Project Completion Summary

In accordance with the project agreement, implementing entities are required to submit a project completion report within six (6) months after Project completion, and the final project progress report (PPR) is considered as a project completion report. While the PPRs meet technical requirements, the information is reported by year and its format is not ideal to convey the overall information and knowledge to wider and more general audiences. To supplement this, implementing entities are requested to prepare a project completion summary.

A project completion summary is intended to cover an entire project life in a reader friendly format by compiling submitted single-year PPRs. It also gives implementing entities an opportunity to express and share insights from project implementation, findings, challenges etc. which may not be presented by PPRs and captured by a final evaluation report.

A project completion summary consists of narrative information (Section A) and financial information (Section B). Any other information (Section C) can be added to the report as an option. Most of the contents can be filled in by copy-and-paste from the submitted PPRs. The completion report should be no more than 20 pages (excluding annexes).

ADAPTATION FUND

Project Completion Summary

Section A: Project result and performance

1. Basic information

Title of project/programme	ADDRESSING CLIMATE CHANGE RISKS ON WATER RESOURCES AND FOOD SECURITY IN THE DRY ZONE OF MYANMAR
Project/Programme category	Regular Project
Project period (if the project was granted an extension, include the original as well as the revised completion date)	16 February 2015 – 16 February 2019 (4 Month extension – until 30 June 2019)
Country(ies)	Myanmar
Sector(s)	Multi – CC, DRR, Livelihoods, EWS
Implementing entity name	United Nations Development Programme
Type of implementing entity (MIE, NIE or RIE)	MIE
Executing entity(ies)	United Nations Development Programme
Amount of financing approved (USD)	US$ 7,289,425 (Adaptation Fund) US$ 624,998 (UNDP) US$ 554,181 (Government of Myanmar (In Kind)) Total - US$ 8,468,604
Project contact(s)	Kyaw Zin Aung Soe (Interim Project Manager) Biplove Choudhary (Chief, Sustainable and Inclusive Growth Unit)
Date of report	March 2020

2. Key milestones – *Please refer to the overview tab in the latest PPR. For the delay in project implementation and related reasons refer to the lessons learned tab, section on "implementation and adaptive management"*

Project inception	26 August 2015
Mid-term review (if applicable)	29 January 2018
Project completion	30 June 2019
Terminal evaluation	17 February 2019

If any, delay in implementation and reasons for delay	The installation/construction of small-scale water infrastructure was delayed slightly owing to a non-responsive RFP process in the first round of bidding. The bid had to be re-advertized as an ITB in the second round. The entire process took some time and caused delays in implementation. In the second round of procurement process, the ITB was re-designed in 3 lots with support of UNDP Bangkok Regional Hub. The procurement process resulted in the selection of two competent firms for the 3 lots and implementation started only in Dec 2017. However, field activities related to this component was completed in Aug 2018, well before project closure. The project team was able to conduct a detail assessment of all water infrastructure investments and make course corrections for some defective infrastructure - at the cost of the implementing partner – as per procurement clause. The lack of clarity in the land approval process for rehabilitation/reforestation activities posed significant challenges to the project team and implementing partner. This caused delays in field activities - as the project had to invest time in securing approval at different levels. Approval from communities and village development committees have been secured. As recommended by General Administration Department (GAD), site verification has been conducted by respective township level committees, but GADs responded that they are unable to grant approval since they are not authorized to grant approval. The project elevated the matter to the Project Steering Committee as well as approached the respective Regional Chief Ministers for assistance, and then to the Minister, Ministry of Natural Resources and Environmental Conservation. The issue was discussed again at the PSC meeting held on 20 Dec 2017, where it was agreed that the project will process for "no objection letter" from the respective GADs and continue with rehabilitation/reforestation activities based on the "no objection letter." The main counterpart Dry Zone Greening Department has committed to provide support in securing the "no objection letter" from the respective GADs of 5 townships.

3. Project overview and description

Myanmar’s Dry Zone is one of the few areas where food security for survival is still a real issue and the linkage of “bad weather” and poverty is immediate and dire. In 2009, a drought triggered 50-70% drop in rice and 80-90% drop in sesame and sunflower harvest – some of the key crops grown in the region. To strike a balance of investments on urgent adaptation needs and greater coverage of beneficiaries, this project combines targeted interventions for resilient livelihood actions and rehabilitation of community ecosystem assets such as forests and watersheds.

The main objective of the project is to reduce vulnerability of farmers in Myanmar's Dry Zone to increasing drought and rainfall variability, and enhance their capacity to plan for and respond to future impacts of Climate Change on food security.

The project components relate to three main Outcomes of 1) Continuous freshwater availability is ensured during the dry seasons in 280 villages in the Dry Zone; 2) Climate-resilient agricultural and livestock practices enhanced in Myanmar's Dry Zone; and 3)Timeliness and quality of climate risk information disseminated to Dry Zone farmers enhanced through use of short-term weather forecasts, medium-term seasonal forecasts, and longer-term climate scenario planning, which are composed of lower-level Outputs to achieve them.

The project has been implemented in five townships in the Sagaing, Mandalay and Magway Regions – Shwebo and Moneywa townships in the Sagaing region, Myingyan and Nyaung Oo townships in the Mandalay Region, and Chauk township in the Magway Region.

4. Results and key outcomes (Alignment with the Adaptation Fund core impact indicators – Number of Direct Beneficiaries reached including women; Trainings conducted including women trained, Early Warning Systems (EWS); Assets Produced, Developed, Improved, or Strengthened; Natural Assets Protected or Rehabilitated i.e. hectares of natural habitats/ meters of coastlines) – *Please refer to the "Performance at completion" in the Results Tracker section in the last PPR to extract this information.*

Outcome 1: Continuous freshwater availability ensured during the dry season in 280 villages in the dry zone

Output 1.1: Water capture and storage capacities in 280 villages enhanced to ensure increased availability of irrigation and potable water supply during dry period.

Output 1.1 was implemented with the support of the following implementing partners – (i) Farm Business Development Technical Team, (ii) Aung Zeyar Social Compassioner's Association, (iii) Hydroconseil, (iv) Well Done Engineering Co Ltd, and (v) Win Top Engineering and General Services Co. Ltd. Under output 1.1, the following results were achieved in the 5 project townships of Shwebo, Monywa, Myingyan, Nyaung U and Chauk. The main achievements under this output include the following:

- 1,629.7 hectares (4025.32 acres) of land treated with soil and water conservation measures
- 135 water retention ponds renovated
- 1 new pond constructed in Myingyan Township
- 70 water pumping systems provided to marginal farmers
- 56 communal water tanks constructed to store water for use during dry periods
- 9 deep tube wells constructed, and 3 existing deep tube wells renovated.
- 20 shallow tube wells constructed
- 45 water diversion canals constructed to facilitate water capture in water retention ponds
- 120 sets of tools provided for field implementation of soil and water conservation activities
- 304 participants from 280 villages and related departments trained on soil and water conservation measures and techniques
- Water quality test for all deep tube wells and shallow tube wells were conducted and the results shared with respective community and Township DRD.

These activities and achievements were handed over to respective departments and communities in the respective project townships prior to closure of project.

Output 1.2: 5,096 hectares of micro-watersheds are protected and rehabilitated through Farmer-Managed Natural Regeneration (FMNR) to increase natural water retention and reduce erosion: and

Output 1.3: Community-based agroforestry plots established on 2,856 hectares of private and communal lands to conserve soil and water

Activities under output 1.2 and 1.3 were packaged together and implemented by three partners – (i) Dry Zone Greening Department, (ii) Network Activities Group, and (iii) Community Development Action. Under these two outputs, the following results were achieved in the 5 project townships of Shwebo, Monywa, Myingyan, Nyaung U and Chauk:

- 3,050 hectares (7,533.5 acres) of land rehabilitated/reforested in natural forest areas
- 1,230 hectares (3,038.1 acres) of community forest rehabilitated/reforested
- 667 hectares (1,647.5 acres) of micro-watershed rehabilitated/reforested
- 522 hectares (1,289.86 acres) of public land (road sides, monasteries, schools and clinics) rehabilitated/reforested
- 1,000 hectares (2,470 acres) of agro-forestry plantation established
- 667 hectares (1,647.49 acres) of barren land rehabilitated/reforested as “modified taungya” or gap plantation
- 902 hectares (2,227.9 acres) of farm boundaries rehabilitated/reforested
- 25 hectares (61.75 acres) of demonstration plots (agroforestry, silvo pasture, inter-cropping) established.

In December 2017, survival counting of rehabilitated/reforested areas implemented in 2017 indicated a survival rate of 87%. Survival counting was conducted twice – in December and May of every year. During May 2018 survival counting, the survival rate was 67.21%. This is due to the dry spell, which is usually experienced in the dry zone from February to May of every year. Following this, the project conducted patching activities to compensate the low survival rate in the previous season.

The joint survival counting of rehabilitated areas in Dec 2018 recorded a survival rate of 88.11%, whereas in the one conducted in April 2019 recorded a survival rate of 86.79 %. Additional patching activities were therefore conducted just before the rainy season in 2019.

Outcome 2: Climate-resilient agriculture and livestock practices enhanced in Myanmar's dry zone

Output 2.1: Drought-resilient farming methods introduced to farmers to enhance the resilience of subsistent agriculture in the Dry Zone

Output 2.2: Resilient post-harvest processing and storage systems introduced to reduce climate-induced post-harvest losses (drought and floods)

Activities under output 2.1 and 2.2 were packaged together and implemented with the support of CESVI Foundation. Under output 2.1 and 2.2 of the project, the following results were achieved in the 5 project townships of Shwebo, Monywa, Myingyan, Nyaung U and Chauk:

- Training on climate resilient farming methods – 1,286 farmers. (male: 892; female: 394)
- Training and implementation on Alternative Wet and Dry (AWD) technology – 261 households. (male: 222; female: 39)
- Training and implementation on establishment of Thanakhar plantation – 215 households. (male: 185; female: 30)
- Training and implementation on establishment of fruit tree plantation – 153 households. (male:136; female:17)
- Training and implementation on farmer-managed seed multiplication – 369 households. (male: 321; female: 48)
- Participatory Varietal selection plots –4 households. (male: 3; female: 1)
- Training and implementation on participatory demonstration plots – 329 households. (male: 272; female: 57) 7 type of demonstration plots are elaborated through interactions with all the stakeholders which are intercropping with different row combination of two or three crops varieties: rice, groundnut, pigeon pea, green gram, sesame, sorghum in order to enhance resilience of farming communities.
- Training and implementation on drip irrigation demonstration plots – 125 households. (male: 116; female: 12)
- Farmer field school training focused on building up capacity of farmers with changing climate impact on agriculture; ensured continued productivity; and economic analysis of crop intensification through different crop and row type. – 455 households. (male: 389; female: 66)
- Provision of rice/multi-crop threshers – 127 threshers. (rice thresher: 20; multi-crop thresher: 107)
- Formation of thresher user group – 127 groups. (rice thresher user groups: 20; multi-crop thresher user groups: 107)
- Operation and maintenance training for thresher user group for 278 farmers. (male: 211; female: 67)
- Establishment of procedures for use of user fees for operation and maintenance of threshers
- Provision of postharvest technology training – 301 households. (male: 250; female: 51)
- Provision of elevated seed storage system – 36 villages

Output 2.3: Climate resilient livestock production systems introduced in 6,300 landless households to buffer the effects of flooding and drought on rural livelihoods

This output was implemented with the support of Community Development Association (CDAs - a local NGO based in Yangon. Under output 2.3 of the project, the following results were achieved in the 5 project townships of Shwebo, Monywa, Myingyan, Nyaung U and Chauk:

- 2 Training of Trainers events conducted for LBVD staff (27 LBVD staff attended the training)
- Training on climate resilient livestock production for livestock breeders – 8,790 households
- Provision of climate resilient livestock to the beneficiaries – 3,700 households
- Establishment of demonstration plots for improved livestock breeds– 108 households
- Establishment of fodder demonstration plots – 40 households
- Payback from primary beneficiaries to waiting beneficiaries under livestock banking system – 3,031 households.
- The project formed Township Livestock Group by integrating all village livestock farmer groups and made linkage with Myanmar Livestock Federation for further technical and financial assistance.

- All activities proposed under output 2.3 were accomplished and handed over to Myanmar Livestock Federation, LBVD and respective community.

Outcome 3: Timeliness and quality of climate risk information disseminated to dry zone farmers enhanced through use of short-term weather forecasts, medium-term seasonal forecasts, and longer-term climate scenario planning

Output 3.1: Climate hazard maps and risk scenarios are developed in each township to support community-based climate risk management and preparedness planning

This output of the project was implemented with the support of Regional Integrated Muli-thazard Early Warning System (RIMES). Under output 3.1 of the project, the following results were achieved in the 5 project townships of Shwebo, Monywa, Myingyan, Nyaung U and Chauk:

- Climate profiles and climate scenario analysis prepared for 5 townships based on 30-years climate data from DMH
- Tools and methodology for participatory vulnerability/risk assessment developed
- Participatory vulnerability/risk assessment conducted in 146 village tracts of 5 project townships
- Hazard maps of the 5 project townships (flood, earthquake and drought) produced and hard/soft copies shared with related departments, i.e. General Administration Department, Dry Zone Greening Department, Forest Department, Environmental Conservation Department, Department of Agriculture, Livestock Breeding and Veterinary Department, Department of Meteorology and Hydrology, Department of Rural Development, Department of Disaster Management and Irrigation and Water Utilization Management Department.
- Agro-meteorological bulletins (3 days, 5 days and 10 days weather forecasts) produced and issued for the 5 project townships
- 1 National level forecast translation and application training for government staff organized at union level
- 2 regional level forecast translation and application trainings organized for government staff at regional and township levels
- 1 mobile application “dmh sesame” developed for climate risk information dissemination to farmers
- 1 mobile application (Disaster Alert Notification) developed for Department of Disaster Management to provide updates and early warning on disaster events and general DRR related issues
- 1 training on forecast translation and application conducted for disaster management sector
- SESAME user interface forum to identify issues and challenges and enhance use of SESAME mobile application conducted, involving all users and stakeholders, including community representatives
- Training for media personnel on forecast translation and application, as well as other climate related products generated through Department of Meteorology and Hydrology conducted. As part of the training, a field visit to project sites was also arranged for media personnel

Output 3.2: Local level climate and disaster risk management framework strengthened for timely and effective communication of climate risk and early warning information

This output of the project was implemented with support of Regional Integrated Multi-hazard Early Warning System (RIMES). Under output 3.2 of the project, the following results were achieved in the 5 project townships of Shwebo, Monywa, Myingyan, Nyaung U and Chauk:

- 75 CBDRM committees formed in the 5 project townships (15 CBDRM teams in 15 villages in each township)
- 5 Climate Rrisk Information Sub-committees formed in the 5 project townships.
- Trainings provided for 75 CBDRM committees at village level
- 75 Village Disaster Management Plans submitted respective Township Disaster Management Committees
- In collaboration with relevant government departments, a second round of awareness and advocacy for village disaster management teams were provided currently in the 75 pilot villages in 5 townships.

5. Issues, challenges and mitigation measures (Environmental and social risks, gender considerations and other risks) – *Please refer to the lessons learned tab in the PPR, specifically the section on "Implementation and Adaptive Management"*

During design stage, the project was subject to an initial Environmental and Social Screening Procedure, which resulted in the identification of minor social and/ environmental risks. It was recommended that these risks be discussed at the inception workshop, as well as managed adequately during implementation. The inception meeting considered these risks and recommended measures to mitigate/eliminate the risks. The measures taken on environmental and social safeguards have been effective in avoiding unwanted negative impacts. Instead, the project has contributed to increased reforestation, watershed area conservation, and the establishment of agroforestry system - which ultimately enhanced carbon sequestration.

In terms of social impacts, the project has promoted better social cohesion and community cooperation through climate-sensitive water resource management and improved health conditions through access to safe water sources and reduction of water borne diseases. The additional household income received from cash for work programmes helped build resilience of households from economic shocks due to climate impacts. The project created positive impacts on empowering women in taking lead role in nursery management, site preparation, species selection and weeding. The project also benefitted a high percentage of vulnerable households - including female headed households, landless households and marginal farmers - through diversified livestock assets, homestead gardening, climate-resilient agriculture and livestock practices and improved ecosystem services. Livelihood opportunities for manual labor in water, forestry and agroforesty related component of the project meant reduced out-migration trends for income opportunities, thereby improving social well-being of the communities.

Gender considerations have been included in all field activities such as participation in workshops, meetings and prioritization exercises, farmers' group formation, selection of laborers for project activities, beneficiary selection for livestock distribution and training activities. While women's participation in trainings and user groups (eg. thresher user groups) have been encouraging, their participation in field activities (labour inputs) have been low because of the physical nature of participation. The project has accorded priority to women-headed households in its livestock distribution programme and there is clear evidence that women are benefitting from project interventions.

The project has placed emphasis on the need for implementing partners to report gender disaggregated data in all its reporting (monthly and quarterly) mechanisms. This data is carefully recorded, and the impacts of results will be monitored from time to time. The project reports gender-related stories from the field and publishes it from time to time through UNDP Intranet site and UNDP facebook page.

The MTE mission noted that the project is making a visible effort to ensure women are a significant part of the project. For instance, the consultation meeting on village selection recorded 28% participation by women; the livestock rapid needs assessment and beneficiary selection in 253 villages recorded 35% participation of women; 20% of livestock farmer committee members are women. In the training activities conducted under the project so far, 38% of the participants are female (4,327 out of 11,415).

6. Lessons learned (Best practices, adaptive management, what worked during the implementation and what did not, what corrective actions were taken during implementation, what are the ways to improve the intervention) – *Please refer to the lessons learned tab in the PPR, specifically the section on "Implementation and Adaptive Management"*

The investments on water resources have proven very impactful for the communities, as there is acute shortage of water in the dry zone - for both domestic and agriculture use. The engagement and participation of communities in water infrastructure related support has been very positive. The communities that have had major domestic water supply projects previously (with the help of international NGOs) present a model for future communities and staged investment in water system using community funds generated from water use fees. There were high community participation and willingness to pay when pond renovation activities are implemented. As noted in the Mid Term Evaluation, the project has leveraged as much as 50% cash contributions from some of these communities. The application of user fees is something that is being applied for the management of other project assets - so as to make project investments more sustainable in the long-run.

A close working relationship with relevant departments at the township level and the high level of outreach and stakeholder consultation served to expand the project activities smoothly and resulted in good participation from the government departments especially under outcome 2 and outcome 3. In some instances, such as promotion of climate resilient agriculture and livestock practices and climate risk information dissemination, concerned departments took leadership role in implementing activities. The collaboration with the Department of Meteorology and Hydrology has been exceptional and data sourced from the department has allowed the project to generate much-needed weather forecasts, which in turn is disseminated to the farmers.

The system of having regular dialogues with project counterparts/partners continue to be immensely beneficial in addressing implementation issues. The monthly project coordination meetings with the counterpart agency (Dry Zone Greening Department) has helped the project in building trust and confidence, in addition to addressing implementation challenges and bottlenecks. The quarterly project coordination meetings with partners is yet another mechanism employed by the project which has ensured better coordination and alignment of project activities. The arrangement to convene Technical Advisory Group (TAG) meetings in the 5 project townships (on a rotational basis) is very useful as this provides opportunities for TAG members and local government stakeholders to witness progress of project activities first hand and provide technical inputs and advise to implementing partners. The PSC has met on a six-monthly schedule, reflecting a high level of attention paid by the Government to the project.

The project database compiled during the initial phase of project implementation has been a useful resource for planning interventions throughout. The project prioritizes interventions on mainly landless, marginal and women-headed households in order to achieve the objectives of reducing vulnerability and enhancing adaptive capacity of households to address climate-related food security issues. The database developed by the project consist of beneficiary details (household head, livelihood source, land holding etc.). For specific sectoral interventions, the project also conducts needs assessments and identifies beneficiaries based on the overall project criteria of prioritizing landless and marginal farmers. All these ensured that most project assistance has been channeled to the most needy and marginalized population.

The agricultural activities including drought-tolerant crop varieties, inter-cropping and other farming methods, threshing equipment, improved seed storage and multiplication have provided clear benefits to the participating farmers. The demonstration plots have generated considerable farmer interest. Participating farmers express a high level of satisfaction and commitment to the improved seed varieties and inter-crop farming. In addition, new threshing equipment and seed storage facilities are greatly appreciated given the high rate of post-harvest losses of 50% and higher, as per the post-harvest assessment report published by the project. For the remaining period, the project will need to focus more on replication of these initiatives in other project and non-project villages.

The high turn-over of government staff and limitation of internal communication and sharing of information within government organizations and between levels of government contributed to lack of awareness of the project. The project has at least ten counterpart departments at various levels and despite the strong field activity coordination efforts, there are still gaps in information flow within the government system. The project has made efforts to provide progress reports to stakeholders, whenever requested.

7. Innovation: description of any innovative practices or technologies that figured prominently in this project – *Please refer to the lessons learned tab in the PPR, specifically the section on "innovation"*

The DMH-SESAME (Specialized Expert System for Agro-Meteorological Early warning) mobile application introduced by the project was a popular/innovative tool that provided weather forecasting and early warning (weather forecasts, crop advisories and disaster alert notification) services. While the tool will continue to be developed further – even beyond the life of the project - the result of this intervention was significant and continue to provide important extension assistance in future agriculture practices. A case study on the development of mobile application for weather forecasting and early warning system was submitted in response to a call from World Bank/GFDRR – and it was featured as a global best practice on climate risk management at local level.

In addition, a second mobile application – DAN (Disaster Alert Notification) was also developed through project support – that provide warnings to communities in times of disaster as well as notifications, important news, Do's and Don'ts for prevalent hazards, and phone numbers that the general public can contact during emergencies. The application also provides a link to the website of the Department of Meteorology and Hydrology (DMH) which users can refer to for weather forecasts and early warning information.

8. Description of the vulnerable communities and social groups affected by the project, and how they have been engaged and empowered – *You might want to refer as well to the section on "community/national impact" in the lessons learned tab of the PPR*

The project has, right from the start, ensured community participation and capacity building to manage new assets/systems (eg. seed storage facility, livestock banking system, crop thresher user groups, water user groups, etc), which will be a key to long term sustainability of project interventions.

The engagement of government counterparts in annual work planning and implementation is a key aspect of project management. This has ensured that project activities are implementation as per government plans and programmes and in accordance with government standards and norms.

The climate risk information management system developed under the project has ensured leadership role by Department of Meteorology and Hydrology (DMH) and integrated project activities with DMH activities. The weather forecasts, including agro-advisories and early warning system generated through project assistance have been fully integrated into government systems/extension programs. The weather forecast and agro-advisory system is owned and operated by the DMH. The Disaster Alert Notification (application) is owned and operated by the Department of Disaster Management. The project has also conducted risk/vulnerability mapping and risk mapping in a participatory manner engaging government staff so as to build local capacity.

During the final year of implementation, the project prepared a sustainability plan and exit strategy for each of the outcomes under the project, as per directives of the 6th Project Steering Committee meeting held on 5 Feb 2018. This has ensured handover and continuity of project activities to relevant communities and government departments, along with documentation/evidence of project activities in each township.

9. Description of how long-term institutional and technical capacity for effective adaptation has been strengthened – *Please refer to the lessons learned tab, section on "readiness interventions"*

The engagement of government counterparts in project implementation, in monitoring project activities, as well as in community trainings and workshops resulted in increased capacity of government officials at the local level. The community trainings were mostly delivered through engagement of technical staff form government departments as resource persons.

The arrangement of having Technical Working Group meetings in project township was instituted with the objective of promoting learning and sharing experience among government counterparts, implementing partners and UNDP project team. The joint monitoring of field activities during the Technical Working Group meeting provided space for cross-learning and providing technical advice/inputs based on local knowledge and experience.

The delivery of project through engagement of local NGO/CSO partners also contributed to capacity development of the institutions, as well as local staff involved in project implementation. The engagement of community in management of important project assets also lead to increased knowledge and capacity of community groups, which in turn ensured long-term sustainability of project activities.

The key beneficiaries of the project, i.e. community groups that were established to manage important project assets (eg. crop threshers, livestock banking system, small-scale water infrastructure, crop and seed storage facilities, etc) were all capacitated on operations, maintenance and use of project assets for efficiency and sustainability.

Local government officials have also benefitted from numerous trainings that were identified by the stakeholders themselves in the initial stages of project implementation. These trainings were delivered through the implementing partners and where possible through engagement of specific subject-area experts in the relevant technical areas.

10. An overview of complementarity and/or coherence of with other climate finance sources in the context of this project (synergies with other projects, national plans etc.) – *Please refer to the lessons learned tab, section on "complementarity and coherence".*

As part of the project, efforts were also put in to formulate a follow-up project to ensure sustainability of project investments, inter-alia through the Sustainable Enterprises and Agricultural Development (SEAD) Project. This project is jointly funded by UNDP and Ooredoo and aims to establish an inclusive and sustainable rural development model in Myanmar's Dry Zone leveraging Ooredoo's advanced mobile technology and UNDP's experience in promoting climate resilient farming practices in the Dry Zone region of Myanmar. 130 target villages in Myingyan and Nyaung U townships are expected to directly benefit from the 15 months project.

11. Sustainability, scalability and replicability – *Please refer to the lessons learned tab, section on "climate resilience measures"*

The farmer field school (FFS) and exchange programme has been useful in disseminating climate resilient measures. The inter-cropping systems have high potential for replication but additional support to expand their use is needed in the form of information/advice, and the possible expansion of the FFS approach to disseminate new measures. For replication, upscaling, and dissemination, a robust strategy is needed.

The introduction of new drought-resistant crops, more diversified cropping systems and the measures to reduce post-harvest losses, and livestock raising by marginal farmers are the most successful interventions. These involve approaches that have potential to be scaled up, both beyond village demo plots and to other areas of the dry zone.

Communities have willingly contributed co-financing for interventions on water retention/capture. Any visible and effective measures to enhance water supply is likely to be replicated and upscaled in the future.

The advance tools in weather forecasting and early warning (weather forecasts, crop advisories and disaster alert notification) have been significant and may provide important extension assistance in future agriculture practices.

Section B: Project expenditure

(The use of spreadsheet is recommended to avoid numerical errors.) – Excel sheet attached

- Project budget
- Actual expenditures
- Variance notes

Section C: Appendices (optional)

- Participants list of an inception workshop
- Key project staff list
- Results tracker
- Reports and other publications
- Websites
- Any other resources

(i) <u>Participants list of an inception workshop in Naypyitaw on 26 August 2015</u>

Sr.	Participant Name	Position	Department
1	U Aung Myo Lwin		Department of Rural Development
2	Dr. Yan Naing Soe	Regional Veterinary Officer	Livestock Breeding and Veterinary Department
3	U Kyaw Naing Oo		General Administration Department
4	U Mg Mg Kyaw		Forest Department
5	U Zaw Tun Aung	SIO	Environmental Conservation Department
6	U Naing Lin Htet	Deputy District Administrator	General Administration Department
7	Dr. San Hla Htwe	Staff Officer	Department of Agriculture
8	U Kyaw Swa Oo	Executive Engineer	Water Resource and Utilization Department
9	U Kyaw Lin Oo	Director	Department of Meteorology and Hydrology
10	Dr. Myo Chit	Assistant Director	Livestock Breeding and Veterinary Department
11	U Tun Tun	Deputy Township Officer	General Administration Department
12	U Saw Tun Win		General Administration Department
13	Daw Cho Cho Mar	Assistant Director	Department of Agriculture
14	Daw Yu Khin	Deputy Director	Water Resource and Utilization Department
15	U Zaw Min Thant	Staff Officer	Environmental Conservation Department
16	U Myint Thein	Assistant Director	Department of Meteorology and Hydrology
17	U Myint Aung		Dry Zone Greening Department

18	U Kyaw Myo Htwe	Deputy Director	Dry Zone Greening Department (HQ)
19	U Aung Kyaw Htun	Director	Dry Zone Greening Department
20	U Myint Sein 2	Assistant Director	Dry Zone Greening Department
21	U Win Zaw	Deputy Director General	Dry Zone Greening Department
22	U Ba Khin	Assistant Director	Dry Zone Greening Department
23	U Myint Win Thu	Staff Officer	Dry Zone Greening Department
24	U Thet Mg Mg	Staff Officer	Dry Zone Greening Department
25	U Wai Myo Hla	Director	Dry Zone Greening Department
26	U Aung Shein	Staff Officer	Dry Zone Greening Department
27	U Khin Mg Oo	Assistant Director	Dry Zone Greening Department
28	U Zaw Linn Win	Staff Officer	Dry Zone Greening Department
29	U Win Bo	Staff Officer	Dry Zone Greening Department
30	U Kyaw Win	Staff Officer	Dry Zone Greening Department
31	U Tun Nyunt Hlaing	Staff Officer	Dry Zone Greening Department
32	U Soe Han	Staff Officer	Dry Zone Greening Department
33	U Htay Aung	Director General	Dry Zone Greening Department
34	U Ba Kaung	Director	Dry Zone Greening Department
35	Dr. Thwe Thwe Win	Staff Officer	Dry Zone Greening Department
36	Dr. Wei Phyo Oo	Staff Officer	Dry Zone Greening Department
37	U Myo Aung	Staff Officer	Dry Zone Greening Department
38	Dr. Myint Oo	Rector	University of Forest
39	Dr. Nyi Nyi Kyaw	Director General	Forest Department
40	U Nay Aye	Director General	Environmental Conservation Department
41	U Khin Mg Yi	Permanent Secretary	MOECAF
42	U Zaw Min	Deputy Director General	Forest Department
43	U Than Tun	Deputy Director	Department of Rural Development
44	U Thiha Soe	Staff Officer	Department of Rural Development
45	Daw Thu Zar Myint	Director	Department of Agriculture
46	U Kyaw Soe		Department of Rural Development
47	U Win Ko Ko	Assistant Director	Environmental Conservation Department
48	U Aung Maw Oo	Assistant Director	FRI, Forest Department
49	U Kyaw Moe Oo	Deputy Director General	Department of Meteorology and Hydrology
50	U Than Oo	Director	Forest Department

51	U Kyaw Soe Win	Staff Officer	Recuse and Resettlement Department
52	Dr. Soe Win	Township Veterinary Officer	Livestock Breeding and Veterinary Department
53	U Mg Shwe Thein	Assistant Township Officer	General Administration Department
54	U Nay Myo Win	Staff Officer	Recuse and Resettlement Department
55	Ms. Thi Hang Thung To	DRR (Operation)	United Nations Development Programme
56	Daw Lat Lat Aye	Team Leader (Pillar II)	United Nations Development Programme
57	Terence Hay Edie	Programme Adivisor	United Nations Development Programme
58	Yusuke Taishi	Regional Technical Advisor	United Nations Development Programme
59	Mr. Karma Lodey Rapten	Chief Technical Specialist	United Nations Development Programme
60	Dr. Myint Wai	NPM	United Nations Development Programme
61	U Khin Mg Lwin	Livestock Specialist	United Nations Development Programme
62	U Khin Mg Htay	Environment & Forest Specialist	United Nations Development Programme
63	U Yan Naing Tun	SCWH Specialist	United Nations Development Programme
64	U Myint Zaw	Agricultural Specialist	United Nations Development Programme
65	Ma Ruat Pwee	Project Assistant	United Nations Development Programme
66	Ma Phyo	Programme Associate	United Nations Development Programme
67	Ma Su Mon	Project Assistant	United Nations Development Programme

(ii) Project Key Staff

Sr	Name	Post	Remark
1	Karma Lodey Rapten	Technical Specialist	
2	Myint Wai	National Project Manager	
3	Myint Zaw	Agricultural Specialist	
4	Khin Maung Lwin	Livestock Specialist	
5	Khin Maung Htay	Environment and Forestry Specialist	
6	Yan Naing Tun	Soil Conservation and Water Harvesting Specialist	
7	Van Lal Ruat Pwee	Monitoring and Evaluation Specialist	
8	Theingi Soe	Project Assistant	
9	Kyaw Zin Aung Soe	Environment Forestry Specialist	May 2017- June 2019
10	Seng Mai	Project Assistant (IC)	Dec 2018- June 2019
11	Ye Win Tun	Driver	

(iii) Assessments, Reports, Surveys and Publications under AF Project

Aug 2014 - 31 Mar 2016

1. Report of the Launching Ceremony of the project
2. Communication Strategy for the AF project
3. Inception report
4. Greening the Dry Zone: Conserving land while improving water access and food security in Myanmar (photo essay published on ALM page)
5. Summary Report of the Target Villages selection process
6. Minutes of the 1st Project Steering Committee meeting
7. Minutes of the 1st Technical Advisory Group meeting
8. Project brochure for public dissemination
9. Monitoring and Evaluation Framework for the AF project
10. NGO/CSO Capacity Assessment Report

Apr 2016 - Mar 2017

1. Completion Report: Renovation of Kin Tat Irrigation Canal in Shwebo
2. Rapid Needs Assessment: Assessment, Identification & Monitoring of Small-Scale Water Infrastructure Needs for Drinking and Irrigation Water in the Dry Zone of Myanmar.
3. Field Survey Report: Soil and Water Conservation Activities under the AF Project.
4. Training Manual for Soil and Water Conservation Activities
5. Interim Report on Soil and Water Conservation Activities in the dry zone, March 2017
6. Participatory Rural Appraisal and Training Need Assessment Report for Promotion of Climate Resilient Agriculture practices in the Dry Zone of Myanmar
7. User Guide for Thresher User Groups
8. Participatory post-harvest assessment report
9. Final report of the delivery of Threshers to Thresher User Groups
10. Training Report: Operation and Maintenance of Threshers
11. Training manual on “Farmer-managed Seed Multiplication Training”
12. Livestock rapid need assessment report
13. Completion Report: Training of Trainers for climate change resilient livestock rearing practices in dry zone.
14. Completion Report: Community trainings on climate resilient diversified livestock rearing practices.
15. Training Report: Training of Trainers on Community Based Disaster Risk Management
16. Community Based Disaster Risk Management manual and tools
17. Climate Analysis: variabilities, extremes, trends, projections and associated risks, Central Dry ZOne of Myanmar.
18. Summary Report: Presentation of Climate Profiles for Monywa and Nyaung U townships in the Central dry zone of Myanmar.
19. Assessment of climate risk information flow in the dry zone of Myanmar - capacities, gaps and user requirements.
20. Vulnerability and rick assessment guide book.
21. Special agro-climatic bulletins for the 5 project townships
22. Standard operating procedure for information/risk dissemination
23. Baseline Report: Impact Assesment - Addressing Climate Change Risks on Water Resources and Food Security in the Dry Zone of Myanmar.
24. Baseline video documentary of the project
25. News Article - Responding to disasters before they happen: Trainings build resilience in Myanmar’s Dry Zone

26. Photo Essay - Supporting Shwebo farmers improve Water Access and Food Security in Myanmar
27. UNDP Myanmar Facebook post on Distribution of Threshers to project beneficiaries https://www.facebook.com/UndpMyanmar/photos/a.473868895986360/1452112624828644/?type=3&theater
28. News Article - Disaster Alert Notification Application to Improve Myanmar's Preparedness
29. DAN (Disaster Alert Notification) - Mobile Application
30. DMH-SESAME (Specialized Expert System for Agro-Meteorological Early warning

April – Dec 2017

1. Second Interim Report on Soil and Water Conservation Activities
2. Report on Joint Survival Counting of Rehabilitation/reforestation areas
3. Report on Farm Boundary Plantation Programme
4. Report on Public Land Tree Plantation Programme
5. Report on Capacity Building Programme on Watershed and Forestry Management
6. Report on Establishment of Agro-forestry Systems in the Dry Zone of Myanmar
7. Public Consultation Report on Identification of Rehabilitation/reforestation Area
8. Report of Seedlings delivery by Dry Zone Greening Department in 2017
9. Completion Report - Training on Climate Resilient Farming Methods - 2017
10. Completion Report - Training on Climate Adaptation and Water Saving Technology (Alternative Wet and Dry (AWD) practices in Paddy Cultivation – 2017
11. Completion Report - Training on Perennial Tree (Thanakha) Plantation – 2017
12. Completion Report - Training on Establishment of Perennial Fruit Trees – 2017
13. Completion Report - Training on Farmer-managed Seed Multiplication Programme – 2017
14. Completion Report - Training on Participatory On-Farm Demonstration of Climate-Resilient Agriculture Practices – 2017
15. Completion Report - Training on Farmer Field School Concepts and Methodology on Climate Resilient Dry land Farming – 2017
16. Completion Report - Training on Drip Irrigation Technology – 2017
17. Progress Report - Implementation of Drip Irrigation Demonstration – 2017
18. Progress Report - Provision of Post-harvest Seed Storage Facilities - 2017
19. Report on participatory varietal selection of rice varieties in Shwebo Township – 2017
20. Report on Refresher Training on Climate Change Resilient Diversified Livestock Rearing Practices
21. Progress Reoprt - Provision/Delivery of Climate Resileint Livestock
22. Report on Livestock Banking System
23. Report - National Training on Climate/Weather Forecast Translation and Application
24. Report - Regional Training on Climate/Weather Forecast Translation and Application
25. Guidelines for Testing Climate Information Flow
26. Risk Assessment Report: Enhancing Capacities for Climate Risk Management in Myanmar's Dry Zone through Climate Information and Services
27. Climate Hazard Maps for 5 Townships (Flood, Drought, Earthquake)
28. Inception Report on Community-Based Disaster Risk Management
29. Baseline Report: Impact Assessment – Addressing Climate Change Risks on Water Resources and Food Security in the Dry Zone of Myanmar
30. Mid-term Evaluation Report
31. Project Story - "Measuring Progress: Adapting to Climate Change in the Dry Zone of Myanmar (http://www.mm.undp.org/content/myanmar/en/home/presscenter/pressreleases/2017/12/20/measuring-progress-adapting-to-climate-change-in-the-dry-zone-of-myanmar.html)

32. The Rice Elections (http://www.mm.undp.org/content/myanmar/en/home/ourwork/environmentandenergy/successstories/The_Rice_Elections.html)

Jan – Dec 2018

1. Mid-term Evaluation Report of AF Project
2. Report on Joint Survival Counting in May - June 2018
3. Completion Report on Seedlings Handover from Dry Zone Greening Department
4. Completion Report on Joint Survival Counting of Seedlings Planted by Community Development Action in Project Townships- Sept 2018
5. Report on Farm Boundary Tree Planting, List of Farmers and Acres - Sept 2018
6. Report on Public Land Tree Planting and Tree Planting Ceremony - Sept 2018
7. Final Completion Report on Public Land and Farm Boundary Tree Planting- Dec 2018
8. Establishment of Agroforestry Report – Dec 2018
9. Livestock sector exit strategy report
10. Report on second time Refresher Training on Climate Change Resilient Diversified Livestock Rearing Practices
11. Livestock sector project completion report of Climate Change Resilient Diversified Livestock Rearing Practices
12. Livestock sector Technical report of Climate Change Resilient Diversified Livestock Rearing Practices
13. Field Survey Report for Site Identification to Implement Construction of Communal Water Tanks & Shallow Tube Well, Rehabilitation of Deep Tube Wells & Providing Water Pumping System (*For Shwebo and Mongywa* Townships) (Feb 2018)
14. Field Survey Report for Site Identification to Implement Construction of Communal Water Tanks & Deep Tube Wells (*For Myingyan and Nyaung U* Townships) (Feb 2018)
15. Field Survey Report for Site Identification to Implement Construction of Communal Water Tanks & Deep Tube Wells (*For Chauk* Township) (Feb 2018)
16. Report for monitoring on village water retention ponds rehabilitated in year 2017 (May 2018)
17. Document for soil and water conservation Township level hand over: five townships (June – July 2018)
18. Final report for soil and water conservation: five townships (August 2018)
19. Document for small scale water infrastructure Township level hand over: Myingyan & Nyaung U (July 2018)
20. Document for small scale water infrastructure Township level hand over: Chauk (August 2018)
21. Final Report Installation and Construction of Deep Tube Wells & Communal Water Tanks (*Chauk* Township) (July-August 2018)
22. Final Report Installation and Construction of Deep Tube Wells & Communal Water Tanks (*Myingyan and Nyaung U* Township) (July-August 2018)
23. Document for small scale water infrastructure Township level hand over: *Monywa and Shwebo Townships* (August2018)
24. Final report for small scale water infrastructure construction: *Monywa and Shwebo Townships* (September 2018)
25. Annual review workshop for year 2017
26. Alternative Wet and Dry Method Training
27. Training for Participatory Demonstration Activity
28. Training for Farmer Field School Concept Training
29. Field day Activity
    - AWD field day activity in summer rice plots
    - Climate resilient Rice Varietal Selection

30. Climate resilient farming method Training
31. Alternative Wet and Dry Method Training
32. Thanakha Tree plantation Training
33. Fruit Tree plantation Training
34. Seed Multiplication Training
35. Demonstration Plot Training
36. Farmer Field School Training

(iv) Website/ Links to Stories on Media

1. The Ancient hairstyle of Set Set Yo https://undp-adaptation.exposure.co/the-ancient-hairstyle-of-set-set-yo
2. Stepping up: The story of one Myanmar woman farmer leading the way - https://medium.com/@UNDPasiapac/stepping-up-the-story-of-one-myanmar-woman-farmer-leading-the-way-e714dd1eedce
3. Reducing poverty and building resilience to climate change in Myanmar's Dry Zone - http://www.undp.org/content/undp/en/home/blog/2015/3/3/Reducing-poverty-and-building-resilience-to-climate-change-in-Myanmar-s-Dry-Zone/
4. GREENING THE DRY ZONE Conserving Land while Improving Water Access and Food Security in Myanmar - https://undp.exposure.co/greening-the-dry-zone
5. Running dry: A window into the Dry Zone of Myanmar - https://medium.com/@UNDPasiapac/running-dry-a-window-into-the-dry-zone-of-myanmar-a14e4e8731cb
6. UNFCCC Adaptation Calendar 2017: Women Leading Adaptation - http://unfccc.int/files/adaptation/application/pdf/20161208_calendar2017_final.pdf
7. FLOW-ON EFFECTS Supporting Shwebo farmers improve Water Access & Food Security in Myanmar - https://undp-adaptation.exposure.co/flowon-effects
8. Responding to disasters before they happen: Trainings build resilience in Myanmar's Dry Zone: http://www.undp.org/content/undp/en/home/presscenter/articles/2016/09/27/responding-to-disasters-before-they-happen-trainings-build-resilience-in-myanmar-s-dry-zone.html
9. WATER IN MYANMAR'S DRY ZONE - https://undp.exposure.co/water-in-myanmars-dry-zone
10. Water Resources and Food Security in Myanmar – CCA adaptation-undp.org, Addressing Climate Change Risks on Water Resources and Food Security in the Dry Zone of Myanmar - http://adaptation-undp.org/projects/af-myanmar
11. DESIGN FOR IMPACT FRAMEWORK - Integrating Open Data and Risk Communication for Decision-Making (see Page 118 for Myanmar case study) - https://opendri.org/wp-content/uploads/2018/05/Design-for-Impact-Open-Data-Risk-Comm-Report.pdf
12. You tube video on AF Project - https://www.youtube.com/watch?v=bZ5cxcec_0g&feature=youtu.be
13. Bringing Smiles back to Shwebo Farmers - http://www.mm.undp.org/content/myanmar/en/home/presscenter/articles/2016/10/bringing-smiles-back-to-shwebo-farmers.html
14. Responding to disasters before they happen: Trainings build resilience in Myanmar's Dry Zone - http://www.undp.org/content/undp/en/home/presscenter/articles/2016/09/27/responding-to-disasters-before-they-happen-trainings-build-resilience-in-myanmar-s-dry-zone.html
15. Photo Essay on Medium by Karma Rapten - https://medium.com/@karmarapten/adapting-to-climate-change-greening-the-dry-zone-of-myanmar-3a3cce68165b
16. Photo Essay on Exposure - https://undp-adaptation.exposure.co/lost-and-found

Facebook Posts:

1. 8 June 2018 - Enhancing Food Security through Improved Post-Harvest Practice in the Dry Zone of Myanmar - http://www.mm.undp.org/content/myanmar/en/home/presscenter/pressreleases/2018/enhancing-food-security-through-improved-post-harvest-practice-i.html
2. 29 May 2018– Video clip of Disaster Alert Notification - https://web.facebook.com/mrtvwebmediaportal/videos/1594208340624986/UzpfSTQ2MjU4MjY1MDQ0ODMxODoxODc2NDQ2ODE5MDYxODg3/?fb_dtsg_ag=AdxUGlpRPdR8W1NG0BFkUZ1mH5nu0Qj6-dwk8wplZRSOGQ%3AAdzKA4pQP3cTvtOj9DcTMqY_6oMxKzh8cYMUP9KfQyv1YQ
3. April 2 - Water Pumps to Improve Irrigation for Dry Zone Farmers
4. 12 March 2018 - Stepping up: The story of one Myanmar woman farmer leading the way - https://medium.com/@UNDPasiapac/stepping-up-the-story-of-one-myanmar-woman-farmer-leading-the-way-e714dd1eedce
5. 2 March 2018 - Running dry: A window into the Dry Zone of Myanmar - https://medium.com/@UNDPasiapac/running-dry-a-window-into-the-dry-zone-of-myanmar-a14e4e8731cb
6. 8 Jan 2018 - Communities in Myanmar's Dry Zone are adapting to the impacts of climate change - https://web.facebook.com/UndpMyanmar/photos/a.464110466962203/1730238683682702/?type=3&theater
7. 12 Dec 2017 – Briefing for students from the Baden-Wurttemberg Cooperative State University, Karisruhe, Germany - https://web.facebook.com/UndpMyanmar/posts/1698402243533013?__tn__=K-R
8. 19 Oct 2017 – The Rice Elections - http://www.mm.undp.org/content/myanmar/en/home/ourwork/environmentandenergy/successstories/The_Rice_Elections.html
9. 5 Sept 2017 - Heat Tolerant Animals Provide Lifeline for Vulnerable Communities in Dry Zone - http://www.mm.undp.org/content/myanmar/en/home/ourwork/environmentandenergy/successstories/Heat_Tolerant/
10. 18 Aug 2018 – AF Project Infographics - https://web.facebook.com/UndpMyanmar/photos/pcb.1592000384173200/1591999654173273/?type=3&theater
11. 4 July 2017 – AF Project Co-Chairs of Project Steering Committee visits project sites in Shwebo Township - https://web.facebook.com/UndpMyanmar/photos/a.473868895986360/1546766285363277/?type=3&theater
12. 4 July 2017 - A water retention pond in Ohn Pauk Village in Shwebo, rehabilitated as part of the "Addressing Climate Change Risks on Water Resources and Food Security in the Dry Zone of Myanmar" project - https://web.facebook.com/UndpMyanmar/photos/a.464110466962203/1546691448704094/?type=3&theater
13. 19 May 2017 - Documentary on Greening the Dry Zone of Myanmar – https://www.youtube.com/watch?v=xIgGd-twBAk&t=15s
14. 7 April 2017 – Distribution of rice threshers - https://web.facebook.com/UndpMyanmar/photos/pcb.1452113674828539/1452112624828644/?type=3&theater
15. 10 Feb 2018 – Inauguration of Kin Tat Irrigation Canal in Shwebo township - https://web.facebook.com/UndpMyanmar/posts/1391775000862407?__xts__%5B0%5D

=68.ARBXEV-5hZxC06LKdvp3AuajbNNJfoTSDBUIQk6jAFuiiM24XocLv2qsvYbkRBsazZMUCeqW9bQkJs_5X3SParwcSWV9uHf1sUkNbAS5HQ4JHPt6vTWmIxmr8v7zUk7ozf1BdrktJQlRZsiIV4Y7LOhgWR-r3OFRCc-onrMM9hhRRsIiihZmgg&__tn__=K-R

16. 11 Jan 2017 – Flow on Effects - Supporting Shwebo farmers improve Water Access & Food Security in Myanmar - https://undp-adaptation.exposure.co/flowon-effects
17. 18 Oct 2016 – Bringing smiles back to Shwebo farmers - http://www.mm.undp.org/content/myanmar/en/home/presscenter/articles/2016/10/bringing-smiles-back-to-shwebo-farmers.html
18. 4 Oct 2016 - Responding to disasters before they happen: Trainings build resilience in Myanmar's Dry Zone - http://www.undp.org/content/undp/en/home/presscenter/articles/2016/09/27/responding-to-disasters-before-they-happen-trainings-build-resilience-in-myanmar-s-dry-zone.html
19. Article on AF project by Daily Eleven Newspaper – following the media training on 15-17 Nov 2018 - https://www.facebook.com/photo.php?fbid=2430857040276525&set=a.178444378851147&type=3&theater
20. Video clip on the AF Project following the media training on 15-17 Nov 2018 - https://www.mrtvmyanmar.com/mm/news-28762?fbclid=IwAR2Vf0VEgvX7jHUWbNAHsbyO3QLq_s6aBS3byN68_4INI19p1fPVvLSwOuo
21. Video footage on participatory varietal selection of groundnut supported through the project https://www.facebook.com/karma.rapten/videos/pcb.10156565074538267/10156566751068267/?type=3&theater
22. MNTV Clip - https://www.facebook.com/mntvnewsofficial/videos/583445122087520/UzpfSTYyMjEyODI2NjoxMDE1NjY2NDczOTkwODI2Nw/
23. Daily Eleven News Article - https://www.facebook.com/photo.phpfbid=2430857040276525&set=a.178444378851147&type=3&theater
24. MRTV Clip - https://www.mrtvmyanmar.com/mm/news-28762?fbclid=IwAR0KXKvz_aSJG9WPK6oUunCLWKDNssRgPZ-kCs4VaLi3sZRcCbBY3YteN1U
25. VOA-Burmese News - https://www.facebook.com/VoA.Burmese.News/videos/2231440113844618/
26. EENADU India - http://www.eenaduindia.com/news/international-news/2018/11/28223623/Farmers-face-climate-change-challenges-in-Myanmar.vpffbclid=IwAR3xlSUEx8Ud1WkMUlpqYHbszYZ5HY_tHCeOLtxFLF94oxOiDeghp9sFqW4

27. News Article on Liberation - https://www.liberation.fr/planete/2018/12/11/en-birmanie-le-changement-climatique-remue-ciel-et-terres_1697312

French Radio voice clip - http://www.rfi.fr/emission/20181212-birmanie-face-rechauffement-climatique