biogeochemical processes, as well as ocean acidification, through the procurement and deployment of sensors for the data buoy in the Bay operated by the NOAA funded program “Research Moored Array for African-Asian-Australian Monsoon Analysis and Prediction” or RAMA. This work is accompanied by some capacity development and networking at national and regional level. BOBLME has been promoting ICM capacity development and supported the training of relevant staff in ICM training courses. A major capacity development activity has been the design of an Ecosystem Approach to Fisheries management training course, which is due for upscaling amongst member countries and in the wider Asia-Pacific region. This course focuses on fisheries but also allows other environmental and human dimensions such as vulnerability and climate driven effects to be built into management plans.

Through the BOBLME programme Norway (EAF Nansen programme) has supported two scientific surveys of marine biodiversity and oceanography in Myanmar waters by the Norwegian Research Vessel (RV) Dr Fridtjof Nansen, operating within the framework of the FAO EAF-Nansen Project “Strengthening the Knowledge Base for and Implementing an Ecosystem Approach to Marine Fisheries in Developing Countries” (GCP/INT/003/NOR) and the BOBLME. Both these surveys are a significant addition to the range of national activities in Myanmar and regional activities involving Myanmar scientists and government officials in a wider Bay of Bengal context. FAO has been collaborating with the Norwegian Agency for Development (NORAD) and the Institute of Marine Research of Bergen, Norway, to carry out fisheries resources and environment surveys in developing countries in Africa, Asia, and Latin America using the vessel RV Dr Fridtjof Nansen since 1975. The on-going survey is the second such survey programme by the EAF Nansen Programme in Myanmar waters. The old research vessel Dr. Fridtjof Nansen had carried out similar surveys in the period 1979-1980, establishing important benchmark information on the state of the Myanmar marine resources. The current survey will massively improve the understanding of the status of the marine resources, and provide the information essential for informed management and sustainability of Myanmar's marine resources for years to come. Please refer to ‘GEF project’ linkages below for information regarding the benefits of Fishadapt and BOBLME coordination.

NORAD: The Norwegian government is also in the process of developing a bilateral programme for support to the fishery sector.

Japan: The government of Japan has a project promoting small-scale aquaculture (SAEP) as a livelihood option in 13 townships in Mandalay, Sagaing, and Magway regions. The project focuses on small-scale aquaculture with low inputs. Fishadapt can work with SAEP-II project to climate proof the existing approach and pilot adaptation technologies in these areas.

DANIDA: The government of Denmark has a planned programme to support for Myanmar Fisheries Sector. The programme aims to 1) help Myanmar’s coastal and marine resources to be utilized in a sustainable and responsible manner by communities and strengthened sector institutions, 2) ensure Myanmar’s coastal and marine resources are exploited sustainably by Myanmar fishers and vessel operators, 3) ensure that all coastal resources accessible to small-scale, artisanal fishers are exploited by small-scale, artisanal fishers 5) help Post-harvest and market, supply and value chain improvements continue to support and maintain the livelihood of the people presently depending on it, 6) ensure the contribution of the sector to the national food balance, nutrition, and food security is maintained, at least at present levels and 7) ensure degradation of coastal and marine environmental is arrested and, where technically and economically feasible, restored. The objectives will include those to ensure Co-management arrangements are in place where fishers and their representative organizations, DOF on central, state/division and district/township level government, and other resource stakeholders collaborate to utilize coastal living aquatic resources sustainably and responsibly and that co-management arrangements are piloted, developed and established in selected communities and villages pertaining to the same ecosystem as the driver of sustainable and responsible coastal fishing. Fishadapt will coordinate closely with Denmark regarding climate adaptation planning and co management in particular.

Swiss Cooperation: The Swiss government is supporting a Community-Led Coastal Management in the Gulf of Mottama. The specific objective of this project is that: Vulnerable women and men in targeted coastal areas of the Gulf of Mottama have improved livelihood security through effective fisheries value chain development, livelihoods diversification and equitable and sustainable management of resources. The project seeks to achieve the following three outcomes: 1) Benefits of sustainable fisheries management in the Gulf of Mottama area are shared through effective value chains and equitable market access 2. Vulnerable coastal communities have increased income through livelihood diversification and improved access to

non-fisheries resources 3. The special habitats of the GoM are sustainably and equitably managed based on clear scientific information and through integrated local, regional, and national institutions/management bodies.

World Bank: The World Bank has two relevant programmes. The Ayeyarwady integrated river basin management project and the Agricultural development support project. The aim of the first is to strengthen integrated, climate resilient management and development of the Ayeyarwady River Basin and national water resources. The project development objective of the AIRBM is to contribute to the development of integrated river basin management on the Ayeyarwady River. It has three components including Component 1: *Water Resource Management Institutions, Decision Support Systems and Capacity Building* 32.00 MUS\$D, Component 2. *Hydro-meteorological Observation and Information Systems Modernization* 30.15 MUS\$D and Component 3. *Navigation Enhancement on the Ayeyarwady River*. The Agriculture development support objective is to increase crop yields and cropping intensity in selected existing irrigation sites in the Recipient's Bago East, Naypyitaw, Mandalay, and Sagaing regions. It has three components including Irrigation and Drainage Management (78.40 MUS\$D), Farm Advisory and Technical Services 17.20 (MUS\$D) and Project Coordination and Management (4.4 MUS\$D)

IFAD: Fostering Agricultural Revitalization in Myanmar (FARM) The project will introduce regional and global best practices to develop a sustainable and scale-able model for smallholder agriculture and rural development across Myanmar's central dry zone. It will support land consolidation and development, productive infrastructure, agricultural and business services, flow of knowledge and capacity building to promote an inclusive development model in this zone. The project will directly benefit 37,600 households consisting of 183,400 people, for an average cost of USD 152 per beneficiary. The project's goal is to improve the economic status of poor rural women and men in the project area. Its objective is to increase incomes of smallholder and landless households.

Government of Italy: The government of Italy is supporting a capacity development project with the IFT. Fishadapt will coordinate closely with this project.

GEF: The project will seek close synergies with other prospective and ongoing GEF-funded projects in Myanmar. A full list of GEF projects in Myanmar is provided in Appendix 9. The FishAdapt project's PIU will be tasked with ensuring coordination and transfer of benefits among the projects. In addition, FAO/Myanmar's Programmatic Approach to GEF Project Design and Implementation will continue to ensure coordination and collaboration among all GEF projects under development and implementation within Myanmar.

In particular, the UNDP Reef to Ridge project. The LDCF project "Adapting Community Forestry landscapes and associated community livelihoods to a changing climate, in particular an increase in the frequency and intensity of extreme weather events" (approved in November 2013). In addition, the project also seeks synergies with the UNDP-UNEP implemented global/regional LDCF project "Building capacity for LDCs from Asia and the Pacific to participate effectively in intergovernmental climate change processes" (submitted in October 2013). While FishAdapt and the R2R do not share the same geographic areas for community level implementation, the projects envision sharing lessons learned and good practice and are planning more specific coordination on policy and knowledge management at a National (Union) level. (The details and frequency of FishAdapt/R2R coordination meetings will be further pinpointed and agreed to within FishAdapt inception discussions).

The planned GEF 6 MyCoast project (under design by FAO) will also focus on planning for productive landscapes in the southern part of Myanmar. This is complementary to the planning

and work that will be carried out in protected landscapes foreseen under the UNDP ridge to reef project.

BOBLME brings in linkages to fisheries and habitat management approaches that would be piloted in these areas to reduce anthropogenic impacts resulting for shore and water-based activities including fisheries. The management strategies and best practice approach, which would be piloted through BOBLME, would feed into the coastal planning mechanisms of the MyCoast project, and provided additional impacts to the protection work of the UNDP ridge to reef project. The overall management approaches piloted and the management plans which result would also be communicated through the regional knowledge and sharing mechanism of the BOBLME.

BOBLME SAP implementation will support FishAdapt through improving the general resilience of the fisheries systems and management in the Bay of Bengal region to non-climate stressors and through supporting Myanmar in its efforts to implement the ecosystem approach to fisheries and aquaculture to reducing vulnerability of the coastal and marine systems in general – these efforts will work together to reduce the “vulnerability context” in which Myanmar fisheries and dependent communities find themselves.

BOBLME SAP implementation will also support Myanmar and neighboring countries to manage climate-related shifts in targets species through the implementation of adaptive management of shared stocks and issues relating to fishers migrations linked to species range shifts, and; support collaboration on regional approaches to safety at sea and extreme events early warning systems.

Concretely, annual coordination events will be convened among the projects, including BOBLME SAP implementation, to provide a platform in which knowledge sharing and results in support of SAP implementation will be coordinated.

At the regional level, BOBLME will strengthen regional cooperation and sharing of management approaches and knowledge through its four -theme regional coordination platform. An annual coordination event would be convened/coordinated by the BOBLME RCU prior to the Project Steering Committee Meeting. This event would see the BOBLME SAP implementation partners organizing parallel knowledge sharing and coordination type meetings under their respective SAP themes. These would extend to projects and initiatives, which were not necessarily directly involved in the implementation and execution of the BOBLME SAP, but which are, nonetheless complementary and contribution to the overall goals of the BOBLME SAP. The Regional Coordination Platform and ensuing PSC would need some clear outcomes linked to this process, but as a starting point, this would serve as the basis for cementing emerging regional agreements in the subsidiary themes of the SAP.

Nationally, the BOBLME SAP will support the up-scaling of FishAdapt through the development of resilience plans in at least additional two pilot coastal areas in Myanmar and will provide further support to the inclusion of coastal fisheries and aquaculture in poverty reduction and development, as well as climate change policies, strategies and planning processes in Myanmar.

This project shall also reach out and build partnerships for capacity building and peer-knowledge exchange with the UNDP-FAO joint programme “Integrating Agriculture in National Adaptation Plans” working on integrating climate adaptation measures for the agricultural sectors (including forestry and fisheries) into relevant national planning and budgeting processes currently working in Kenya, Nepal, Philippines, Thailand, Uganda, Uruguay, Vietnam and Zambia but also planning regional activities. In addition, the project will also seek collaborate with the UNDP-UNEP lead GSP-NAP to align to the national NAP processes, the

UNFCCC LEG group and the UNFCCC Adaptation Committee to share the key opportunities and challenges of the national progress for the fishery and aquaculture sectors.

4.2 IMPLEMENTATION ARRANGEMENTS

4.2.1 Roles and responsibilities of the executing partners

The project will be implemented by FAO under its Direct Execution arrangements (DEX). The project will be implemented under FAO and GEF policies and rule in order to ensure it achieves its objectives, outcomes, and outputs as described in the results framework. FAO will be responsible for all financial and progress reporting to the GEF secretariat.

The project's implementation will be supported by an International Chief Technical Advise (CTA) and a full time project coordinator from DOF. The project roles and responsibilities are outlined in Fig 11 below.

A project Management Unit (PMU) will be established in DOF, Yangon Region office. The PMU will also have a coordination and support office in DOF NPT. Operational support will be provided by FAO Myanmar GEF support unit. Sub offices will be operated in Ayeyarwady and Rakhine. Learning and coordination centres will be established in District level DOF offices as required. Capacity Development and network coordination support units will be established in MFF and IFT.

DOF officers will be important partners in the implementation of the project. In particular, in Rakhine, Ayeyarwady and Yangon where the community level components will be implemented. They will receive capacity building and then work closely with the project to support implementation at township and village level. In particular, DOF staff will provide coordination support and technical advice to supervise the EAFM-CCA/EAA-CCA approach delivery (formation of groups, community consultations, adaptation planning and delivery, monitoring and evaluation). DOF staff at all levels will receive training and participate in law/policy development. They will also act as field coordinators and monitor progress of implementation where necessary. The draft protocol for support to coordination and implementation by DOF staff at community, Township, and District level is outlined in Appendix 13.

The project will work with closely with IFT who will provide training and capacity building support. Training modules will be developed and implemented by them and other training partners. IFT training will be carried out at the training centre or in Regions/States depending on cost/ efficiency.

MFF will provide access to its networks for the collection and dissemination of information and good practice.

4.2.2 FAO's role and responsibilities, as the lead GEF agency

FAO will be responsible for the implementation of the project under it DEX arrangements. As the lead GEF Agency, FAO will be responsible for oversight of the GEF resources as well as the project as a whole to ensure that GEF policies and criteria are adhered to and that the project meets its objectives and achieves expected outcomes and outputs as established in this project Document, work plans and budget in an efficient and effective manner. FAO will report on the project progress to the GEF Secretariat and financial reporting will be to the GEF Trustee. FAO will administer the GEF resources in accordance with FAO's rules and procedures and ensure the timely delivery of project inputs and outputs, in close consultation with DOF. FAO will closely monitor the project and provide technical support (through FAO's Fisheries and Aquaculture Department and the fishery technical group in the Regional Office for Asia and the

Pacific) and carry out supervision missions, as required.

The project will be coordinated by the FAO Myanmar office who will be responsible for the following primary activities: i) providing financial and audit services to the project; ii) recruitment and contracting of project staff; iii) overseeing financial expenditures against project budgets; iv) appointment of independent financial auditors and evaluators; and v) Oversee project implementation in accordance with the project document, work plans, budgets, agreements with co-financiers and the rules and procedures of FAO; vi) Provide technical guidance to ensure that appropriate technical quality is applied to all project activities and outputs; vii) Field supervision mission as necessary; and viii) ensuring regular reporting to GEF Secretariat and Evaluation Office, through the annual Project Implementation Review, on project progress and provide financial reports to the GEF Trustee as necessary appropriate FAO channels ix) conducting mid-term review

FAO Representative-Myanmar will be designated as the **Budget Holder (BH)** of the project's GEF resources. They will appoint a Chief Technical Adviser (CTA) and will be responsible for timely operational, administrative, and financial management of the project. In this capacity, the FAO-Myanmar will authorize the disbursement of the project's GEF resources and will designate a project Operational and Administrative Officer. The BH will establish a multi-disciplinary Project Task Force within FAO to support the Budget Holder and the project CTA, including the LTO (chair), a RAP Forestry Officer, the Fisheries Resource Division FIR (with branch representatives from FIRE, FIRA, and FIRO), the Fisheries and Aquaculture Policy and Economics Division (FIP), the FAO Development Law Service (LEGN), the FAORAP Forestry Group and Funding Liaison Officer (FLO) from FAO-GEF Coordination Unit

The FAO-RAP BH will work in close consultation with CTA, DOF, the FAO LTO, and FLO (see below) for the management of the GEF and other resources channelled through FAO. The BH will submit to the GEF Coordination unit and the LTO, six-monthly financial reports on the use of the GEF resources that shows the amount budgeted for the year, amount expended since the beginning of the year, including un-liquidated obligations (commitments) including details of project expenditures on an output-by-output basis, reported in line with project budget lines as set out in the project budget included in the Project Document. Financial reporting and operations, procurement of goods and contracting of services for project activities financed by these resources will be implemented in accordance with FAO rules and procedures. Final approval of procurement, letters of agreement, and financial transactions rests with the BH who will adhere to internal FAO clearance procedures.

Within FAO-RAP, a **FAO Lead Technical Officer (LTO)** will be appointed to supervise and provide technical guidance to the project. The LTO will be supported by the Project Task Force. The Chief Technical Adviser (CTA) will report technically to the FAO LTO. The FAO LTO will review all reports and clear, or obtain clearance as necessary, from the Project Task Force. Following approval, the reports will be submitted by the LTO, to the FAO GEF Coordination Unit as necessary. The LTO in close consultation with the CTA and with the support of the Project Budget holder Operational and Administrative officer in FAO-Myanmar:

- Conduct project supervision missions
- Represent FAO in the Project Steering Committee for technical matters (along with the BH);
- Technically review and clear annual work plans and budgets prepared by the CTA
- Request financial and monitoring reports;
- Review project progress reports monitoring outputs as established in the Project Results Framework, implementation reviews and financial reports
- Coordinate the preparation of the annual Project Implementation Review (PIR) by the CTA to be cleared by the FAO GEF Coordination Unit in the Investment Centre Division (TCI) and submitted to GEF.

- Review and provide clearance for the Terms of Reference (TOR) of consultancies, letters of agreement (LOA) and contracts; review technical specifications of procurement and subcontracting material developed by the CTA;
- Technically review and provide clearance for the selection of the consultants and firms to be hired with GEF funding
- Provide technical oversight to activities carried out by the executing partners and CTA
- Review and provide clearance (or obtain clearance from relevant task force members, as appropriate) for all technical reports
- Act as chair to the FAO Project Task Force.
- Coordinate management responses preparation to midterm review and terminal evaluation
- Undertake any other trouble shooting as requested by the budget holder

The **FAO GEF Coordination Unit in TCI** will review and approve project progress reports, implementation reviews, financial reports, and budget revisions. The FAO GEF Coordination Unit will review and clear the annual PIR and undertake supervision missions if considered necessary. The PIRs will be included in the FAO GEF Annual Monitoring Review submitted to GEF by the FAO GEF Coordination Unit. The FAO GEF Coordination Unit will participate in the mid-term review and the final evaluation and the development of corrective actions in the project implementation strategy as needed to mitigate eventual risks affecting the timely and effective implementation of the project. All budget reviews and project progress reports are submitted to the GEF Coordination Unit for review, clearance, and uploading on the FPMIS. The GEF Coordination Unit will also be responsible for reviewing and clearing budget revisions prior to submitting them to the Finance Division for final approval and for collaborating with the Finance Division in the six-monthly call for funds.

The **FAO Finance Division** will clear budget revisions, provide annual Financial Reports to the GEF Trustee and, in collaboration with the FAO GEF Coordination Unit, call for project funds on a six-monthly basis from the GEF Trustee.

FAO Myanmar, in consultation with the CTA, LTO, BH and the GEF Unit, will appoint the National and international consultants and staff as outlined.

FAO will be responsible for the establishment of the Project Management Unit and any subregional/state level support units as required. The PMU will be located in the Department of Fisheries Offices, Yangon. The PMU will be responsible for the financial and operational management of the project, i.e. supervision of the project activities and deliverable, hiring consultants, budget management, reporting, evaluation and monitoring. In particular, the PMU will:

- Prepare draft Annual Work Plans and budget (AWP/B), in consultation with project counterparts, in a timely manner, for review and clearance by the LTO, and BH, prior to their submission to the PSC and the GEF Coordination Unit, respectively, for approval in a timely manner
- Implement the project in accordance with the approved Project Document and the results-based Annual Work Plan and Budget (AWP/B), and in compliance with FAO procedures and GEF requirements
- Coordinate line agencies to work closely and implement ISLME project in accordance with approved work plan
- Organize PSC meetings, and prepare reports of PSC meetings and circulate these documents to all PSC members.
- Maintain records pertaining to the technical and financial aspects of project operation, including the monitoring of project activities and their outcomes

- Establish an M&E system to monitor project progress and impact
- Prepare quarterly and six-monthly project progress reports
- Provide six-monthly results-based financial reports to FAO
- Disseminate project information and best practices

FAO will ensure full cycle monitoring and evaluation in addition to evaluation as agreed with the donor and government. Main evaluations will be at mid-term and on completion although thematic/technical evaluations and lessons learned may be carried out as appropriate and agreed by the PSC.

4.2.3 Project technical, coordination, and steering committees

The project will make use of steering, coordination, and technical advisory committees as outlined in Fig 11.

The project steering committee (PSC) will be established at the start of project operations. It will be made up of the following suggested members:

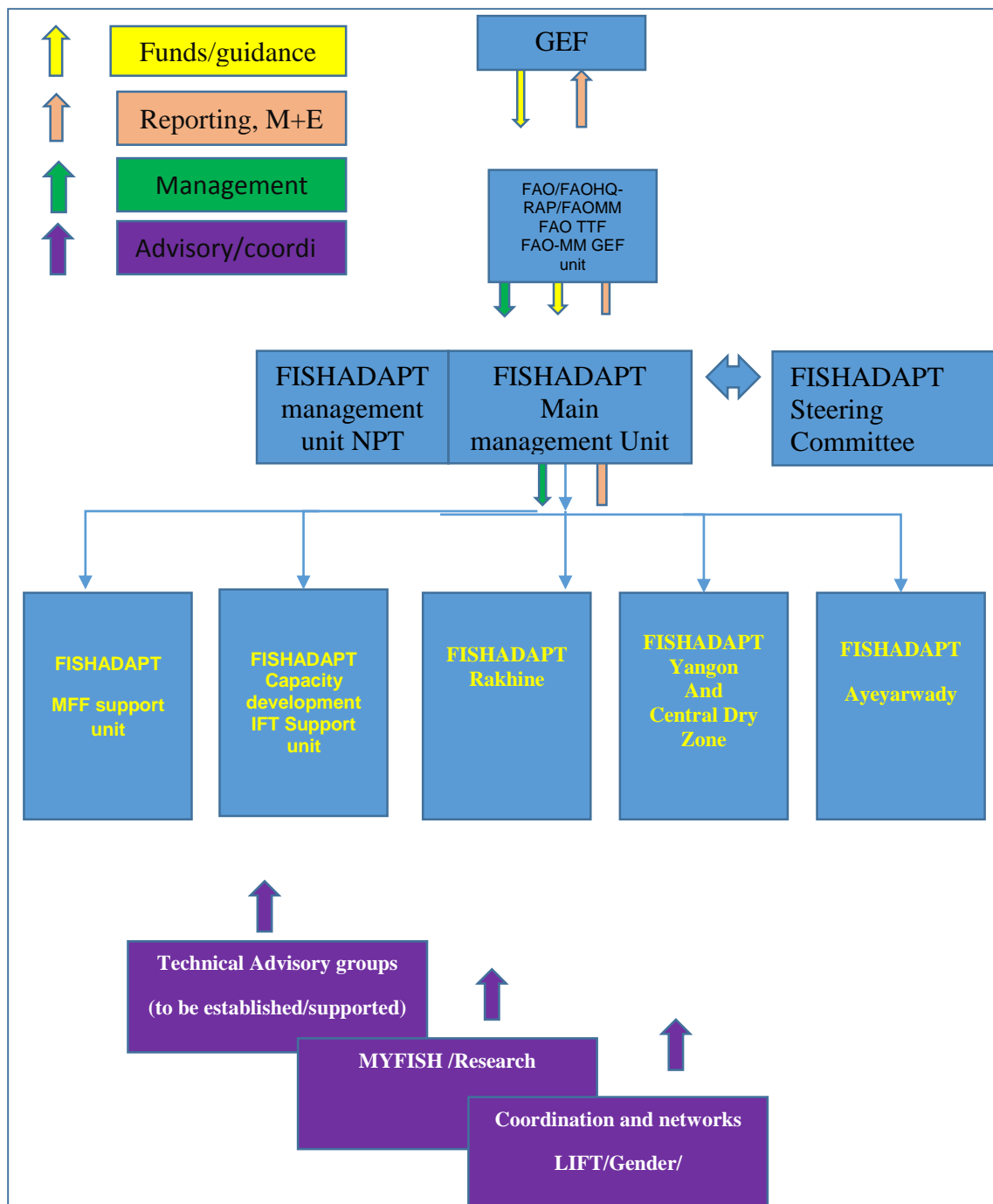
- DOF (Project coordinator)
- Myanmar GEF Operational Focal Point (MOF)
- FAO Myanmar
- Project CTA
- MFF (representative)
- IFT
- NGO (partner NGO)

The steering committee will provide guidance and approval at high level for the project work plans. During project inception, it is foreseen that it will meet more frequently in order to get work under way or to address specific issues under its mandate. The PSC will meet once a year and its specific responsibilities will be: (i) overall oversight of project progress and achievement of planned results as presented in annual Project Progress Reports; (ii) take decisions in the course of the practical organization, coordination and implementation of the project; (iii) facilitate cooperation between MLFRD and other project partners and project support at the local level; (iv) advise the PMU on other on-going and planned activities facilitating collaboration between the Project and other programmes, projects and initiatives in the target states/regions ; (v) facilitate that co-financing support is provided in a timely and effective manner; and (vi) review and approve Inception Report, six-monthly Project Progress Reports and approve AWP/B vii) interact with external reviewers as requested

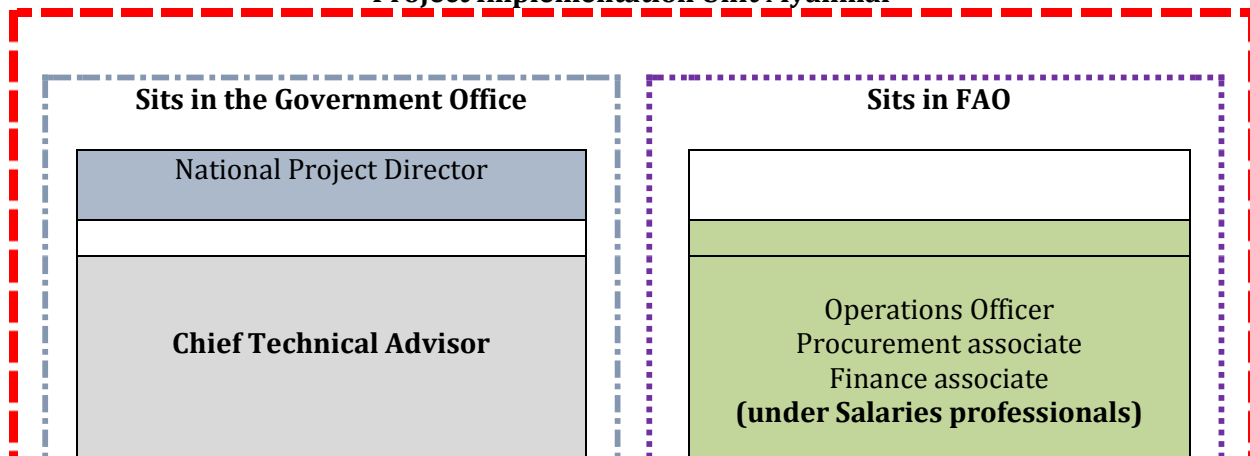
At local level (District, Township, Village) the project will work with existing coordination mechanisms (which will be identified during project start up and projects/programmes. If those mechanisms do not exist, the project will create multidisciplinary coordination mechanisms to ensure coordination across all relevant stakeholders. At District level, the DOF staff will create knowledge sharing centres on CCA for the fisheries and aquaculture sector.

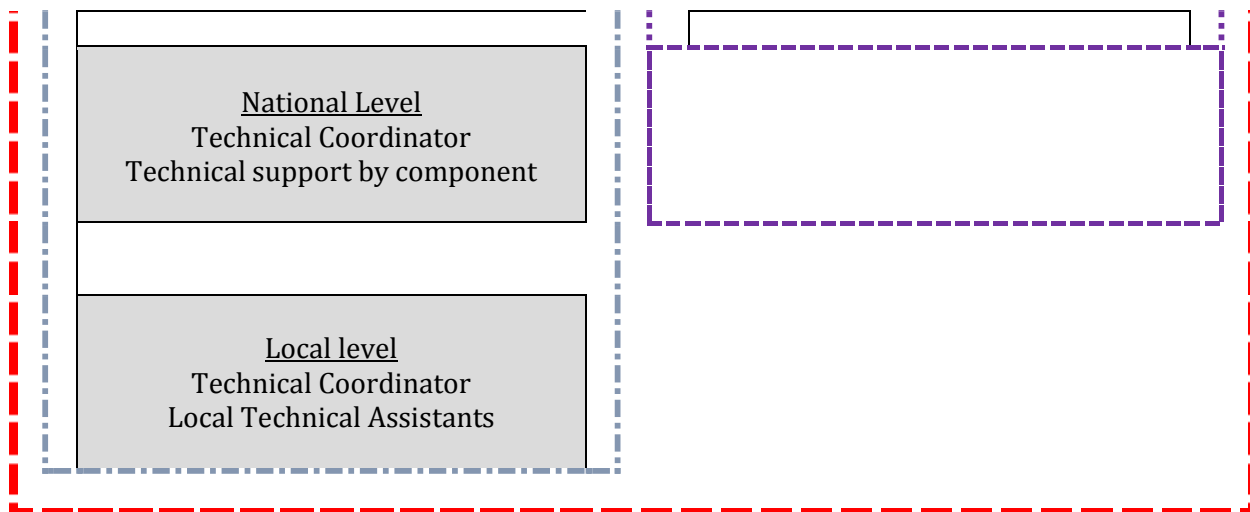
The project will make use of Technical Advisory Committees on an ad-hoc basis, depending on need. These may for example include technical areas such as Law/Policy for CCA, Development of technical adaptation approaches and practices, Aquaculture, Gender. The technical advisory committees will be from a broad range of expertise and organizations appropriate to the technical area concerned.

Fig 11 Fishadapt Management structure



Project Implementation Unit Myanmar





4.3 FINANCIAL PLANNING AND MANAGEMENT

4.3.1 Financial plan

Component/output	DOF	MFF	Worldfish	JICA	LIFT	FAO	Total Co-financing	% Co-financing	GEF	% GEF	Total
Component. 1: Strengthen the National, Regional/ State and Township level regulatory and policy frameworks to facilitate the adaptive capacities of the fisheries and aquaculture sector]	635,050	260,000	26,000	58,500	650,000	45,500	1,675,050	68%	794,541	32%	2,469,591
O 1.1.1: National level climate change vulnerability assessments for fisheries and aquaculture sector carried out.	105,842	43,333	4,333	9,750	108,333	7,583	279,175	30%	641,715	70%	920,890
O 1.1.2: Myanmar's National Policy on Fisheries Sector and supporting regulatory framework including national aquatic bio-security framework are strengthened.	105,842	43,333	4,333	9,750	108,333	7,583	279,175	90%	30,565	10%	309,740
O 1.1.3: Government Policies and Strategies on fisheries and aquaculture sector-specific implications for key land-use planning and resource tenure policies and adaptation options are in place, with special attention to support integrated management of mangrove areas with fisheries, aquaculture and other stakeholders	105,842	43,333	4,333	9,750	108,333	7,583	279,175	90%	30,565	10%	309,740
O 1.1.4: Land and resource tenure policy, legal and regulatory framework strengthened to capacitate co-management in capture fisheries.	105,842	43,333	4,333	9,750	108,333	7,583	279,175	90%	30,565	10%	309,740
O 1.1.5: Institutional strengthening and capacity needs assessment for DoF, other relevant GoM agencies, and private sector & training program developed and applied.	105,842	43,333	4,333	9,750	108,333	7,583	279,175	90%	30,565	10%	309,740

O 1.1.6: A system to inform policy and planning through monitoring and assessment of the impacts of climate change on the fisheries and aquaculture sector at community, district, and national level piloted and scaled up.	105,842	43,333	4,333	9,750	108,333	7,583	279,175	90%	30,565	10%	309,740
Component 2: Enhanced critical adaptation practices demonstrated by fishers and fishing communities in vulnerable coastal and inland water regions of Myanmar	1,660,900	680,000	68,000	153,000	1,700,000	119,000	4,380,900	68%	2,073,265	32%	6,454,165
O 2.1.1: Climate change vulnerability assessments undertaken in target fishing communities in coastal and inland regions are used to inform action plans and identify key adaptation actions	415,225	170,000	17,000	38,250	425,000	29,750	1,095,225	39%	1,712,222	61%	2,807,447
O 2.1.2: Community based climate change adaptation and disaster risk management plans developed for target inland and coastal fisheries, including mangrove-fisheries interactions.	415,225	170,000	17,000	38,250	425,000	29,750	1,095,225	90%	120,347	10%	1,215,572
O 2.1.3: Critical adaptation technologies and practices piloted with targeted groups (e.g. resource monitoring; fishing gear; post-harvest processing; safety at sea; vessel design, etc.)	415,225	170,000	17,000	38,250	425,000	29,750	1,095,225	90%	120,347	10%	1,215,572
O 2.1.4: Community-based early warning system developed, including the use of ICT based information services to enable regular and early warning.	415,225	170,000	17,000	38,250	425,000	29,750	1,095,225	90%	120,347	10%	1,215,572
Component 3: Develop and apply/mainstream adaptation models to strengthen the resilience of Myanmar's aquaculture sector to the impacts of climate change.	1,758,600	720,000	72,000	162,000	1,800,000	126,000	4,638,600	67%	2,238,651	33%	6,877,251
O 3.1.1: Climate change vulnerability assessments carried out for aquaculture production systems in target coastal and inland regions in order to inform planning and develop adaptation actions.	351,720	144,000	14,400	32,400	360,000	25,200	927,720	34%	1,763,661	66%	2,691,381

O 3.1.2: Climate-related risk reduction strategies and plans developed for target inland and coastal, aquaculture production systems and fish farming communities	351,720	144,000	14,400	32,400	360,000	25,200	927,720	90%	108,611	10%	1,036,331
O 3.1.3: Critical adaptation technologies and practices piloted with targeted production systems and fish farming communities (e.g. diversification of farmed species and production processes; stocks and strains with wider tolerance to environmental changes; storm resistant cage and pond construction).	351,720	144,000	14,400	32,400	360,000	25,200	927,720	90%	108,611	10%	1,036,331
O 3.1.4: Aquaculture-based early warning system developed, including the use of ICT based information services to enable regular and early warning.	351,720	144,000	14,400	32,400	360,000	25,200	927,720	90%	108,611	10%	1,036,331
O 3.1.5: Pilot integrated mangrove-aquaculture and rainfed rice paddy-fish systems assessed and implemented.	351,720	144,000	14,400	32,400	360,000	25,200	927,720	86%	149,155	14%	1,076,875
Component 4: Knowledge management, monitoring and evaluation, training and scaling up adaptation practices, lessons learned development and dissemination.	586,200	240,000	24,000	54,000	600,000	42,000	1,546,200	72%	607,829	28%	2,154,029
O 4.1.1: Cutting edge training modules and how -to" guidelines for fisheries and aquaculture stakeholders developed.	97,700	40,000	4,000	9,000	100,000	7,000	257,700	39%	409,603	61%	667,303
O 4.1.2: Peer-to-peer learning program targeting fishers and fish farmers implemented to provide access to improved knowledge on climate variability, climate impacts and adaptation options	97,700	40,000	4,000	9,000	100,000	7,000	257,700	90%	29,445	10%	287,145
O 4.1.3: Information and knowledge sharing platform on aquatic animal disease and water quality concerning the fishery and aquaculture sector developed and in use	97,700	40,000	4,000	9,000	100,000	7,000	257,700	76%	80,445	24%	338,145

O 4.1.4: Project monitoring system operating implemented providing systematic information on progress in meeting project outcome and output targets	97,700	40,000	4,000	9,000	100,000	7,000	257,700	90%	29,445	10%	287,145
O 4.1.5: Midterm and final evaluation conducted	97,700	40,000	4,000	9,000	100,000	7,000	257,700	90%	29,445	10%	287,145
O 4.1.6: Project-related “best-practices” and “lessons-learned” published	97,700	40,000	4,000	9,000	100,000	7,000	257,700	90%	29,445	10%	287,145
Project Management	244,250	100,000	10,000	22,500	250,000	17,500	644,250	69%	285,714	31%	929,964
Total Project	4,885,000	2,000,000	200,000	450,000	5,000,000	350,000	12,885,000	3	6,000,000	2	18,885,000

4.3.2 GEF/LDCF/SCCF inputs

The GEF will provide the LDCF grant to the amount stated.

4.3.3 Government inputs

The government will provide in kind contributions through provision of data/information, staff time and office space in Yangon, Rakhine, Ayeyarwady, and NPT.

4.3.4 FAO inputs

FAO will provide the following inputs, which are outlined in the budget table (Appendix 3)

Personnel services:

Travel - Official travel by experts will involve not only travel to and from Myanmar but also internal travel in the project sites. This will entail travel by air, train, and road. In addition, the national experts involved will be required to spend a significant time during their assignment in the field, which will require the payment of a daily subsistence allowance during these periods.

Contracts, letters of agreements or contractual service agreements - Where feasible contracts, letters of agreement or similar arrangements will be awarded to organisations for the provision of services and inputs to the project. This will include livelihood support to communities and to an organisation for the delivery of capacity building and training to stakeholders.

All LOA's and contracting will follow FAO's rules for procurement under GEF projects including any necessary tendering processes, quality assurance and monitoring. The services provided under these LOA's will be integrated into project implementation. A full summary is provided in Table 4.1 below. The following letters of agreement are foreseen,

Table 4.1 Summary of foreseen agreements and contracts.

Letter of agreement summary title	Summary	Number of LOA's	Under main component
Fisheries and Aquaculture Sector Vulnerability Assessment – National	Support the National VA assessment through consultations and workshops. Agreed National VA. VA revised and updated before the project end	1	1
Studies to strengthen the science base for CCA in the sector.	Science based studies on new technologies and practices for fisheries and aquaculture Methodologies for piloting and feedback (piloting costs covered under separate budget) Law and policy briefs	10	2 and 3
In depth studies on highly vulnerable fisheries systems identified under LOA 1.	Specific science based studies on key CC vulnerable fisheries and /or Aquaculture systems identified	5	2 and 3
Support to Networks and policy consultation MFF	Strengthen existing fisheries and aquaculture networks in terms of CC monitoring, information	1	4

	exchange. Organise Network meetings Social media networks.		
Develop and pilot training modules	Carry out CD needs assessments for all CD work. Design and pilot CD modules (scaling up carried out by other budget line)	1	All
Develop and establish CC/DRM/EWS and monitoring system	Carry out needs assessment of CC and EWS monitoring and reporting systems for the sector. Pilot and develop the systems Develop training / CD modules.	1	1
Policy consultation	Carry out national CCA policy mainstreaming consultation. Based on state/region meetings and consultations. Ensure participatory and consultative with all sector stakeholders and consensus developed. Produce draft strategy/law recommendations. Update in last year.	1	1
Livelihood Support to communities Ayeyarwady	Under the management of the project and through local NGO/CBO provide full livelihoods support to DOF and Fishadapt community interventions. Including :- Community mobilization (PRA, awareness raising and meetings) EAFM, EAA and CCA (focus on vulnerability reduction to CCA). Support CCA planning and implementation. Support to groups in <ul style="list-style-type: none"> • Fisheries management (e.g. stow net approach)/CCA • Aquaculture /CCA • VDG/CCA • Women's group/CCA • Processors/small business/CCA • Inputs suppliers/CCA • Credit and microfinance/CCA Carry out training and extension activities (fisheries and aquaculture and other technical areas) Monitor plans and follow up as required Resolve community internal conflicts should they arise	3	2 and 3
Livelihood support to communities Rakhine	Under the management of the project and through local NGO/CBO provide full livelihoods support to DOF and Fishadapt community interventions .Including :- Community mobilization (PRA, awareness raising and meetings) EAFM, EAA and CCA (focus on vulnerability reduction to CCA). Support CCA planning and implementation. Support to groups in <ul style="list-style-type: none"> • Fisheries management (e.g. stow net 	3	2 and 3

	<p>approach)/CCA</p> <ul style="list-style-type: none"> • Aquaculture /CCA • VDG/CCA • Women's group/CCA • Processors/small business/CCA • Inputs suppliers/CCA • Credit and microfinance/CCA <p>Carry out training and extension activities (fisheries and aquaculture and other technical areas)</p> <p>Monitor plans and follow up as required</p> <p>Resolve community internal conflicts should they arise</p>		
Livelihoods support to communities Yangon	<p>Under the management of the project and through local NGO/CBO provide full livelihoods support to DOF and Fishadapt community interventions .Including :-</p> <p>Community mobilization (PRA, awareness raising and meetings) EAFM, EAA and CCA (focus on vulnerability reduction to CCA.</p> <p>Support CCA planning and implementation. Support to groups in</p> <ul style="list-style-type: none"> • Fisheries management (e.g. stow net approach)/CCA • Aquaculture /CCA • VDG/CCA • Women's group/CCA • Processors/small business/CCA • Inputs suppliers/CCA • Credit and microfinance/CCA <p>Carry out training and extension activities (fisheries and aquaculture and other technical areas)</p> <p>Monitor plans and follow up as required</p> <p>Resolve community internal conflicts should they arise</p>	3	2 and 3
Livelihoods support to communities Dry Zone	<p>Under the management of the project and through local NGO/CBO provide full livelihoods support to DOF and Fishadapt community interventions .Including :-</p> <p>Community mobilization (PRA, awareness raising and meetings) EAFM, EAA and CCA (focus on vulnerability reduction to CCA.</p> <p>Support CCA planning and implementation. Support to groups in</p> <ul style="list-style-type: none"> • Fisheries management (e.g. stow net approach)/CCA • Aquaculture /CCA • VDG/CCA • Women's group/CCA 	3	2 and 3

	<ul style="list-style-type: none"> Processors/small business/CCA Inputs suppliers/CCA Credit and microfinance/CCA <p>Carry out training and extension activities (fisheries and aquaculture and other technical areas)</p> <p>Monitor plans and follow up as required</p> <p>Resolve community internal conflicts should they arise</p>		
--	--	--	--

General operating expenses (GOE) – Project funds to cover miscellaneous expenses required in the field for the operation of the project, such as telephone communications, photocopy paper, renting of transport vehicles, etc. One car will be provided for the project.

Materials, supplies and equipment - Materials and equipment will be required in relation to the operation of the programme and for the training activities.

Training - Training activities are included as part of the terms of reference and activities for the national experts. In addition, there will be local-level workshops during the project implementation and a national workshop at the end of the programme.

4.3.5 Other co-financiers inputs

The following confirmed sources of co-finance are agreed for Fishadapt.

Table 4.2. Summary of sources of confirmed co-financing and name (USD)

Sources of Co-financing	Name of Co-financier (source)	Type of Co-financing	Co-financing Amount (\$)
DOF/MLFRD development budget	DOF MLFRD	In kind	4,885,000
Myanmar Fisheries Federation	MFF budget	In kind	2,000,000
Worldfish	Worldfish	In kind	200,000
JICA	JICA	In kind	450,000
LIFT	LIFT	In kind	5,000,000
FAO	FAO TCP	Cash/in kind	350,000
Total Co-financing			12 885 000

4.3.6 Financial management of and reporting on GEF/LDCF/SCCF resources

All financial management and reporting in relation to the GEF resources will be carried out in accordance with FAO's rules and procedures for the implementation of GEF DEX projects.

Financial Records: FAO shall maintain a separate account in United States dollars for the project's GEF resources showing all income and expenditures. Expenditures incurred in a currency other than United States dollars shall be converted into United States dollars at the United Nations operational rate of exchange on the date of the transaction. FAO shall administer the project in accordance with its regulations, rules, and directives.

Financial Reports. The BH shall prepare six-monthly project expenditure accounts and final accounts for the project, showing amount budgeted for the year, amount expended since the beginning of the year, and separately, the un-liquidated obligations as follows:

- Annually: Details of project expenditures on a component-by-component and output-by-output basis, reported in line with project budget codes as set out in the Project document, as at 30 June and 31 December each year.
- Final report: Final accounts on completion of the Project on a component-by-component and output-by-output basis, reported in line with project budget codes as set out in the Project document.
- A final statement of account in line with FAO Oracle Project budget codes, reflecting actual final expenditures under the Project, when all obligations have been liquidated.

Financial reports for submission to the donor (GEF) will be prepared in accordance with the provisions in the GEF Financial Procedures Agreement and submitted by the FAO Finance Division

Budget Revisions. Budget Revisions: Budget revisions will be prepared by the BH in accordance with FAO standard guidelines and procedures as needed. The budget revision will take into consideration the status of the implementation of the project activities towards achieving specific outputs and outcomes. The budget revision will be submitted by BH through FPMIS. The budget revision should be prepared based on field needs and the agreed AWP (the AWP is normally prepared by PMU /guided and cleared by LTO). PMU normally prepares the draft budget revision proposal to BH and LTO for their reviews, and then BH will submit the budget revision to FAO-GEF Coordination Unit for approval. Budgets are the costed equivalent of the work plan in that they foresee the transformation of inputs into activities and activities into outputs. Budget management, monitoring, and revision are the responsibility of the Budget Holder and constitute a substantive, integral, and essential component of project management. Project Budget Holders are required to carry out at least two budget revisions per year in full consultation with the PTF: • one in March following the corporate equalization process (explained in the following paragraph) and; • one in September/October to support work-planning for the following year, to ensure that expenditures that have occurred in the year are adequately covered by the corresponding budget..

Responsibility for Cost Overruns. The BH is authorized to enter into commitments or incur expenditures up to a maximum of 20 percent over and above the annual amount foreseen in the project budget under any budget sub-line provided the total cost of the annual budget is not exceeded.

Any cost overrun (expenditure in excess of the budgeted amount) on a specific budget sub-line over and above the 20 percent flexibility should be discussed with the GEF Coordination Unit with a view to ascertaining whether it will involve a major change in project scope or design. If it is deemed a minor change, the BH shall prepare a budget revision in accordance with FAO standard procedures. If it involves a major change in the project's objectives or scope, a budget revision and justification should be prepared by the BH for discussion with the GEF Secretariat.

Savings in one budget sub-line may not be applied to overruns of more than 20 percent in other sub-lines even if the total cost remains unchanged, unless this is specifically authorized by the GCU upon presentation of the request. In such a case, a revision to the Project document amending the budget will be prepared by the BH. Under no circumstances can expenditures exceed the approved total Project budget or be approved beyond the NTE date of the project. Any over-expenditure is the responsibility of the BH.

Audit: The Project shall be subject to the internal and external auditing procedures provided for in FAO financial regulations, rules, and directives and in keeping with the Financial Procedures Agreement between the GEF Trustee and FAO. The audit regime at FAO consists of an external audit provided by the Auditor-General (or persons exercising an equivalent function) of a member nation appointed by the Governing Bodies of the Organization and reporting directly to them, and an internal audit function headed by the FAO Inspector-General who reports directly to the Director-General. This function operates as an integral part of the Organization under policies established by senior management, and furthermore has a reporting line to the governing bodies. Both functions are required under the Basic Texts of FAO, which establish a framework for the terms of reference of each. Internal audits of accounts, records, bank reconciliation, and asset verification take place at FAO field and liaison offices on a cyclical basis.

4.4 PROCUREMENT

Careful procurement planning is necessary for securing goods, services and works in a timely manner, on a “Best Value for Money” basis. It requires analysis of needs and constraints, including forecast of the reasonable timeframe required to execute the procurement process. Procurement and delivery of inputs in technical cooperation projects will follow FAO’s rules and regulations for the procurement of supplies, equipment, and services (i.e. Manual Sections 502 and 507). Manual Section 502: “Procurement of Goods, Works and Services” establishes the principles and procedures that apply to procurement of all goods, works and services on behalf of the Organization, in all offices and in all locations, with the exception of the procurement actions described in Procurement Not Governed by Manual Section 502. Manual Section 507 establishes the principles and rules that govern the use of Letters of Agreement (LoA) by FAO for the timely acquisition of services from eligible entities in a transparent and impartial manner, taking into consideration economy and efficiency to achieve an optimum combination of expected whole life costs and benefits.

As per the guidance in FAO’s Project Cycle Guide, the BH will draw up an annual procurement plan for major items, which will be the basis of requests for procurement actions during implementation. The first procurement plan will be prepared at the time of project start-up, if not sooner, in close consultation with the CTA/NPC and LTO. The plan will include a description of the goods, works, or services to be procured, estimated budget and source of funding, schedule of procurement activities and proposed method of procurement. In situations where exact information is not yet available, the procurement plan should at least contain reasonable projections that will be corrected as information becomes available.

The procurement plan shall be updated every 12 months and submitted to FAO BH and LTO for clearance, together with the AWP/B and annual financial statement of expenditures report for the next instalment of funds.

The BH, in close collaboration with the CTA/NPC, the LTO and the Budget and Operations Officer (if in place) will procure the equipment and services provided for in the detailed budget in Appendix 3, in line with the AWP and Budget and in accordance with FAO’s rules and regulations.

The Budget Holder for extra budgetary funds is responsible for development and submission of a Procurement Plan for use of the extra budgetary funds based on reasonable estimates of annual requirements or as soon as possible after identifying new requirements (which may be at the time of finalization of the project documents).

4.5 MONITORING AND REPORTING

4.5.1 Oversight and monitoring responsibilities

FAO will be responsible for monitoring of all project activities with the support of the counterpart and implementing partners. The Technical Divisions of FAO will provide technical guidance for the monitoring and assessment of the project.

Project oversight will be carried out by the Project Steering Committee (PSC), the FAO GEF Coordination Unit, and relevant Technical Units in HQ. Oversight will ensure that: (i) project outputs are produced in accordance with the project results framework and leading to the achievement of project outcomes; (ii) project outcomes are leading to the achievement of the project objective; (iii) risks are continuously identified and monitored and appropriate mitigation strategies are applied; and (iv) agreed project global environmental benefits/adaptation benefits are being delivered.

The FAO GEF Unit and HQ Technical Units will provide oversight of GEF financed activities, outputs, and outcomes largely through the annual Project Implementation Reports (PIRs), periodic backstopping, and supervision missions.

Project monitoring will be carried out by the Project Management Unit (PMU) and the FAO budget holder. Project performance will be monitored using the project results matrix, including indicators (baseline and targets) and annual work plans and budgets. At inception the results matrix will be reviewed to finalize identification of: i) outputs ii) indicators; and iii) missing baseline information and targets. A detailed M&E plan, which builds on the results matrix and defines specific requirements for each indicator (data collection methods, frequency, responsibilities for data collection and analysis, etc.) will also be developed during project inception by the M&E specialist with the support of the project team.

4.5.2 Indicators and information sources

The project indicators and information sources are included in the attached Results framework and AMAT indicator table.

4.5.3 Reporting schedule

Standard FAO monitoring and evaluation guidelines for GEF projects will be followed. These include measurable results based indicators, reviews and evaluation reports of the project impact. The Technical Divisions of FAO will provide technical guidance for the monitoring and assessment of the project. The project will recruit a full time M+E national specialist who will be supported by an international M+E specialist. A detailed M+E plan will be developed within 3 months of project start up. The project will produce the following reports (Table 4.3)

Specific key reports that will be prepared under the M&E program are: (i) Project inception report; (ii) Annual Work Plan and Budget (AWP/B); (iii) Project Progress Reports (PPRs); (iv) annual Project Implementation Review (PIR); (v) Technical Reports; (vi) co-financing reports; and (vii) Terminal Report. In addition, assessment of the GEF Monitoring Evaluation Tracking Tools against the baseline (completed during project preparation) will be required at midterm and final project evaluation.

Table 4.3 Summary of project monitoring and evaluation activities

Type of M&E activity	Responsible Parties	Time-frame	Estimated budget (USD)
Inception Workshop and reports	CTA/PMU, FAO BH/ LTO	Within two months of project start up	5 000

Type of M&E activity	Responsible Parties	Time-frame	Estimated budget (USD)
Project Inception Report, publication and dissemination	CTA/PMU	Immediately after workshop (including translation and publishing)	500
Project M+E plan To include detailed project component baseline establishment plan	PMU, International and National M+E staff and consultants	Within 3 months of project start up M+E plan to be reviewed annually.	Within TOR of national M+E expert
Project intervention baseline surveys and follow up impact assessment surveys. Following methodologies agreed under the project M+E plan. Note For community level impact assessment PM+E will be adopted to allow direct feedback.	PMU, International and National M+E staff and consultants DOF and partners staff involved in project delivery. For community level work self evaluation (PM+E) by groups involved in the project implementation at that level including fishers, fish farmers, women and those from marginalised groups.	Starting within 3 months of project start up including one principle survey. Specific surveys linked to each key intervention and initiated as appropriate. Follow up impact assessments carried out after completion of interventions and to inform project evaluations as required.	Within TOR of national and national M+E experts Within LOA 's of delivery partners
Training of Project Staff and Partners in data collection, formatting and reporting	PMU, International and National M+E staff and consultants Technical consultants	During year 1 of project implementation and ongoing as required	20 000
Project progress review and planning workshops	PMU, International and National M+E staff and consultants	Annually, prior to PSC meetings. More frequently during project start up as required.	Within TOR of national M+E expert and project staff.
Project Steering Committee (PSC) meetings	PMU, DOF, PSC /CTA	Annually with 2 in the first year (5 in total)	20 000
Results-based Annual Work Plan and Budget (AWP/B)	PMU, International and national staff and consultants	Annually	Within TOR of national M+E expert and project staff
Supervision missions	FAO LTO FAO FLO (Funding Liaison Officer - TCI) with inputs from PMU/TA	Yearly or as required	Under Agency fee
Project Progress Reports – PPRs	PMU	Semi-annually	Within TOR of national M+E expert
Project Implementation Review - PIR	CTA/PMU LTO /FAO FLO (Funding Liaison Officer - TCI)	Annually	20 000 (and some support under agency fee)
AMAT tracking tool	PMU/M+E expert	Mid-term review and final evaluation.	20 000

Type of M&E activity	Responsible Parties	Time-frame	Estimated budget (USD)
Co-financing Reports	PMU/CTA	Annually	Within TOR of national M+E expert
Technical reports and evaluations including gender	PMU/CTA, LTO	As appropriate under the monitoring plan	12 000
Mid-Term Review	IEE under FAO external PSC, External Consultants, LTO , TCI-GEF Unit with the project team and stakeholders	At mid-point of project implementation	25 550
Terminal Evaluation	External Consultant, FAO independent evaluation unit in consultation with the project team and stakeholders	Three months before the end of project implementation	50 000
Terminal Project Report	PMU. CTA, LTO, FLU	Draft prior to final PSC meeting and finalised month before the end of project implementation	7 000
National M+E expert		Full time (48 months)	80 640
International M+E expert		Part time	37 800
Total			298 490

Project Inception Report. It is recommended that the PMU prepare a draft project inception report in consultation with the LTO, BH and other project partners. Elements of this report should be discussed during the Project Inception Workshop and the report subsequently finalized. The report will include a narrative on the institutional roles and responsibilities and coordinating action of project partners, progress to date on project establishment and start-up activities and an update of any changed external conditions that may affect project implementation. It will also include a detailed first year AWP/B, a detailed project monitoring plan. The draft inception report will be circulated to the PSC for review and comments before its finalization, no later than one month after project start-up. The report should be cleared by the FAO BH, LTO, and the FAO GEF Coordination Unit and uploaded in FPMIS by the BH.

Results-based Annual Work Plan and Budget (AWP/B). The draft of the first AWP/B will be prepared by the PMU in consultation with the FAO Project Task Force and reviewed at the project Inception Workshop. The Inception Workshop (IW) inputs will be incorporated and the PMU will submit a final draft AWP/B within two weeks of the IW to the BH. For subsequent AWP/B, the PMU will organize a project progress review and planning meeting for its review. Once comments have been incorporated, the BH will circulate the AWP/B to the LTO and the GEF Coordination Unit for comments/clearance prior to uploading in FPMIS by the BH. The AWP/B must be linked to the project's Results Framework indicators so that the project's work is contributing to the achievement of the indicators. The AWP/B should include detailed activities to be implemented to achieve the project outputs and output targets and divided into monthly timeframes and targets and milestone dates for output indicators to be achieved during the year. A detailed project budget for the activities to be implemented during the year should also be included together with all monitoring and supervision activities required during the year. The AWP/B should be approved by the Project Steering Committee and uploaded on the FPMIS by the BH.

Project Progress Reports (PPR): PPRs will be prepared by the PMU based on the systematic monitoring of output and outcome indicators identified in the project's Results Framework (Annex 1). The purpose of the PPR is to identify constraints, problems, or bottlenecks that impede timely implementation and to take appropriate remedial action in a timely manner. They will also report on projects risks and implementation of the risk mitigation plan. The PPR will be submitted to the BH and LTO for comments and clearance. The BH will upload the PPR on the FPMIS.

Annual Project Implementation Review (PIR): The LTO (in collaboration with the PMU) will prepare an annual PIR covering the period July (the previous year) through June (current year) to be submitted to the BH and the TCI GEF Funding Liaison Officer (FLO) for review and approval no later than (check each year with GEF Unit but roughly end June/early July each year). The FAO GEF Coordination Unit will submit the PIR to the GEF Secretariat and GEF Evaluation Office as part of the Annual Monitoring Review report of the FAO-GEF portfolio. PIRs will be uploaded on the FPMIS by the TCI GEF Coordination Unit.

Key milestones for the PIR process:

- Early July: the LTOs submit the draft PIRs (after consultations with BHs, project teams) to the GEF Coordination Unit (faogef@fao.org , copying respective GEF Unit officer) for initial review;
- Mid July: GEF Unit responsible officers review main elements of PIR and discuss with LTO as required;
- Early/mid-August: GEF Coordination Unit prepares and finalizes the FAO Summary Tables and sends to the GEF Secretariat by (date is communicated each year by the GEF Secretariat through the FAO GEF Unit);
- September/October: PIRs are finalized. PIRs carefully and thoroughly reviewed by the GEF Coordination Unit and discussed with the LTOs for final review and clearance;
- Mid November 17: (date to be confirmed by the GEF): the GEF Coordination Unit submits the final PIR reports -cleared by the LTU and approved by the GEF Unit- to the GEF Secretariat and the GEF Independent Evaluation Office.

Technical Reports: Technical reports will be prepared by national, international consultants (partner organizations under LOAs) as part of project outputs and to document and share project outcomes and lessons learned. The drafts of any technical reports must be submitted by the PMU to the BH who will share it with the LTO. The LTO will be responsible for ensuring appropriate technical review and clearance of said report. The BH will upload the final cleared reports onto the FPMIS. Copies of the technical reports will be distributed to project partners and the Project Steering Committee as appropriate.

Co-financing Reports: The BH, with support from the PMU, will be responsible for collecting the required information and reporting on co-financing as indicated in the Project Document/CEO Request. The PMU will compile the information received from the executing partners and transmit it in a timely manner to the LTO and BH. The report, which covers the period 1 July through 30 June, is to be submitted on or before 31 July and will be incorporated into the annual PIR. The format and tables to report on co-financing can be found in the PIR.

Tracking Tools: Following the LDCF policies and procedures, the relevant AMAT tracking tools for full sized projects will be submitted at three moments: (i) with the project document at CEO endorsement; (ii) at the project's mid-term review/evaluation; and (iii) with the project's terminal evaluation or final completion report. The TT will be uploaded in FPMIS by the GEF Unit. The TT are developed by the Project Design Specialist, in close collaboration with the FAO Project Task Force. They are filled in by the PMU and made available for the mid-term review again for the final evaluation.

Terminal Report: Within two months before the end date of the project, and one month before the Final Evaluation, the PMU will submit to the BH and LTO a draft Terminal Report. The main purpose of the Terminal Report is to give guidance at ministerial or senior government level on the policy decisions required for the follow-up of the project, and to provide the donor with information on how the funds were utilized. The Terminal Report is accordingly a concise account of the main products, results, conclusions, and recommendations of the project, without unnecessary background, narrative, or technical details. The target readership consists of persons who are not necessarily technical specialists but who need to understand the policy implications of technical findings and needs for insuring sustainability of project results.

4.5.4 Monitoring and evaluation plan summary

After the first 24 months, a mid-term evaluation based on the progress indicators identified at the inception of the project, which will be carried out jointly by FAO, the donor and the Government to assess progress against the work plan and identify needs for reorientation.

Important decisions concerning the modalities of project continuation, such as the possible re-orientation of project activities, will be taken. This tripartite mission will also approve the candidate for the final independent impact assessment mission.

Towards the end of the project, an independent end-of-project impact assessment evaluation will be carried out, also based on comparison of performance indicators defined at formulation and refined during project execution. This information will be included in the draft Final Report. The terms of reference, exact timing and place will be decided in consultation among the three concerned parties.

The project will carry out thematic evaluations as required during its lifetime to better understand the impact of the work and to draw lessons for future implementation.

4.6 PROVISION FOR REVIEW AND EVALUATION

As outlined above FAO will arrange for Independent Mid-term review and final evaluations as independent External Evaluations (IEE).

For full-sized projects, a Mid-Term Review will be undertaken at project mid-term to review progress and effectiveness of implementation in terms of achieving the project objectives, outcomes, and outputs. Mid-term Reviews are encouraged for medium sized projects. Findings and recommendations of this review/evaluation will be instrumental for bringing improvement in the overall project design and execution strategy for the remaining period of the project's term. FAO will arrange for the mid-term review/evaluation in consultation with the project partners. The evaluation will, inter alia:

- review the effectiveness, efficiency and timeliness of project implementation;
- analyse effectiveness of partnership arrangements;
- identify issues requiring decisions and remedial actions;
- propose any mid-course corrections and/or adjustments to the implementation strategy as necessary; and
- highlight technical achievements and lessons learned derived from project design, implementation, and management.

It is recommended that an independent Final Evaluation (FE) be carried out three months prior to the terminal review meeting of the project partners. The FE will aim to identify the project impacts and sustainability of project results and the degree of achievement of long-term results. This evaluation will also have the purpose of indicating future actions needed to sustain project

results and disseminate products and best practices within the country and to neighbouring countries.

4.7 COMMUNICATION AND VISIBILITY

The project will develop a fully elaborated communication strategy based on FAO good practice in communication for development⁴¹

During the project PPG phase and PIF development, the project has engaged and communicated with a wide range of stakeholders at community to national level through meetings and consultations. This approach will be continued into the implementation phase. A national project start up workshop will be held in the second quarter of the first year. The purpose of these meetings will be to re-engage stakeholders and build on the interest generated during PPG phase. There will be a number of similar meetings at region/state, District, township and village level.

The National Project Coordinator and the Chief Technical Advisor will play key roles in maintaining good communication about the project with national stakeholders at all levels, but most importantly among high-level actors in agencies of central Government, aimed at maintaining their interest in and commitment to the project throughout its entire lifetime. This will be achieved through personal bilateral communication with these actors (the selection criteria for the individual to fill the CTA post will include the ability to communicate effectively in this way), taking advantage in particular of the strategic position of the NPC to channel messages regarding the project to other Government stakeholders. Given their broad stakeholder base, the Project Steering Committee and Stakeholder Committees (see Section 4.2) will also serve as vehicles for communication and raising visibility regarding the project and its aims and approaches.

The project communication and visibility plan developed during start-up will ensure that due credit is provided to the GEF during the implementation of the project including on publications, posters, signboards etc.

The communication plan will be based on the participatory analysis of stakeholders during project development and provide the opportunity to inform stakeholders as much as possible.

⁴¹ FAO 2014. Communication for development sourcebook.

SECTION 5 – SUSTAINABILITY OF RESULTS

5.1 SOCIAL SUSTAINABILITY

The project adheres to FAO's environment and social standards guidance⁴² to the five key principles that balance the social, economic and environmental dimensions of sustainability including; improving efficiency in the use of resources, conserving, protecting and enhancing natural ecosystems, protecting and improving rural livelihoods and social well-being, enhancing the resilience of people, communities and ecosystems; and promoting good governance of both natural and human systems:

Social sustainability and environmental sustainability is integrated throughout the project design and is a key element of actions at all levels. The adoption of the Ecosystem Approaches, sustainable livelihoods approaches and participatory planning for fisheries and aquaculture and climate change adaptation with communities ensures that the project will target and engage stakeholders appropriately including women. The establishment of community groups (e.g. VFS) to support this planning and then implementation is a major factor in ensuring the long-term adoption of these approaches. Policy law development and consultation undertaken by the project will at all times ensure full participation of affected stakeholders and communities. These approaches will realise a range of socio-economic benefits including the ability to better manage fisheries (co-management) and adapt to climate change impact. Livelihoods will be strengthened through improved and sustainable catches, improved post-harvest processing and marketing, and diversified through a range of alternatives.

Through the adoption of participatory planning the project will ensure the engagement of indigenous, vulnerable, and marginalised groups with specific targeted interventions including involvement in fisheries co-management for the sustainable use of resources and the sharing of benefits generated and participation in monitoring. This will be especially important in areas of the project such as Rakhine State with significant populations of minority groups. The socio economic benefits

The adoption of EAFM and EAA approaches will ensure contribution of time by the communities and individuals and commitment from them.

The project will also work closely with the GoM, Ministry of Social Welfare Relief, and Resettlement and the Gender Equality Network to ensure it is in support of the National Strategic Plan for the Advancement of Women (NSPAW). FAO has developed guidance on the integration of gender during project development and implementation and this has been followed throughout the planning and development phase of the PPG. Gender will be fully integrated into project implementation through a gender strategy, which will be developed and implemented on project start up. The project support government targets related to gender.

In addition, the criteria to define the 2nd phase communities will not only include vulnerability as indicated through the vulnerability assessments but also through community buy-in and willingness to engage in the project. This approach will support the social sustainability of the project's activities.

5.2 GENDER

Gender and the involvement of women is of particular importance in the project. The project will support gender mainstreaming. Specific gender sensitive adaptation technologies and

⁴² FAO Environmental and Social Guidelines (<http://www.fao.org/3/a-i4413e.pdf>)

approaches will be developed during the project for women. A gender strategy will be developed and implemented throughout the project. The proposed indicators will ensure monitoring of gender actions. Capacity building will be provided for those working with the project. The proposed project is fully aligned to the Government of Myanmar National Strategic Plan for the Advancement of Women (NSPAW) (2013-2022). It is also consistent with the GEF Policy on Gender Mainstreaming (PL/SD/02. May 1, 2012) and is fully aligned with the gender policy of FAO and will contribute to four of its five objectives:

- Women participate equally with men as decision-makers in rural institutions and in shaping laws, policies and programs – the Project will provide support to women's associations at its demonstration sites to strengthen their role in rural institutions
- Women and men have equal access to and control over decent employment and income, land and other productive resources - men's and women's different roles, responsibilities and daily practices will be assessed with respect to the major aquaculture and inland fisheries addressed by the project.
- Women and men have equal access to goods and services for agricultural development and to markets - the Project will actively engage women in activities to support harvesting, processing, packaging, and marketing of fish and aquaculture products.
- Women's work burden is reduced by 20% through improved technologies, services and infrastructure – through access to better technologies and practices, information on market prices, etc., women's high workload will be reduced.

Specifically the project will work with existing or develop new women's groups at community level (through NGO's such as PACT). Women will be empowered to take a role in the community planning and implementation at all levels through EAFM and EAA CCA approaches. Examples of gender-differentiated technologies and adaptive actions to address the specific risks and barriers women face to adapting to climate change and to reducing their vulnerability include:

Component 1: Strengthen the National, Regional/ State and Township level regulatory and policy frameworks to facilitate the adaptive capacities of the fisheries and aquaculture sector.

- 1 National level Vulnerability assessments and consultation processes will involve and engage women at all levels
- 15 Fisheries and Aquaculture sector Policies, Laws or strategies at Union, State/Region, and District level will be strengthened for CCA in a gender sensitive manner and with full engagement of women. In the process.
- Institutional and individual capacities development to include and engage women with, at least 1,200 women Government (DOF) and partner organisations trained in CCA approaches for the sector.

•Component 2: Enhanced critical adaptation practices demonstrated by fishers and fishing communities in vulnerable coastal and inland water regions of Myanmar

- 60 community level EAFM - CCA vulnerability assessments undertaken along with associated adaptation plans, with the participation of women in all.
- At least 15,000 women engaged in the implementation of fisheries adaptation plans at community level;
- All adaptation technologies developed are gender sensitive.
- EWS system reaches at least 25,000 women.

•Component 3: Develop and apply adaptation models to strengthen the resilience of Myanmar's aquaculture sector to the impacts of climate change.

- 60 community level EAA CCA vulnerability assessments undertaken along with associated adaptation plans, with the participation of women in all.
- At least 15,000 women engaged in the implementation of fisheries adaptation plans at community level;
- All adaptation technologies (10) developed are gender sensitive.
- EWS for aquaculture reaches at least 25,000 women.
- Pilot integrated mangrove and paddy fish systems involve at last 30% women.

Component 4. Knowledge management, monitoring and evaluation, training and scaling up adaptation practices, lessons learned development and dissemination.

Knowledge and information will be

- At last, 1,500,000 women have enhanced understanding of CCA issues in fisheries and aquaculture.
- 13 innovative training modules developed by the project are gender sensitive.
- 35 peer-to-peer learning systems involve women and men.
- Knowledge sharing platforms developed are sensitive to the needs of and engage women

5.3 ENVIRONMENTAL SUSTAINABILITY

The project adopts an Ecosystem approach to Fisheries management (EAFM) and Aquaculture (EAA). EAFM is the practical way to implement sustainable development for fisheries by finding a balance between ecological and human well-being through good governance. These will be applied to enhance the resilience of aquatic ecosystems to climate change impacts and fishing and fish farming activities. These approaches also reduce the underlying vulnerability of fishing and fish farming communities. A national Climate Change Vulnerability Assessment will identify “at risk” ecosystems and in particular small-scale traditional fisheries and fish farming systems for specific action. Environmental sustainability will be ensured through positive impacts of the introduced climate change adaptation plans, fisheries management plans, technologies and approaches on a range of ecosystem services. These will be shown in demonstration areas and in the longer term on larger areas through upscaling of best practices. Screening of any new CCA technologies and approaches developed by the project will be undertaken according to national legislation. Long term strengthening of climate change adaptation knowledge sharing networks and environmental monitoring will be undertaken by ensuring these can operate within national mechanisms and resources on project completion.

5.4 FINANCIAL AND ECONOMIC SUSTAINABILITY

The project will build on and take into account current institutional structures and procedures and avoid introducing parallel arrangements or those that would be difficult to sustain after project closure. Specific project activities for addressing longer-term financial sustainability will be developed for critical project outputs as appropriate. At community level, the use of community groups and revolving funds will ensure long-term sustainability of those interventions. Part of the piloting and assessment of the development of new climate change technologies and approaches by the project will be cost benefit and economic analysis to ensure sustainability. As a specific activity, the project will develop a post-project sustainability action plan with partners, including an analysis of recurrent expenditures and a financial plan.

The project will work closely with other development partners and support the government and communities in strengthen their networks, contacts, and capacity.

5.5 SUSTAINABILITY OF CAPACITIES DEVELOPED

The project is designed to ensure sustainability of capacities developed at all levels and to ensure these are transferred to partners and stakeholders during and after the project completion. The capacity development activities that will be undertaken will respond to the findings of the capacity development needs assessments carried out during the PPG phase and during implementation in order to maximize the likelihood of impact and sustainability. Activities will be aligned to effective capacity development approaches⁴³. Key strategies aimed at ensuring sustainability, in addition to impact will include the following:

- Complementing capacity development in middle and upper levels of Government with the strengthening of community-level organisations, which typically have low levels of participant turnover and which have the potential to sustain and support the capacities of individual community members in the long term. At institutional level, the project will principally support and work with the Ministry of Livestock Fisheries Rural Development (MLFRD); dedicated Institute of Fisheries Technology (IFT) to carry out institutional capacity assessment and then develop needs based training and capacity development modules and interventions covering the full scope of the project actions. The project will also work with partners such as Worldfish and local universities to develop and pilot appropriate climate change adaptation technologies and practices this retaining capacity. Capacity development modules will on project completion then be available for a wide range of stakeholders to use and upscale. At the same time, “training of trainers” as a complement to the provision of direct training to the final beneficiaries themselves, in order to ensure that the community-level beneficiaries of capacity development will have on going support from extension agents beyond the life of the project to help troubleshoot and update their capacities.
- Development of community-level capacities for analysis, experimentation and dialogue, so that community members are able to update their technical capacities in the future in response to evolving conditions (particularly of climate and demography). This form of capacity development will include peer-to-peer exchanges and the well-proven farmer field school approach;
- Sustainability will further be assured carrying out follow-up activities with the recipients of training in order to ensure that knowledge is adequately assimilated and consolidated before the project ends. These will include regular knowledge attitudes and practices (KAP) assessments, for example through awareness surveys and tests at either individual or institutional levels
- Based in the DOF the project will fully engage its staff in the implementation of the project. All materials used will be in Myanmar language.

The project will also strengthen existing climate change adaptation networks and environmental monitoring systems. Needs of these networks will be identified during the capacity needs assessments.

At community level, the empowerment of community groups, through specific and targeted capacity development, (including women’s groups) will ensure long-term sustainability of these actions.

5.6 APPROPRIATENESS OF TECHNOLOGY INTRODUCED

⁴³ See FAO’s approach for more effective capacity development to achieve more impactful and sustainable results www.fao.org/capacity-development

FAO as a fisheries and aquaculture technical agency has extensive experience of developing and introducing appropriate technologies and practices and has a wide range of guidance available for all parts of the fisheries and aquaculture sector. FAO has supported the government of Myanmar in the development of new technologies and practices in an appropriate way before. Most recently, the Government of Myanmar has participated in the planning stages of the BOBLME project, which has involved the development of EAFM capacity in Myanmar.

At all stages the project will ensure that any technologies and practices developed are fully appropriate to the fisheries and fish farming systems they will support. In particular, appropriate science based studies, value chain, cost benefit and socio economic analysis will be used to ensure rigour.

5.7 REPLICABILITY AND SCALING UP

The project is designed to ensure replicability and scaling up. At community level, interventions will be effectively developed in three pilot States. However, the approaches for EAFM and EAA will upscale throughout the country. All DOF staff in the country will be given basic training in the approaches to ensure that on lateral posting they are able to support interventions. All capacity development modules and materials will be retained by the DOF dedicated training institute (IFT) and be available for use throughout the country. The policy and legal interventions will be carried out nationwide in the development of a national strategy for the sector. This will be a key guiding principle for the country in the future.

Lessons learned from project evaluations and science based studies will be communicated to stakeholders to ensure systematic and informed decision-making is possible. Peer-to-peer/community-to-community exchanges and coordinated efforts with government development partners will support scaling-out of the project's lessons learned.

The project is also developed to ensure cross-sectoral and multi-disciplinary approach to climate change adaptation, fisheries management, and aquaculture for inland and marine resources. Development of the multi-agency – cross-sectoral coordination mechanisms on Climate Change Adaptation in the fisheries and aquaculture sector is innovative and will help ensure sustainability and scaling up. Private sector will be fully involved in the demonstration and piloting of approaches and technologies, which will further promote up scaling and sustainability of the project.

APPENDICES

APPENDIX 1: RESULTS MATRIX/ FAO/GEF RESULTS MATRIX

Results Chain (AMAT = coherence with AMAT table)	Indicators	Baseline ¹	Year 1	Year 2	Year 3	Year 4	End of Project Target	Means of Verification and Responsible Entities	Assumptions
--	------------	-----------------------	--------	--------	--------	--------	-----------------------------	--	-------------

¹Value in the case of quantitative indicators and description of situation in the case of qualitative indicators. Please insert the year of the baseline

Results Chain (AMAT = coherence with AMAT table)	Indicators	Baseline ¹	Year 1	Year 2	Year 3	Year 4	End of Project Target	Means of Verification and Responsible Entities	Assumptions
Project Objective/Impact To enable inland and coastal fishery and aquaculture stakeholders to adapt to climate change by understanding and reducing vulnerabilities, piloting new practices and technologies, and sharing information. (AMAT O.1 and gender indicators)	Number of direct beneficiaries of the project	2015 No fisheries and aquaculture stakeholders are adapted to CC impact in target communities	15,000	25,000	25,000	25,000	90,000 (at least 30,000, women)	Project evaluation	Continued political stability
	% female % Youth	N/A N/A	30%	30%	30%	30%	30%	SPRG survey National statistics	No natural disaster/cyclones
	Community level Vulnerability Assessment Union and Sector	2015. 10 VA carried out during PPG	20 3	40 10	30 1	30 0	120 15	Project M+E	Community members remain committed implementing CCA actions Continued adoption and acceptance of EBA-based approaches Continued favourable governance environment at all
Component 1: Strengthen the National, Regional/ State and Township level regulatory and policy frameworks to facilitate the adaptive capacities of the fisheries and aquaculture sector									

Results Chain (AMAT = coherence with AMAT table)	Indicators	Baseline ¹	Year 1	Year 2	Year 3	Year 4	End of Project Target	Means of Verification and Responsible Entities	Assumptions
Outcome 1 Enhanced capacity of DoF, GoM and private sector stakeholders to address climate change issues through improved relevant national policies and strategies facilitating a climate resilient fisheries and aquaculture sector. AMAT : Indicator 11: Institutional arrangements to lead, coordinate and support the integration of climate change adaptation into relevant policies, plans and associated processes	1. CCA mainstreamed into FI and Aq relevant Laws, Strategies and policies (at Union and local level). [AMAT 11score]	2015. 1. 9 Union FI and Aquaculture laws do not integrate CCA in 2015 <u>AMAT score 2 in 2015</u> 15 Region/state level FI/Aq laws do not integrated CCA.	1		3		3	Project evaluation	Political stability maintained
	2. Fi and Aq mainstreamed into CCA laws and policies	2. FI and AQ in NAPA, not mainstreamed into CCA laws or policies		4	4	6	14	Actual laws and strategies AMAT score Fi and Aq mainstreamed in NAP and INDC.	Government reforms continue to allow changes to policies
	3. Capacity of staff improved	3. Government staff do not have capacity to support climate change adaptation in the sector	600	1000	1000	900	3,500 (1,200 women)	Project reports and KAP surveys	Government staff and stakeholders are able to participate in consultations and CD events.
Output 1.1.1: National level climate change vulnerability assessments for fisheries and aquaculture sector carried out. [AMAT 6 :]	Climate Change Vulnerability Assessment of FI and AQ sector	2015. No CC assessment exists for the sector at national or state/region and or sub national level						Publication of assessments and updated assessments	Stakeholders are able to participate in and lead vents
	Union/National level		1				1	Meeting reports	Government reforms continue to allow changes to policies
	Region/state		4	5	5		14		

Results Chain (AMAT = coherence with AMAT table)	Indicators	Baseline ¹	Year 1	Year 2	Year 3	Year 4	End of Project Target	Means of Verification and Responsible Entities	Assumptions
Output 1.1.2: Myanmar's National Policy on Fisheries Sector and supporting regulatory framework including national aquatic bio-security framework are strengthened. AMAT 11, 12, 13	Policies (including laws and strategies) strengthened Climate Change Adaptation integrated into National frameworks for biosecurity, fisheries, and aquaculture.	2015: Climate Change is not integrated into sector laws, policies or strategies at any level 1. National 2. State/Region in Rakhine, Ayeyarwady, Yangon	1	3 3	8		11 laws 1 3	Draft Revised Laws (law objectives) Strategies published	
Output 1.1.3: Government Policies and Strategies on fisheries and aquaculture sector-specific implications for key land-use planning and resource cies and adaptation options are in place, with special attention to support integrated management of mangrove areas with fisheries, aquaculture and other stakeholders AMAT 6	Policy on land and resource tenure law strengthened to allow integrated mangrove area management with fisheries and aquaculture stakeholders.	2015, Climate Change is not integrated into any sector laws, policies or strategies		1			1	Draft Revised Laws (law objectives) Policy consultation completed	Stakeholders are able to participate in consultation
Output 1.1.4: Land and resource tenure policy, legal and regulatory framework strengthened to capacitate co-	Land and resource tenure law at National, Region/State	2015, Climate Change is not integrated into any sector laws, policies or strategies			3		3	Draft Revised Laws	Stakeholder participation is enabled

Results Chain (AMAT = coherence with AMAT table)	Indicators	Baseline ¹	Year 1	Year 2	Year 3	Year 4	End of Project Target	Means of Verification and Responsible Entities	Assumptions
management in capture fisheries AMAT 6	level strengthened to enable fisheries co management and/EAFM objectives to be realised.								
Output 1.1.5: Institutional strengthening and capacity needs assessment for DoF, other relevant GoM agencies, and private sector & training program developed and applied. AMAT 9	Institutional assessment Capacity development plan implemented (3,500 stakeholders trained) Training course developed	2015. No Institutional Capacity development assessment or plans exist for the sector (<i>no training courses or modules for CC exist. (EAFM course (BOBLME/FAO), EAA (FAO), Myanmar stow net fisheries Co-management approach exists.)</i>)	1 1 2	 6	 2	 2	1 1 8	Assessment published Capacity development plan completed Courses Gender indicators	
Output 1.1. 6: A system to inform policy and planning through monitoring and assessment of the impacts of climate change on the fisheries and aquaculture sector at community, district, and national level piloted and scaled up. <i>AMAT Indicator 14: Countries with systems and frameworks for</i>	Climate Change monitoring system in place National State/region Community	2015. No Climate Change Monitoring system exists for the fisheries and aquaculture sector		1 4 9			1 8 9	Pilot monitoring systems in place	

Results Chain (AMAT = coherence with AMAT table)	Indicators	Baseline ¹	Year 1	Year 2	Year 3	Year 4	End of Project Target	Means of Verification and Responsible Entities	Assumptions
the continuous monitoring, reporting and review of adaptation AMAT 5. Public awareness raised AMAT 6, & 7	level Public awareness reaches all those in the sector	No awareness materials in 2015		500,000	1,500,00	1,000,000	3,000,000	Survey Sample of fishers and fish farmers surveys	
Component 2: Enhanced critical adaptation practices demonstrated by fishers and fishing communities in vulnerable coastal and inland water regions of Myanmar									
Outcome 2.2.1 Fishers in coastal and inland water regions of Myanmar increase their knowledge of and reduce their vulnerability to climate change, and disasters and develop/demonstrate critical adaptation practices and technologies	Number of stakeholders benefiting from the project	2015 . Limited CC adaptation planning through LIFT/Development projects exists, not for sector	5000	15,000	15,000	10,000	45,000 (at least 30% women)	Project monitoring reports Survey Sample of fishers and fish farmers surveys Gender	Continued Recognition of CC implications by community members and commitment to taking corresponding CCA actions and accepting short term costs Acceptance of EAFM approaches and new technologies Continued positive

Results Chain (AMAT = coherence with AMAT table)	Indicators	Baseline ¹	Year 1	Year 2	Year 3	Year 4	End of Project Target	Means of Verification and Responsible Entities	Assumptions
									governance environment at community levels
2.1.1 Climate change vulnerability assessments undertaken in target fishing communities in coastal and inland regions are used to inform action plans and identify key adaptation actions AMAT 6	Number of community Vulnerability Assessments completed	2015 No Vulnerability Assessments exist for the fisheries and aquaculture sector 9 underway for the PPG phase.	10	20	20	10	60	Project reports	
2.1.2: Community based climate change adaptation and disaster risk management plans developed for target inland and coastal fisheries, including mangrove-fisheries interactions. AMAT 6	Number of community Climate Change Adaptation and DRM plans for fisheries based on vulnerability assessments. Mangrove area plans	2015 No Fisheries sector Vulnerability Assessments exist for the fisheries and aquaculture sector 9 underway for the PPG phase.	10	20 1	20	10	60 1	Project reports	
2.1.3: Critical adaptation technologies and practices piloted with targeted groups (e.g. resource monitoring; fishing gear; post-harvest processing; safety at sea; vessel design, etc.)	Number of people benefiting from adaptation technologies and practices developed	2015 No adaptation approaches and technologies exist	7,500	15,000	15,000	7,500	45,000 (30% women)	Project reports Good practice documents	

Results Chain (AMAT = coherence with AMAT table)	Indicators	Baseline ¹	Year 1	Year 2	Year 3	Year 4	End of Project Target	Means of Verification and Responsible Entities	Assumptions
AMAT 1,2,3	Number of technologies and practices developed.		10				10		
2.1.4: Community-based early warning system developed, including the use of ICT based information services to enable regular and early warning. AMAT 8	Early Warning system EWS for Climate impacts and Disasters for vulnerable Pilot communities developed Number of people benefiting from EWS	2015. Government systems exist with DMH. No EWS system exists for fisheries and aquaculture sector.		1 10,000		15,000 50,000	1 75,000 (50% women)	Project reports Project surveys and assessments	
Component 3: Develop and apply/mainstream adaptation models to strengthen the resilience of Myanmar's aquaculture sector to the impacts of climate change.									

Results Chain (AMAT = coherence with AMAT table)	Indicators	Baseline ¹	Year 1	Year 2	Year 3	Year 4	End of Project Target	Means of Verification and Responsible Entities	Assumptions
Outcome 3.1. Small-scale fish farmers in coastal and inland water regions of Myanmar increase their knowledge of and reduce their vulnerability to climate change, and develop and demonstrate critical adaptation practices and technologies.	Number of people benefiting from improved adaptation technologies and practices	2015 No practices and technologies exist.	7,500	15,000	15,000	7,500	45,000 (at least 15,000 women)	Project reports	Continued Recognition of CC implications by community members and commitment to taking corresponding CCA actions and accepting short term costs Acceptance of EAA and new technologies to address CC impact. Continued positive governance environment at community levels
3.1.1. Climate change vulnerability assessments carried out for aquaculture production systems in target coastal and inland regions in order to inform planning and develop adaptation actions.	Climate Change VA EAA –CCA For	2015 ,No plans exist	10	20	20	10	60	Project reports	

Results Chain (AMAT = coherence with AMAT table)	Indicators	Baseline ¹	Year 1	Year 2	Year 3	Year 4	End of Project Target	Means of Verification and Responsible Entities	Assumptions
AMAT 6									
3.1.2: Climate-related risk reduction strategies and plans developed for target inland and coastal, aquaculture production systems and fish farming communities AMAT 6	EAA-CCA plans completed	2015 No plans exist	10	20	20	10	60	Project reports	
3.1.3: Critical adaptation technologies and practices piloted with targeted production systems and fish farming communities (<i>e.g.</i> diversification of farmed species and production processes; stocks and strains with wider tolerance to environmental changes; storm resistant cage and pond construction). Amat 1,2,3	Critical adaptation practices and technologies developed.	2015 No technologies exist	10	20	20	10	60	Project reports	

Results Chain (AMAT = coherence with AMAT table)	Indicators	Baseline ¹	Year 1	Year 2	Year 3	Year 4	End of Project Target	Means of Verification and Responsible Entities	Assumptions
3.1.4: Aquaculture-based early warning system developed, including the use of ICT based information services to enable regular and early warning. AMAT 8	Early warning system for Aquaculture Number of people benefiting from EWS in Aquaculture	No system exists for vulnerable communities DMH provide weather and long term forecast and CCA forecast for the country	1				1	Project reports	
				10,000	15,000	25,000	75,000		
3.1.5: Pilot integrated mangrove-aquaculture and rainfed rice paddy-fish systems assessed and implemented. AMAT 8	Mangrove Aquaculture systems developed Mangrove-Aquaculture piloted in Rakhine Rice-Fish / IPM piloted in Ayeyarwady	2015 No specific systems for CCA exist.		1			1	Project reports	
				5			5		
Component 4. Knowledge management, monitoring and evaluation, training and scaling up adaptation practices, lessons learnt development and dissemination.									
Outcome 4.Enhanced understanding and access to adaptation practices and technologies enable stakeholders to manage	Number of people benefiting receiving information	2015. No awareness raising activities undertaken			1,500,000	1,500,000	3,000,000	Project reports Project impact validation sub surveys	Continued recognition of the importance of knowledge

Results Chain (AMAT = coherence with AMAT table)	Indicators	Baseline ¹	Year 1	Year 2	Year 3	Year 4	End of Project Target	Means of Verification and Responsible Entities	Assumptions
information and scale up adaptation in the fisheries and aquaculture sector AMAT 5	from awareness raising activities							Project monitoring	management approaches developed by the project Continued political commitment to addressing the project Willingness to coordinate between institutions
4.1.1: Cutting edge training modules and how -to" guidelines for fisheries and aquaculture stakeholders developed.	Training modules EAFM-CCA EAA-CCA Mangrove- Aquaculture Rice Fish	2015: No Manuals exist for CCA adaptation in fisheries and aquaculture sector in Myanmar	4	5 1 1	2	2	13 1 1	Project reports	
4.1.2: Peer-to-peer learning program targeting fishers and fish farmers implemented to provide access to improved knowledge on climate variability, climate impacts and adaptation options.	Fisher and fish farmer peer to peer programme	MFF have network CCA P2P does not exist	5	10	10	10	35	Project reports	
4.1.3.: Information and	National	2015	1				1	Platform	

Results Chain (AMAT = coherence with AMAT table)	Indicators	Baseline ¹	Year 1	Year 2	Year 3	Year 4	End of Project Target	Means of Verification and Responsible Entities	Assumptions
knowledge sharing platform on aquatic animal disease and water quality concerning the fishery and aquaculture sector developed and in use AMAT 6,7,8, Relating to - Access to improved climate information and early-warning systems enhanced at regional, national, sub-national and local levels	Fisheries and aquaculture network strengthened for CCA Number of people receiving information from the project	Information sharing platform for CCA does not exist MFF and DOF have networks Myafish network, Public awareness raising not done	30,000	40,000	40,000	40,000	150,000	exists. Sample Survey by FISHADAPT	
4.4: Project monitoring system operating implemented providing systematic information on progress in meeting project outcome and output targets	Monitoring and Evaluation system	No M+E system	1				1	Monitoring and evaluation plan developed and implemented Minutes of progress monitoring meetings	
4.5: Midterm and final evaluation conducted	Evaluations	No evaluations		Mid term		Final	2 evaluations	2 Evaluations completed	
4.6: Project-related “best-practices” and “lessons-learned” published	Guidelines Policy briefs Good practice manuals	No documents exist.		5			10	Documents published.	

APPENDIX 2: WORK PLAN (RESULTS BASED)

Output	Activities	Responsible institution/ entity	Year 1				Year 2				Year 3				Year 4			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Component 1: [Strengthen the National, Regional/ State and Township level regulatory and policy frameworks to facilitate the adaptive capacities of the fisheries and aquaculture sector]																		
Output 1.1.1National level climate change vulnerability assessments for fisheries and aquaculture sector carried out.	Activity1.1.1.1.Development of policy advice on sector vulnerability, impact and development of good practice/policy briefs – science based studies (for VA see UNFCCC/CDY)	DOF/FISHADAPT IFT WFC Universities																
	Activity1.1.1.2. Capacity development in VA for partners and development of methodologies for Myanmar.	IDOF/FISHADAPT IFT WFC Universities																
	Activity1.1.1.3 Formal CC VA carried out lead by DOF. All levels and all regions/states/townships. Priorities for action identified for FI/AQ and action plan/strategy developed (with indicators). Community level and indigenous knowledge integrated. VA updated at least once during project life.	DOF/FISHADAPT IFT WFC Universities																
	Activity1.1.1.4 Communication of findings and good practice to sectors, (link to networks in C4 and all other components). Myanmar language	DOF/FISHADAPT IFT WFC Universities																
Output 1.1.2Myanmar’s National Policy on Fisheries Sector and supporting regulatory framework including national aquatic bio-security framework are strengthened.	Activity.1.2.1. Inventory and review of relevant national policies, strategies and frameworks (for coherence and alignment to CCA/CCRF/EAFM/DRM etc.) including formal and informal.	DOF/FISHADAPT																
	Activity1.1.2.2. Capacity development for Policy makers (based on IA and 1.1 (link to 1.5) and development of consultation strategy and leaders	IFT WFC DOF/FISHADAPT Universities																

Output	Activities	Responsible institution/ entity	Year 1				Year 2				Year 3				Year 4			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
	<i>Activity1.1.2.3. National sector CCA policy consultation supported to ensure full stakeholder engagement and develop consensus on areas of policy strengthening. (Potential for web based to be integrated)</i>	DOF/FISHADAPT (lead)																
	<i>Activity1.1.2.4. Strengthened Policy and regulatory frameworks developed /iterated (and piloted). This may be left at developing advice on policy change). These would be reviewed prior to project completion.</i>	DOF/FISHADAPT MLFRD																
Output 1.1.3. Government Policies and Strategies on fisheries and aquaculture sector-specific implications for key land-use planning and resource tenure policies and adaptation options are in place, with special attention to support integrated management of mangrove areas with fisheries, aquaculture and other stakeholders	<i>Activity1.1.3.1. Inventory and review of integration of relevant national policies, strategies and frameworks (for coherence and alignment to SSF/A., EAA/ EAFM/CZM/EBA CCA/CCRF/EAFM/DRM etc.) including formal and informal.</i>	DOF/FISHADAPT																
	<i>Activity1.1.3.2. Capacity development for Policy makers on policy integration (based on IA and 1.1, 1.2. (link to 1.5) and development of consultation strategy and leaders etc.</i>	DOF/FISHADAPT																
	<i>Activity1.1.3.3. National sector policy consultation supported to ensure full stakeholder engagement and develop consensus on areas of policy strengthening. (Potential for web based to be integrated)</i>	DOF/FISHADAPT																
	<i>Activity1.1.3.4. Strengthened Policy and regulatory frameworks developed /iterated (and piloted). This may be left at developing advice on policy change). These would be reviewed prior to project completion.</i>	DOF/FISHADAPT																
Output 1.1.4: Land and resource tenure policy, legal and regulatory framework strengthened to capacitate co-management in capture fisheries	<i>Activity1.1.4.1. Inventory and review, gap analysis. Land tenure and Forestry departments are responsible policies. EAFM integrated as baseline approach.</i>	DOF/FISHADAPT																
	<i>Activity1.1.4.2. Capacity development in policy development</i>	DOF/FISHADAPT																

Output	Activities	Responsible institution/ entity	Year 1				Year 2				Year 3				Year 4			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
	<i>Activity1.1.4.3 Policy consultation and revision</i>	DOF/FISHADAPT																
Output1.1.5: Institutional strengthening and capacity needs assessment for DoF, other relevant GoM agencies, and private sector & training program developed and applied	<i>Activity1.1.5.1. Formal Institutional Capacity Assessment completed for Fisheries and Aquaculture sector and related agencies/partners and in relation to CCA.</i>	DOF/FISHADAPT																
	<i>Activity1.1.5.2. Identification of Capacity Development Gaps to be addressed by FISHADAPT and development of CD programme with Partners.</i>	DOF/FISHADAPT																
	<i>Activity1.1.5.3 Implementation of Capacity Development programme for FISHADAPT. Including full training cycle management</i>	DOF/FISHADAPT																
	<i>Activity1.1.5.4. Monitoring and evaluation of training programme</i>	DOF/FISHADAPT																
Output 1.1.6 A system to inform policy and planning through monitoring and assessment of the impacts of climate change on the fisheries and aquaculture sector at community, district, and national level piloted and scaled up.	<i>Activity1.1.6.1. CC Monitoring , communication and capacity and needs assessed, including special science based studies</i>	DOF/FISHADAPT																
	<i>Activity1.1.6.2 CC Monitoring and assessment capacity developed within sector stakeholders and assessment carried out. (linked to C2 and 3)</i>	DOF/FISHADAPT																
	<i>Activity1.1.6.3. CC Monitoring system for sector piloted in 3 vulnerable Townships and approach finalized.</i>	DOF/FISHADAPT																
	<i>Activity1.1.6.4. Capacity of DoF and partner capacity developed and system scaled up in each State/region (. Townships)</i>	DOF/FISHADAPT																
Component 2: Enhanced critical adaptation practices demonstrated by fishers and fishing communities in vulnerable coastal and inland water regions of Myanmar.																		
Output 2.1.1 Climate change vulnerability assessments undertaken in target fishing communities in coastal and inland regions are used to inform action plans and identify	<i>Activity2.1.1.1. (linked to TNA and CD needs assessment as basis). EAFM based CC adaptation approach developed and piloted with partners (based on FAO – ITA project and EAFM).</i>	DOF/FISHADAPT																
	<i>Activity2.1.1.2. Community consultations</i>	DOF/FISHADAPT																

Output	Activities	Responsible institution/ entity	Year 1				Year 2				Year 3				Year 4			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
key adaptation actions	<i>carried out in xxx townships (1 village per township)</i>																	
	<i>Activity2.1.1.3.Community adaptation needs for fisheries identified and agreed</i>	DOF/FISHADAPT																
	<i>Activity2.1.1.4. Community needs used to inform policy consultations and science based studies. (C1)</i>	DOF/FISHADAPT																
Output 2.1.2: Community based climate change adaptation and disaster risk management plans developed for target inland and coastal fisheries, including mangrove-fisheries interactions	<i>Activity2.1.2.1. Findings from 2.1 used to develop community specific action plans in 200 communities. a)Phased implementation, based on training /extension CD programme for DoF Township/District /NGO officers. b)Yangon c)Dry Zone d)Ayeyarwady e)Rakhine,</i>	DOF/FISHADAPT																
Output 2.1.3. Critical adaptation technologies and practices piloted with targeted groups (e.g. resource monitoring; fishing gear; post-harvest processing; safety at sea; vessel design, etc.)	<i>Activity2.1.3.1 Based on national, sector VA and Community VA/needs Critical adaptation technologies identified and piloted (EAFM-CCA- co management approach)(full sector- value chain, PH, etc.) in pilot regions.</i>	DOF/FISHADAPT																
	<i>Activity2.1.3.2. EAFM/CCA/VA Training modules developed for each Technology and practice.</i>	DOF/FISHADAPT																
Output 2.1.4: Community-based early warning system developed, including the use of ICT based information services to enable regular and early warning.	<i>Activity2.1.4.1. EWS needs identified (based on DRM assessment and community consultations) with partners.</i>	DOF/FISHADAPT																
	<i>Activity2.1.4.2. capacity development of partners and DRM.</i>	DOF/FISHADAPT																
	<i>Activity2.1.4.3 Implementation of EWS with in 5 pilot sites (with DMH)</i>	DOF/FISHADAPT																
Component 3: Develop and apply/mainstream adaptation models to strengthen the resilience of Myanmar's aquaculture sector to the impacts of climate change.																		
Output 3.1.1. Climate change vulnerability assessments	<i>Activity3.1.1.1. CC VA methodology for small-scale aquaculture developed (based</i>	DOF/FISHADAPT																

Output	Activities	Responsible institution/ entity	Year 1				Year 2				Year 3				Year 4			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
carried out for aquaculture production systems in target coastal and inland regions in order to inform planning and develop adaptation actions.	<i>on EAA/CCA/VA)</i> <i>- policy level for all aquaculture</i>																	
	<i>Activity3.1.1.2. Capacity Development for partners in VA</i>	DOF/FISHADAPT																
	<i>Activity3.1.1.3 VA for Aquaculture completed</i>	DOF/FISHADAPT																
Output 3.1.2: Climate-related risk reduction strategies and plans developed for target inland and coastal, aquaculture production systems and fish farming communities	<i>Activity3.1.2.1. Capacity development in approaches o CC risk reduction in aquaculture developed</i>	DOF/FISHADAPT																
	<i>Activity3.1.2.2. CCA plans developed for 100 aquaculture (interventions/farms or farmer groups)</i>	DOF/FISHADAPT																
	<i>Activity Development of climate proof Biosecurity framework.</i>	DOF/FISHADAPT																
Output 3.1.3: Critical adaptation technologies and practices piloted with targeted production systems and fish farming communities (e.g. diversification of farmed species and production processes; stocks and strains with wider tolerance to environmental changes; storm resistant cage and pond construction).	<i>Activity2.1.3.1 Based on national, sector VA and Community VA/needs Critical adaptation technologies identified and piloted (EAA-CCA-(full sector- inputs, value chain, PH, etc.)</i>	DOF/FISHADAPT																
Output 3.4: Aquaculture-based early warning system developed, including the use of ICT based information services to enable regular and early warning	<i>Activity3.1.4.1. EWS needs identified (based on DRM assessment and community consultations)</i>	DOF/FISHADAPT																
	<i>Activity3.1.4.2.Capacity development of partners and DRM.</i>	DOF/FISHADAPT																
	<i>Activity3.1.4.3 Implementation of EWS with responsible agency,</i>	DOF/FISHADAPT																
Output.3.1.5: Pilot integrated mangrove-aquaculture and rainfed rice paddy-fish systems assessed and implemented.	<i>Activity3.1.5.1. Pilot integrated mangrove-aquaculture and rainfed rice paddy-fish systems assessed and implemented - SIS systems critical for many farmers</i>	DOF/FISHADAPT																
Component 4: Component 4: Knowledge management, monitoring and evaluation, training and scaling up adaptation practices, lessons learnt																		

Output	Activities	Responsible institution/ entity	Year 1				Year 2				Year 3				Year 4			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
development and dissemination.																		
Output 4.1: Cutting edge training modules and how -to" guidelines for fisheries and aquaculture stakeholders developed.	Activity4.1.1.1 Support to systematic CD and TNA assessment (linked to IA in C1) completed by key training partners of stakeholders	DOF/FISHADAPT																
	Activity4.1.1.2 Adaptation technologies and practices for development into training modules	DOF/FISHADAPT																
	Activity4.1.1.3. Training programme piloted and then implemented by partners for (DOF/NGO/..).	DOF/FISHADAPT																
	Activity4.1.1.4 Training programme follow up and evaluation along with dissemination	DOF/FISHADAPT																
4.2: Peer-to-peer learning program targeting fishers and fish farmers implemented to provide access to improved knowledge on climate variability, climate impacts, and adaptation options.	4.2.1.1 Based on CD/TNA assessments xx exchange programmes developed developed and published	DOF/FISHADAPT																
	MFF network strengthened for CCA	DOF/FISHADAPT																
	Worldfish/university networks strengthened for CCA	DOF/FISHADAPT																
	- National and global networks engaged and informed (GSP etc.)	DOF/FISHADAPT																
4.3.: Information and knowledge sharing platform on aquatic animal disease and water quality concerning the fishery and aquaculture sector developed and in use	4.3.1 Review of existing networks.	DOF/FISHADAPT																
	4.3.2. Strengthening of existing networks and/or development of new one's	DOF/FISHADAPT																
	4.3.3. Development of DoF CCA/CC coordination unit.	DOF/FISHADAPT																
4.4 Project monitoring system operating implemented providing systematic information on progress in meeting project outcome and output targets	4.4.1 Development of project M+E system	DOF/FISHADAPT																
	4.4.2 Project baseline and surveys	DOF/FISHADAPT																
	4.4.3. Project progress reports	DOF/FISHADAPT																
	4.4.4. Gender target monitoring	DOF/FISHADAPT																
4.5: Midterm and final evaluation conducted	4.5.1 Mid Term evaluation	DOF/FISHADAPT																

Output	Activities	Responsible institution/ entity	Year 1				Year 2				Year 3				Year 4			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
	<i>4.5.2. Terminal evaluation</i>	DOF/FISHADAPT																
4.6: Project-related “best-practices” and “lessons-learned” published	<i>4.6.1. Identification of best practice</i>	DOF/FISHADAPT																
	<i>4.6.2. Prepare and review best practice</i>	DOF/FISHADAPT																
	<i>4.6.3. Publish best practice (multilingual).</i>	DOF/FISHADAPT																
Project Management																		
	<i>Activity: Inception and work-planning</i>	DOF/FISHADAPT																
	<i>Activity Monitoring reports</i>	DOF/FISHADAPT																
	<i>Activity: Develop and implement gender strategy</i>	DOF/FISHADAPT																
	<i>Activity Develop and implement Communication strategy</i>	DOF/FISHADAPT																
	<i>Activity: Evaluation</i>	DOF/FISHADAPT	IR							MT R								T E

APPENDIX 3: RESULTS BUDGET

Appendix 3.1 Results based budget by Component (estimates based on local costing at 10/2015)

Description (and FAO Oracle Code)	Unit	No. of units	Unit cost	Component 1	Component 2	Component 3	Component 4	PM Costs	Total
5300 Salaries professionals									
1. International CTA	Month	48	12,000	74,880	195,840	207,360	69,120	27,360	574,560
2. Financial management/ analyst	Month	48	2,000	12,480	32,640	34,560	11,520	4,560	95,760
5300 Sub-total salaries professionals				87,360	228,480	241,920	80,640	31,920	670,320
5570 International Consultants									
1. International Fisheries Co management and EAFM specialist	Week	45	3,000	0	135,000	0	0	6,750	141,750
2. International Aquaculture EAA -CCA specialist	Week	45	3,000	0	0	175,544	0	8,777	184,321
3. International CD - CCA specialist	Week	12	3,000	33,750	33,750	33,750	33,750	6,750	141,750
4. International M+E expert	Week	12	3,000	36,000	0	0	0	1,800	37,800
5. International CC -FI and Aq Policy specialist	Week	12	3,000	0	0	0	36,000	1,800	37,800
6. International socio economics and gender	Week	12	3,000	0	36,000	0	0	1,800	37,800
7. Evaluation consultant (component 4-IEE)	Week	17	3,000	0	0	0	51,000	2,550	53,550
Sub-total international Consultants				69,750	204,750	209,294	120,750	30,227	634,771
National consultants									0
1) National Project Coordinator PT (Fish and Aq)	Week	192	500	24,000	24,000	24,000	24,000	4,800	100,800
2 National Fisheries CCA Specialist	Week	192	400	0	76,800	0	0	3,840	80,640
3. National CCA-VA-PRA fisheries	Week	192	400	0	76,800	0	0	3,840	80,640
4. National Aquaculture VA -CCA	Week	192	400	0	0	76,800	0	3,840	80,640
5 National Aquaculture EAA-CCA	Week	192	400	0	0	76,800	0	3,840	80,640
6. National CD adviser-training coordinator	Week	192	400	0	38,400	38,400	0	3,840	80,640
7. National M+E +IT	Week	192	400	0	0	0	76,800	3,840	80,640
8. Region/State trainer-coach facilitators	Week	180	400	0	72,000	0	0	3,600	75,600
9 National legal frameworks - policy	Week	192	400	76,800	0	0	0	3,840	80,640

Description (and FAO Oracle Code)	Unit	No. of units	Unit cost	Component 1	Component 2	Component 3	Component 4	PM Costs	Total
10. National Mangrove specialist	Week	90	400	0	0	36,000	0	1,800	37,800
11. Facilitator/trainers (3)	Week	384	400	0	76,800	76,800	0	7,680	161,280
12. National Gender - so-economist FI-AQ	Week	44	400	0	0	17,600	0	880	18,480
13. National DRM FI and AQ	Week	12	400	0	2,400	2,400	0	240	5,040
14 National Fisheries Technical consultants as required(PH/Gear/SAS etc)	Week	44	400	17,600	0	0	0	880	18,480
15. National Communications expert	Week	192	400	0	0	0	76,800	3,840	80,640
Sub-total national Consultants				118,400	367,200	348,800	177,600	50,600	1,062,600
5570 Sub-total consultants				188,150	571,950	558,094	298,350	80,827	1,697,371
5650 Contracts and LOA's									
LOA Sector Vulnerability Assessment - National	LOA	1	19,000	19,000	0	0	0	950	19,950
LOA Studies to strengthen science base	LOA	15	10,000	0	75,000	75,000	0	7,500	157,500
LOA Studies on vulnerable fisheries systems	LOA	5	10,000	0	0	50,000	0	2,500	52,500
LOA support to Networks and policy consultation MFF	LOA	1	45,000	0	0	0	45,000	2,250	47,250
LOA develop and pilot training modules	LOA	1	22,000	0	0	0	22,000	1,100	23,100
LOA WFC to develop and establish CC monitoring system	LOA	1	22,000	22,000	0	0	0	1,100	23,100
LOA Policy consultation	LOA	1	25,000	25,000	0	0	0	1,250	26,250
LOA Livelihood Support to communities Ayeyarwady	LOA	30	11,000	0	330,000	0	0	16,500	346,500
LOA - Livelihood support to communities Rakhine	LOA	30	11,000	0	0	330,000	0	16,500	346,500
LOA Livelihoods support to communities Yangon	LOA	30	11,000	0	330,000	0	0	16,500	346,500
LOA Livelihoods support to communities Dry Zone	LOA	30	11,000	0	0	330,000	0	16,500	346,500
5650 Sub-total Contracts				66,000	735,000	785,000	67,000	82,650	1,735,650
5900 Travel									
5684 International	Flight and travel	1	290,000	0	128,889	161,111	0	14,500	304,500

Description (and FAO Oracle Code)	Unit	No. of units	Unit cost	Component 1	Component 2	Component 3	Component 4	PM Costs	Total
5685 National	All local transport inc flight	1	120,000	0	60,000	60,000	0	6,000	126,000
5698 Non staff travel	flight	1	15,000	4,286	2,857	3,571	4,286	750	15,750
5900 Sub-total travel				4,286	191,746	224,683	4,286	21,250	446,250
5023 Training and workshops									
C1 policy consultations etc				0	0	0	0	0	0
Region/state meetings	Meeting	20	1,000	20,000	0	0	0	1,000	21,000
District level meetings	Meeting	40	1,000	40,000	0	0	0	2,000	42,000
Township level meetings	Meeting	40	500	20,000	0	0	0	1,000	21,000
Village level meetings	Meeting	50	300	15,000	0	0	0	750	15,750
Aquaculture Biosecurity	Meeting	10	500	5,000	0	0	0	250	5,250
Aquaculture CCA technologies	Meeting	10	500	5,000	0	0	0	250	5,250
National and technical	Meeting	6	5,000	30,000	0	0	0	1,500	31,500
C) All- Training (DOF and INGO level)				0	0	0	0		
EAFM-CCA (15x30 for 5days)	course	22	3,500	77,000	0	0	0	3,850	80,850
EAA-CCA	course	22	3,500	77,000	0	0	0	3,850	80,850
Climate Monitoring CCA	course	8	3,500	28,000	0	0	0	1,400	29,400
Follow up training	course	8	3,500	28,000	0	0	0	1,400	29,400
ToT EAA	course	11	3,500	0	38,500	0	0	1,925	40,425
ToT PRA-VA	course	11	3,500	0	38,500	0	0	1,925	40,425
Tech CCA FI and Aq meetings	course			0	0	0	0	0	0
CCA-Value Chain and Posy harvest	course	5	2,000	0	10,000	0	0	500	10,500
CCA-Fishing gear	course	5	2,000	0	10,000	0	0	500	10,500
CCA-Safety at sea	course	5	2,000	0	0	10,000	0	500	10,500
CCA-Coastal aquaculture	course	5	2,000	0	0	10,000	0	500	10,500
CCA-Inland aquaculture	course	5	2,000	0	0	10,000	0	500	10,500
Post graduate study (MSC-Diploma, to be defined)	course	5	10,000	0	0	50,000	0	2,500	52,500
5023 Sub-total training				345,000	97,000	80,000	0	26,100	548,100
6000 Expendable procurement									
Best practices and lessons learned publications	Publication	3	12,000	0	18,000	18,000	0	1,800	37,800

Description (and FAO Oracle Code)	Unit	No. of units	Unit cost	Component 1	Component 2	Component 3	Component 4	PM Costs	Total
Bi-annual status reports	Report	8	500	4,000	0	0	0	200	4,200
Posters	Poster	4	2,000	8,000	0	0	0	400	8,400
Material for aquaculture	Lump sum	1	50,000	0	50,000	0	0	2,500	52,500
Materials for fisheries	Lump sum	1	50,000	0	0	50,000	0	2,500	52,500
Field-offices expendables (3)	Lump sum	4	30,000	0	0	120,000	0	6,000	126,000
District office expendables	Lump sum	3	15,000	0	0	0	45,000	2,250	47,250
Software license	Lump sum	1	308	0	0	0	308	15	323
Billboard signs -info and demarcation	Signs	3	2,000	0	0	0	6,000	300	6,300
6000 Sub-total expendable procurement				12,000	68,000	188,000	51,308	15,965	335,273
6100 Non-expendable procurement									
Car hire for field work	days	900	110	0	49,500	49,500	0	4,950	103,950
Boat for field work (x 8 people), engine and safety equipment	Boat	3	3,000	0	0	9,000	0	450	9,450
Motorcycles for field work	Motorcycle	6	1,500	0	4,500	9,000	0	675	14,175
Smartphone/tablet/data recorder	handset	10	250	0	2,500	0	0	125	2,625
Small field implements	Lump sum	3	9,000	0	27,000	0	0	1,350	28,350
Router-Internet etc	Lump sum	1	5,000	0	5,000	0	0	250	5,250
Communication materials	Lump sum	1	17,425	0	17,425	0	0	871	18,296
LDC projector	Projector	1	3,000	0	0	3,000	0	150	3,150
Laptops	Laptop	10	1,000	0	0	0	10,000	500	10,500
Color printer/photocopier/scan	C Printer	3	1,500	0	0	0	4,500	225	4,725
Desks and office equipment	Office eqpt	4	7,000	0	14,000	14,000	0	1,400	29,400
6100 Sub-total non-expendable procurement				0	119,925	84,500	14,500	10,946	229,871
6300 GOE budget									
Miscellaneous including contingencies		1	321,109	91,745	61,164	76,455	91,745	16,055	337,164
6300 Sub-total GOE budget				91,745	61,164	76,455	91,745	16,055	337,164
TOTAL				794,541	2,073,265	2,238,651	607,829	285,714	6,000,000

Appendix 3.2 Results based budget by Year (estimates based on local costing at 10/2015)

Description (and FAO Oracle Code)	Unit	No. of units	Unit cost	Year 1	Year 2	Year 3	Year4	Total
5300 Salaries professionals								
1. International CTA	Month	48	12,000	143,640	143,640	143,640	143,640	574,560
2. Financial management/ analyst	Month	48	2,000	23,940	23,940	23,940	23,940	95,760
5300 Sub-total salaries professionals				167,580	167,580	167,580	167,580	670,320
5570 International Consultants								
1. International Fisheries Co management and EAFM specialist	Week	45	3,000	35,438	35,438	35,438	35,438	141,750
2. International Aquaculture EAA -CCA specialist	Week	45	3,000	46,080	46,080	46,080	46,080	184,321
3. International CD - CCA specialist	Week	12	3,000	35,438	35,438	35,438	35,438	141,750
4. International M+E expert	Week	12	3,000	9,450	9,450	9,450	9,450	37,800
5. International CC -FI and Aq Policy specialist	Week	12	3,000	9,450	9,450	9,450	9,450	37,800
6. International socio economics and gender	Week	12	3,000	9,450	9,450	9,450	9,450	37,800
7. Evaluation consultant (component 4-IEE)	Week	17	3,000	13,388	13,388	13,388	13,388	53,550
Sub-total international Consultants				158,693	158,693	158,693	158,693	634,771
National consultants								
1) National Project Coordinator PT (Fish and Aq)	Week	192	500	25,200	25,200	25,200	25,200	100,800
2 National Fisheries CCA Specialist	Week	192	400	20,160	20,160	20,160	20,160	80,640
3. National CCA-VA-PRA fisheries	Week	192	400	20,160	20,160	20,160	20,160	80,640
4, National Aquaculture VA -CCA	Week	192	400	20,160	20,160	20,160	20,160	80,640
5 National Aquaculture EAA-CCA	Week	192	400	20,160	20,160	20,160	20,160	80,640
6. National CD adviser-training coordinator	Week	192	400	20,160	20,160	20,160	20,160	80,640
7. National M+E +IT	Week	192	400	20,160	20,160	20,160	20,160	80,640
8. Region/State trainer-coach facilitators	Week	180	400	18,900	18,900	18,900	18,900	75,600
9 National legal frameworks - policy	Week	192	400	20,160	20,160	20,160	20,160	80,640
10. National Mangrove specialist	Week	90	400	9,450	9,450	9,450	9,450	37,800
11. Facilitator/trainers (3)	Week	384	400	40,320	40,320	40,320	40,320	161,280
12. National Gender - so-economist FI-AQ	Week	44	400	4,620	4,620	4,620	4,620	18,480
13. National DRM FI and AQ	Week	12	400	1,260	1,260	1,260	1,260	5,040

Description (and FAO Oracle Code)	Unit	No. of units	Unit cost	Year 1	Year 2	Year 3	Year4	Total
14 National Fisheries Technical consultants as required(PH/Gear/SAS etc)	Week	44	400	4,620	4,620	4,620	4,620	18,480
15. National Communications expert	Week	192	400	20,160	20,160	20,160	20,160	80,640
Sub-total national Consultants				265,650	265,650	265,650	265,650	1,062,600
5570 Sub-total consultants				424,343	424,343	424,343	424,343	1,697,371
5650 Contracts and LOA's								
LOA Sector Vulnerability Assessment - National	Study	1	19,000	19,950				19,950
LOA Studies to strenghten science base	Study	15	10,000	78,750	78,750			157,500
LOA Studies on vulnerable fisheries systems	Study	5	10,000		52,500			52,500
LOA support to Networks and policy conultation MFF	LOA	1	45,000	11,813	11,813	11,813	11,813	47,250
LOA develop and pilot training modules	LOA	1	22,000	23,100				23,100
LOA WFC to develop and establish CC monitoring system	LOA	1	22,000	23,100				23,100
LOA Policy consultation	LOA	1	25,000	26,250				26,250
LOA Livelihood Support to commnities Ayeyarwady	LOA	30	11,000	69,300	103,950	103,950	69,300	346,500
LOA - Livelihood support to communities Rakhine	LOA	30	11,000	69,300	103,950	103,950	69,300	346,500
LOA Livelihoods support to communities Yangon	LOA	30	11,000	69,300	103,950	103,950	69,300	346,500
LOA Livelihoods support to communities Dry Zone	LOA	30	11,000	69,300	103,950	103,950	69,300	346,500
5650 Sub-total Contracts				460,163	558,863	427,613	289,013	1,735,650
5900 Travel								
5684 International	flight and travel	1	290,000	76,125	76,125	76,125	76,125	304,500
5685 National	All local transport inc flight	1	120,000	31,500	31,500	31,500	31,500	126,000
5698 Non staff travel	flight	1	15,000	3,938	3,938	3,938	3,938	15,750
5900 Sub-total travel				111,563	111,563	111,563	111,563	446,250
5023 Training and workshops								

Description (and FAO Oracle Code)	Unit	No. of units	Unit cost	Year 1	Year 2	Year 3	Year4	Total
C1 policy consultations etc								
Region/state meetings	Meeting	20	1,000	5,250	5,250	5,250	5,250	21,000
District level meetings	Meeting	40	1,000	10,500	10,500	10,500	10,500	42,000
Township level meetings	Meeting	40	500	5,250	5,250	5,250	5,250	21,000
Village level meetings	Meeting	50	300	3,938	3,938	3,938	3,938	15,750
Aquaculture Biosecurity	Meeting	10	500	1,313	1,313	1,313	1,313	5,250
Aquaculture CCA technologies	Meeting	10	500	1,313	1,313	1,313	1,313	5,250
National and technical	Meeting	6	5,000	7,875	7,875	7,875	7,875	31,500
C) All- Training (DOF and INGO level)								0
EAFM-CCA (15x30 for 5days)	course	22	3,500	20,213	20,213	20,213	20,213	80,850
EAA-CCA	course	22	3,500	20,213	20,213	20,213	20,213	80,850
Climate Monitoring CCA	course	8	3,500	7,350	7,350	7,350	7,350	29,400
Follow up training	course	8	3,500	7,350	7,350	7,350	7,350	29,400
ToT EAA	course	11	3,500	10,106	10,106	10,106	10,106	40,425
ToT PRA-VA	course	11	3,500	10,106	10,106	10,106	10,106	40,425
Tech CCA FI and Aq meetings	course			0				0
CCA-Value Chain and Posy harvest	course	5	2,000	2,625	2,625	2,625	2,625	10,500
CCA-Fishing gear	course	5	2,000	2,625	2,625	2,625	2,625	10,500
CCA-Safety at sea	course	5	2,000	2,625	2,625	2,625	2,625	10,500
CCA-Coastal aquaculture	course	5	2,000	2,625	2,625	2,625	2,625	10,500
CCA-Inland aquaculture	course	5	2,000	2,625	2,625	2,625	2,625	10,500
Post graduate study (MSC-Diploma, to be defined)	course	5	10,000	13,125	13,125	13,125	13,125	52,500
5023 Sub-total training				137,025	137,025	137,025	137,025	548,100
6000 Expendable procurement								
Best practices and lessons learned publications	Publication	3	12,000	9,450	9,450	9,450	9,450	37,800
Bi-annual status reports	Report	8	500		2,100		2,100	4,200
Posters	Poster	4	2,000	2,100	2,100	2,100	2,100	8,400
Material for aquaculture	Lump sum	1	50,000	13,125	13,125	13,125	13,125	52,500
Materials for fisheries	Lump sum	1	50,000	13,125	13,125	13,125	13,125	52,500
Field-offices expendables (3)	Lump sum	4	30,000	31,500	31,500	31,500	31,500	126,000
District office expendables	Lump sum	3	15,000	11,813	11,813	11,813	11,813	47,250

Description (and FAO Oracle Code)	Unit	No. of units	Unit cost	Year 1	Year 2	Year 3	Year4	Total
Software license	Lump sum	1	308	81	81	81	81	323
Billboard signs -info and demarcation	Signs	3	2,000	1,575	1,575	1,575	1,575	6,300
6000 Sub-total expendable procurement				82,768	84,868	82,768	84,868	335,273
6100 Non-expendable procurement								
Car hire for field work	days	900	110	25,988	25,988	25,988	25,988	103,950
Boat for field work (x 8 people), engine and safety equipment	Boat	3	3,000	2,363	2,363	2,363	2,363	9,450
Motorcycles for field work	Motorcycle	6	1,500	14,175				14,175
Smartphone/tablet/data recorder	handset	10	250	2,625				2,625
Small field implements	Lump sum	3	9,000	28,350				28,350
Router-Internet etc	Lump sum	1	5,000	5,250				5,250
Communication materials	Lump sum	1	17,425	4,574	4,574	4,574	4,574	18,296
LDC projector	Projector	1	3,000	3,150				3,150
Laptops	Laptop	10	1,000	10,500				10,500
Color printer/photocopier/scan	C Printer	3	1,500	4,725				4,725
Desks and office equipment	Office eqpt	4	7,000	29,400				29,400
6100 Sub-total non-expendable procurement				131,099	32,924	32,924	32,924	229,871
6300 GOE budget								
Miscellaneous including contingencies		1	321,109	84,291	84,291	84,291	84,291	337,164
6300 Sub-total GOE budget				84,291	84,291	84,291	84,291	337,164
TOTAL				1,598,831	1,601,456	1,468,106	1,331,606	6,000,000

APPENDIX 4: RISK MATRIX

Risk Description	Category ¹	Impact ²	Likelihood ³	Mitigating actions	Owner	Status ⁴
Local community in conflict and unable to participate in project fully (especially in sensitive areas). Local community conflicts prevent project implementation teams working with and travelling to communities.		L	L	The project will mitigate this through careful selection criteria developed and applied during the identification of pilot project demonstration sites. Full participatory consultation with community stakeholders, government, and local authorities to ensure management of expectations.	Monitored by the project implementation unit (Government - FAO project Coordination unit) and reported to Advisory and management units as necessary.	Ongoing throughout the project.
Significant natural or human induced disasters or crises prevent planned programme delivery.		M/H	M/H	Mitigation will be through the development of a CCA/DRM strategy for the project and communities. If such events do occur then activities in that region will, after consultation and agreement with stakeholders, be rescheduled.	Monitored by the project implementation unit (FAO project Coordination unit) and reported to Advisory and management units	Ongoing throughout project
Extreme climate events affect livelihoods of stakeholders. (For example, higher surface water temperature may cause greater evaporation rate in aquaculture ponds, increasing mortality of fish culture, low market price due to muddy smell. (Soft-shell mud crab farming in		L	L	The project mitigates this risk through its support to the development of CC adaptation technologies and approaches. The project will build the capacity of farmers, communities and government to better deal with the ongoing climate variability including extremes and future climate change through adaptation practices	Monitored by the project implementation unit (FAO project Coordination unit) and reported to Advisory and management units	Ongoing throughout the project.

¹ Risk categories defined in the FAO ERM Strategy:

² H: High, M: Medium, L: Low

³ H: High, M: Medium, L: Low

⁴ To be updated during implementation and monitoring phase (no change, reduced, increased).

Risk Description	Category¹	Impact²	Likelihood³	Mitigating actions	Owner	Status⁴
pond water surface areas will be particularly vulnerable).						
Communities, fishers, fish farmers and other key stakeholders do not adopt or implement the CC adaptation technologies, practice, laws and policies developed by the project.		M	M	<p>The project mitigates this risk through its planned capacity development programme, advocacy, and communications for the implementation of the EAFM/EAA/VA approaches and policy mainstreaming. Ownership will be built with stakeholders at all levels (fishers, communities, fish farmers, Government, and partners) who will be encouraged and supported in piloting and developing the technologies and practices needed. Knowledge and good practice generated will be shared broadly through existing networks.</p> <p>The adoption of participatory community led methodologies will ensure</p>	Monitored by the project implementation unit (FAO project Coordination unit) and reported to Advisory and management units	Ongoing, throughout the project
Gender issues not adequately addressed and women not fully engaged with the project.		M	M	<p>The project mitigates this risk through the development and monitoring of its own gender strategy. FAO has extensive experience in the region and has developed good practice with gender in development project implementation. Further, specific gender target will be set on project start up.</p>	Monitored by the project gender specialist and implementation unit.	Ongoing throughout

APPENDIX 5: PROCUREMENT PLAN

NOT RELEVANT FOR FISHADAPT PRODOC

APPENDIX 6: TERMS OF REFERENCE (TORS)

International Fisheries Co management and EAFM specialist

International CD - CCA specialist

Evaluation consultant (component 4-IEE)

1. International Expert – CTA and Fisheries and aquaculture Climate Change Adaptation expert

Duration: 48 months

Duty Station: Yangon/Myanmar

Under the overall supervision of the FAOR and the technical supervision of RAP and FIPI, and in close collaboration with the National Project Coordinator and government counterparts, he/she will be responsible for supervising the international and domestic consultants/experts, and providing high-level guidance to the project. Specifically, he/she will:

- Supervise project planning and implementation of the project,
- Provide policy and technical advice to DOF and MLFRD
- Advise on the terms of reference, selection, and recruitment of local agencies and NGOs to be contracted under the project, and support the CFHC in their supervision.
- Manage the FAO experts and the international and domestic consultants and other parties subcontracted by FAO.
- Planning, directing, coordinating and monitoring all project activities and the work of staff and consultants assigned to the project
- Oversee the writing of project reports including inception and twice yearly progress report and final report.
- Assist in the organization of the training and study tour programs.
- Prepare technical and project reports and submit them to the MLFRD and DOF in a timely manner.
- Prepare, brief progress reports as foreseen by the project document and an end-of-assignment report providing activity-output indicators and making recommendations.

International Fisheries Co management and EAFM specialist

Duration: 45 weeks

Duty Station: Yangon/Myanmar

Under the overall supervision of the FAO Representative, the CTA and in close collaboration with the National Counterparts, he/she will be responsible for providing technical advice regarding Fisheries Co-management and EAFM. Specifically, he/she will:

- Providing technical advice with respect to fisheries management and EAFM
- Advise on the application of the EAFM approach in Myanmar
- Advise on the implementation of fisheries co-management in Myanmar in the context of CCA
- Prepare progress reports and contribute to project evaluations as required
- Develop good practice and lessons learned for dissemination
- Develop, Coordinate to monitoring relevant LOA's
- Contribute to evaluations and other project M+E activities as required

International Aquaculture EAA -CCA specialist

Duration: 45 weeks

Duty Station: Yangon/Myanmar

Under the overall supervision of the FAO Representative, the CTA and in close collaboration with the National Counterparts, he/she will be responsible for providing technical advice regarding Aquaculture EAA -CCA. Specifically, he/she will:

- Providing technical advice with respect to Aquaculture CCA and EAA
- Advise on the application of the EAA approach in Myanmar
- Advise on the integration of CCA into Aquaculture policy
- Advise on the development of the project biosecurity framework
- Develop good practice and lessons learned for dissemination
- Develop, Coordinate to monitoring relevant LOA' s
- Contribute to evaluations and other project M+E activities as required.

International Capacity Development/CCA specialist

Duration: 12 weeks

Duty Station: Yangon/Myanmar

Under the overall supervision of the FAO Representative, the CTA and in close collaboration with the National Counterparts, he/she will be responsible for providing technical advice regarding International Capacity Development/CCA specialist. Specifically, he/she will:

- Provide advice on the project individual, organizational and institutional capacity development activities including organizational development and effective training activities under all component
- Support the coordination of capacity development and learning needs assessment for all project stakeholders.
- Support national team on organizational CD activities (i.e. strengthening fisheries and aquaculture networks) and institutional CD activities (i.e. institutional CD assessments and action plan definition to enhance cross-sectoral coordination)
- Support the national team in developing an integrated training and CD strategy and implementation plan for the project
- Support the modification and piloting of EAFM and EAA (and other courses/modules) for use in Myanmar
- Support IFT and other training providers in the implementation of LOA's related to CD and training.
- Provide advice on the coordination and implementation of the CD and training under component 2 and 3 in relation to community adaptation planning
- Develop good practice and lessons learned for dissemination\
- Develop, Coordinate to monitoring relevant LOA' s
- Contribute to evaluations and other project M+E activities as required with specific focus on Capacity Development results

International Monitoring and Evaluation expert.

Duration: 12 weeks

Duty Station: Yangon/Myanmar

Under the overall supervision of the FAO Representative, the CTA and in close collaboration with the National Counterparts, he/she will be responsible for providing technical advice regarding Monitoring and Evaluation expert. Specifically, he/she will:

- Provide technical advice to the project team relating to Monitoring and evaluation
- Advise and support the National consultant M+E on the development of an M+E strategy and its implementation (including the development of indicators)
- Advise on the use of theory of change for project monitoring and evaluation
- Contribute to meetings and workshops related to M+E
- Contribute to Reports and Evaluations as required.
- Advise on training to national project staff and counterpart in project M+E
- Advise on the National Climate monitoring system
- Develop good practice and lessons learned for dissemination\
- Develop, Coordinate to monitoring relevant LOA's
- Contribute to evaluations and other project M+E activities as required

International Fisheries CC –Fisheries and Aquaculture policy specialist.

Duration: 12 weeks

Duty Station: Yangon/Myanmar

Under the overall supervision of the FAO Representative, the CTA and in close collaboration with the National Counterparts, he/she will be responsible for providing technical advice regarding Fisheries CC –Fisheries and Aquaculture policy specialist. Specifically, he/she will:

- Provide technical advice on the mainstreaming of CC into national and Region/State level fisheries and aquaculture (and other sector)
- Provide technical advice on policy consultation processes
- Develop good practice and lessons learned for dissemination\
- Develop, Coordinate to monitoring relevant LOA's
- Contribute to evaluations and other project M+E activities as required

International Socio-economist and gender specialist

Duration: 12 weeks

Duty Station: Yangon/Myanmar

Under the overall supervision of the FAO Representative, the CTA and in close collaboration with the National Counterparts, he/she will be responsible for providing technical advice on socio-economic and gender issues. Specifically, he/she will:

- Provide advice on the integration of gender into the project implementation
- Advise on the project gender strategy (development and implementation)
- Develop good practice and lessons learned for dissemination\
- Develop, Coordinate to monitoring relevant LOA's
- Contribute to evaluations and other project M+E activities as required

International Evaluation specialist

Duration: 17 weeks

Duty Station: Yangon/Myanmar

Under the overall supervision of the FAO Representative, the CTA and in close collaboration with the National Counterparts, he/she will be responsible for providing technical advice regarding project evaluation. Specifically, he/she will:

- Provide technical advice and support to evaluations during the project life
- Support coordination of the Mid Term review, Terminal evaluation and any thematic technical evaluations

- Develop good practice and lessons learned for dissemination\
- Develop, Coordinate to monitoring relevant LOA' s
- Contribute to evaluations and other project M+E activities as required

National Experts

National project coordinator

Duration: 192 weeks

Duty Station: Yangon/Myanmar

Under the overall supervision of the FAO Representative, the CTA and in close collaboration with the National Counterparts, he/she will be responsible for supervising the management and implementation of the project. Specifically, he/she will:

- Ensure the timely mobilization of all necessary government resources in all project districts in a harmonized and coordinated manner including defining the organizational and chronological aspects of project delivery
- Oversee the implementation and management of the project
- Supporting meetings of the project steering committee
- Support recruitment and management of required national and international consultants to support project implementation;
- Prepare information for and support the writing of reports.
- Assist in the organization of meetings and training and study tour programs.
- Undertake any other duties as required.

National Fisheries CCA Specialist

Duration: 192 weeks

Duty Station: Yangon/Myanmar

Under the overall supervision of the FAO Representative, the CTA and in close collaboration with the international and national counterparts, he/she will be responsible for the Fisheries CCA implementation and technical advice. Specifically, he/she will:

- Coordinate the implementation of Component 2 with project team members
- Develop and implement community based DRM/CCA plans
- Lead the development of the project communication information sharing platforms and communication strategy e
- Develop good practice and lessons learned for dissemination\
- Develop, Coordinate and monitor LOA's under component 1
- Contribute to evaluations and other project M+E activities as required.

National CCA-VA-PRA in fisheries specialist

Duration: 192 weeks

Duty Station: Yangon/Myanmar

Under the overall supervision of the FAO Representative, the CTA and in close collaboration with the international and national counterparts, he/she will be responsible for the CCA-VA-PRA in fisheries specialist implementation and technical advice. Specifically, he/she will:

- Support the project team in the coordination of VA and PRA activities under the project
- Coordinate the National level VA assessments and supervise technical implementation of LOA' with partners\Coordinate the implementation of Component 2
- Develop CCA biosecurity frameworks
- Develop good practice and lessons learned for dissemination\
- Develop, Coordinate and monitor LOA's under component 1
- Contribute to evaluations and other project M+E activities as required.

National CCA-VA-PRA in Aquaculture specialist

Duration: 192 weeks Duty Station: Yangon/Myanmar

Under the overall supervision of the FAO Representative, the CTA and in close collaboration with the international and national counterparts, he/she will be responsible for the CCA-VA-PRA in Aquaculture implementation and technical advice. Specifically, he/she will:

- Support the implementation of VA under component 3 and 1 (aquaculture sector)
- Lead the implementation of Component 3.
- Lead the development of Aquaculture EWS under component 3 (integrated with components 1,2 and 4)
- Lead the pilot of integrated rainfed- rice fish and small-scale aquaculture in the CDZ
- Develop good practice and lessons learned for dissemination
- Develop, Coordinate and monitor LOA's under the component
- Contribute to evaluations and other project M+E activities as required.

National Capacity Development adviser-training coordinator

Duration: 192 weeks

Duty Station: Yangon/Myanmar

Under the overall supervision of the FAO Representative, the CTA and in close collaboration with the international and national counterparts, he/she will be responsible for the Capacity Development adviser-training coordinator implementation and technical advice. Specifically, he/she will

- Lead the implementation of Component 4
- Lead the development of the project CD-Training plan and its implementation
- Develop peer to peer learning mechanisms
- Develop good practice and lessons learned for dissemination
- Develop, Coordinate and monitor LOA's under relevant components
- Contribute to evaluations and other project M+E activities as required.

National Monitoring and Evaluation and project IT specialist

Duration: 192 weeks

Duty Station: Yangon/Myanmar

Under the overall supervision of the FAO Representative, the CTA and in close collaboration with the international and national counterparts, he/she will be responsible for the implementation of the Monitoring and Evaluation of the project technical advice. Specifically, he/she will

- Provide technical advice to the project team relating to Monitoring and evaluation
- Development the project M+E strategy and lead implementation
- Develop a project implementation monitoring system
- Develop project baseline monitoring (through surveys and PRA and other appropriate methods)
- Advise on the use of theory of change for project monitoring and evaluation
- Organise and contribute to meetings and workshops related o M+E
- Contribute to Reports and Evaluations as required.
- Advise on training to national project staff and counterpart in project M+E
- Advise on the National Climate monitoring system
- Develop good practice and lessons learned for dissemination
- Develop, Coordinate and monitor LOA's where appropriate
- Contribute to evaluations and other project M+E activities as required.

National Region/State trainer-coach facilitators (x3 posts)

Duration: 384 weeks in total

Duty Station: Yangon/Myanmar

Under the overall supervision of the FAO Representative, the CTA and in close collaboration with the international and national counterparts, he/she will be responsible for the Region/State trainer-coach facilitation and support coordination. Specifically, he/she will

- Lead and coordinate with partners the implementation of all components at State/Region/District level.
- Support the establishment of coordination mechanisms with partners and other government agencies
- Provide training and hands on coaching to government staff and project partners
- Support development and implementation of critical adaptation technologies and practices.
- Develop good practice and lessons learned for dissemination\
- Develop, Coordinate and monitor LOA's
- Contribute to evaluations and other project M+E activities as required.

National legal framework and policy specialist.

Duration: 192 weeks

Duty Station: Yangon/Myanmar

Under the overall supervision of the FAO Representative, the CTA and in close collaboration with the international and national counterparts, he/she will be responsible for the implementation of the legal framework and policy elements of the project and technical advice. Specifically, he/she will

- Coordinate the implementation of component 1 (and linkages to other components)
- Lead the national fisheries and aquaculture sector policy, law and institutional assessments and consultations
- Provide advice on the strengthening of relevant policies.
- Provide technical advice on the development of training and capacity development for the component and coordinate through partners.
- Develop an inventory of relevant policies, laws and strategies under component 1
- Provide technical advice on land use planning and resource tenure.
- Develop good practice and lessons learned for dissemination\

- Develop, Coordinate and monitor LOA's under component 1
- Contribute to evaluations and other project M+E activities as required.

National Mangrove specialist.

Duration: 90 weeks

Duty Station: Yangon/Myanmar

Under the overall supervision of the FAO Representative, the CTA and in close collaboration with the international and national counterparts, he/she will be responsible for the implementation of the Mangrove elements of the project and technical advice. Specifically, he/she will

- Provide advice on the integration of Mangroves into the project implementation including the use of Mangrove for CCA and Vulnerability reduction
- Develop Mangrove – fisheries – aquaculture CCA plans for communities
- Develop good practice and lessons learned for dissemination\
- Develop, Coordinate and monitor LOA's
- Contribute to evaluations and other project M+E activities as required.

National Facilitator-Trainers (x3 posts)

Duration: 384 weeks

Duty Station: Yangon/Myanmar

Under the overall supervision of the FAO Representative, the CTA and in close collaboration with the international and national counterparts, he/she will be responsible for coordination and implementation of the project CD and training plans. Specifically, he/she will

- Support the project team in the development and implementation of the project CD/training strategy.
- Undertake CD needs assessments
- Develop and pilot training and CD modules
- Develop and monitor LOA's related to CD and training

National Gender - socio-economist.

Duration: 44 weeks

Duty Station: Yangon/Myanmar

Under the overall supervision of the FAO Representative, the CTA and in close collaboration with the international and national counterparts, he/she will be responsible for the implementation of the gender and socio-economic elements of the project and technical advice. Specifically, he/she will

- Develop and implement the project gender strategy ensuring full integration with other components
- Advise Component teams on socio economic issues relating to project implementation
- Provide advice on gender, fisheries and aquaculture and CCA in Myanmar
- Develop good practice and lessons learned for dissemination\
- Develop, Coordinate and monitor relevant LOA's
- Contribute to evaluations and other project M+E activities as required.

National DRM Fisheries and Aquaculture Specialist.

Duration: 12 weeks

Duty Station: Yangon/Myanmar

Under the overall supervision of the FAO Representative, the CTA and in close collaboration with the international and national counterparts, he/she will be responsible for the implementation of the DRM Fisheries and Aquaculture Specialist elements of the project and technical advice. Specifically, he/she will

- Support the development of the project DRM /EWS strategy\
- Advise on DRM capacity development (with other project components)
- Coordinate the development and piloting of the project Climate EWS under component 1, 2 and 3.
- Develop good practice and lessons learned for dissemination\
- Develop, Coordinate and monitor LOA's
- Contribute to evaluations and other project M+E activities as required.

National Fisheries and Aquaculture Technical Specialists .

Duration: 192 weeks in total

Duty Station: Yangon/Myanmar

Under the overall supervision of the FAO Representative, the CTA and in close collaboration with the international and national counterparts, he/she will be responsible for the provision of Fisheries and Aquaculture technical advice elements of the project and technical advice. Specifically, he/she will provide advice on

- Small-scale fisheries and aquaculture
- Fishing gear (vessels, gear, engines)
- Post-harvest, and markets, including value chains.
- Safety at Sea,
- Aquaculture technology (fish, shrimp, seaweed etc.
- Hatcheries and bloodstock
- Aquaculture Biosecurity framework.
- Aquaculture law
- Integrated Aquaculture(Mangrove and rice fish/IPM)
- Livelihoods

National Communications expert. .

Duration: 192 weeks

Duty Station: Yangon/Myanmar

Under the overall supervision of the FAO Representative, the CTA and in close collaboration with the international and national counterparts, he/she will be responsible for the implementation of the project communication strategy and provision of technical advice. Specifically, he/she will

- Lead the development of the project communication strategy and its implementation (across all components but mainly 4).
- Lead the development of ICT and social media as communication tools
- Lead coordination and strengthening support to existing networks (MFF, MyFish, LIFT and the national CC forum).
- Lead the development of the information sharing platform on aquatic animal health

- Lead the development and dissemination of good practice and lessons learned
- Develop, Coordinate and monitor LOA's under the component
- Contribute to evaluations and other project M+E activities as required.

APPENDIX 7: ENVIRONMENTAL AND SOCIAL ASSESSMENT

Category C projects¹

PROJECT NAME	FishAdapt: Strengthening the adaptive capacity and resilience of fisheries and aquaculture-dependent livelihoods in Myanmar
---------------------	--

Project description: approximately 500 words or less

The fisheries and aquaculture sector in Myanmar is important for food and nutrition security and the economy. Climate change is forecast to have significant impact on the sector. For capture fisheries (marine and inland) these impacts include changes in sea surface temperature, higher inland water temperature, changes in ocean currents, changes in the frequency of El-Nino Southern Oscillation (ENSO) events, sea level rise and changing levels of rain and water availability. The aquaculture sector is also exposed to hazards such as salt-water intrusion, flooding of ponds, shortages in water supply, and altered local ecosystems with changes in competitors, predators, and invasive species. Myanmar is also vulnerable to disasters and recently experienced the Tsunami (2004), Cyclone Nargis (2003), and Giri storm (2010). These caused significant loss of life, damage to infrastructure and impacted fishers and fish farmers. The Myanmar National Adaptation Plan of Action (NAPA) has identified adaptation priority strategies in fisheries and aquaculture to address the impacts of climate change. These are included in Priority areas 1, 2, 3, and 4. Key areas of focus for the project will include for example: strengthening national capacity, fisheries co-management measures, integrated mangrove fisheries and aquaculture integrated, inland fisheries and small-scale aquaculture, and issues related to land tenure.

This project will work at the national level on policies and institutional strengthening and will demonstrate strengthened adaption at the community level in areas such as: Ayeyarewady Region, Yangon Region, and Rakhine State with additional regions identified in relation to small-scale inland aquaculture development. Vulnerable groups such as the poor and women will be targeted.

The Project Objective is to enable inland and coastal fishery and aquaculture stakeholders to adapt to climate change by understanding and reducing vulnerabilities, piloting new practices and technologies, and sharing information.

The project adopts an Ecosystem approach to Fisheries management (EAFM) and Aquaculture (EAA). EAFM is the practical way to implement sustainable development for fisheries by finding a balance between ecological and human well-being through good governance. These will be applied to enhance the resilience of aquatic ecosystems to climate change impacts and fishing and fish farming activities. These approaches also reduce the underlying vulnerability of fishing and fish farming communities. A national Climate Change Vulnerability Assessment will identify “at risk” ecosystems and in particular small-scale traditional fisheries and fish farming systems for specific action. Environmental sustainability will be ensured through positive impacts the introduced climate change adaptation plans, fisheries management plans, technologies and approaches on a range of ecosystem services.

The project builds upon existing and emerging Government programs

¹ Refer to FAO Environmental Impact Assessment – Guidelines for FAO Field Projects <http://www.fao.org/docrep/016/i2802e/i2802e.pdf>

The adoption of EAFM and EAA approaches can result in restriction of access for some stakeholders by community c-management groups. This is done in a participatory and consultative way. Fisheries Management plans for example may require a reduction in fishing capacity to ensure fishing effort is within sustainable limits for that fishery. Should this occur then the project will mitigate the impact through the planned development of alternative livelihood strategies that are an integral part of EAFM and EAA approaches.

Sustainable management of natural resources and positive environmental benefits are a key element of the project. Analysis of the project shows that there are no negative environmental impacts. The project fulfils the FAO criteria outlined for fisheries and aquaculture projects and EIA, which include:

- Follow the ecosystem approach to fisheries and aquaculture, thus adhering to the CCRF.
- Preserve aquatic ecosystems and protect the quantity and quality of fisheries resources, including genetic resources.
- Preserve traditional patterns of resource use or strengthen subsistence and cash economies.
- Avoid dumping of fish processing wastes in water bodies.
- Avoid the depletion of other fishery stocks or wild populations.
- Avoid negative impacts on aquatic habitats such as coral reefs, sea-grass beds, mangrove, and wetlands.
- Reduce incidental captures (particularly non-target or protected species).
- Protect artisanal fisheries from conflicts with commercial fishing vessels and their gears.
- Protect small-scale farmers and local communities.
- Encourage sustainable exploitation of spawning and nursery areas in inshore areas.
- Be planned in coordination with river basin development or integrated coastal management initiatives.
- Ensure evaluation and responsible use of non-native and non-adapted fish and aquatic species according to
- FAO guidelines.
- Create favourable habitats for water-related diseases vectors.
- Ensure safe use of compounds such as pesticides and antibiotics.
- Monitor ecological changes in coastal and inland waters.

(<http://www.fao.org/fishery/topic/2013/en>)

According to FAO's EIA methodology, it can be categorised as C.

Certification:

Project Category C	Yes	No
I affirm that I have performed an environmental review of this project and certify that the project conforms to the pre-approved list of projects excluded from environmental assessment and that the project will have minimal or no adverse environmental or social impacts. No further analysis is required.	✓	

Title, name and signature of project Lead Technical Officer:

Date:

APPENDIX 8: PROJECTS AND PROGRAMMES RUN BY FAO MYANMAR

Approval Year	Project Symbol	Project Title
2015	OSRO/MYA/502/CHA	Livelihoods recovery support for conflict-affected communities in Northern Rakhine State, Myanmar
2015	TCP/MYA/3503 BABY07	Enhancing Inter-Ministerial Coordination for Strengthening Food Safety Control Management in Myanmar
2014	TCP/MYA/3504	Reduction of Post-Harvest Losses along the Food Chain in Myanmar
2015	TCP/MYA/3505	Promoting an Integrated Home Garden and School Garden Approach for food and nutrition security in Myanmar
n.a.	UNJP/MYA/022/OPS	Improving Farmer Livelihoods in the Dry Zone through Improved Livestock Health, Productivity and Marketing
n.a.	GCP /MYA/017/GFF	Sustainable cropland and forest management in priority agro-ecosystems of Myanmar (FSP)
n.a.	TCP/MYA/XXXX	Improvement of tilapia seed production and growout culture management in Myanmar
2015	TCP/MYA/3503 BABY03	Mid-term review of Country Programming Framework (CPF) implementation
2014	TCP/MYA/3501	Strengthening Myanmar's National Forest Monitoring System - Land Use Assessment and Capacity Building
2014	OSRO/MYA/402/FRA	Enhance of Food Security and Resilience for conflict affected communities in Northern Rakhine State, Myanmar
2014	GCP /MYA/021/LDF	FishAdapt: Strengthening the adaptive capacity and resilience of fisheries and aquaculture-dependent livelihoods in Myanmar (PPG)
2014	TCP/MYA/3503 BABY06	Formulation of National Action Plan for Zero Hunger
2014	TCP/MYA/3503 BABY04	Technical assistance to assess the feasibility of Warehouse Receipt Financing System for Rice in Myanmar
2014	TCP/MYA/3503 BABY05	Formulation of TCP proposal on Genetic Management and Improvement of Tilapia in Myanmar
2014	TCP/MYA/3402 BABY12	PIF Formulation for GEF project proposal on reducing vulnerability to forest fires in Myanmar
2013	UNJP/MYA/020/OPS	Formulation and operationalization of a National Action Plan for Poverty Alleviation and Rural Development through Agriculture (NAPA) to implement the National Strategy for Poverty Alleviation and Rural Development (NSPARD) for Myanmar
2014	OSRO/MYA/401/CHA	Support to Food Production and Nutrition for the Conflict-affected Population in Kachin State
2014	TCP/MYA/3502	Support for animal feeding strategies for improved livestock production in Myanmar
2014	TCP/MYA/3503	TCP Facility
2014	TCP/MYA/3503 BABY01	Technical assistance to the costing of national plan of action for food and nutrition of Myanmar
2013	UNJP/MYA/021/OPS	Formulation of a proposal on Improved Farmer Livelihoods through Improved Animal Health and Production Services?
2013	TCP/MYA/3402 BABY11	Formulation of TCP proposal on Reduction of post-harvest losses along the food chain in Myanmar
2013	TCP/MYA/3404	Royal Jelly Production in Myanmar
2013	OSRO/MYA/301/CHA	Enhancement of food production and nutrition of vulnerable conflict-affected families in Kachin State, Myanmar
2013	TCP/MYA/3405	Emergency support to affected communities in Rakhine State
2013	TCP/MYA/3402 BABY09	Formulation of a project proposal on animal feeding strategies for improved livestock production in Myanmar
2013	GCP /MYA/019/GFF	Sustainable cropland and forest management in priority agro-ecosystems of Myanmar (PPG)

2012	TCP/MYA/3403	Accelerating the Development of Hybrid rice in Myanmar
2013	TFD-12/MYA/001	Improving nutrition through the Development of Monastery School Fruit and Vegetable Garden
2013	TFD-12/MYA/002	Development of school garden activities at No. 138, Aung Chan Tha Village Primary School.
2013	TCP/MYA/3402 BABY07	Formulation of aquaculture development project proposal for LDCF/GEF
2012	TCP/MYA/3402 BABY06	Formulation of LIFT project proposal on Improved Farmer Livelihoods through Improved Livestock Disease Control and Supply Chains
2012	TCP/MYA/3401	Capacity building to improve market access for fish and fishery products
2012	TCP/MYA/3402 BABY05	The Formulation of National Action Plan for the Implementation of Poverty Alleviation and Rural Development
2012	TFD-10/MYA/001	Enhancing Income through Layer Duck rearing for Nargis Affected Farmers in Bogalay Township
2013	TCP/MYA/3402 BABY08	Formulation of National Forest Monitoring System (NFMS) Action Plan for Myanmar
2012	TCP/MYA/3402	TCP Facility
2012	TCP/MYA/3402 BABY01	Formulation of TCP Project Porposal on Enhancing Capacity Building for Hybrid Rice Production in Myanmar
2012	TCP/MYA/3402 BABY02	Field Mission to Myanmar for Mapping Potential GEF Projects
2012	TCP/MYA/3402 BABY03	Finalization of Country Programming Framework for Myanmar (2012-2016)
2012	TCP/MYA/3402 BABY04	Formulation of TCP Project Proposal on Royal Jelly Production in Myanmar
2012	TFD-10/MYA/002	Support for improvement of crops, small livestock and fish production for small farmers and landless households
2012	TFD-10/MYA/003	Support for improvement of crops, small livestock and fish production for small farmers and landless households
2011	OSRO/MYA/102/CHA	Enhancing Food and Nutritional Security Through Crop Production in NRS, Myanmar
2011	OSRO/MYA/101/CHA	Restoration of the production capacity of small farmers and vulnerable households in the most Cyclone Giri affected Township of Myebo - (11-FAO-011)
2010	TCP/MYA/3302	Food security through the strengthening of the institutional capacity for seed production
2010	OSRO/MYA/004/CHA	Restoration of fishers' livelihoods in cyclone Giri affected area - (10-FAO-049)
2010	OSRO/MYA/003/CHA	Post-floods restoration of food security and livelihoods in Northern Rakhine State (NRS) - (10-FAO-032)
2010	UNJP/MYA/014/UNO	Enhancement of Human Security for the Muslim Resident Population and other vulnerable persons in northern Rakhine State, Myanmar - HCR-AS-09-077
2010	TCP/MYA/3301	Planning for the 2010 Myanmar census of agriculture (MCA 2010)
2010	OSRO/MYA/001/CHA	Enhanced Food Security and Livelihoods in NRS
2010	MTF /MYA/013/CSV	Community based Food Security Project in Magway Township, Dry Zone, Myanmar
2010	OSRO/MYA/002/UNJ	Recovery of Livelihood Opportunities in the Delta
2009	OSRO/MYA/905/UK	Integrated Shelter and Livelihoods Asset Replacement for Under Assisted Coastal Communities in 7 Village Tracts of Labutt
2009	OSRO/MYA/904/AUS	Immediate support to dry season crop production for small-scale farmers affected by Cyclone Nargis in the Ayeyarwadi delta in Myanmar
2009	GCP /MYA/010/ITA	Sustainable small-scale fisheries and aquaculture livelihoods in coastal mangrove ecosystems.

2009	GCP /MYA/011/ITA	Support to Special Rice Production
2009	GCP /MYA/012/ITA	Immediate Rehabilitation of Farming, Coastal Fisheries and Aquaculture Livelihoods in the Cyclone Nargis Affected Areas.
2009	OSRO/MYA/903/CHA	Empower marginalized landless poor and vulnerable women headed households in Northern Rhakine State through vegetables and poultry productions support.
2009	OSRO/MYA/902/SWE	Restoration of production capacity and food security for the most vulnerable farmers and fishers affected by Cyclone Nargis
2009	TCP/MYA/3204	Sustainable community-based Mangrove management in Wunbaik Forest Reserve
2009	OSRO/MYA/901/JPN	Restoration of food security and agriculture-based livelihoods in the most Cyclone Nargis-affected areas of the Ayeyarwady Delta of Myanmar.
2008	OSRO/MYA/810/AUL	Restoring and improving preservation and processing capacity for the most vulnerable fishing households in the cyclone Nargis-affected area.
2008	OSRO/MYA/809/PWC	Emergency support to restore food security and livelihoods for the most cyclone NARGIS-affected farmers through distribution of draught animals for cultivation in Ayeyawaddy and Yangon Divisions, Myanmar
2008	OSRO/MYA/808/UK	Coordination of Cyclone Nargis agricultural emergency and rehabilitation interventions.
2008	OSRO/MYA/801/WBK	Improvement of prevention, control and eradication of Highly Pathogenic Avian Influenza (HPAI) in Myanmar
2008	OSRO/MYA/804/UK	Emergency Support to the Restoration of Food Security in Areas of Southern Myanmar Affected by Cyclone Nargis
2008	OSRO/MYA/807/ITA	Immediate Rehabilitation of Farming, Coastal Fisheries and Aquaculture Livelihoods in the Cyclone Nargis Affected Areas
2008	TCP/MYA/3202	Capacity Building and Technology Adoption for Sustainable Food Security in the Wa Special Region, Myanmar
2008	TCP/MYA/3203	TCP Facility
2008	TCP/MYA/3203 BABY01	Formulation of National Medium-Term Priority Framework (NMTPF)
2008	TCP/MYA/3203 BABY02	Damages and needs assessment and programme formulation mission for emergency and rehabilitation response to Cyclone Nargis
2009	TCP/MYA/3203 BABY03	Seed Programme Development in Myanmar
2009	TCP/MYA/3203 BABY04	Formulation mission for Agricultural Census-2010
2009	TCP/MYA/3203 BABY05	Assessment of the capacity building needs for improving market access for fish and fishery products from Myanmar
2008	OSRO/MYA/802/ITA	Emergency support to restore food security in cyclone NARGIS-affected farmers through the provision of agriculture inputs and technical assistance
2008	OSRO/MYA/805/SWE	Emergency supply of fishing gear, boat repair tools and fish processing implements, and aquaculture supplies to immediately restore food security for vulnerable fishers and fish farmers affected by Cyclone Nargis - (SIDA component n.7400343501)
2008	OSRO/MYA/806/CHA	Emergency support to restore food security in cyclone NARGIS-affected areas through the provision of agriculture inputs and technical assistance.
2008	TCP/MYA/3103	Emergency assistance to support the rehabilitation of the livelihoods of cyclone-affected families in Ayeyarwady and Yangon divisions
2008	TCP/MYA/3201	Dairy Cattle Improvement
2007	OSRO/MYA/702/USA	Immediate Technical Assistance to Strengthen Emergency Preparedness for Highly Pathogenic Avian Influenza (HPAI) (Grant N. GHA-G-00-06-00001)

2007	GCP /MYA/009/EC	Support for Sustainable agriculture and rural livelihoods in Northern Rakhine State of Myanmar
2007	GCP /MYA/008/WFP	Support to ex-poppy farmers and poor vulnerable families in border areas
2007	TCP/MYA/3102	TCP Facility
2006	TCP/MYA/3101	Improving oil palm research, development and production
2006	UTF /MYA/006/MYA	Oil Crops Development Project (OPEC Fund)
2006	OSRO/MYA/601/AUL	Prevention and Control of Avian and Human Influenza in Myanmar
2005	TCP/MYA/3003	Strengthening capacity and upgrading the Forest Research Institute Yezin
2005	COOP/MYA/J/144258	Preparation of Country Strategy and Operations Paper (COSOP) - (TCI Budget N.: 2436)
2005	MYA/05/001/ /01/34	Emergency Assistance to Tsunami-affected Fishing Communities, Fishers cum Farmers, and Homestead Gardeners
2005	GCP /MYA/005/EC	Support for Agricultural and Natural Resource Management in Northern Rakhine State of Myanmar - Phase II

APPENDIX 9: GEF PROJECTS IN MYANMAR

Approved national projects

ID		Title	Fund	Agency	Type
3407	Myanmar	Development of the National Biodiversity Strategy and Action Plan (NBSAP)	Biodiversity	UNEP	EA
3702	Myanmar	Preparation of National Adaptation Programme of Action (NAPA)	Climate Change	UNEP	EA
5123	Myanmar	Sustainable Cropland and Forest Management in Priority Agro-ecosystems of Myanmar	Multi Focal Area	FAO	FP
5159	Myanmar	Strengthening Sustainability of Protected Area Management	Biodiversity	UNDP	FP
5182	Myanmar	Enabling Activities to Facilitate early Action on the Implementation of the Stockholm Convention on Persistent Organic Pollutants (POPs) in Myanmar	POPs	UNIDO	EA
5321	Myanmar	Improvement of Industrial Energy Efficiency	Climate Change	UNIDO	FP
5567	Myanmar	Adapting Community Forestry Landscapes and Associated Community Livelihoods to a Changing Climate, in Particular an Increase in the Frequency and Intensity of Extreme Weather Events	Climate Change	UNEP	FP
5702	Myanmar	FishAdapt: Strengthening the Adaptive Capacity and Resilience of Fisheries and Aquaculture-dependent Livelihoods in Myanmar	Climate Change	FAO	FP
6992	Myanmar	Ridge to Reef: Integrated Protected Area Land and Seascape Management in Tanintharyi	Multi Focal Area	UNDP	FP

Approved regional and global projects

ID		Title	Fund	Agency	Type
385	Regional	Asia Least-Cost Greenhouse Gas Abatement Strategy (ALGAS)	Climate Change	UNDP	EA
3853	Regional	Building Capacity for Regionally Harmonized National Processes for Implementing CBD Provisions on Access to Genetic Resources and Sharing of Benefits	Biodiversity	UNEP	MSP

4623	Global	Support to GEF Eligible Parties (LDCs & SIDs) for the Revision of the NBSAPs and Development of Fifth National Report to the CBD - Phase II	Biodiversity	UNEP	FP
4649	Regional	GMS-FBP Greater Mekong Sub-region Forests and Biodiversity Program (PROGRAM)	Multi Area Focal	ADB	FP
4652	Regional	GMS Forest and Biodiversity Program (GMS-FBP) - Creating Transboundary Links Through a Regional Support	Multi Area Focal	ADB	MSP
4794	Global	Umbrella Programme for National Communication to the UNFCCC	Climate Change	UNEP	FP
5136	Global	Support to 20 GEF Eligible Parties for Alignment of National Action Programs and Reporting Process under UNCCD (Add-on Umbrella 2)	Land Degradation	UNEP	MSP
5815	Regional	Building Climate Resilience of Urban Systems through Ecosystem-based Adaptation (EbA) in the Asia-Pacific Region.	Climate Change	UNEP	FP
6925	Global	Umbrella Programme for Biennial Update Report to the United National Framework Convention on Climate Change (UNFCCC)	Climate Change	UNEP	FP
8024	Global	Preparation of Intended Nationally Determined Contribution (INDC) to the 2015 Agreement under the United Nations Framework Convention on Climate Change (UNFCCC)	Climate Change	UNEP	MSP
9120	Regional	Support to Preparation of the Third National Biosafety Reports to the Cartagena Protocol on Biosafety - Asia Pacific Region	Biodiversity	UNEP	MSP

APPENDIX 10: LIST OF POLICIES RELEVANT TO FISHADAPT

Inventory of Policies, Strategies, and Laws relevant FISHADAPT at Federal and sub-national (State/Division/Township etc.) for the Union of Myanmar

Policy	Short summary of scope/relevance to FISHADAPT	Date	Source/reference
National-Union level			
Myanmar's National Adaptation Programme of Action (NAPA) to Climate Change	National Climate Change Adaptation Plan of action for Myanmar.	2012	http://unfccc.int/resource/docs/napa/mmr01.pdf
UNFCC National communication	National climate change communication.	2012	www.unfccc.int
Fifth National and Economic Social development plan	National development plan	2011	2012-2016
National Strategy on Rural development and poverty	National rural development plan	2011	Government of Myanmar
UN Strategic Framework for Myanmar 2011-2015.	National framework for UN in Myanmar	2011	
National Biodiversity Strategy and Action Plan (NBSAP)	National Biodiversity Strategy and plan	2011	Government of Myanmar
National Strategic Work Plans for the Rural Development and Poverty Alleviation		2011	Government of Myanmar
National Sustainable Development Strategy (NSDS)		2009	Government of Myanmar
Millennium Development Goals (MDGs).		2000	Government of Myanmar
Hyogo framework and ASEAN agreement on disaster management and emergency response (AADMER)	Developed Standing Orders in 2009 NDPCC constituted in 2009 and reconstituted in 2013 Developed National Disaster management Law in 2013 and TDMP in 2013	2005	Government of Myanmar
Law relating to Aquaculture (The State Law and Order Restoration Council Law No. 24/89).	National law relating to Aquaculture at all levels. No reference to DRM or Climate Change	The 8th Waxing Day of Tawthalin, 1351 BE 7th September, 1989	http://www.lexadin.nl/wlg/legis/nofr/oeur/lxwebum.htm and FAO 2011. A review of Myanmar Fisheries legislation with particular reference to freshwater fisheries legislation.

			APFIC, Bangkok.
The Freshwater Fisheries Law The State Law and Order Restoration Council (The State Law and Order Restoration Council Law No.1/91)	National law relating to Freshwater Fisheries.	1991 The 5th Waning Day of Tabaung, 1352 M.E. (4th March, 1991)	http://www.lexadin.nl/wlg/legis/nofr/oeur/lxwebum.htm and FAO 2011. A review of Myanmar Fisheries legislation with particular reference to freshwater fisheries legislation. APFIC, Bangkok.
Myanmar Marine Fisheries Law (The State Law and Order Restoration Council Law No. 9/90).	National law relating to Marine Fisheries.	1990 The 2 nd Waxing Day of Kason 1352 M.E 25 th April 1990	DOF, Legal section
Law relating to the Fishing Right of Foreign Fishing vessels (The State Law and Order Restoration Council Law No. 11/89)		12 th Waning Day of Tabaung, 1350 B.S. 2 nd April, 1989	
Law Amending the Myanmar marine Fisheries law (The State Law and Order Restoration Council Law No. 16/93)		The 13 th Waxing Day of Thadinkyut, 1355 M.E. (28 th October, 1993)	
Law Amending the Law Relating to the Fishing Right of Foreign Fishing Vessels (The State Law and Order Restoration Council Law No. 15/93).		The 10 th Waxing Day of Thadinkyut, 1355 M.E. (25 th October, 1993)	
Aquaculture Law	Union fisheries law relating to Aquaculture	18.6.2015	DOF Legal section (10 th Draft)
Myanmar Marine Fisheries Law	Union fisheries law relating to Marine Fisheries.	18.6.2015	DOF Legal section (10 th Draft)
National Land Use Policy	Relating to land use	31.5. 2015	Land Use Allocation and Scrutinizing Committee
Sub national (State/Region/Division/Township)			
Freshwater Fisheries law, Mandalay Region	Regional and State Law relating to Freshwater fisheries	19.3.2012	DOF, Legal Section
Freshwater Fisheries law, Ayeyarwady Region	Regional and State Law relating to Freshwater fisheries	23.3.2012	DOF, Legal Section
Freshwater Fisheries law, Tanintharyi Region	Regional and State Law relating to	2.10.2012	DOF, Legal Section

	Freshwater fisheries		
Freshwater Fisheries law, Sagaing Region	Regional and State Law relating to Freshwater fisheries	9.10.2012	DOF, Legal Section
Freshwater Fisheries law, Yangon Region	Regional and State Law relating to Freshwater fisheries	10.4.2013	DOF, Legal Section
Freshwater Fisheries law, Kachin State	Regional and State Law relating to Freshwater fisheries	10.5.2013	DOF, Legal Section
Freshwater Fisheries law, Bago Region	Regional and State Law relating to Freshwater fisheries	5.12.2013	DOF, Legal Section
Freshwater Fisheries law, Mon State	Regional and State Law relating to Freshwater fisheries	11.4.2014	DOF, Legal Section
Freshwater Fisheries law, Magwe Region	Regional and State Law relating to Freshwater fisheries	27.6.2014	DOF, Legal Section
Freshwater Fisheries law, Chin State	Regional and State Law relating to Freshwater fisheries	1.9.2014	DOF, Legal Section
Freshwater Fisheries law, Rakhine State	Regional and State Law relating to Freshwater fisheries	4.9.2014	DOF, Legal Section
Freshwater Fisheries law, Kayin State	Regional and State Law relating to Freshwater fisheries	6.9.2014	DOF, Legal Section
Freshwater Fisheries law, Shan State	Regional and State Law relating to Freshwater fisheries	8.9.2014	DOF, Legal Section
Freshwater Fisheries law, Kayar State	Regional and State Law relating to Freshwater fisheries	28.11.2014	DOF, Legal Section

Fishadapt analysis of relevant laws at Township, district and state/region¹

In order to support the development of the policy mainstreaming component of the project and to ensure an enabling environment for the community level work of components 2 and 3 the DOF staff attending the meeting were asked to list the relevant laws they were aware of and to make specific recommendations to the FISHADAPT team. The group feedback is as follows, noting that the implementation phase of the project will carry out more in depth analysis prior to developing new laws:

State/Regional Level

Laws	Recommendations
1. Yangon, Ayeyarwaddy, Rakhine State Fresh Water Fisheries Law and other F/A laws	1. Put a section on preserving mangrove forests
2. As same as above	2. Put a section to protect breeding practices of fishes on putting fish ladder in every construction of dams, dikes, and area development activities
3. As same as above	3. Put a section or prescription to protect aquatic species from impacts of chemical fertilizers and drugs from farming and agriculture
4. As same as above	4. Put a section to protect fishers and fishing rights (e.g. rights to access of resources, rights to protect, rights to access legal assistance, rights to protect from any harm by rigid regulations, human threats and disasters)
5. Marine Law	5. Put a section to protect the ecosystem of ocean (e.g. production of sand from ocean ground, gas, oil etc.)
6. Aquaculture Law	6. Put a session on land rights and ownership

Township Level

Laws	Recommendations
Fresh water Fishery Law	1. Add a section on land ownership for fish and shrimp ponds with legal document as same as Form (7) of Agriculture.
	2. Add a section on weather forecast and warning related to F/A sector
	3. Suggested that people to have a right of land to make a pond or paddy farm freely
	4. Suggested that to put a session on co-management of fisheries in huge dams or dikes

Community Level

Laws	Recommendations
After the disaster, the following factors should be applied for fisheries legally	3. Suggested that Union Government could be practiced on repayment of revenue by fishers and F/A business to resume their business without harm to all
1. Putting a system on Insurance for damage and loss of assets	4. To make and to grow mangrove forest as a buffer zone to breed fishes and shrimps or to dig ponds to protect mangrove forests from inappropriate practices of ponds
2. To manage the repayment of cost for damage and loss of assets by different levels of Township, District and State/Region management	
3. During the disaster, the department should apply the following procedures for fishers	

¹ 2015. Fishadapt DOF officer capacity development needs consultation. Yangon, Myanmar

<p>who do fishing to prevent damage and loss of lives of fishers:</p> <ol style="list-style-type: none"> 1. Providing insurance to fishers by department 2. Providing repayment to fishing boats and assets by department 	
---	--

DOF officer feedback on law modifications

The DOF staff present at the meeting agreed that mainstreaming climate change into laws where possible would be valuable to implementation. The depth of the discussion indicated that the situation is complex with the decentralization of Union laws to regions/states and districts. A key recommendation is that the project invest in understanding the complexity of the laws and how they can be modified to support CCA planning and vulnerability reduction.

Some key points discussed included:

- Working with the fisheries department legal experts very closely (and recruitment of a law specialist).
- A detailed review of the laws and understanding the overlaps in laws between sectors (Forestry, Fisheries, Wildlife etc.) and working to ensuring coherence.
- Technical areas to be included to enable the project to be implemented (Mangrove conservation, fish ladders/fish passes, prevention of pollution, water management, protection of fish species, protection of ocean ecosystems)
- Land utilization (in favour of zoning for aquaculture as a CC adaptation livelihood option).
- Access and rights during events such as floods, droughts etc.
- Conflict resolution approaches.
- Weak information sharing and coordination
- Fisheries management in Dams
- Climate Insurance

APPENDIX 11: COORDINATION WITH OTHER INITIATIVES BY THE FISHADAPT PROJECT

Extended summary of baseline investments, projects and programmes relevant to Fishadapt

Donor/Project Title	Donor source	Dates	Total funds	Summary	Relevance
Government of Myanmar					
Ministry of Livestock Fisheries and Rural development, Department of fisheries (DOF)	GoM	Ongoing	n/a	The DOF development programme is the main partner for the Fishadapt project. Fisheries and aquaculture are principally within the mandate of the Fisheries Department (DOF) under the Ministry of Livestock, Fisheries, and Rural Development. The Ministry and DOF headquarters are in NayPiTaw (NPT) with offices in the regions and states and Districts	Main partner for Fishadapt
Institute of Fisheries Technology (IFT) (part of DOF)	GoM	Ongoing	n/a	The mandate to strengthen individual capacities (i.e. knowledge, skills, and competencies) under the DOF is carried out by its Fisheries, Research and Development Institute of Fisheries Technology (IFT) is based in Yangon. It was established through joint collaboration between the Government of Myanmar, UNDP, FAO and DANIDA under the "Institute for Fisheries Technology Project (1980-1983) and built on a 5 hectare site. It has a range of teaching rooms, practical labs and areas, a library and offices and residential accommodation	Partner for CD
General Administrative Department (GAD)	GoM	Ongoing	n/a	Administrative and governance Township Disaster Management Plan (2013TDMP, Township Development Planning Village Tract Disaster Management Planning	Linking village development planning guideline to Fishadapt
Department of Rural Development Affairs (DRD)	GoM	Ongoing	n/a	Development (Micro level). Village Development Planning Guideline (being developed)Community based development planning	Link with TDMP or CBDRR action plans to Fishadapt
Department of Agriculture	GoM	Ongoing	n/a	Agriculture .Climate Smart Agriculture, Solar	Coordination at multi

Donor/Project Title	Donor source	Dates	Total funds	Summary	Relevance
				power Tube-well Technology	levels
Department of Irrigation	GoM	Ongoing	n/a	Irrigation. Small-scale water impoundments, Sustainable water supply systems	Coordination
Relief and Resettlement Department	GoM	Ongoing	n/a	DRR and Emergency Response ASEAN Committee on Disaster Management, NDPCC, Standing Order (2009), Hazard profile (2009), MAPDRR (2009, 2012), DM law (2013),	RIMES through Monsoon Forums, National Volunteer Approach
Environmental Conservation Department	GoM	Ongoing	n/a	CC & Environmental conservation Climate Change Adaption (CCA)National Environmental Policy (1994), Myanmar Agenda 21 (1997), National commission for Environmental Affairs (1990), National Environmental Conservation committee (NECC) (2011) Environmental Conservation Law (2012 degraded forest, community based reforestation, community based mangrove reforestation,	Coordination
Department of Forestry (DOF)	GoM	Ongoing	n/a	Forest Law Act (1992), Wildlife Act (1994), Protected Area and Forest Policy Statement (1995);Vacant, Virgin and Fallow Land Management law (2012) Land Custom Amendment Law (2015) Farm land law (2012)	Partner for implementation of forestry related components. Coordination and National Coordination on CC mechanism?
Department of Meteorology and Hydrology (DMH)	GoM	Ongoing	n/a	Weather Forecasting and monitoring, Early Warning, Inland water transport organization law (2014, Government led early warning system, River flood monitoring, Monsoon forecast, Tsunami alert,	Partner for implementation of Early warning System establishment, Access of weather information, Warden of river water, Study on Indigenous knowledge and practices. Coordination and National Coordination on CC mechanism
Planning Department	GoM	Ongoing	n/a	Planning Framework of Economic and Social	National Adaptation

Donor/Project Title	Donor source	Dates	Total funds	Summary	Relevance
				Reform (2010-15) National Planning Law (2014)	Planning and financing?
Department of Health	GoM	Ongoing	n/a	Public Health and services Disease control plan, Health Sector Master Plan, Health care laws: Health care for population and control law (2015) Integrated health services	
Department of water resources and improvement of river systems	GoM	Ongoing	n/a	Water resource management Coastal Inland Water Transportation business permit law (2015) Water resources and river system maintenance law (2006)	Inland Fisheries management
Department of Education	GoM	Ongoing	n/a	National Education Sector Plan, National Education Law 2014)	Development of curriculums?
Universities and research					
Agricultural University, Yesin				Agricultural Research and technology Climate Smart Agriculture, Solar power Tube-well Technology Agricultural University, Yesin	Coordination, Studies, research
University of Yangon				Research and technology	Coordination, Studies, research
University of Mawlamying				Research and technology	Coordination, Studies, research
University of Sitwe				Research and technology	Coordination, Studies, research
Donors – Bilateral					
USAID Sustainable Seafood Industry Development Project and Technical Assistance programme to MLFRD/MFF	USAID	2015-Ongoing		Ministry of Livestock and Fisheries to provide technical assistance under “Farmer to Farmer” program to support aquaculture development, including tilapia culture, in twelve locations.	
Norway Support to the fisheries sector in Myanmar	NORAD	2016		The Norwegian government is also in the process of developing a bilateral programme for support to the fishery sector.	Fishadapt can work with the NORAD project to integrate CCA into planning and implementations and the development of policy.
Small-scale Aquaculture Programme (SAEP-II	JICA	2015-2018		The government of Japan has a project promoting small-scale aquaculture (SAEP) as a livelihood option in 13 townships in in Mandalay, Sagaing,	Fishadapt can work with SAEP-II project to climate proof the existing

Donor/Project Title	Donor source	Dates	Total funds	Summary	Relevance
				and Magway regions. The project focuses on small-scale aquaculture with low inputs.	approach and pilot adaptation technologies in these areas.
DANIDA Programme to support Myanmar Fisheries Sector.				The programme aims to 1) help Myanmar's coastal and marine resources to be utilized in a sustainable and responsible manner by communities and strengthened sector institutions, 2) ensure Myanmar's coastal and marine resources are exploited sustainably by Myanmar fishers and vessel operators, 3) ensure that all coastal resources accessible to small-scale, artisanal fishers are exploited by small-scale, artisanal fishers 5) help Post-harvest and market, supply and value chain improvements continue to support and maintain the livelihood of the people presently depending on it, 6) ensure the contribution of the sector to the national food balance, nutrition, and food security is maintained, at least at present levels and 7) ensure degradation of coastal and marine environmental is arrested and, where technically and economically feasible, restored. The objectives will include those to ensure Co-management arrangements are in place where fishers and their representative organizations, DOF on central, state/division and district/township level government, and other resource stakeholders collaborate to utilize coastal living aquatic resources sustainably and responsibly and that co-management arrangements are piloted, developed and established in selected communities and villages pertaining to the same ecosystem as the driver of sustainable and responsible coastal fishing	Fishadapt will coordinate closely with Denmark regarding climate adaptation planning and co management in particular
Swiss Cooperation	Swiss Cooperatio	2015-ongoing`		The Swiss government is supporting a Community-Led Coastal Management in the Gulf	Fishadapt will coordinate closely with this project

Donor/Project Title	Donor source	Dates	Total funds	Summary	Relevance
	n			of Mottama The specific objective of this project is that: Vulnerable women and men in targeted coastal areas of the Gulf of Mottama have improved livelihood security through effective fisheries value chain development, livelihoods diversification and equitable and sustainable management of resources. The project seeks to achieve the following three outcomes: 1) Benefits of sustainable fisheries management in the Gulf of Mottama area are shared through effective value chains and equitable market access 2. Vulnerable coastal communities have increased income through livelihood diversification and improved access to non-fisheries resources 3. The special habitats of the GoM are sustainably and equitably managed based on clear scientific information and through integrated local, regional, and national institutions/management bodies.	regarding climate adaptation planning and co management in particular
Community Development for Remote Townships Project (CDRT)	UNDP	2012- on going	USD 56.1 million	Capacity development, agriculture development, irrigation development, provision of seeds, construction of warehouse, establishment of rice/ grain bank, soil conservation	
The Project for Strengthening Human Development Institutions in Agriculture	JICA	2013-2016	USD 11.2 million	Enhancement of research and extension ability of agriculture related research institutes, including YAU and DAR, provision of equipment	
Italian Cooperation	Government of Italy	2016		The government of Italy is supporting a capacity development project with the IFT.	Fishadapt will coordinate closely with this project
Michigan State University	USAID	2016		Value Chain approach for Aquaculture (With MFF)	Coordination and sharing of lessons.
Development Banks					
World Bank Ayeyarwady integrated river basin management project	World Bank	3/15 – 9/2020	100 MUSD	The program development objective for the Series of Projects (of which the AIRBM will be the first) is to strengthen integrated, climate resilient management and development of the Ayeyarwady	Yes, The project has components relevant to FISHADAPT.

Donor/Project Title	Donor source	Dates	Total funds	Summary	Relevance
				<p>River Basin and national water resources.</p> <p>The project development objective of the AIRBM is to contribute to the development of integrated river basin management on the Ayeyarwady River.</p> <p>Component 1: Water Resource Management Institutions, Decision Support Systems and Capacity Building 32.00 MUSD</p> <p>Component 2. Hydro-meteorological Observation and Information Systems Modernization 30.15 MUSD</p> <p>Component 3. Navigation Enhancement on the Ayeyarwady River</p>	<p>It has explicit Climate Change Resilience and planning components</p> <p>Potential negative environmental impacts on fisheries and freshwater resources</p> <p>Component 2 monitoring systems may be relevant to FISHADAPT EWS.</p>
Agricultural development support project.	WB	7/15-7/2022	100 MUSD	<p>The Project Development Objective is to increase crop yields and cropping intensity in selected existing irrigation sites in the Recipient's Bago East, Nay Pyi Taw, Mandalay, and Sagaing regions.</p> <p>Components</p> <p>1. Irrigation and Drainage Management (78.40 MUSD)</p> <p>2. Farm Advisory and Technical Services 17.20 (MUSD)</p> <p>3. Project Coordination and Management (4.4 MUSD)</p>	<p>Yes but marginal in relation to FISHADAPT.</p> <p>Climate change mentioned</p> <p>Does not overlap geographically with FISHADAPT except component 1 , National)</p>
IFAD: Fostering Agricultural Revitalization in Myanmar (FARM	IFAD	Ongoing		<p>The project will introduce regional and global best practices to develop a sustainable and scale-able model for smallholder agriculture and rural development across Myanmar's central dry zone. It will support land consolidation and development, productive infrastructure, agricultural and business services, flow of knowledge and capacity building to promote an inclusive development model in this zone. The project will directly benefit 37,600 households</p>	Coordination

Donor/Project Title	Donor source	Dates	Total funds	Summary	Relevance
				consisting of 183,400 people, for an average cost of USD 152 per beneficiary. The project's goal is to improve the economic status of poor rural women and men in the project area. Its objective is to increase incomes of smallholder and landless households.	
The Livelihoods and Food Security Trust Fund (LIFT)	Multi donor trust fund	2015-1/07/2018	112.5 MUSD	LIFT has 3 calls for proposals Delta 3 (16 MUSD) Dry Zone (52 MUSD) Financial inclusion (44.5 MUSD) See relevant calls for proposals	Specific fisheries and aquaculture calls. Significant integration through livelihoods approach adopted in tenders. LIFT projects and programmes have geographic overlap in Dry Zone and Delta.
NGOs and private sector					
Myanmar Fisheries Federations	Memberships	Ongoing		MFF is a non-profit organization that encourages and promotes the fisheries and aquaculture business of Myanmar. Currently, their work does not include helping their members think about climate change adaptation. LDCF resources will complement this baseline association and networking work with inputs to enable an increased understanding of climate change adaptation challenges among fishers and aquaculture pond owners in Myanmar	Partner
Disaster Preparedness and Climate Change Adaptation in Ayeyarwady. Delta Forest Resource Environment Development and Conservation Association DKH - Diakonie Katastrophenhilfe	(Germany)(Project No. 20130701/20131301	2014 - 2017	EU 900,000 = USD 1 218 666.19	Construction of School-Cum-Cyclone Shelter (SCCS), Construction of embankment for preventing soil erosion near villages, Construction of rain water harvesting ground tanks, Introduction of water desalination and purification system, Community Training on Disaster Risk Reduction	
Sustainable Community Alternative Livelihood Enhancement to	ADRA	2011 - 2014	USD 1 693 276	Improved livelihood yields and production in aquaculture/fishing through access to technology	

Donor/Project Title	Donor source	Dates	Total funds	Summary	Relevance
Undermine Poverty (SCALE UP)	LIFT FMO			and increased employment opportunity. Community Forestry establishment, mangrove forest restoration, capacity building and aqua-forestry provide for the implementation of GEF project	
Livelihoods and Environmental Assets Restoration in Rakhine (CLEAR) EcoDev, ECCDI, BANCA, BDA, SDF MERN is a Lead agency)	EcoDev LIFT (UNOPS)	Jul 2011 to Jun 2014	USD 2 999 816	Objectives: Ensure food and livelihood of coastal communities in Gwa T/S and Kyeintali Sub T/S through agricultural and livelihood support. Establish cooperative mangrove rehabilitation and management Improve capacity for livelihoods development and environmental governance Activities: Agriculture development (Agricultural demonstrations through farmer-led extension Multipurpose nursery establishment Community Forestry establishment and development of management plan Communal Aquaculture Development and grants to interest groups Income generation and local product making grants to interest groups Participatory Biodiversity conservation Forest rehabilitation Natural forest improvement operation Community water supply development Cash for work and small infrastructure work IP joint planning and project management Participatory livelihood assessment and village development plan Participatory Action Research and learning on sustainable land use Awareness raising Capacity Building (trainings)	
Rural Community Based Agricultural Capacity Building and Development Programme	World Vision Myanmar (WVM)	Ongoing	USD 2.6million	Provision of seeds and fertilizers, construction of dike and drainage, wells and ponds, soil conservation, water harvesting, training and distribution of info., market access improvement, value-adding, Micro-credit	
"Improvement of Food Security and Sustainable Agriculture Development: Support to Crop	International Volunteers	Ongoing	USD 1.82million	Ensure food and nutrition security, increase crop productivity, test and produce quality rice, potato and vegetable seeds, improve crop production	

Donor/Project Title	Donor source	Dates	Total funds	Summary	Relevance
Production Programme in Ayeyarwady"	Service Association (AVSI) Foundation Italy			technology, improve irrigation networks, increase community capacity to sustain agricultural system. Provide food-crop packages in 48 villages numbering 850 households for a total of 3,800 people. Provide farm machinery, gardening tools and fuel to 3000 marginalized farmers, along with horticultural packages to vulnerable rural households. Provide training in natural compost methods and quality seed replication techniques.	
PACT Myanmar, Yangon	Multiple including LIFT	Ongoing		<p>PACT Myanmar reviewed their programme and approach (www.pactworld.org/myanmar/). Pact has been implementing health, livelihoods, community development, microfinance and food security programs in Myanmar since 1997. In partnership with UNDP, USAID, DANIDA, Chevron, Coca-Cola, and more than 13,300 local organizations and community groups, Pact continues to carry out far-reaching projects throughout the emerging democracy. PACT have supported the Nargis emergency response. PACT have no specific Climate Change programme in Myanmar but do in other countries.</p> <p>PACT are in the process of collaborating with WorldFish in Myanmar for an aquaculture project.</p> <p>PACT have a programme for gender mainstreaming and CD from government staff. They have Microfinance but not specifically for fishers. Microfinance is carried out by a separate section of PACT. PACT currently work in the Dry Zone (not the Delta) and have forthcoming projects with CESVI.</p>	Potential implementation partner at community level. Coordination and CD
UNDP :				The UNDP has a significant programme in Myanmar. In particular the NAP in Myanmar is	Coordination, key partner

Donor/Project Title	Donor source	Dates	Total funds	Summary	Relevance
				being sponsored by ADB and UNDP. They are also looking at stocktaking for policy. Currently UNDP have an LDCF CCA project in Rakhine under consideration (this involved DOF). A second project with the Adaptation Fund AF in the Dry Zone is underway. In terms of pipeline projects UNDP have 1) A GEF BD project on protected areas running from 2015-2019 this is a RAMSAR project of 5-7 MUSD. 2) The GEF 6 proposal (reef to ridge) in the south of 5-6 MUSD.	
Myanmar Climate Change Alliance Project (GCCA): funded by EU, from September 2013 through 2016.	EU,	2013-2016		Coordination mechanism	Coordination
Worldfish	ACIAR, LIFT, AusAID	Ongoing		ACIAR and AusAID Asia Division are financing a four-year project through the Worldfish project "Myanmar's Inland & Coastal Fisheries - Improving Research and Development of Myanmar's Inland and Coastal Fisheries (MYFish)", running from September 2012 through August 2016. It establishes a partnership between WorldFish and four local Myanmar agencies and institutions: the Department of Fisheries (DoF) under the Ministry of Livestock and Fisheries, the Myanmar Fisheries Federation (MFF), Yangon University, and the Food Security Working Group (FSWG). This ACIAR project addresses the three constraints: (i) the lack of a comprehensive information base on fisheries; (ii) the lack of proven management approaches and technologies; (iii) and limited technical capacity to implement fisheries projects; by improving the management capacity for Myanmar's inland capture and culture fisheries, and by facilitating the emergence of co-management of fisheries and small-scale aquaculture. Research objectives are to characterize and improve the fisheries sector in	Partner for Fishadapt on research, CD and implementation.

Donor/Project Title	Donor source	Dates	Total funds	Summary	Relevance
				the northern (upstream) and southern (downstream) Ayeyarwady Delta areas and to assess the scope for fisheries development in the Central Dry Zone. The first objective of the ACIAR project is to conduct a thorough review of current fisheries practices in the Ayeyarwady Delta and Central Dry Zone. The second objective is to identify and test viable options for improving the fisheries operations in Myanmar, through pilot interventions to test proposed fisheries improvements.	

APPENDIX 12: SUMMARY OF PILOT SITES, DISTRICT, AND REGIONS FOR FISHADAPT PROJECT AND SUMMARY FINDINGS FROM COMMUNITY CONSULTATIONS.

12.1 Background.

The project PIF and PPG consultation phase confirmed that Ayeyarwady, Yangon and Rakhine states were vulnerable to climate change and would be priority areas for the piloting and scaling up at region level of the principle components of the project relating to small-scale fisheries and aquaculture (Component 2 and Component 3).

In addition it was recognised that on-going small-scale aquaculture activities in the Central Dry Zone (CDZ) could benefit from the CCA VA planning and the development and implementation of small-scale aquaculture adaptation practices and technologies.

At the same time, it is recognised that the project national level work on CCA VA, planning and knowledge management will both benefit from and contribute to the work in the pilot regions.

The following sections provide an outline of the pilot areas, their status, and vulnerability to the impacts of climate change.

11.2. Selection of pilot regions, states and phasing of implementation

During consultations with stakeholders, it was agreed that the project field and community level work would be implemented through two distinct but strongly interlinked phases.

The first phase will be the development, piloting, and building capacity in a limited number of villages (9) in Ayeyarwady, Rakhine and Yangon. During this phase the full implementation approach would be developed, piloted and refined (including community VA, CCA planning for the sector, CD courses and manuals, project monitoring and management)

During this phase, CCA VA and plans would also be developed within the 10 communities of the EFSP project to allow lessons learned to be developed and shared.

The second phase will be the “scaling up “ of these pilots and approaches to a broader number of villages within these three regions (to the target 120 villages) .

Selection of pilot communities: During the PPG inception workshop¹ initial draft selection criteria were developed and discussed along with areas of concern to be considered. These initial criteria were developed to allow the project consultations to get underway and consultations begin. The criteria were developed for the main fishery and aquaculture systems identified in the priority regions of Ayeyarwady, Rakhine, Yangon, and CDZ. In addition, it was recommended that during project implementation these criteria be further developed and refined along with transparent decision making and consultation processes. These processes to

¹ Report of the MLFRD-FAO project development inception workshops on fishadapt: strengthening the adaptive capacity and resilience of fisheries and aquaculture-dependent livelihoods in Myanmar. Nay Pyi Taw and Yangon, Myanmar 18 and 20 November, 2014

be integrated into the proposed EAFM-EAA and PRA approaches and to ensure the engagement of communities, women, and vulnerable groups

The broad criteria developed for aquaculture related interventions for the initial 9 pilots included:

- Accessible through transport system (boats and/or roads)
- Occurrence of aquaculture and an interest in the community
- Climate hazard /risk in the area and high underlying livelihood vulnerability high
- Small-scale fish farmer's organizations
- Proximity to inputs, suppliers (hatcheries, feed)
- The presence of DOF staff (MFF, NGO's etc.) (In some Townships staff are not posted.
- Proximity to markets
- Coordination with baseline projects and programmes and coordination mechanisms to avoid duplication with any existing projects
- Trap and hold system (Tiger prawn)
- Lack of technology and investments

The broad criteria for capture fisheries sites included

- Underlying livelihood vulnerability high (such as impact of hazards such as damage to the water inlet, reduced catch of indigenous species, presence of exotic species, conflict/competition with agriculture, overfishing/IUU),
- Nargis affected area,
- Remote area, likely to be vulnerable.
- Small-scale capture and aquaculture fisheries present (trap and hold)
- Market vulnerability through lack of investment (high interest loan), limited market access and high transportation costs
- Stow net and drift net vulnerable.
- Small-scale fishing village (inshore fishing)
- Impact of climate change
- At least 20-person fishing community
- Community organisation existing
- Convenient transportation and communication
- Safe and secure area

12.3. Location of Pilot sites.

Yangon, Ayeyarwady and Rakhine pilot areas

Through a consultation process, 9 villages were identified and approved for the initial pilot phase and outlined below, the pilot villages for CDZ were to be identified during project start up.

Fig.12 General Location of project initial pilot sites and pilot regions states in Yangon (Kyauktan Township), Rakhine (Myebon Township) and Ayeyarwady (Ah Mar Township).



Central Dry Zone

During the PPG phase, consultation with partners confirmed the importance of the project working with selected communities in the Central Dry Zone in Myanmar which are recognised by the NAPA as vulnerable to the impacts of climate change.

According to the 2013 FAO-LIFT Dry Zone Development Programme Scoping Report¹ the CDZ comprising much of Magway, Mandalay and lower Sagaing divisions, is one of the most food insecure areas in Myanmar. The zone covers 17% of the country with a total area of 677,000 km². The population of the CDZ is 27% of the country with some 11 million people. In the DZP area of six Townships, the total population is 1.41 million of which 1.17 million live in the rural areas. Irregular and scarce rainfall leads to extreme water shortages and is a constant threat to the viability of rural livelihoods. As water is the primary driver of income generation in the agricultural communities that dominate the rural CDZ, the failure of rains or seasonal scarcity stretches coping strategies and lock households into a cycle of poverty and vulnerability. The government of Myanmar and partners such as LIFT, Worldfish and JICA

¹ 2013. FAO-LIFT . Dry Zone Development Programme Scoping Report – Annex 2: Seeds, Crops and Livestock

have prioritise areas in Mandalay (Myingyan, Natogyi, Taungtha, Mahlaing) and Magway (Pakokku and Yesagyo) for the development of small-scale aquaculture in order to diversify and build resilience of small-scale farmers. Fishadapt will work with these partners on the identification of 20 small-scale fish farming communities to undertake CCA planning.

Fig 13 General Map indicating Central Dry Zone , Myanmar t



Yangon, Rakhine, and Ayeyarawdy are by far the largest aquaculture producers with 173,354 ha of ponds in Ayeyarawdy, 155,553 in Rakhine and 70,083 in Yangon. Three districts in the DZ were proposed during the validation meeting including Kathar District in upper Sagaing Region, Minbu District in Magwe Region and Singu District in Mandalay region. The potential for pilot sites in those districts will be further investigated during project start up.

12.4. PPG phase and Community consultation assessment approach.

During the FISHADAPT inception, meeting consultations it was agreed that the project would carry out detailed stakeholder consultation with communities and villages identified by participants as potential priority areas for the project to work in during the project formulation stage. The information collected would inform general project design according to the PIF and framework, but more specifically components 2 and 3.

The objectives of the consultations were:

- Sensitise and engage the communities in the project and its processes in preparation for implementation

- Assess the broader vulnerability (including disaster risk), livelihood context and climate vulnerability of the communities
- Assess the specific livelihood context and climate vulnerability of fishers, fish farmers small-scale processors and those with dependent livelihoods
- Understand gender issues within the community and how these relate to general and climate vulnerability
- Assess capacity development gaps at community level
- Identify key stakeholders (at all levels) for the project at community/township level including poor/marginalised groups and their potential involvement in the project
- Understand the range of potential adaptation options and interventions with respect to the project framework.

Assessment frameworks used

A number of frameworks were used to inform and guide the community assessments. These are more fully elaborated in the draft Fishadapt PPG community consultation methodology and the full results reported in the community consultation report from the PPG phase.¹

Sustainable livelihoods framework

In order to engage the communities and to get a more holistic analysis of the issues relating to vulnerability (including disaster risk) and climate impacts a sustainable livelihoods framework (with specific analysis of climate change impacts and adaptation) was adopted. The SLA framework has a wide range of benefits when used in the design of projects^{2, 3}.

Climate change vulnerability

Analysis of potential climate change impact and vulnerability of fisheries communities was informed by existing frameworks for the sector⁴ and those adopted by the UNFCCC⁵. A range of potential impacts of climate change to the sector was presented during the FISHADAPT inception meeting and these were used as a basis for discussion with the communities and analysis of the findings.

Capacity development

The FAO capacity development framework was adapted to inform collection of data with respect to capacity development. A short briefing on CD tools was provided to facilitators prior to the training.

Participatory Rural Assessment (PRA) tools were used for the consultation with communities.

A range of PRA tools were used for discussion with the community groups. The list of tools used, community groups, and facilitators is presented below. The PRA approaches

¹ 2015. Community Assessment report for PPG phase of Fishadapt. FAO Myanmar. (6 reports and regional synthesis).

² FAO http://www.fao.org/docs/up/easypol/581/3-7-social%20analysis%20session_167en.pdf

³ FAO-ILO 2009, The livelihoods assessment toolkit (LAT), first edition. Rome 2009.

⁴ 2010. Badjeck et al. The impacts of climate variability and change on fishery based livelihoods. Marine Policy 34. (3). 375-383. 2010,

⁵ www.unfccc.int (Vulnerability analysis)

were those adopted by CRS ¹ and the Myanmar YMCA². Time constraints meant that a full PRA assessment using all tools was not possible.

The PRA tools were enhanced by the Key Informant (KI) interviews with stakeholders identified as important by the community

The assessment was carried out between March and June 2015 with the data syntheses

A short SLA briefing/training was provided to facilitators before the assessment took place. During this briefing the facilitators develop the broad information needs and sources framework for the community. Following the assessment, the information was then summarised and synthesised into a topical framework.

The draft protocol for the FISHADAPT community assessment was adapted for this community³.

The key groups to be consulted included

- Community groups
- Women's groups
- Fishers Groups
- Fish farmers groups
- Small-scale processors/sector dependent livelihoods group.

The PRA approaches adopted included:

- Group discussion/briefing
- Focus Group Discussion. (1) General community to cover timeline and history and CD 2) fishers/fish farmer group to cover seasonal calendar/historical production/problem census/previous training and future training)
- Transect/Village map (required for fishing grounds, 3) Women's group (Venn/problems/seasonal activity)
- Seasonal calendar (all groups)
- Wealth ranking (each group).
- Venn diagram
- Different production matrices as needed
- Time line (work with older residents)
- Problem census
- Climate change questions integrated into each FGD and KI
- Capacity development (previous project training, government training)

12.5 Description of pilot communities and findings from community consultations.

12.5.1. Ayeyarwady Division

¹ 2001. Schoonmaker Kreudenberger PRA and RRA. A manual for practitioners. CRS

² 2009. YMCA Myanmar PRA guide for field work. (Myanmar language)

³ FAO 2015 Draft protocol for FISHADAPT Myanmar community assessments (unpublished project document).

Fig 14. Location of Fishadapt pilot sites in Ayeyarwady region, Ayeyarwady Division Pyapon District, Ba Wa Thit Village tract. Ahmer Township Ahmar 1 ward, Auk SeikKwin and Thamain Pale.



Table 12.1 Location of pilot village sites in Ayeyarwady and codes (from: www.mimu.org)

State Region	District	Township	Village Tract	Village Pcode	Village name	Long	Lat	Source
Ayeyarwady	Pyapon	Pyapon	Ba Wa Thit	150655	Ah Mer 1 (Ba Wa Thit 1)	95.339767	15.78729	GAD, Mar 2015
Ayeyarwady	Pyapon	Pyapon	Ba Wa Thit	150661	Auk Seik Kwin (Tha Yet Chaung)	95.44931	15.80058	GAD, Mar 2015
Ayeyarwady	Pyapon	Pyapon	Ba Wa Thit	150666	Tha Mein Pale	95.326759	15.74343	GAD, Mar 2015

12.5.1.1. Ahmar 1 ward (Ba Wa Thit 1)

The village was selected for its vulnerability to CC impacts and its reliance on fisheries for livelihoods. It is also susceptible to erosion. The specific location of the village is given in Table 12.1. The village also referred to as Ba Wa Thit 1 but the name with the name reconciled as Ah Mer 1.

The village is located in Ahmar beside Ahmar river. Road access is only available in summer and winter (not fully in winter) by car, motorbike and line bus. In the rainy season access is only by boat. There are 359 households, 1 pagoda, 3 monasteries, 1 primary school, 1 wooden jetty for transportation, 2 concrete main roads between Ahmar 1 and other wards. It has 3 wells and a water distribution system. There is one kindergarten school and 1 primary school. Health facilities include a rural health centre and a small hospital.

The main livelihoods are fishing and fishery related activities such as selling and marketing fishery products, etc. There are no landing statistics for the village. The other activities are rice cultivation, small shops/grocery and snack shops, motorcycle taxi, trading, selling Myanmar foods/ Mohinga, coconut noodle, small trading, a nipa palm workshop, casual labour.

For women the main economic activities : selling and marketing fish, prawn, crabs, foods and snacks, Food Processing (making / producing fish paste, dried fish and prawn etc.), Small-scale livestock, (chickens, ducks and pigs etc.), Sorting fish and prawn, nets repairing and making, Casual labour (carrying and selling water, washing clothes, making nipa palm roofing, etc.).

About 80% of resident households are poor, less income and facing and challenging with different socio-economic problems. No community based revolving fund system for development is not established yet. Currently, about 85 % households have no regular income, no saving money for investment to improve their socio-economic status.

In terms of vulnerability, the village has been impacted by a number of events such as in 2014, 75% of paddy fields were destroyed by floods and sea water intrusion. In 2010, cold wave crossed over Ahmar myo. In 1990 there was significant soil erosion.

Summary of key issues facing the community

The main problems for of the fishers is lack of investment for replacement of fishing gear and repairing fishing boats. The lack of financial support is the same for everyone (farmers, fish-farmers, fishers, and small-scale producers by both government and or private sector).

For fishers their catch rate also down (less income for their household). Therefore, they want to learn about new fishing technique and post-harvest technology to improve their livelihood. Now they are using traditional fishing method and practices. They wish to get loans with low interest rate or other support for fishing gear by NGOs and Government and government training programs on conservations and responsible fishing practices (especially to provide EAFM program and training are needed for the fishers. This village has opportunities to do fish and prawn culture, however, most of villagers have no investment.

Fishing boats over 100 destroyed, fishing nets about 450 destroyed around 250 huts collapsed Most of the villagers lack knowledge on the government fisheries law, sustainable coastal resources management, gender, DRR and environmental conservation. Villagers or native people have no opportunity to do fishing in two village streams due to the system of tender for lots, which are won by those outside the village.

Whilst women are engaged in the community and strategic gender needs are quite differ. Improve women leadership and female participation at community and township levels is needed.

The village has a had a problem with changes to the tides and currents which have caused riverbank erosion ever year. Between three to seven households have had to move inland each year. Annually around 10 feet of Ahmar stream bank area was lost and destroyed by tide/current effects In total about 100 feet have been. Affected households had to ask relatives,

friends for land for a new house. The community suggest that they need and embankment dyke to prevent salt intrusion and flood. Part of the reason for this they feel was the lack of embankment (and reduced mangrove tree cover along the Ahmar stream). The mangrove forest was destroyed in 1997 due to disasters and encroachment by shrimp farms. Part of the reason for the reduction in mangrove is also the use of wood for cooking, and selling.

There is no cyclone shelter. The community had limited capacity to respond disasters and management on social, political and environmental affairs and impacted seriously in the past and at present.

Table 12.2. Summary of community problems from Ah Mer 1 village.

Problem	Who	When	Impact	Cause	Community proposed Solution
Community					
Erosion problem yearly and some houses need to move	The Village , around 150 people	Mostly In the rainy season	About 30 houses to be moved	Unusual tide/current directions to the bank and erosion from the Amar stream	Erosion control measures needed.
No seed grain for sowing (grain lost/damaged)	17 Farmers with 70 overall people	In July and August	Cannot plant, have to buy more grain, higher cost	Flooding and salt water intrusion to store.	Buy replacement
High interest rate for borrowing money (mostly fishers)	90 Households (350 people)	In September	Indebtedness, unable to repair boat or fish until repairs or new nets are found.	No alternative livelihoods (work in the rainy season).	Need to borrow at lower rates or to have more livelihood alternatives.
No employment for the youth	50 youth	Year round	Youth, no money and jobs.	No suitable jobs for them, no local jobs.	Create suitable employment opportunities for the youth
Difficult to hire labour for rice cultivation	17 farmers,	From May to-Sept.	17 farmers,	Scarcity or Less skills labour for cultivation.	Should change cultivation pattern with machines
No or limited investment	200 HHs	The whole year	800 people	Poverty, unable to access loans	Need loans with low interest for poor households
Difficult transportation access in the rainy season	The whole community in ward	May- November	all Amar village	Bad road condition, more time consuming in the water way.	Need support from government for improved roads
Some children drop out from the school because the parents are poor.	About 10 children	June- February		The parents have no income	Advocacy and consultation to the parents for marginalized children
No training access for the villagers regarding DRR awareness, Health, hygiene, and livelihoods skills training)	359 HHs,	Year round	Over 1000 people	No trainers inside the Amar village. Some Technical skill trainers did not come to the village.	Create awareness raising and livelihoods skills training for the villagers by TOT system. (i.e: invite 1 trainee from 1 house system)
Lower or less daily income	Over 200 HHs	Year round	Over 800 people	Less employment in the village	Provide investment loan and create more

					jobs opportunities for the poor
No communication for GSM mobile phone and not good connection for CDMA	Over 200 people	Everyday		No reliable on MEC communication tower	Other communication company should come to the village like Ooredoo and Telenor for increasing communication access.
Not sufficient access in electricity	Over 100 people		The whole community	Only 2 hours access for lighting daily in the village.	The government can support with Mahar Electricity cable line.
Fishers					
Lack of Investment	fishers	Year round	Fishers family	To buy new fishing gear To get loan	To provide fishing gear and boat by NGOs and other organisation
Advance money	Fishers	Year round	Fishers family	To buy provision / fuel for fishing trip High interest rate Difficult to get advance money	Low interest microfinance.
Lack of technology	Fishers	Year round	Fishers family	Using traditional fishing method Lack of knowledge	To support Training and demonstration of new technology To provide fishing gear by NGOs and other organisations.
Market	Fishers	Year round	Fishers family	Only one collecting centre in the village. Selling low price	Extend more collecting centre To provide fish handling and value added fisheries product training program
Decreased catch rate	Fishers	Year round	Fishers family	Increase fishers Climate change	Improve management Raise awareness of close season Support alternative livelihood when closed season
Transportation limitation	Small-scale producers	Rainy season	delay in selling the village products	Road only can travel in dry or summer season	Upgrade and repair current road condition can travel year round
Lack of investment or insufficient invest money	Small-scale producers and traders	Especially from August - October	Less profit and no regular income need to borrow the invest money with high interest rate	Need to invest some enough amount of money	Create and provide investment loan with low and reasonable interest rate.
Limited access for advanced food processing technology, sustainable	Labours and producers	Summer season	higher cost low quality and less hygienic products	Required to go very far place to grind small fishery products	Provide loan to establish fish and shrimp paste mill

livelihoods awareness and equity.					
---	--	--	--	--	--

Some of the key cc related issues include land erosion along river bank, rising sea level, storms, heat waves, cool periods and sea water intrusion.

The main problem of the fishers is investment money for buying new fishing gear and for trip cost (Provision and fuel...etc.). On the other hand their catch rate also down and less income for their family. So they want to learn about new fishing technique and post-harvest technology for increase their livelihood. Now they are using traditional fishing method and practices. They need to get loan by small interest rate and support fishing gear by NGOs and Government.

Government training program for awareness of conservation and responsible fishing practices. Especially to provide EAFM program and training are needed for the fishers.

This village has transportation constraints especially in the rainy season. All villagers could not travel to other villages and towns such as to Daw Nyein village, Phyar Pon myo, Yangon City by bus, car, or motor bikes during the rainy season, and mostly rely on the water way for three seasons. In the summer, villagers can take passenger bus line or can use other vehicles to travel other villages and towns. Other problems are lack of investment and technologies: for example, food processing, value added, making quality products and market chain linkage, climate change and DRR response.

Amar is a multicultural society comprising four different ethnic groups; however, mostly are Myanmar nationals.

Although practical gender needs is not too difference between male and female, however, strategic gender needs are quite differ. Improve women leadership and female participation at community and township levels is needed.

Key issues to address:

- Amar face soil erosion problems seriously to prevent and solve.
- Generally, Amar community wealth differentiation is quite different between rich and poor families ratio.
- Less Employment opportunities for women and youths;
- Women are receiving less daily wages than men;
- Some fishing and poor families' members face domestic disputes/abuse.
- Transportation constraint in the whole rainy season, as no car, bus or motor bikes could not travel on the road way to other villages, towns and cities, including the PhyaPon and Yangon.
- Very limited GSM phone line connection and poor access in Amar Myo or surrounding area and no internet access in the community.
- Some of the key cc related issues include land erosion along river bank, rising sea level, storms, heat waves, cool periods and sea water intrusion

12.5.1.2 Auk Seik Win village

Auk SeikKwin is close to Ahmar and located near Tha Yet Chaung canal. The specific location of the village is given in Table A.12.1

The communities are considered very vulnerable with few village resources. The economic situation of this village is considered poor with most of the traders from nearby villages or other town. There are 1,600 people in the village (with around 300 houses). Most are fishers but have diverse livelihoods. There are around 173 fishing households, most have migrated from other villages there are around 20 original fishers. The village products are coconuts, betel nuts, Crabs, shrimp, nipa palm marketing, most of farmers and fishers are willing to do collective fish and prawn culture in future. Another alternative income generation activity is raising livestock. The village has over 2,040 paddy fields, shallows wells, coconut trees, stream, and over 20 acre of forest. The villagers feel they do not have good skills and education and no investment to establish small-scale or their own businesses.

The village has 300 houses (no brick houses or no good wooden houses). Most of village houses are constructed by bamboo pole, bamboo matting wall, nipa palm roofing. There is a one story good bricking church building in the village beside village earth road. There is 1 primary school, 2 village ponds, some shallow wells, no clinic or Rural Health Centre and no disaster shelter. There are 3 monasteries, one primary school, wooden jetty for transportation, a concrete main road and electricity (only main road- 2hr/day). The villagers use solar system electricity for lighting at home. Most are Christian and Karen ethnic group. There are 3 churches.

This village is frequently affected by natural disasters like Nargis with flood and salt-water intrusion. In November 2014, the village was flooded by salt, which affects rice production.

There are 40 female saving groups' members with PACT- Myanmar.

Most of farmers are facing salt-water intrusion to their paddy fields and are dissatisfied with private business men (fishing tender owner) who come from other villages.

The main problem of the fishers is investment money for buying new fishing gear and for trip cost (Provision and fuel etc.). Their catches are also down and less income for their family. So they want to learn about new fishing technique and post-harvest technology for increase their livelihood. Now they are using traditional fishing method and practices. They wish to get loans with low interest by NGOs and Government. A Government training program for awareness of conservation and responsible fishing practices is needed especially to provide EAFM program and training are needed for the fishers.

Most of villagers are interested to do fish and prawn culture and extended livelihoods and techniques for their food security in future.

Table 12.3. Summary of community problems from Auk Seik Win village.

Community	Who	When	Impact	Cause	Solution
Food insecurity	About 1600 people	Especially From Sept. to November	Mostly only two times meals per day, some parents, and households can eat one time per day without curry during the lean period.	Scarcity of resources and employment, no capital to invest. Low catches amount and low productivity.	Providing good quality grain or seeds; support microfinance loan for investment; conduct required technical trainings and awareness etc.
No capital or investment money	About 295 HHs	Every time, every month	Less income No storage of food Children' education not finished/drop out from school	Sea water enters paddy fields, climate change, loss of income	Need investment money with low interest.
Not enough grain for rice cultivation	Farmers, 151 with 2430 acre	May-June	151 people 2430 acre	People are moving and working to other towns	Provide seeds/ grain and techniques; provide revolving loan
No fund to run the village	All village, 300 HHs	Around a year	All village, 300 HHs	Inconvenience food insecurity	Establish village revolving fund
Insufficient drinking water	Over 200 HHs	April-,May	Over 200 HHs	Abundant temperature, Insufficient well	To build brick well in 3 places
No electric light	All village and students	Between June and Feb	All village and students	After over 100-120 year, government don't give electric light	Giving solar and electric light
No regular work for villagers	About (100) people	About (6)month	No regular income Instable living condition	No capital or investment money for alternative livelihoods	To support IG opportunities and revolving loan
Children's school expense is difficult for parents	Parents of about 350 Students	Schooling period June-February	Students 350	Parents work are not regular, poor income; not convenience in supporting children' education	Create livelihoods opportunities and improve parents awareness on children rights and care
No sufficient school rooms and area with current numbers of students in the village	Students	8 months	Narrow teaching area for students # noisy and less concentrate	No sufficient school buildings	To apply to the government and finding external donors
no doctor and no formal dispensary in village	Sick people, children and elders	Year round	Pregnant women, sick people, infants and elders	No doctor with government order or assignment	Inform and request to the DoH through local authorities and networking

No women participation in community management level	Educated and medium age women	All year/ year round	All women with different skills and capacity	Women are low confidence to involve and leading in community affairs	Supporting awareness on Leadership, community development, and management trainings in future.
Fishers	Who	When	Impact	Cause	Solution
Lack of Investment (no microfinance)	fishers	Year round	Fishers family	To buy new fishing gear Need trip cost (food/fuel)	Low interest microfinance. Provide fishing gear and boat by NGOs and other organisation
Fishing licence and ground (no access)	Fishers	Year round	Fishers family	Cannot bid for tinder log. Re buy tinder log from owner by Higher amount	Get tender log from government by floor price Establishes village fishers community and management
No Market	Fishers	Year round	Fishers family	Lack of collection centre in the village. Selling low price	Setup village collecting centre provide revolving fund for fishers community
No Ice	Fishers	Jun, July, August	Fishers family	Good catch season, Not enough ice	To build ice storage building in the village support setup ice plant in the region/township .
Lack of technology	Fishers	Year round	Fishers family	Using traditional fishing method Lack of knowledge	support Training and demonstration of new technology training program for value added fisheries products.

Reduced catches rate	Fishers	Year round	Fishers family	Impact of climate change Using prohibit drug (Paddy) Poison fishing practices	establishes mangrove forest enforcement and Control of using prohibit drug (Paddy)and poison. development of aquaculture technology
----------------------	---------	------------	----------------	---	---

12.5.1.3 Thamain Pale

Thamain Pale village is located in Ahmar ward . The specific location of the village is given in Table 12.1

This village is situated three hours by boat between U Pay creek and Thamain Pale A Pyin Creek. Most of the village are fishers with crab traps or as hired fisheries labour.

The village was established in 1973-74 with 10 households, there are now 189 (with 951 residents). There is one small library a church and a monastery.

The main income earning activities for men are rice cultivation, making crab traps, finding and selling firewood, seasonal farmland hired labour, crab collecting and marketing, on shore fishing worker, migrant worker/working in other countries and cities, village administration and management. For women the main activities are collection of snails, crab traps, firewood finding and selling, weeding and transplanting, selling vegetables and fruits, selling food, small groceries, etc. Consideration to enhance and create alternative livelihood opportunities and training should be provided. In addition, Support to initiate access to credit loan, revolving village fund and skills trainings to strengthening local CBOs capacities.

Fish culture pounds and shrimp pounds are situated near Tha Main Pale stream and garden land.

There is no disaster and cyclone shelter.

This village has reserved forest or community owned mangrove forest in front of the village or beside the stream, which is jointly supported by the Actmang – Japan NGO and FRED A Myanmar NGO in 2004-2005 through cash for work program.

The main problem of the fishers is investment for buying new fishing gear and for trip costs (provisions and fuel etc.). On the other hand, their catch rate has also fallen and they are earning less income for their families. They want to learn about new fishing technique and post-harvest technology to increase their livelihoods. They are now using traditional fishing methods and practices. They need to get loan by small interest rate and support fishing gear by NGOs and Government.

Government training program for awareness of conservation and responsible fishing practices. Especially to provide EAFM program and training are needed for the fishers.

Communications are poor with transportation constraints.

In addition, would like to suggest to implementers for providing gender, livelihoods and sustainable fishery and environmental management policies orientation sessions should be provided before project implementation towards reducing migration, social conflicts, and environmental conservation possible.

Table 12.4. Summary of community problems from Thamain Pale village

Problem	Who	When	Impact	Cause	Solution
No regular employment	136 HH / 680 people	March – June 4 months is most difficult period	Could not eat enough regular foods including the children	No regular income	Provide and support livelihood (including loan with low interest), interested in livestock, fish and crab culture, and rice cultivation etc.
In sufficient income for food, shelter and clothes	Over 700 villagers among	Year round, especially in the above 4 months		No regular job, scarcity of resources	Provide livelihoods skills training, financial and resource management training first and then money or loan for investment
Very few loan providers supporter for the villagers	All HHs	Same with above		No organization / NGOs	Information sharing and enhanced networking with other NGOs and government officials to recognize village problems
Higher school children drop out from school	About 100 children	June - Feb	School children	Not enough money for fees , poverty, low income and few job opportunities in the village , poor economy of the parents	Awareness raising and provide investment loans and training
Rising food and commodity price	189 HHs	Especially in Thingyan festival and rainy season		Difficulties in transportation access	Improve rice cultivation and livelihoods opportunities
Increasing debts	Landless and poor households - 136	Yearly		Climate change effects and scarcity of natural resources	Government and NGOs support needed to solve
No or fewer fishing area for the villagers in two streams (beside the village)	All fishers (old and casual)	From July- Nov.		No money for Fish Inn tender	Fishing and fish culture opportunity from the government with direct cost
<u>Women Group</u>					
No participation of women in community management and administration	All women	Year round		Most women are spending their time with household tasks Some have less confidence	Organize and provide trainings and supports for improving women role and participation
Domestic dispute	5 households	Frequently everyday		Disputes within household	Training and awareness raising of gender issues,
Fishing					
Lack of Investment for fishing gear	Fishers	Year round	Fishers family	To buy new fishing gear Need trip cost (food/fuel)	Low interest microfinance. To provide fishing gear (crab trap) by NGO's and other organisation

Need fishing boat	Fishers	Year round	Fishers family	Cannot go to effective fishing ground. Fishing by walking.	To get low interest loan for buy fishing boat To support by NGOs and other organisation
Advance Money for buying gear.	Fishers	Year round	Fishers family	To buy provision and crab bait High interest loan	To get low interest rate microfinance.
Market problems	Fishers	Year round	Fishers family	Lack of collection centre in the village. Selling low price	To setup village collecting centre To provide revolving fund for fishers community
Decreased catch rate	Fishers	Year round	Fishers family	Impact of climate change Decrease mangrove forest Increase crab fishers	To establish mangrove forest To Control of using prohibit drug (Paddy) and poison. Fisheries management measures
Lack of technology	Fishers	Year round	Fishers family	Using traditional fishing method Lack of knowledge	To support Training and demonstration of new technology Training program for value added fisheries products.
Aquaculture					
No or low investment money	All fish farmers and livestock raising households	Year round	Poor income and	Less opportunity for income and credit loan with low interest	Provide livelihoods loan with low interest (to do livestock, fish, and crab culture, small trading etc.)
Difficulty in fish and prawn culture permit and area	All fish farmers in the village	Year round	Food insecurity and lack of opportunity in fish culture	Most of fish farmers and aquaculture households faced a problem with access to their own farming and fishing area. The Lot had been purchased/won by the businessmen from other areas. This resulted in overfishing and conflict with the community.	Negotiate, communicate and consultation with business men or fishing tender winner and government authority persons Improve fisheries management
Original villagers or fishers have no direct opportunity for fishing and fish culture	All fishers and fish farmers families	During fishing season or year round	Impact to food insecurity and lack income and less livelihoods opportunity	Official tender winners create social problems between fishers, farmers, and fish farmers. Preventing local community from farming, breaking dykes and allowing salt water intrusion.	Negotiate, communicate and consultation with business men or fishing tender winner and government authority persons Improve community management of village resources

Lack of Technology and knowledge	All farmers fish and fishers	Year round	Fishers and fish farmers are poorer, Lack of income and livelihoods opportunity	Using traditional and experience based fishing methods and fish culture practices No fishing training and no sustainability approach	Conduct and provide appropriate technical trainings regards sustainable fishing and fish catch methods.
----------------------------------	------------------------------	------------	---	---	---

12.5.2. Yangon Division

Fig 15. Yangon region, location of pilot sites of Mee Pya, Zwe Bar Kone Tan and Chaung Wa.

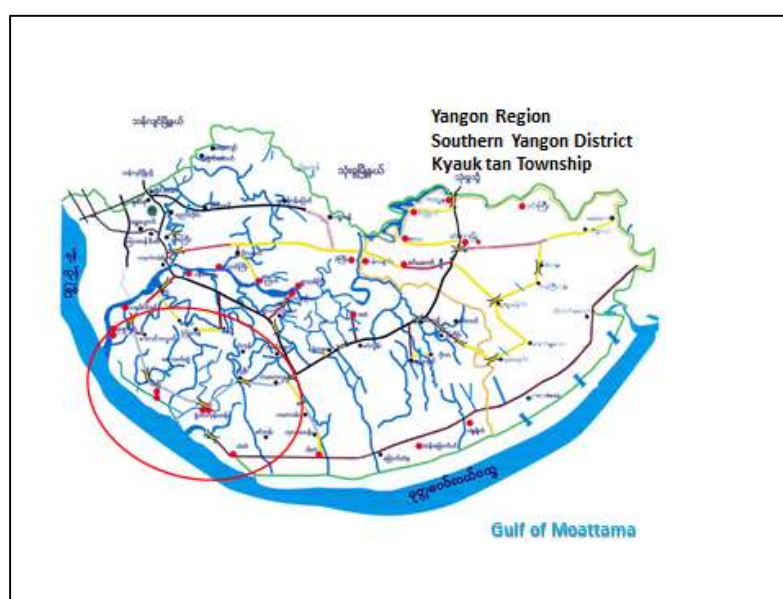


Fig 16 Yangon region, location of pilot sites of Mee Pya, Zwe Bar Kone Tan and Chaung Wa.



Table 12.5. Location of Pilot sites in Ayeyarawady and Pcodes (from: www.mimu.org)

SR Pcode	State Region	District	Township	Village Pcode	Village	Longitude	Latitude	Source
MMR013	Yangon	Yangon (South)	Kyauktan	151188	Chaung Wa	96.283737	16.585649	GAD, Mar 2015
MMR013	Yangon	Yangon (South)	Kyauktan	164085	Zwe Par Kone Tan	96.357597	16.53163	GAD, Mar 2015
MMR013	Yangon	Yangon (South)	Kyauktan	157539	Mee Pya	96.321297	16.5462	GAD, Mar 2015

12.5.2.1 MeePya village

MeePya Village (MIMU P Code 157539) is located in Yangon South Region, Kyauktan Township at Lat 96.32129669 and Long 16.5461998 (www.mimu.org).

The population of MeePya is currently 6,819 with 3,405 men and 3,414 women. There are 1,407 houses reported. Nearly everyone is Buddhist.

The village was established 1937 when there were a few houses. By 950 there were 230 houses and 2 monasteries. The village has always been affected by erosion and the area has reduced year on year. The village has been moved due to erosion. The Shwe-pon-tha pagoda was in the village location had to shift from the original place to a new one (which is a current place) due to erosion. It is also vulnerable to storms and flooding, the earliest memory of which is in 1954. There is an embankment.

The school was constructed in 1990 and an earth road to the village in 1997. Electricity arrived in 2009, mobile phone coverage in 2014 and the hospital in 2015.

The environment in the village has been considered good but the pollution of water in the sea and rivers is increasing. There is no municipal system for the trash collection yet. So, some less environmental awareness households are throwing HH trash to the nearby river or streams.

The main livelihood activities are Agricultural, fishing (stow net, Trammel net, fence net, set gill net, portable cast net, crabs trap, long-line, etc.), making and selling fishery products, hiring cars/ car taxi service, motor cycle taxi service, boats rental service are the main economic activities. In addition, there are some grocery stores and selling of snacks and traditional foods.

Villagers' income comes from rice cultivation, fishing, marketing and casual works. About 30% of HHs are doing agricultural works, 40 % of households are doing fishing, and the rest households are doing miscellaneous mixed jobs.

The village products are rice, sticky rice, fish, green bean, small prawn/ shrimp, dried fish, fish (ngar Si Paung), fish paste, etc. The villagers own Cars (14) and Motorbike (80) for private taxi to and from the Mee Pya to Kyauk Tan township. Farming households make up 346 HHs, 3 own Store shops; 2 have Grocery shops there is one year round Fish whole shop. The Markets are in Kyauk Tan and Thanlyin fish wholesale market;

Working outside the village or abroad and in big cities is common to partially support their parents, family income seasonally. About half the village are able to undertake casual labour.

Credit is available for loan for paddy, at the local market (vendors) and through Pet Myanmar for fishers.

The villagers do not have individual or group savings.

The village has no involvement in policy making. The headman takes most decisions. Fishers are aware of the fishery law and punishments. There is no specific traditional laws.

Table. 12.6. General problem census combined for all groups Mee Pya

Issue	Who	When	Impact	Cause	Solution
Fishers					
Catching less fish (low catch per unit effort (CPUE))	All fishers, 300 hh	All the time	Drop year on year, reduces income	Encroachment by larger / other fishers Some fishers use small mesh size Increased number of fishers Increased capacity Fish availability changed, (migration patterns ?)	Need enforcement Demarcation of grounds needs to be clear Improve fisheries management
Conflict between fishing groups	Drift net users	All the time	Income reduced, worse year by year, reduced catch, consequently decrease income.	Due to small mesh size, it is hard for drift net users to get fish so they need to fish elsewhere. Small fish caught in the small size mesh are not good for the fisheries sustainability.	Fishing gears-screening carefully by authorized organisation Improve community fisheries management
Difficult to find loans	Fishers and their family,	All the time	Had to borrow money with high interest rate or take advanced money from collecting centres	Less catch and income, but deep debt due to high interest rate. Collecting centres manipulate market price and lower the price when the fishers send their fish to them.	Linkage to NGOs or INGOs or Govt orgs that can lend money to them without interest or with low interest rate.
Making less profit	Fishers and community	Worse year by year	Hard to pay salary to workers Hard to grow business	Less catch, Some can't get the good price at collecting centre due to their advanced money Weak in post harvest techniques and insufficient ice (fish rot)	Enforcement (fishing area and gear) Value added products training Post harvest tech;
Market problem	Fishers and community	Especially in rainy season and beginning of winter (abundant fish)	Less income	Low the price (collecting centre)	Training for processing tech: (processing, at the time of market glut) Linkage with the orgs that can help to get good market for fishers
No ice	Fishers and	As soon as	All the catch can't be sold	Insufficient ice makes fish rot.(in the boat)	More Ice factories are needed.

Issue	Who	When	Impact	Cause	Solution
	income of the village	possible	with high price (some are rotten in the boat)		
Not enough crew	Boat owners And fishery business of the village	All the time	The fishery business can't grow more (can't use the resource they have for their community development)	Less salary (indirectly related to less catch)	Good pay to crews and give incentives
Lack of technology	Community Negative trend in fishery business of the village		Fishery business The development of the community	Lack of knowledge	Training are needed (from GOV or INGOs or NGOs) New fishing tech; Processing tech
Fish farmers/ Aquaculture	Who	When	Impact	Cause	Solution
Lack of land to expand	Paddy hh 70% traders		Loosing income Cant invest Fish consumption less	Land conversion law	Land utilisation policy at national level
Community	Who	When	Impact	Cause	Solution
Scarcity of water or water shortage	All HH in the village	April to June	All households need to buy water (for drinking and domestic use) Increased expenditure	Not sufficient water ponds Climate Change & dried water Increased population	Reduce the domestic water used Ponds renovation and new ponds digging
Myauk Chaung road and embankment are broken in rainy season frequently	villagers	During rainy season	School children and villagers were flooded when crossing	Water erosion Land erosion	Raising land New embankment and or renovation
No regular income & insufficient	About 600 HH	April to June (especiall	Foods shortage especially in	Less employment opportunities Have no regular	Establish village revolving fund Provide suitable

Issue	Who	When	Impact	Cause	Solution
food supply		y)	the rainy season	employment and income Storm winds	livelihoods trainings
Domestic Dispute	15 HH	Year round	Women and children victims of domestic abuse	Less awareness on Gender Equality, Equity and GBV prevention.	Improving women participation and empowerment. Provide Gender awareness and women rights trainings
Less women participation in CBOs	All women	Year round	Women have no/less opportunity in community administration, less involvement in community and households affairs decision making.	No women participation in village administration group/ association less women participation in community meetings	Improving women participation and leadership in community and household levels. Provide Gender, CEDAW and Human Rights trainings
Less employment opportunities for women	All women (married and young)	Year round		Low opportunity for women No factories	Need to provide livelihoods trainings (alternative) Sewing training Beauty parlour training
Less opportunity to learn new livelihoods technologies	Adults and young people	Year round	No regular income Reduced food supply and storage	Less and very few employments for women in the village and young girls	Create jobs opportunities for both women and men
Scarcity of water or water shortage	All HH in the village	April to June	All households need to buy water (for drinking and domestic use) Increased expenditure	Not sufficient water ponds Climate Change & dried water Increased population	Reduce the domestic water used Ponds renovation and new ponds digging
Myauk Chaung road and embankment are broken in rainy season frequently	villagers	During rainy season	School children and villagers were flooded when crossing	Water erosion Land erosion	Raising land New embankment and or renovation
No regular income &	About (600)	April to June	foods shortage	Less employment opportunities	Establish village revolving fund

Issue	Who	When	Impact	Cause	Solution
insufficient food supply	HH	(especially)	especially in the rainy season	Have no regular employment and income Storm winds	Provide suitable livelihoods trainings Create alternative Livelihoods Opportunities
Domestic disputes	15 HH	Year round	Women and children victims of domestic abuse	Less awareness on Gender Equality, Equity and GBV prevention.	Improving women participation and empowerment.
Less women participation in CBOs	All women	Year round	Women have no opportunity in community administration and less involvement in community management affairs for decision making.	No women participation in village administration group/ association less women participation in community meetings	Improving women role, empowerment and participation in both community and household leadership & management. Provide Gender, CEDAW and Human Rights trainings
Less employment opportunities for women	All women (married and young)	Year round		Low opportunity for women No factories	Need to provide livelihoods trainings (alternative) Sewing training Beauty parlour training
Women received less opportunity to learn new livelihoods related technologies	Adults and young people	Year round	No regular income Less food supply and storage	Less and very few employments for women in the village and young girls	Create alternative livelihoods and jobs opportunities for both women and men

Table 12.7. Summary community perceived climate change hazard Mee Pya.

Hazard	Impact	Risk	Who does it impact	Adaptation strategy	Solution
Malar Storm (1995)	Two children were dead	Around (100) houses were destroyed	Storm/ natural disaster	Borrowing money from the relatives and friends.	Rebuilding the damaged houses with self-reliance system.
Tsunami (1999)	Flood and destroyed some houses; Damaged roads and houses	About (80) households faced food shortage	Natural disaster	Information sharing and collecting some money from the rich families other.	Repair the houses and raising the awareness about the disaster.
In 2000	Some houses	Soil erosion,	Natural disaster	Moving to	Establish village

Flood and broken embankment for two times	were flooded about 3 feet high by salty water for one day. Some pigs, and chicken died by flood.	damaged drinking water ponds and houses, risk to occur Water bone and Infectious diseases, low farming productivity etc.		other high place	embankment with all villagers participation.
Cyclone Nargis (in 2008)	Only 20 houses left, and others houses' roofs moved away and damaged.	Some villagers both male and female received depression psychological disorders. To recover livelihoods and income generation.	Natural disaster	Report to township administration office and Information sharing with others individuals, company and NGOs.	Repairing houses and roofing themselves by the villagers and received some supports from the Save the Children (50 houses) and Shwe Taung company.
Broken village embankment (in July, 2014)	Around 400 houses were flooded.	Health and hygienic problems	Sea tide	To repair with community participation.	The district administration office provide 7 lakh MMK to repair the part of the village embankment by the labour supports of the villagers urgently.
Unusual raining (in 2010)	Heavy rain, and raining about one month in the summer season.	Climate change might be happened frequently.	Climate change		Replantation and conservation on mangrove. Awareness raising and plantation trees with stakeholders participation and supports. Repairing the embankment.
High temperature (in recent year and happen)	Dried paddy plants, and soil damaged. Fishery products also reduced.	Health problems, drinking water	Climate	Mangrove trees plantation	Embankment constructed in 2007 with the government support.

Meepya village has a range of social, environmental and economic challenges. These include:

- Low employment opportunities for both women and men especially for youths;
- Lack of awareness of policies
- Lack of capacity development including training and alternative livelihoods and income generation activities;

- Gender equality and equity gaps in ownership on assets, daily wages, access to and control over financial and resources management;
- Labour charge and daily wage differentiation between men and women;
- Lack of awareness and capacity to respond to climate change and disasters risks effects with community based approach;
- Technical support trainings needed (regards Fishery management, fish and prawn culture, Livelihoods, DRR and climate change);
- No or less women participation in decision making process and community management and leadership roles;

For fishers the main problem of the village is that they have catch rates have declined significantly so they are unable to earn a livelihood. A particular problem is debt cycles due to the need to borrow money in advance to purchase gear and repair boats/gear. Interest rates are very high. They need to learn post-harvest tech for the catch (need trainings for advanced fishing tech as well) so that they can be able to sell all the fish they catch with the best quality and high price.

For small-scale processors they need is the capital, loans with low rate, training for new process, new technology and technology for added value to the products.

Women, men and youths play an important role in fishing, marketing, foods processing and finding family income respectively. Women are taking more responsibilities in unpaid and domestic activities such as cooking, washing and preparing foods, fetching water, caring children and elders as well as in food processing activities. Men are spending more time in community management, social communications or information sharing and productive works than women. These differentiations and constraints lead women with limited and lack of access to social networks, update DRR, CCA information sharing, learning process and community leadership.

Policy responses A mix of social protection policies, human rights and CEDAW awareness is needed to respond by different ways for women and men. Some villagers have own experience in migration and working abroad and in other cities. Gender issues include:

- strengthening Gender mainstreaming and equality awareness through peace building approaches;
- Provide skills training for livelihood diversification and market links;
- Organize and improve capacities of community-based organizations regards gender mainstreaming into sustainable fishery and aquaculture development;
- Women's leadership training is needed to promote a transformational leadership model for sharing power and catalyze fundamental social change including gender equality.

Many of these can be addressed in parallel with the Fishadapt project. The common challenges to minimize for future improvement and positive changes required as follows:

Suggestion from facilitator is to support mangrove forests sustainable management include conserve and rehabilitate, replant etc. to support aquaculture intensification given land use restrictions. Also consider mud crab fattening when the mangrove mature. Strongly consider establishment of cyclone shelter and early warning system (e.g. by megaphone because not

clear whether or not clear if they use temple's megaphone, rainy season planning activities by megaphone and mobile phones). Technical extension (e.g. grow-out, on farm hatcheries) for fish farmer. Weather and climate information awareness training needed.

12.5.2.2 Zwe Bar Kone Tan

This village is located near Kyauk Tan. It is also situated on the Yangon river. The road transportation and mobile phone connection access are also available in the village.

This village was established about 150 years ago. Since 2012 all village households received electricity by self contribution and management of the system. In 1915 – village name changed from Nyaung hyint pin to Zwe bar Kone Tan. This village has good infrastructure and one third of households possess reliable livelihoods assets The village has 4 drinking water ponds plus 11 water pounds.

Economic activities are Agriculture rice, bean cultivation; Fishery, small trading; opening grocery shops; net making, carpenter, motor cycle taxi, rice milling, 178 small fish ponds in the paddy fields. Market facilities are either to Yangon or Kyauk tan. Money is available to borrow from the Pact Myanmar, AC Leader, Local Money lender. No individual and group savings

There are 7 fish collector shops, 6 taxi's, 53 motor cycle, 2 rice mill, 3 carpenter groups, 1 light truck, 104 fishing boats , 20 small boats, 1 transport boat, 17 Fishing Nets (small set net (pipe ga nan), used in the stream); (104), drift grill net; 2 small beach seine net (pipe wine pu); sea stow net 7, in shore fishing. Small-scale processing and dried fish and prawn marketing

The current problems are scarcity of hired labour, difficult to buy ice and instability price for raw fish and prawn, some school children about (50) cannot go to school from poor families of Kan Thar Yar, Mingalar De Hlaing and Seik Kan Thar wards. Less awareness and low capacity to response disasters and climate change. No awareness on Gender, Equity, women rights, gender based violence, governments labour laws, Fishery laws etc..

Flood and storm affect the areas. In particular in flood in in 2001 and Nargis storm . There are some Mangrove forest (5 acres), most are Kant ba Lar species. The village has some Kok Ko trees and Eucalyptus trees. Early warning for disasters was from T V, Radio, Internet and mobile phone.

The main problem of the village is that they have got less catch these days than before. So, they need to learn post-harvest tech for the catch (need training for advanced fishing tech as well) so that they can be able to sell all the fish they catch with the best quality and high price. They have no training program for advance fishing technology and handling catch. Need to form a formal fishers group. Some of the young people went to abroad for their livelihood as labour. Because of to get more salary. So, the fishers are face with labour shortage. If we provide awareness program and build up capacity building, they will increase their knowledge and development fishery sector in the village.

Many improvement and development of the village with electricity from National Grid, access mobile phone, concrete road, village clinic, opportunity to propose what village need through restructure of country political system. Village is facing with bank erosion problem especially in rainy season even though there is mangrove forest at the bank, so it is needed to find the way how to save and overcome for the bank erosion. Regarding with the ice maintaining

period from solid state to liquid state and price difference from different, it is need to establish small-scale ice factory at the village or other village where is more potential to get water amount for producing ice.

The villagers have less opportunity to read daily newspapers, Journals, because of the far distance from Than Lyan myo and transportation constraint.

- Less Employment opportunities for women
- women daily wages are less than men
- getting information related to domestic disputes , mobility of labour, migration, and marketing information etc.

On the basis, would like to suggest to implementers for providing gender, livelihoods and sustainable fishery and environmental management policies orientation sessions should be provided before project implementation towards reducing migration, social conflicts and environmental conservation possible

Table 12.8. Summary of community problems.

Community	Who	When	Impact	Cause	Solution
Lack of employment opportunities and Less investment	Over 300 hhs	Especially in March to Jun - (3) months		Poverty, less employment, many family members	Create livelihood and employment opportunities
No Doctor at Rural Health Center	The whole community	Year round		Insufficient health care service for the village community	Weakness of government support
Insufficient proof latrine	Over 300 hhs	Year round		Less hygiene and primary health care knowledge	Provide hygiene and health training
No safe birth space for pregnant women	All pregnant women & some mothers	Year round		Less awareness on reproductive health	Raise awareness on Gender and Reproductive Health care
Insufficient drinking water and need more ponds	All hhs	March -May (3 months)		Current ponds have not very well foundation; Cannot dig for tube wells.	need village tube well at least 800' depth required (or) require advanced technology
Lack/ less employment opportunities for graduate people/ youths	65 people + around 500 youth	The whole year		Lack employment, less income,	Create village based employment opportunities; Establishment of village revolving fund
Increasing out migration rate	About 1000 people (until now from many years ago)	Less income and employment opportunity		Poverty, have many family members	Provide extended livelihoods trainings and create both part time and regular job opportunities
Damaging to village roads	15) hhs in 2 wards	All year		Because earthen road and ground surface is lower	Maintain and re-construct more reliable road

No Combine Rice Harvester	All farmers (178) hhs	Oct- Nov (harvesting period)		Cannot buy (too expensive)	Provide Loan (instalment repayment)
Small-scale processors					
Finance	Traders Fishers HH	June, July October, November, December	Difficult to control for operational cost	No direct payment system for purchasing all products from fish collecting centre	Improve payment system between seller and buyer Establish low interest village based microfinance system
No Ice	Collecting centre Traders Fishers	June, July October, November, December	Difficult to maintain solid state to liquid state Unstable ice price	Too far the availability of ice sources (YGN) Price differences between YGN and KyaukTan	Establish small-scale quality ice plan at the village or nearest area of village
Storage facility	Collecting centre Traders Fishers	June, July October, November, December	Difficult to control fish quality in the longer time	Availability of used storage facilities Cannot afford for new storage facilities	Produce high quality storage facility at the local
Fishers	Who	When	Impact	Cause	Solution
Less money for Investment	All fishers and their family in the village	Throughout the year	Can't buy fishing gear, fuel, provision, ice...etc.	Take advance money from money lender. Reduces income low catch rate	Linkage NGOs or INGOs or Gov orgs that can lend money to them without interest or with low interest rate.
Catching less fish (low CPUE)	All fishers in the village	Throughout the year	Became worse year by year, reduce catch, consequently decrease income,	Climate change	To provide modern fishing technology and fish handling on boat training and demonstration.
Market problem	Fishers and community	Throughout the year	Less income	Lower the price (collecting centre)	Training for value added processing tech: (processing) Linkage with the orgs that can help to get good market for fishers
Not enough crew (shortage of crew)	Fishers	Throughout the year	Cannot fishing without full manpower	Fishing boat owner can not pay more salary	To give more salary
Market problem	Fishers and community	Throughout the year	Less income	Lower the price (collecting centre)	Training for processing tech: (processing, at the time of market glut) Linkage with the orgs that can help to get good market for fishers

Resources decrease	Fishers and community	Worse year by year	Less income	Climate change using small mesh size net.	To provide modern fishing technology and fish handling on boat training and demonstration. Awareness program for responsible fishing tech; Close season and area and law enforcement.
Difficult to buy fishing gears/net	Boat owners And fishery business of the village	All the time	Can not fishing in time (season)	Buy fishing gear/net from distance area. (it take two to three month long)	Provide fishing gear and net by low price or instalment. to arrange easy to buy fishing gear and net.
Lack of technology	Community Negative trend in fishery business of the village	All the time	Fishery business The development of the community	Lack of knowledge	Training are needed (from GOV or INGOs or NGOs) New fishing tech; Fish handling ; Processing tech

12.5.2.3 Chaung Wa Village

This village is located in situated in Kyauk Tan township and not very far from Mee Pya and nearly the same transportation access and geographical situation with the Mee Pya village.

The village was established in 1943 with 200 houses and there are now 520. The village location had to shift from the original place to a new one (which is a current place) due to erosion.

Economic activities of the villagers are rice milling, farming/rice cultivation, fishing, selling fishery products, opening collector shops, car/ motor cycle taxi, daily wages labours etc. Income earning months for farmers and casual labours are from November to February. For fishers, small-scale producers, from June to February. Regarding the Expenditure, June to November is high expense months, especially for school children parents. Lower expenditure months are December to March.

Money to borrow is available form the Money- Pet Myanmar, Money lenders. The market facility is local at the village collecting centre. There are no individual and group savings

Women make and repair fishing nets, plantation/ paddy cultivation, uprooting, weeding (Agricultural works); wish collection and sorting, vegetable selling, fish and prawn selling, opening small grocery shops, selling traditional foods, marketing dried fish, etc. Marketing place or selling fishery products within village, in Kyauk Tan township, at Yangon wholesale market.

The village is vulnerable to natural disasters including the 1985 high tide and flood, 2007 storm (about 30 houses were damaged) and in 2008 the Nargis cyclone hit and about 300 houses were damaged.

Fishing is carried out in the Yangon river, Hmaw wun Creek inshore and inland also fresh water ponds and paddy fields.

The main problem of the village is that they are catching less fish than before. They wish to learn more new and different learn fishing gear technology and post-harvest technology.

For women there are few employment opportunities, they receive lower daily wages than men. The village faces a scarcity of drinking water for about 3 months (March, April, May). Child labour is used in income generation and service sector. Some households have experienced domestic disputes. Few women place or participation in village Administration Committee, as well as in some CBOs. For women the project needs to improve Gender equity and gender mainstreaming awareness to senior management and staff of key stakeholders through a capacity development program to address gender equality gaps. Strengthen a set of gender indicators that would be useful to monitor and analyse gender-disaggregated data in FishAdapt project and programmes. Develop Gender Mainstreaming in Fisheries and Aquaculture Strategy that is in line with the FAO Policy on Gender Equality. Bridge the gap between gender in policy responses and integration of gender analysis and other technical perspectives.

Table 12.9. Summary of community problems from Chung Wa village (The approach differs from other village as it did not collect as much detail on the issues as the others.

Issue	Solution
Community	
Lack of labour	Pay higher salary
Security, embankment too low.	Need to raise, Government support
Storm	Cyclone shelter needed
Fishers group	Solution
Inland fishers	
Conflict between fishers	Demarcate by fishing type
Catches down	Awareness programme for closed season
Lack of technology	Training in technology
Lack of livelihood during close season	Employment in road construction. Other income activities, poultry, piggery, duck
Lack of loans/investment	Low interest microfinance. (10-20% per month now)
Lack of wood species for boat building	Fibreglass boats
Inshore	
Investment/loan for everything	Low interest rates, long term.
Lack of technology	Training and instruments etc.
Catches down	Enforcement of closed season. mesh size enforcement
Conflict between fishing types	Demarcate and enforcement
Crew shortage	Need to catch more fish

12.5.4.Rakhine State

Fig 17. Map of Rakhine state showing location of Kyauk Maw Gyi, Ohn Taw and WaKauk Gyi villages.



Table 12.10 Location of Pilot sites in Rakhine and codes (from : www.mimu.org)

State Region	District	Township	Village Tract	Village Pcode	Village	Long	Lat	Source
Rakhine	Mrauk-U	Myepon	Ah Ngu	197256	Kyauk Maw Gyi	93.360558	20.04269	GAD, Mar 2015
Rakhine	Mrauk-U	Myepon	Ah Ngu	197255	Ohn Taw	93.378281	20.030741	GAD, Mar 2015
Rakhine	Mrauk-U	Myepon	Pyin Chaung	217979	Wa Kauk Gyi	93.287041	20.06669	GAD, Mar 2015

12.5.3.1 Kyauk Maw Gyi village

The village is situated close to Myepon and only take about 5 minutes drive by car to reach on concrete road. The village code and coordinates are given in Table 12.8. The three small hills in front of the village are characteristic.

The village was established 1962. Like many villages in Myanmar it has had a name change. The previous name of the village was Tha Yet Pin Gyi Pite Seik then Kyauk Maw Gyi (in 1982). There are 110 houses, 1 monastery with a total population of 1109. There are 4 village wells water which are not enough for both drinking and domestic household use. Annually, all villagers face water scarcity in about 4 months. Livestock include goats, pigs, duck and chicken. No municipal household waste collecting system in the village and the villagers are sometimes fined for throwing rubbish into the stream and putting the domestic waste in the HH compounds.

The main village livelihood is fishing and selling fishery products. Around 20 households provide casual labour. Fishing has increased to 80 households from 40 in 1970 and 8 in 1968. Fishing is in the Kyet Sin River, Hanter sea inshore water fishing ground and Hanter sea shore. Mangrove forest was established for about 5 miles, jointly provided by Melteser INGO and Red Cross with cash for mangrove plants plantation program implemented in 2014. Economic activities for men are fishing (stow net, cast net, line etc.), motor cycle taxi, firewood trading, fishery products marketing, crab trap and casual works, etc. If natural disasters occur fishers cannot

work on that day. In Rakhine, there are greater variety of fishery products, more than Yangon and Ayeyarawady divisions. The fishing area is wider and has more aquaculture opportunities.

Fishers can catch more during October to February period every year. On the other hand, there is reduced catch during April to August.

The market price are different between selling in the village and selling in Myay Bon town. For

Income generation activities for women include sorting fish and shrimps, collecting fish, crab, prawn and shrimps for raw market and selling. This includes the drying and processing to produce different kinds of fishery products including shrimp and fish paste, salt fish, dried fish and prawn, etc. Generally, women are mostly involved in fishery products marketing, food processing, and households.

Paddy fields to grow rice. Firewood is bough in during April, May, June, July, August, September every year. During October to March most of villagers find and cut trees themselves in the small hills near the village. Nowadays, the quantity of wild trees and fire wood plants are less and the resource depleted.

The village is vulnerable and in 1968, this village was affected by the cyclone/ storm and in 2014 by floods. Natural disasters occur in May, June. During July and August they are faced with floods and land erosion risk. There are two types of sea tide flow in a month.

There are no individual or group saving schemes.

There is no embankment dyke to prevent for salt intrusion and flood. No cyclone shelter.

After Giri storm, the village roads are flooded about two times per year to about 3 feet.

The strategic needs for men are alternative livelihoods training, systematic fish and prawn culture and breeding awareness and practice, sustainable fisheries and coastal resources management. The basic needs for men are employment, food security in the rainy season, investment and fishing gears.

The needs for women are investment for own income generation activities, food and water security in the rainy season, access to primary health care service especially for reproductive health care and secure birth area. The strategic needs for women are: capacity building to improve self-empowerment and women participation in decision making and community management role, they have strong desire to ensure children's education is finished or graduated. In addition, some women requested to support value added food processing technology and market linkage, leadership training, etc.

The main problem of the fishers is investment for buying new fishing gear and for trip cost (Provision and fuel...etc.). Catch rate also down and less income for their family. So they want to learn about new fishing technique and post-harvest technology for increase their livelihood. Now they are using traditional fishing method and practices. They need to get loan by small interest rate and support fishing gear by NGOs and Government. Government training program for awareness of conservation and responsible fishing practices. Especially to provide EAFM program and training are needed for the fishers.

Most of the villagers have lack of knowledge on the government fisheries law, sustainable coastal resources management and environmental conservation, knowledge etc. Some casual and fishing families are facing foods difficulties especially in the rainy season.

Women are key players throughout the fisheries products value chain activities, however, they are marginalized from decision-making and resource management processes. There is consideration to address basic gender needs including invest money or corporative funding of fish-dependent communities in a holistic manner by creating alternative livelihoods opportunities for broader

socioeconomic conditions and implementation strategies. Using a gender lens to design and implement fisheries co-management programs requires partnerships among organizations and individuals with expertise in a myriad of arenas: conservation, sustainable fisheries, community development, climate change adaptation, maternal and child health, nutrition, market chain among others.

The assessment found that gender roles and gender division of labour create situations that are inequitable, particularly regarding the status, standing and power of women. For further action, assessment on investment and financial flows needed to address Climate Change adaptation and mitigation in key sectors. Coordinate and consultation with key line Ministries engaged on DRR and Climate Change planning. Due to request from the FGD respondents, food processing and value added training, saving money and financial management, livestock training, fish and prawn culture training are requested by the villagers.

Table 12.11 Summary of community problems from Kyauk Maw Gyi village.

Hazard	Impact	Risk	Who does it impact	Adaptation strategy	Solution
Cyclone	Fishing boats and nets damaged Houses are damaged	Every monsoon season	Villager and fishers	Plantation of mangrove forest EWS warning announcement, they move to hill behind the village	To build cyclone shelter Embankment construction planting mangrove forest planting More effective early warning system are needed.
Flood	Difficult to move in the village one place to another Can't fish	About 2 feet flooded in the village Every year in monsoon season	Villager and fishers	Raise to house foot/base	To construction embankment
High temperature	Rise sea level can not working in full time Catch rate decrease Some fish species lost	Increase year after year	Villager and fishers Especially older people and child.	Stay under shelter, don't fish (few alternatives)	Planting tree for shelter To control mangrove forest

12.5.3.2 Ohn Taw village

Ohn Taw village is located close to Myebon in the river estuary, but not on the sea shore side. The village code and coordinates are given in Table 12.10.

The village has a population of 325 with 97 houses. Houses are mostly made of timber and bamboo. Some are built with brick and zinc plate roof. Sanitary condition is poor and drains in along the creek site of the village. Few have toilets It was established in 1968 by U Tha Htaw Yee. It has a main road to AhNgu Ward of Myay Bon and 2 jetties for boat transport. There are 2 wells, 1 village water reservoir pond 1 monastery, 1 primary school, are around 250 acres of paddy field. Electricity is provided to some houses using solar power system for lighting. Mobile phone network access covers the whole areas.

The main business in the village is fishing, fishery related food processing activities and marketing fishery products. The other economic activities are rice cultivation, livestock raising, casual work and small gardening. About 30 families have income remittance money from their sons, daughters and relatives working abroad in other countries as migrated workers. These include in Thailand (20), Malaysia (5) and Korea (4). There are no individual or group saving schemes.

For men daily wages tasks involve climbing coconuts trees, selling vegetables, flowers and coconuts, occasional fishery labour and road construction. For women the main tasks include; selling and marketing fish, prawn, crabs, foods and snacks; food Processing (making / producing fish paste, dried fish and prawn etc.) for fish post-harvest processing, small-scale livestock rearing (chickens, ducks and pigs etc.), sorting fish and prawn, net repair and making, casual labour, washing clothes, making nipa palm roofing.

The village has a good and secure environment, village roads in the village are earth lane. Most of village houses compounds are surrounded by bamboo fences. However, water scarcity and shortages occur for about four months every year. Soil fertility and rice production have decreased using traditional methods. There is a mangrove conservation group with (4) members and mangrove nursery forest in the village or along the river.

The village is however vulnerable to floods and storms which are frequent. For example, Marlar storm struck in 2004 and two thirds of village houses were damaged and collapsed. Other livelihoods assets and paddy seeds also destroyed. In 2008 - Nargis cyclone struck and one village pond constructed. In addition, salty water intrusion. The village feel they need an embankment dike to prevent salt intrusion and floods. There is no cyclone shelter. Mangrove planting has been carried out as a wind break.

Villagers are interested to participate in the project including capacity building and learning process if possible in future. Natural and financial resources, opportunities for productivity increases from agriculture and fisheries in this village are limited. However, they felt if the project designers can set up effective strategies with strong community participation, transparency in governance and community management system and improving women role and gender equality in providing in kind and technical supports to the poorest must be helpful and recognized.

There are significant environmental considerations to address including strengthening Climate Change adaptation and Disasters risk reduction capacity and technical challenges in this coastal area. The disasters involve floods, higher levels of siltation and fluctuating temperatures.

However there are also a number of social issues to address such as debt, food insecurity, water shortage

Fishing is carried out in the Myebon river and Hanter sea inshore fishing ground. The main problem of the fishers is investment for buying and replacing fishing gear and for trip cost (Provision and fuel etc.). They need to get loan by small interest rate and support fishing gear by NGOs and Government Catch rates are down with less income for their family. Fishers want to learn about new fishing techniques and post-harvest technology to improve their livelihood. They use traditional fishing method and practices. They have had a government

training program for awareness of conservation and responsible fishing practices. Especially to provide EAFM program and training are needed for the fishers.

There are some old shrimp culture pond

Gender needs are not greatly different but strategic gender needs do differ. Improving women's leadership roles and female participation at community and township levels should be improved.

Most of the villagers have lack of knowledge on the government fisheries law, sustainable coastal resources management and environmental conservation, gender equity etc.

Table 12.12 Summary of community problems from Ohn Taw village.

Problem	Who	When	Impact	Cause	Solution
Community group					
Insufficient Food security	Around 50 HH (poor families)	Especially in rainy season (from June-September)	Cannot eat meals with curries Poor nutrition	No regular income in the village	Support other or alternative livelihoods opportunities and investment
Scarcity of water in summer (both for drinking and household use)	The whole village	From March-June	No water in the wells Need to buy water for drinking and HH use	Climate change, dried water Fewer water pond Increased population	Provide sufficient or reliable water supply system from Pho Thar Myaung stream to the Ohn Taw village The plastic pipe size should be at least 3" inch size;
Lack of investment for livelihoods	80 HH	July-October	Poor food security less opportunity to finish children education required to borrow money with high interest rate (20-30%).	Less or no investment	Provide and establish Village revolving fund. Support Low interest rate micro credit scheme.
Difficulty in communication and transportation as village roads/ lane are flooded and slippery	school children elder persons pregnant women patients About 100 people at present	In rainy season	school children are facing flood when they go to school Older people and pregnant women cannot go to other ward during rainy season (about 4 months)	Bad road condition High tides, rising sea level	Repair the road and do maintenance Elevating road

No electricity in the village and most of HH could not buy Solar plate	About 75% of HH cannot buy solar panels all 1 households need electricity	Year round and annually	School children cannot read and learn in night Less opportunity for development	The government system of lottery to allocate panels to villages	Request and inform to the township departments for consideration
No midwife, doctor or health assistant staff in the village	Women, children and sick persons	Year round and annually	Pregnant women, and sick persons have to go to the Myebon for health and medical assistance year round.	No access to primary health care in the village	MoH should provide solution.
Family planning (poor knowledge of family planning).	Married women and teenagers	People age between 18-45 years old	Families too large to care for , poor women's health	Less awareness on primary health and contraception	Distribute reproductive health care awareness and IECs in the villages Provide TOT training for primary health care
Poor literacy and numeracy	All school children	Schooling period	Poor education level compared to Mye bon and Sitwe.	Economic situation of the parents Poor situation	More attention and care of both parents and teachers on school children in future Provide more time in teaching and learning by the teachers and parents
Increasing higher sea tide level and intrusion of salt or sea water	The whole village	during May – October annually	Dried plants and low production Affected about 6 times in every year	Low land situation Changing sea tide level	Making embankment and growing mangrove trees Conservation mangrove forests and environment.
Need agricultural techniques and training for food security	Over 100 households are very keen to accept as they have land to grow	in winter and summer seasons	Need to buy vegetables everyday which are expensive and not fresh	Eating less amount of nutritious foods and un-fresh fruits and vegetables	Provide home garden and agriculture techniques training. Providing vegetables seeds Support low interest investment money

No opportunity to learn alternative livelihoods and financial management training	around 90 HHs	summer and winter seasons	No cash saving and poor money management and control	Never received the training before	provide livelihoods trainings and financial management ToT trainings
Damage to and loss of fishing gear every year by strong wind blowing and climate change affect	Fishers families (40)	June-October (rainy season)	Lost and loosing boats and fishing gears	Climate change affects	Provide DRR and climate change awareness & prevention training
No cyclone shelter and or disaster resistance building in the village	The whole village	year round	No early warning system. If villagers received the storm warning the heads of households send family members to the Mye Bon town and AhNgu hills for safety.	No disaster resistance building in the village yet	Provide DRR and security and safety training Provide early warning. Construct cyclone shelter or disaster resistance building for the villagers for saving lives
Sanitation and hygiene problems	all HH	year round	Contaminated water and rubbish in the river and sea cause communicable diseases like diarrhoea and other itching.	Most of the villagers have less awareness on environmental conservation but bad practice in throwing rubbish into the sea and along river bank	Provide gender and health trainings, CLEAN and hygiene trainings
Domestic disputes	80 HHs	year round	quarrels in families and houses children are afraid some received psychological disorders etc.	Poverty and economic problems Some social problems within households	Provide livelihood development support, Provide Gender Equality, Family planning and Gender Based Violence prevention trainings.

Table 12.13. Summary of community problems from Ohn Taw village problems specific to fishers

Problem	Who	When	Impact	Cause	Solution
Fishers					

Lack of Investment for fishing gear	Fishers	Year round	Fishers family	Difficult to get loans and high interest rates Not able to break even when fishing and always in debt High price of materials/gear.	To provide long term low interest microfinance To provide fishing gear and boat by NGOs and other organisation To improve fisheries management and increase catches
Market problems, low market price	Fishers	Year round	Fishers family	Fishers borrow from money lenders to purchase gear and have to sell catch back to the money lender who give a poor price.	Long term low interest microfinance. Set up village community fish collecting centre.
Lack of technology for improved catches	Fishers	Year round	Fishers family	Using traditional fishing method. Perceived to give low CPUE. No skills in processing and post harvest	Support Training and demonstration of new fishing technology To provide fish handling and value added fisheries product training program
Climate change	Fishers	Increase year by year	Fishers family	Climate change impacts	Replanting of mangrove forests To provide health care centre
Decreased catch rate (CPUE)	Fishers	Year round	Fishers family	Climate change affecting the fish distribution and movements Low water levels in river Too many people fishing	Control and replanting of mangrove forest and habitat Control IUU fishing Manage fisheries
Conflicts over fishing ground	Fishers	Year round	Fishers and family	Closed fishing tender lot. Fishers can't fish in different areas. Fishers from other areas poach	To Demarcate of fishing lot by competent authority Improve fisheries management.

12.5.3.3 Wa Kauk Gyi village

Wa Kauk Gyi village is remote and situated on low land in a disaster prone area. It is around three and half hours by motor boat to reach. The village code and coordinates are given in Table 12.8.

The village was established in 1953 with 32 households, prior to this mangrove forest covered Nga Man Ye island. Since 1943 people cleared this to farm land mostly for prawn – paddy cultivation using traditional methods. Generally the village has poor infrastructure and no disaster shelters. The village has been destroyed by storms for example in 1968 but it was re-established. From 2002- 2003 monsoon rains have been late.

The village has a lot of aquaculture activities including individual small-scale culture and a big shrimp farms (Nga Man Shwe Myay corporative farm).

There are around 40 fish farmers and some face land loss problems to other large scale commercial farmers. The small-scale farmers are unhappy with the way the large scale farmers operating.

Although native poor and vulnerable fish farmers have local knowledge, heritage lands, family labor, and skills to establish individual or collective farm fish and prawn culture business, is there overwhelming and exploited by the outsider business man already started from 2010.

So, vulnerable and marginalized fish farmers are asking to assessment team that when project will start? and how FishAdapt project will be implemented? What are the criteria for selection beneficiaries? Who will be benefit? Who could be involved? How landless and or poor can involve? And appeal for considering native people food security, sustainable livelihoods, and their children education as they are facing many social, political, climate change, economic and environmental problems at present.

Climate change effects and happening natural disasters is emerging huge constraints for Wa Kauk Gyi village as well. The condition of village infrastructure, housing situation, access to water, natural resources, credit loans and livelihoods opportunities are very poor and limited. Native villagers are seems to quite familiar with seasonal climatic changes as they response for coping strategies, prevention practice, as example. Sharing update climate change related information, moving to safer places and sending elders, women, children and disabled persons by boats before cyclone and storm coming in the past. These prevention techniques and capacity is not adequately safe and reliable methods for saving vulnerable lives.

At village level, tailored CC adaptive strategies will be needed for different livelihoods in the target area, and identical livelihoods in other different areas. At higher levels, Government will need to pay heed to local governance regulations, and social and gender equality as well as monitoring on sustainability of coastal livelihood resources to ensure necessary delivery of resources and provisioning quality services in future.

The main problems for the fishers are difficulty in finding loans or cash for fishing operation, new gear or repair for boats. They would like loans from NGOs or government and Government.

Reduced catches resulting in lower income

Lack of technology, they want to learn about new fishing technique and post-harvest technology to increase their income. Now they are using traditional fishing method and practices.

For the market problem, they want their own collecting centre support by government.

Government training program for awareness of conservation and responsible fishing practices. Especially to provide EAFM program and training are needed for the fishers.

Most of village households are very poor with limited ability to borrow. They also are not aware of government policies and sustainable livelihoods, climate change adaptation, natural

resource management. They have limited access in communication, transportation, and networking.

Due to focus group response, around 35 fish farmers are facing socio-economic difficulties and stresses on losing their family owned paddy fields lands which were being exploited by a big business farm owner and or collective tiger prawn culture group in Wa Kauk Gyi village.

The source of village income through fishery, intensive fish and tiger prawn culture (both individual, small-scale and cooperative farm group (medium scale). Most of villagers do crab trap, fishery products processing, small livestock breeding, and mixed casual works. All respondents or village representatives are interested to do small-scale fish and prawn culture and desired to develop their livelihoods and income generation activities if possible.

Farmers and villagers have less awareness on the existing national government laws and policies, including land use and ownership policy, marine and fresh water fishery laws, aquaculture law, gender equality policies, environmental laws, etc.

Some villagers assumed that due to the government's new land tenure and ownership policy - rich, clever outsiders and educated business people received more opportunities in using, and taking other poor people' heritage lands by applying cooperative SME business works permit from relevant Ministries in Nay Pyi Taw. Recently, all poor fish farmers from this village are feeling unpleasant, feeling so sorry, stressful on loosing land ownership and human rights.

The facilitator also noticed some imbalance power relations, strange communications, voices, behaviours and centralized governance practice between poor, fish farmers, local government authorities and business men when data collection period.

Practical gender needs are (1) investment money/ income, (2) to maintain or own cultivable land, (3) Water, rice and foods (4) Cyclone shelter, (5) access to primary health care. Practical gender needs are not very differed between male and female, however, the strategic gender needs look a little varied between male and female. When women said they would like to support their children' education to be finished or until graduated first, men are considered for improving village roads and infrastructure first as their one of strategic needs. For the second one priority, women answered to provide income generation and livelihoods training, men urged for DRR and primary health care training etc.

Villagers have in sufficient livelihood assets and fishing gears, as well as less skills to extend. In addition, most of community based organizations are not functioning well and less collaboration due to very limited communications and poor transportation assets and access.

The vulnerability to poverty in fishing communities is being high caused by seasonality climate change risks and absence of safety in fishing and within fishery society. There are some social conflicts between small and medium scale fisheries and local fishers, fish farmers and processing business man and his group.

Most of fishers are experiencing with low catch rate, reduce processing capacity, higher prices of fishing gears, inputs and basic commodities are the causes of vulnerability of the fisher folks in this village.

The village fishery products are mainly identified by three: (1) raw fishery products (include fresh fish, crabs, prawn, shrimps, etc.), (2) dried and value added fishery products (include dried fish and prawn, fish and shrimps paste, etc.), (3) Salted fish with traditional methods.

Small-scale producers are facing huge challenges in limited communication and poor transportation access to go to other towns and cities to sell village products and fishery products. Normally, it takes about four hours by motor boat to and from Myay Bon myo to Wa Kauk Gyi village. In addition, public ferry boat arrival time is not exact and irregular, for these constraints, small-scale fish, crabs and prawn traders faced damaged commodities or getting lowest price on their fishery products in the past.

On the other hand, most of marginalized poor villagers are facing foods insecurity and less opportunity to involve village community based income earning jobs and alternative livelihoods as they have lack of investment and credit loan opportunities. These stresses lead to native villagers as common constraints and challenges on coastal livelihoods.

Table 12.13. Summary of community climate hazard from Wa Kauk Gyi village.

Hazard	Impact	Risk	Who does it impact	Adaptation strategy	Solution
Community group					
Nga Man Ye Storm (1968)	All houses were damage Cattle lost paddy fields and livelihoods materials damage	All houses collapsed All cattle and poultry died	All villagers and fishers	collecting pieces of wood, pole, bamboo, etc. and re constructed houses again by the villagers. Move to safe place	To build cyclone shelter More effective early warning system are needed.
Cyclone Storm (2004)	5 deaths, children/people Damaged Monastery and 101 houses were damage and collapsed-Cattle lost	Every year in the rainy season	Villagers and fishers	Construct houses with more resistance design or a little bit stronger Listening weather information from radio and others	Prevent disasters Sending elders, women and children to other higher or more protective place or safe village Listen and practice early warning system
MaLar Storm (2006)	No death a few damage	Only around 50 villagers		Households heads, men were informed and carried wife, children and households members by motor boats to other safe place. (prevention)	Moved to other safe village after receiving update cyclone information Construction cyclone shelters
Bangladesh Typhoon (2007)	No death, however a few houses damaged	flood intrusion sea water	villagers	Prevention and alert	Construct more disaster resistance building construct village embankment
Giri Storm (2010)	110 houses collapsed All poultry and cattle died Lost and	Health problems lost damaged village infrastructure and materials	All villagers, monks, teachers and children	Most of villagers were staying in the monastery, some villagers were moved to other place before the storm. DRC constructed 45	Provide DRR/CBDRM training to all villagers listing daily and weekly weather news and

	damaged all livelihoods and fishery materials	economic crisis		houses, DRC provided fishing nets and boats, water pond. WFP provided Rice and cooking oil to the victims, Merlin provided water container. DRC and Myanmar Heart constructed a village pond. DRC provide 1 lakh grant money to (22) poorest households for rehabilitation.	prevention methods use Provide cyclone shelter
Flood (in 2014)	Raised sea water level around 3 feet	Damage to paddy, fishing gears, small livestock Damage to village embankment	Villagers and poultry	Prevention and precaution practice to minimise damage and risks	Building more higher village embankment and infrastructure Constructed disaster resistance building or place Attend Community based disasters risks management training and apply in the village
Fishers					
Cyclone	Fishing boats and nets damaged All houses are damage Cattle lost Road damage	Every two to three years	Villager and fishers	Plantation of mangrove forest Listing to early warning announcement, Move to safe area Keep store fishing net and boats	To build cyclone shelter Mangrove forest planting More effective early warning system are needed.
Storm	Fishing boats and nets damage All houses are damage Cattle lost	Every year in pre monsoon season	Villager and fishers	Prepare houses to be strong enough Prepare life saving equipment while/for fishing	Mangrove forest planting and protection
Flood	Difficult to move in the village one place to another Can't fishing	About 3-4 feet flooded in the village Every year in pre monsoon season	Villager and fishers	Rise to house foot/base Move Cattle to safe place Rise to village road.	To construction Embankment (protect river water enter to village)
High temperature	Rise sea level can not working in full time Catch rate decrease Difficult drink water	Increase year after year	Villager and fishers Especially older people and child.	Stay under the shelter	Planting tree for shelter To control mangrove forest Health for older people and child. Digging more fresh water pond by Gov/ NGOs

Table 12.14. Summary Problem census (Fishing group) Wa Kauk Gyi village

Fishers	Who	When	Impact	Cause	Solution
Lack of Investment Investment money for fishing gear	fishers	Year round	Fishers family	Difficult to get advance money with high interest rate High interest rate High price for material	To provide long term low interest microfinance. To provide fishing gear and boat by NGOs and other organisation
Market	Fishers	Year round	Fishers family	Catch are selling to only money lender	To set up revolving fund provide by Government /NGOs To set up village community own collecting centre
Fishing ground	Fishers	Year round	fishers	low water in River (unable to fish) Too far from village Need fishing gears and boat are strong enough	To support low interest rate microfinance To support community revolving fund
Decrease catch rate	Fishers	Year round	Fishers family	Climate change Low water in river Damage mangrove forest	Control and replanting of mangrove forest and habitat
Lack of technology	Fishers	Year round	Fishers family	Using traditional fishing method Lack of technology for alternative livelihood	To provide training program for alternative livelihood To support Training and demonstration of new fishing technology To provide fish handling and value added fisheries product training program

APPENDIX 13: SUMMARY OF KEY FINDINGS OF DOF INDIVIDUAL CAPACITY ASSESSMENT FOR FISHADAPT PROJECT.

Summary of Key findings form PPG DOF Individual Capacity needs assessment and Climate Change Adaptation in the sector.

13.1 Background

During the PPG phase of the project assessment rapid capacity needs assessments were undertaken with DOF staff in order to better understand their capacity to support the work of the project on climate change adaptation and fisheries and aquaculture, and to understand better their individual capacity development needs. This work involved focus group discussions during feedback meetings, a questionnaire to staff in the pilot districts and a SWOT analysis¹. Due to time limitations it was not possible to fully analyse responses nor to fully develop a CD plan which will be prepared during implementation. The findings reported here are to inform initial planning.

13.2 The staff of DOF.

There are 2,126 staff employed by with 285 Officers and 1,417 support and general staff with 424 paid on daily basis. In the pilot Districts there are 14 officers in Rakhine, 25 in Yangon and 31 I Ayeyarwady. Approximately half the staff are women.

Table 13.1. DOF staff by State Region and level showing staff numbers in pilot states (August 2015).

	State and Region	Officers	Support/General Staff	Daily Waged staff	Total
1	Nay Pyi Taw Head Office	97	448	44	589
2	Nay Pyi Taw DOF	9	40	4	53
3	Kachin State	7	50	9	66
4	Kayin State	9	10	6	25
5	Kayar State	3	11	2	16
6	Chin State	5	18	12	35
7	Mon State	11	42	10	63
8	Rakhine State	14	114	70	198
9	Shan State	7	28	11	46
10	Sagyne Region	14	86	26	126
11	Bago Region	18	102	41	161
12	Yangon Region	25	131	37	193
13	Tanintharyi Region	15	56	23	94
14	Magwe Region	7	26	14	47
15	Mandalay Region	13	106	28	147
16	Ayeyarwady Region	31	149	87	267
	Total	285	1417	424	2126

DOF staff individual capacity development needs assessment findings.

DOF staff in the project pilot areas of Rakhine, Ayeyarwady and Yangon took part in a training needs assessment by survey questionnaire. A range of questions related to their current work and tasks, their understanding of Climate Change Adaptation and their perceived CD needs were asked. 52 out of a total of 75 responses were received.

¹ 2015 . Institutional, policy and capacity assessment of the DOF Myanmar report for Fishadapt PPG. FAO Myanmar.

General Individual Capacity development needs : The majority of staff are educated to Diploma (4%) , Bachelor (95%) or Masters (1%) level (though not specifically in fisheries). The top areas for existing and general work-related capacity development identified by staff included fisheries management (100%), the role of fisheries and aquaculture in income generation (90%) and the role of fisheries and aquaculture in food security/production (82%) with similar needs expressed by men and women.

Most staff (65%) also identified monitoring climate impacts on the sector as an important area where they required capacity development.

With respect to training approaches required most preferred workshops followed by hands on training, study tours and technical training.

Fig 18. Technical knowledge gaps identified by respondents (as % of total respondents)

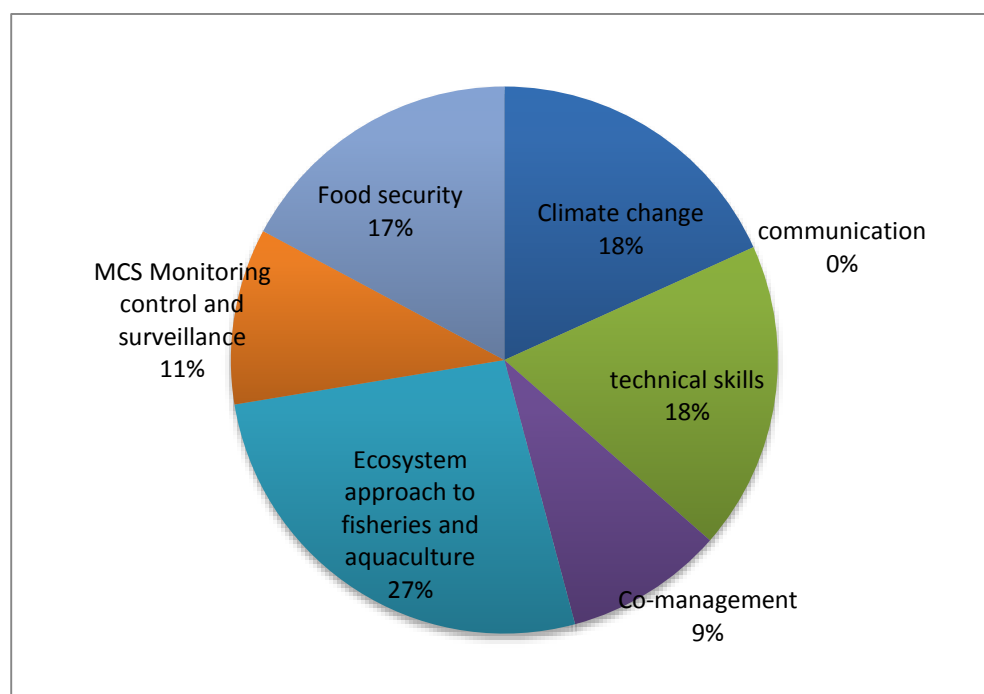
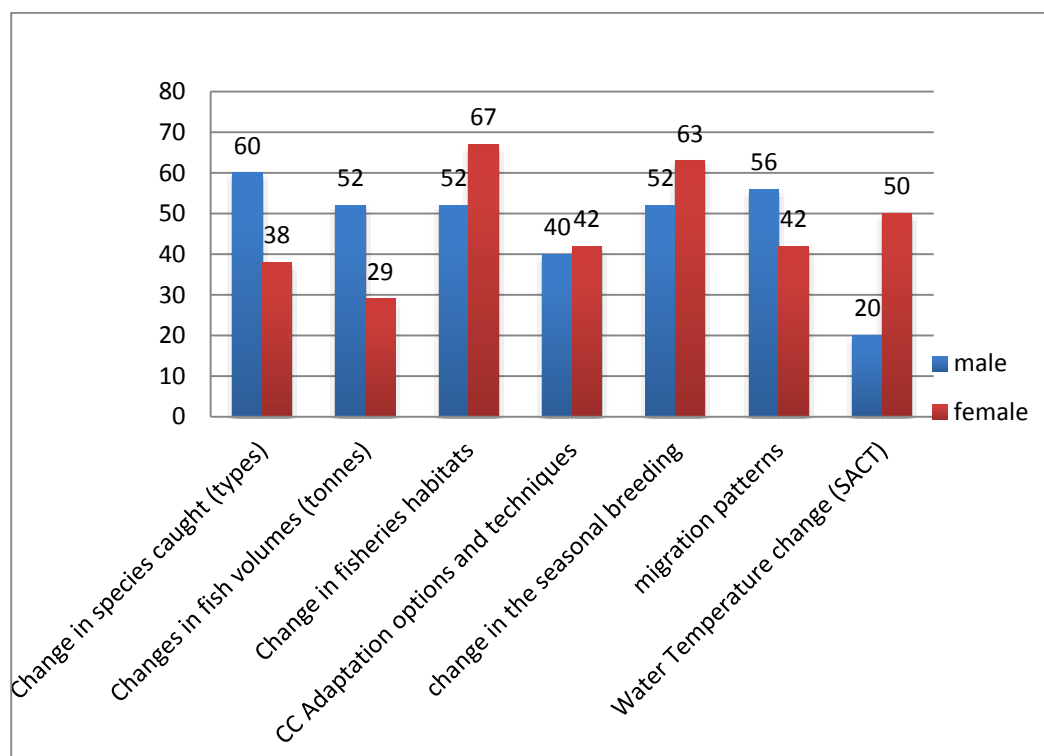


Fig 19. Technical constraints where knowledge of staff needs to be strengthened (as a % of respondents).



Coordination: Coordination was recognized as a key area to strengthen but also as an area where they needed capacity development support. Respondents saw coordination on climate change and with DMH as key.

Fig 20. Analysis of where Coordination can be best strengthened (as a % of respondents).

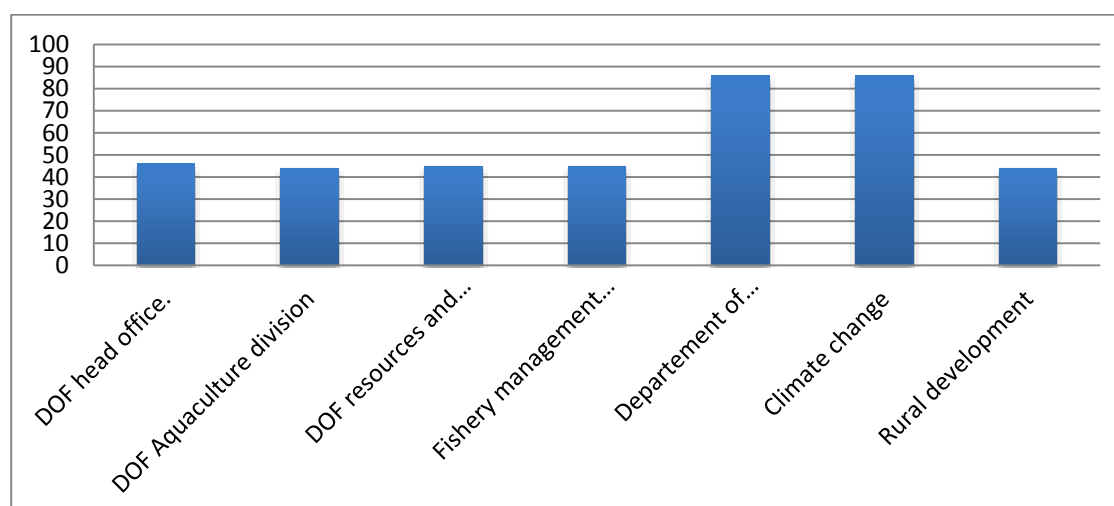
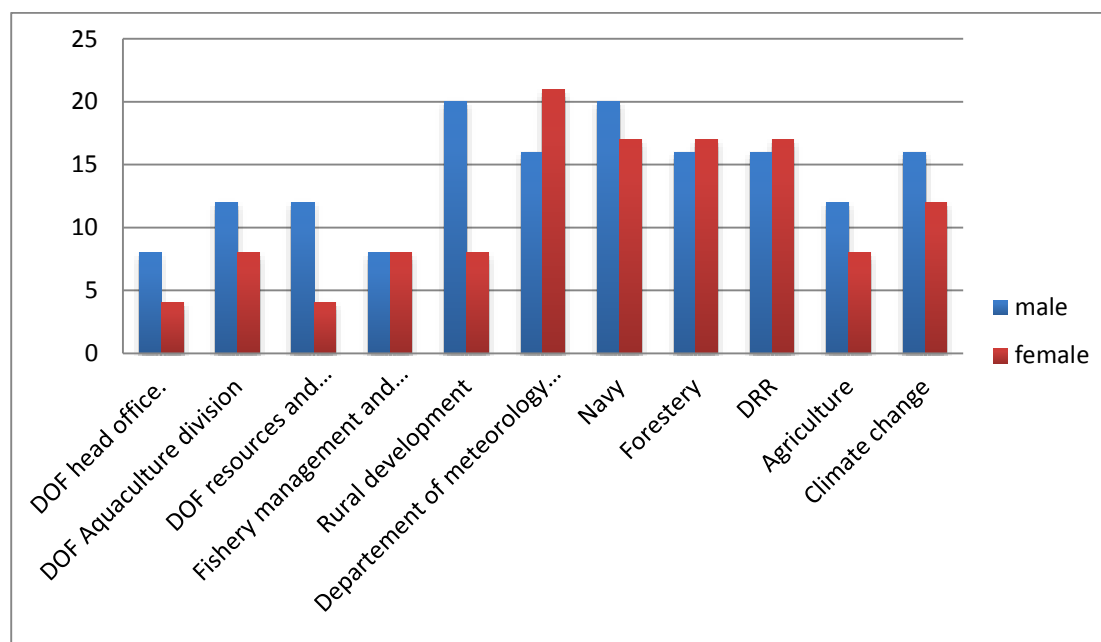


Fig 21. Organizations with whom coordination needs to be strengthened to address CC adaptation.



13.3 DOF staff SWOT analysis of key issues relating to the project implementation

During the PPG phase of the project DOF staff carried out a SWOT analysis in relation to the project implementation.

The SWOT analysis is below but they can be summarized as follows :

- Coordination is seen as important at many levels for project implementation. It does need strengthened and to include partners.
- Organizational structures at all levels (DOF, communities) are an asset though they need strengthened. DOF staff are enthusiastic for the project.
- Existing planning structures in place (to township level) which can be strengthened. Plans don't tend to be implemented well.
- CCA policies, plans and strategies for the sector are missing
- CCA capacity is missing in the sector (technical and human)
- Some planning does take place but this needs to be strengthened and informed by good data.
- There are some data but in general this is also missing at different scales. Research is needed to strengthen the CCA science base and to inform decision making.
- Global and national level interest in the issues.
- A range of external threats include : Political situation, lack of technical knowledge, lack of awareness be decision maker, limited budget and issues around slow decision making by ministers.

APPENDIX 14: SUMMARY OF DRAFT PROCESS FOR FISHADAPT WORKING WITH DOF OFFICERS AND PARTNERS.

The following tables contain the draft summary of the Fishadapt process working with DOF staff at township, District and community level.

Table 14.1 Township level engagement

Fishadapt inputs	Township activities	Outputs
<u>1 Training (by project and from partner under LOA)</u> Climate Change Adaptation and planning(VA) Fisheries Management (EAFM) and Fisheries Co-Management Aquaculture development and Climate Change Adaptation (EAA Training Training in FISHADAPT village methodology and procedures PRA and community mobilisation Technical topics as identified. Refresher training as required <u>2. Training follow up</u> FISHADAPT facilitators to support one cycle. FISHADAPT monitoring. <u>3. Resources</u> Costs of travel to village. Cost of meetings and expenses All materials for training community <u>4. Livelihood needs/inputs</u> Livelihoods inputs based on community plans (PRA	Participate in Training courses and develop plan with FISHADAPT Brief Township colleagues and raise advocacy of the project Organize coordination meeting with partners at township(MFF groups/ NGO/projects /Government/Worldfish, Universities ?) <u>Implement FISHADAPT approach. Including :</u> 1 Identify Villages for implementation using project criteria (Community approach) (and with NGO if there) 2 Agree plan with your supervisor, and FISHADAPT and arrange follow up facilitators. 3 Form community groups carry out PRA to identify stakeholders and target groups (Small-scale F and Aq, processors, Women, poor) (with support of NGO partners). 4 Develop participatory plans (gender sensitive) <ul style="list-style-type: none"> VA completed Participatory EAFM – EAA integrated CCA plan EWS (for selected communities) 5. Prepare request to supervisor and to FISHADAPT for approval of plan implementation 6 Coordinate implementation of approved plans (with partner/NGO as required) <ul style="list-style-type: none"> Fisheries and/or aquaculture groups formed Facilitation of implementation Coordination with FAO or NGO for livelihood support inputs Technical training as identified by community (SAS, Gear, post harvest etc.) Women's groups (remember) 	Improved knowledge for DOF staff in EAF/EAA/CCA Coordination with partners at Township level (awareness raising for the sector) Project implemented in at least 2 Villages in your township CCA plans developed and implemented Fisheries management plans developed and implemented. Aquaculture CCA plans developed and implemented. 2 Villages community development groups strengthened. Including one women's groups

Provided by FISHADAPT/FAO or Provided by NGO partner 5. For Some participating Townships New CCA technologies developed Resources for policy consultations and raising awareness of CCA	7. Follow up with community to ensure plans implemented 8. Monitor plan as required and prepare progress reports. <u>For Some participating Townships</u> Pilot new CCA technologies Run policy consultations and raise awareness of CCA Participatory identification of representatives for national CCA policy consultation (to District, State/Region and then National level <u>Participate in science based studies</u>	For some Townships New CCA technologies piloted Participate in policy consultations Science based studies completed
---	--	--

Table 14.2. District level engagement

Fishadapt inputs	Township activities	Outputs
<u>Training</u> Training for senior /supervisory staff in CCA/EAFM/EAA/ Training for senior /supervisory staff in FISHADAPT village method Training in policy mainstreaming (including CCA). <u>Training follow up</u> FISHADAPT District – State/Region facilitators to support FISHADAPT planning and implementation, and monitoring. <u>Resources</u> Costs of travel to FISHADAPT related meetings. Cost of meetings Expenses All materials for trainings, consultations and policy workshops. 5. For Some participating Townships	Participate in Training courses Carry out advocacy at (District – State/Region) Coordination meeting with partners at District – State/Region (MFF groups/NGO/projects/Government) Supervise/coordinate work of DOF Townships/Villages and collate reports (approve workplans./targets with FISHADAPT) Organize and participate in CCA planning meetings (eg NAP/MCCA/LIFT etc.) as high level support and advocacy.. Collate Township plans and develop VA and CCA implementation plan (for your District – State/Region) With FISHADAPT project team authorize/approve request from Township to FISHADAPT for plan implementation. Implement approved District – State/Region plans (with partner/NGO as required) Monitor and report all plans and follow up as required (including Partners at District – State/Region) Host FISHADAPT team/provide and workarea in District – State/Region as required, <u>For Some participating District – State/Region</u>	Improved knowledge for DOF staff in EAF/EAA/CCA Improved awareness of the fisheries and aquaculture sector in CCA planning at sub-federal level. Coordination with partners at Township level (awareness raising for the sector) Project implemented in at least xx Villages/Township/Regions/States, Districts, CCA plans (integrated EAFM/EAA) for your (District – State/Region) developed and implemented. xx,, Districts/Regions/States, carry out VA and develop and implement CCA plans (integrated EAFM/EAA) xx,, Districts/Regions/States, carry develop CCA gender strategies. <u>For Some participating District – State/Region</u> Policy mainstreaming (Xx Districts/Regions/States develop CCA strategies and revise laws and policies. New CCA technologies piloted Participate in policy consultations

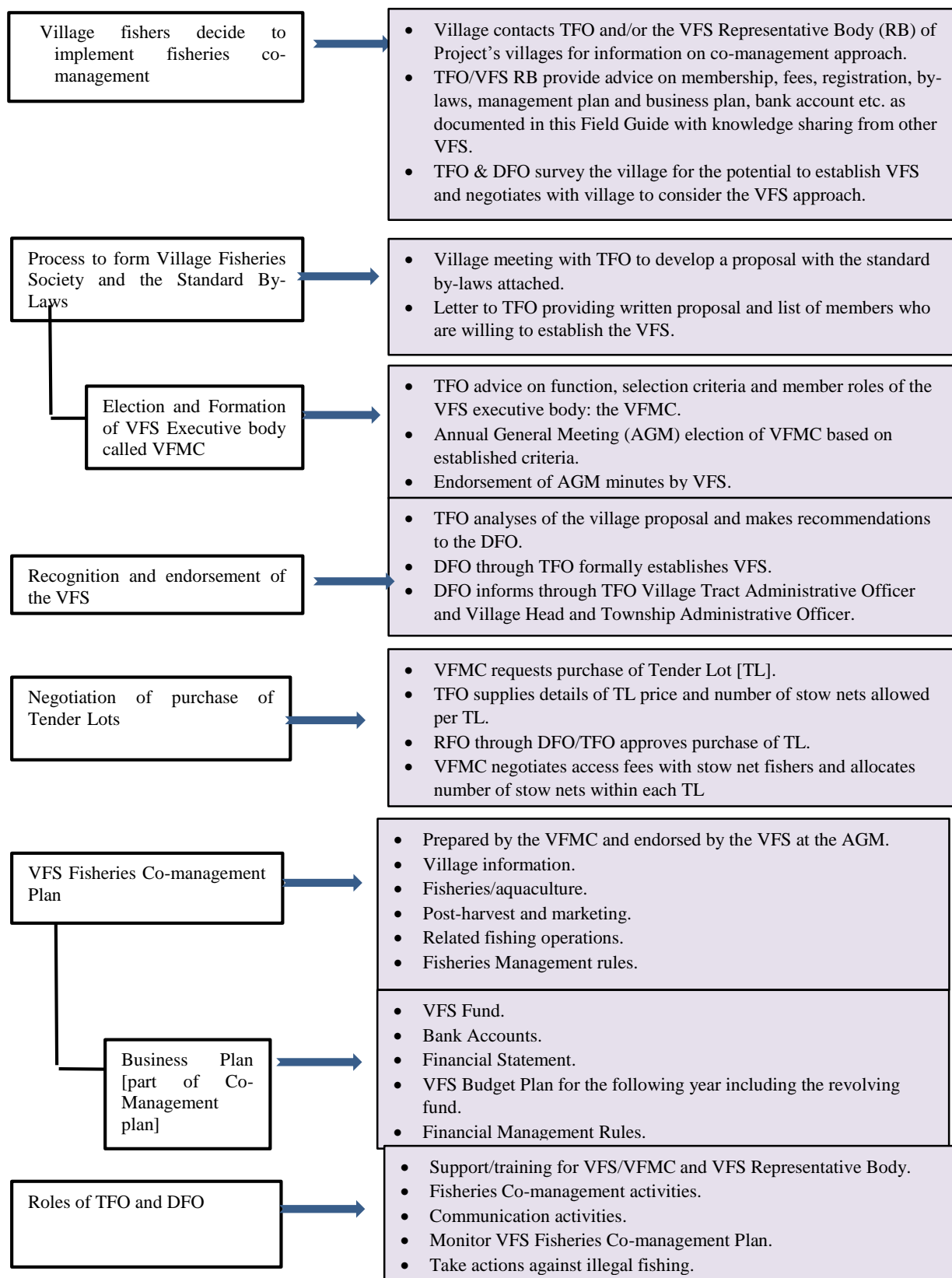
New CCA technologies for piloting Resources for policy consultations and raising awareness of CCA	<p>Coordinate piloting of new CCA technologies</p> <p>Run policy consultations and raise awareness of CCA</p> <p>Participatory identification of representatives for national CCA policy consultation (to District, State/Region and then National level)</p>	Science based studies completed
--	---	---------------------------------

Table 14.3. Community level engagement

Fishadapt inputs	Township activities	Outputs
<p><u>Community mobilization/PRAVA</u></p> <p>PRA at community by DOF (and NGO) community meetings</p> <p>Facilitation for group formation (if required and as identified in PRA (fisheries, Aquaculture, VD, Gender)</p> <p>Group planning support (CCA/VA, fisheries and aquaculture,VDG womens group)</p> <p>Plan implementation support (priority to Fi and Aq, VDG and</p> <p><u>Training</u> Awareness raising of CCA/VA and EAFM/EAA.</p> <p>Training in technical topics as identified.</p> <p><u>Resources</u> Costs of participation in meetings. Cost of meetings</p> <p>All materials for training and group formation (enabling).</p>	<p>Participate in project PRA and awareness raising activities. Including EAFM, EAA and CCA. Focus on vulnerability reduction to CCA.</p> <p>Agree key vulnerability related issues in fisheries and aquaculture and CCA and how to address these.</p> <p>Form groups (<u>or agree to participation/strengthening of existing groups</u>) for example</p> <ul style="list-style-type: none"> • Fisheries management (eg stow net approach)/CCA • Aquaculture /CCA • VDG/CCA • Women's group/CCA • Processors/CCA • Inputs suppliers/CCA • Credit and microfinance/CCA • etc. <p>Develop and agree as a community and in coordination with other partners working there, participatory implementation plans with DOF and partners. Identify success indicators.</p> <p>Implement agreed plans with DOF (and NGO and FISAHDAPT)(based on existing FAO/GOM approach)</p> <p>Participate in training and extension activities (fisheries and aquaculture and other technical areas)</p> <p>Participate in exchange schemes with other communities</p> <p>Monitor plans and follow up as required</p> <p>Resolve community internal conflicts should they arise</p>	<p>Improved knowledge for community /fishers/fish farmers in CCA, (fisheries, aquaculture etc.)</p> <p>Village CCA plan(s) developed and implemented (including VA/EAFM/EAA). .</p> <p>Vulnerability to CC impacts reduced.</p> <p>Villages community development groups strengthened. Including one women's groups</p>

<p><u>Livelihood needs/inputs</u> Livelihoods inputs based on community plans. Provided by FISHADAPT/FAO or Provided by NGO partner</p> <p>5. For Some participating Townships /communities</p> <p>Piloting of new CCA technologies Policy consultations and raising awareness of CCA</p>	<p><u>For Some participating</u> District – State/Region</p> <p>Participate in piloting of CCA technologies for fisheries and aquaculture Participate in policy consultations (Participatory identification of representatives for national CCA policy consultation (to District, State/Region and then National level) <u>Participate in science based studies</u> Participate in EWS Participate in PME for climate</p>	<p><u>For Some participating</u> District – State/Region New CCA technologies piloted</p> <p>Communities empowered and participating in policy development.</p> <p>Science based studies completed</p>
---	---	--

APPENDIX 15: DRAFT STEPS FOR INTRODUCING THE VILLAGE-BASED CO-MANAGEMENT APPROACH, KEY PROCESSES KEY ACTIONS.



APPENDIX 16: DETAILED DESCRIPTION OF MYANMAR FISHERIES AND AQUACULTURE SECTOR

Myanmar Fisheries and Aquaculture Sectors

Myanmar is endowed with abundant and diverse aquatic systems with 2,400km of coastline facing the Bay of Bengal and the Andaman Sea. It has an extensive river and lake system¹. The main rivers include: the Ayeyarawady River, stretching over 2,000 km and draining 58% of the country, the Sittaung (5.4%); the Thanlwin (18.4%); the Mekong (4.2%); the Rakhine (Arakan) coastal basin in the west, which drains into the Bay of Bengal, and; the Tanintharyi (Tenasserim) coastal basin in the south, which drains into the Andaman Sea. Prominent lakes include Inle Lake in Shan State, and Indawgyi Lake in Kachin State².

According to the Union of Myanmar Fishery Sector statistics (2015), an estimated *one million people directly and three million people indirectly are involved in the fisheries and aquaculture sector* which is a critical contributor to Myanmar's food and nutrition security. The small-scale components of these sectors are significant given local dependence on them. Both aquaculture and capture fisheries make a significant contribution to GDP (approximately 9%). The sector also contributes to the livelihoods of rural people/coastal and inland fisheries and aquaculture sector, through fish processing, trading, and fishing boat manufacturing.

Fish, in particular, is an important staple in the diets of Myanmar people and often their only source of animal protein. In 2015, the estimated per capita consumption was 61 kg/capita/year (although lower estimates have been suggested³). This positions the fisheries and aquaculture sectors as an important component of the country's food and nutrition security efforts.

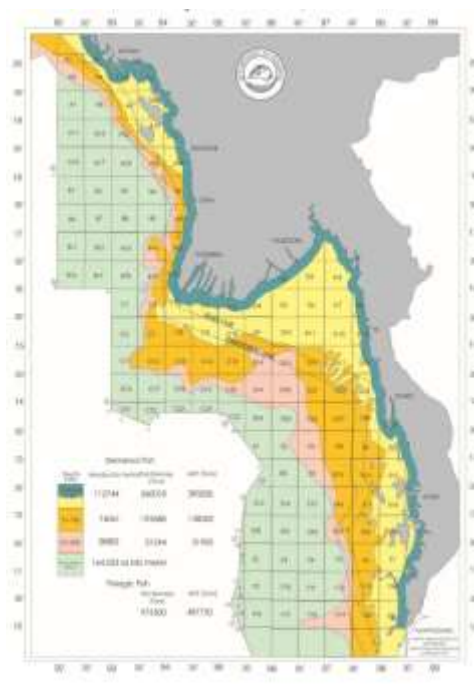
Figure 22. Myanmar Fishing grounds, Biomass, MSY and surveyed areas⁴.

¹ 2015. Fishery statistics 2015. Union of Myanmar, Department of Fisheries.

² 2011. FAO Aquastat. Myanmar report (accessed 10/2015).

³ Some analysis suggests lower figures for example, 2014. Needham, S. & Funge-Smith, S. J. The consumption of fish and fish products in the Asia-Pacific region based on household surveys". FAO Regional Office for Asia and the Pacific, Bangkok, Thailand . RAP Publication 2015/12. 87pp

⁴ 2015. Fishery statistics 2015. Union of Myanmar, Department of Fisheries.



Myanmar's fisheries and aquaculture sector includes marine, coastal and inland areas.

In the last ten years, fish production has seen steady growth across the fisheries subsectors (see Table 1.2). However, this increasing catch is putting more pressure on the natural aquatic resource base. During consultations with communities during the project preparation phase IUU and overexploitation of resources was reported by fishers. The Government has had difficulties in finding lessees for recent fishery leases as the fisheries resources of the inland or coastal area for lease have degraded and, thus, are less attractive for leasing. It should be noted that analysis of the data collection systems in Myanmar suggests current reporting systems overestimate catch reporting and improved statistics will be supported by this and other projects¹. In addition recent (unpublished²) surveys by the RV Nansen (2014 and 2015) as part of the BOBLME project and supported by Norway suggested a significant decline in marine fishery stock since the previous assessment.

Table 16.1 Myanmar fishery and aquaculture production by year (2003/4 till 2014/15)

Fishery Production (Source: DOF statistics) (1,000 metric tons)						
	Year	Total	Aqua- culture	Leasable Fisheries (inland)	Open Fisheries (inland)	Marine/ coastal Fisheries
1	2002-03	1595.87	252.01	109.53	180.61	1053.72
2	2003-04	1986.96	400.36	122.28	331.98	2232.34
3	2004-05	2217.47	485.22	136.79	366.75	1228.71
4	2005-06	2581.78	574.99	152.69	478.43	1375.67
5	2006-07	2859.86	616.35	170.10	548.09	1525.32
6	2007-08	3193.92	687.67	191.05	625.44	1689.76
7	2008-09	3542.19	775.25	209.72	689.71	1867.51

¹ 2014. Review of fisheries data collection systems in Myanmar. BOBLME project. FAO RAP.

² 2014, 2015. Survey of Myanmar waters by the RV Nansen. In preparation (FAO, GOM, GON)

8	2009-10	3921.97	858.76	237.46	764.97	2060.78
9	2010-11	4163.46	830.48	250.04	913.12	2169.82
10	2011-12	4478.21	898.96	282.64	963.82	2332.79
11	2012-13	4716.22	929.38	290.00	1012.97	2483.87
12	2013-14	5047.53	964.26	304.44	1076.59	2702.24
12	2014-15	5316.95	999.63	315.36	1147.76	2854.20

Inland Aquaculture

Inland aquaculture has great potential to increase the adaptive capacities of rural communities through, for example, livelihood and food diversification and through the development of more resilient productions systems.

According to Union of Myanmar statistics,¹ most of the aquaculture practiced in Myanmar is land based and conducted within earthen ponds. As of 2014-15, the total pond area was ca.185,000 hectares consisting of around 90,000 ha fishponds and 90,000 ha of shrimp ponds. Freshwater aquaculture is the major source of country's aquaculture production with Rohu (*Labeo rohita*) as the dominant culture species. Other commonly cultured species include Chinese carps, major carps, some catfishes, tilapia and freshwater prawns.²

Much of Myanmar's aquaculture uses a monoculture approach, which may be efficient from a production perspective but also renders the sector highly vulnerable to changes in environmental and market conditions and where productivity may be constrained by the availability of low-cost feeds. There are 27 private feed mills producing feed pellets, feed formulae and feed conversion ratios that are not yet optimized, leaving room for untapped but potential resource efficiency gains.

For aquaculture feed, both small-scale and commercial private sector freshwater fish farms utilize farm-made feeds from locally available ingredients--such as rice bran and groundnut cake.

Diversification of production through polyculture and integrated aquaculture systems is being encouraged, which will increase the resilience of aquaculture farms to such shocks and may contribute to increased ecosystem services from within the ponds.

Efforts are underway to develop more small-scale aquaculture production (Small-scale production of Small Indigenous Species [SIS] in rice paddy). Indeed, many farmers practice small-scale SIS stocking in household ponds.

Despite this potential to harness Myanmar's considerable range of living aquatic resources from its freshwater environments (especially floodplains), strict controls on the conversion of rice lands into other uses (especially aquaculture) and a lack of integrated water management planning, may be the largest constraints to adaptation in the aquaculture sector. Therefore, a review of current land and water use policies to support adaptation actions, such as flexible land use planning to allow for optimal pond siting, conversions to aquaculture from other land uses and development of integrated rice-fish systems, *as well as for holistic environmental and social impact assessments of water use options*, is necessary.

Marine/coastal aquaculture

¹ 2015. Fishery statistics 2015. Union of Myanmar, Department of Fisheries.

² 2014. Review of fisheries data collection systems in Myanmar. Bay of Bengal LME project. FAO.

Coastal aquaculture in Myanmar is mainly limited to shrimp farming, with small quantities of mud crabs and groupers being produced in pens and cages. Marine shrimp farming, with particular reference to black tiger shrimp (*Penaeus monodon*) and white shrimp (*P. Vannamei*) under extensive and traditional systems, is practiced mostly in Rakhine State.

Soft-shell mud crab production and crab fattening is becoming more popular as they increase market value of crabs caught. Myanmar has no experience or in-country technologies for farming oyster mussels, cockles, or clams. Marine seaweed culture (e.g., *Eucheumasp.* for carrageenan production) is being tested in the southern part of the coastal area but is yet to become significant commercially.

The coastal aquaculture sector contributes significantly to export earnings and shows potential for future development and diversification – but *careful attention is needed to ensure its resilience to climate change*. For example, disaster risk management planning is not currently integrated into aquaculture development planning and there is a lack of technical knowledge of potential hard (e.g. cage strengthening) and soft (e.g. mangrove-fringe forestry) exposure reduction options and a need for better-informed site planning to render climate resilient coastal aquaculture systems. In addition, there is little documentation of potential impacts of the slow-onset changes, such as sea level rise and changes in water temperatures and alkalinity on aquaculture development, and how the different sub-sectors are more or less vulnerable to these risks and which sectors should be promoted in the face of new opportunities.

The government operate a range of support activities, which include operation of production hatcheries. For fish, the government operates 26 hatcheries in 11 States/Regions and 6 hatcheries for shrimp.

Coastal aquaculture in Myanmar has significant potential to provide further contributions to economic growth and food and nutrition security as well as to provide adaptation options for other sectors. However, the sector is facing risks related to changes in water availability and quality, increases in fish diseases linked to higher temperatures, and direct exposure to floods, sea surges and cyclones. These *risks are compounded by current institutional and management frameworks* and by a *lack of* understanding of how the different aquaculture production systems, and the communities' dependent on these, *are vulnerable to climate-driven changes*.

Inland capture fisheries

Myanmar has extensive capture fisheries in its freshwaters. For management (licensing/regulation) purposes, Myanmar divides its inland capture fisheries into two main categories: i) Leasable Fisheries, and ii) Open Capture Fisheries.

i) Leasable Fisheries

Leasable (or “*Inn*”) Fisheries refer to fishing activities for which fishing rights are granted under a lease, via auction, by the DOF to individuals or groups who possess means to operate and sustain the designated fisheries resources. Leasable Fisheries are conducted almost exclusively in the key fishing grounds on floodplains. More than 50 percent of Leasable Fisheries licenses are located in Ayeyarawady Division, in the lower floodplains and delta of the river. The peak season involves capturing fishes migrating off the floodplain at the beginning of river drawdown. By regulation, the lessees must release some fish fry or fingerlings to their lot to sustain the stock once the floodwaters have risen: but the numbers, size or species to be stocked is neither defined nor monitored closely. In an attempt to maintain and increase productivity of Leasable Fisheries, DOF and private hatcheries have provided quality freshwater finfish stock during the early period of a rainy season in the past two decades, to counter-balance the potential high mortality due to carnivorous nature of fishes. On the other hand, there are leasable fisheries that

are dependent entirely on natural recruitment of indigenous species and in exceptional cases on exotics such as Tilapia (*Oreochromis niloticus*).

Leasable fisheries mainly contribute to the livelihoods of large commercial operators or institutions but depending on the management of the system can also support large numbers of sub-lessees and fish sellers. The nationwide number of Leasable Fisheries licenses dropped from 4,002 in 1970 to 3,458 today. The decrease is due to unsuccessful auction of the licenses due to decreases in fish productivity, which is potentially linked to adverse impacts of climate change and variability, including sedimentation from the change of river water current, flood and inundation, fish habit change, and extermination of some endemic fish species. In addition to providing quality finfish culture as above, DOF is also extending the lease period to up to 9 years to promote improved long-term management, though no clear improvement is yet to be reported.

ii) Open Capture Fisheries

Open capture fisheries refers to fishing in all other inland areas including rivers, reservoirs and seasonal or perennial flooded areas. Fishing rights are granted by issue of fishing licenses, including a set fee for most licenses. Some of the larger gears, particularly "bag-nets" set in rivers, are allocated by a tender system ("tender lot" fisheries). Fees are variable between regions according to production and capacity. In order to maintain the sustainable fishery resources in Open Fisheries, DOF conducts the stocking of quality fish seeds every year in all open fishery water bodies. However, little to no information is collected on the status of the target species and the fisheries activities nor is significant information collected on the consumption of fish and the nutritional benefits derived from these. In addition, the DOF has limited extension staff and has little opportunity to gather information on the dispersed fishing activities that are occasional, seasonal or rice paddy fishing.

The fishing techniques used in inland fisheries include drift net, gillnet, traps and pots, pole-and-line, stationary traps, and bamboo stake traps in the near shore of rivers, with an estimated landing of freshwater fish and prawn in the order of 1.147 million tonnes in 2015. The reported trend is increasing. Officially, it is a requirement for all licenses that holders report their catches, although in practice, this is only likely for the larger leasable fisheries and larger fixed gear fisheries. This is one source of underestimation of the actual status of the production from inland fisheries. The entire fishery is closed during June to August (to allow spawning and recruitment). In practice, this is probably enforced only for the *Inn* fishery, tender lot fisheries and larger gears. The small-scale fishery occurs year-round and is considered technically "illegal" during these months. Knowledge on the impact of changing water flows and temperatures on reproductive cycles is lacking and, therefore, fixed temporal and spatial management tools risk-causing hardships for the dependent communities, while not producing desired biological improvements.

In recent years under the "Environmentally Sustainable Food Security Programme" (ESFSP) and with support from the Italian government, the FAO DOF project "**Village-Based Freshwater Fisheries Co-management Approach for Open Waters**" has developed and successfully piloted a process based on co-management to support joint management of these resources. Under this approach, Village Fisheries Societies (VFS) are the driver of Co-management and provide village fishers a greater stake in the management of their fisheries resources. Each Village Fisheries Society developed a Village Fisheries Co-management Plan, which includes a Business Plan, for the sustainable management of its operations. By-laws for VFS and rules for management were key success factors. The transfer of fishing rights to the VFS (by the Ayeyarawady Regional Government) improved the fishing rights of the village fishers. The management of Tender Lots by the VFS enables the fishers to obtain greater benefits through higher prices and reduced costs bypassing intermediaries who previously owned the Tender lots. Livelihoods are strengthened

through VFS to fund fisheries operations through the VFS Fund. Value-added activities provide village households with greater income and ascertain stability, particularly to women's groups. Villages understand the impacts of their actions on the environment and the need for management action for limiting overfishing and illegal fishing. The villages undertook mangrove rehabilitation as well as terrestrial plants for firewood. The key roles of the government agencies are to endorse, support and nurture the VFS and its activities, transfer-fishing rights through Tender Lots to VFS, keep in regular contact with VFS, providing action on illegal fishing.

ii) Marine/coastal capture fisheries:

Myanmar's 2400 km long coastline can be divided into three regions: the Rakhine Coastal Region (from the mouth of the Naaf River to Mawtin Point, about 740km in length), the Ayeyarwady Delta and the Gulf of Mottama (Martaban) Coastal Region (from the Mawtin Point to the Gulf of Moattama, about 460km in length) and the Thainintharyi Coastal Region (from the Gulf of Moattama to the mouth of the Pakchan River, about 1,200 km in length) in the Bay of Bengal and in the Andaman Sea. With the long coastline, several large estuarine, delta systems and numerous offshore islands,

Myanmar possesses a considerable diversity of coastal habitats, including coral reefs, mangroves, sandy beaches and mudflats. The Ayeyarwady River, one of the largest rivers in Southeast Asia, feeds the vast Ayeyarwady delta area dominating the central part of the country.

Marine capture fisheries can be categorized into two main type, including i) inshore fisheries and ii) offshore fisheries. This project is mainly concerned with the inshore fisheries also known as coastal fisheries, which are the most productive and where the fishing vessels operate within 10 km from the shoreline in the northern area and ten nautical miles in the southern area.

Fishing vessels range from the traditional and/or small-scale type to Commercial vessels of up to thirty feet using engines not more the twelve horsepower. Under the Marine Fisheries Law, artisanal fishers are given priority to fish in all zones. Marine fisheries management plans determine Maximum Sustainable Yield (MSY), season and area closures, and prohibited fishing gear.

Fisheries management

Myanmar has specific management measures in place. These include that Commercial fishing vessels, such as trawlers and fish purse seiners, are prohibited from fishing less than five nautical miles from shore.

Identified nursery areas are protected to ensure survival of juveniles of commercially important fish species. This includes one fishing ground in Rakhine area, four fishing grounds in Ayeyarwady, two fishing grounds in Mon and two fishing grounds in the Tanintharyi region, which have all been declared as closed fishing areas for 3 months (June to August) annually.

Two fishing zones have been established through a licensing scheme whereby zones are designated for specific fishing gear, classes of fishing vessels and ownership. The two fishing zones are:

- Zone 1, extending from the shoreline to 10 nautical mile in the all coastal area and
- Zone 2, from the outer limit of the Fishing Zone 1 out to the EEZ limit.

Marine fishing activities are controlled by the licensing and registration system under the current *Fisheries Law and the Foreign Investment Law 1995*. Pair trawling, electric fishing, fishing using poisons, chemicals and explosives, and motorized push nets are all banned in Myanmar. A moratorium has been placed on new or additional fishing licences. This is to ensure that the

current fishing pressure on coastal fisheries resources will not be increased. Current licences are issued annually, (1 Sept - 31 Aug for the deep-sea fishery, and 1 Apr - 31 Mar for the coastal fishery). The entry of new individuals into the fishing industry is controlled. Fishers must be registered and anybody working, living or staying on a fishing vessel must have a fisher's registration card.

Currently, there are neither individual transferable quotas (IQTs) nor total allowable catch (TAC) regulations in Myanmar's fisheries industry. Foreign fishing vessels, including joint ventures must obtain permission from the Department of Fisheries to operate in the fishery.

There is therefore a need for the project to evaluate and support adaptability and climate resilience of fisheries management frameworks.