



GLOBAL ENVIRONMENT FACILITY
INVESTING IN OUR PLANET

Naoko Ishii
CEO and Chairperson

August 25, 2016

Dear Council Member:

ADB as the Implementing Agency for the project entitled: ***Myanmar: Rural Productivity and Ecosystems Services Enhanced in Central Dry Zone Forest Reserves***, has submitted the attached proposed project document for CEO endorsement prior to final approval of the project document in accordance with ADB procedures.

The Secretariat has reviewed the project document. It is consistent with the proposal approved by Council in April 2016 and the proposed project remains consistent with the Instrument and GEF policies and procedures. The attached explanation prepared by ADB satisfactorily details how Council's comments and those of the STAP have been addressed. I am, therefore, endorsing the project document.

We have today posted the proposed project document on the GEF website at www.TheGEF.org. If you do not have access to the Web, you may request the local field office of UNDP or the World Bank to download the document for you. Alternatively, you may request a copy of the document from the Secretariat. If you make such a request, please confirm for us your current mailing address.

Sincerely,



Naoko Ishii

Attachment: GEFSEC Project Review Document
Copy to: Country Operational Focal Point, GEF Agencies, STAP, Trustee



GEF-6 REQUEST FOR PROJECT ENDORSEMENT/APPROVAL

PROJECT TYPE: Full-sized Project

TYPE OF TRUST FUND: GEF Trust Fund

For more information about GEF, visit TheGEF.org

PART I: PROJECT INFORMATION

Project Title: Rural Productivity and Ecosystems Services Enhanced in Central Dry Zone Forest Reserves			
Country(ies):	Myanmar	GEF Project ID: ¹	9267
GEF Agency(ies):	ADB (select) (select)	GEF Agency Project ID:	
Other Executing Partner(s):	Ministry of Natural Resources and Environmental Conservation (formerly Ministry of Environmental Conservation and Forestry)	Submission Date:	2016-08-22
GEF Focal Area (s):	Multi-focal Areas	Project Duration (Months)	60
Integrated Approach Pilot	IAP-Cities <input type="checkbox"/> IAP-Commodities <input type="checkbox"/> IAP-Food Security <input type="checkbox"/>	Corporate Program: SGP <input type="checkbox"/>	
Name of Parent Program	[if applicable]	Agency Fee (\$)	454,750

A. FOCAL AREA STRATEGY FRAMEWORK AND OTHER PROGRAM STRATEGIES²

Focal Area Objectives/Programs	Focal Area Outcomes	Trust Fund	(in \$)	
			GEF Project Financing	Co-financing
LD-2 Program 3 (select) (select)	Improved forest management and/or restoration	GEFTF	477,200	20,000,000
LD-3 Program 4 (select) (select)	Support mechanisms for SLM in wider landscapes established	GEFTF	1,070,000	20,139,700
BD-4 Program 9 (select) (select)	Sector policies and regulatory frameworks incorporate biodiversity considerations	GEFTF	520,000	485,300
(select) CCM-1 Program 1 (select)	Accelerated adoption and management practices for GHG emission reduction and carbon sequestration	GEFTF	566,400	800,000
(select) CCM-2 Program 4 (select)	Policy, planning and regulatory frameworks foster accelerated low GHG development and emissions mitigation	GEFTF	566,400	2,275,000
(select) (select) SFM-3	Integrated landscape restoration plans to maintain forest ecosystem services are implemented at appropriate scales by government, private sector and local community actors, both women and men.	GEFTF	1,587,000	2,000,000
(select) (select) (select)		(select)		
(select) (select) (select)		(select)		
Total project costs			4,787,000	45,700,000

B. PROJECT DESCRIPTION SUMMARY

¹ Project ID number remains the same as the assigned PIF number.

² When completing Table A, refer to the excerpts on [GEF 6 Results Frameworks for GETF, LDCF and SCCF](#).

Project Objective: To enhance rural productivity and ecosystems services in the Central Dry Zone forest reserves through integrated approaches to natural resources management (NRM)						
Project Components/ Programs	Financing Type³	Project Outcomes	Project Outputs	Trust Fund	(in \$)	
					GEF Project Financing	Confirmed Co-financing
1. Soil and water conservation practices improved	TA	<p>1.1 Best practice and capacity building models in SLM /IWRM established and applied to at least 5,500 ha forest reserve and 5,000 ha of agricultural land around Mae Nyo Taung Forest Reserve (MNT FR) by 2022</p> <p>- avoided GHG emissions of 280,751 tCO₂e over 20 years from SFM</p> <p>- avoided GHG emissions of 195,301 tCO₂e over 20 years from CSA (IS/WRM)</p> <p>- net increase of at least 15% of annual gross agricultural income per participating household in villages and townships around MNT FR from baseline of USD 1,200, including at least 50% of female-headed households</p>	<p>1.1.1 Integrated assessments of degraded areas in the CDZ, covering soil, freshwater, forest ecosystems, biodiversity and landscapes</p> <p>1.1.2 Capacity development (field trials, training of trainers, etc.) conducted for men and women in DZGD and Forest Department on integrated soil and water management (IS/WRM) processes and remedial / intervention options (e.g. agronomy, vegetative rehabilitation and development, structural changes, management and institutional / policy measures)</p> <p>Gender indicator: 30% of government participants are women</p> <p>1.1.3 Technical assistance and training on IS/WRM provided for men and women from households in Mae-Nyo-Taung Forest Reserve and surrounding villages</p> <p>Gender indicator: 50% of community participants are women</p>	GEFTF	893,000	7,775,000
2. Biodiversity and Ecosystems Management Mainstreamed into	TA	2.1 Biodiversity and ecosystems values, management principles and targets	2.1.1 Technical staff from DZDG, Forest Department, Environment	GEFTF	500,000	500,000

³ Financing type can be either investment or technical assistance.

Forest Management Planning		<p>mainstreamed into strategic planning and operations of MONREC by 2022 (addressing Aichi Biodiversity Targets 2 and 14)</p> <p>2.2 Integration of Key Biodiversity Areas (KBAs) and community participation mechanisms into CDZ protected area and forest management planning systems by 2022</p>	<p>Conservation Department, local universities and other relevant institutions trained in KBA and ecosystems services assessments</p> <p>Gender indicator: 30% of government participants; and 50% of government participants, are women</p> <p>2.1.2 Status of biodiversity conservation priorities, including KBAs, reviewed and updated for CDZ</p> <p>2.2.1 Strategies and priorities to increase protection of high value species (e.g. Burmese Star Tortoise, Baer's Pochard etc) identified and mainstreamed into planning processes</p> <p>2.2.2 Forest management plans strengthened to integrate cross sector elements, including sustainable use and conservation of biodiversity, effective law enforcement mechanisms</p> <p>2.2.3 Gender-sensitive behaviour change communications and campaigns conducted to increase awareness and participation of communities in biodiversity and ecosystems management</p>			
3. Forest Ecosystems Rehabilitation and Management Scaled Up	Inv	<p>3.1 Model for SFM in dryland ecosystem demonstrated:</p> <p>- 1,750 ha of dryland forest restored / rehabilitated by 2022</p>	<p>3.1.1 At least 550 hectares for forest reserve under afforestation and at least 1,200 hectares of forest reserve under assisted natural</p>	GEFTF	2,950,150	34,175,000

		<p>- avoided emissions of 637,318 tCO₂e over 20 years</p> <p>3.2 Sustainable land and water management practices scaled up in agro-ecological landscapes</p> <p>- 50,000 ha with improved agricultural productivity and avoided GHG emissions of 1,708,875 tCO₂e over 20 years</p> <p>3.3 Sustainable forest management practices and biodiversity conservation scaled up in forest reserves, protected public forests, and protected areas</p> <p>- 300,000 ha of Permanent Forest Estate under strengthened conservation measures</p> <p>(addressing Aichi Biodiversity Targets 7 and 14)</p> <p>- 45,000 ha of degraded forest lands improved and leading to 2,998,541 tCO₂e in avoided emissions over 20 years</p>	<p>regeneration (ANR) in Mae-Nyo-Taung Forest Reserve</p> <p>3.2.1 Replication and scaling up strategy, including codes of conduct and best practices in IS/WRM, SFM/REDD+, biodiversity conservation (based on testing under Component 1)</p> <p>3.2.2 Training and extension support on IS/WRM (e.g. agroforestry, crop diversification, post harvest handling, water storage, small scale irrigation etc),</p> <p>3.2.3 Small scale investments in remedial / rehabilitation of infrastructure in communities in and around additional selected forest reserves, protected public forests and PAs in the CDZ.</p> <p>3.3.1 Technical assistance and training on SFM and biodiversity conservation approaches communities in and around selected forest reserves, protected public forests and PAs</p> <p>3.3.2 Establishment of pilot payment for forest and water ecosystems services at one candidate site</p>			
4. Policy and Knowledge Management Capacity Strengthened	TA	<p>4.1 Cross sector policy reform priorities related to land use, water use and agricultural development in CDZ defined and subject to</p>	<p>4.1.1 Policy study on land and water use and other subsidiary legislation conducted by 2018</p> <p>4.1.2 Stakeholder ministries, agencies,</p>	GEFTF	204,500	2,000,000

		public policy processes by 2022. (Addressing Aichi Biodiversity Target 2) Gender indicator: Determinants of women's empowerment in dryland ecosystems addressed in policy analyses and dialogue 4.2 Climate-sensitive integrated information management systems established and supporting decision-making processes within MONREC and relevant departments by 2022 Gender indicator: Sex-disaggregated data, and issues / concerns /determinants of women's empowerment in dryland ecosystems incorporated into system at level of DZGD	civil society and academe engaged in dialogue on revitalizing policy and legislative frameworks related to national resources management, including National Land Use Policy (2014), proposed Water Law and National Water Policy and other subsidiary legislation relevant to agricultural development and productivity (Addressing Aichi Biodiversity Target 2) 4.2.1 Functional integrated information management system on drylands ecosystems management operational by 2022 4.2.2 Baseline sub-national GHG inventory system, supported by monitoring, reporting and verification protocols developed for DZDG and relevant agencies, by 2022			
	(select)			(select)		
	(select)			(select)		
	(select)			(select)		
	(select)			(select)		
Subtotal					4,547,650	44,450,000
Project Management Cost (PMC) ⁴					(select)	239,350
Total project costs						4,787,000
						45,700,000

C. CONFIRMED SOURCES OF [CO-FINANCING](#) FOR THE PROJECT BY NAME AND BY TYPE

Please include evidence for [co-financing](#) for the project with this form.

Sources of Co-financing	Name of Co-financier	Type of Cofinancing	Amount (\$)
GEF Agency	Asian Development Bank	Loans	45,000,000
GEF Agency	Asian Development Bank	Grants	200,000

⁴ For GEF Project Financing up to \$2 million, PMC could be up to 10% of the subtotal; above \$2 million, PMC could be up to 5% of the subtotal. PMC should be charged proportionately to focal areas based on focal area project financing amount in Table D below.

Recipient Government	Ministry of Natural Resources and Environmental Conservation (Dry Zone Greening Department)	In-kind	500,000
(select)		(select)	
(select)		(select)	
(select)		(select)	
(select)		(select)	
(select)		(select)	
(select)		(select)	
Total Co-financing			45,700,000

D. TRUST FUND RESOURCES REQUESTED BY AGENCY(IES), COUNTRY(IES) AND THE PROGRAMMING OF FUNDS

GEF Agency	Trust Fund	Country Name/Global	Focal Area	Programming of Funds	(in \$)		
					GEF Project Financing (a)	Agency Fee ^{a)} (b) ²	Total (c)=a+b
ADB	GEF TF	Myanmar	Land Degradation	(select as applicable)	1,547,200	146,984	1,694,184
ADB	GEF TF	Myanmar	Biodiversity	(select as applicable)	520,000	49,400	569,400
ADB	GEF TF	Myanmar	Climate Change	(select as applicable)	1,132,800	107,616	1,240,416
ADB	GEF TF	Myanmar	(select)	SFM	1,587,000	150,750	1,737,750
(select)	(select)		(select)	(select as applicable)			0
(select)	(select)		(select)	(select as applicable)			0
(select)	(select)		(select)	(select as applicable)			0
(select)	(select)		(select)	(select as applicable)			0
(select)	(select)		(select)	(select as applicable)			0
(select)	(select)		(select)	(select as applicable)			0
Total Grant Resources					4,787,000	454,750	5,241,750

a) Refer to the Fee Policy for GEF Partner Agencies

E. PROJECT'S TARGET CONTRIBUTIONS TO GLOBAL ENVIRONMENTAL BENEFITS⁵

Provide the expected project targets as appropriate.

Corporate Results	Replenishment Targets	Project Targets
1. Maintain globally significant biodiversity and the ecosystem goods and services that it provides to society	Improved management of landscapes and seascapes covering 300 million hectares	300000 hectares
2. Sustainable land management in production systems (agriculture, rangelands, and forest landscapes)	120 million hectares under sustainable land management	55,000 hectares
3. Promotion of collective management of transboundary water systems and implementation of the full range of policy, legal, and institutional reforms and investments contributing to sustainable use and maintenance of ecosystem services	Water-food-ecosystems security and conjunctive management of surface and groundwater in at least 10 freshwater basins;	Number of freshwater basins
	20% of globally over-exploited fisheries (by volume) moved to more sustainable levels	Percent of fisheries, by volume
4. Support to transformational shifts towards a low-emission and resilient development path	750 million tons of CO _{2e} mitigated (include both direct and indirect)	5820786 metric tons
5. Increase in phase-out, disposal and reduction of releases of POPs, ODS, mercury and other chemicals of global concern	Disposal of 80,000 tons of POPs (PCB, obsolete pesticides)	metric tons
	Reduction of 1000 tons of Mercury	metric tons
	Phase-out of 303.44 tons of ODP (HCFC)	ODP tons
6. Enhance capacity of countries to implement MEAs (multilateral environmental agreements) and mainstream into national and sub-national policy, planning financial and legal frameworks	Development and sectoral planning frameworks integrate measurable targets drawn from the MEAs in at least 10 countries	Number of Countries: 1
	Functional environmental information systems are established to support decision-making in at least 10 countries	Number of Countries: 1

F. DOES THE PROJECT INCLUDE A “NON-GRANT” INSTRUMENT? No

(If non-grant instruments are used, provide an indicative calendar of expected reflows to your Agency and to the GEF/LDCF/SCCF Trust Fund) in Annex D.

PART II: PROJECT JUSTIFICATION

A. DESCRIBE ANY CHANGES IN ALIGNMENT WITH THE PROJECT DESIGN WITH THE ORIGINAL PIF⁶

A.1. *Project Description*. Elaborate on: 1) the global environmental and/or adaptation problems, root causes and barriers that need to be addressed; 2) the baseline scenario or any associated baseline projects, 3) the proposed alternative

⁵ Update the applicable indicators provided at PIF stage. Progress in programming against these targets for the projects per the *Corporate Results Framework* in the [GEF-6 Programming Directions](#), will be aggregated and reported during mid-term and at the conclusion of the replenishment period.

⁶ For questions A.1 –A.7 in Part II, if there are no changes since PIF, no need to respond, please enter “NA” after the respective question.

scenario, GEF focal area⁷ strategies, with a brief description of expected outcomes and components of the project, 4) [incremental/additional cost reasoning](#) and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and [co-financing](#); 5) [global environmental benefits](#) (GEFTF) and/or [adaptation benefits](#) (LDCF/SCCF); and 6) innovativeness, sustainability and potential for scaling up.

The original project design as presented in the PIF remains essentially the same. Co-financing from project executing partner, DZGD has doubled to USD 500,000.

Project preparation has; a) given more clarity and refinement to the approaches, b) sharpened focus on project areas, stakeholders and delivery mechanisms, and c) provided additional insights and data to support implementation. These are incorporated into the narrative on the **proposed alternative scenario**, below.

Summary of Main Modifications between PIF and Request for CEO Endorsement

Originally in PIF	In CEO Endorsement	Justification
Project area to cover “Forest Reserves” (FR) only	Project area expanded to cover Permanent Forest Estate (PFE), which included Forest Reserves, Protected Public Forests (PPFs) and Protected Areas (PAs)	The distinction between FRs and PPFs classification is one related to administrative process. Data on Permanent Forest Estate (PFE) is also fragmented and not easily accessible, so it is difficult to distinguish biophysical differences between FRs and PPFs, although PPFs are generally regarded to be at higher levels of degradation. Expanding the defined area of coverage allows the project to work in RFs, PPFs and PAs to facilitate replication and scaling up. This intends to: a) ensure that basic information is collected for the PFE across the CDZ (not only FRs), b) encourage spatial distribution of project interventions across the 3 regions in CDZ (Magway, Mandalay and Sagaing), c) increase accessibility to site(s) and population in surrounding land settlements, d) leverage capacity of District offices of DZGD and FD, e) seek potential overlap or proximity between RFs/PPFs to Protected Areas, and importantly, f) enhance potential to work in contiguous FRs, PPFs and PAs to establish corridors and promote ecosystem connectivity.
Project Outcome 1.1: “... 10,500 ha of dryland ecosystems”	Project Outcome 1.1 “...5,500 ha of forest reserve and 5,000 ha of agricultural land..”	Greater definition following project preparation activities.

⁷ For biodiversity projects, in addition to explaining the project’s consistency with the biodiversity focal area strategy, objectives and programs, please also describe which [Aichi Target\(s\)](#) the project will directly contribute to achieving..

Output 2.2 “At least one payment for forest ecosystems services (PFES) pilot scheme developed and tested.”	Now Output 3.3.2: “Establishment of pilot payment for forest and water ecosystems services at one candidate site”	Shifted due to better fit under activities for Component 3, as part of replication and scaling up (particularly the household survey and ecosystems assessment methodology done under the ADB RETA). Project preparation consultations favoured candidate site (subject to validation) as Popa Mountain Park where there is potential for both forest and water ecosystems services opportunities.
Output 3.1.1 “At least 750 hectares of forest reserve under reforestation and at least 1,000 hectares of forest reserve under ANR in Mae Nyo Taung FR”	Output 3.1.1: “At least 550 hectares of forest reserve under reforestation and at least 1,200 hectares of forest reserve under ANR in Mae Nyo Taung FR”	Due to limited forest land availability and to promote cost effectiveness (noting that GHG emissions reduction is not negatively impacted). Outcome remains the same: “1,750 ha of dryland forest restored /rehabilitated by 2022”
Outcome 3.3: “Sustainable forest management practices and biodiversity conservation scaled up in forest reserves and KBAs... 300, 000 ha with strengthened conservation measures...”	Outcome 3.3: “Sustainable forest management practices and biodiversity conservation scaled up in forest reserves, protected public forests, and protected areas... 300,000 ha of Permanent Forest Estate (PFE) under strengthened conservation measures”	Maintain consistency with the expanded definition of project areas (see above). Also PAs are subject to official gazetting, boundary demarcation and management planning, whereas KBA methodology has not gained wide currency as yet, and will be scaled up in the context of Component 3.

Project area

Boundaries of the Central Dry Zone have different demarcations depending on the institution or agency concerned. The dry zone for the LIFT Programme includes only the southern part of Sagaing region, most of Mandalay region, northwestern and southern parts of Magway region and the southeastern strip of Bago region. For purposes of the GEF project, 12 districts and 54 townships (excluding Gangaw district) within the regions of Mandalay, Sagaing and Magway will be considered as these are within the jurisdiction of the DZGD (refer to skeleton map below).

The GEF project was initially cast to support ecosystems services in areas designated as Forest Reserves (FR). Forests in Myanmar are classified under the Permanent Forest Estate (PFE), which includes: a) Reserve Forests (same as Forest Reserve), b) Protected Area System (falling under reserved forest), and c) Protected Public Forests (PPF). Information on the PFE (national scale) is presented below:

Permanent Forest Estate in Myanmar

Category	Number	Area (ha)	Percentage of land area
Reserved Forests	812	12,045,572	17.80

Protected Public Forests	326	4,731,669	7.0
Protected Areas	39	3,891,535	5.75
TOTAL		20,668,676	30.55

Source: FAO, 2016 p.5

The Forest Law 1992 further classifies “Reserved Forest” under: a) commercial reserved forest, b) local supply reserved forest, c) watershed or catchment protection reserved forest, d) environment and biodiversity conservation reserved forest, and e) other categories of reserved forest. In practice and in the Central Dry Zone in particular, these distinctions are often blurred. Given that the Myanmar Master Forest Plan seeks to expand coverage of all types of forests, and since the GEF project aims to support management of ecosystems, the scope of the GEF project will cover the Permanent Forest Estate, including reserved forests, protected public forests and protected areas in the Central Dry Zone.

For implementation, the GEF project will initially focus on one Forest Reserve (Mae Nyo Taung, Meikhtila District), and for scaling up activities under Component 3, provide coverage over at least 300,000 ha of the PFE – which will include Forest Reserves, Protected Public Forests and/or Protected Areas. This is elaborated below under the narrative for Component 3.

Capacity Development and Technical Assistance for Improved Rural Productivity

A proposed capacity development and technical assistance framework has been prepared based on intensive stakeholder consultations and literature reviews – presented in the table below. These have been crafted on the basis of a rapid gap analysis of existing programs within main departments of MONREC, and assessment of long term needs in the CDZ. Capacity development and technical assistance in this GEF project will be informed and guided by a number of knowledge resources and seminal works, including but not limited to:

ICRISAT Watershed Management in Dryland Ecosystems: Multipronged program aims to empower government technicians, researchers and extension specialists with new techniques and methods to manage watersheds to enhance and sustain crop productivity in semi—arid tropical areas of Asia (Wani, S.P. et al., 2002). A number of case studies offer institutional innovations and environmental governance tools, such as the consortium to manage Adarsha Watershed in India (Wani, S. P. et al, 2003).

World Overview of Conservation Approaches and Technologies (WOCAT): Offers a database on sustainable land management (SLM) technologies, approaches and methods supplemented by a number of case studies (www.wocat.net). (noting that a new knowledge portal will be launched soon).

FAO Climate Smart Agriculture (CSA) Sourcebook: CSA offers approaches to developing the technical, policy and investment conditions to achieve sustainable agricultural development for food security under climate change. The FAO has put together a comprehensive integration of these effects into national agricultural planning, investments and programs. The CSA approach is designed to identify and operationalize sustainable agricultural development within the explicit parameters of climate change (FAO, 2013).

IWMI Water Accounting+: Water accounting integrates hydrological processes with land use, water flows and services which result from water consumption in river basins. The objective of water accounting is to achieve equitable and transparent water governance for all users of water. It aims to promote a sustainable water balance. Water accounting is a process which assesses stocks, flows and consumption of water, and uses data sets related to available water resources, evapotranspiration, agricultural services, utilized flow, surface water, ground water, ecosystems services and sustainability (www.wateraccounting.org).

Mercy Corps Strategic Resilience Assessment (STRESS): This tool applies systematic efforts to evaluate and prioritize the cumulative impacts resulting from interacting and multi-sector shocks and stresses facing communities. In addition to different forms of shock and stress such as poor access to quality inputs, erratic precipitation, land degradation etc, the tool also looks at financial stresses, primarily debt accumulation of farming households in the CDZ (Vaugh, Eric and Levine, Eliot, 2015). It may be worthwhile to combine this tool with the application of RAPTA guidelines developed by the GEF-STAP.

FAO Sustainable Forest Management (SFM) Toolbox: The SFM Toolbox collates a large number of tools, case studies and other resources, organised in modules. It has been created to provide forest owners, managers and other stakeholders with easy access to those resources for SFM implementation. The Toolbox offers practical insights into management of natural production forests, forest and landscape restoration, and SFM REDD+ (<http://www.fao.org/sustainable-forest-management/toolbox/sfm-home/en/>).

RECOFTC Model for Community Forestry: The Center for People and Forests can customize a range of training modules on community forestry and NRM (e.g. participatory community management of protected areas, internal governance of CFs, participatory mapping etc), climate change adaptation and mitigation (e.g. community forestry and REDD+), forest conflict and governance (e.g. conflict mediation, forest policies and governance) and community outreach (e.g. how to facilitate, how to train etc).

ADB Technical Assistance (TA) on “Promoting Ecosystems Services for Forest Carbon Financing in Asia and the Pacific: The ongoing TA pilot study will (i) Map ecosystem services in the Central Dry Zone covering both forest and agriculture ecosystems; (ii) Determine the dependence of local communities on ecosystem services; (iii) Build an understanding of livelihood opportunities and challenges and potential options for reducing pressure on the forest reserve; and, (iv) Undertake training and capacity building in ecosystem services assessment and valuation. This TA has been designed to provide the baseline data, information and analysis for the Mae Nyo Taung FR site under the GEF project; some of the tools, such as survey templates may be replicated (notably at candidate site for PES).

Overview of Capacity Development and Technical Assistance Framework

The framework below consists of a potential suite of training, capacity building and technical initiatives which will be customized and packaged in the context of this GEF project. The program will be delivered using blended learning techniques: a) seminar / classroom / lecture, b) on-site demonstrations and field school approach, c) participatory methods (e.g. soil mapping, forest inventory etc), d) structured role play and games, socialized learning, e) combined with investments in small scale infrastructure (e.g. learning by doing), and f) cross visits, study tours and participation in conferences and exhibitions.

Most activities can be conducted in Mandalay at the newly built DZGD Training Hall. The Central Forestry Development Training Centre of Forest Department is equipped with hostel facilities, and the DZGD has guest house facilities for 20-30 pax. A field office will be set up at Mae Nyo Taung FR to support on-site demonstrations along with farmer field school. Similar field offices may be set up on location in FR / PPF/ PAs as appropriate.

Domain	Content	Target Audience	Resources for Development and Delivery
THEME: Integrated soil and water conservation and management			
Watershed management	Principles for effective community participation in watershed management Farm-based land and water management techniques	DZGD, FD, ECD, Department of Irrigation and Water	Co-lead by Watershed Division in Forest Department in MONREC

	<p>Water management at field and watershed scale</p> <p>Conjunctive use of groundwater and rainfall</p> <p>Efficient supplemental irrigation</p> <p>Nutrient management for dryland agriculture</p>	<p>Management (DIWM)</p> <p>Village / township leaders</p> <p>NGOs/CSOs</p> <p>Forest User Groups, Water User Groups</p>	<p>Collaboration with Department of Irrigation and Water Management (DIWM)</p> <p>Draw on case materials and tools developed by ICRISAT, IWMI and others</p> <p>Seminar / lecture combined with on location – learning by doing and simulation exercise (e.g. “river basin game”)</p> <p>International / national specialists</p>
Climate resilient water storage and supply management	<p>Orientation to Water Accounting+ and related tools</p> <p>Rainwater harvesting techniques for institutions and households</p> <p>Small pond construction, operations and maintenance</p> <p>Check dam construction, operations and maintenance</p> <p>Farmer-led small scale irrigation management (including small scale drip irrigation)</p>	<p>DZGD, FD, DIWM</p> <p>Village / township leaders and community stakeholders</p> <p>NGOs/CSOs</p> <p>Water User Groups</p> <p>Private sector companies</p>	<p>Co-lead by DZGD and DIWM</p> <p>Draw on resource of International Water Management Institute (IWMI)</p> <p>Seminar/lecture with on site design and demonstrations (through civil works etc)</p> <p>Possible cross visits and study tour</p> <p>International / national specialists</p>
Climate smart agriculture for dryland ecosystems	<p>Assessment of land degradation and water resource challenges and risks</p> <p>Implementing landscape approaches</p> <p>Water and soil management in dryland agriculture</p> <p>Crop production approaches for climate change mitigation, adaptation and resilience building</p> <p>On-farm trials supported by farmer field school approach / extension</p> <p>Explore new techniques and approaches (hydroponics,</p>	<p>DZGD, FD, Dept of Rural Development, Dept of Irrigation and Water Management (DIWM)</p> <p>Village / township leaders and community stakeholders</p> <p>NGOs/CSOs</p> <p>Water User Groups</p>	<p>Co-lead by international /national specialists and Department of Rural Development</p> <p>Joint activity with GEF/FAO project</p> <p>Draw on WOCAT, FAO Climate Smart Agriculture Sourcebook, World Agroforestry Centre and other tools</p> <p>Inputs from Planning and Statistics Division on land</p>

	small scale drip irrigation, solar powered pumps, green manure etc)	Private sector companies	and forest use planning Seminar / lecture with on site demonstrations and on-farm trials / farmer field school Links to agricultural coordination centres under ADB loan project International / national specialists
THEME: Strengthening forest management planning and implementation			
Improving forest governance	Basic concepts of forest governance Forest policy analysis Climate change and forest policy Forest tenurial rights Participatory, gender inclusive, community mapping Conflict mediation GIS applications for land use planning	FD, DZGD Potential Forest User Groups NGOs/CSOs Village / township and community stakeholders Women's organizations	Co-lead by DZGD and CF Unit in Forest Department (with the RS/GIS Unit, FD) Draw on resources of RECOFTC, FREDA Inputs from Planning and Statistics Division (FD) on land use and forest management planning Participatory approaches on site, combined with classroom training Potential study tour International/national specialists
Community forestry (CF)	Core concepts and principles Promoting gender equality Practical approaches to CF Lessons from CF in other countries Establishing pilot programs; sites and management plans CF in protected and/or key biodiversity areas Implementing participatory tools and methods (e.g. mapping)	FD, DZGD Potential Forest User Groups NGOs/CSOs Village / township and community stakeholders Women's organizations	Co-lead by DZGD and CF Unit in Forest Department Draw on resources of RECOFTC, FAO (collaboration with GEF project) Participatory approaches on site, combined with classroom training Potential study tour International/national specialists

Biodiversity / wildlife management and monitoring	Understanding biodiversity and ecosystems services Biodiversity assessments and survey methods (participation in KBA at candidate site) Customary sustainable use of biodiversity Biodiversity monitoring for dryland ecosystems Strengthening management of protected areas	DZGD, FD, ECD, DIWM Universities and research institutes Village / township and community stakeholders NGOs /CSOs	Co-lead by Nature and Wildlife Conservation Division (Forest Department) and international NGO (e.g. Wildlife Conservation Society, WWF) Share resources of WCS and GEF/UNDP project Participatory approaches on site combined with classroom training Possible study tour International / national specialists
Sustainable financing mechanisms	Assessment of financial status of protected areas Options for sustainable financing of protected area system Economic valuation of ecosystems services Payment for forest and water ecosystems services Introduction to microfinance and enterprise development (focus on women)	DZGD, FD, ECD, DIWM Universities and research institutes NGOs/CSOs Private sector companies	Co-lead by WCS and ECD / MONREC, with participation of ADB Draw on methods, guidance and case materials of GEF-STAP, IPBES, GIZ-ValuES, SGA Network, EEPSEA and ADB RETA Microfinance training will draw on resources PACT Global and Mercy Corps
THEME: Addressing climate change challenges			
Community-based fire management	Gender and fire Community models for decision-making in fire management Agricultural burning Awareness creation Fire prevention and management techniques in dryland ecosystems	DZGD, FD Township and village level administrations Community-based organizations / CSOs/ NGOs Forest User Groups	Co-lead by DZGD, FD Draw on resources of FAO, ITTO Participatory approaches on site combined with classroom training International / national specialists
REDD preparation – forest inventory	Analysis of drivers of forest degradation Use of GHG inventory software	DZGD, FD Township and village level administrations	Co-lead by Forest Research Institute and FAO / UN-REDD-Programme

	Conduct of forest inventory for CDZ Social and environmental safeguards Monitoring, reporting and verification (MRV) protocols	Community-based organizations / CSOs/ NGOs Forest User Groups	Delivered by FAO consultants, with support from project International SFM/REDD+ Specialist Seminar /lecture with on-site activity
Sustainable forest management (SFM)	Introduction to SFM Toolbox (e.g. Global Forest Watch, decision support tools etc) Reforestation /afforestation Natural regeneration Non-timber forest products (NTFPs) Governance mechanisms	FD, DZGD, ECD, DIWM Village leaders and community stakeholders NGOs / CSOs	Co-lead by DZGD and International SFM/REDD+ Specialist, in collaboration with GEF/FAO Refine and document existing DZGD methodology Draw on FAO, CIFOR and other resource materials

Component 1: Soil and water conservation practices strengthened

Approaches to soil conservation in the CDZ

In 1957 soil classifications were made through aerial photo interpretations, followed by general scientific classifications by a newly created Land Management Bureau. The classification system was modified in 1970 by the Land Use Division of the Myanmar Agricultural Service (MAS) to correlate with the FAO/UNESCO classification system. There are 24 main soil types in Myanmar, which are determined by the different vegetation, climate, biophysical and geological features.

In the three regions of the CDZ (Sagaing, Mandalay and Magway) forest area soils are of the red brown, yellow brown and indaing variety, with some light forest soils in forest uplands. These soils have a sandy loam and clay loam texture, with some areas displaying silty loam and clay gravel features. Alkalinity (pH) ranges from 5.0-8.5 depending on the area. Non-forest areas can be of different variety – catena savanna, compact turfy primitive, primitive crushed, meadow carbonate or meadow alluvial – which contain more plant nutrients than soils found in forest areas, and support different types of crops. Regardless of soil type or characteristic, the need for soil conservation measures and carefully managed fertilizer applications are essential (MoAI, nd).

Salinity risk assessment and monitoring are needed in order to gain a full understanding of the problems in order to develop strategies to reduce soil degradation. Research on soil problems is under responsibility of the Land Use Division in the MAS. In the CDZ, some experiments have been carried out by using gypsum on soils which have a high concentration of sodium (ie. sodic soils), however the LUD has insufficient capacity to monitor soil degradation, plan and implement mitigating measures.

In Myanmar, physical techniques are used to control run off and soil erosion, rather than vegetative techniques. This is more pronounced in the CDZ, where vegetative measures are more difficult to implement and require physical interventions to ensure plants are established and cover the ground in a short period of time. Many farmers are already exposed to contour ploughing, contour earth or stone bunding, forming ‘trash lines’ from crop residues, etc. However, due to capacity and financial limitations, the LUD, MoALI and MONREC interventions are restricted to small

demonstration plots undertaken with support from farmers. In many cases, farmers require payments to induce participation (FAO, Working Paper 3, June 2016).

Prevalence of saline and sodic soils are highest around irrigated areas and some of the smaller groundwater systems. Soil reclamation in these areas can be difficult, costly and time-consuming. It will require improved drainage, regular applications of lime or gypsum – and for farmers, a shift to rainfed cropping (FAO, Working Paper 3, June 2016).

In watershed areas, where siltation rates are highest, the concern of MONREC has been with tree planting on surrounding slopes. Most of these areas are agricultural land and subject to shifting cultivation, which limits opportunities to combat soil erosion. Recent experience that re-grassing or adding cover crops, when combined with reforestation is more effective at preventing soil erosion in watershed areas. Cover crops improve soil by reducing erosion, but also by providing organic matter to improve overall soil health by catching nutrients before they can leach out of the soil and by adding nitrogen to the soil. Their roots can even help unlock some nutrients, converting them to more available forms. Cover crops can also slow down movement of water, thus reducing its soil-carrying capacity; and help stabilize soil particles (IWMI discussion, July 2016).

Need for water accounting framework in CDZ

In the CDZ, variability in water resources and lack of capacity to manage this variability is inextricably linked with food insecurity and widespread poverty. Water resource assessments in the CDZ conducted by the International Water Management Institute (IWMI), and ADB in preparation for the “Irrigated Agriculture Inclusive Development Project”, suggest that:

Rainfall unpredictability, which is high in the central part of the Dry Zone, impedes agricultural production by increasing the risk of drought at the beginning of the rainfed crop cycle

Surface water from rivers and storage reservoirs is plentiful, but lack of infrastructure and the high costs of pumping make access difficult. Estimated volumes of water used in irrigation are small compared to runoff and 3% of the total flow of the Irrawaddy river

IWMI’s community-level survey found that, of the water collected for use in villages (excluding irrigation), about 15-20% was allocated for drinking purposes, about 50% for other domestic uses and 30-40% for livestock watering

Irrigation efficiency is very low as the ADB loan project attest - as less than 5% of water abstracted is transpired by crops – which is compounded by very limited, credible agronomic advice provided to farmers

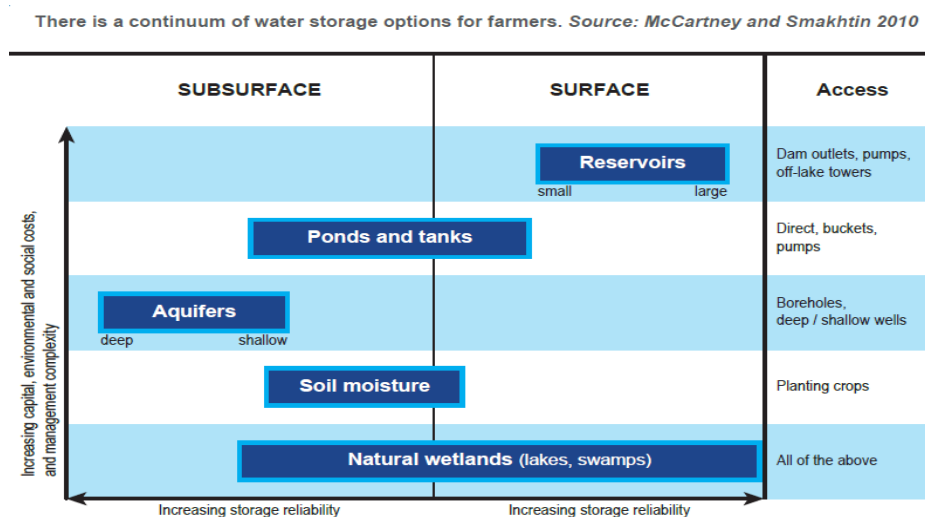
Data on groundwater is meagre, however, available information on annual recharge suggests that up to 330,00 ha of area can be irrigated, with support from hydrogeological study and effective planning and finance

Some farmers in the Dry Zone are adopting small-scale individual pumping of surface water and groundwater to cope with irregular rainfall and shortfalls in existing formal irrigation schemes. They normally use small, motorized pumps to access water from shallow wells or streams

Farmer- managed technologies, such as rainwater harvesting ponds and small-scale pumping, have significant advantages in terms of their flexibility, reliability, ease of use and simple maintenance. All villagers benefit from having assured access to water for domestic uses and livestock watering, while those without land gain opportunities to work within irrigated farming systems. (IWMI, 2015; ADB 2016).

Bio-physical environments, farming systems, water access and irrigation infrastructure, create vastly different opportunities and priorities over small distances and even micro-scales. A strategic and integrated approach to water resources management will circumvent piecemeal and unsustainable water use practices that have been prevalent. There

are no single, blanket solutions; rather, interventions in integrated water resources management must be customized to the particular human settlement area. The schema below, illustrates the range of water storage options for denizens of the CDZ, supplemented by a summary table on annual water balance in the CDZ.



Annual Water Availability in km ³	
Rainfall	55
Rivers	365
Storage	10
Irrigation withdrawals	7.5
Effective irrigation	0.4
Groundwater	5 - 300
Domestic use	<1

Source: IWMI, 2016

Efforts to promote soil and water conservation in the CDZ need to be viewed at three different scales:

Field scale: to prevent erosion and loss of top soil; retain water in fields

Small catchments: community forestry, soil conservation and tree planting projects to protect village water supply dams, improve water quality, rehabilitate degraded lands

Large catchments: rehabilitation and reforestation programs at landscape scales.

Climate smart agriculture in CDZ project areas

Due to variations in agro-ecological conditions, more than 60 different crops are grown in Myanmar. They can be grouped into six main categories: (a) cereals: rice, wheat, maize and millets; (b) oilseeds: groundnut, sesame, sunflower and mustard; (c) food legumes: black gram, green gram, butter bean, red bean, pigeon pea, cowpea, chickpea and soybean; (d) industrial crops: cotton, jute, sugar cane, rubber and tobacco; (e) food crops: potato, onion, chillies, vegetables and spices; and (f) plantation crops: tea, coffee, coconut, cocoa, oil-palm, toddy palm, banana and other fruits. Pulses and some horticultural crops are commonly grown and consumed in the CDZ. There is scope for exporting these crops to India and China. Although there are variations in size or landholdings, the average is about 2.35 ha per household, although there also are many landless families. The farming/livelihood systems in the CDZ

areas which are not dependent on paddy production and are located in non-irrigated rainfed areas, are characterized by a mixed farming system in which crops and livestock are closely integrated and interdependent.

As indicated above, water is a significant factor which limits crop production especially in dry-zone upland areas with bimodal rainfall patterns of 750 mm of precipitation (even as low as 600 mm in dry years). In these areas, risk-prone farmers are likely to use mixed cropping systems to spread the risk and mitigate failure. In these areas in situ moisture conservation practices such as low tillage, stubble mulching etc, to retain as much of the rainfall as possible and facilitate access to crop root systems should be extension priority. Currently this is neither advocated nor practiced systematically (FAO, Working Group #1, June 2016 p.13). Conservation agriculture is not followed to the extent needed in the CDZ. Climate variability affects farming systems, which is further impacted by population and grazing pressures. Climate smart agriculture (CSA) in this GEF project will involve introduction to communities in the project area, to a wide range of integrated techniques to stabilize both the cropped lands and where possible, forest lands. It is important to maximize available resources to support crop cultivation and stabilize village lands. Measures to improve fertility and increase productivity will include the basic principles of crop management such as good and timely land preparation, correct planting techniques, mixed cropping, fallow, and maintaining a fine surface tilth or mulch to increase moisture retention and reduce evapotranspiration, among others (FAO, Working Group #1, June 2016).

Outcomes and Outputs

The outcome and outputs from the PIF remain essentially the same, with added gender indicators, and indicators on increased net annual agricultural income for households around the MNT Forest Reserve.

Outcome 1.1 Best practice and capacity building models in SLM / IWRM established and applied to at least 5,500 ha forest reserve, and 5,000 ha of agricultural land in and around Mae Nyo Taung (MNT) Forest Reserve by 2022.

Avoided GHG emissions of 280,751 tCO₂e over 20 years from improved forestland management; and 195,301 tCO₂e from improved agricultural productivity

Net increase of at least 15% of annual agricultural income per participating households (HH) in villages and townships around the project area, from baseline of USD 1,200, including at least 50% of female-headed households (based on HH survey undertaken under ADB RETA)

Output 1.1.1 Integrated assessments of degraded areas in the CDZ covering soil, freshwater, forest ecosystems, biodiversity and landscapes

Output 1.1.2 Capacity development (field trials, training of trainers etc) conducted for men and women in DZGD and Forest Department on integrated soil and water management (IS/WRM processes and remedial / intervention options (e.g. agronomy, vegetative rehabilitation and development, physical/structural changes, management and institutional / policy measures etc)

At least 30% of government participants are women

Output 1.1.3 Technical assistance and training on IS/WRM provided for men and women from households in Mae Nyo Taung Forest Reserve and surrounding villages

At least 50% of community participants are women

Activities

Water balance study for selected parts of the dry zone using the IWMI “Water Accounting+” approach, including assessment of water resources status and trends (e.g. surface, groundwater, community use patterns), assessment of the effectiveness of current water resource management schemes, including small scale, farmer-led irrigation (linked to Component 3)

Community-led mapping of soil health and soil erosion status and trends, including an assessment of the effect of land degradation on ecosystems services, undertaken in conjunction with MONREC, Department of Rural Development, and specialized NGO (linked to Component 3)

Design / customize training and capacity building courses in a) watershed management, b) climate resilient water storage and supply management, and c) climate smart agriculture for dryland ecosystems and delivery to target audiences (based on framework presented above)

Develop demonstrations of good agricultural practice, remedial soil and water conservation approaches in Mae Nyo Taung FR (based on methodology described in PIF, as well as application of training and capacity development above)

Identify and refine approaches, technologies and investments with potential for replication and scaling up under Component 3.

Component 2: Biodiversity and Ecosystems Management Mainstreamed into Forest Management Planning

Preliminary analysis is presented in the PIF, with some additional insights below.

A gap analysis of the protected area system identified the following concerns:

Limited institutional capacity of National Wildlife Conservation Division in Forest Department

Need to improve management effectiveness of PAs to address the range of threats, including encroachments and exploitation

More attention should be given to ecosystems and species representation

PAs receive low levels of investment (declining budget of NWCD) with minimal external donor support
There are overlapping agency mandates, and

There is a need to factor in plant genetic resources and livestock, particularly in the CDZ (NBSAP, nd)

The Key Biodiversity Approach (KBA) approach is considered appropriate, since conservation of many species can be strengthened through the protection of a network of sites at which they occur. In Myanmar, the most important criterion used to define KBAs is the regular occurrence of significant number of one of more globally threatened species. Given the absence of data on populations, minimum area requirements etc, a provisional assessment is needed based on ecological requirements, density and home range size, and availability of appropriate habitat at sites (NBSAP, nd. p.58).

In Myanmar, thorough threats analysis has only been conducted for mammals, birds, amphibians, some reptiles (turtles and crocodiles), some plants, some invertebrate species and a few marine species. Current information on the status of most globally threatened species in Myanmar accounts to a few survey records from a few sites where surveys were possible. National status surveys have been conducted for limited number of species, such as the Tiger. **“For many species, there are no recent field records from Myanmar.”** As such only preliminary lists of globally threatened species, KBAs and conservation corridors have been developed at the national scale, and even less so, in the Central Dry Zone.

Two of eight priority conservation corridors in Myanmar are situated in the CDZ. These include a) Priority Corridor 1 - Central Myanmar Dry Forests, which includes remaining areas of natural habitat in the CDZ, and supports a number of endemic species, most notably Burmese Star Tortoise (Critically Endangered), White-throated Babbler, Hooded Treepie and Burmese Bushlark. The Priority Corridor also supports the largest known wild population of Eld’s Deer (Vulnerable) in the world; and b) Priority Corridor 2 - Central Myanmar Mixed Deciduous Forests. The Priority Corridor includes extensive areas of mixed deciduous forest on hills to the north and west of the Central Dry Zone, especially within Alaungdaw Kathapa National Park and proposed Mahamyaing Wildlife Sanctuary. The Priority Corridor supports populations of several globally threatened species, including Hoolock Gibbon (*Bunipithecus*

hoolock), Capped Leaf Monkey (*Trachypithecus pileatus*), Asian Elephant and Banteng (*Bos javanicus*) (all are endangered species).

Project preparation consultations with various stakeholders validate the approach being proposed in the GEF project, particularly in view of limited resources. There will be a close association with the UNDP/ GEF project on “Strengthening Sustainability of Protected Area Management in Myanmar” (reference Stakeholder Involvement Plan). The table below presents summary information on 12 PAs in the CDZ, and illustrates the need to undertake proper biodiversity assessments to identify and track species. Some information on KBAs in the CDZ was presented in the PIF, and will be subject to confirmation during project implementation. Efforts will be made to increase areas of protection if warranted, by expanding PAs based on KBA assessments, aligning PA management with forest management, and strengthening implementation of priority biodiversity corridors, among others.

Protected Areas under Forest Department In Central Dry Zone

Region	Name	Type of Protected Area	Area (ha)	IUCN	Key Resources
Sagaing	Alaungdaw Kathapa	National Park	159,700	II	Asian elephant, Asiatic black bear, leopard, gaur, sambar deer, serow,
	Bauditataung	National Park	7,300	VI	Dryland ecosystems
	Catthin	Wildlife Sanctuary	26,900	IV	Eld’s deer, Sambar deer, Barking deer, gaur
	Maharmyaing	Wildlife Sanctuary	118,000	IV	Banteng, Asiatic wild dog, Sambar deer, small Asian mongoose, wild boar, Hoolock gibbon, Asian elephant, wild cat
	Minsontaung	Wildlife Sanctuary	20,600	IV	Barking deer, Hog deer, birds (need to be identified)
Mandalay	Lawkanada	Wildlife Sanctuary	47	IV	TBC
	Minsongtaung	Wildlife Sanctuary	2,300	IV	Burmese star tortoise
	Popa	Mountain Park	12,900	IV	Medicinal plants
	Pyin-O-Lwin*	Bird Sanctuary	12,700	IV	Green pea fowl, Barking deer, Grey peacock pheasant
	Shwe-U-Daung*	Wildlife Sanctuary	32,600	IV	gaur, elephants, banteng, bears, Serow deer, Sambar deer
Magway	Shwesettaw	Wildlife Sanctuary	55,300	IV	Eld’s deer, Samar deer, Barking deer, gaur, Burmese star tortoise
	Wethikan	Bird Sanctuary	440	IV	Waterbirds

Total			448,787		
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Source: Instituto Oikos and BANCA (2011)

* *administratively in Dry Zone, but not ecologically*

Outcomes and Outputs

Outputs remain the same as in the PIF, with exception of Output 2.2.2 which has been shifted to Component 3 (see below).

Outcome 2.1 Biodiversity and ecosystems values, management principles and targets mainstreamed into strategic planning and operations of MONREC by 2022 (addressing Aichi Biodiversity Target 2 and 14).

Output 2.1.1 Technical staff from DZGD, Forest Department, Environmental Conservation Department, local universities and other relevant institutions trained in KBA and ecosystems services assessments.

At least 30% of trainees are women

Output 2.1.2 Status of biodiversity conservation priorities, including KBAs, reviewed and updated for CDZ

Outcome 2.2 Integration of Key Biodiversity Areas (KBAs) and community participation mechanisms into CDZ protected area and forest management planning systems by 2022.

Output 2.2.1 Strategies and priorities to increase protection of high value species (e.g. Burmese Star Tortoise, Baer's Pochard etc) identified and mainstreamed into planning processes

Output 2.2.2 Forest management plans strengthened to integrate cross sector elements, including sustainable use and conservation of biodiversity, effective law enforcement mechanisms

Output 2.2.3 Gender-sensitive behaviour change communications (BCC) and campaigns conducted to increase awareness and participation of communities in biodiversity and ecosystems management.

Activities

The GEF project will work with the DZGD, Nature and Wildlife Conservation Division of Forest Department, a leading international NGO and other NGOs /CSOs to execute these activities:

Review of updated Protected Area gap analysis and actions taken since last CBD national communication (in collaboration with UNDP/ GEF project)

Participatory design and implementation of KBA training for relevant Government Departments, NGOs/CSOs and stakeholder communities

Conduct of key biodiversity assessment for at least one identified high priority site based on existing mapping of PAs and KBAs in CDZ (potentially, Popa Mountain Park, but subject to continued review)

Participatory design and delivery of capacity building for field level ecologists, protected area managers, forest rangers, CSOs and NGOs on application of tools and methods for sustainable use and conservation of biodiversity in dryland ecosystems

Workshops on integration of Protected Area Management components in forest management planning for at least 5 districts, with emphasis on expanded monitoring, improving protection and enforcement and sustainable financing mechanisms (building on ongoing work of WWF, WCS, Freeland, and Fauna and Flora International as well as Component 3 activities). This will inform the land management planning processes, and

Design and implementation of behaviour change communications (BCC) and campaigns to inform Government decision-makers, opinion leaders / key influencers and local communities of the importance of biodiversity in dryland ecosystems. This will be guided by the KM approach elaborated below.

Component 3: Forest Ecosystems Rehabilitation and Management Scaled Up

Data on Permanent Forest Estate (PFE)

Project preparation confirmed that detailed information on reserve forests and protected public forests in the CDZ is either fragmented or inaccessible. In some cases, the administrative boundaries need to be re-affirmed and cross-referenced with the Government notification system. Furthermore, corresponding information on agricultural or land settlement areas around the PFE are not readily available, as this is fragmented across a number of Ministries and Departments. Information on protected areas, although still not optimal, is improving, based on surveys conducted by NGOs and CSOs. PAs cover a total of 448,787 ha in the CDZ as indicated above. Summary information on numbers of RFs, PPFs and PAs which constitute the Permanent Forest Estate (PFE) in the 3 CDZ regions is provided below.

Permanent Forest Estate in CDZ

Region	Sagaing	Magwe	Mandalay	Total
Reserve Forests	28	85	49	162
Protected Public Forests	21	40	18	79
Protected Areas	5	2	5	12
Total	54	127	72	253

Source: GIS Division, Forest Department and Instituto Oikos and BANCA (2011)

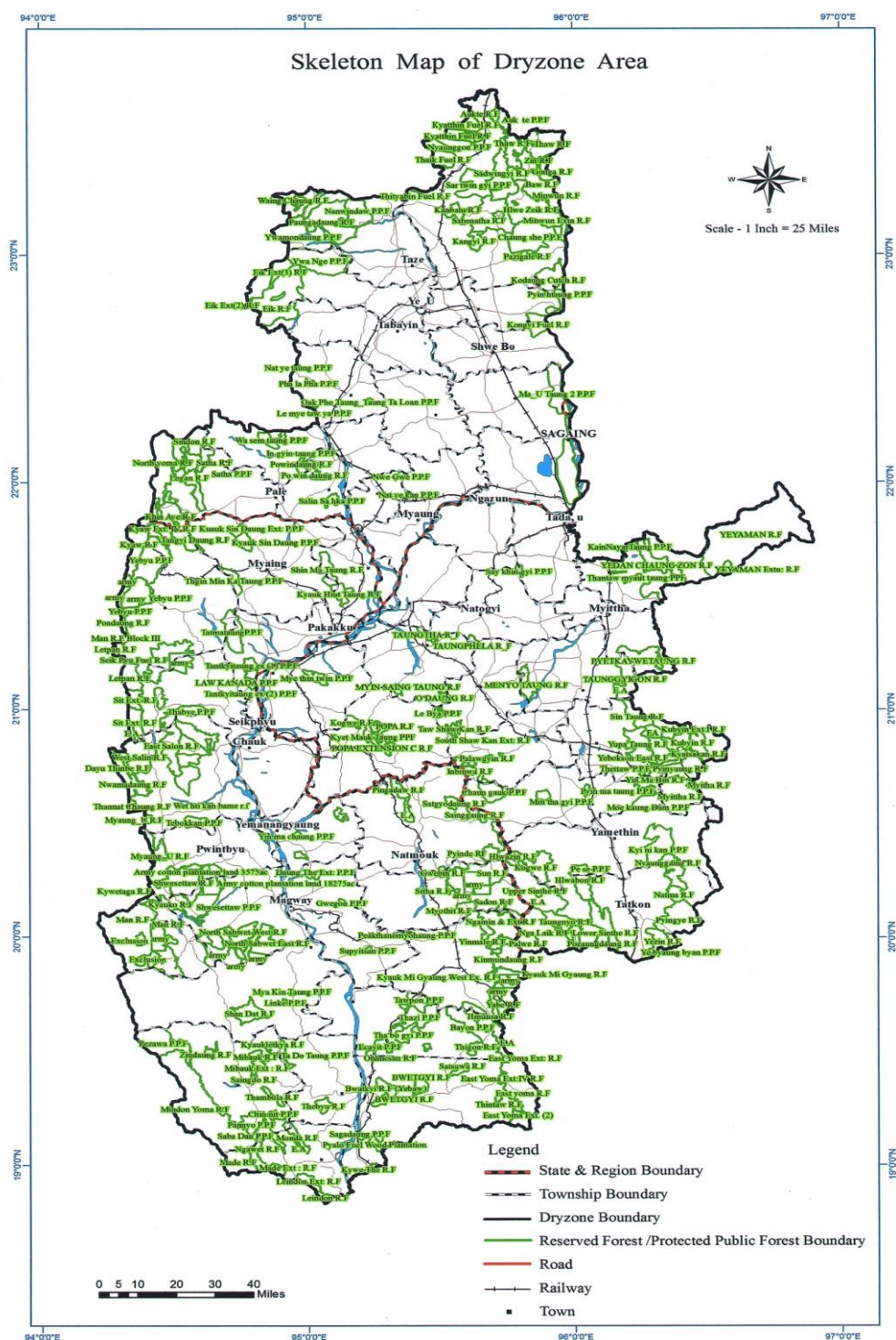
Community Forestry

Community forestry is be applied as a useful tool to protect and develop the forests. The CF Instruction provides the administrative basis for the handover of forest land for management and use by communities. The 30-year National Forestry Master Plan mandates that CFUGs manage 2.27 million acres by 2030-2031, but progress so far has been poor.

The goal has been to create a model CF in each township, but recent literature and discussions with such NGOs as ECCDI and RECOFTC confirm that Forest User Groups (FUGs) face numerous challenges, with very limited support from the FD in most cases. FUGs in the Dry Zone face more difficulty than other regions. They tend to fare better where there is sustained NGO support, local leadership is strong and relations with FD are good. But deforestation and degradation continues at relatively high rates (estimates vary but roughly 1% per annum for both deforestation and forest degradation). In Mandalay in the Dry Zone, because of unfavourable climatic conditions, the 30-year tenure for the FUGs does not seem attractive. In some areas external private interests have captured the CF area and are converting it to agricultural land. Sometimes land has been appropriated by a few individuals for agroforestry. Regardless, there is a need for systematic guidance for communities (ECCDI, nd; FAO Working Group #5, June 2016).

It would be insightful to take comparative perspectives on what has worked in other countries, and analyze the best options for promoting larger scale adoption of CF in Myanmar. Over two decades of implementation, only 5.6 percent of the intended progress has been achieved in CF (FAO, Working Paper #5, June 2016, p.25). The GEF project will take steps to consolidate lessons learned in CF and create enabling conditions through technical assistance interventions.

Below is a ‘skeleton map’ which shows general location, distribution and relative size of RFs and PPFs in the Central Dry Zone (boundaries are more discernable when enlarged)



Source: GIS Division, Forest Department, 2016

Scaling up sites

The GEF project will confirm scaling up areas based on a number of criteria, including, but not limited to: a) availability of basic information, b) spatial distribution across the 3 regions, c) accessibility to site(s), d) levels of deforestation and degradation, e) population in surrounding land settlements, f) capacity of District offices of DZGD and FD, g) potential overlap or proximity to Protected Areas, and h) potential to strengthen forest reserve or protected public forest as corridor to link with other sites for ecosystem connectivity. Below is a cross section of potential scaling up sites, which will be further scoped prior to project-based technical assistance and investments. It should be noted that the shaded RFs/PPFs provide ecological connectivity to Popa Mountain Park, a major protected area, and possible site for PES. Furthermore, Protected Areas identified in Component 2, will also be covered under Component 3 activities as relevant.

Potential Candidate Reserve Forests and Protected Public Forests

Region	District	Township	RF / PPF	Area* (ha)
Mandalay	Kyauk Se		Pyat Kha Ywe Taung RF	5,545
				3,367
		Myitthar	Maung Kwe Kan RF	
			Ya Dan Chaung Sone RF	7,730
			Ya Dan Chaung Sone (North) RF	6,442
		Kyuek Se		2,820
		Tadaroo	Say Khin Gyi PPF	1,014
		Sint Kaing	Kein Na Yar Taung PPF	
	Myingyan	Taung Tha / Myingyan	Taung Tha Taung RF**	1,336
		Taung Tha/Nwa Htoo Gyi	Taung Phi La RF**	1,539
			Myin Saing Taung RF**	1,093
		Taung Tha	Odaung RF**	1,230
		Kyauk Pa Daung	Koe Kwe RF**	2,461
			Popa Taung PPF**	4,685
	Meikhtila	Wundwin	Taung Gyi Gone	12,704
		Mahlaing	Myin Oo Hlae PPF**	1,476
		Mahlaing/Meikhtila	Taung Shaw Kan RF**	1,779
		Mahlaing	Le Byar PPF**	1,402
		Meikhtila	Taung Shaw Kan Extension RF**	270
			Inpin Wa RF**	602
			Kon Tan RF**	518
			Kon Tan Extension RF**	506

			Mone Taing RF**	60
			Mone Taing Extension RF**	147
		Tharzi	Yu Par Taung RF	10,815
			Sin Taung RF	6,788
	Yamethin	Yamethin	Hlwa Zin RF	1,583
			Koe Kwe RF	7,839
			Kyee Ni Kan PPF	12,748
		Pyaw Bwe	Chaung Kauk PPF	3,992
			Min Thar Gyi PPF	2,598
	Mandalay Region Subtotal			
Magwe	Pakkokku	Yesakyo/Myiang	Shin Ma Taung RF	6,068
			Kyauk Htat Taung RF	4,351
		Myaing	Kyauk Sin Taung PPF	2,185
			Kyauk Sin Taung Extension 1 PPF	2,143
			Thein Min Kha PPF	3,239
			Tetma Taung PPF	9,438
		Pauk/Pakkoku	Tant Kyi Taung PPF	1,295
			Tant Kyi Taung Extension 1 PPF	2,752
			Tant Kyi Taung Extension 2 PPF	1,671
			Seik Phyu Fuel RF	17,486
		Seik Phyu/Pauk	Tha Pyae PPF	3,836
			Tha Pyae Extension PPF	3,327
			Aye Chan Thar PPF	8,529
	Minbu	Salin	Ashae Salin RF	12,795
			Beik Tha Noe PPF	805
	Magwe	Magwe	Daung Nay PPF	405
			Daung Nay Extension PPF	1,019
		Natmauk	Sat Cho Taung RF	2,719
			Saing Gaung RF	2,979

		Ye Nan Chaung	Sapamyaw PPF	1,827
	Tha Yet	Minhla	Shan Tat RF	8,446
		Sin Paung Wae	Bwet Kyi RF	3,257
			Bwet Kyi Yae Paw RF	4,429
Subtotal Magwe Region				104,871
Sagaing	Yin Mar Bin	Yin Mar Bin/Sar Lin Gyi	Poe Win Taung RF	4,605
		Sar Lin Gyi	Salin Sakha PPF***	2,266
	Shwebo	Wet Let	Ma U Taung 2 PPF	9,663
		Shwebo/Khin Oo	Kone Gyi Fuel RF	5,175
		Khin Oo/Kanbalu	Kho Daung RF	10,867
		Khin Oo	Pyin Daung PPF	3,387
	Monywa	Chaung Oo	New-Khwe PPF	1,049
		Chaung Oo	Nat Yae Kan PPF	931
	Subtotal Sagaing Region			
TOTAL				245,084

*area is rounded up

**potential corridors connecting Popa Mountain Park

***potential corridor between Magwe and Sagaing regions

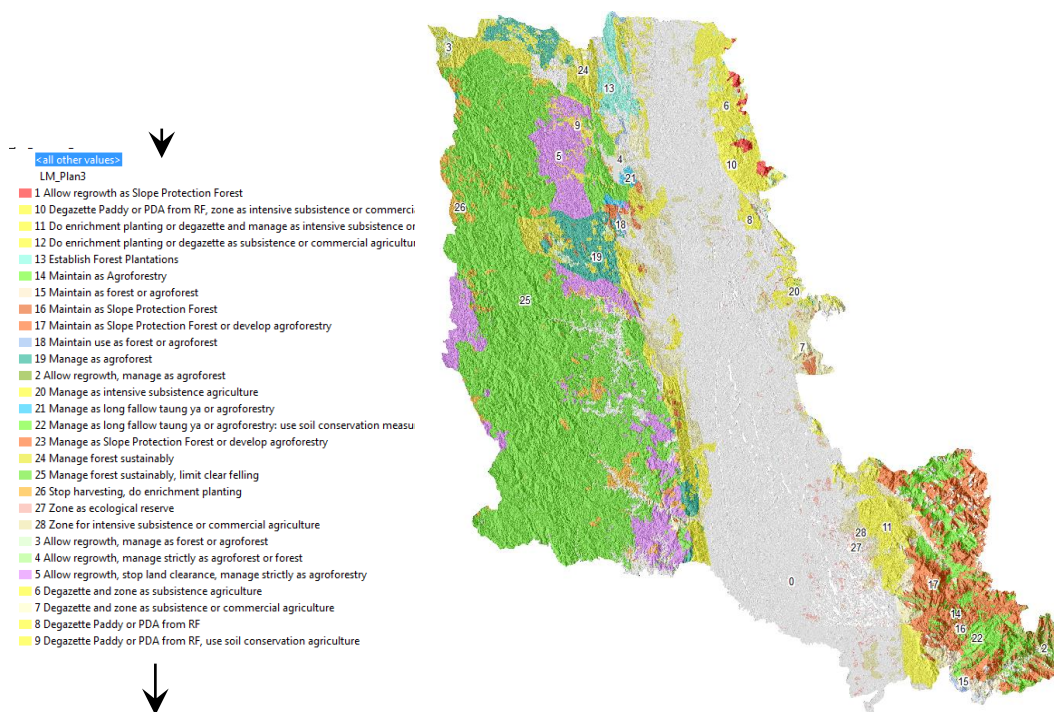
Forest inventory (linked to Component 4, Outputs 4.2.1 and 4.2.2) using internationally accepted methods, will monitor progress towards targets under Component 3.

Land management planning

Part III, Chapter 1 of the new Land Use Policy advocates for land use planning processes which will be incorporated in the National Land Law. The policy identifies a suite of guiding principles for the establishment of district level land use plans. The absence of a methodology or framework for a typical land use plan, fragmentation of data, limited knowledge, insufficient capacity and unclear mandates of concerned departments and agencies, suggest that this will be a major challenge. Some recent efforts are addressing this challenge, such as the “OneMap” project, supported by the Swiss Development Cooperation (SDC). The OneMap project, which will span 8 years, aims to create an online, open access, spatial platform on land. It will compile, enhance and make land related data accessible in a range of formats, and support decision making processes, among other things. OneMap is guided by a technical working group which consists of 25 line departments and agencies, with the MONREC as focal ministry.

As part of this effort, the Forest Department has initiated a pilot study on the zoning approach for land use management. This study was undertaken in Tuangoo District, Bago Region, and developed a decision support tool for district level land use planning and land use zoning, as well as elements of a draft land use management plan. The process combines use of science-based evidence with extensive public consultation. Once validated, this approach will be replicated for other districts and scaled up to the regional and national level.

The GEF project will contribute to this process by strengthening development and implementation of forest management plans, which are also done at the district level, and which serve as an essential component of a broader land use management plan. At present, forest management plans in the CDZ are not uniform in presentation, contain variable and limited data, and may be ineffective in implementation due to shortages of skilled human resources and financing, particularly at the district level.



Sample view of land use planning in Taungoo District, Bago Region

Source: GIS Division, Forest Department June 2016

Land use and land use rights

Preliminary data based on Interviews with households in Mae Nyo Taung Forest Reserve suggest that there is prevailing uncertainty about land use rights in the CDZ, and recurring issues about land tenure in protected areas (Myanmar Times, 25 June 2016). This was corroborated generally by discussions with NGOs and CSOs working in the rural development sector. As such, training and capacity building activities will give due consideration to increasing awareness of land use policy and law, and providing guidance on land tenure issues and rights, particularly, a) how to register with the Settlement and Land Records Department, and b) how to resolve disputes.

Afforestation and assisted natural regeneration

During project preparation, the team undertook a thorough review of the DZGD approach to afforestation and natural regeneration. Reviews of the PIF had highlighted concerns related to cost of tree planting, for which ADB had provided responses. In addition to the responses provided by ADB at PIF review stage, further insights are given below:

Initial cost estimates had also included investments in civil works such as fencing (to keep out goats and other encroachments), fire breaks, tube wells and access roads. When these are removed, the cost per hectare is reduced considerably

Cost estimates actually include the entire continuum from procurement of seedlings, nursery development and management, integrated pest management, surveying, staking, digging, planting, composting / fertilizing, weeding, mulching, survival counting and regular monitoring - up to the third year of maturity

One way to improve cost efficiency would be to reduce rate of mortality (or increase ‘survival rate’), which would preclude additional planting (and ‘patching’) requirements

When compared with cost structures in other countries such as Australia (Summers, D. et al, 2015), and the political and economic complexities of reforestation in other South East Asian economies (Barr, C.M and Sayer, J. A., 2012) it is believed that for purposes of this GEF project, an allocation of USD 1,200 per ha for tree planting is reasonable

Species selection for afforestation will include combinations of native and non-native species, such as eucalyptus, tectona hamitonia, acacia (3 types), luceona, cassia, termanilia and azadirachta indica (neem). Eucalyptus is commonly known as a reforestation tree species due to fast growing and adaptability characteristics, however the negative effects on local environments are well known (Ying Yong Sheng and Tai Sue Bao, 2009). Eucalyptus does provide some benefits however, including fuelwood for communities, disinfectant properties of leaves and oils, as well as health benefits (for respiratory ailments). FAO guidance suggests that eucalyptus be avoided for monoculture, and when used in afforestation projects, to be “careful of the proportion” (<http://www.fao.org/docrep/005/AC772E/ac772e0p.htm>). As such the GEF project will ensure that only 10-20% of the planted area will consist of eucalyptus.

The GEF project will ensure that in capacity building and technical assistance for sustainable forest management (SFM), the Myanmar stakeholders are able to benefit from other experiences and models in South East Asia, such as “rainforestation” in the Philippines, framework species methods for ANR in Thailand, Cambodia and Lao PDR (Neidel, David, 2012) or collaborative small holder plantation management in Indonesia (Nawir, A. A. et al., 2007).

Payment for Ecosystems Services

Payments for ecosystem services are considered to have medium-high potential as a PA financing mechanism in Myanmar. They have already been recognised to be a priority within MONREC: a decision has been made to develop a national PES system, and ECD is exploring possible implementation models, legal and institutional needs. There are various opportunities for PES in PAs in major tourist areas, as well as those located in the watersheds which serve hydropower facilities, urban water supply schemes and other industrial water users.

There is potential for a pilot PES in this GEF project. While primary interest in Myanmar right now, is in marine and coastal ecosystems, especially in relation to the fisheries habitat and productivity, and coastline protection services provided by mangroves and coral reefs, the GEF project will explore payment for forest and water ecosystems services. Neither ecosystem services nor PES are yet explicitly mentioned in the laws governing PA management, and considerable work needs to be carried out to establish whether other key requirements are in place (for example relating to contract law, property rights, and a willingness to pay on the part of ecosystem service beneficiaries) (Emerton, L. et al., 2015).

The PES under the GEF project will be experimental and contribute to processes in the ECD / MONREC on drafting new guidelines for PES based on a real case example. In so doing, the GEF project will also be guided by:

STAP advisory documentation on PES (Wunder, S., Wertz-Kanounnikoff, S. and Ferraro, P., 2010)

Capacity building initiatives under IPBES, the GIZ-ValuES project (Berghofer, A. et al., April 2016; Berghofer, A. and Schneider, A. December 2015) or the Sub-Global Assessment-Network (Despot Belmonte, K. et al. August 2015)

Case studies from South East Asia (www.ecosystemmarketplace.com), and

Inputs from Wildlife Conservation Society, which has advanced the thinking on sustainable financing for PAs in Myanmar (Emerton, L. Kyin, A. and Tizard, R., 2015).

Changes from PIF

Afforestation target has been reduced from 750 ha to 550 ha, and the ANR target increased from 1000 ha to 1200 ha. The principal reasons for this are limited forest land availability and cost effectiveness (see summary table on changes to PIF above).

Output 3.3.2 Establishment of pilot payment for forest and water ecosystems services at one candidate site

This output was previously under Component 2 and now shifted to Component 3 as this is a better 'fit' (see summary table on changes to PIF above).

Revised Outcomes and Outputs for Component 3

Outcome 3.1: Model for SFM in dryland ecosystem demonstrated: with 1,750 ha of dryland forest restored / rehabilitated by 2022, and avoided emissions of 637,318 tCO₂e over 20 years

Output 3.1.1 At least 550 ha of forest reserve under afforestation and at least 1,200 ha of forest reserve under assisted natural regeneration in Mae Nyo Taung Forest Reserve

Outcome 3.2: Sustainable land and water management practices scaled up in agro-ecological landscapes

- 50,000 ha under improved agricultural productivity and avoided GHG emissions of 1,708,875 tCO₂e over 20 years

Output 3.2.1 Replication and scaling up strategy, including codes of conduct and best practice in IW/WRM, SRM/REDD+, biodiversity conservation (based on development /demonstration /testing under Component 1)

Output 3.2.2 Training and extension support on IS/WRM (e.g. agroforestry, crop diversification, post harvest handling, water storage, small scale irrigation etc)

Output 3.2.3 Small scale investments in remedial / rehabilitation of infrastructure in communities in and around areas in the Permanent Forest Estate (PFE)

Outcome 3.3: Sustainable forest management practices and biodiversity conservation scaled up in the Permanent Forest Estate with 300,000 ha with strengthened conservation measures, of which at least 45,000 ha will be improved forest lands. These efforts will address Aichi Biodiversity Targets 7 and 14.

- Avoided emissions of 2,998,541 tCO₂e over 20 years

Output 3.3.1 Technical assistance and training on SFM/CF and biodiversity conservation approaches for communities in and around selected forest reserves, protected public forests and protected areas (potential sites listed above)

Output 3.3.2 Establishment of pilot payment for forest and water ecosystem services at one candidate site

Activities

Preparation of detailed profiles of reserve forests and protected public forests (linked to Component 1)

Afforestation of 550 ha of forest reserve area in Mae Nyo Taung

Assisted natural regeneration of 1,200 ha of forest reserve area in Mae Nyo Taung

Final design and packaging of capacity building and technical assistance packages

Delivery of training and capacity building through blended techniques (refer to Knowledge Management approach) to identified target audiences

Technical and financial feasibility studies to support small scale investments in remedial / rehabilitation of water storage and supply management systems, including rainwater harvesting systems, small ponds, small scale irrigation etc

Technical and financial feasibility studies to support small scale investment in climate smart agriculture including, improved management techniques (e.g. land management, planting, germplasm screening), use of green manure, drip irrigation and hydroponics, vermiculture, home gardening, agroforestry etc

Ecosystems services assessment and contingent valuation study conducted

Payment for forest / water ecosystems services designed and operational with supporting guidance documentation

Knowledge management, including behaviour change communications, cross visits to demonstration sites, farmer field schools and related extension support (i.e. agricultural coordination centres) in project areas, conference participation, etc., and

Packaging of investment concepts to secure additional financing to scale up / commercialize innovative technologies.

Component 4: Policy and Knowledge Management Capacity Strengthened

Role of GEF Project in Policy Dialogue

Potential policy reform issues were presented in the PIF, and validated during project preparation. Several informants asked what role the GEF project could actually play, given that many other donors are contributing much larger funding amounts to support national level policy reform dialogue. The GEF project re-affirmed its role as ‘facilitating’ and ‘enabling’ by bringing special concerns of the Dry Zone to the table. Such concerns would be supported by science-based evidence which results from project technical interventions. Furthermore, if policy reforms are to be effective, they will need to be internalized within the institutions and decision-making processes at township and district level administrations within the CDZ.

Drivers of Deforestation and Forest Degradation and GEF Project Contribution to REDD+ Readiness

Myanmar became a partner country of the UN-REDD Programme in December 2011 and has started implementing REDD+ readiness activities. A REDD+ Readiness Roadmap was finalized in 2013, based on a multi-stakeholder dialogue and engagement process and through the work of three multi-stakeholder Technical Working Groups (TWG): Drivers and Strategies; National Forest Monitoring System and Forest RELs/RLs; and Stakeholder Consultation and Safeguards. Since 2014, the UN-REDD Programme has supported implementation of the Roadmap. The TWG for the Drivers and Strategies has undertaken preliminary assessment and identification of several drivers from the forestry and non-forestry sectors with possible future trends in deforestation and forest degradation (UN-REDD Programme, July 2013 pp 50-61.)

The UN-REDD Programme in Myanmar envisages five outcomes:

Outcome 1: Relevant stakeholders engaged and their capacities developed

Outcome 2: National institutions have capacity to implement effective and participatory governance arrangements for REDD+

Outcome 3: REDD+ safeguards defined and national safeguards information system developed

Outcome 4: Development of Myanmar's national forest monitoring system (NFMS) and preliminary forest RELs/RLs supported

Outcome 5: National REDD+ Strategy developed

Analysis of the drivers of deforestation and forest degradation is a critical component of a proposed National REDD+ strategy. A recently launched FAO/UNEP/UNDP study intends to complete a comprehensive assessment of key direct and indirect drivers of deforestation and forest degradation, as well as barriers for sustainable management of forests, and enhancement and conservation of forest carbon stocks in Myanmar (UN-REDD Programme, March 2016). The GEF project will be informed by this study (scheduled for completion in October 2016). Consultations with the Myanmar REDD+ Readiness team supported by FAO, UNEP and UNDP, based in the Forest Research Institute, re-affirmed Outcome 4.2; and activities were designed to contribute to the broader national effort.

Outcomes and Outputs

Outcome 4.1: Cross sector policy reform priorities related to land use, water use and agricultural development defined and subject to public policy processes by 2022 (Addressing Aichi Biodiversity Target 2)

Output 4.1.1 Policy study on land and water use and other subsidiary legislation conducted by 2018

Output 4.1.2 Stakeholder ministries, agencies, civil society and academe engaged in dialogue on revitalizing policy and legislative frameworks related to natural resources management, including National Land Use Policy (2016) / Land Law, proposed National Water Policy / Water Law and other subsidiary legislation related to agricultural development and productivity (Addressing Aichi Biodiversity Target 2)

Gender indicator: The determinants of women's empowerment, discussed in the provisional Gender Action Plan and section A.4 below, will be addressed in the policy above analyses and resulting dialogue.

Outcome 4.2: Climate sensitive integrated information management systems established and supporting decision making processes within MONREC and relevant departments by 2022.

4.2.1 Functional integrated information management system on dryland ecosystems management operational by 2022

4.2.2 Baseline sub-national GHG inventory system, supported by monitoring, reporting and verification protocols developed for DZGD and relevant agencies by 2022.

Gender indicator: The basic M&E system for the GEF project will track sex-disaggregated data. It will also be set up to capture as much information as possible on determinants of women's empowerment as indicated in the GAP and in Section A.4 below. The GEF project will encourage the DZGD to internalize this system into their long term programming and operations.

Activities

Policy analysis, including gender implications, of national land use law, proposed national water law and subsidiary legislation

Multi-stakeholder workshops to present and discuss findings at township, district and regional level

Workshop on analysis of the drivers of deforestation and forest degradation

Training for MONREC on use of GHG inventory software (by FAO)

Conduct of forest inventory for selected areas of CDZ

Establishment of social and environmental safeguards, monitoring, reporting and verification (MRV) protocols.

4) **Co-financing**: The Dry Zone Greening Department (DZGD) has increased in-kind co-financing commitment from \$250,000 to \$ 500,000. This is elaborated in the official co-financing letter attached. The ADB RETA on “Promoting Ecosystems Services and Forest Carbon Financing in Asia-Pacific”, will contribute co-financing of \$200,000.

5) **Global Environment Benefits**: The GEBs remain the same as in the PIF, with exception of new information below:

Mitigated/avoided GHG emissions and increased carbon sequestration in CDZ forest landscapes (Calculated using the FAO EX-ACT Carbon Balance tool which is attached), totalling **5,820,786 tCO₂e** over 20 years; detailed breakdown as follows:

- Estimated avoided GHG emissions from SFM practices delivered in 3,750 ha (in Mae Nyo Taung forest reserve are **280,751 tCO₂e** over 20 years. ADB and DZGD are confident that this target is achievable since forest reserve is being the established as a model demonstration site, with some capacity and resources already in place.
- Estimated avoided GHG emissions from Climate Smart Agriculture and integrated water resource management practices of **195,301 tCO₂e** over 5,000 ha of agricultural lands around Mae Nyo Taung forest reserve over 20 years. The approach (reference EX-ACT) is to make a safe assumption that success will be achieved across 4,000 ha, or around 80%, within this area due to a number of externalities which include climate-related risks, variable water availability, uneven uptake of good agricultural practices, poor soil nutrition, choice of crop etc. The estimated yields per ha are slightly lower than the national averages provided by FAO (1.5 t/ha and 0.5 t/ha respectively) given the challenges in CDZ. Mae Nyo Taung FR, as an emerging demonstration site, has more basic infrastructure than other FRs/PPFs (which will be part of the scaling up sites).
- Estimated avoided emissions from afforestation and ANR over 1,750 ha in Mae Nyo Taung FR is **637,318 tCO₂e** over 20 years. ADB and DZGD are confident with this target as this is the DZGD core competency.
- Avoided emissions of **1,708,875 tCO₂e** from intensive Climate Smart Agriculture and integrated water resource management practices over 50,000 ha of agricultural lands around PFE over 20 years. The approach (reference EX-ACT) is to make a safe assumption that success will be achieved across 35,000 ha, or around 70%, within this area due to a number of externalities which include climate-related risks, unpredictability in water availability, uneven uptake of good agricultural practices, poor soil nutrition, choice of crop etc. The yields per ha estimates are slightly lower than the national average provided by FAO, given the special challenges of the CDZ. The margin of sensitivity is high because these externalities are not likely to be singular, but compounded in nature; and also because areas around the scaling up FRs /PPFs are likely to be in a higher state of degradation than those around Mae Nyo Taung FR (above).
- Avoided emissions of **2,998,541 t CO₂e** through improved management of 45,000 ha of degraded forest lands in the PFE. ADB and DZGD are reasonably confident with this estimate due to: a) new, stronger leadership at Ministerial and DG levels, b) focus on land management concerns, including forestlands, and remit of the DZGD to increase vegetative cover, c) project will promote concomitant improvements in management, particularly law enforcement, and greater community participation. One area of uncertainty relates to land conversion (often illegal) by vested interests, which remains a challenge and in some cases out of the control of the DZGD. As such, the project team anticipates 88-90% of the target (ie. 40,000 ha) is more likely achievable.

The overall assumption used in the EX-ACT is that degradation is moderate during the "initial state", and through project interventions, would remain "moderate", whereas without the project, degradation would be "large".

Indirect / consequential GHG emissions reductions

The GEF use of the term "indirect emissions" has made it difficult to compare GEF GHG impact with that of other institutions using alternative definitions of "indirect emissions". The recommended definition has been updated to harmonize with international standards and best practice – now referred to as "consequential emissions".

"Consequential emission reductions are typically achieved after GEF project closure and occur outside of the project results framework. Top-down and bottom-up approaches are recommended to estimate consequential emission reductions. These rely heavily on assumptions and expert judgement regarding the GEF project investment, and its assumed contribution to future market potential and penetration. As such, consequential GHG emission reductions should be reported separately from direct and/or direct post-project GHG emission reductions" (Guidelines for Greenhouse Gas Emissions Accounting and Reporting for GEF Projects, June, 2015).

In the current GEF project, consequence emissions reduction scenarios may accrue from: a) a number of policy and regulatory changes in Myanmar (e.g. elimination of forest land conversion, land tenure rights, land use planning, prohibiting illegal timber trade, agricultural zoning, etc); or b) changes in behaviour or uptake / adoption of good practices in SFM, IWRM, SLM and biodiversity conservation on a wider scale. However, it is considered premature to calculate consequential GHG emissions reductions at the CEO endorsement stage because: a) a full and proper transition to new Government will be prolonged, and any new policies and regulations will need time to take hold; b) new policies / regulations and improved implementation of existing policies / regulations in AFOLU are more likely to have greater impact in areas where economic interests, populations, forest density and conservation values are higher than the CDZ; c) confidence with integrity of data has not yet been achieved, d) gaps persist, especially at local / field levels where absorptive capacity is low, and e) institutional challenges (e.g. cross sector cooperation and information sharing etc) remain, and e) capacity to support "top down and bottom up" approaches is still limited (as indicated in the narrative related to Outcome 4.2). Reliable consequential GHG emissions reduction estimates would be more feasible well into project implementation, and once the "OneMap" and REDD+ Roadmap are more advanced at the national level. In this regard, the analysis of indirect and direct drivers of deforestation referenced under Outcome 4.2 will not be completed and validated until early 2017.

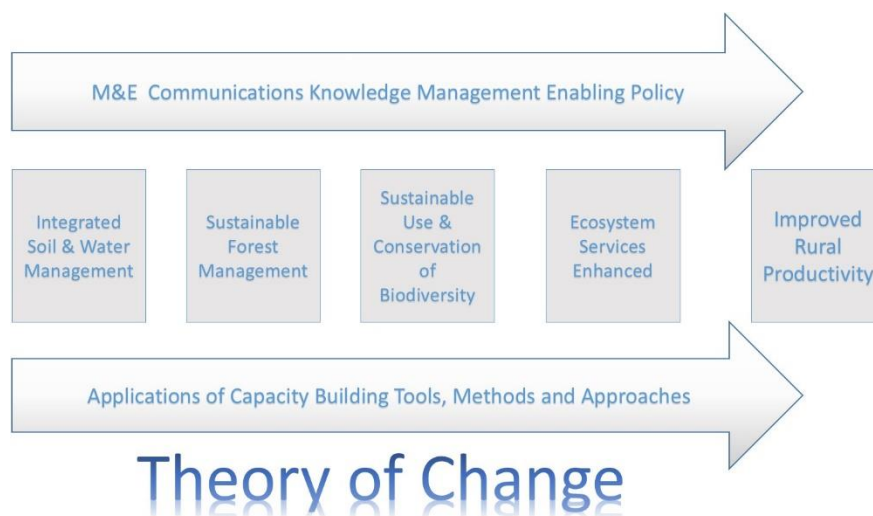
A.2. Child Project? If this is a child project under a program, describe how the components contribute to the overall program impact.

N/A

A.3. Stakeholders. Identify key stakeholders and elaborate on how the key stakeholders engagement is incorporated in the preparation and implementation of the project. Do they include civil society organizations (yes ☒ /no ☐)? and indigenous peoples (yes ☐ /no ☒)? ⁸

Intensive stakeholder consultations were conducted during project preparation (information available upon request). These consultations followed, by and large, the process outlined in the RAPTA guidelines (O'Connell et al, 2016, pp. 28-32; 39-50; 87-89). The project-level Theory of Change, illustrated below was used to facilitate all discussions, and validate, review, refine and adapt various interventions based on stakeholder feedback. This also included discussion on prior, ongoing and anticipated program and project interventions (e.g. the "one Map Myanmar" initiative, the multi-donor Livelihoods and Food Security Trust Fund – LIFT, other GEF projects, etc). Consultations were also supplemented by a) additional literature reviews, and b) information from prior (March 2015) village and household level meetings, and c) preliminary insights from ongoing (June-July 2016) household and village level surveys being conducted around the Mae Nyo Taung Forest Reserve under the ADB RETA (co-finance for the GEF project), d) review of survey results from LIFT-supported village development planning initiatives (Rahman, S., 2015).

⁸ As per the GEF-6 Corporate Results Framework in the GEF Programming Directions and GEF-6 Gender Core Indicators in the Gender Equality Action Plan, provide information on these specific indicators on stakeholders (including civil society organization and indigenous peoples) and gender.



Stakeholder engagement during project implementation will seek to apply principles of functionality, transparency, accountability and participation (FTAP) towards environmental governance (USAID, EcoGov Ph II, 2013). Functionality - allows project stakeholders to understand and appreciate the logic (i.e. theory of change) and direct application of techniques and approaches for their individual situation. Transparency – refers to openness of approach to foster clear understanding of goals and objectives as well as fair and equitable access to information; which will be essential to manage perceived resource use conflicts. Accountability – encourage all stakeholders to assume responsibility for risks as well as outcomes. Participation –requires inclusiveness to foster “buy-in” and a sense of ‘ownership’, and should be linked to a clear understanding of how direct and indirect benefits might be derived from project interventions.

Stakeholder consultations reviewed proposed project targets and activities, which also gave rise to the provisional design of the capacity-building and technical assistance framework, presented above. The possible roles of key stakeholders have been identified the Stakeholder Involvement Plan below. It should be noted that stakeholder engagement in the project context will be cascading – in the sense that larger, established national and regional institutions and NGOs/CSOs will leverage engagement with smaller, more localized beneficiary counterparts such as community-based resource user groups and individual small holders.

Furthermore, some areas for innovative approaches were identified based on stakeholder experience and insights. These are expanded in the discussion on knowledge management.

Project Stakeholder Involvement Plan

Organization	Role in GEF Project
National and Sub-National Government	
Dry Zone Greening Department (DZGD)	Lead Project Implementing Partner – GEF Project Chair, Project Technical Steering Committee Chair, Project Executive Committee Coordinate with all GEF initiatives Host Project Management Unit (PMU) Facilitate project cycle
Forest Department (FD)	Project Implementing Partner – GEF Project Member. Project Technical Steering Committee

	Member, Project Executive Committee Facilitate project work plan implementation
Environmental Conservation Department (ECD)	Project Implementing Partner – GEF Project Member, Project Technical Steering Committee Member, Project Executive Committee Facilitate project work plan implementation
Department of Irrigation and Water Management	Project Implementing Partner – ADB Loan Project Member, Project Technical Steering Committee Oversee /implement ADB loan project Participate on GEF Project Technical Steering Committee Information sharing between PMUs
International Agencies	
FAO Representation Office Myanmar	Under GEF-5 project “Sustainable Cropland and Forest Management in Priority Agro-Ecosystems in Myanmar” Sharing information on soil, water and forest sector reviews Joint SLM, CSA and SFM activities in Meiktila District (their site is Kyaukpataung township) Facilitation of linkages with Farmer Field School in Nyaung U District DZGD representation in FAO project field activities
FAO / UNDP / UNEP REDD+ Programme	Strengthen linkages to Forest Research Institute (FRI) Sharing of analysis of drivers of forest degradation Training of DZGD, FD and others on use of GHG inventory software, conduct of forest inventory for CDZ, social and environmental safeguards, and establishment of monitoring, reporting and verification (MRV) protocols
ADB	Under ADB RETA “Promoting Ecosystems Services and Forest Carbon Financing in Asia and the Pacific”, Sharing of methodology and information to inform scaling up of similar ecosystems services assessment in additional candidate site(s)
LIFT Program	Under Dry Zone subprogram, will: Share data and knowledge based on its interventions at selected townships, particularly in relation to agricultural sector work supported by IFDC and FAO Leverage relationships with partner NGOs and CSOs that support innovative approaches that can be scaled up (e.g. Golden Plains approach to composting; Yezin University work in vermin-composting; TDH work on hydroponics; stress test approach of Mercy Corps; microfinance of PACT Global etc)

International Water Management Institute (IWMI)	<p>Contribution to water balance study using Water Accounting+ approaches</p> <p>Inputs into design and delivery of training, capacity building, as well as civil works and M&E systems development related to integrated soil and water management – with special emphasis on watershed management</p> <p>Provision of technical resource persons for above activities</p>
UNDP	<p>Under Adaptation Fund project “Addressing Climate Change Risk on Water Resources and Food Security in the Dry Zone of Myanmar”,</p> <p>Serve on Project Technical Steering Committee</p> <p>Explore joint training and capacity-building activities in water capture and storage, management of micro-watersheds, community-based agro-forestry, conservation agriculture and provision of climate risk information to stakeholders</p>
UNDP	<p>Under the GEF-5 project “Strengthening Sustainability of Protected Area Management in Myanmar”,</p> <p>SEE COLLABORATION with Wildlife Conservation Society (below)</p>
Non-Government Organizations / Civil Society Organizations	
Gender Equality Network (GEN)	<p>Build on 2013 Women and Leadership assessment to incorporate elements of environment leadership.</p> <p>Seek to deliver this as training of trainers for women leadership for government representatives, village, township and district level communities.</p> <p>Involve and engage members of network as specialists in training capacity building activities related to the GEF project Gender Action Plan, particularly gender and community forestry enterprises , land use and land rights dialogue.</p>
National Women’s Affairs Federation	<p>Liaison with District and Township level representatives to encourage participation of women in training and capacity building activities (part of Gender Action Plan network development)</p>
RECOFTC - The Center for People and Forests	<p>Custom design and delivery of training and capacity building activities related to Sustainable Forest Management, specifically community-based forestry</p> <p>Facilitation of cross-site visits</p> <p>Provision of technical resource persons for above activities</p>
Wildlife Conservation Society (WCS)	<p>Sharing of updated PA gap analysis from UNDP-GEF project (above)</p> <p>Lead role in design and implementation of KBA training</p> <p>Lead role in design and delivery of capacity building for biodiversity conservation and mainstreaming into forest</p>

	<p>management planning, with emphasis on protection of key endemic species found in dryland ecosystems</p> <p>Contribution to policy and legislative issues related to decentralization of PA management to State levels, new tools to increase community participation in conservation (with NWCD)</p>
Myanmar Environment Rehabilitation Conservation Network (MERN)	<p>Participation of network members (e.g. BANGA, Friends of Wildlife etc) in socio-economic and key biodiversity assessments (KBAs)</p> <p>Use of resource persons for mainstreaming biodiversity into forest management planning, and possible PES activity in Popa Mountain Park area</p>
Ecosystem Conservation and Community Development Initiative (ECCDI)	<p>Inputs into landscape level assessments and design of SLM and IWRM training and capacity building</p> <p>Participation in delivery of training and capacity development programs under integrated soil and water conservation and management, with emphasis on agronomy and livelihoods</p>
Forest Resource Environment Development and Conservation Association (FREDA)	<p>Engage FREDA resource persons to participate in design and delivery of training and capacity building activities, specifically to work on front line with project beneficiaries</p> <p>Utilize national and localized expertise in sustainable forest management (community forestry, reforestation, natural regeneration, agro-forestry and gender)</p>
World Wildlife Fund	<p>Orientation of project technical team on application of INVEST open source spatial planning tool</p> <p>Sharing of information on KBA applications in Tanintharyi landscape for activities related to biodiversity</p> <p>Inputs into design of natural capital and ecosystems services assessments related to KBAs</p>
Mercy Corps	<p>Application of Strategic Resilience Assessment (STRESS) methodology in project areas of CDZ based on proven methods</p> <p>Use of resource persons to design and employ agricultural production strategies for farming households</p> <p>Use of resource persons to help farmers improve access to institutional microfinance</p>
Golden Plain Livelihood Development Services Cooperative	<p>Conduct of soil mapping, assessment and soil analysis at demonstration site</p> <p>Training on community soil mapping and assessment for scaling up</p> <p>Demonstration of climate smart agriculture (ie. 'green manure' technology) at main forest reserve area and training / capacity building at scaling up sites using farmer field school approach</p>

	Provision of field level agronomists, particularly on front line with project beneficiaries
Land Core Group (LCG)	Conduct policy analysis related to land use policy implementation Provide inputs into land and gender issues for development of training and capacity building activities Advisory services on establishing M&E system to align with Land Information Management System (LIMS) and emerging “one Map Myanmar” system

A.4. *Gender Equality and Women's Empowerment.* Elaborate on how gender equality and women's empowerment issues are mainstreamed into the project implementation and monitoring, taking into account the differences, needs, roles and priorities of women and men. In addition, 1) did the project conduct a gender analysis during project preparation (yes ☒ /no ☐)?; 2) did the project incorporate a gender responsive project results framework, including sex-disaggregated indicators (yes ☒ /no ☐)?; and 3) what is the share of women and men direct beneficiaries (women - 30-50%, men 50%)? ⁹

A project Gender Action Plan (GAP) is presented in ANNEX E. This will be reviewed by the project team and internalized into the project work plan during project inception. While the GAP identifies some actions and targets, special efforts will be supported to monitor changes in women's empowerment over time. Dryland ecosystems pose a number of challenges for both men and women due to gender distinctions in roles, relationships, responsibilities, unequal access to and control of, productive assets and resources. The policy framework in Myanmar does not fully recognize the needs and important contribution of women in the use and management of resources in dryland ecosystems. Below are some indicators and targets which may be incorporated into the M&E system, to the extent possible, to monitor change in women's empowerment over the life of project and beyond.

Some relevant data is being collected in the community and household level surveys being conducted and analyzed under the ADB RETA (for Mae Nyo Taung FR). The community and HH level survey tool will be refined and applied in the context of scaling up under Component 3 (reference Output 3.3.2).

Level / Indicator	Participation	Decision-Making	Control of Productive Assets
Government	30% of all participants in training and capacity building are women	Increased awareness of gender issues and concerns in the context of natural resources management at department level, along with ability to collect, analyze, use and disseminate sex-disaggregated data % increase in number of female officers in DZGD (esp Assistant Director, Deputy Director and	Gender-relevant modifications to land tenure and water use rights policies and regulations recognized at district and township levels

⁹ Same as footnote 8 above.

		Director) from baseline of four (4)	
Community	50% of all participants in training and capacity building are women	<p>Provision of 'safe space' where women can increase social capital through interaction with other women in context of water user groups, forest user groups, producers' associations, savings and loans groups etc</p> <p>Reduced workloads as result of spending less time getting fuelwood and water</p>	<p>Inputs into design and operations of small ponds, rainwater harvesting systems, drip irrigation, tube wells and other civil works</p> <p>Increased ability to influence productive inputs such as water allocations, land use, agricultural tools, seeds, fertilizers, extension services etc</p>
Household	50% of all participants in training and capacity building are women	<p>Improved access to information and technology (e.g. through such mechanisms as front line centres)</p> <p>Increased dietary diversification, particularly higher animal protein consumption</p>	<p>% increase in income for female-headed HH</p> <p>% increase in FH-HH asset base</p>

A.5 Risk. Elaborate on indicated risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, the proposed measures that address these risks at the time of project implementation.(table format acceptable):

Presented below is a risk mitigation framework which will guide the project:

Risk	Rating	Mitigating Action(s)
Exposure to harsh climatic conditions in CDZ	Low	Given the difficulties working in during the heat of summer months, project management will adjust activities to reduce exposure of project team and other stakeholders as appropriate. For project staff, field offices in Mae Nyo Taung and Popa Mountain (or other) areas will be set up as accommodation. For community stakeholders that engage in project activities (e.g. afforestation), temporary shelters with basic amenities will be built on location. This is a standard practice of DZGD in their program implementation.

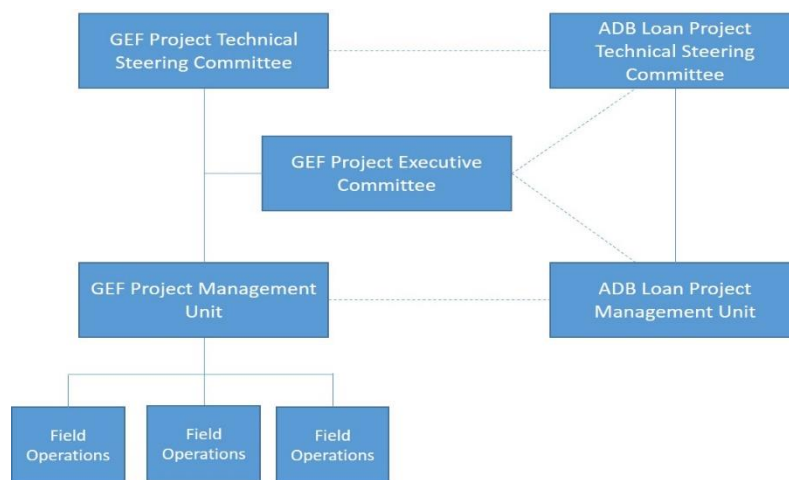
Lack of sustained commitment to reforms to promote climate resilience, sustainable land use and increased community participation	Low to Moderate	<p>The new Government of Myanmar is taking a more proactive approach to addressing climate change, land and water use challenges. Strong government commitment exists at national and subnational levels, to addressing these issues which affect agriculture, as the main driver of the economy. The recent re-organization of MONREC, with new Ministerial leadership, has injected enthusiasm within departmental ranks. Assistant Directors, Directors and Directors General now appear to be more motivated to fulfill the mandates of their respective departments and divisions, due to increased transparency and opening up of lines of communication.</p> <p>The system now encourages public consultation, as evidenced by the recent (and ongoing) policy dialogues related to land use and water use policies. As articulated in Section A.8, the KM approach, the GEF project will take steps to inform communities about key reform issues and concerns, encourage public participation in relevant fora, and facilitate ways in which reform concerns can be translated into action. The GEF project will create enabling conditions in which special concerns of CDZ can be brought to the table, and supplement ongoing and planned national level policy reform dialogues.</p>
Lack of sustained community support or engagement in project activities	Moderate	<p>One of the appealing elements of the project is the direct support to a) increase community participation in forest management, and b) support increased rural productivity, livelihoods and incomes. Preliminary interaction with communities in and around Mae Nyo Taung FR has been undertaken (primarily through the ADB RETA), which has helped to sensitize communities, at least initially, to the nature and scope of proposed longer term project interventions.</p> <p>The GEF project management team will understand that a) it will take time to build trust with communities, and b) tangible benefits need to be realized by communities to sustain support and participation. To help facilitate the interaction with communities, the project will work with key interlocutors such as the NGOs and CSOs identified in the Stakeholder Involvement Plan. Some of these, such as FREDIA, ECCDI and Golden Plains, have field technical specialists already embedded within communities. Others, such as RECOFTC and WCS, specialize in advancing community-based approaches to natural resource management, with toolkits already developed and tested.</p> <p>This will build on already-established relationships between communities around the PFE and field level / front line operations of the DZGD in these areas; supplemented by “cash in work” / capacity-building opportunities that will be offered by the GEF project.</p>

Lack of coordination with other adaptation, water and land use projects and initiatives	Moderate	<p>The number of externally funded initiatives focussing on CDZ concerns is increasing. It is critical that these initiatives are coordinated to avoid duplication; to ensure that the various initiatives work together not in isolation; to share knowledge; and importantly contribute to scaling of investments.</p> <p>Project preparation has been very proactive in terms of ‘reaching out’ to a number of projects and institutions, as indicated in the stakeholder section. Consultations were structured such that the parties were able to clearly identify a) areas of direct and relevant collaboration, b) areas where collaboration might be less direct or not easily undertaken, and c) areas where no collaboration would be foreseen.</p> <p>ADB/GEF team acknowledges that most project organizations are not inherently compelled to collaborate and share information. The GEF project management team will need to do regular outreach, and ‘go the extra kilometre’ in order to ensure meaningful collaboration. This means that it will be important to find ways to convince other project implementors, that co-benefits can be generated, and scaleable results achieved. Terms of reference for key personnel will encourage a strong level of outreach, with possible incentive structure.</p> <p>Finally, the DZGD will also take steps to increase levels of interaction with other Government counterparts working in the CDZ (as below).</p>
Lack of coordination between and among relevant Government agencies	Moderate	<p>The GEF project will establish a high-level Project Steering Committee comprising senior local government officials, and chaired at Vice-Ministerial or DG level to provide oversight and overall guidance / direction. An Aide Memoire signed by the Ministry of Agriculture, Livestock and Irrigation (MALI), ADB and AFD acknowledges the GEF project linkages. The MALI has agreed to the institutional arrangements outlined in the CEO endorsement document under Section A.6 – which have been designed to strengthen MONREC – MALI coordination in the CDZ at subnational levels (regional, district and township).</p> <p>As indicated in Section A.6 Institutional Arrangements and Coordination, the project organizational structure will also foster working linkages at the project management level (between MALI and MONREC in particular).</p> <p>Special efforts will be made to coordinate with a wider range of other Ministries and government agencies on a project activity basis. The approach is articulated in Section A.8, (Knowledge Management), which a number of specific</p>

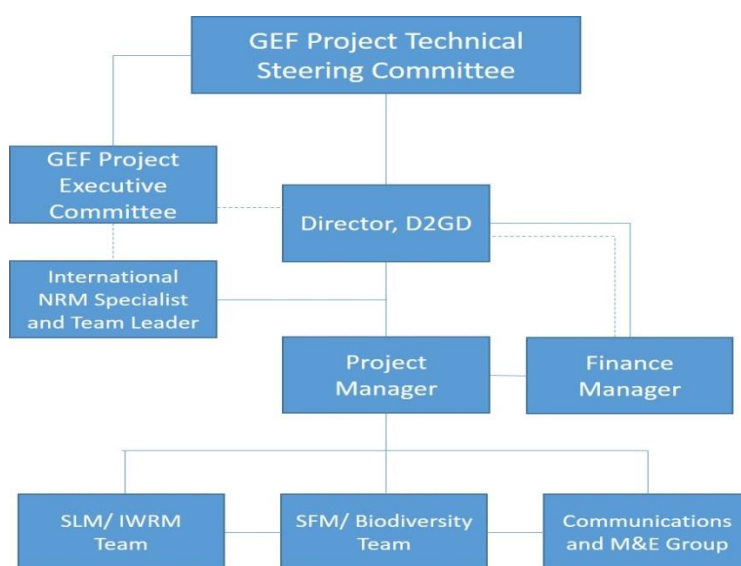
		mechanisms to foster coordination are presented in the narrative under Section A.6..
Low institutional capacity (technical, financial, environmental management) and challenges finding qualified personnel	Moderate	<p>Technical Assistance, grants and other forms of support will be provided under the co-financing projects (e.g. Ecosystems Services Valuation and Irrigated Agriculture Inclusive Development Project). Furthermore, preparation of this project has pinpointed the human resource and institutional capacities of the various stakeholder organizations - which has helped to widen the roster of potential technical experts in specialized domains. Some of this is reflected in the Project Stakeholder Involvement Plan under Section A.3.</p> <p>As the GEF project fits well within the mandate of the DZGD, staff officers in the Mandalay and other 2 regions are already oriented to the objectives and proposed work program of the GEF project. Some of these officers have participated in trainings and meetings supported by other donor-funded programs (e.g. FAO/UNEP/UNDP REDD+ Roadmap). This 'headstart' has also been facilitated by a training workshop supported by the ADB RETA co-financing project on addressing deforestation issues and valuation of ecosystems services (04 August 2016), during which there was also a session on the proposed GEF project.</p> <p>The human resource matrix for the GEF project has been structured such that international specialists will also mentor national specialists. In particular the project will require strong technical leadership and guidance – an international NRM specialist and team leader will support and work closely with a national project manager, who will eventually graduate to lead the project full time.</p>
Impacts of climate change and/or increased variability (e.g., on water availability; crop and livestock resilience to high temps., drought, disease; forest fires):	Low to Moderate	The GEF project team will develop adaptive management strategies and work around plans based on a number of different projected scenarios.

A.6. Institutional Arrangement and Coordination. Describe the institutional arrangement for project implementation. Elaborate on the planned coordination with other relevant GEF-financed projects and other initiatives.

Figures below illustrate the project organizational and management structure:



Project Organizational Structure



Project Management Structure

Institutional arrangements for the GEF project are detailed as follows:

Roles	Departments / Agencies	Description of Roles / Responsibilities
GEF Executing Partner	Ministry of Natural Resources and Environmental Conservation (MONREC) with Dry Zone Greening Department (DZGD) as lead department	Coordination with all GEF initiatives Facilitate project cycle Chair Project Technical Steering Committee Host GEF Project Management Unit (PMU)

ADB Loan Executing Agency	Ministry of Agriculture, Livestock and Irrigation, Department of Irrigation and Water Resources	Oversee /implement ADB loan project Participate on GEF Project Technical Steering Committee
GEF Project Technical Steering Committee	Chair: MONREC Secretary: DZGD /PMU Members: DZGD, Forest Department (FD), Environmental Conservation Department (ECD), Irrigation Department (ID-MALI), UNDP/GEF Adaptation Fund Project	Meets: Annually Main roles: Validate annual work plan Validate major outputs Recommends changes to project framework Helps coordination with other projects Facilitate policy dialogue
GEF Project Executive Committee	Chair: DZGD Members: FD, ID, ADB/GEF	Meets: Quarterly Main role: Lead <u>technical</u> execution of project Prepare quarterly work plans and budgets Guide contractor performance Advise on project operations
Project Management Unit (PMU)	DZGD with support from ADB/GEF	In line with ADB policy and procedures: Provide general oversight and technical direction to project Ensure coordination and linkages with ADB loan PMU Establish and implement project operational, administrative and financial management systems and processes Assist in preparing contracting packages Support for drafting of technical elements of contracts Monitor contract performance Recommend payments to contractors Prepare draft technical and financial reports

		Prepare all required GEF monitoring and tracking tools Act as Secretariat for Project Technical Steering Committee, Project Executive Committee and various other project meetings Regular liaison and coordination with project partners / stakeholders
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Basic terms of reference for key personnel are presented in ANNEX F.

How will stakeholder and institutional coordination take place?

The information presented above identifies a number of ways in which a range stakeholders will participate in project implementation. The GEF Project Management Unit (located in the DZGD Mandalay Headquarters) will serve as the main locus for coordination. The Project Director (Director of Planning, DZGD), the International Team Leader and the National Project Manager (in coordination with the Communications Specialist) will be tasked to lead these efforts, using the available human and financial resources.

Mechanisms for coordination will include, but not be limited to: a) Project Technical Steering Committee (PTSC) annual meetings (including the ADB loan PTSC), b) GEF Executive Committee quarterly meetings, c) Special sessions / roundtable meetings which bring together other projects and stakeholders at the management level, d) Field level, operational meetings/events/activities which bring together township and district level stakeholders from government and civil society (noting that field offices are proposed in Mae Nyo Taung and Popa Mountain Park areas), e) Cross participation in training and capacity-building activities, f) Cross visits between project sites (GEF, FAO, UNDP, LIFT, etc), g) Joint communiqués and briefs, h) Joint development and dissemination of knowledge products, i) Direct engagement of selected and eligible NGOs/CSOs under contracts for services, j) Reciprocal social media and information sharing arrangements etc.

Additional Information not well elaborated at PIF Stage:

A.7 Benefits. Describe the socioeconomic benefits to be delivered by the project at the national and local levels. How do these benefits translate in supporting the achievement of global environment benefits (GEF Trust Fund) or adaptation benefits (LDCE/SCCF)?

Socio-economic benefits will be difficult to quantify prior to implementation, especially those derived by farming households and forest workers in the context of the project. This is due mainly to the absence of time series data in the DZGD and Forest Department, and limited (or difficult to verify) information from the Department of Agriculture (DoA) and Department of Rural Development. Consultations with other donor-funded programs, government departments, NGOs, private sector companies, field level agronomists and foresters, and village administrations, suggest that socio-economic benefits will tend to be highly localized to project sites, especially where there is sustained technical support and community leadership engagement.

A number of actions will attempt to support the generation of benefits. First, will be to demonstrate and quantify benefits through farmer field school (or similar demonstration site) supported by extension services (e.g. front line centres supported by IFAD or agricultural coordination centers under the ADB loan projects) which aim to strengthen market linkage for famers; Second, to encourage participatory approaches (e.g. community soil mapping, community

forestry etc) in which farmers / forest workers define ways in which they can better manage resources to their long term advantage. The best way to do this will be to engage experienced NGOs/CSOs which have front line technical and extension officers, that have established relationships and trust with local communities; Third, to support project technical interventions with well developed knowledge products (some quantifiable ecosystems benefits will be available through the ADB TA) to help internalize key messages; Fourth, “cash-in-work” programs, where community participants are remunerated at fair market rates for project-related activities (e.g. afforestation labour, digging wells, building ponds etc.). Finally, the training and capacity-building is meant to assist farmers and forest workers widen their livelihood / income options, apply coping mechanisms, strengthen financial resilience (ie. Improve creditworthiness or help get out of debt with informal money lenders) etc.

The GEF project expects benefits in the following ways: a) increase in gross agricultural income per household of 15% in land settlements around Mae Nyo Taung Forest Reserve. This is quantifiable due to baseline information emerging from field level surveys ongoing. b) increased availability of water has potential to improve agricultural productivity and reduced health care costs, c) diversification of livelihood and income opportunities through adoption of good practices and codes of conduct in management of land, water and forests, particularly if households are able to reduce debt burdens (from informal lenders).

A.8 Knowledge Management. Elaborate on the knowledge management approach for the project, including, if any, plans for the project to learn from other relevant projects and initiatives (e.g. participate in trainings, conferences, stakeholder exchanges, virtual networks, project twinning) and plans for the project to assess and document in a user-friendly form (e.g. lessons learned briefs, engaging websites, guidebooks based on experience) and share these experiences and expertise (e.g. participate in community of practices, organize seminars, trainings and conferences) with relevant stakeholders.

Elements of a KM approach are elaborated below:

Objectives:

Improve knowledge management processes within the Dry Zone Greening Department (DZGD), to enhance program delivery

Strengthen the absorptive capacity of project stakeholders to internalize relevant, high quality data, information and apply knowledge, and

Facilitate the flow of knowledge between and among project stakeholders, beneficiaries, influencers, decision-makers etc

Principles:

Encourage participation, transparency and accountability in project implementation

Use multimedia approaches (print, broadcast, web), with some emphasis on traditional, non-formal media such as puppetry

Engage thought leaders, influencers and champions at community level

Capture key messages from project results and package “audience-segmented” communications

Translate key messages into local languages

Use and/ or build on existing knowledge platforms and portals

Emphasize and quantify, if possible, the nature of benefits derived from NRM

Support scaling up of knowledge to improve practical application and create “systems-based” learning

Some Key Resources:

GEF Knowledge Approach Paper (June, 2015)

Section 3.7 of STAP Advisory Document on “Guidelines for embedding resilience, adaptation and transformation into sustainable development projects”

ADB Knowledge Management Directions Supporting Finance ++

World Agroforestry Centre, FAO, ICRISAT and WOCAT case study literature on scaling-up sustainable land management practices

IWMI literature on scaling up multiple use water resources

Creating enabling conditions for scaling knowledge and technology

What is “scaling up”? Considerable documentation and guidance on scaling up exists as it applies to commercialization of research and development - getting new types of products and processes into the marketplace. For goods and services that address social needs, most available literature relates to health, agriculture, food and nutrition sectors. A couple of definitions are worth considering in the context of the GEF project:

“Actions to deliver more tangible and quality benefits to more people over a wider geographical area more quickly, more equitably, which will endure over a long period of time” (modified from International Institute for Rural Reconstruction)

“Scaling-up [is] a process requiring a strategy and implementation plan that considers the policy context, delivery mechanisms and resource requirements, as well as the pace of change, sequencing of activities, areas for prioritization and monitoring and evaluation” (Maghman, L. and Hanson, K. 2010)

There are a number of different facets to scaling up:

Functional: the integration of policy and management by concerned line agencies

Horizontal: integration of policies and management across sector-based ministries and departments (e.g. agriculture, fisheries, environment, health, public works, etc)

Vertical: integration from local level organizational units up to central office (e.g. ward /village, township / city, state, regional)

Spatial: replication of processes across sites or bio-geographic areas; but also refers to reach, availability and accessibility to services or technical support, and

Temporal: acknowledgement that there are differential rates of adoption or change at different levels within a system.

Actions required to scale up implementation of programs, strategies, action plans and good practices would involve:

Proof of concept (e.g. successful site demonstrating tangible benefits, promising prototypes), and/or

Increasing critical mass by encouragement of parallel sites, networking (e.g. centers of excellence and learning institutions, local government alliances, information centers, implementation partners etc) and innovative training strategies.

Potential / Proposed Actions to Support Scaling (to be integrated with implementation)

Establish M&E system to collect and validate multiple data parameters (biophysical, socio-economic, climate, geological etc) (Functional)

Ensure smooth and coordinated transfer of data and information from field / village and forest level operations to township, district, regional and central offices in DZGD, FD and ECD (Vertical)

Encourage sharing of data and information between MONREC and other Ministries and Departments, notably MoALI (Horizontal)

Orient DZGD and other stakeholders on the design and implementation of behaviour change communications (under Output 2.2.3) (Spatial)

Work with partners to build up central, accessible resource centers (e.g. agricultural coordination centres under ADB loan; FD central training facilities etc) (Functional)

Packaging and dissemination of knowledge products to include:

Project updates

Policy briefs, talking points and speeches

Prepare pipeline of ‘stories to tell’ that demonstrate how people’s lives are impacted

Audio visual presentations: a) technical demonstrations, b) community outreach, c) social media including Youtube, Facebook etc which provide easy to understand guidance (ie. ‘how to do’)

Presentations at national and international conferences and exhibitions

Encourage cross visits and community exchanges (Spatial)

Experiment with secondments across departments and agencies (Horizontal)

Support proof of concept and scale up technological innovations unique to dryland ecosystems (Spatial)

How will knowledge management address sustainability?

Strengthen capacity of DZGD, FD and ECD to provide technical services to client communities, but also to leverage strategic partnerships with NGOs/CSOs as key delivery mechanisms – focus on township and district level administrations. Bring to bear a wider set of skills, tools etc

Strengthen arguments for increased annual budget allocations, as most conservation funds are set up with the explicit aim of attracting and administering funding from multiple sources outside the public budget and traditional development assistance projects

Demonstrate and quantify benefits through farmer field school (or similar demonstration site) supported by extension services (e.g. front line centres supported by IFAD or agricultural coordination centers under the ADB loan projects) which aim to strengthen value chain and market linkages for farmers;

Encourage participatory approaches (e.g. community soil mapping, community forestry etc) in which farmers / forest workers define ways in which they can better manage resources to their long term advantage. The best way to do this will be to engage experienced NGOs/CSOs which have front line technical and extension officers, that have established relationships and trust with local communities;

Support project technical interventions with well developed knowledge products (some quantifiable ecosystems benefits will be available through the ADB TA) to help internalize key messages

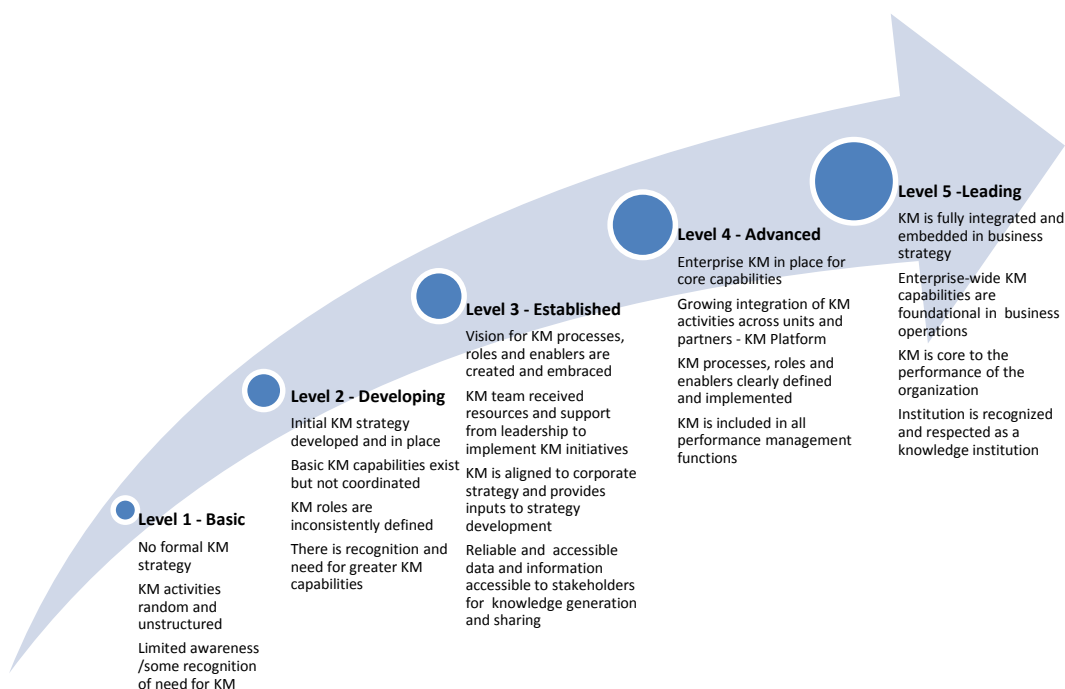
Use “cash-in-work” programs, where community participants are remunerated at fair market rates for project-related activities (e.g. afforestation labour, digging wells, building ponds etc.). This may not constitute real employment / livelihood, but one could argue that this is a way of assisting communities while programs require time to take hold

The training and capacity-building is meant to assist farmers and forest workers widen their livelihood / income options, apply coping mechanisms, strengthen financial resilience (ie. improve creditworthiness or help get out of debt with informal money lenders) etc, and

Identify opportunities for public-private partnerships

Knowledge management maturity assessment model

The aspiration will be to guide DZGD to advance from Level 1 to Level 3 in the life of project.



Scaling up innovative approaches: some examples in CDZ

Project preparation reviews and consultations point to a few technological interventions which merit attention. These are linked to pilots with the Livelihoods and Food Security Trust Fund (LIFT) Dry Zone Programme.

- a. Drip irrigation or hydroponics for household level horticulture: Training farmers to use drip irrigation schemes using water from existing sources, mainly village ponds to promote horticulture without using soil. Given that

there is competition for water for domestic and irrigation use, a proprietary drip system developed by NGO Terre des homes (TdH), has been modified for greater water use efficiency. Hydroponic systems can also be used, although more water is required than with drip irrigation, there is no need for soil (ie. land), and the water is cycled through the system. Based on early results from LIFT, it was discovered that drip-irrigated plots grow vegetables with daily values of of \$0.26 - \$0.61 per household Produce can be consumed (and offset money that would have otherwise been spent on food), and/ or sold in local markets. In 2014, drip irrigation in 14 villages produced 2.3 tonnes of vegetables (mostly eggplant, okra, cucumber, carrot and beans) on plots averaging 56 m² (discussions with LIFT programme officers). Combined with development of water resources, these systems can be replicated and scaled up.

- b. Use of “green’ manure to increase soil nutrition: Use of green manure by small holder farmers and home gardeners is increasing in many areas where soil is subject to nutrient depletion. Green manure can be cost effective, increase soil nutrition, deter formation of weeds, and can also help reduce effects of soil erosion. Green manure needs to be applied in different ways depending on the specific biophysical environment. For example, studies indicate that mixing sunflower and red clover can increase zinc concentration in wheat (Forough, A. et al, 2014), and also improve soil biological properties – microbial biomass, soil respiration and enzymatic activities, as well as yields of maize (Tejada, M. et al. 2008); increases in calcium and magnesium due to green manure applications for sugar cane (Edmilson, Jose, A. et al, 2004). In the Central Dry Zone of Myanmar, Golden Plains Cooperative is experimenting with green manure applications on small demonstration plots using sun hemp and other leguminous plants; as a low-tillage approach tailored to the climatic and cropping patterns in the CDZ. Experimental trials at the Department of Agricultural Research, Yezin revealed that the cultivation of *Sesbania rostrata* as a green manure crop (for 45-60 days and ploughing it into the soil), before paddy crops, can increase production by about 25 percent (FAO, Working Paper #5, June 2016, p.16).
- c. Small scale solar irrigation pumps: A couple of Myanmar-based social enterprises, Proximity Designs and Development Resources International have developed affordable solar powered irrigation pumps to promote sustainable agriculture and provide long-term savings for farmers who would no longer need to buy diesel fuel for engine pumps to irrigate crops. The companies claim that pumps can save farmers up to US\$300 per year (Myanmar Business Today, 25 October, 2015) in displaced maintenance and fuel costs, are much lighter (for mobility) and quieter than Designed specifically for the local agricultural market, the pumps are submersible and can fit into 50 mm diameter wide tube-wells commonly used in the CDZ. The pumps can generate higher water yields and are much more adaptable for drip irrigation methods.

B. DESCRIPTION OF THE CONSISTENCY OF THE PROJECT WITH:

B.1 Consistency with National Priorities. Describe the consistency of the project with national strategies and plans or reports and assessments under relevant conventions such as NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, etc.:

The GEF project is consistent with the Myanmar obligations towards compliance with international conventions and corresponding national policies and strategic plans: i) UN Convention to Combat Desertification (UNCCD) in that it supports programs related to greening of the CDZ, providing water for crop production, and supporting awareness and education (MOF, 2006), ii) UN Framework Convention on Climate Change (UNFCCC) - addressing priorities identified in the Myanmar National Adaptation Plan of Action (NAPA), proposing Nationally Appropriate Mitigation Actions (NAMA), and contributing to the REDD+ Programme. Specifically, the NAPA includes the following: i) Agriculture: Second Priority - Increased climate change resilience of rural and subsistence farmers in the Dry and Hilly Zones through legume crop diversification and climate-resilient varieties; Third priority - Increasing the climate change resilience of Dry Zone communities by diversifying and intensifying home-gardens through solar-power technology, high-income fruit crops and climate-smart agriculture approaches: ii) Forests: First priority - Building the resilience of degraded/sensitive forest areas to climate change impacts through reforestation. Second priority - Community-based reforestation for climate-resilient ecosystems and rural livelihoods in degraded watershed areas of the Central Dry Zone. iii) Water Resources: Institutional capacity building for improving dam design and management. iv) Biodiversity:

Second Priority - Mainstreaming ecosystem-based climate change adaptation for buffering rural communities against climate change impacts into policy, planning and relevant projects (MOECA, 2012).

The GEF project also addresses identified targets under the Convention on Biological Diversity (CBD), notably Aichi Targets 2, 5, 7 and 14 in the Myanmar National Biodiversity Strategic Action Plan. The table below provides more details in this regard:

Aichi Biodiversity Target	Relevant Project Outputs / Outcomes	Potential Benefit Indicators
Target 2: By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.	<p>Outcome 2.1 Biodiversity and ecosystems values, management principles and targets mainstreamed into strategic planning and operations of MONREC by 2022</p> <p>Output 2.2.1 Forest management plans strengthened to include cross sector elements, including sustainable use and conservation of biodiversity, effective enforcement mechanism</p> <p>Outcome 4.1: Cross sector policy reform priorities related to land use, water use and agricultural development in CDZ defined and subject to public policy processes by 2022</p> <p>Output 4.1.2: Stakeholder ministries, agencies, civil society and academe engaged in dialogue on revitalizing policy and legislative frameworks related to national resources management, including National Land Use Policy (2014), proposed Water Law and National Water Policy and other subsidiary legislation relevant to agricultural development and productivity.</p>	<p>Sub-national accounting system incorporates natural resource, biodiversity, and ecosystem service values</p> <p>Convention compliance capacity improved through assessments of biodiversity values</p> <p>Guidelines and applications of economic appraisal tools available to stakeholders</p> <p>Increased possibility of integrating biodiversity and ecosystem service values into sectoral and development policies (e.g. agriculture, irrigation, water)</p> <p>Biodiversity and ecosystem services support environmental impact assessment and strategic environmental assessment capacity of MONREC</p>
Target 5: By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.	Outcome 3.3: Sustainable forest management practices and biodiversity conservation scaled up in the Permanent Forest Estate with 300,000 ha with strengthened conservation measures, of which at least 45,000 ha will be improved forest lands. These efforts will address Aichi Biodiversity Targets 7 and 14. Avoided emissions of 3,373,358 tCO ₂ e over 20 years	<p>Improved status of degraded forest and other dryland area habitats</p> <p>Improved condition and reduced vulnerability of ecosystems (including reduced fragmentation)</p> <p>Improved status of habitat dependent species in dryland forests</p>
Target 7: By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.	Outcome 3.3: Sustainable forest management practices and biodiversity conservation scaled up in the Permanent Forest Estate with 300,000 ha with strengthened conservation measures, of which at least 45,000 ha will be improved forest lands. These efforts will address Aichi Biodiversity Targets 7 and 14. Avoided emissions of 3,373,358 tCO ₂ e over 20 years	<p>Increase in forest and agricultural ecosystems under improved management</p> <p>Improved productivity of selected forest and agriculture dependent species</p> <p>Increase in sustainably sourced NTFPs</p>

Target 14: By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.	<p>Outcome 2.1 Biodiversity and ecosystems values, management principles and targets mainstreamed into strategic planning and operations of MONREC by 2022</p> <p>Outcome 3.2: : Sustainable land and water management practices scaled up in agro-ecological landscapes</p> <ul style="list-style-type: none"> - 50,000 ha under improved agricultural productivity and avoided GHG emissions of 1,708,875 tCO₂e over 20 years 	<p>Improved conservation status of species that contribute to ecosystem services</p> <p>Improved human health and well-being derived from selected ecosystem services (i.e. fresh water)</p> <p>Increased proportion of the population using improved water services</p> <p>Increase in proportion of total freshwater resources available for use</p>
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The GEF project further aligns directly with identified priorities identified by the Master Plan for the Agriculture Sector, Food Security Working Group related to water resources management, the Community Forestry National Working Group, the National Plan of Action for the Advancement of Women particularly in relation to Women and the Environment. These would include, among others, the Farmlands Law, the Vacant, Fallow and Virgin Land Management Law, Land Acquisition Act, Land Use Policy, Environmental Conservation Act, Conservation of Water Resources and Rivers Law, as well as the emerging Water Law and National Water Policy.

Specific to the new Land Use Policy of 2016, the GEF project addresses a number of priority areas including, but not limited to: a) Part III – planning and changing land use, b) Part V – procedures related to land acquisition, relocation, compensation, rehabilitation and restitution, c) Part VI – land dispute resolution and appeal, and d) Part IX – equal rights of men and women. Issues relevant to these provisions will be integrated into the various technical assistance activities promoted by the project. The GEF project also addresses priority considerations under the proposed national Water Use Policy. Documentation on the proceedings are not fully translated into English, however, the project will provide technical assistance in relevant areas which are identified under Components 1 and 4; a) to promote demand driven approaches to use of water resources, b) to ensure proper land resource planning supports sustainable water use, and c) to ensure efficient means of water supply - as they apply to the CDZ.

Myanmar's recently formulated approach to Intended Nationally Determined Contributions (INDCs) towards climate change mitigation, identifies a number of actions in the forest sector. By 2030, the National Permanent Forest Estate Target is to increase national land area as forest land. Reserved Forest (RF) and Protected Public Forest (PPF) should be 30% of total national land area, and Protected Area Systems (PAS) should be 10% of total national land area. Management. Under Forest Management, the country aims: a) To decrease the rate of deforestation so that a significant mitigation contribution from the sector can continue to be realised, b) To preserve natural forest cover to maintain biodiversity and ecosystems in Myanmar, c) To realize the co-benefits of the policy such as reducing soil erosion etc., d) To increase capacity for Sustainable Forest Management (MOECA, 25 August 2015). The GEF project will contribute to achieving a good part of these objectives as relevant to the Central Dry Zone.

The GEF project is also consistent with the Strategic Framework for Rural Development as outlined by the former Ministry of Livestock, Fisheries and Rural Development in its Participatory Village Development Plan, which envisages activities related to CF, village forests, renewable energy (including biogas), energy-saving stoves, rural handicrafts, rural food processing, seasonal employment creation (food and cash), development of watershed areas, agroforestry, biodiversity conservation, agriculture, forestry extension etc.

The new Ministry of Agriculture, Livestock and Irrigation (MALI) in collaboration with FAO has recently (January, 2016) produced a series of Working Papers which cover Crop Production, Extension and Research (#1), Livestock Production, Extension and Applied Research (#2), Agricultural Water and Soil Management (#3), Environmental Conservation and Forestry (#5), among others, which provide sector analyses, description of needed technical

interventions and investment profiles. The GEF project is aligned with the key priorities identified in these sector assessments.

C. DESCRIBE THE BUDGETED M & E PLAN:

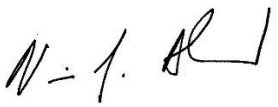
Type of M&E activity	Responsible Parties	Budget (GEF and ADB)	Time Frame
Inception Workshop	<ul style="list-style-type: none"> PMU DZGD, FD, ECD Irrigation and Water Resources Management Department ADB 	GEF: \$2,000 ADB: \$3,500	Within 2 months of project start-up
Inception Report with Annualized Work Plan	<ul style="list-style-type: none"> PMU, DZGD 	None	1 month after project inception meeting
Measurement of project indicators (outcome, progress and performance indicators, GEF tracking tools)	<ul style="list-style-type: none"> National Project Manager International Team Leader M&E Coordinator / Officer Communications Officer 	GEF \$ 15,000	Outcome indicators: start, mid and end of project Progress/perform. Indicators: annually
Semi-annual progress and operational reports to ADB and GEF	<ul style="list-style-type: none"> National Project Manager International Team Leader M&E Coordinator / Officer Communications Officer 	None	Within 30 days of end of reporting period i.e. on or before 31 January and 31 July
Project Technical Steering Committee meetings	<ul style="list-style-type: none"> PMU, DZGD 	GEF: \$6,000 ADB: \$20,000	Annual
Reports of PTSC meetings	<ul style="list-style-type: none"> PMU, DZGD 	None	Annually
Project Implementation Reports (PIRs)	<ul style="list-style-type: none"> PMU, DZGD ADB 	None	Annually, as part of reporting routine
Monitoring visits to field sites	<ul style="list-style-type: none"> Project technical specialists M&E Coordinator / Officer 	GEF: \$20,000 ADB: \$15,000	As appropriate
Website data sets updated regularly	<ul style="list-style-type: none"> National Project Manager IT Officer / Communications Officer 	GEF: \$ 15,000	
Mid Term Review	<ul style="list-style-type: none"> External consultants ADB 	GEF: \$15,000 ADB: \$30,000	At mid-point of project implementation
Terminal Evaluation	<ul style="list-style-type: none"> External consultants ADB 	GEF \$ 15,000 ADB: \$ 30,000	At least 6 months prior to project termination date
Project Semi-Annual and Final Reports	<ul style="list-style-type: none"> PMU, DZGD 	None	Semi-annually; final report within 2 months of the project completion date

Type of M&E activity	Responsible Parties	Budget (GEF and ADB)	Time Frame
Co-financing report	▪ ADB, DZGD	None	Within 1 month of the PIR reporting period, i.e. on or before 31 July
Total M&E Plan		GEF: \$73,000 Co-finance:\$98,500 TOTAL: \$171,500	

PART III: CERTIFICATION BY GEF PARTNER AGENCY(IES)

A. GEF Agency(ies) certification

This request has been prepared in accordance with GEF policies¹⁰ and procedures and meets the GEF criteria for CEO endorsement under GEF-6.

Agency Coordinator, Agency Name	Signature	Date (MM/dd/yyyy)	Project Contact Person	Telephone	Email Address
Nessim Ahmad, Deputy Director General, Sustainable Development and Climate Change Department, Concurrently Chief Compliance Officer, ADB			Pavit Ramachandran, Senior Environment Specialist	+662 263-5301	pramachandra n@adb.org

¹⁰ GEF policies encompass all managed trust funds, namely: GEFTF, LDCF, and SCCF
GEF6 CEO Endorsement /Approval Template-Dec2015

ANNEX A: PROJECT RESULTS FRAMEWORK (either copy and paste here the framework from the Agency document, or provide reference to the page in the project document where the framework could be found).
See Attached Annex A.

ANNEX B: RESPONSES TO PROJECT REVIEWS (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF).

See attached Annex B documents.

ANNEX C: STATUS OF IMPLEMENTATION OF PROJECT PREPARATION ACTIVITIES AND THE USE OF FUNDS¹¹

A. Provide detailed funding amount of the PPG activities financing status in the table below:

PPG Grant Approved at PIF: USD 137,000			
<i>Project Preparation Activities Implemented</i>	<i>GEF/LDCF/SCCF Amount (\$)</i>		
	<i>Budgeted Amount</i>	<i>Amount Spent To date</i>	<i>Amount Committed</i>
Project Preparation Activities*	137,000	0	0
Total	137,000	0	0

Project preparation activities has been self-financed by ADB and the government counterpart, and none of the PPG funding has been committed or disbursed. Given this, ADB has been requested by the project counterpart to cancel and return the PPG funds and then increase the project grant by the same amount.

¹¹ If at CEO Endorsement, the PPG activities have not been completed and there is a balance of unspent fund, Agencies can continue to undertake the activities up to one year of project start. No later than one year from start of project implementation, Agencies should report this table to the GEF Secretariat on the completion of PPG activities and the amount spent for the activities. Agencies should also report closing of PPG to Trustee in its Quarterly Report.
GEF6 CEO Endorsement /Approval Template-Dec2015

ANNEX D: CALENDAR OF EXPECTED REFLOWS (if non-grant instrument is used)

Provide a calendar of expected reflows to the GEF/LDCF/SCCF Trust Funds or to your Agency (and/or revolving fund that will be set up)

N/A