Strengthened drought and flood management through improved science-based information availability and management in Myanmar

Deliverable 8 (activity 3.3) Roadmap and lessons learned report

UNEP

Report

December 2019

This report has been prepared under the DHI Business Management System certified by Bureau Veritas to comply with ISO 9001 (Quality Management)

Approved by

X

Oluf Zejlund Jessen
Head of Department, Water Resources
Signed by: Oluf Zeilund Jessen

Strengthened drought and flood management through improved science-based information availability and management in Myanmar

Deliverable 8 (activity 3.3) Roadmap and lessons learned report

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EXECUTIVE SUMMARY

This report is the last written deliverable of the Climate Technology Centre and Network (CTCN) technical assistance to Myanmar entitled 'Strengthened drought and flood management through improved science-based information availability and management' (reference number 2016000035). It is funded by Green Climate Fund (GCF) Readiness and Preparatory Support Programme. This technical assistance is implemented by DHI in cooperation with the partner in Myanmar the Climate Change Division of the Environmental Conservation Department (ECD), Ministry of Natural Resources and Environmental Conservation (MONREC). The ECD is the National Designated Authority (NDA) of the GCF as well as the National Designated Entity (NDE) of the CTCN.

The purpose of this report is to present and reflect on lessons learned during this project and describe recommendations for further development of the portal, and to present a roadmap for the upscaling of the technical assistance outcomes supported by the GCF.

The main output of this technical assistance is a web portal developed by DHI which provides free access to state-of-the-art remote sensing data and information, tools and reporting abilities for flood and drought management, water resources and water related sectors in Myanmar. The portal address is:

www.flooddroughtmonitor.com/myanmar

The knowledge, data and tools are intended to be applied by the stakeholders in their daily activities and reporting. The data and tools can be used in both planning and operational activities. Additionally, guidance is provided to stakeholders on drafting a proposal for a project to upscale the outcomes achieved.

The lessons learned from this technical assistance are related to factors directly influencing the success of the implementation, and some additional general recommendations from stakeholders for a future upscaling project. Regarding the former, in sum, the main lessons learned encompassed the following: need for an effective NDE engagement; impact of having the output or at least a prototype ready from the very start of the project; translation and interpretation services are essential; the capacity building and training approaches were highly satisfactory; including a gender expert position; and ensuring an early engagement and start in drafting the Concept Note.

The roadmap is produced from the meetings and workshops dedicated to the draft Concept Note with the Executing Entities: the ECD, the DOA, the DAR and IWUMD. The GCF NDA was following closely and approving every step of the discussions and decisions made. The goal of the roadmap is to realize the implementation of the future project by obtaining GCF approval of the funding proposal. The roadmap includes the main challenges, required steps, major milestones and an estimated timeline.

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ACRONYMS & ABBREVIATIONS

AE	Accredited Entity
CTCN	Climate Technology Centre & Network
DHI	www.dhigroup.com
DOA	Department of Agriculture
DAR	Department of Agricultural Research
ECD	Environmental Conservation Department
GCF	Green Climate Fund
GHG	Green House Gases
IWUMD	Irrigation and Water Utilization Management Department
MIMU	Myanmar Information Management Unit
MOALI	Ministry of Agriculture Livestock and Irrigation
MONREC	Ministry of Natural Resources and Environmental Conservation
MOTC	Ministry of Transport and Communication
MSWRR	Ministry of Social Welfare, Relief and Resettlement
NDA	National Designated Authority
NDE	National Designated Entity
PPF	Project Preparation Facility
SAP	Simplified Approval Process
UNEP-DHI Centre	www.unepdhi.org/

1 Background

This report is Deliverable 8 under Activity 3.3 of the Climate Technology Centre and Network (CTCN) technical assistance to Myanmar entitled '*Strengthened drought and flood management through improved science-based information availability and management*' (reference number 2016000035). It is funded by Green Climate Fund (GCF) Readiness and Preparatory Support Programme.

This technical assistance is implemented by UNEP-DHI in cooperation with the Climate Change Division of the Environmental Conservation Department (ECD), Ministry of Natural Resources and Environmental Conservation (MONREC). The ECD is the National Designated Authority (NDA) of the GCF as well as the National Designated Entity (NDE) of the CTCN. Figure 1.1 presents a diagram and timeline of project activities. This is the last written deliverable of the technical assistance, all activities having come to an end by 31st of August 2019.

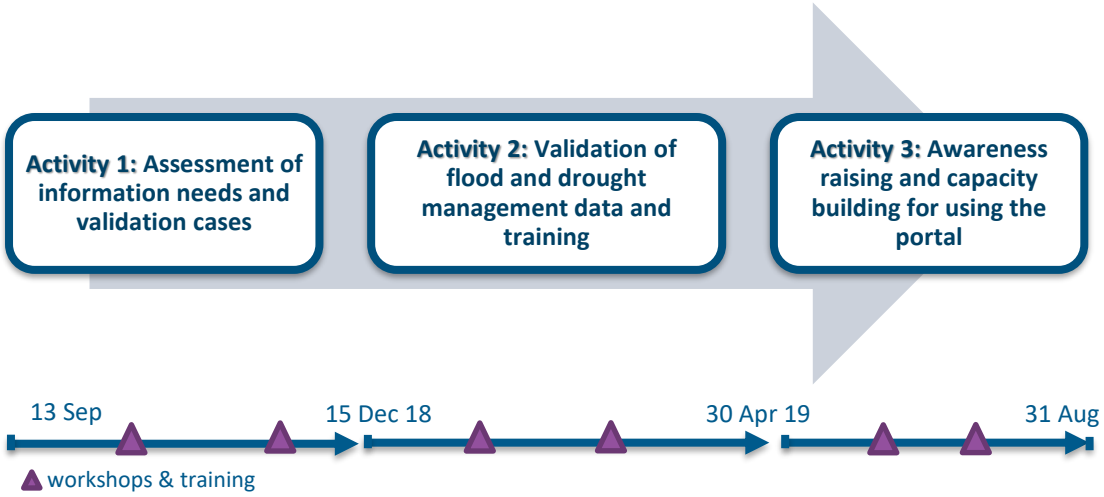


Figure 1.1 Diagram of the Activities of this technical assistance, timeline and key events.

The main output of this technical assistance is a web portal developed by DHI and set up for Myanmar. It provides free and easy access to data and information for flood and drought management, water resources and water related sectors (www.flooddroughtmonitor.com/myanmar). DHI will keep the system running for the period of 5 years and is responsible for its maintenance. The overall objective of the portal is to provide a better understanding of the climate at regional and national scale.

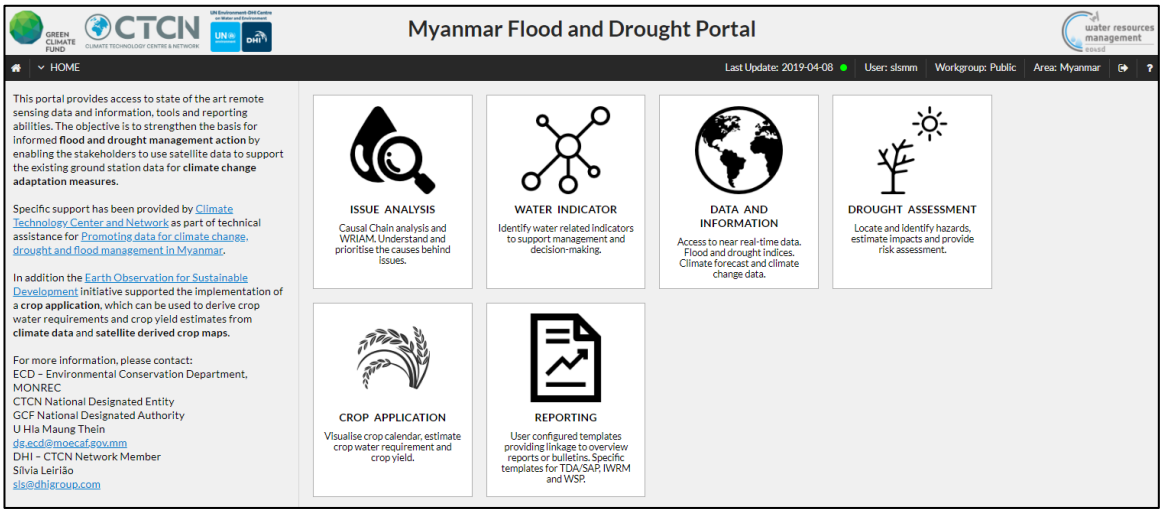


Figure 1.2 Screenshot of the home page of the Myanmar Flood and Drought portal.

The activities focused on workshops and training, validation of selected datasets of the web-portal, the generation of a strong user community, and provision of guidance to the ECD and other stakeholders for the drafting of a GCF Simplified Approval Process (SAP) Concept Note for upscaling of the outcomes of the technical assistance including installation of the portal in Myanmar.

The purpose of this report is twofold:

- To present the lessons learned during this technical assistance. The expectation is that these will be applied when defining and structuring future responses to similar CTCN technical assistances as well as national / regional projects that follow.
- To provide a roadmap to realize the implementation of a future project by obtaining GCF approval of the funding proposal. It includes the main challenges, required steps, major milestones and an estimated timeline.

2 Lessons learned

The main lessons learned are listed as follows.

Effective NDE engagement

Organizational changes at the NDE rendered the initial kick-off meeting on the 13th of September 2018 ineffective as it had been held with different people. This caused most of Activity 1 to be carried out based on DHI's experience and support from the local partner. Only after an NDA/NDE contact person was assigned to work with DHI was collaboration effective, however a lot of time was used in establishing appropriate communication channels.

Prototype in place from the start

Having the portal setup from the start dramatically increased our impact to stakeholders, resulting in an increase in participation registered during the first national workshop and strengthened collaboration with the NDA/NDE. It was up and running for the first national workshop, using it not only as an inception and data collection workshop but also as an opportunity for early-on training. Having a prototype in place of the technology from the beginning allows stakeholders to quickly understand the scope of the technical assistance and reduce misunderstanding with abstract concepts or unknown technology.

Translation and interpretation services essential

National workshops and training require simultaneous translation (hiring of translator and simultaneous translation apparatus) during events and translation of workshop materials. In the response planning, it was assumed technical training sessions would not require this, however after the first experience it was clear it is a resource of utmost importance. Without it, it would have been impossible to carry out any event in the country. Email communication can be delayed in Myanmar, which poses a risk to implementation efficiency.

High satisfaction with training approach

The interest in being part of the technical assistance was overwhelmingly positive, with all institutions wanting to participate from the first national workshop to the last. The overall impression of the first workshop and technical training was good (77%). 17% thought the course was excellent, and only 3% (one person) thought that it was only acceptable. 86% of the participants would recommend the course to others.

The objectives of the second technical training session were to: inform on the status of the ongoing CTCN technical assistance; and do focused training of technical specialists within the flood and drought, water resources and disaster management framework. 33% of participants were satisfied and 40% were significantly satisfied with the training session.

Regarding the third 3-day training, the overall satisfaction was high, with 78% being satisfied or significantly satisfied. 22%, corresponding to 5 people, were moderately satisfied. For the 1-day training overall, participants are very satisfied with the training, 55% were significantly satisfied and 18% moderately satisfied.

The final training and closing workshop, feedback was the following: 95% of participants found it good or excellent, and only 5% (one person) found it average. The topic that most participants found most interesting was the reporting app, where 10 respondents mentioned this as one of the most interesting topics for them. Second came the response "all topics were interesting", which was stated by 5 participants. Both the drought assessment and data and information were mentioned by 3 participants each. Finally, for the course content, respondents chose "Strongly agree" or "Agree" for all topics, except for the last – "The Myanmar Flood & Drought Portal will be helpful in my day to day activities". For this topic, only 65% responded in those ranges, 4 people chose "Neither/nor" and 3 people chose "Disagree".

It is considered that the methodologies used in our training were very effective: printouts of hands-on training exercises in both English and Burmese languages; minimum 4 instructors in the training team; simultaneous translator present, if unavailable then a consecutive translator; a number of guided brainstorming exercises in multi-disciplinary teams.

Including a Gender Expert

The technical assistance team during every capacity building session always promoted a balanced gender break down of participation in terms of attendance as well as contributions during the sessions. It is believed the technical assistance would have benefitted even more with the existence of a specific Gender Expert position.

Since the response plan stage gender considerations have been pivotal and this technical assistance has indeed followed gender sensitive approaches. But for future technical assistances, it is believed the input of such an expert would not only help with capacity building but also deliver recommendations for content and technical components of the portal and could have potentially influenced functionality.

Early engagement in drafting Concept Note

Alongside technical training events, workshops and high-level meetings were organized throughout project implementation focusing on upscaling the portal. These efforts were started in Activity 2.1 (20th February 2019). In hindsight, it is recognized the early start of this project track greatly contributed for the successful engagement of Executing Entities and conclusion of the Concept Note draft.

Overall Recommendations

The following are recommendations provided by stakeholders after the implementation stage. These could be implemented if further development of the portal is taken forward. These recommendations would not be performed by stakeholders, but by developers, and would be adopted as improvement specifications by the proposed project.

- Development of human resources are needed at the ECD's Climate Change Division to make them physical repositories of the output of this technical assistance.
- For effective training and dissemination, a large capacity building programme with focus on government, academia and civil society is needed.
- For effective validation, different cases covering the different climate-vulnerable areas in Myanmar would have to be set up and national data custodians heavily involved, providing not only national data but expert knowledge. Remote sensing data is available in many places, but often the need for validation is forgotten. How to validate data applying the methodology developed and considering the examples produced should form a huge part of any future capacity building program.
- Data has been validated using a methodology that assumed that observed data at the station is "correct". Using remote sensing data can be relevant – even with poor performance at specific locations/stations - since there is not a sufficient coverage of stations in the entire country. In addition, rainfall estimates from remote sensing at a large catchment scale might be more accurate than from single stations.

3 Roadmap for scaling up

This roadmap sets out a high-level plan with major milestones towards the goal of upscaling the outcomes of this technical assistance. The process this roadmap contains is what has been discussed and presented in the meetings and workshops dedicated to the draft Concept Note with the Executing Entities: the ECD, the DOA, the DAR and IWUMD. The GCF NDA was following closely and approving every step of the discussions.

Hence, the roadmap goal, challenges, milestones and timeline presented herein follow from the development of the draft GCF Concept Note carried out during those meetings and workshops. Detailed information on the meetings and workshops can be found in the reports listed below:

- Deliverable 4 (activity 2.1) Technical training session and draft Concept Note guidance
- Deliverable 5 (activity 2.2) Technical training session and validation report
- Deliverable 6 (activity 3.3) Workshop Note – session dedicated to draft GCF SAP Concept Note only
- Deliverable 7 (activity 3.1 and 3.2) Technical training session and closing workshop

Overall goal

The overall goal is to realize the implementation of the upscaling project by obtaining GCF approval of a funding proposal. Figure 3.1 presents the overall country programming overview of the GCF, also true for Myanmar. At the time of writing, the Executing Entities are at the stage of finalizing the draft Concept Note proposal with UNEP-DHI's assistance, and the NDA is expected to submit it after the conclusion of this technical assistance (August 2019).

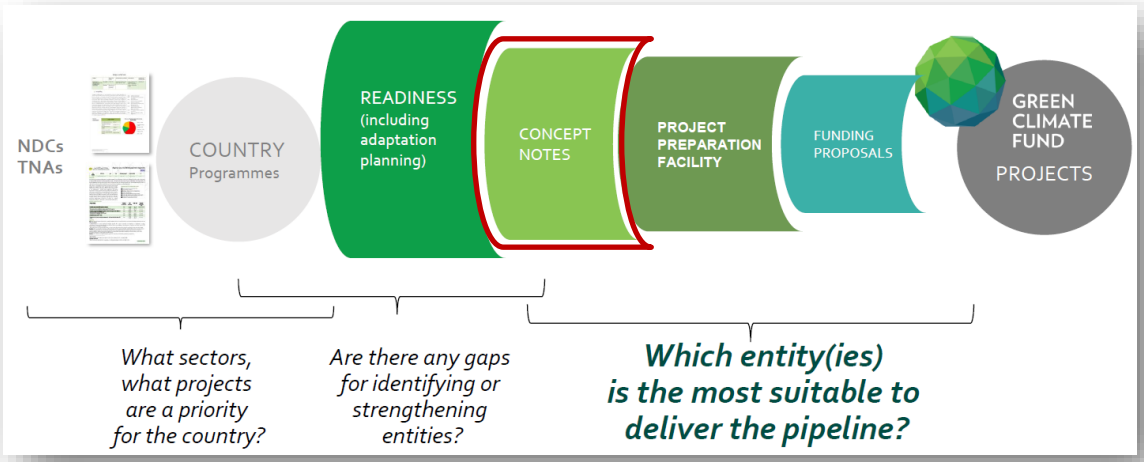


Figure 3.1 GCF country programming overview (taken from "Introduction to GCF Country Programming" Enkhbat B. Nay Pyi Taw Workshop, 2019), current stage signalled in red.

Barriers / challenges to be addressed

By the end of this technical assistance the biggest achievement pointed out by all parties is engagement of multilevel stakeholders from high up management to technical staff, ownership of the portal created, as well as a strong user community.

The main obstacle is the preparation of a funding proposal. Executing Entities do not have the funds to support the writing of a detailed proposal nor to support the necessary project preparation meetings. The three national Executing Entities are located in Nay Pyi Taw and Mandalay. To jointly prepare a funding proposal, it will be necessary to mobilize disbursement resources.

Moreover, the focus of the project is in three different climate areas in Myanmar: Pakkoku township in Magway Region, Hakha township in Chin State and Labutta township in Ayeyarwady Region. Before moving to project implementation, project preparation meetings for engagement and structuring procedures need to be held in each of the three townships. This will ensure not only a stronger technical scope of work and financial proposal but also that the local branches of the Executing Entities are activated, consulted and informed well before the funding proposal is submitted.

Project Preparation Facility

The solution to the main barrier is accessing GCF's Project Preparation Facility (PPF). It is a funding window that supports Accredited Entities (AEs) in project preparation. According to the GCF guidelines it is meant to cover "pre-feasibility and feasibility studies; project design; environmental, social and gender studies; risk assessments; and other project preparation activities". There is a cap of USD 1.5 million and the support amount should be in line with the funding proposal total.

The PPF would be used to support the elaboration of the detailed funding proposal. Mid- and late- stage detailed design, project structuring, agreement on the type of support required and outstanding project development needs will have been identified.

The PPF would also allow the Executing Entities to pre-contract services and, as mentioned in the GCF guidelines for PPFs, acquire advisory services and/or other services to financially structure a proposed activity.

Procedure from submission to approval

Figure 3.2 presents the road from the submission of the Simplified Approval Process Concept Note to project implementation, including roles of the GCF actors. Information was obtained from "Simplified Approval Process (SAP) funding proposal preparation guidelines - A practical manual for the preparation of SAP proposals" (GCF, 2018).

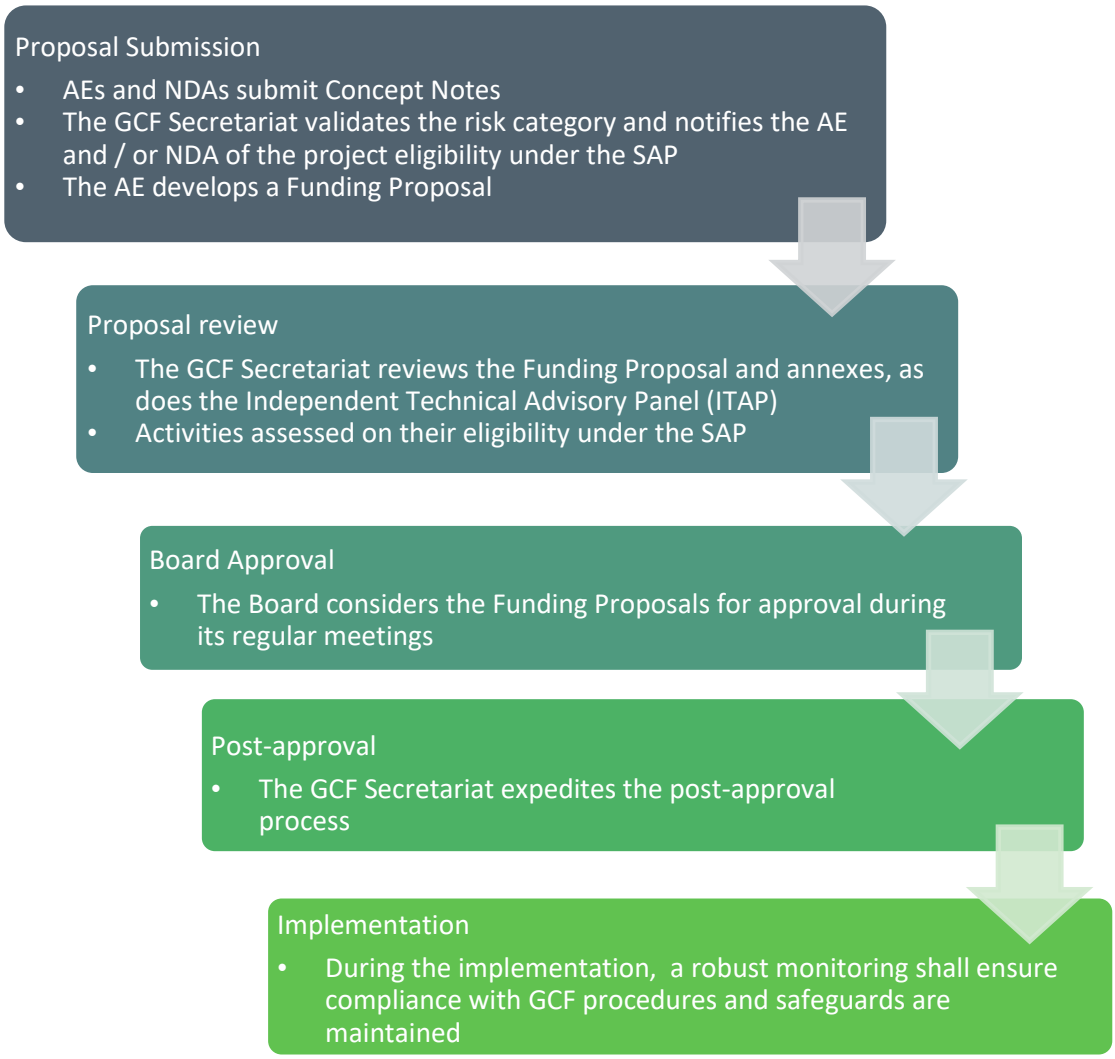


Figure 3.2 SAP proposal approval process

Milestones

The next list presents the roadmap milestones needed to reach the overall goal.

1. Draft SAP Concept Note finalized

Currently DHI is supporting the Executing Entities to finalize the draft document and annexes remotely. This process is expected to take a month duration after the end of the Readiness funded technical assistance.

2. Submission of the SAP Concept Note

Final version of the concept note and annexes are submitted by the AE and NDA.

3. Approval of SAP Concept Note and access to PPF

GCF Secretariat approves the Concept Note, including the request for PPF grant.

4. Approval of PPF Grant

Approval by the GCF Secretariat is usually processed at the start of the relevant quarter, i.e. 1 January, 1 April, 1 July, or 1 October.

5. Draft SAP Funding Proposal

AE uses the PPF grant to support the SAP Funding Proposal and outstanding preparation activities are carried out. Monitoring and Reporting to the GCF are required during this stage.

6. Submission of the SAP Funding Proposal

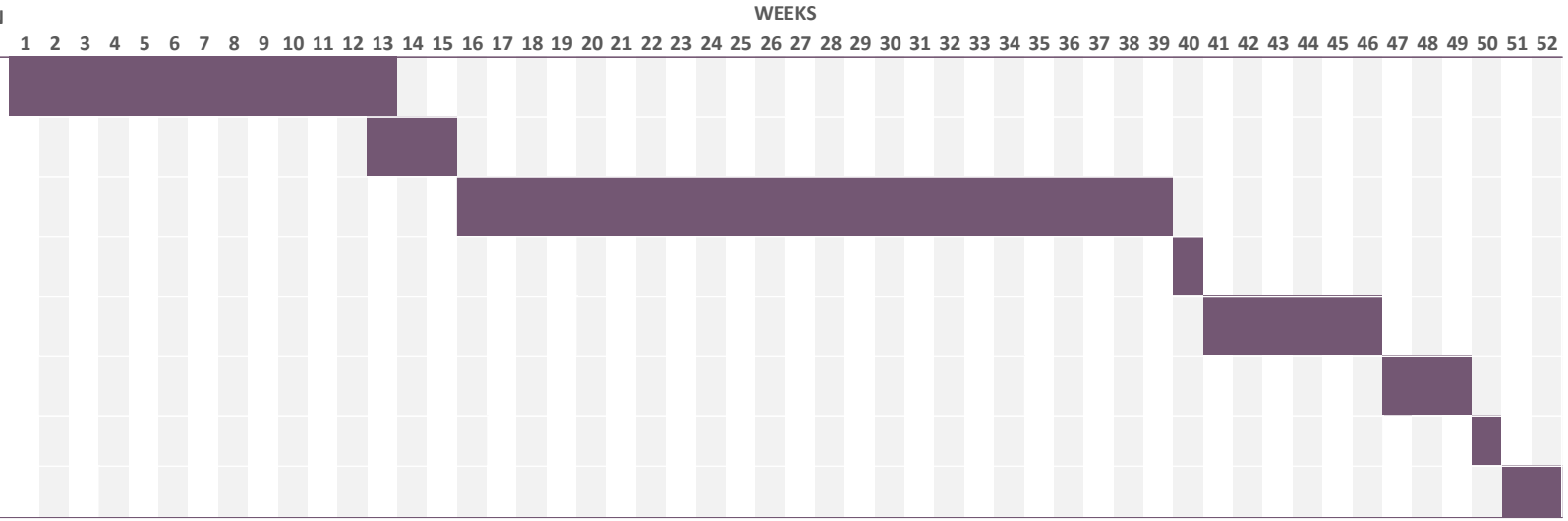
Funding proposal is submitted to the GCF Board by the AE.

7. Approval and implementation

Timeline

The following timeline is included in this Roadmap by way of example only. It presents an estimate of how long the realization of this roadmap could potentially take. It is difficult to provide estimates for the different stages of the roadmap, however, GCF's specific indicative timeframes are applied. Previous experience indicates that approximately one year is an underestimation of the time needed.

ACTIVITY	PLAN START	PLAN DURATION
CN completed and submission	1	13
GCF Secretariat CN review	13	3
PPF grant	16	24
Funding Proposal submission	40	1
FP review by GCF Secretariat	41	6
FP review by ITAP	47	3
Present FP at GCF Board meeting	50	1
GCF and AE sign and disbursement	51	2



NOTE: Roadmap timeline is based on estimates and GCF indicative timeframes. Ideally, the above timeline should include iterations; however, those estimates would not be accurate enough at this stage so they are not included explicitly.

APPENDIX A

Draft Simplified Approval Process Concept Note 31 Aug 19

GCF DOCUMENTATION PROJECTS

Simplified Approval Process Concept Note

Project/Programme Title:	Implementing climate resilient water resources, flood and drought adaptation practices through innovative extension services in vulnerable States/Regions of Myanmar
Country(ies):	Myanmar
National Designated Authority(ies) (NDA):	Environmental Conservation Department (ECD)
Executing Entities:	ECD, Department of Agriculture (DOA), Irrigation and Water Utilization Management Department (IWUMD)
Accredited Entity(ies) (AE):	_____
Date of first submission/ version number:	*[YYYY-MM-DD] [V.0]*
Date of current submission/ version number	*[YYYY-MM-DD] [V.0]*

GREEN CLIMATE FUND

Please submit the completed form to **sap@gcfund.org**,
using the following name convention in the subject line and file name:
"CN-[Accredited Entity or Country]-YYYYMMDD"

Simplified Approval Process CONCEPT NOTE Template V.1.1

A. Project / Programme Information (max. 1 page)			
A.1. Project or programme	☒ Project ☐ Programme	A.2. Public or private sector	☒ Public sector ☐ Private sector
A.3. Indicate the result areas for the project/programme	Mitigation: Reduced emissions from: ☐ Energy access and power generation ☐ Low emission transport ☐ Buildings, cities and industries and appliances ☐ Forestry and land use Adaptation: Increased resilience of: ☒ Most vulnerable people and communities ☒ Health and well-being, and food and water security ☒ Infrastructure and built environment ☒ Ecosystem and ecosystem services		
A.4. Estimated mitigation impact (tCO2eq over lifespan)		A.5. Estimated adaptation impact (number of direct beneficiaries and % of population)	Direct – approximately 120,000 people working under Natural resources and conservation, agriculture and irrigation ministries (12% combined of an estimated 1 million [1]public sector employees) Indirect – 25.37 million people (70% of the total rural population)[2]
A.6. Indicative total project cost (GCF + co-finance)	Amount: USD to be estimated	A.7. Indicative GCF funding requested (max 10M)	Amount: USD to be estimated
A.8. Mark the type of financial instrument requested for the GCF funding	☒ Grant ☐ Loan ☐ Guarantee Other: specify_____		
A.9. Estimated duration of project/ programme:	a) 4 years	A.10. Estimated project/ Programme lifespan	Up to 4 years
A.11. Is funding from the Project Preparation Facility needed?	Yes ☒ No ☐	A.12. Confirm overall ESS category is minimum to no risk[3]	☒ C or I-3
A.13. Provide rational for the ESS categorization (100 words)	The project will contribute to the implementation of 5 out of the 6 Focus Areas of the Myanmar Climate Change Policy, Strategy and Master Plan, and change the way climate change adaptation practices are informed nationwide and increase the resilience of climate vulnerable populations of the Labutta, Hakha and Pakkoku. This project does not require nor will lead to any displacement of people, nor affect indigenous people, protected areas and cultural heritage sites. Furthermore, it will not generate waste nor affect people's health. It will not have any trans-boundary impacts. In conclusion, the project will pose little to no environmental or social risk, as evident in the GCF ESS screening checklist (Annex 1). Furthermore, the project does not trigger any of the exclusion criteria stipulated in the GCF SAP guidelines.		
A.14. Has the CN been shared with the NDA?	Yes ☒ No ☐	A.15. Confidentiality[4]	☐ Confidential ☒ Not confidential

[1] MDRI & The Asia Foundation (2015), Conceptualizing Public Sector Reform In Myanmar.
[2] MOECAF (2012), Myanmar's Initial National Communication to the United Nations Framework Convention on Climate Change.
[3] Refer to the SAP ESS Guidelines
[4] Concept notes (or sections of) not marked as confidential may be published in accordance with the Information Disclosure Policy (Decision B.12/35) and the Review of the Initial Proposal Approval Process (Decision B.17/18).

A.16. Project/Programme rationale, objectives and approach of programme/project (max 100 words)	Brief summary of the problem statement and climate rationale, objective and selected implementation approach, including the executing entity(ies) and other implementing partners, including who will be implementing the measures to manage the environmental and social risks. Myanmar's climate is changing as shown by observable trends over last six decades: (a) Mean temperature has risen by around 0.08°C each decade; (b) Overall rainfall has mainly risen throughout the country; (c) Late onset and early termination of southwest monsoon; (d) More extreme events; and (e) Sea levels are rising. Most of Myanmar's population relies on climate sensitive livelihoods making them vulnerable, and are exposed to the impacts of climate change by living in flood and drought stricken, low lying and coastal areas. As a response, the government has drawn the Myanmar Climate Change Master Plan (2018-2030), and the Environmental Conservation Department (ECD), Ministry of Natural Resources and Environmental Conservation (MONREC), the Department of Agriculture (DOA) and the Irrigation and Water Utilization and Management Department (IWUMD), Ministry of Agriculture, Livestock and Irrigation (MOALI), play a crucial role in realizing several of the sectoral outcomes and expected results. Amongst others, the ECD is an Actor of the Master Plan with its mandate of integration, coordination and promotion of adaptation measures; the DOA in the implementation of climate smart agricultural practices and access to water; and the IWUMD in management of and access to water. Ideally and in line with the Maste Plan, institutions, academia and civil society will be applying in their daily activities the best available data, information and tools, informing water resources and extreme event management practices that are resilient, specifically in the climate vulnerable States/Regions of Myanmar. The distance between international and national data producers and local data users would be bridged by an Information Management System (IMS) and a mobile application for the extension services of the DOA and IWUMD providing them access to relevant data, information and tools. These technological resources would be extensively validated and maintained by the ECD. Climate change initiatives from planning to research would be served at different levels (e.g. region/state, district, catchment, subcatchment), and the ECD, DOA and IWUMD would be implementing climate change adaptation measures on the ground in highly vulnerable areas through gender sensitive processes. The main barrier is the lack of data, information, tools for Myanmar and strengthened capacity of national actors. As a response to this and start moving towards the ideal, a GCF Readiness funded project ran from September 2018 to August 2019 providing technical assistance to Myanmar for '*Strengthened drought and flood management through improved science-based information availability and management*'. This project was anchored with the ECD, delivered by UN Environment's Climate Technology Centre and Network (CTCN)[5] and carried out by UNEP-DHI. The objective was to provide free access to the best available remote sensing data for Myanmar and tools for its application in water resources and extreme event management via an online platform – the Myanmar Flood & Drought Portal[6]. Approximately 100 people, half of these female, have access to the free remote sensing data and tools, and half of those were trained. A total of 20 different entities (mostly government and two universities) were involved, namely: Department of Meteorology and Hydrology (DMH), Department of Disaster Management (DDM), Department of Agriculture (DOA), Irrigation and Water Utilization Department (IWUMD) and Yezin Agricultural University. UNEP DHI will continue to maintain and run the platform, so the stakeholders will have continued access for a period of 5 years.

[5] https://www.ctc-n.org/technical-assistance/projects/promoting-data-climate-change-drought-and-flood-management-myanmar
[6] http://www.flooddroughtmonitor.com/myanmar

The Portal was built on outputs of a Global Environment Facility funded 4 mill USD project[7] which established the IT infrastructure and functionality, that allowed the technical assistance to be successful in the stakeholder engagement, creation and growth of the user community via the ECD. In addition, the "Earth Observation for Sustainable Development" initiative[8] funded by the European Space Agency (ESA) supported the implementation of a Crop Application, which can be used to derive crop water requirements and crop yield estimates from climate data and satellite derived crop maps. Myanmar and these stakeholders have successfully benefitted from a chain of synergies between projects, the next link created, having been the preparation of this concept note proposal to the GCF by the three Executing Entities (EE): the ECD, IWUMD and DOA. They recognized as being crucial for bringing to effect the proof of concept achieved at the micro-level by the technical assistance, to use the data and tools to adopt climate resilient practices on the ground in vulnerable areas in Myanmar. Below are listed key recommendations[9]:

- Extension of existing functionality has been requested by expert users from different departments of government and other stakeholders. Co-creation and gender sensitive procedures should be used for new components and the refusrbishment where needed of existing Portal.
- Development of human resources needed at the ECD to make them physical repositories of the Portal and capable of its maintenance and operation.
- For their effective adoption in-situ applications and working tracks for Mountaneous areas, Delta regions and Dry zones in Myanmar are required. All three EE will reform their relevant workflows to integrate the new resources.
- For effective training and dissemination, a large capacity building programme with focus on government, academia and civil society is needed.
- For effective validation, different cases covering the different climate-vulnerable areas in Myanmar would have to be set up and local extension officers heavily involved, providing not only data but expert knowledge.

We propose a project spanning an approximate 4 year implementation period, with the overall goal of changing how climate change adaptation practices are informed nationwide and increase the resilience of climate vulnerable population of delta, mountaneous and central dry zone areas; as well as contributing to 5 Focus Areas (Key Entry Points) of the Myanmar Climate Change Policy, Strategy and Master Plan[10]:

- Climate smart agriculture, fisheries and livestock for food security
- Sustainable management of NR for healthy ecosystem
- Resilient, inclusive and sustainable cities and towns
- Climate risk management for health and wellbeing
- Education, science and technology

The outcomes of the proposed project to ensure this goal are: Outcome 1 ECD continuously maintaining resources for water related, extreme event management and climate resilient practices in Myanmar; Outcome 2 Increased climate resilience of exposed populations in the mountainous, delta and dry zone climate vulnerable areas of Myanmar; and Outcome 3 Increased capacity at national and local level supported by innovative data and information services. These will be achieved by reaching the following objectives: a) establishing an Information Management System (IMS) and workflow reform at the ECD with improved data provision and collection services and tools that are co-created in climate vulnerable areas of Myanmar; b) sea water intrusion, drought and landslide adaptation measures implemented in Labutta, Pakkoku and

[7] For more information on the project please visit the project home page https://fdmt.iwlearn.org/en
[8] http://eo4sd-water.net/
[9] UNEP-DHI (2019). Deliverable 7 (activity 3.3) Roadmap and lessons learned report, Strengthened drought and flood management through improved science-based information availability and management in Myanmar project.
[10] The Republic of the Union of Myanmar (2019), Myanmar Climate Change Strategy (2018 – 2030); Myanmar Climate Change Master Plan (2018 – 2030).

	Hakha townships respectively; c) local and national capacity building, consultation and communication programme. The proposed project falls within the GCF's categories of fundable projects: Capacity development, planning support, institutional development and strengthening, advisory services, communication and outreach, and monitoring systems; Household-level facilities and production within an already built-up area and with no additional footprint; and Small-scale community-based watershed and habitat management and rehabilitation, climate resilient agriculture, soil and water conservation.

B. Project / Programme details (max. 3 pages)

B.1. Context and Baseline (max. 1 page)

Describe as relevant the climate vulnerabilities and impacts, GHG emissions profile, and mitigation and adaptation needs that the prospective intervention is envisaged to address.

The Myanmar Climate Change Strategy (MCCS) characterizes how natural resources are under pressure from climate change driven by developments in the energy, industry and urban sectors, land use change and deforestation. The MCCS has the most recent climate change risk profile of Myanmar, observed changes and projected climate change. Contextualizing the proposed project, we hereby highlight the following national baseline conditions[11]:

- Climate change projections for Myanmar by end of 2100 considering scenario representative concentration pathway (RCP) 4.5: 0.8-2.7°C increase of minimum temperature, 0.8-2.6°C increase of maximum temperature, and 36 % increase in precipitation
- Climate change projections for Myanmar by end of 2100 under RCP 8.5: 0.9- 4.6°C increase of minimum temperature and 0.8-4.4°C increase of maximum temperatures, and 40 % increase in precipitation.
- Currently, the largest part of Myanmar's population is concentrated in areas most exposed to recurring tropical storms, cyclones and floods and potential storm-surge effects (the Delta), as well as most exposed to chronic drought (the Dry Zone);
- To this day, 85 % of the rural population relies on climate-sensitive sectors for their livelihoods such as rain-fed agriculture, livestock and fishery and forest resources; meaning their livelihoods and wellbeing are highly sensitive and vulnerable to natural disaster, this has direct implications on the country's economy:
    - In 2008, the estimated cost of loss and damage after Cyclone Nargis was more than US$4 billion
    - In July–August 2015, the estimated cost of the damage from floods and landslides was US$1.51 billion;
    - Currently, coastal population is suffering the effects of sea level rise, if it increases by 0.5 m, the shoreline on the Ayeyarwady Delta would move inland by 10 km;

Additionally, due to climate change the following climate hazards are projected to increase in severity in Myanmar, exacerbating their impacts (MCCS, 2019):

- Drought hazard causes crop failure and low yields; severe water shortages, including limited consumable water and decreased river flows; ultimately a decline of farmers' productivity.
- Sea level rise hazard causes inundation with seawater of cultivated lands and villages; loss of land, infrastructure and coastal habitats; and saltwater intrusion and coastal erosion.
- Intense rainfall hazard causes flashfloods, intense surface runoff and soil erosion; and crop damage.
- Flood hazard causes river floods; flash floods; urban flooding; damage to coastal ecosystem and ecosystem services; severe inundation of land; damage of crop, land and infrastructure.

The proposed project will focus in three types of climate-vulnerable States/Regions of Myanmar, each of them very affected by the above hazards: Pakkoku Township (Magway Region) in the dry zone, Labutta Township (Ayeyarwady Region) in the delta area, and Hakha Township (Chin State) in the mountanous area. The reasons the ECD, DOA and IWUMD are focusing on these townships is, on the hand, these being the best studied in Myanmar having had Climate Change Vulnerability Assessments carried out to support the project's ground interventions, and on the other hand, because collectively they represent three different geophysical and environmental profiles, and consequently challenges these institutions need to solve. Overall, claimate change studies have shown communities in these townships will face increased disaster risks due to climate change if adaptation measures are not adopted.

Therefore, complementing the overall baseline conditions, we highlight the following at local level for each project area:

- Pakkoku Township[12]:

[11] The Republic of the Union of Myanmar (2019), Myanmar Climate Change Strategy.

[12] Fee, L.; Gibert, M.; Bartlett R.; Capizzi, P., Horton, R., Lesk, C. (2017), Climate Change Vulnerability Assessment of Pakokku Township, Magway Region, Myanmar, 2016-2050, UN-Habitat Myanmar.

- shorter monsoon season causing water shortages for agriculture, drinking water, and livestock
- higher temperatures and faster evaporation of fertilizers impacting nutrient cycling in soil and lowering agricultural yields; severe heat affects livestock health and agricultural productivity
- the above combined with deforestation and land degradation have reduced the ability of the surrounding ecosystem to provide critical services, reducing crop productivity and yields.

- Labutta Township[13]:
  - Sea water infiltration increases salinization impacting nutrient cycling in soil and lowers rice yields;
  - Exposure to storm surges and erosion is higher in deforested areas along the coast and water canals;
  - A shorter monsoon season and higher temperatures gives less time to collect rain water and faster evaporation resulting in water shortages for agriculture and drinking water;
- Hakha Township[14]:
  - More flashfloods and landslides due to heavy rainfall in shorter monsoon season posing a risk to basic infrastructure, people's mobility and access to basic services.
  - Prolonged drought due to erratic rainfall and increased dry season poses threats to agriculture, food security and drinking water sources.
  - Exploitation of forest ecosystem, the most predominant, is leading to very high levels of degradation and deforestation.
  - Unsustainable farming practices affecting soil fertility and also causing soil erosion.

Finally, Myanmar is a net carbon sink nation[15], yet since the Initial National Communication to the UNFCCC came out in 2012, it was confirmed that the trend of GHG emissions in Myanmar for CH_4 and N_2O emissions in agriculture sector denoted a sharp increase during 2000-2005. Land use change and deforestation was declared and is today a major source of GHG emissions while the total annual CO_2 removals by natural forests continue to decline.

Please indicate how the project fits in with the country's national priorities, action plans and programs and its full ownership of the concept. Describe the main root causes and barriers (social, gender, fiscal, regulatory, technological, financial, ecological, institutional, etc.) that need to be addressed. Where relevant, please describe the key characteristics and dynamics of the sector or market

The National Adaptation Programme of Actions[16] (NAPA), and the Intended Nationally Determined Contribution[17] (INDC) highlight the goals and priority activities for Myanmar's immediate and urgent adaptation needs, where lack of data services and the efficient and sound integration within institutions of its use (focus on climate data and indicators), capacity and knowledge is a cornerstone. In the NAPA, with the identification of 32 Priority Adaptation Projects for effective climate change adaptation in Myanmar for i) Agriculture; ii) Early Warning Systems; iii) Forest; iv) Public Health; v) Water Resources; vi) Coastal Zone; vii) Energy, Industry, and viii) Biodiversity; the main barriers to their implementation were identified:

- "limited technical capacity of local and national stakeholders for planning (…) and implementing climate change adaptation;"
- "limited availability of locally relevant, usable climate information for the end users;"
- "limited effective assessment of climate change impacts in Myanmar, which in turn limits the planning of effective adaptation activities;"

To address these barriers, relevant needs identified are:

- "improving national institutional capacity to undertaking effective adaptation planning;"
- "improving adaptation knowledge and awareness by facilitating information gathering and exchange structures;"
- "facilitating research (including long-term research) on the impacts of climate change, costs and benefits of adaptation and appropriate adaptation measures for addressing these impacts."

In the INDC, the Myanmar government identified mitigation actions and policies in the primary areas of forestry and energy amongst others, to reduce GHG emissions and benefit development, as well as key needs:

- "To strengthen the climate change related institutional and policy environment through sharing of technical knowledge and best practice, training and institutional support."

[13] Fee, L.; Gibert, M.; Bartlett R.; Capizzi, P., Horton, R., Lesk, C. (2017), Climate Change Vulnerability Assessment of Labutta Township, Ayeyawady Region, Myanmar, 2016-2050, UN-Habitat Myanmar.
[14] Chitale, V.S., Gibert, M., Bhuchar S., Capizzi, P., Ling, H. (2018) Assessment climate change vulnerability of Hakha Township, Chin State, Myanmar, 2017-2050: Scenarios for resilience building, ICIMOD and UN-Habitat/UN Environment.
[15] MOECAF (2012), Myanmar's Initial National Communication to the United Nations Framework Convention on Climate Change.
[16] UNEP (2012), National Adaptation Programme of Actions.
[17] Government of Myanmar (2015), Intended Nationally Determined Contribution.

- "To increase awareness of climate change at national, state and region and local level."
- "To consistently monitor and take stock of the status of national environmental quality (i.e. through the use of standardised indicators)"

Complementing the above, a more specific barrier/need pointed out by the stakeholders of the technical assistance project, who considered flash floods, flooding and temperature rise as burning issues[18], was that they lacked access to data and information to carry out their day-to-day tasks. These are national experts who deal with impacts of climate change, and to support their activities they require: data and tools related to flood, drought and sea level rise, socio-economic datasets, climate change projections, rainfall, temperature, soil and vegetation data as well a diversity of indicators based on these. Stakeholders also identified confidentiality of government data can be an obstacle to inter-ministerial data and information sharing they know is required to carry out better informed assessments.

The Myanmar Flood & Drought Portal started to address these barriers and needs directly, which the proposed project is upscaling. It was pointed out as highly relevant for the MCCS itself, because of the free access information that it is providing and the fact that it will be live for a period fo 5 years. The proposed project will build on this platform, expand its functionality and reach. The proposed project also adds the spatial dimension, with activities targeting different levels of administration and three climate-vulnerable townships in three States/Regions, in strict alignment with the focus of the Myanmar Climate Change Policy 2018-2030 (MCCP)[19], that states *"(…) millions of Myanmar's people are concentrated in regions naturally exposed to severe climatic events, in particular the Central Dry Zone Area, the Delta Region and the Coastal Areas. People living in Hilly regions and Plain lands will also be diversely affected by several effects of climate change."*

Gender equality action needs stipulated in the 2030 Agenda for Sustainable Development[20]: *"improving gender data, statistics and analysis to effectively monitor progress for women and girls across all goals and targets."* The proposed project has a gender balance and sensitivity dimension with specific activities targeting women and men, as well as extensive production of gender break down data throughout the project.

The Myanmar Climate-Smart Agriculture Strategy of 2016[21] laid out adaptation measures which can be supported by this project. The existing Crop Application of the Myanmar Flood & Drought Portal will be one of the tools the ECD, DOA and IWUMD will use as part of the future IMS and mobile app, that allows calculation of crop water requirements and yield estimates. It uses remote sensing data as forcing, and has a crop calendar displaying planting, growing and harvesting periods for different crops. In fact, the stakeholders of the GCF Readiness project being upscaled are users of these tools and include Department of Agriculture (DOA), Irrigation and Water Utilization Department (IWUMD) and Yezin University. This furthers the strengthening of networks to collaborate in the implementation of climate change adaptation and mitigation priorities, another action area highlighted by the MCCS.

As stated in the MCCS, policies and strategies such as NAPA, INDC and REDD+ did not prioritize the education sector. The universities of Yezin and Yangon were brought in as stakeholders during the technical assistance, and the portal is currently being use by three of their instructors for research purposes and in class. This outcome is already supporting at small scale innovation for climate-smart growth and adaptation. The proposed project will address this with a dedicated project component to capacity building, Component 3, including coordinating with Universities to include relevant project outputs in national curriculums.

Finally, the National Comprehensive Development Plan (NCDP) that the government is drawing up, guides long-term reforms and identifies Climate Change and Environmental Development as pillars for policy direction. The proposed project will strengthen the ECD DOA and IWUMD's capacity to respond to this plan:

- by providing them with the IMS empowering them with improved climate, water and extermem event related data and information
- by enabling them to provide better informed extension services through the mobile app
- and furthering the record of implementing adaptation measures in three critical climate-vulnerable State/Regions of the country informed with improved climate data services.

B.2. Project / Programme description (max. 1 page)

Describe the expected set of components and activities to address the above barriers identified that will lead to the expected outcomes.

[18] UNEP-DHI (2019), Deliverable 2 (activity 1.2) Workshop report and cases for validation.
[19] The Republic of the Union of Myanmar (2019), Myanmar Climate Change Policy (2018 – 2030).
[20] UN WOMEN (2017), Turning promises into action: Gender equality in the 2030 agenda.
[21] MOALI (2016), Myanmar Climate-Smart Agriculture Strategy.

INSERT PROJECT LOGFRAME

Please explain why this project or programme is ready for scaling up and has the potential for transformation. Has it been piloted in the country or region? Are the proposed interventions well documented for their costs and benefits?

The national knowledge of institutions and data usage critical for this project was promoted by the GCF Readiness funded technical assistance to Myanmar entitled '*Strengthened drought and flood management through improved science-based information availability and management*'. Not only the public sector was targeted but also Burmese academia. And not only stakeholders located in the capital Nay Pyi Taw were targetted but also in Mandalay, Bago and Yangon. The focal point was the Climat Change Division of the Environmental Conservation Department (ECD), which is the national coordinator for climate change issues and hence mobilized the relevant ministries and departments.

During the aforementioned project, the core data providers and data consumers (and institutions with dual roles) within Myanmar were engaged and contributed to the outputs, namely, data validation of flood and drought related indicators selected by the stakeholders. The DMH, DDM and DOA provided observed data which was used to support a methodology to evaluate the data/indicators' performances for Myanmar. The current situation was understood in terms of existing data platforms, as these institutions together with the Population and Survey Departments, shared knowledge of their portals as we prepared for this upscaling project. We identified synergies and overlaps that informed this project description and support the outcomes to be achieved.

The Second National Communication to the UN Framework Convention on Climate Change (UNFCCC) is currently being prepared, and the responsible parties assiduous presence at the workshops and training sessions of the technical assistance project. The outcomes are directly contributing to the elaboration of the Second Communication, and input has been incorporated into our proposed project components.

Efforts made during the readiness funded CTCN technical assistance, and success achieved will start to die out. It is expected the established user community to break up if dynamics are not maintained and expanded. This would result in GCF Readiness funds and the outcomes of this technical assistance not being upscaled, and loss of potential climate-resilient activities which could have been informed by the free access data and tools, training and propelling momentum generated by the Readiness project.

Describe in what way the Accredited Entity(ies) is well placed to undertake the planned activities and what the implementation arrangements with the executing entity(ies) and implementing partners will be.

Please provide a brief overview of the key financial and operational risks and any mitigation measures identified.

B.3. Expected project results aligned with the GCF investment criteria (max. 1 page)

Please describe and provide an estimate of the expected impacts aligned with the GCF investment criteria:

Impact potential:

Paradigm shift:

NOTE: At the time of submission the draft is still being finalized.