

Hpa-An Township: Environmental Scoping Report and Recommendations



Myanmar, October 2019

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Abbreviations

Organizations

JEU	Joint Environment Unit <i>(of the United Nations Environment Programme and the United Nations Office for the Coordination of Humanitarian Affairs)</i>
NRC	Norwegian Refugee Council
UNEP	United Nations Environment Programme
OCHA	United Nations Office for the Coordination of Humanitarian Affairs
UNHCR	United Nations High Commission for Refugees

Thematic

DRR	Disaster Risk Reduction
ECD	Environmental Conservation Department
EIA	Environmental Impact Assessment
FGD	Focus group discussion
GIS	Geographic Information System
IEE	Initial Environmental Examination
ICLA	Information, counselling and legal assistance
IDP	Internally displaced person
LFS	Livelihoods and Food Security
NEAT+	Nexus Environmental Assessment Tool
WASH	Water, Sanitation and Hygiene

Executive Summary

This report presents the results of an environmental scoping mission by the UN Environment Programme / OCHA Joint Environment Unit (JEU) and Norwegian Refugee Council (NRC) to Hpa An Township, Kayin State in Southeast Myanmar. The mission took place from 23 September to 1 October 2019 and was financially supported by NRC, UNEP and OCHA.

There are approximately 5,600 internally displaced people in Kayin, mostly from conflict and environmental issues like river bank erosion. The purpose of the mission was to highlight key areas of environmental risk in NRC's programming in Hpa An, and to apply and promote the Nexus Environmental Assessment Tool (NEAT+). The JEU team also trained seven NRC staff in the use of NEAT+ so that it can be applied to other projects across Myanmar.

The NEAT+ field test took place in two locations within Hpa An Township: Saint Chaung and Sein Pa La village. These locations were selected by NRC. Separate environmental sensitivity assessments were completed for each location. The Livelihoods and Food Security (LFS) expert completed the activity module based on NRC's current activities in Sein Pa La village (Agriculture, Livestock and Irrigation modules). Neither the WASH nor the Shelter and Settlements modules were completed as NRC does not have these specific technical activities in the area of the pilot.

The findings of this report are based on a combination of a field test of the NEAT+, six focus group discussions including participatory mapping with community groups, and a secondary data review. In this report, the results of the NEAT+ are analyzed in the context of the focus group discussions, secondary data review, and the NRC programme of work to provide tailored recommendations for mitigating environmental risks in Hpa An, and more broadly on a national level.

Key findings (and related recommendations) cover programmatic, strategic and external advocacy relevant recommendations. These include:

- **The need to prioritise disaster risk reduction interventions and education:** Risk of natural hazard exposure and disaster risk reduction underlie many of the recommendations throughout this report. In particular, the issues of soil erosion and flooding identified in this assessment require a cross-sectoral Eco-DRR lens in order to efficiently mitigate the impacts of disasters on local communities.
- **There is a large gap in waste management in Hpa An,** in both NRC activities and those of other organizations working in the area.
- **Climate change** was noted by all people consulted, with negative consequences on livelihoods - particularly agricultural production.
- **The capacity for screening environmental risks** in current humanitarian operations on an organizational level is low. No standard tools are widely deployed by organizations.

- **There is a key opportunity to require a basic level of environmental screening in the Myanmar Humanitarian Fund**, and incorporate the use of the NEAT+ into the guidance for fund recipients.
- Hpa An was a suitable location for a pilot and training of the NEAT+, but **areas of Myanmar with current displacement and upcoming projects will benefit more from the tool**. Members of the South East team can train other NRC staff across the country and use the NEAT+ before new upcoming projects start in November 2019 and January 2020.

This report is one of the main outputs of the visit and it is hoped that the results and environmental findings from this mission will be used by NRC towards planning mitigation activities and/or environmentally sensitive project planning in both upcoming and existing interventions across Myanmar. Lessons learnt from the NEAT+ pilot will also be captured and used for its future application globally as well as for potential future updates of the tool.



Figure 1: Saint Chaung villagers walk on the eroded riverbank that has displaced the majority of the village.

Map

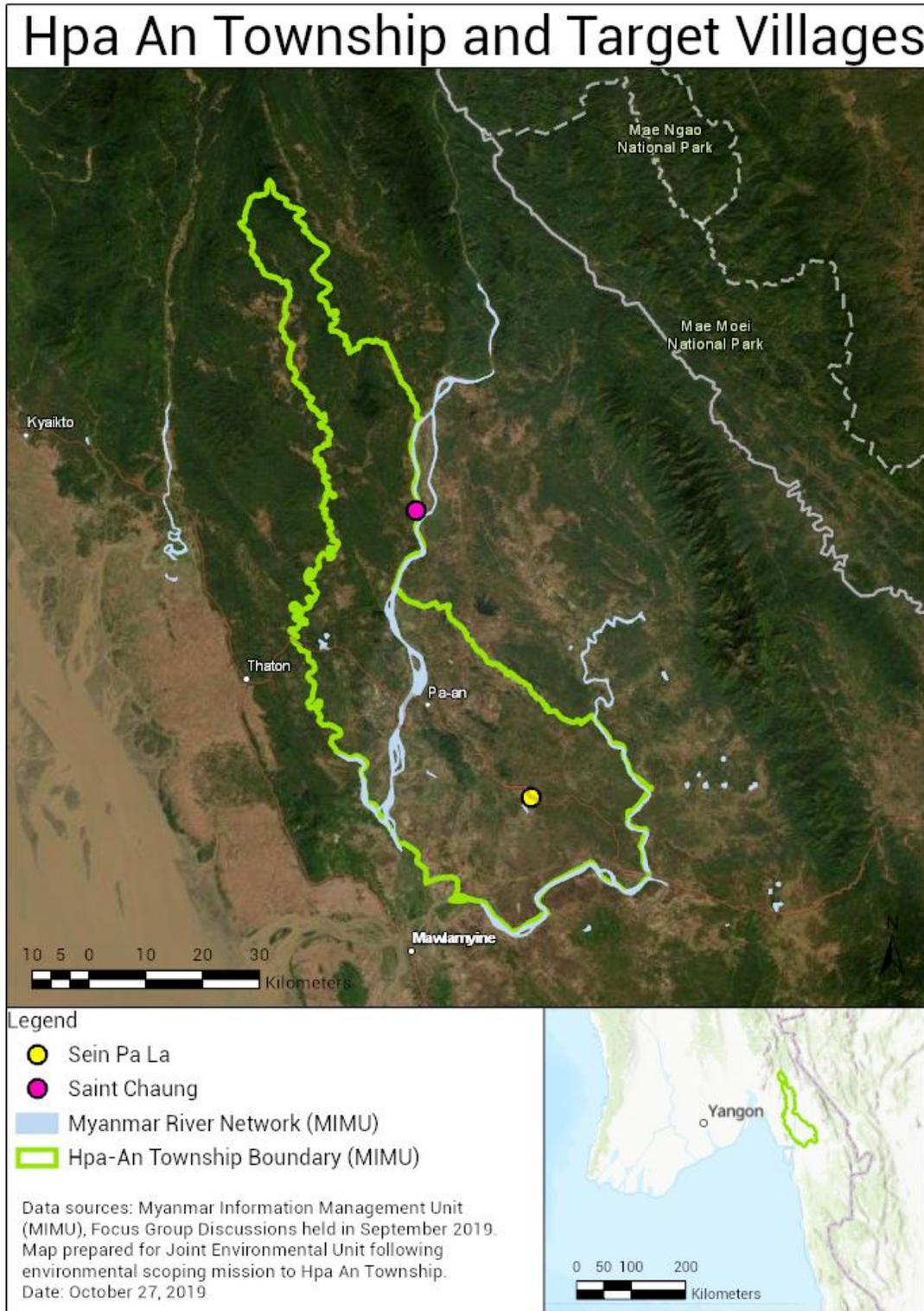


Figure 2: Map of Hpa An township and target villages

Saint Chaung and Sein Pa La Villages



Figure 3: Map of Saint Chaung and Sein Pa La villages

Introduction

Objectives

From 23 September to 1 October 2019, Mandy George (Environmental Field Adviser, JEU) and Theresa Dearden (Project Support Analyst, UNEP) travelled to Myanmar to conduct the third field pilot of the NEAT+ and produce a series of recommendations to increase the environmental sustainability of the Norwegian Refugee Council's (NRC) programming.

The overarching objectives of the field pilot and scoping mission were to:

1. Highlight the key areas of environmental risk in NRC's Hpa An programme to inform project design.
2. Build capacity with local field staff to extend the pilot to other areas of interest.
3. Explore how the NEAT+ can fit into NRC's systems and requirements at an organizational level.
4. Share and promote the tool with other in-country humanitarian/environmental organizations and Joint Initiative partners.
5. Apply and document the use of the NEAT+ tool from a user perspective, with a view to further improve it.

In this report, the results of the NEAT+ are analyzed in the context of the focus group discussions, secondary data review and the NRC programme of work to provide tailored recommendations for mitigating environmental risks in Hpa An, and more broadly on a national level. Recommendations are thus presented at three levels:

1. Programmatic: Project Implementation
2. Organizational strategy: Mainstreaming the NEAT+ in NRC
3. External advocacy and capacity building

NEAT+ Background

The NEAT+ was developed by the Coordination of Assessments for Environment in Humanitarian Action "Joint Initiative",¹ in partnership with NRC and other partners (see below). The tool builds on a previous version ("NEAT") designed by NRC. It was updated and further developed by the Joint Initiative and overseen by a working group of over 25 organizations. For more information, including the tool and guidance notes, visit: <https://ehaconnect.org/resources/neat>.

The NEAT+ is an open source, simple and pragmatic project-level environmental assessment tool that provides a snapshot of the current sensitivity of the local environment, highlighting any underlying vulnerabilities. The tool then overlays activity-specific information to identify

¹ <https://www.eecentre.org/2017/01/01/the-joint-initiative/>

potential exacerbating risks posed by a project. The tool is intended to enhance project quality and improve the accountability of humanitarian programming. The NEAT+ is a targeted response to an identified need for a tool that allows an effortless and rapid identification of key environmental issues by users with limited or no environmental expertise. It consists of various technical modules including environmental sensitivity, WASH, Shelter, and Food Security and Livelihoods. Data is collected in Kobo Toolbox or in Excel.

The Joint Initiative ran from January 2017 to January 2019 and aimed to improve coordination between environment and humanitarian actors both before and after disasters, with a focus on updating and improving key humanitarian environmental assessment tools. It was a collaborative effort between USAID, UNHCR, WWF, JEU, NRC and the Swedish Civil Contingencies Agency (MSB). The project, through better dissemination of tools, resources and environmental data, supported efficient consideration of environment and climate knowledge in humanitarian assistance. The Joint Initiative produced various deliverables working towards the improved integration of environment in humanitarian action, including the NEAT+. The JEU is now the custodian of the NEAT+.

Context: Myanmar and Hpa An

Hpa An Township is in Kayin State, located in the southeast of Myanmar along the border with Thailand and the national states/regions of Kayah, Naypyidaw, Bago, and Mon. The state covers 30,385 km², and consists of 7 townships. Hpa-An is the capital city of Kayin State. The state's population is 1.43 million (2011 HMIS data), or 47 people per square kilometre. 16% of Kayin's population lives in urban areas.² Kayin has 5,600 displaced people in the state,³ mostly as a result of armed conflict but also from the environmental impact of riverbank erosion from neighbouring Mon State.

The two villages assessed as part of this scoping had internally displaced persons (IDPs) from past conflict in Kayin State or due to river bank erosion in Mon State. Most were displaced between 8 and 20 years ago. Both originally displaced residents and local residents were broadly similar in environmental practices and there were no major discernible differences between the two groups. Owning land is the characteristic that determined the level of income in households and there was a substantial difference in living standards between land and non-land owners. Another factor influencing income levels is remittances from Thailand or Malaysia, which are common in Kayin State with households that can afford to send family members to work overseas. The impact of remittances was seen clearly on the income levels of families in Saint Chaung village in particular, where houses were generally constructed from good-quality purchased timber, among other more obvious signs of improved standard of living.

Sensitivities in Myanmar around citizenship have politicised the issue of displacement and this was evident in both villages where communities did not want to identify as "displaced" and focus

² https://themimu.info/states_regions/kayin

³ <https://www.unocha.org/myanmar/about-ocha-myanmar>

group discussion (FGD) questions had to be adapted to remove references to displacement. In the case of Muslim residents of Saint Chaung this was due to not having formal citizenship status. In neither village did anyone refer to themselves as displaced. This impacted somewhat on the field application of the NEAT+, which works best in displacement contexts.

NRC are mostly working in villages in Hpa An Township in development-type interventions, although there is one camp of more recent conflict displacement where NRC conducts information, counselling and legal assistance (ICLA) activities for ID cards.

Myanmar and Hpa An environmental regulatory context

In Myanmar, Environmental Impact Assessment (EIA) procedures were introduced in December 2015 and are practiced in large scale development/infrastructure projects in several sectors. Being project specific, EIA has some limitations as it does not contribute to higher level decision making. According to Myanmar law, investment proposals are required to conduct either EIA or Initial Environmental Examination (IEE). There are, however, no requirements for humanitarian organizations to conduct EIAs, and from a range of humanitarian, conservation and development actors consulted as part of this mission, no EIA requirements are strictly applied to smaller scale development initiatives. Strategic Environmental Assessments (SEA) have in some cases emerged to bridge the gap in EIA enforcement. Under the 2015 EIA procedure, SEA is a recognized tool to be carried out by government departments on specific projects or development activities and plans. There is however not a strong mandatory requirement for conducting SEA according to existing environmental regulations.

The Environmental Conservation Department (ECD), one of the six departments under the Ministry of Environmental Conservation and Forestry, formed a regional focal unit in Hpa An. This unit primarily oversees the environmental management and resource conservation of regions, promoting environmental awareness among the public. Despite the existence of this unit, in reality there is no organized structure for environmental governance and management at the Hpa An township level. Sectoral departments take individual responsibility for managing environmental issues pertaining to their activities. For example, the forest department will typically monitor the status of deforestation and loss of wildlife, but the township development committee handles solid waste management. The only environmental impact assessment in Hpa An was completed in 2017⁴ by the Myanmar Environment Institute.

Myanmar and Hpa An disaster risk context

According to the Global Climate Risk Index 2016,⁵ Myanmar was the second most disaster-prone country in the world from 1995 to 2014. Furthermore, Myanmar has been identified as one of the

⁴ Myanmar Environment Institute (2017) Hpa-An Township Environmental Assessment https://themimu.info/sites/themimu.info/files/documents/Hpa_An_Township_Environment_Assessment_Report_Nov2017.pdf

⁵ Sönke Kreft, David Eckstein, Lukas Dorsch & Livia Fischer (2016) "Global Climate Risk Index 2016." German Watch. Available from: <https://germanwatch.org/en/11366>

20 countries in the “climate-conflict nexus” by UN OCHA⁶, meaning that the combination of severe environmental vulnerability along with pre-existing social fragility and weak institutions can create stressors which lead to increased risk of violence and conflict. Climate change will increasingly act as a driver in forced displacement and resource scarcity in Myanmar. Hpa An

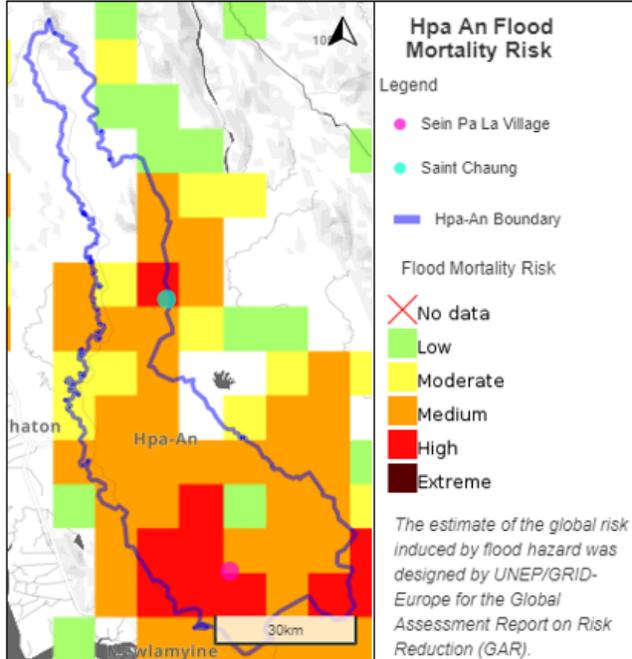


Figure 4: The estimated flood mortality risk in Hpa An.

Township experiences high exposure to risk caused by natural hazards including flooding, landslides due to precipitation and tropical cyclones (e.g. Figure 4 displays the estimated flood mortality risk in Hpa An), expected to exacerbate existing issues regarding climate vulnerability and displacement.

While Myanmar is particularly vulnerable to natural hazards and the increasing impacts of climate change, there are biophysical features within Myanmar that can act as buffers to those natural hazards. Healthy ecosystems such as mangroves, wetlands, and forests can reduce physical exposure to many hazards and sustain local livelihoods by providing important ecosystem services such as food and building materials. Ecosystem-based disaster risk reduction

(Eco-DRR) programs can help increase community resilience to disasters by identifying opportunities for restoration and protection of key ecosystems. Some examples of the ongoing Eco-DRR work globally is the “[Opportunity Mapping for Ecosystem-based Disaster Risk Reduction \(Eco-DRR\)](#)” by UNEP and GRID-Geneva which is identifying areas of high restoration and/or protection potential to reduce risk from certain natural hazards (see Figure 4). The spatial data for this project is developed on a global level and can be accessed through a [MapX data project](#). On a national level ACTED, a French NGO, is implementing a project in Rakhine state which involves planting and conserving mangrove forests.

⁶ OCHA Policy Development and Studies Branch (2016) “Understanding the climate-conflict nexus from a humanitarian perspective: a new quantitative approach”. Available: https://reliefweb.int/sites/reliefweb.int/files/resources/OCHA_OP17_climate%20change_online.pdf

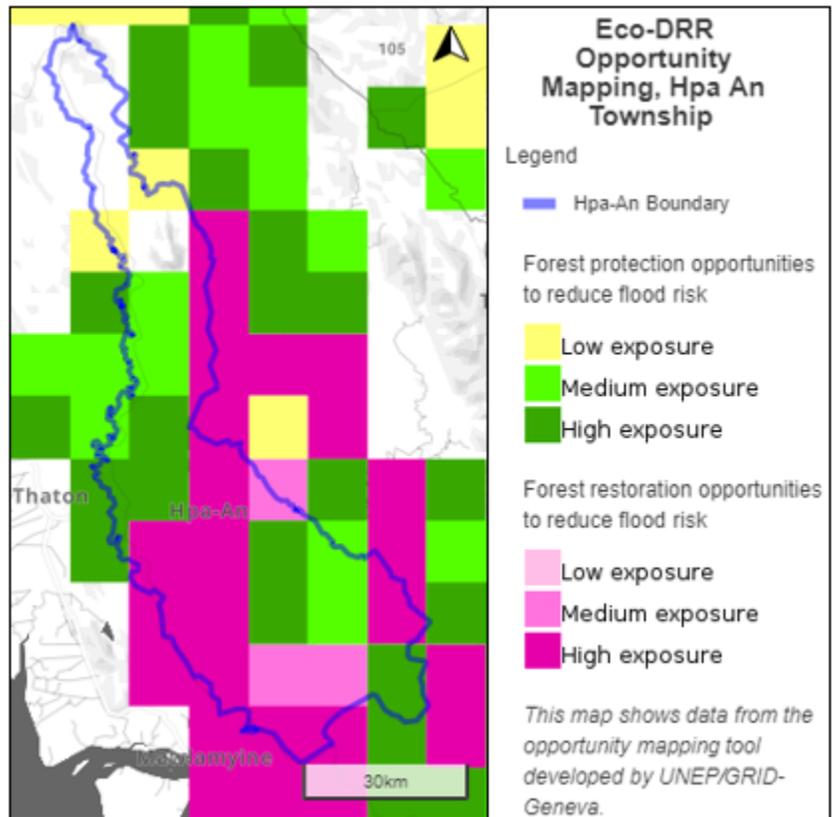


Figure 5: Map displaying forest restoration and protection opportunities within Hpa An Township to reduce flood risk. Developed by UNEP/GRID-Geneva.

Risk of natural hazard exposure and disaster risk reduction underlie many of the recommendations throughout this report. In particular, the issues of soil erosion and flooding may require a cross-sectoral Eco-DRR lens in order to efficiently mitigate the impacts of disasters on local communities. NRC currently conducts limited DRR activities in Hpa An. These include participation in simulations for flood response and providing DRR education as part of shelter response after an event.

The NEAT+ highlighted both risk of landslides and risk of flooding as key issues in the villages assessed. These will be expanded in subsequent sections of the report.

Risk of landslides or mudslides	
Additional Information	Mitigation Tips
Hilly or mountainous terrain combined with an unstable top layer can result in landslides or mudslides. Earthquakes or rainfall events further destabilizes the stability of the ground. A lack of vegetation further exacerbates the risk. Re-vegetating protection or rehabilitation can prevent landslides. Alternatively, engineering can also be used to minimize risk, such as building terraces or walls.	<ul style="list-style-type: none"> Minimize vegetation removal Avoid building on acute slopes Limit hill cutting Conduct landslide/stability/geomorphology assessment Revegetate to stabilize Conduct/establish risk maps

Figure 6: Results from the NEAT+ environmental sensitivity module regarding the “risk of landslides or mudslides” issue of concern.

Risk of flooding	
Additional Information	Mitigation Tips
A close proximity to water bodies increases risk of flooding from severe weather events. A lack of drainage infrastructure and vegetation increases the rate of surface runoff, causing more severe flooding events. Disaster risk reduction measures can reduce the severity of these events on the population.	<ul style="list-style-type: none"> • Consult national/local hazard maps • Establish a simple early warning mechanism • Map area of interest depicting main risks and root causes to flood risks • Clear drainage/canals • Set up natural filtration systems • Implement nature-based solutions for water-related risk mitigation • Analyze the environmental status of wetlands and consider watershed management (e.g. management, restoration, reforestation) • Improve the infiltration capacity of the soil with vegetation coverage

Figure 7: Results from the NEAT+ environmental sensitivity module regarding the “risk of flooding” issue of concern.

Methodology

The methodology followed for the field application of the NEAT+ tool in Hpa An Township involved conducting a two-day field test of the NEAT+ with NRC field and office staff in various locations, facilitating focus group discussions with local communities and holding a half day multi-stakeholder workshop presenting preliminary results and discussing the NEAT+. These data collection methods are expanded on below.

1. Secondary data review pre-field test

Before arrival in Hpa An, the JEU team completed a secondary data review of open spatial and non-spatial data available on a national level and for Myanmar and Hpa An. Non-spatial data was mostly reviewed through reports and studies done in Myanmar by civil society organizations. Over 100 spatial datasets were compiled into a geodatabase, collected from sources such as [Open Street Map](#), [HDX](#), and the Myanmar Information Management Unit [geoportal](#). Relevant spatial datasets were uploaded to a MapX [data project](#), which is open to the public. [MapX](#) is an open-source, cloud-based geospatial mapping platform managed by UN Environment and GRID-Geneva. Once the open geospatial data had been uploaded to MapX, the national level data could be compared to global datasets to conduct a preliminary study on the biophysical conditions of the target areas. Optical satellite imagery was obtained from the Copernicus Open Data Hub to assess ground conditions before and after the settlement.

2. NEAT+ field test

The tool was applied over two days with various users from NRC, including field staff, the regional programme advisor and the Livelihoods and Food Security sector advisor. The NEAT+ field application took place in two locations within Hpa An Township: Saint Chaung and Sein Pa La village. These locations were selected by NRC and separate environmental sensitivity assessments were completed for each location. The LFS expert completed the activity module based on NRC’s current activities in Sein Pa La village (Agriculture, Livestock and Irrigation modules). Neither the WASH nor the Shelter and Settlements modules were completed as NRC does not have these specific technical activities in the area of the pilot.

NRC already had an organizational Kobo account in Hpa An, which was utilized for the tests. Many field staff were already familiar with Kobo mobile data collection. All tests were completed on tablets provided by NRC. NRC's M&E manager from Yangon accompanied the NEAT+ team on the trip, who was very familiar with Kobo and the FGD methodology applied.

3. Focus Group Discussions and Participatory Mapping

Focus group discussions (FGDs) and participatory mapping exercises were conducted for more detailed contextual information and to validate the results of the NEAT+.⁷ FGDs were held with the local communities of Saint Chaung and Sein Pa La villages. The groups were separated by gender, and in the case of Sein Pa La further separated into property owners and non-property owners. Groups were not divided into displaced and non-displaced as originally planned, given the sensitivities around displacement, the long timeframe of displacement and the lack of displacement as a distinguishing factor of difference between groups. FGDs were organized by NRC field staff, who also provided translation assistance. The questions followed a similar line of enquiry to the NEAT+ environmental sensitivity module, with some additional questions related to Shelter, WASH and LFS. A participatory mapping element was included so that participants could indicate where they were collecting natural resources, disposing of waste, and collecting water. The results of the participatory mapping exercises are available on the MapX data project but are viewable only by approved members⁸ of the project to protect participant anonymity.

4. Yangon workshop

On 30 September 2019, a workshop was held by JEU and NRC in Yangon to present the NEAT+ and preliminary findings from the field test, and to engage participants in broader discussions about different aspects of screening and assessing environmental risk in humanitarian settings. Twenty-five representatives from the government, civil society organizations and UN agencies attended the half-day workshop (see participant list in Annex B). The aim of the workshop was to promote the use of the NEAT+ and to have a broader discussion on screening for environmental risk and the use of environmental data in humanitarian action. These discussions have informed the recommendations for NRC.⁹

See Annex B for a full workshop report.

NEAT+ usability learning

Key findings related to the usability and functionality of the NEAT+ arising from the pilot include:

⁷ Note: FGDs are not necessary for the completion of the NEAT+.

⁸ To request access to the MapX “NEAT+ Myanmar” data project as a member, please contact theresa.dearden@un.org

⁹ See “Recommendations” section.

- **As much about the process as the results:** The NEAT+ can act as a useful checklist of ideas and information, a productive process to go through not only for the results generated but to stimulate discussion (if answered in a group). The prompts and hints are particularly useful for this.
- **Easy to use:** The NRC team was already familiar with using Kobo for data collection, and they found the process of data collection and download straightforward. This was the same for field and technical staff. The process of explaining the NEAT+ can make it appear more complicated than the reality, and efforts should be made to explain it as simply as possible, preferably by using demonstrations. Completing the collection, download, and analysis processes with the field staff during the test eased the friction between user and tool.
- **Language simplification and direction:** Some of the technical language could be simplified, in particular if working with non-native English speakers. Additionally, some of the issues of concern could be made more directive. For example, the phrase "The environment has fragile ecosystems. Loss of biodiversity may be an issue" could be changed to "The environment has fragile ecosystems. Further assessment is required to determine if loss of biodiversity is accelerating."
- **New mitigation tips feature is a highly practical addition:** The latest revision of the NEAT+ added in mitigation tips for each area of environmental concern that was well received as one of the most practically useful aspects of the tool.
- **Answering questions via FGDs with community members requires verification:** The environmental sensitivity module was completed as an FGD with community answers inserted. Overall this generated some inaccuracies in the results. This may have been influenced by translation issues but was more likely due to community members not having the correct answers to all questions. This shows that the module is best answered by staff who know the area well, but in consultation with the community for some questions (e.g. climate change).
- **Useful even in places without recent displacement, but best used in displacement contexts:** The NEAT+ functions best in contexts where there is current displacement. Testing it in Hpa An showed that it was still a useful tool for highlighting environmental issues of concern and mitigation tips, but the vocabulary and way the questions are phrased is more accurate where there is a noticeably displaced population. This does not invalidate using the NEAT in areas of long-term residence or non-displacement, but requires overlooking some of the terminology when completing the modules and reviewing the results.
- **Speed is not always of the essence:** The pilot highlighted the importance of taking time to answer the questions as accurately as possible. Although the environmental sensitivity module can be conducted in 20-30 minutes, if the user is not sure of the answer it is better to take longer to research the answer rather than base answers on guesswork.
- **Can be used both to modify existing activities (M&E) or plan new ones:** The NEAT+ test provided ideas for mitigation that could be incorporated into existing implementation plans to increase sustainability, as well as inform future activities.
- **Highlights areas that need more research:** Some mitigation activities may seem quite broad as the tool can be used anywhere in the world. However, even for the mitigation measures or environmental concerns that are not specific to the local context, they still can highlight

areas that need further research before programme implementation. As mentioned above, even the process of going through the mitigation tips and determining whether they are applicable to the local context can be a useful starting point for dialogue and planning.

- **Agile first step without environmental expertise which frames technical concepts within humanitarian jargon and priorities:** Almost all the questions were answered easily without environmental expertise and the level of questioning worked well for all types of users. The only questions where there was some debate or confusion were on soil types, gradient and topography.
- **Links to MapX data sets from the hints and prompts would help users answer questions:** In particular those that they might not know, such as climate type or proximity to water bodies or international borders
- **Answering the environmental sensitivity module as a group exercise worked well:** This allowed for discussion on each question and increased the collective understanding of the issues.

Environmental concerns

Findings from NEAT+

Environmental sensitivity module

Saint Chaung

Issues of High Concern	Issues of Medium Concern	Issues of Lower Concern
The environment has high biodiversity value. Vulnerable and/or rare flora and fauna may be at risk.	The environment has fragile ecosystems. Loss of biodiversity may be an issue.	There may be a weakened or poor governance system. There may be low capacity for environmental management.
The community may be close to a protected/conservation area. There may be legal/social implications.	Indoor air pollution, caused by poor ventilation and cooking/heating, may be an issue.	The environment has a low regenerative capacity. The effects of land and soil degradation are more significant.
There are areas of high cultural significance. This can threaten social cohesion.	This area may be at risk of soil erosion from water.	
The community may have a high dependency on the natural environment. This can threaten livelihoods and social cohesion.	This area may be at risk of storm surges and/or coastal erosion.	
Rates of deforestation may exceed regeneration capabilities. Deforestation may be a risk.	Natural resources may be scarce and in high demand. This can lead to social conflict.	
The water sources may be vulnerable to contamination. Water quality may be an issue.	There may be high and/or unsustainable rates of extraction of resources from the local environment.	
There is low capacity to manage solid waste. Environmental sanitation and disease transmission may be an issue.		
There is low capacity to manage wastewater. Environmental sanitation and disease transmission may be an issue.		
Disaster waste may be an issue. Disaster waste can pose public health risks, and impede relief or recovery activities.		
This area may be at risk of flooding.		
The area may have heightened exposure to climate-related risks and extreme weather events.		
Natural resource availability/accessibility may be affected by changing climatic conditions.		

Figure 8: Environmental Sensitivity Analysis, Saint Chaung.

Saint Chaung village had a high number of issues of concern, primarily due to the fact that the village is located on a rapidly eroding river bank with no local knowledge of how to prevent this erosion, and that there is no waste management system.

Sein Pa La

Issues of High Concern	Issues of Medium Concern	Issues of Lower Concern
Indoor air pollution, caused by poor ventilation and cooking/heating, may be an issue.	The environment has high biodiversity value. Vulnerable and/or rare flora and fauna may be at risk.	The community may have a high dependency on the natural environment. This can threaten livelihoods and social cohesion.
There is low capacity to manage wastewater. Environmental sanitation and disease transmission may be an issue.	There are areas of high cultural significance. This can threaten social cohesion.	The environment has a low regenerative capacity. The effects of land and soil degradation are more significant.
This area may be at risk of flooding.	Rates of deforestation may exceed regeneration capabilities. Deforestation may be a risk.	The water resources may have a low regenerative capacity. Water scarcity may be an issue.
The area may have heightened exposure to climate-related risks and extreme weather events.	The water sources may be vulnerable to contamination. Water quality may be an issue.	There is low capacity to manage sewerage and fecal sludge. Environmental sanitation may be an issue.
There may be high and/or unsustainable rates of extraction of resources from the local environment.	There is low capacity to manage solid waste. Environmental sanitation and disease transmission may be an issue.	Disaster waste may be an issue. Disaster waste can pose public health risks, and impede relief or recovery activities.
Natural resource availability/accessibility may be affected by changing climatic conditions.	Natural resources may be scarce and in high demand. This can lead to social conflict.	The area may have poor slope stability. Landslides or mudslides may be a risk.
		This area may be at risk of soil erosion from wind.
		This area may be at risk of soil erosion from water.

Figure 9: Environmental Sensitivity Analysis, Sein Pa La.

Saint Pa La village had lower issues of concern overall, due to the inland location of the village and land-owning status of many residents. Risk of flooding and poor waste management were two of the highest risks identified, verified by the FGDs (see below).

FSL Activity Module

The food security and livelihoods module was conducted for Sein Pa La village only. The WASH and Shelter modules were not conducted as NRC does not currently have these activities in the South East. The Livestock and Agriculture sub modules were the relevant ones for NRC's activities. One question was answered in the Food Assistance sub module on solid waste, but the rest were not relevant as NRC does not conduct food distributions. Overall the environmental risks identified from planned/ongoing activities were low given the small scale of these activities and the fact that many of the planned activities are already considering environmental impact.

Livestock

Environmental Concerns	Environmental Sensitivity	Potential Activity Impact	Potential Environmental Risk
Key environmental concerns			
The environment has fragile ecosystems. Loss of biodiversity may be an issue.	Null	Medium	Low
The environment has a low regenerative capacity. The effects of land and soil degradation are more significant.	Low	Null	Low
Other environmental concerns			
The environment has high biodiversity value. Vulnerable and/or rare flora and fauna may be at risk.	Medium	Null	Low
The water resources may have a low regenerative capacity. Water scarcity may be an issue.	Low	Null	Low
The water sources may be vulnerable to contamination. Water quality may be an issue.	Medium	Null	Low
Natural resources may be scarce and in high demand. This can lead to social conflict.	Medium	Null	Low
Mitigation Tips			
<ul style="list-style-type: none"> • Larger livestock species, such as cattle or buffalo, have a greater environmental footprint. These species are resource intensive in terms of food and water requirements, and also produce significantly more greenhouse gas emissions. Where appropriate, diversify herd species with smaller species to strengthen resilience and also reduce environmental impacts. • Local wildlife can prey on livestock or compete for food. This may encourage livestock managers to kill wildlife to prevent wildlife-livestock contact or to reduce food competition. Wildlife-livestock contact can also lead to the spread of diseases. Herding and livestock management strategies should be developed to minimize potential conflict with wildlife. • Look for synergies in different uses of land. For example, livestock activities can enhance and restore grazing and agricultural land through rotational land use activities. • Shared-used water points can contaminate water sources and can also increase risk of human-animal disease transmission. Downstream aquatic ecosystems can also be negatively impacted. Identify sensitive receptors, and site watering points away and downstream from these receptors. Protect water sources from contamination by livestock manure. • Slaughter sites should be collaboratively identified with community members. Slaughter should be carried out away or downstream from water courses to minimize contamination risk, as well as away from residential areas due to strong odors. Ensure that livestock managers have an appropriate strategy for the disposal or usage of livestock carcass remnants. • Veterinary pharmaceuticals can remain active in livestock manure or urine, leading to soil and/or water contamination. Imprudent usage of antibiotics or other medicines also lead to microbial resistance. Practice integrated pest management, using pharmaceuticals and chemicals as a last resort. Select species adapted to local conditions to reduce the need for medicines. Animal pharmaceuticals should be properly sourced, stored and disposed of. • Local communities may not be fully aware of the long-term implications of their activities or how to cope with changing climatic conditions. Educational activities can improve beneficiary awareness and provide or exchange the necessary skills and knowledge required to practice in environmentally sustainable and climate-sensitive techniques. 			
Additional Resources			
Sector Environmental Guidelines: Livestock			Link
USAID's Sector Environmental Guidelines aim to support environmentally sound design and management of humanitarian and development projects. These guidelines provide concise, plain-language information regarding potential environmental impacts, and prevention and mitigation strategies.			
Sector Environmental Guidelines: Integrated Pest Management			Link
USAID's Sector Environmental Guidelines aim to support environmentally sound design and management of humanitarian and development projects. These guidelines provide concise, plain-language information regarding potential environmental impacts, and prevention and mitigation strategies.			
Additional Details/Comments			

Figure 10: FSL Livestock Analysis, Sein Pa La.

Agriculture

Environmental Concerns	Environmental Sensitivity	Potential Activity Impact	Potential Environmental Risk
Key environmental concerns			
The environment has fragile ecosystems. Loss of biodiversity may be an issue.	Null	Null	Null
The environment has a low regenerative capacity. The effects of land and soil degradation are more significant.	Low	Null	Null
Other environmental concerns			
The environment has high biodiversity value. Vulnerable and/or rare flora and fauna may be at risk.	Medium	Null	Low
The water resources may have a low regenerative capacity. Water scarcity may be an issue.	Low	Null	Null
The water sources may be vulnerable to contamination. Water quality may be an issue.	Medium	Null	Low
Natural resources may be scarce and in high demand. This can lead to social conflict.	Medium	Null	Null
Mitigation Tips			
<ul style="list-style-type: none"> Beginning new agricultural activities requires additional assessments to better understand provisioning capacities of the local environment and the suitability of planned species, given the absence of existing knowledge about crops and local environment. Given potential unfamiliarities, comprehensive training for beneficiaries is also recommended, given potential unfamiliarities. Utilize and preserve traditional knowledge. Traditional knowledge and practices have evolved over time based on an understanding of the local environment. Their practices are often sustainable, as they have been employed over generations. Disturbing traditional practices can lead to a loss of knowledge resulting in future unsustainable practices. Traditional knowledge can be a valuable source of information - consult locally when designing the project. Avoid single crop farming as it can cause land and soil degradation. Different species of crops consume and regenerate different nutrients in the soil, improving soil fertility. Rotational cropping (intercropping) improves land productivity, and reduces erosion and pest occurrence. Planting multiple species also increases resilience by providing alternatives if faced with climatic or environmental shocks. Irrigation requirements should be calculated and assessed against the water source recharge capacities to ensure sustainability of the interventions. Needs of other users (e.g. for drinking, livestock or other agriculture) should be considered, as well as seasonal/climatic variations. Rules and access agreements for water usage should be devised collaboratively, with monitoring and enforcement mechanisms. Water runoff can cause soil erosion and also transport contaminants into water bodies. An absence of drainage infrastructure can also lead to salt accumulations or waterlogged soils. Drainage systems improve agricultural productivity and minimize environmental risks. Systems should be designed considering local topography, soil and water conditions, and climate. The soil disturbance from tillage activities leads to increased rates of soil erosion and a loss of soil fertility. This leads to long-term land degradation and reduced agricultural outputs. Promote zero or low tillage activities. When tilling, promote the inclusion of natural sources of nutrients (e.g. manure) to preserve fertile top soils. 			
Additional Resources			
Sector Environmental Guidelines: Agriculture			Link
USAID's Sector Environmental Guidelines aim to support environmentally sound design and management of humanitarian and development projects. These guidelines provide concise, plain-language information regarding potential environmental impacts, and prevention and mitigation strategies.			
Sector Environmental Guidelines: Integrated Pest Management			Link
USAID's Sector Environmental Guidelines aim to support environmentally sound design and management of humanitarian and development projects. These guidelines provide concise, plain-language information regarding potential environmental impacts, and prevention and mitigation strategies.			
Sector Environmental Guidelines: Safer Use Pesticides			Link
USAID's Sector Environmental Guidelines aim to support environmentally sound design and management of humanitarian and development projects. These guidelines provide concise, plain-language information regarding potential environmental impacts, and prevention and mitigation strategies.			

Figure 11: FSL Agriculture, Sein Pa La.

FSL activities and/or planned activities in Sein Pa La include:

- *Training in business plans for livelihoods activities*, mostly for livestock, agriculture and small businesses (e.g. fish ponds, ducks, tree crops, shops). These will build on business ideas that residents have already had but without the capital to invest in to date.
- *Cash grants*: conditional on starting new businesses (linked to training)
- *Farmer field school*: Both short and longer courses, covering a limited number of topics, including non-chemical crop protection, the safe use of chemicals and tree grafting. Longer-term courses will consider the full production cycle on an individual's farmland (e.g. vegetable production, commercial flower production or tree nurseries).

Summary of key environmental concerns

Key environmental concerns have been identified by the NEAT+, FGDs and the secondary data review. Identifying the potential concerns, opportunities, and pressures that may negatively influence the functioning of key ecosystem services is important throughout the programming process. To understand what the key environmental concerns in Hpa An Township are, the

Pressure-State-Response (PSR) framework¹⁰ can be applied to analyze the cause of environmental change and potential responses. Ultimately, the NEAT+ automatically-generated analyses are based on a Pressure-State-Response framework; however, mitigation tips are written at a general and global level. For the purpose of this report, the PSR framework is given a more critical and locally defined lens to create customized mitigation tips for activities in Hpa An Township, and more broadly, Myanmar. *Note: An application of the PSR framework is not a required process to complete the NEAT+. This is used for the purpose of this report, to provide a more detailed analysis for NRC.*

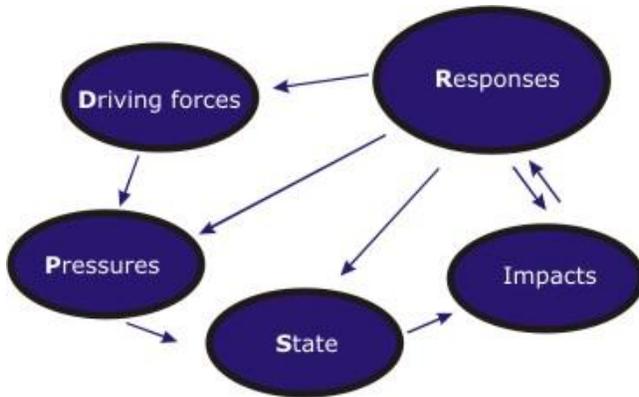


Figure 12: PSR Framework.

The PSR is useful in this context to structure and classify information, and to assist in the identification of recommendations that are tailored to environmental concerns and local contexts. By developing a framework of interrelations between the biophysical environment and humanitarian concerns, programming and monitoring needs can be mapped accordingly.

Although the PSR framework is generally applied in exclusively environmental "states", here it is slightly modified to consider both environmental and humanitarian concerns.

- The *State* component refers to the present condition of the concern, according to the results obtained by the NEAT+, discussion with field staff, secondary data review and/or focus group discussions.
- The *Pressure* component identifies and tracks threats to the concern which are currently influencing or could influence its state. Many of these pressures can be directly derived from the NEAT+ reports.
- The *Response* component identifies and tracks potential actions that can alleviate pressures. Where possible, current activities implemented by NRC are taken into consideration as a medium for mitigation in the below recommendations section. Many of the suggested responses come directly or are modified from the "mitigation tips" that appear in the NEAT+ activity summaries.

Broadly, the key environmental concerns related to humanitarian activities are linked to:

1. Waste management;
2. Land degradation and erosion;
3. Water and Wastewater management;
4. Climate Change and variability.

¹⁰ For more about the PSR framework see the OECD-developed model, pg. 21: <http://www.oecd.org/environment/indicators-modelling-outlooks/24993546.pdf>

These concerns are often cross-cutting across humanitarian settings and are difficult to address in silos. Through the NEAT+ pilot, other environmental concerns that emerged included:

1. A lack of institutional waste and recycling programs;
2. Lack of knowledge about natural hazard prevention;
3. Scarce reuse of water.

These concerns are summarized in a table below and expanded upon in the following section.

Table 1. State-Pressure-Response of key environmental concerns

	State	Pressure	Response
Waste Management	No waste management or recycling facilities.	<ul style="list-style-type: none"> ● Improper hazardous waste disposal ● Lack of recycling / disposal options ● Lack of education on waste / toxic waste management 	<ul style="list-style-type: none"> ● Investigate recycling as a livelihood activity ● Community incinerators ● Education on safe battery/toxic waste management
Land Degradation / Erosion	Recent flooding events have led to losses of large plots of land into the Salween River from the Saint Chaung village	<ul style="list-style-type: none"> ● Locals are organizing a sand quarrying company to remove a sandbank from river to reduce erosion ● No knowledge about Eco-DRR methods of stabilizing river banks 	<ul style="list-style-type: none"> ● Discourage the excavation of river bank ● Provide education about natural methods of river bank stabilization ● Perform comprehensive land degradation/ land health study to understand rate of change and carrying capacity.
Water and wastewater management	Little to no wastewater management.	<ul style="list-style-type: none"> ● Lack of water-saving knowledge leading to unnecessary waste. ● Wells in Sein Pa La are drying in the summer 	<ul style="list-style-type: none"> ● Education programs on ways to save and reuse water.
Climate change and variability	Less predictable rainfall patterns and increasing	<ul style="list-style-type: none"> ● Crops are spoiling due to early arrival of the dry season 	<ul style="list-style-type: none"> ● Mainstream climate change adaptation (CCA)

temperatures.

- Loss of income
- Lack of knowledge in crops suitable for the changing climate

- into activities, in particular FSL
- Education on CCA

Waste Management

In both Sein Pa La and Saint Chaung village, a lack of waste facilities or awareness about safe waste management has led residents to follow ad-hoc and informal waste management practices. In Saint Chaung, many residents dump their garbage in the river or burn it. In Sein Pa La, all residents reported burning their garbage. There are no communal dump sites in either village. Batteries are disposed of in the same manner as garbage and there seemed to be no awareness that they have toxic contents. In both villages, recycling activities are carried out by the informal sector in which individual collectors come through the village and purchase recyclables such as glass and tin, to subsequently clean, sort, store and sell them in bulk to the recycling industry both locally and for export. These visits do not occur with any regular frequency.

Low capacity to manage solid waste	
Additional Information	Mitigation Tips
<p>Unmanaged solid waste can have significant health and environmental implications. Solid waste is often host to harmful pathogens, and is also a breeding ground for insect and rodents, carriers of disease. Unmanaged solid waste can contaminate soils, surface waters and groundwater. Women are most likely to manage solid, water, and household waste, which can pose serious health risks if mismanaged. Contaminated water can also drain into streams and other surface water, which is used for washing, cleaning and bathing increasing risk of further contamination among women and children.</p>	<ul style="list-style-type: none"> • Complete WASH activity module of the NEAT+ • Identify local waste management solutions • Organize waste management within the camp/area • Identify local/regional facilities for hazardous waste • Share information on best waste management practices and raise awareness of negative/dangerous practices (e.g. burning plastic) • At a minimum, provide separate dump points for organic and inorganic waste • Identify ways to improve solid waste management (e.g. inventory of waste fractions, sorting, composting, recycling, reusing) • Ensure that there is no low temperature plastic waste burning • Ensure that areas used for waste burial/management are not used for other purposes (e.g. gardening) • Ensure that there is an appropriate distance between latrines and water points • In areas subject to flooding, opt for “elevated VIP” latrines as opposed to “ground-dug” latrines

Figure 13: Results from the NEAT+ environmental sensitivity module regarding the “low capacity to manage solid waste” risk.

Arguably more important than proper waste facilities and dump sites is the lack of knowledge about negative consequences of improper waste management on human health. Uncontrolled burning of waste creates emissions containing fine particulates and complex organic compounds which are highly damaging locally and globally. The impact of low temperature burning of plastics can cause health problems such as headaches, nausea, and rashes in the short term. Over time, it can increase the risk of developing heart disease or other respiratory illnesses. The release of dioxins and furans (commonly found in PVC and plastic products) into the atmosphere has also been linked to serious health problems such as impairment of the immune and reproductive system, liver problems, certain types of cancer, and negative effects

on the developing nervous system.¹¹ Heavy rains or winds can cause leaching of these toxins into the surrounding environment and settling on crops. Additionally, the practice of dumping garbage and plastics in the river pollutes the environment and can become hazardous to human health. Uncontrolled waste disposal can encourage vectors to breed, leading to increases in infectious diseases including cholera and dengue fever.

These issues are not unique to these villages - rapid economic growth and urbanization in Myanmar has led to significant challenges in waste management. Globally, Myanmar is ranked 17th in countries by mass of mismanaged plastic waste¹². The 2017-2030 Myanmar National Waste Management Strategy¹³ estimates that one to two-thirds of generated waste is not properly collected or disposed of. There is an urgent need for organizations and businesses



Figure 14: Improper disposal of waste by a river bank.

operating in Myanmar to be accountable to the entire lifecycle of their products and align activities to the overall goal of the Waste Management Strategy, which is *"to develop and implement the holistic and integrated waste management strategy based on principles of inclusiveness, zero waste, zero emissions and circular economy to achieve a greener, cleaner and healthier environment in Myanmar"*.

Traditionally, waste collection and disposal in Myanmar is the responsibility of the respective township¹⁴. While improving capacities of local governments to manage waste collection and disposal could be one method of waste mitigation, this avenue may be out of the scope of current organizations working within Hpa An

Township - although it should be encouraged. Improving the impact of waste management at the village level could also be encouraged through reduction of waste streams by recycling programs, and/or on improved incineration for waste management. First, a study should be conducted in order to better understand the different waste streams and quantities and identify opportunities for reduction, recycling or reuse of certain types of waste. The waste composition affects the viability of various downstream waste management processes as well as the type of

¹¹ Lali Z (2018) Release of Dioxins from Solid Waste Burning and its Impacts on Urban Human Population- A Review. *J Pollut Eff Cont* 6: 215. doi: 10.4172/2375-4397.1000215.

¹² Jambeck, Jenna R., Roland Geyer, Chris Wilcox, Theodore R. Siegler, Miriam Perryman, Anthony Andrady, Ramani Narayan, and Kara Lavender Law. "Plastic waste inputs from land into the ocean." *Science* 347, no. 6223 (2015): 768-771. Available https://www.iswa.org/fileadmin/user_upload/Calendar_2011_03_AMERICANA/Science-2015-Jambeck-768-71_2.pdf

¹³ Myanmar National Waste Management Strategy 2017- 2030. Available from https://optoce.no/wp-content/uploads/2019/04/Myanmar-National-Waste-Management-Strategy_Mar-2018.pdf

¹⁴ Ibid.

contaminants that may ensue. This study can be used to inform the best-available programming decision.

Recycling programmes can create livelihood activities for communities, which can assist in diversifying agricultural livelihoods and provide alternative income streams for residents. Traditional livelihood activities involving recycling plastics and other materials usually involve bringing recyclables to an institutional facility for cash. This process could be made more efficient by enhancing the communication channels between collectors and households. One example which works to increase collection opportunities is [Recycling Myanmar](#), a location-based mobile application based out of Pyay which connects individual collectors and businesses to households who wish to recycle materials.

Finding innovative methods of utilising recycled materials from waste also represents a key opportunity for resource recovery and reducing the depletion of raw materials and costs in production. Some national examples of recycling livelihood activities include [Chu Chu Design](#), in the Dala Township outside Yangon, which recycle plastics to create fabrics to make purses, bags, and household goods, supporting local families. A programme like this could assist in livelihood diversification from current dependence on agriculture, which is becoming more difficult to predict and profit from due to climatic variability. [RecyGlo](#) is a Yangon-based recycling initiative which provides waste segregation awareness and training, as well as waste characteristics analytics and other recycling services. To this end, engagement with private sector and/or the support to the formal organization of waste recyclers into collectives or groups, with subsequent business development, could be considered a development activity (to be discussed with relevant actors for example UNDP or others engaged in livelihoods and market creation).

Plastics and batteries should be prioritised given their potential for impact on human health and the lack of existing local recycling schemes. It is usually preferable to set up local recycling schemes that do not rely on national/global markets or need large quantities of materials to be viable.

For waste that cannot be recycled, incinerators provide a safer alternative to low temperature garbage burning. Medical clinics in Hpa An may already have incinerators on-site, or access to medical incinerators for their hazardous goods. Partnering with these medical facilities to provide safe methods of waste disposal for nearby residents could greatly reduce health risks associated with household burning. For Saint Chaung and Sein Pa La, utilizing medical clinic incinerators may not be a viable option as neither has a medical clinic within the village (the closest clinics are in Shwe Gun and Ein Du, respectively). Community-level incinerators and/or a safely managed dumpsite can also help lower the amount of waste burning occurring at the household level.

	Waste Management
Relevant NRC Activities	NRC do not tend to work on waste management but have stated that they can if they have the technical support. For example, waste management could be turned into a livelihood activity (e.g. collecting, recycling and reusing waste).
Mitigation tips	<ul style="list-style-type: none"> • Encourage consideration of the Myanmar National Waste Strategy 2017-2030 into organizational programmes and strategies • Conduct study on waste streams and quantities, including identification of local waste management solutions. • Investigate reuse and recycling opportunities as livelihood opportunity or to reduce health risks • Consider the establishment of a community incinerator and/or safely managed dump site with management capabilities to avoid burning waste on household plots in proximity to homes, posing a health risk. • Establish a safe system for dry cell battery and toxic waste disposal. Potential hazardous waste should be separated at the source. • Share information on best waste management practices and raise awareness of negative/dangerous practices (e.g. burning plastic). • For livelihood trainings planned, integrate positive waste management practices, for example the safe disposal of pharmaceuticals when treating livestock. • Engage with private sector and/or the support to the formal organization of waste recyclers into collectives or groups, with subsequent business development. • Review NRC procurement strategies to minimize waste generated by NRC in target villages (e.g. styrofoam lunch boxes and plastic water bottles).

Land Degradation/Erosion

Land degradation is often caused by an accumulation of factors, such as repeated extreme weather events, poor farming practices, land clearance, inappropriate irrigation, and pollution. Left unchecked these factors can create a positive feedback loop which exacerbates soil erosion, causes waterlogging and salinization in irrigated areas, and leads to a decline in soil fertility. Beyond the effects to the land itself, degradation can also lead to system-level losses in biodiversity and disruptions to key ecosystem services, including food production, microclimate regulation, water retention, and carbon storage. Understanding the rates and “hotspot” areas of change is vital in minimizing the potential for unnecessary degradation.

In the case of Saint Chaung village, which is located on the banks of the Salween River, land degradation is being caused by an increase of frequency, duration and intensity of floods and lack of knowledge about mitigation measures. Flooding has been intensified recently due to the

increased and non-sustainable mining practices across the region. The Salween river, also known as the Nu river in China, is the second largest river in Southeast Asia, stretching over 2,400 km through China, Myanmar and Thailand. From 2018-2019, four flooding events caused over 20 acres of land located longitudinally along the bank to erode into the river, which included 12 houses and a football pitch. Much of this sediment settled a short distance downriver, as can be seen in Figure 15. River erosion is displacing many households either closer to the main road or, if they can afford, to the town of Shwe Gun across the river or Hpa An town. Over half of the households of Saint Chaung have relocated in the past decade. Most of these emigrating households are Buddhist, and remaining households are Karen or Muslim. To mitigate the river erosion, the villagers have partnered with a local sand excavation company to remove a new sand-bar which has risen in the middle of the river, as they believe it is the cause of the erosion.

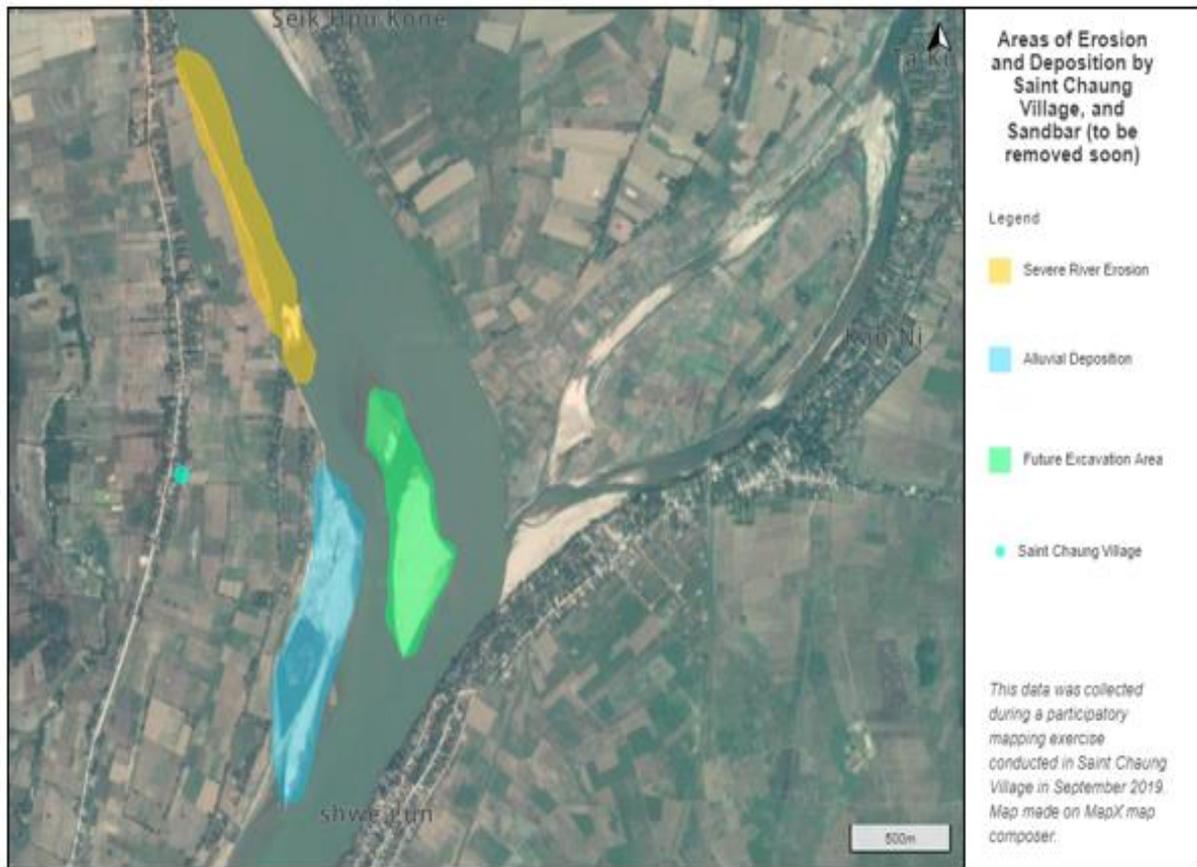


Figure 15: Map of Saint Chaung Village and areas of alluvial erosion, deposition and the location of the sandbar to be excavated by a local company, as pointed out during focus group discussions.



Figure 16: Satellite imagery analysis showing river bank extent on January 30, 2014 (blue line) and current extent as of January 23, 2019 in area surrounding Saint Chaung Village.

Flooding is also an issue in Sein Pa La village, but to a lesser degree. As seen in Figure 16, Sein Pa La is not only five meters above sea level, but it is surrounded by lowlands which assist in drainage during flood events. Due to the nature of their surroundings, the floods last for shorter durations and are lower in volume and velocity. Villagers in Sein Pa La are not subsistence farmers and still must make their way to markets to sell their crops and buy food. The increase in floods in recent years also lead to a loss in soil fertility and a reduction in agricultural productivity in both Sein Pa La and Saint Chaung village. This could exacerbate the effects already experienced by villagers and increase the rate of emigration and displacement from Saint Chaung.

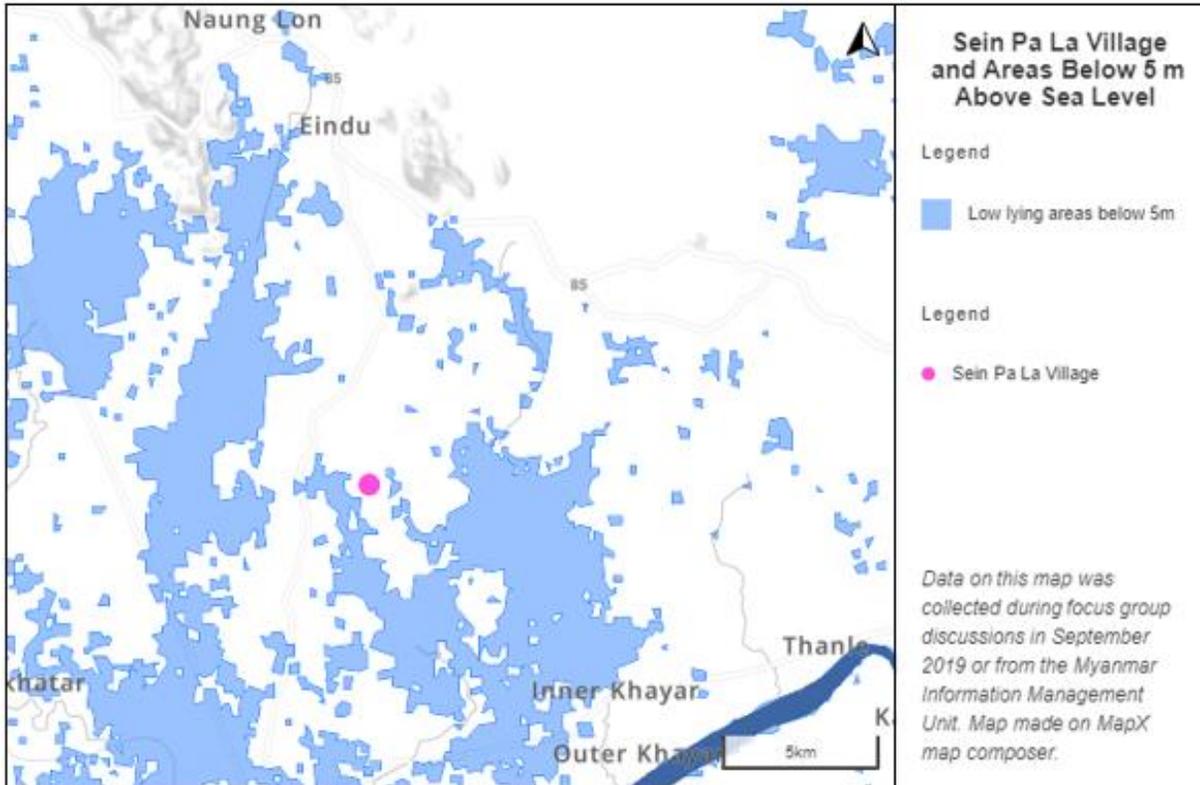


Figure 17: Sein Pa La village location and lowland areas below 5 m above sea level.

Risk of soil erosion (water)	
Additional Information	Mitigation Tips
Soils such as clay are vulnerable to water erosion. Water movement, for example through rainfall or river flow, can carry soils particles leading to a loss of soil. Removing vegetation increases erosion leading to a loss of fertile topsoil, making the area difficult to revegetate. Arable land is also destroyed as gullies form or river banks collapse. Promote the protection and/or planting of deep root light trees, grass and bushes to stabilize soil and slopes.	<ul style="list-style-type: none"> • Promote vegetation • Set up drainage/canals • Establish soakaway pit, ideally with vegetation
Land and/or soil degradation	
Additional Information	Mitigation Tips
Arid or continental climates are particularly vulnerable to land and soil degradation. Inappropriate farming or livestock practices, or deforestation from the collection of wood fuels leads to the loss of farming land. Secondary effects include increasing the risk of desertification, water scarcity and pollution, and flooding. Changing climate conditions and extreme weather events can exacerbate these conditions and lead to increased vulnerability to land and soil degradation. Livelihoods dependent on agriculture and livestock are threatened by land and soil degradation, and therefore also threatens food security and nutrition.	<ul style="list-style-type: none"> • Proactively minimize ground cover loss • Establish vegetation land cover. Utilize the suggested landcover datasets from MapX to assess vegetation cover. To see more spatial data which is useful to NEAT+ assessments, click here (https://app.mapx.org/?project=MX-WJO-FOV-NNB-1BN-SZN) for the full MapX catalogue. • Establish erosion control mechanisms • If erosion/soil loss is already evident, seek expert assistance to develop a regeneration plan • Conduct an agricultural productivity assessment • Support and provide training on sustainable farming and/or climate smart/climate resilient agricultural practices

Figure 18: Two results from the NEAT+ environmental sensitivity analysis containing information and mitigation tips regarding the risks of soil erosion and land and/or soil degradation.

Awareness of Eco-DRR mitigation principles in Saint Chaung is low. Currently, the villagers are planting small annual pea crops by the river bank, which provide no root stabilization properties. Good stabilization results can be achieved through the planned planting of quick-growing, deeply rooted plants such as bamboo or vetiver grass. Vetiver grass (*Chrysopogon zizanioides*) is a fast-growing grass which forms dense hedges that prevent the soil from runoff, and has been proven to provide effective, efficient, economical, and sustainable erosion control systems¹⁵ in temperate and tropical areas in Asia and Africa. It can survive in adverse soil conditions, creates dense and deep root systems, and can be harvested for use in livelihood activities. As there is always a risk of unintentionally creating invasive species breakouts in situations of non-native plant introductions, the [Myanmar Vetiver Network](#) (which is already working to bring awareness in Myanmar about the uses of vetiver grass) should be consulted



Figure 19: Sheer cliffs that assist bank stabilization.

before embarking on any planting schemes. There is also the [Vetiver Network International](#) group with more examples of the application of vetiver grass worldwide.

Other mitigation ideas for bank stabilization would be to reduce the slope of the banks (as seen in the picture on the left, they are left as sheer cliffs) to better withstand flooding events, and to dig drainage canals from the river. Constant water inundation increases the risk of landslides or mudslides occurring on acute slopes.

The natural lifespan of a river involves movement and evolutions in size and shape over time. Saint Chaung village was established less than 100

years ago, so no multi-generational memory exists about river behavior before the village was built. During focus group discussions villagers noted that when they were young, the river was so thin, "You could kiss your boyfriend or girlfriend across it". It is highly unlikely that the sand excavation scheme will have the intended results of reducing river bank erosion at Saint Chaung village. The excavation could have unpredictable results including the acceleration of riverbank erosion due to reduced friction between the river and soil. While bank stabilization methods should be implemented immediately to reduce the economic and physical exposure to flooding and displacement, long-term planning should likely include a strategy for relocating villagers. A full study on the cost-benefit of investing in river stabilization infrastructure versus relocating villagers to Shwe Gun or another location should be completed, which considers the natural progression of river growth with potential for exacerbation due to climate variability.

¹⁵ For more biophysical information about *Chrysopogon zizanioides* see https://www.vetiver.org/TVN_VS_GAL_PUB/VS_Vetiver_the_Plant_o.pdf or for projects using Vetiver grass for riverbank stabilization see <https://www.adb.org/results/water-pda-applying-vetiver-system-slope-stabilization-and-erosion-control-citarum> or https://postconflict.unep.ch/publications/DR_Congo/DR_Congo_Eco_DRR_case_study_2016.pdf

Land Degradation/Soil Erosion	
Relevant NRC Activities	NRC does not have activities tackling this issue in Hpa An. NRC does partner with the department of agriculture that works with switching corn and paddy varieties, promoting tree crops hedges against dryness.
Mitigation tips	<ul style="list-style-type: none"> ● Discourage the excavation of the sand bank from the Salween river ● Promote bank stabilizing activities such as planting deep-rooting plants or grading the river banks ● Conduct a hazard assessment of bank stability ● ICLA program - assistance on insurance claims or options available for residents whose land falls into the river ● Dig drainage channels from river ● Support and provide training on climate smart/climate resilient agricultural practices ● Conduct cost-benefit analysis of long-term riverbank stabilization versus relocation of Saint Chaung villagers

Water and Wastewater Management

Both Saint Chaung and Sein Pa La village residents rely on wells for household water supply. Saint Chaung residents also collect water from the Salween river during the dry season, which they boil before drinking. The Salween River is one of the top 10 most polluted rivers in the world¹⁶ and it can be expected that many upriver residents and industries practice similar solid waste management as in Saint Chaung – i.e., disposal in the river. Thus, this practice should be discouraged to the extent possible to minimize risks to human health. However, no residents reported getting sick from either drinking river water or their wells, of which there is one deep tube well every 3-4 houses.

Neither village expressed grievances at access to drinking water, however in Sein Pa La, recent hot summers have led to household level wells drying. When this occurs, residents must go to neighbors who have deeper wells to collect water, or to the lowlands nearby where the wells rarely dry. Alternatively, they may choose to dig a deeper well to access more water. The geological features of Sein Pa La make it well suited to wells - typically wells are 15-30 feet deep with a fast recharge rate.

¹⁶ FAO. Salween River Basin. <http://www.fao.org/nr/water/aquastat/basins/salween/index.stm>

Vulnerability of water sources to contamination	
Additional Information	Mitigation Tips
<p>Surface and shallow water sources are particularly vulnerable to contamination. Poor sanitation practices or infrastructure can cause microbial contamination of drinking water sources, causing diarrheal diseases. Children are disproportionately affected. Water-borne diseases can be particularly dangerous for women who are pregnant or lactating. Farming and livestock activities can also lead to contamination of water sources. Extreme weather events (especially flooding and storms) can result in decreased water quality or contamination, while sea level rise can contribute to increased salinity of groundwater resources. An assessment of the local water quality situation could identify and prevent possible sources of contamination.</p>	<ul style="list-style-type: none"> • Complete WASH activity module of the NEAT+ • Assess water quality • Consult with health authorities for monitoring and early action • Identify and address source of pollution • Put in place contamination prevention measures; provide efficient sanitation facilities with proper waste-water treatment • Create a buffer zone around surface water • Restrict access to surface water • Conduct awareness raising with local and host populations to prevent water contamination and over-exploitation • Ensure safe access for women and other vulnerable groups • Develop WASH programs focusing on sanitation facilities • Develop sensitization messages on transmission of waterborne diseases and mitigation measures that can be done on a household level • Set up monitoring system to control water quality

Figure 20: Results from the NEAT+ environmental sensitivity analysis on vulnerability of water sources to contamination.

Wastewater management in both villages is largely non-existent. Most houses have improved Thai pit latrines, although approximately ten households in Sein Pa La practice open defecation. The labor for digging the pit latrines is generally outsourced (possibly using remittances from relatives working in Thailand) and the latrines are sealed and lined with soil, mud or concrete. Where possible improved pit latrines should be encouraged as a replacement to open defecation, as flooding can lead to contamination of crops, eutrophication of nearby water sources and contamination of wells.

Low capacity to manage sewerage and fecal sludge	
Additional Information	Mitigation Tips
<p>Poor sanitation infrastructure or practices can have significant health implications. Soil that is loose (e.g. sand) allows the movement of contamination such as human waste into water bodies. These water bodies may be used for drinking, cleaning or bathing. Children and the elderly are particularly affected by contaminated water due to weaker immune systems.</p>	<ul style="list-style-type: none"> • Complete WASH activity module of the NEAT+ • Identify improvements to sanitation infrastructure (e.g. improve latrine design) • Conduct sensitization campaigns on good sanitation practices and links to health

Figure 21: Results from the NEAT+ environmental sensitivity analysis on low capacity to manage sewage and fecal sludge.

Household grey water which is used for washing and bathing is rarely re-used. Residents usually throw grey water into the bush, or onto the nearest plant by their kitchen. Particularly in Sein Pa La, re-using household grey water could represent a critical water input for crops during summer droughts. Introducing grey water capture systems along with educational programs about ways in which to reuse grey water can help encourage water-efficient behaviours. In one LFS programme in northern Uganda, NRC trained participants in permaculture agricultural methods, including principles such as building circle gardens, on-contour ditches to slow, spread and sink water into the soil, agroforestry, producing no waste and leaving natural features in the fields in order to build healthy soil, retain vegetation cover and reduce or reverse land degradation. Villagers in Sein Pa La expressed that they would be willing to try more sustainable agricultural

methods if they received training and it did not reduce their current income levels. Assessing interest and potential uptake of programs which encourage sustainable practices and still provide income should be scoped by NRC, for inclusion in their current farmer training programs.

Low capacity to manage wastewater	
Additional Information	Mitigation Tips
A lack of drainage infrastructure leads to unmanaged wastewater. Wastewater is a carrier of contamination which can be harmful to human health and also to livelihood activities such as farming and livestock. Pools of wastewater are breeding grounds for mosquitos. Contaminated water can also drain into streams and other surface water, which is used for washing, cleaning and bathing increasing risk of further contamination among women and children.	<ul style="list-style-type: none"> ● Complete WASH activity module of the NEAT+ ● Develop sensitization messages on links between environmental sanitation and disease transmission ● Undertake sensitization sessions with the community ● Ensure waterpoints have infiltration built in ● Introduce greywater capture ● Promote ground cover vegetation to enhance infiltration and reduce surface runoff ● Conduct WASH assessments ● Consult health authorities ● Identify improvements to waste water management (e.g. suitable technology for treating and managing waste water, possible re-use of waste water)

Figure 22: Results from the NEAT+ environmental sensitivity analysis on low capacity to manage waste water.

Water and Wastewater Management

Relevant NRC Activities

NRC Myanmar does not currently have active WASH programming in Myanmar, but with global expertise, and through other activated core competencies (shelter and settlements, livelihoods and food security, and education) is positioned to incorporate and integrate relevant activities into intervention strategies.

Mitigation tips

- Protect open wells from contamination
- Encourage the replacement of open defecation with improved pit latrines.
- Provide education about reusing household grey water
- Introduce grey water capture systems
- Gauge interest in permaculture training program

Climate Change/Climate Variability

All groups consulted, in addition to the results of the NEAT+, noted increasing climatic change and variability with negative consequences on livelihoods - particularly agricultural production. All groups noted increased temperatures and more erratic rainfall patterns. Rainfall is becoming harder to predict, and residents noticed the overall amount of rainfall has decreased. For residents of Sein Pa La, who mostly grow high-value tree crops such as rubber, durian, rambutan and other fruits, the early arrival of hot temperatures is causing the fruit to spoil before ripening. There have also been issues with rubber tree plantations catching fire in the past two summers.

The main issues arising from climate change and variability in this area are an increase of flooding, saltwater intrusion into farmland, drier dry seasons and rising temperatures. Rubber plantations can contribute to rising temperatures in the immediate vicinity of the plantation as larger trees are cut down when the land is cleared for planting rubber. For example, Sein Pa La is in the middle of a large plantation and suffers from rising temperatures.

Due to the relatively recent establishment of both villages, there is not a wealth of collective memory on adapting to climatic variability in the context of their landscapes and agricultural activities. Traditional knowledge that may have been retained from Sein Pa La’s original village in Mon State has little application to their activities now, as before they farmed large pastures with rice, ground nuts, and fish, and now focus almost exclusively on high-value tree crops. However, everything they learned about farming tree crops they learned collectively, from each other, adapting practices as needed since their arrival in Sein Pa La. Thus, the ability and desire to adapt practices to optimize production and profit does exist. Capacity-building programmes on adapting crops to climate stressors, including increasing shade, saving water, and planting climate-resistant crops, should be mainstreamed into current LFS activities that NRC is implementing throughout the township.

Increased risk to climatic hazards	
Additional Information	Mitigation Tips
Climate-related events - such as changes in precipitation patterns or increase temperature variability - can exacerbate existing socio-economic stresses such as poverty, food insecurity, land degradation, water shortages, sanitation challenges, etc. This can undermine outcomes of response activities. The severity and frequency of natural hazards such as extreme precipitation events or droughts are also heightened by climate change.	<ul style="list-style-type: none"> • Seek assistance from a climate change adaptation expert • Conduct climate vulnerability and climate vulnerability capacity assessments • Consult regional, national or local climate change adaptation plans • Consult communities on changes in climate patterns over time • Undertake adaptation measures (e.g. the Climate Resilience Evaluation for Adaptation Through Empowerment (CREATE) https://cmsdata.iucn.org/downloads/create_factsheet_final.pdf) • Mitigate/adapt (e.g. switching to more climate-resistant crops, creating increased shade, and water saving) • Promote sustainable and climate-smart livelihoods activities and agriculture (for example agroforestry) • Support initiatives such as community water use groups and tree nurseries

Figure 23: Results from the NEAT+ environmental sensitivity analysis on increased risk to climatic hazards.

Climate Change/Climate Variability	
Relevant NRC Activities	Work with the dept of agriculture that works with switching corn and paddy varieties, promoting tree crops hedges against dryness.
Mitigation tips	<ul style="list-style-type: none"> • Consider steering away from invasive species like rubber, that can invade natural forests. • Use shade trees for fruit plantations - e.g. rubber plantations if they already exist - to protect fruit trees from drying out. Ideally use non-invasive species.

- Balance traditional with innovative practices to take the best sustainable ideas of both
- Integrate further adaptation measures into new programme planning to increase community resilience
- Conduct climate vulnerability assessment and seek assistance from a climate change adaptation expert
- Consult national climate change adaptation plans
- Support and provide training on sustainable farming and/or climate smart/climate resilient agricultural practices
- Provide faster growing seed varieties/more hardy seeds as part of livelihoods programming
- Undertake adaptation measures (e.g. the Climate Resilience Evaluation for Adaptation Through Empowerment [CREATE] https://cmsdata.iucn.org/downloads/create_factsheet_final.pdf)
- Promote the use and mainstreaming of nature-based solutions such as ecosystem-based approaches for climate adaptation (e.g. the use of alternatives and crop diversification to tackle climate change and natural resource scarcity).

Recommendations

Recommendations are divided into three sections: Programmatic, Organizational Strategy, and External advocacy.

1. Programmatic: Project Implementation

It is critical that a plan to mitigate the above environmental and human impacts is designed and put into place now, while there is still time to prevent further irreversible damage. Too often, humanitarian practitioners overlook necessary environmental objectives due to the uncertainty of length of stay and maintain a short-term outlook due to programme and funding cycles. If action is not taken now, remedial action will come at a much greater cost, with less satisfactory results. There are clear future consequences if current trends in waste management and lack of DRR continue. NRC and partners have already made good progress in sustainable livelihoods in the area that can be built on.

Programmatic recommendations specific to the major environmental issues outlined above can be found across the previous section of the report. In addition, the following are recommended:

1. **Look at environmental issues across sectors and not in isolation** to understand their full impacts.
2. **Prioritise disaster risk reduction interventions and education:** Risk of natural hazard exposure and disaster risk reduction underlie many of the recommendations throughout this report. In particular, the issues of soil erosion and flooding identified in this

assessment require a cross-sectoral Eco-DRR lens in order to efficiently mitigate the impacts of disasters on local communities. It is recommended that at a minimum NRC incorporate DRR messaging into their existing programming and assist communities to advocate to the local government for more support, and ideally that they begin new activities specifically addressing this issue. The risk if this does not happen is that some of the villages bordering the river like Saint Chaung will continue to erode rapidly and cause displacement. Activities and educational messaging can be easily incorporated into livelihoods activities, through promoting sustainable and climate-smart livelihoods activities and agriculture (for example agroforestry), in cash for work, or as community development projects. This could include for example:

- a. Planting grass, shrubs, trees for stabilization;
 - b. Consulting/developing hazard maps, including mapping main risks and root causes to flood risks;
 - c. Enhancing and protecting all ground cover including grass;
 - d. Promoting vegetation and improve the infiltration capacity of the soil with vegetation coverage;
 - e. Setting up drainage/canals or clear drainage/canals;
 - f. Establishing soakaway pit, ideally with vegetation;
 - g. Setting up natural filtration systems.
3. **Consider working in waste management or advocating to government / other partners to do so:** one significant gap in NRC activities to address the major environmental issues of concern identified by the assessment is the issue of waste management. Waste management practices can be mainstreamed through other sector activities (for example education about efficient cooking practices could also include appropriate methods for disposing of utensil wastewater or compost), or NRC could work with partner organizations or initiatives that do work in waste management to ensure that the lifecycle of project activities is environmentally accountable.
4. **Increased focus on community engagement and accountability to affected people:** Many of the environmental issues noted can be avoided through better community engagement and accountability to communities. This was a topic that was noticeably lacking in the area, with very few accountability mechanisms in place like feedback systems.
5. **Increase environmental education:** Environmental education can tackle many of the environmental issues present in this area. Education is particularly important to address waste management and promote DRR. Based on the NEAT+ results, FGDs and secondary data analysis, the most prevalent issue seemed to be a lack of awareness of environmental risks and sustainable practices. Community education can fall under the livelihood programs (adapting agricultural practices to climate variability; promoting risk reduction initiatives such as soil stabilising crops), WASH (re-using wastewater, caution against collecting water from open sources), and energy (efficient cooking practices). The recently started livelihoods programme in Sein Pa La represents a key opportunity

to mainstream environmental education and awareness into livelihood and food security activities.

6. **Repeat the NEAT+ methodology in other villages where NRC works in the South East:** The methodology completed in Sein Pa La and Saint Chaung should be repeated in other villages or camps across the south east where NRC works. This will not only solidify the NEAT+ methodology and concepts with the field staff but also allow for a stronger comparison of environmental situations between areas. The biophysical characteristics can differ significantly between areas as shown by the pilot in two different villages, creating unique environmental situations which may need to be considered in planning.

2. Organizational strategy: Mainstreaming NEAT in NRC

NRC does not have an environmental management system in Myanmar or globally, but there are opportunities for the tool to fit into the organization's programme management system and strategy revision process. Integrating the NEAT+ into organizational processes will ensure that the tool does not remain a standalone function, but becomes systematically used across the organization to inform sustainable programme planning or adjustment when used as a monitoring tool. Myanmar has an opportunity to illustrate how this could be done more broadly in NRC. A pilot in Uganda in early September 2019 can also contribute to this learning.

NRC's PCM Framework will be revised in 2020 and is currently in a consultation process. There is an opportunity to link the environmental analysis element of the Myanmar Strategy to include the NEAT+ as a tool to be used in the "Identification" phase alongside other sector assessments; in the "Formulation" phase for sustainable and context-appropriate programme development, and the "Implementation" phase for monitoring and evaluation. As the Myanmar and Uganda pilots showed, there is an opportunity for NRC to use the NEAT+ throughout critical programme management phases.¹⁷

¹⁷ E.g. Identification of issues for the new FSL activities in Sein Pa Lar village, and adjusting the implementation of ongoing projects in the area.

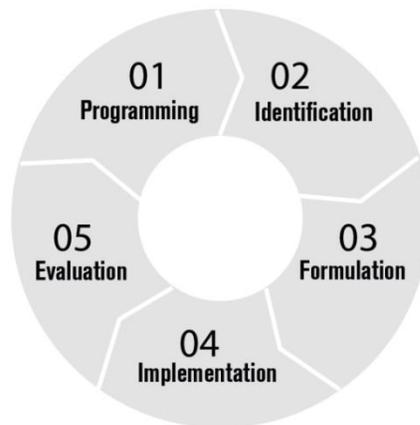


Figure 24: NRC Project Management Cycle.

The original NEAT was developed by NRC with the same modules that it currently contains, based on the greater level of environmental impact of NRC's programmes. Therefore a "light" adaptation of the NEAT+ could be conducted for NRC if deemed necessary, for example updating the language or mitigation tips to reference NRCs PCM, specific vocabulary used, or reference organizational documents, strategies and policies. This would not be a time-consuming procedure, however it would need to be decided whether to do at the national, regional or global level. Limited technical expertise would be needed given that the backend logic of the tool would not need to be changed for this, just the text edited.

Recommendations:

1. Adapt the NEAT+ for NRC (a "light" adaptation - vocabulary, mitigation tips, links for further guidance, resources).
2. Include the NEAT+ as a tool for "environmental analysis" of programmes in Myanmar and eventually globally.
3. Conduct a baseline (environmental sensitivity module) across the country for all NRC programmes to analyse the country level trends and use as an advocacy tool for funding to address the main risk identified or for additional technical support. Use this as a pilot for a global baseline initiative. Note that a future update of NEAT+ is expected to include a dashboard function, which could be used for comparison and monitoring of programmes in different locations.
4. Include environment as a cross cutting issue in the country level strategy, but with pragmatic suggestions for environmental mainstreaming, including a screening/analysis process that contributes towards programme proposals, design and development.
5. To articulate how environment fits as a cross cutting issue, highlight where in the PCM Framework the NEAT+ fits - the recommendation is as part of "Identification" that leads to sustainable project formulation.

6. Use the South East team who have been trained in the NEAT+ (7 people) to train other areas of the country, capitalizing on the staff member who is already moving to the North East.
7. Apply NEAT+ in new project areas. Suggestions by NRC to date include:
 - a. Kachin in the new MFH funded Shelter programme (beginning October 2019);
 - b. New MOFA funded programmes beginning in the new year (2020);
 - c. Upcoming work in Northern Rakhine (e.g. in advance of community infrastructure projects such as road resurfacing and building culverts).
8. Integrate into future proposals (NMFA, UNHCR, GIZ, OFDA) from global and local levels, and monitor donor interest (funding success rate) of project proposals for evidence of environmental screening as a value-add proposition.
9. Exchange learning between Uganda and Myanmar post-pilots.
10. Expansion to other areas where the Regional Adviser works (Bangladesh and Ukraine).
11. Share this report with the region, and globally.

12. External advocacy

The NEAT+ team and NRC's country director discussed the possibility of externally advocating for more systematic use of the NEAT+ across the humanitarian system in Myanmar. One suggestion from the country director, who sits on the board of the Myanmar Humanitarian Fund (MHF),¹⁸ an OCHA-managed country-based pooled funding mechanism, was to explore how the NEAT+ could be required as part of the conditions to granting funding, possibly working with specific Clusters.

A subsequent meeting with OCHA Myanmar's head of the humanitarian financing unit identified that the most appropriate place for the NEAT+ to be represented in the MHF would be in the annexes and training (see recommendations below).

It was also identified that environment has been taken out of the global application template for all country based pooled funds and that this should be reinstated if possible in the global template, as well as in Myanmar. NRC can play a role both in Myanmar and globally in advocating for the environment to be a criteria for CBPF selection, and for NEAT+ to be included in the annexes and training linked to the relevant CBPF.

Recommendations

NRC Myanmar

- Advocate for the environment to be reinstated in MHF.
- Advocate locally and globally for the environment to be a criteria for CBPF selection, and for NEAT+ to be included in the annexes and training linked to the relevant CBPF.

¹⁸ <https://www.unocha.org/myanmar/about-mhf>

NRC regional/global

- Capitalize on NRC's representation on the board of country based pooled funds in other countries such as Ukraine, to advocate for similar inclusion of the NEAT+ and environment more broadly.

UNEP/OCHA Joint Environment Unit

- Work with OCHA to reinstate environment into the application template, both globally¹⁹ and in Myanmar. The template is reviewed on an annual basis.
- Support OCHA Myanmar to:
 - Include the NEAT+ in the annexes for the MHF that highlight the important factors to be taken into account when implementing projects with the funding.
 - Include a question in the Scorecard on how applications plan to identify and mitigate environmental risk.
 - Include the NEAT+ in the training for those who receive MHF funding (March 2020).

¹⁹ There are a total of 18 country based pooled funds to date.

Annexes

Annex A: NEAT Presentation

NEAT introductory presentation, given to all staff at the Hpa An Office, and adapted for the workshop:

<https://docs.google.com/presentation/d/1StrddJAObiTOWF2wwrbsxT0IKQwDjpvGLJ40ffsek58/edit?usp=sharing>

Annex B: NEAT+ Workshop Summary and attendance list

Summary

On 30th September 2019, a workshop was held by the UN Environment / OCHA Joint Unit (JEU) and the Norwegian Refugee Council (NRC) in Yangon to present the NEAT+ environmental screening tool and preliminary findings from a Hpa An field test, and to engage participants in broader discussions about different aspects of screening and assessing environmental risk in humanitarian settings. Twenty representatives from civil society organizations and UN agencies attended the half-day workshop (see participant list in Annex 2). The workshop was opened by the Country Director of NRC.

Part 1: The NEAT+

After receiving an overview of the NEAT+ tool and preliminary results from the Hpa An field test (see presentation links in Annex 1), participants engaged in a discussion about potential applications of the NEAT+ in their own operations and donor and national requirements. In particular, the key questions posed to participants were:

- Do you have tools or systems to screen for environmental risk in humanitarian activities?
- How do these fit into your environmental management systems or broader assessment and planning processes?
- Are donors asking you to screen/assess for environmental risk?
- Are there local/national EIA requirements and are these applied to humanitarian contexts?

Discussion centred on these questions and the themes summarized below.

→ *Functionality of NEAT +*

Questions posed around the functionality of the tool included clarifying whether the NEAT+ questionnaires are standard for all pilots for comparison, or if they are adapted to the context and organization. The NEAT+ team clarified that the questionnaires remain the same so that comparison between locations is possible and to not impact on the back end logic of the tool. It can however be adapted for an organization's specific use, for example by adapting the language and editing the mitigation activities and tips.

The accuracy of the tool was questioned and how much testing has already taken place. The NEAT+ team clarified that the tool has already been field tested in three locations by JEU, as well as extensively by other organizations and has proven to be accurate, in particular when used for contexts that it was specifically designed for - i.e. displacement.

Some concerns raised by conservation actors included how environmental conditions can be assessed accurately without proper environmental expertise. It was emphasised that the NEAT+ is not meant to replace environmental expertise, but allow humanitarian organizations who do not always have this expertise available globally to start considering environmental impacts of their planned interventions and provide tips on how to mitigate the potential risks identified by the NEAT+.

Most organizations present indicated that they already use Kobo in their operations.

→ *Tools for environmental screening*

When asked about existing tools for considering environmental issues in humanitarian programming, participants mentioned the following existing tools/approaches:

- Malteser mainstream environmental questions into wider project planning assessments.
- The Red Cross uses a preparedness tool called "National Society Preparedness for Effective Response" which looks into the capacity of National Societies and how prepared they are for response. Environmental response preparedness/risk consideration is considered as one of the 37 components of the tool.
- The Red Cross Community-based DRR programs also use integrated community risk assessments that often include sections on environmental risks.

→ *Mainstreaming environment into humanitarian systems/processes*

There was a discussion about how the NEAT+ could fit into the humanitarian planning architecture in Myanmar, and the question was posed as to how environmental risk and environmental issues more broadly could be integrated into the HNO or the MIRA process. There is no specific environmental process managed by OCHA in country, though the cluster/sectors are encouraged to include environment in their contributions to the HNO, alongside other cross cutting issues. OCHA raised the point that it will be important to ensure that the impetus to use the tool comes from the top down and whether it will be possible to include it in the CERF for

protracted emergency funding. The JEU emphasized that following this phase of extensive field testing, advocacy and rollout, the next step will be to focus more on how to institutionalize the approach/tool.

→ *National EIA requirements*

Participants were asked about any existing EIA requirements in Myanmar, and it is the understanding of the group that these only exist for large scale infrastructure projects and not for humanitarian programming.

→ *Donors and environment*

ECHO posed a question to the humanitarian partners present as to whether there is an appetite for the environment to be made a more robust donor requirement from ECHO, bearing in mind that they already ask many cross cutting questions of implementing partners, for example on gender and conflict sensitivity. Overall there was an appetite in the room for this, as donor requirements will drive change. However participants stressed the importance of moving past simply saying that the organization has broadly thought about the environment, to having tools like the NEAT+ to identify risks and how to tackle them more concretely. It was also stressed that looking at the environment needs to be meaningful, not just a narrative, and that donors should hold humanitarian organizations to account.

The representative from the Norwegian Embassy acknowledged the relevance of environmental mainstreaming in programming and the importance of screening for environmental risk, emphasizing Norway's commitment to supporting humanitarian response that is environmentally sensitive and contributes to bolstering affected populations' resilience.

→ *Coordination between environmental and humanitarian actors*

A question was posed to conservation actors present as to how they work with humanitarian organizations, if at all. WWF mentioned that they are working to include humanitarian safeguards on gender and conflict in their work and are connected to humanitarian organizations on issues relating to displacement in sensitive environmental areas of Myanmar.

→ *Remote support for NEAT+*

Participants discussed how they can receive remote support for rolling out the tool at a later date if field support is not available. The JEU team informed the group that various means of support exist:

1. In the NEAT+ download package available at: www.eecentre.org/neat there is a full guidance package for using the tool.
2. The JEU can provide remote technical support. Contact: ochaunep@un.org

Part 2: Environmental data in humanitarian contexts

The second part of the workshop focused on environmental data use in humanitarian contexts, including a discussion on data sharing and geospatial data. The discussion followed a presentation of MapX and some results from participatory mapping exercises held in Hpa An Township with local communities (see presentation in Annex 1). The questions posed to participants included:

- How does your organization use environmental data in operations? If you are an environmental organization, do you use humanitarian data in your organizations?
- What challenges do you face in accessing and using data?
- Where are the gaps?

Participants were interested in learning more about MapX and connections of spatial data to the NEAT+. To summarize the discussions specifically about MapX and NEAT+:

- While country-level data was gathered and used for pilots to assess accuracy of field results and data availability, a future version of the NEAT+ tool will connect users to verified global-level spatial datasets. This is to ensure that data is timely, relevant, and best-available, as national datasets cannot be verified at the same rate.
- MapX is open-source and built on OSM infrastructure. The code can be viewed here: <https://github.com/fxi/map-x-mgl>
- While MapX is open-source, the data on it is not necessarily open. Some verified global datasets have a "view only" license, and some projects choose to keep their data private and only visible to members.

During the presentation, the story map displayed results from the participatory mapping exercise, including the issue of St. Chaung village river erosion, and subsequent scheme to quarry a sandbar from the Salween river. The villagers believe that removing the sandbar will reduce erosion on the river bank. Furthermore, they were not aware of any methods of natural bank stabilization and hoped to build a concrete wall along the bank. This led to a question posed to participants about whether any known Eco-DRR projects have been implemented in Myanmar. In Rakhine State, ACTED is implementing an ECO-DRR project which involves planting and conserving mangrove forests. Red Cross is supporting Indonesian Red Cross on plastic disposal that can cause urban floods by setting up a reuse and recycling system.

In terms of data gaps and sharing between organizations, environmental actors shared that they collect highly specific and localised data for planning and monitoring. WWF and WCS tend to work in different protected areas, so the information sharing between the two organizations is low. There are working groups on general common topics, but overall organizations generally

collect their own project-specific data. Due to the need for small-scale, accurate GPS data, global datasets are generally not useful for environmental actors. The last nationwide assessment performed by WWF was the [WWF Natural Capital Analysis](#).

The issue of data sensitivity was also raised by the representative from the Myanmar Information Management Unit (MIMU), as environmental data in Myanmar can often be sensitive due to the connection to land tenure, and therefore cannot be shared widely. However, MIMU does provide open access to government administrative data on the MIMU website. There is no formal mechanism for organizations to share their data with MIMU, and also no incentive (beyond the 3W completed quarterly) to do so. Thus data sharing between organizations is quite limited.

The Red Cross participant mentioned that the GIS community in Myanmar is still small. Although there is a desire for geospatial data and analysis in the work being performed across the country, the capacity is low. Barriers include: low bandwidth to process heavy imagery and data, lack of training available, and costly software. Easy and accessible tools and training are necessary to enhance the ability for organizations to integrate and draw insights from spatial data in their planning and programming.

Presentations

- NEAT+ presentation: <https://docs.google.com/presentation/d/1StrddJA0BiTOWF2wwrbsxT0IKQwDjpvGLJ4Offsek58/edit?usp=sharing>
- MapX story Map presentation: <https://app.mapx.org?project=MX-A2L-WO8-3WX-5LL-CYB&views=MX-YIDSJ-YO5FG-4D2CQ>

Workshop attendance list

Organization	Name	Position	Contact details
NRC	Brian Wittbold	Regional Advisor	■■■■■■■■■■■■■■■■■■■■
NRC	Su Myat Yin Chaw	M&E manager	■■■■■■■■■■■■■■■■■■■■
NRC	Nay Blut Htoo	SE Area Manager	■■■■■■■■■■■■■■■■■■■■
NRC	Laura Marshall	Country Director	■■■■■■■■■■■■■■■■■■■■
JEU	Mandy George	JEU Consultant	■■■■■■■■■■■■■■■■■■■■
UNEP	Theresa Dearden	Analyst	■■■■■■■■■■■■■■■■■■■■

American Red Cross	Manish Tewani	Country Representative	■■■■■■■■■■■■■■■■■■■■
OCHA	Helena Mazarro	Humanitarian Affairs Officer	■■■■■■■■■■■■■■■■■■■■
OCHA	Olivier Uzel	Information Management Officer, Head IM Unit	■■■■■■■■■■■■■■■■■■■■
MIMU	Catherine Lefebvre	Information Management Specialist	■■■■■■■■■■■■■■■■■■■■
Malteser International	Claudia Plock	Country Programme Advisor	■■■■■■■■■■■■■■■■■■■■
World Conservation Society	Kyaw Zay Ya	GIS Manager	■■■■■■■■■■■■■■■■■■■■
Norwegian Embassy	Naw Dora	Sustainable Development Program Coordinator	■■■■■■■■■■■■■■■■■■■■
ZOA Myanmar	May Thet Nwe Oo	WASH Adviser	■■■■■■■■■■■■■■■■■■■■
UNICEF	Aye Aye Soe	Construction Engineer, Health and Nutrition Section	■■■■■■■■■■■■■■■■■■■■
WWF	Stefano Zenobi	Conservation Impact	■■■■■■■■■■■■■■■■■■■■
WWF	Pyoe Phyo Aung	Energy Officer	■■■■■■■■■■■■■■■■■■■■
World Vision Myanmar	Moe Thu	Humanitarian and Emergency Affairs Director	■■■■■■■■■■■■■■■■■■■■
European Commission	Win Win Thein	Programme Officer	■■■■■■■■■■■■■■■■■■■■
NRC	Nwe Nwe Win	Communication Officer	■■■■■■■■■■■■■■■■■■■■