



AYEYARWADY INTEGRATED RIVER BASIN MANAGEMENT PROJECT

Environmental and Social Management Plan - Final

Nyaung U and Pakkoku River Enhancement Works

Micro Projects

Report prepared by Directorate of Water Resources and Improvement of
River Systems

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Abbreviations and Acronyms

AIRBM	Ayeyarwady Integrated River Basin Management Project
ARAP	Abbreviated Resettlement Action Plan
ASEAN	Association of Southeast Asian Nations
BoQ	Bills of Quantity
C3	Component 3
DG	Director General
DGPS	Dynamic Global Positioning System
DMH	Department of Meteorology and Hydrology
DWIR	Directorate of Water Resources and Improvement of River Systems
DWT	Deadweight
EIA	Environmental Impact Assessment
ESMP	Environmental and Social Management Plan
GDP	Gross Domestic Product
GPS	Global Positioning System
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
IWT	Inland Waterway Transport
LAD	Least Available Depth to determine the allowable vessel draft
LAW	Least Available Width to determine the maximum vessel beam
LAR	Least Available Radius in bends to determine maximum vessel length
LAC	Least Available Air Clearance at bridges and cables to determine maximum "air draft"
MSL	Mean Sea Level
NGO	Non-Governmental Organization
NWRC	National Water Resources Committee
PMU	Project Management Unit
PSC	Project Steering Committee
RAP	Resettlement Assessment Plan
RVO	Enterprise Agency Netherlands
SEA	Strategic Environmental Assessment
SWL	Safe Working Load
SWOT	Strengths Weaknesses Opportunities Threats
ToR	Terms of Reference
WB	World Bank

I. Description and Rationale

1. Purpose, context and content of the project

The Government of Myanmar has received a US\$100 million credit from the World Bank for the Ayeyarwady Integrated River Basin Management Project (AIRBMP). The objective of the project is help Myanmar develop the institutions and tools needed to enable informed decision making in the management of Myanmar's national water resources and to implement integrated river basin management on the Ayeyarwady, while immediately enhancing the river's productivity with "low/no regrets" investments in the hydro-meteorological observation system and services (to support agricultural productivity and water-related disaster risk management) and in navigation enhancements (to promote sustainable transportation) on the Ayeyarwady. The project would also support a prompt and effective response to potential crises and emergencies. The project will be implemented over the period 2015-2020.

As part of the project, the Directorate of Water Resources and Improvement of River Systems (DWIR) propose to undertake a number of micro-projects that will promote safe navigation and improve public safety in the Ayeyarwady River. DWIR has been traditionally carrying out seasonal dredging for the last decades. However the Pakkoku and Nyaung U River Enhancement Works (Micro-Projects) will be the first seasonal dredging carried out including environmental and social considerations.

These micro-projects consists of small, temporary, and reversible navigation enhancement interventions aimed at providing a safer and more reliable navigation channel between Pakkoku Township and Nyaung U Port, in the mid-section of the Ayeyarwady River in Myanmar. The navigation enhancement interventions consist of: (i) dredging in Pakkoku; (ii) dredging in Nyaung U; and (iii) the installation of two permeable groynes in Nyaung U; that will divert water flow to ensure the dredged channels are maintained during low flow for safe navigation and public safety.

2. DWIR, Ayeyarwady River Dredging and Public Safety

The DWIR has a long history of maintaining safe navigation in the Ayeyarwady River. DWIR's mandate includes to:

- (a) improve the navigation channel and to stabilize the inland river ports;
- (b) protect the river banks from erosion;
- (c) cooperate with other organizations in demarcation of danger water level of the towns;
- (d) utilize the river water for domestic and agriculture all the year round;
- (e) protect bank erosion of border rivers;
- (f) observe the long term existence of the cross river bridges by river engineering point of views;
- (g) manage the prevention of the river water pollution; and
- (h) maintain adequate depth for maximum loading capacity of the vessels.

To comply with that mandate, DWIR is responsible for dredging ports and rivers within Myanmar. The DWIR commenced dredging in 1972 and has undertaken a consistent annual program since that time. Dredging quantities have ranged from approximate 150,000m³ in 2007-2008 to nearly 5,000,000m³ in 2014-2015. From 1989 until the present, DWIR have dredged approximately 24 million m³ of sediment. In 2015-16, DWIR propose to undertake 2,225,000m³ of dredging in Myanmar.¹ It is worth noting that the Ayeyarwady is the fifth largest river in terms of sediment load in the world.

Despite following through with their mandate to the best of its ability, vessel accidents still occur regularly along the Ayeyarwady River. According to DWIR, from 2011 to the present, a total of 78 incidents occurred in the River, including; (i) collisions between vessels (9); (ii) grounding and or

¹Does not include the micro-projects contained in this ESMP

water inundation (52); and (iii) accidents involving other infrastructure such as bridges (17). Groundings are the highest number of incidents and as such, dredging is a key component for public safety to ensure safe navigation for the users of the river.

3. Proposed Project

The Micro-Project will be carried out by the Government of Myanmar with its own personnel and equipment (under Force Account Procurement method). The location of the Micro-Projects is shown in Figure 1.

3.1 Description of Alternatives

No project Alternative

If the Micro Project site is not carried out, key bottlenecks identified by DWIR in the Nyaung U and Pakkoku sites will remain unaddressed. The current LAD is insufficient to guarantee safe passage between Nyaung U and Pakkoku and could cause delays in transportation (for cargo, passengers and tourism), and increase the likelihood of groundings. Once a boat is grounded it can take from days to weeks to reestablish circulation.

Alternatives considered for Pakkoku

Originally, the Pakkoku Micro Project was designed to dredge the entire channel from East to West (see Figure 9 below). However, it was considered to only open the upstream mouth of the channel and the downstream outlet so the increased flow of the river during the flood season will create a scouring effect and open the channel naturally. The revised design minimized the dredging volume, and the associated environmental impacts, considerably.

Alternatives considered for Nyaung Oo

Management of dredged material has a fundamental effect on the whole construction process as well as its environmental and social impacts. The disposal sites for the dredging materials have been weighed against sustainability criteria to discern an optimal site which minimizes impact on communities and the environment. The sustainability criteria included: (i) Project technical sustainability; (ii) costs, (iii) environmental impacts, and (iv) social impacts. A full description of each considered dumping site is included in Annex 1 and the methodology for dredging disposal site is included in Annex 6. The proposed disposal sites are immediately adjacent to the dredge sites. The sites are not inhabited and are like for like with respect to sediment type

3.2 Final Design

The project has five components as identified in Table 1. The groynes design has been adapted to permeate water and therefore minimize environmental or economic impacts. Further, the design has ensured that boat access to important reaches of the river is maintained, thereby reducing any exclusion. The dredge locations are in critical locations where the current channel significantly restricts navigation and therefore increases the potential for an accident. The disposal sites for the dredging materials have been weighed against sustainability criteria to discern an optimal site which minimizes impact on communities and the environment.

The Micro-Project is divided in 5 Components as follows:

Comp No.	Type of Works	Volume of Works	Dry Weight (@1.6 tonnes/m ³)
A	Wooden Groynes at Nyaung U Waterway	420 +550 m	
B	Dredging at Nyaung U (Northern Channel)	286,000 m ³	457,600 tonnes
C	Dredging at Nyaung U (Southern Channel)	290,000 m ³	464,000 tonnes
D	Dredging at Pakkoku East Waterway (Upstream)	635,756 m ³	1,017,210 tonnes
E	Dredging at Pakkoku West Waterway (Downstream)	177,700 m ³	284,320 tonnes

Table 1 Overview of Micro-Projects

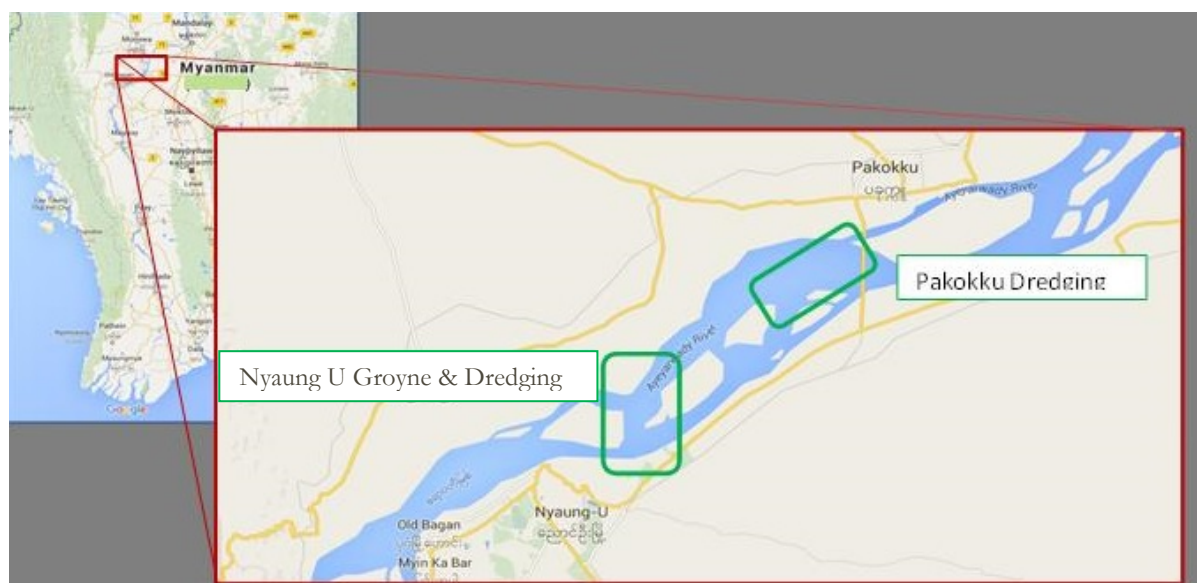


Figure 1 Location of the Nyaung U and Pakkoku Micro-Projects

3.3 Safeguards Management

In the context of an extremely dynamic river and riverine communities constantly adapting their livelihoods to the changing river, the Micro Projects impacts are considered temporary and reversible and are not anticipated to result in unprecedented or significant loss. Moreover, mitigation measures are readily available and have been incorporated into project design. Therefore, this Micro-Project is classified as Category B as per World Bank Policies.

This Environmental Management Plan provides appropriate management procedures: including an environmental code of practice for dredging operations, public health and safety management, occupational hazard prevention and control, interaction with ongoing shipping, and waste management. DWIR has carried out two rounds of consultations on the Micro Projects with communities and project affected people, in and January 11-13 and Feb 12-14, 2016. Findings of the consultations are included in Section 2 environmental and social baseline and in Annex 6 record of Micro Projects consultation. DWIR is in the process of translating this final ESMP and is expected to disclose it on its web site in early March with the final ESMP released on 1 April 2016.

4. AIRBMP Navigation Approach Objectives and Description

4.1 Strategic and immediate objective

Component Three of the AIRBMP aims at facilitating the improvement of Ayeyarwady River navigation. Component Three contains four strategic and 15 immediate objectives, and outputs formulated. The Micro-Project falls within Strategic Objective 2, and Immediate Objective 2.1:

Strategic Objective 2: As identified above, DWIR has a long history of dredging the Ayeyarwady River. The proposed river enhancement works are part of a large component that will be implemented in the stretch Mandalay – Bagan (Stretch 1). Stretch 1 aims to achieve a Least Available Depth (LAD) of 1.8m for barges of 1000 DWT, and will serve as pilot projects for extension beyond Stretch 1. The navigation improvements will allow vessels to pass and to be loaded more heavily during dry seasons flow, thereby increasing the efficiency of passenger and cargo transport; and moreover by increasing LAD, this significantly improves the safety of the public using this stretch of the river.

Immediate objective 2.1: Execution of the works of the Micro-project. Feasible and social and environmentally sound removal of relevant physical barriers to long-haul navigation between Mandalay and Bagan by conducting dredging works, and by installing river training infrastructure near Nyaung U and Pakkoku. The Micro Project involves small, temporary, reversible interventions.

4.2 Dynamic River Management Concept and AIRBMP implementation phased approach

Recognizing that the Ayeyarwady River is a very dynamic, sediment-laden river and can only be feasibly controlled in a few strategic locations, the overall AIRBMP navigation strategy is termed “dynamic river management.” In practical terms, this means annual updating of navigation maps, sophisticated navigation aids, strategic seasonal dredging, temporary structures such as wooden groynes, and in a few select places, permanent river control structures.

DWIR has notable experience with strategic seasonal dredging, and with the support of AIRBMP, this approach has been adapted to include environmental and social considerations. The strategic seasonal dredging approach involves the following time-sensitive work during dry season: (i) surveying the river to identify bottlenecks as they change every year (November-December); (ii) engineering design and environmental/social assessment (January-February); and (iii) construction/dredging (March – June). The surveying, engineering design and environmental and social assessment work might not be relevant in the next dry season as the dynamic Ayeyarwady River morphology is likely to change.

AIRBMP is supporting DWIR in a phased approach to implement dynamic river management. AIRBMP is supporting DWIR in the implementation of these Micro Projects in the 2015-2016 dry season. With the Micro Projects DWIR is piloting the incorporation of environmental and social considerations into strategic seasonal dredging design. In addition, DWIR will carry out a Pilot Project 1 in Mandalay Waterways (KM901-KM998) in 2017. It is called a Pilot because it will be the first river navigation enhancement works utilizing modern engineering design, including sediment modelling, and involving permanent structures. The detailed engineering design is in the process of being finalized. DWIR will carry out an ESIA in 2016 to inform the final Pilot 1 Design. DWIR will pilot the dynamic river management approach in the Stretch 1 between Mandalay and Nyaung Oo in 2018. Stretch 1 will likely include a set of interventions similar to the Micro Projects and Pilot 1. A separate Strategic Environmental and Social Assessment will be conducted to inform the design and location of Stretch 1 navigation enhancement interventions in 2016-2017; and a more specific Environmental and Social Impact Assessment (ESIA) is expected to be conducted for the proposed navigation enhancement interventions in 2017-2018.

4.3 Brief rationale and overview of the works

The Micro-Projects at Nyaung U and Pakkoku have been proposed by DWIR based on the Department's significant experience with strategic seasonal dredging and information from surveys, technical advice, local expertise, and waterway users.

The aim of the Nyaung U Micro-Project is to concentrate the flow into the main north-south channel just upstream of Nyaung U, and to have better access to the downstream port of Nyaung U on the left bank. This project involves the construction of two groynes and main channel dredging works. The Nyaung U Micro project consists of three components:

- Component A: construction of two (2) groynes upstream of Nyaung U;
- Component B: dredging of the northern channel; and
- Component C: dredging of the southern channel.

The Nyaung U Micro project is shown in Figure 2.

The Pakkoku Micro-Project contains two dredging components that will open a new navigation channel just downstream of the Pakkoku Bridge in an east-west alignment that will be significantly safer than the existing channel. The new channel provides a better alignment for vessels perpendicular to the bridge's horizontal clearance. This project's dredging works will induce scouring of the new channel that will occur naturally during higher flows. Without the proposed dredging works, this scouring will not occur. The Pakkoku Micro-Project consists of:

- Component D: dredging of the eastern channel; and
- Component E: dredging of the western channel.

The Pakkoku Micro-Project is shown in Figure 3.

The works at Nyaung U and Pakkoku are proposed to be conducted between March and June 2016 prior to the monsoon season. The works are used to improve navigation this dry season, but also to guide the navigation channel through dredging and temporary groynes so that the wet season flows can shape the channel for the subsequent dry years.

It must be noted that no geomorphology or sediment studies have been conducted or models applied prior to the designs. The works are considered to be dynamic, temporary and reversible and will serve as a pilot project in line with historical seasonal dredging and groyne construction undertaken by DWIR since 1972 and the World Bank Environmental and Social Safeguards Policies. The results will be monitored carefully as part of the ESMP.

Figure 2 Proposed Works at Nyaung Oo

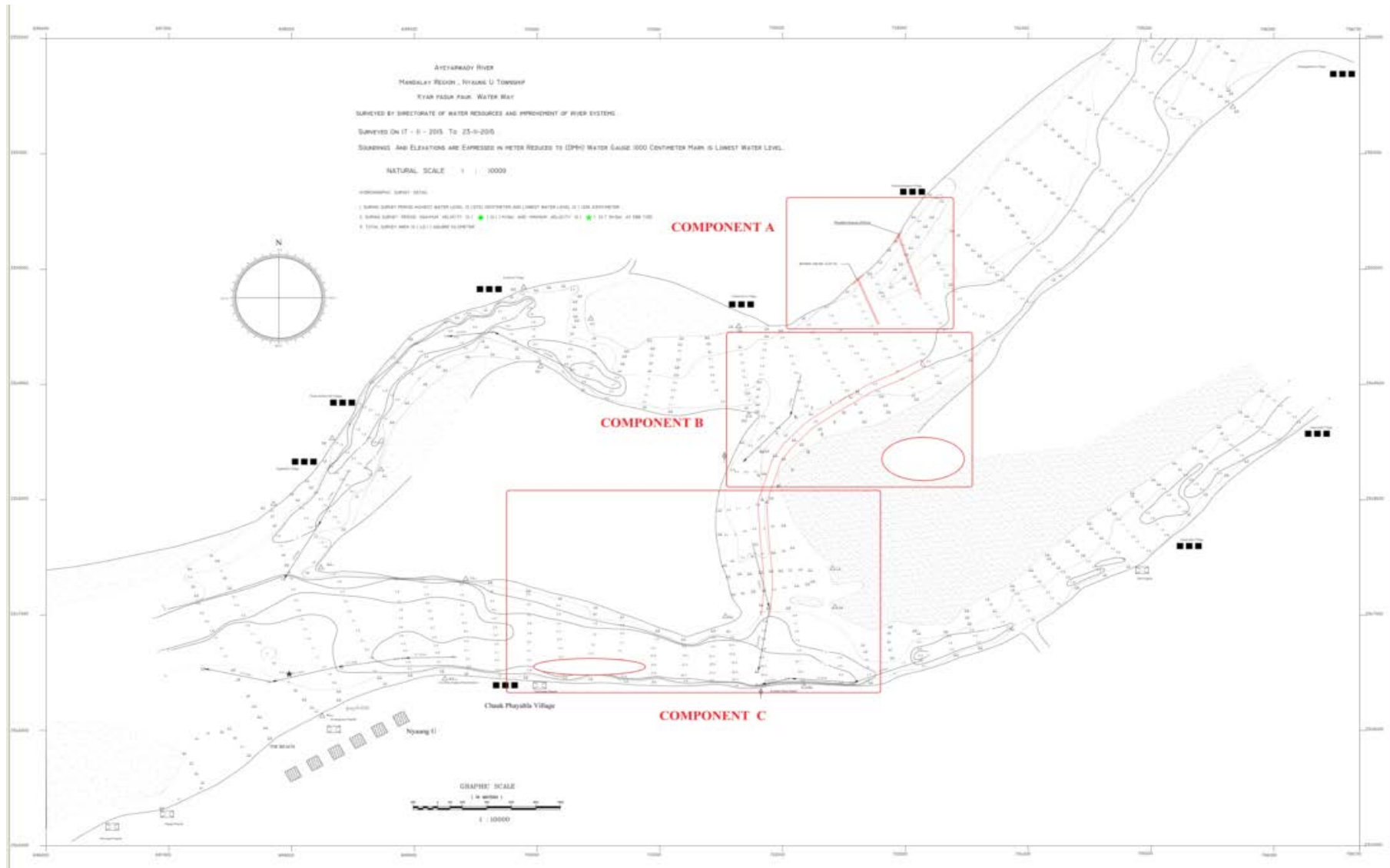
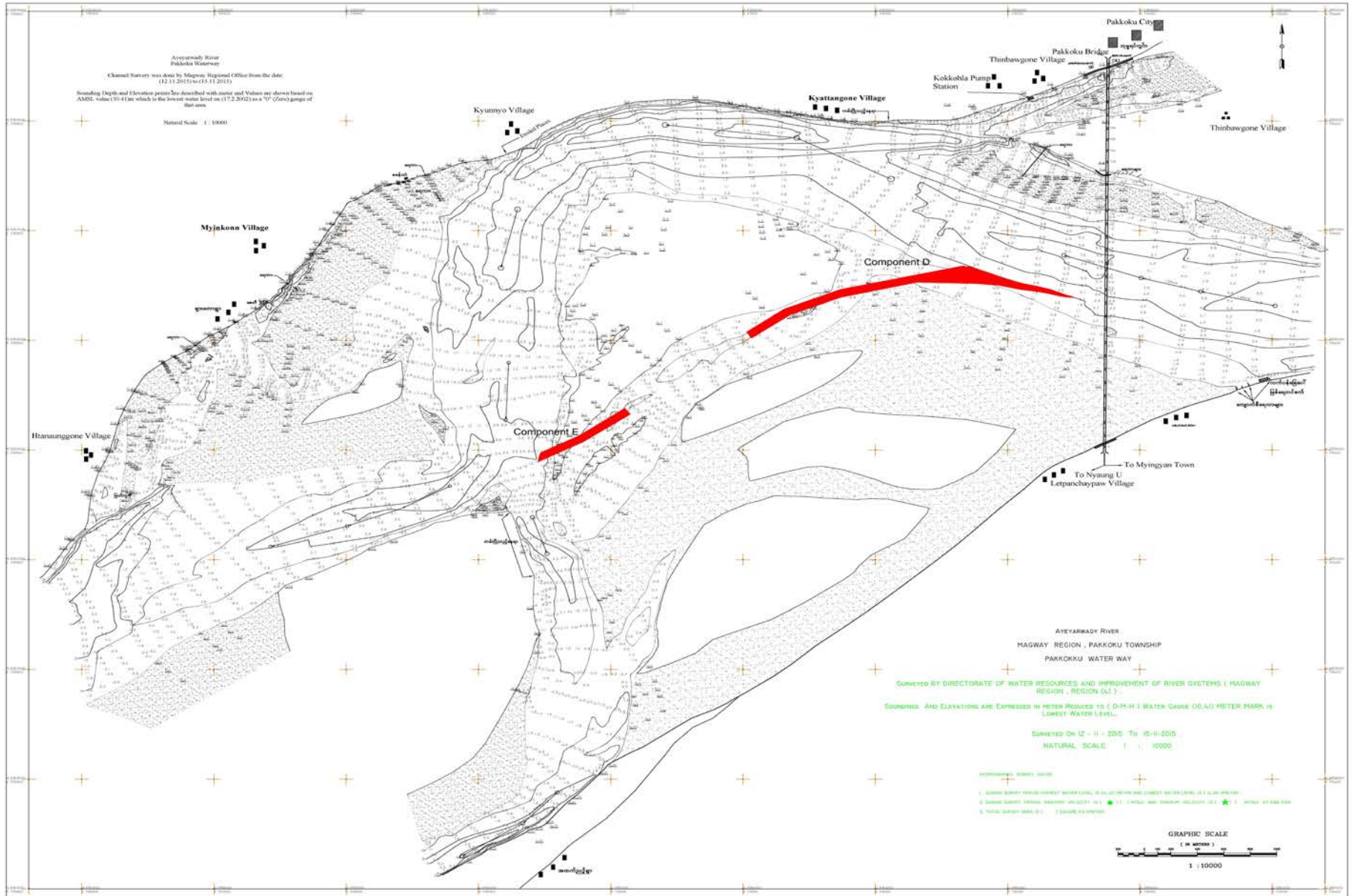


Figure 3 Proposed Works at Pakkoku



II. General Description of the Works

1. Permeable Timber Pile Groynes

Groynes are structures placed at an angle to the flow in order to deflect water away from critical zones and control lateral erosion along river banks. The primary function of the wooden pile groynes as part of the Micro-Projects is to encourage the build-up of sand banks in their proximity such that increased depths will result in a safe navigation channel. The planned design for the groynes is a double row of 0.15m diameter piles spaced at 1.5m with longitudinal and cross-bracing at the top (see Figure 4). The groyne increased flow resistance which is further increased by the accumulation of debris on its upstream face. This feature causes the bottom protection to gain in importance. At the head of the groyne; the height of the piles will be 1.5m to 2.40m above the LAD level. The piles will be driven into the substrate to a depth of 3m. The groynes are aligned at an angle to the flow downstream to the direction of the channel, thereby allowing scouring to occur to maintain safe navigation. Groynes will be effective during the low water season following their construction as they will be overtopped during flood events. All materials for constructing the groynes will be supplied by barge; there will be no need to access the construction site by land.



Figure 4 Examples of local timber pile groynes

2. Mechanical/Hydraulic Dredging

A cutter suction dredger is a stationary vessel that uses a rotating cutter head to loosen the material in the bed ('cutting'). A suction inlet located beneath the cutter head is connected by a suction tube directly to one or more centrifugal pumps. The vacuum force at the suction inlet sucks up the loosened material. The suction tube and cutter head are attached to a ladder. The ladder with cutter head is positioned at the fore of the vessel. On the aft side, the cutter generally has two spud poles. One spud pole (the auxiliary spud) passes straight through the vessel, while the other is mounted on a movable spud carriage, which can be moved lengthwise along the vessel or pontoon. Steel cables are used to move the ladder or cutter head back and forth, with the spud in the spud carriage at the center of each concentric circle that it describes. Moving the spud carriage causes the cutter suction dredger to move as well ('stepping'). The cutter suction dredger discharges the dredged material directly to shore via a floating pipeline or into a barge with a special loading system. An example of a cutter suction dredge used in Myanmar is shown in Figure 5.



Figure 5 Cutter Suction Dredger with floating pipes

3. Mechanical Dredging

A backhoe dredger is a barge-mounted excavator for dredging. The barge is a self-propelled. A backhoe has a moderate production rate that scoop sediment only (very little water is retained). The backhoes employ an articulated excavator bucket mounted on an articulated boom and use hydraulically operated rams for movement, positioning and excavating. The material is excavated, brought to the surface and placed in the split barges for transport to the placement area. An example backhoe dredge is shown in Figure 6. An example of a backhoe dredge working with a split barge is shown in Figure 7.



Figure 6 DWIR Backhoe dredge



Figure 7 DWIR Split barge

4. DWIR Fleet of Dredgers, and preferred option for the Project

DWIR owns and operate a fleet of dredging equipment. The existing fleet consists of IHC dredgers and equipment from PR China. Information on the dredges and their environmental capacity is contained in Table 2 and Table 3.

Cutter Suction Dredgers

- CSD1700 type dredger
- CDS 600 type dredger
- Beaver-1500 type dredger
- Beaver-1200 type dredger
- Beaver-1000 type dredger
- Beaver-500 type dredger

Trailing Suction Grab Dredger

Trailing Suction Dredger

Backhoe Dredgers

Table 2 DWIR's Fleet of Dredgers

The majority of dredging will be conducted by a Cutter Suction Dredger (CSD) which has a better than average environmental reputation.

	Safety	Accuracy	Turbidity	Mixing	Spill	Dilution	Noise
Suction Dredger	+	-	+	-	-	0	+
Cutter Suction Dredger	+	+	0/+	0/+	0	0	+
Trailer Suction Hopper Dredger	+/0	-	-/0	-	0	-	+
Bucket Ladder Dredger	-	+	-/0	0/+	+	+	-
Backhoe Dredger	-	+	-/0	+	+	+	+
Grab Dredger	-	-	-/0	0	+	+	+

Table 3 Environmental aspects of standard dredging equipment.²

- '+' better than average;
- '0' about average;
- '-' below average; all qualifications seen as relative to other dredger types.

²Source PIANC EnviCOM report 100 'Dredging Management Practices for the Environment'.

III. Social and Environmental Management

1. Myanmar Environmental Impact Assessment Procedures

The Government of Myanmar has enacted legislation, rules and procedures in relation to the undertaking of projects in Myanmar. The principle piece of legislation in relation to environmental and social issues for projects is the *Environmental Conservation Law 2012*. Following the enactment of the law, the *Environmental Conservation Rules 2014* were published. On 29 December 2015, the Ministry of Environment, Conservation and Forestry (MOECAF) enacted and published the *Environmental Impact Assessment Procedures* (EIA Procedures - MOECAF Notification 616).³

The EIA Procedures, follow the Asian Development Bank model, and include three levels of assessment, these being exempt development; and projects that will have environmental and social impacts that would be ranked as Category A or Category B projects. The Environmental instruments required include Environmental Impact Assessment (EIA - also known as an Environmental and Social Impact Assessment); or an Initial Environmental Examination (IEE) respectively. The definition of Category A and B include in the EIA Procedures is similar to that included in the World Bank Environmental and Social Safeguards Policies. The Ministry of Environment, Conservation and Forestry (MOECAF) is in the process of developing specific procedures for project involving involuntary resettlement or impact indigenous peoples. In the meantime, the EIA Procedures require proposed projects to follow World Bank or Asian Development Bank procedures.

On February 25th, 2016, as documented in the meeting minutes, DWIR obtained clarification from MOECAF on how to apply the newly approved EIA Procedures to the Micro Projects. On the basis that the AIRBM Project has been approved by the cabinet prior to the issuance of the EIA Procedures, is following World Bank Safeguard Policies, the Micro project is small in scope, and given the urgency of completing the routine dredging activities before the end of the dry season, MOECAF advised DWIR to continue with the Micro Project following the timeline and procedures included in this ESMP. The draft Micro Project Environmental and Social Management Plan (ESMP) was presented to MOECAF, including results on consultations. MOECAF considered the draft ESMP technical content in line with the Myanmar EIA Procedures. MOT has sent an official letter requesting the Micro Projects be approved under Art 36 of the *Environmental Conservation Law 2012* with the final ESMP included for MOECAF's records.

2. Environmental and Social Baseline

2.1 Baseline Environmental and Social Characteristics at Pakkoku

Pakkoku Township lies to the north-east of the proposed dredging works. Extensive sand bars exist to the south of the channel. Vegetation on these sandbars is sparse and some areas are cultivated. Forest exists on the southern bank of the channel. A deep channel and pool lie to the north below a high floodplain levee. The floodplain here contains mixed forest, cultivated land and small settlements. During the teams site visit,⁴ approximately 20 vessels and fishing boats were moored on the river bank close to Kyattangone village. Wading birds and water fowl were observed in the middle channel. Mollusc shells were observed in the surface layers of the sand and silt on the sand. Small standings of higher plants and grasses were present.

³The AIRBMP ESMF includes a detailed description of Myanmar Environmental and Water Resources Management legal and institutional framework.

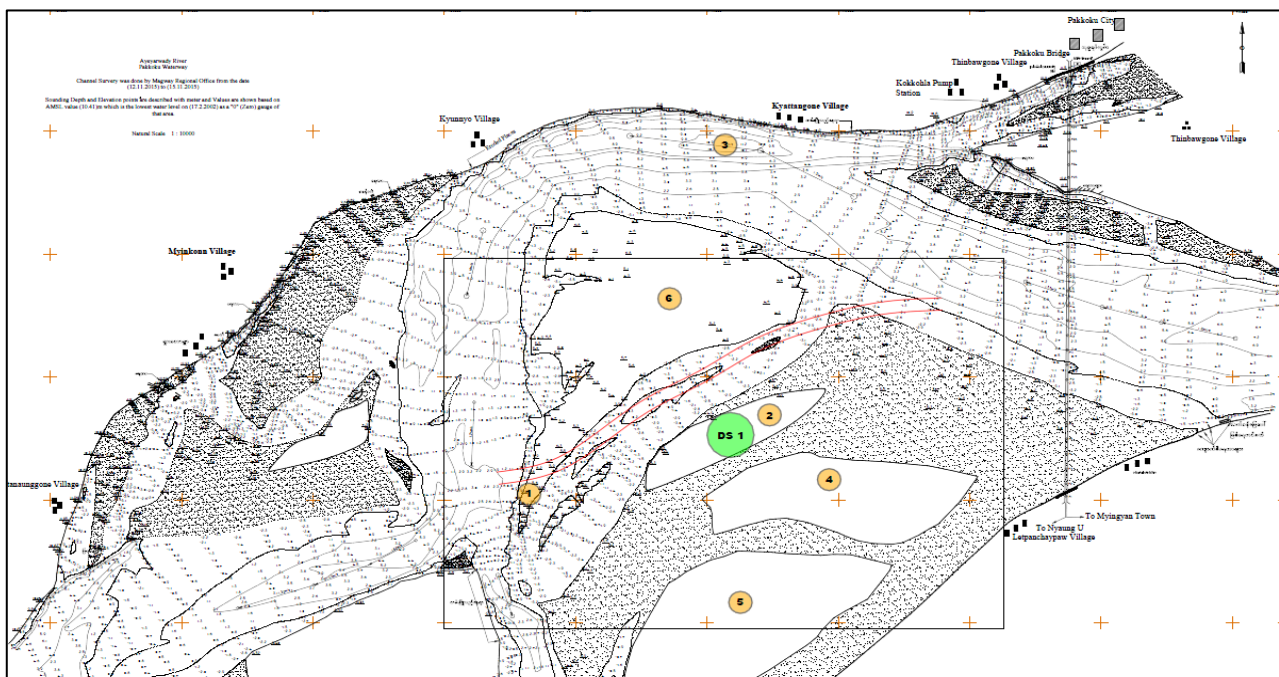
⁴ AIRBM Project Management Unit-DWIR, government officials from the Department of Fisheries, the Environment Conservation Department, and the General Administration Department visited the Micro-Project sites from January 11-15. Members of the WB AIRBM Task Team including an Environmental Specialist and Senior Transport Specialist, were accompanied by a Senior Environmental Specialist, a Senior Social Specialist and a Fisheries Expert also participated in the visit.

A temporary fishing camp is located at position (1). The camp is inhabited by three families (17 persons) that reported having permanent homes approximately 4km away on the floodplain to the south. The tender fishery, which expires on 31 March 2016, is operated during the dry season and catch rates peak in March when fish are migrating upstream. The fishers operate under one license although it would appear that the license is a rolling license that is renewed annually. The fishers indicated that they normally continue fishing in the area after the license expires. Fish are caught in bamboo and net barrier traps, and with gillnet and seines. Fishers reported landing a wide range of species and fish sizes. Species observed at the time of survey included *L. rohita*, Tilapia, Barbonymous, small cyprinids and *Mystus* catfish species.

The three families include a family of five (tender owner father, wife and three children aged nine to 17), a family of three (mother, father and child aged five), and a family of five (mother, father and three children aged one to eight). Three extended family including brother in law (23), wife (25) and cousin (27), live in the home of the tender owner. The community ranges in age from 42 to one year old. Of the 18 family members, eleven fish for their livelihood.

During baseline surveys an initial community consultation was undertaken. The main concerns of the families regarding the possible impact of the Micro project include impact to their temporary settlement due to dredging work, and decline of fish production, especially in the deeper pool between the upstream and downstream dredging areas. When asked, the fishers could not estimate their anticipated loss fully. The head of the families advised that they could easily relocate as theirs is a temporary camp meant to be dismantled during rainy season.

Figure 8 Pakkoku Micro Project with fishing camps and communities



2.2 Baseline Environmental and Social Characteristics at Nyaung U

To the north of Nyaung U there are extensive floodplains that are seasonally inundated to a depth of 0.5m-1m. Floodwaters deposit fine, mineral-rich alluvial silts supporting traditional and recession agriculture. Common crops include maize, beans, lentils, soybean, ground nuts, melon, and rice. Scrub, grass meadows, and gallery forest were also observed. Livestock (e.g. pigs, poultry and cattle) rearing is commonly practiced. Grasses are harvested for cattle food and firewood is gathered from the floodplain. Small species of mollusc were present in dredged material loaded into the hold of a split dredging barge observed operating close to location (13). An internalized floodplain exists to the east with an area of approximately 6 km². The floodplain supports cultivation and livestock rearing.

An estimated 40 to 50 small wooden motorized boats were observed within the 3 km radius of the Nyaung U Micro project. At least half appear to be engaged in fishing based upon observations of their activity or the presence of gears in the boat. Fishers mainly employ monofilament drift and stationary gillnets of varying mesh size to exploit the multi-species assemblage. Species caught include *Ompok*, *Mystus*, *Tilapia* and *Labeo* genera.

Fishing camps were observed on the south-east corner of the south island (see areas 3 and 7 in Figure 8). Recession agriculture was observed in the south-west and east part of the main sandbar (see area 9 in Figure 8).

Within a small inlet to the north of the mainstream, U Kyi Naing, a fisher, has developed what could be described as a unique aquaculture process. The fisher attracts the fish through feeding and during this process, nets the fish into the small inlet. The fisher then continues to feed the fish to the appropriate size and then harvests the fish. Further, local residents use the small inlet to access agricultural lands in proximity to area 4 in Figure 8.

In the south, the area is at a higher elevation, forming Nyaung U. Nyaung Oo town and Old Bagan are located to the south-west. Land use here is predominantly urban with notable cultural resources (e.g. shrines, pagodas) and is partly forested. Five villages are located on the floodplains to the north of the main channel and three villages exist on the southern shoreline.

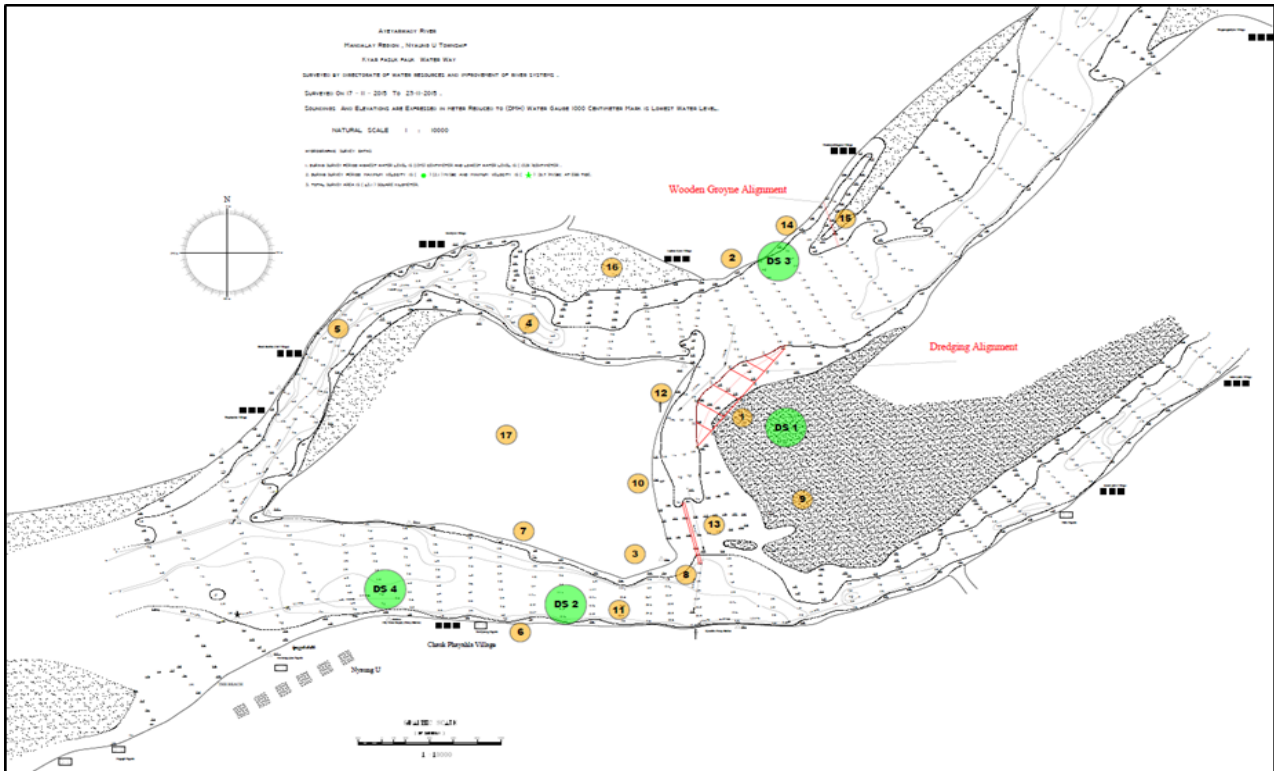
During the baseline surveys, a community consultation was undertaken. This included fishers at the Nyaung U waterway downstream site, farmers from Zeetaw, Yele kyun and Lapbankyun villages, and fishers with license issued by the Pakkoku Fishery Department.

In relation to the original proposal concerning the construction of the groynes, discussions were undertaken with: (i) Village Development Committee and people from Zee Daw Yele Lal kyun and Lapbankyun villages who use the inlet as a transport route for their village; (ii) Farmers and fishers along the river bank and near the groyne root; and (iii) U Kyi Naing from Htauk Shar Bin Village, Pakkoku Township who uses the area for fishing under his license.

From the consultations, it was apparent that the construction of the groynes as originally proposed could result in impacts in relation to access as well as restrict fish moving in and out of the inlet. The construction activities would be less of an impact on agricultural farmers as they indicated that they would harvest their crops by the end of February and they project materials will be transported by boat. By contrast, U Kyi Naing indicated that the noise of construction would scare the fish away and his income would be impacted. Other fishers did not consider that the groyne would impact on their livelihoods.

In relation to the downstream dredging, four communities consulted in areas (3 and 7) indicated that they plan to move out from the island by no later than the end of March and therefore it was unlikely that the dredging would impact them. In addition, the fishers consulted preferred to fish in the area of the deep pool (11) and normally do not fish in the shallow area where Nyaung Oo dredging is proposed. Additionally, there were fishers that used the island as a temporary day base. The fishers indicated that the dredging was unlikely to impact them greatly as they had other areas where they could establish their day camp and fish.

Figure 9 Location of Nyaung U



2.3 Fisheries Characterization at Micro Projects Site

Species observed during the field visits include *Labeo rohita*, *Tilapia*, *Barbonymus*, *Wallago attu*, small cyprinids and others belonging to *Ompok*, *Mystus* catfish species. According to the Department of Fisheries, these are presentative of the fish species present on the Micro Project sites. Based on consultation with fishers, the proposed dredge sites were not heavily utilized by local fishers and on this basis; it can be assumed that they are not important fisheries habitats. No catch per unit effort is available at the time of writing this Environmental and Social Management Plan.

According to IUCN (Smith 2004)⁵, there are no Threatened (Vulnerable (VU); Endangered (EN); or Critically Endangered (CR)) species of aquatic fauna or flora at the project locations.

It is unlikely that Irrawaddy dolphins, *Orcaella brevirostris*, are present at the Micro-Project site. According to IUCN, surveys undertaken between 1996 and 2003 indicated that the dolphin population, comprising about 60 individuals are concentrated in geomorphologically complex stretches of the Ayeyarwady with channel convergences, islands, and defiles. The surveys suggested that Mingun (just upstream of Mandalay) was the approximate downstream range limit for the species. Mingun lies some 150 km upstream from the Micro-project site. The upper range limit of the population is Bhamo (about 380 km upstream of Mandalay) where the course of the river is interrupted by rocks. Local Shan people call this 'Labine' or 'Dolphin Point'. An updated assessment in 2014 estimated that the dolphin population now comprises 63 individuals.

⁵ Smith, B.D. (2004) *Orcaella brevirostris* (Ayeyarwady River subpopulation). The IUCN Red List of Threatened Species 2004: e.T44556A10919593.

3. Environmental and Social Impacts and Mitigation Measures

3.1 General Impacts

Dredging can have a number of short term impacts including:

1. Disturbance and removal of benthic species and communities;
2. Short-term increases in the level of suspended sediment can give rise to changes in water quality which can affect aquatic flora and fauna, both favorably and unfavorably, such as increased turbidity and the possible release of organic matter, nutrients and or contaminants depending upon the nature of the material in the dredging area. It is noted that the Ayeyarwady River is a highly dynamic and ever changing environment and therefore turbidity and suspended sediment is naturally high; and
3. Settlement of these suspended sediments can result in the smothering or blanketing of benthic communities.

The Micro Projects consider the following mitigation and avoidance measures to reduce the impact of dredging and the construction of the groynes on the environment, including:

1. Undertaking dredging when flows are low to reduce the downstream impacts from suspended sediments;;
2. Weighing dredging disposal sites against sustainability criteria (see Annex 5);
3. Modifying the groynes design to allow access for small boats;
4. Relocating temporary structures for fishermen living in the floodplain to ensure they can maintain their activities; and
5. If monitoring shows that the groynes do not fulfill their functions, they can be easily dismantled. Given the small size of the works, no cumulative impacts outside of the immediate vicinity of the components are likely to occur.

In the context of an extremely dynamic river, the Micro Projects impacts are considered temporary and reversible and are not anticipated to result in unprecedented or significant loss. Moreover, mitigation measures are readily available and have been incorporated into project design. Fishers and their families have adapted to living on the constantly shifting flood plains along the Ayeyarwady and are well-accustomed to frequent moves. The Micro-Project could temporarily impact the access to livelihood of a small number of individuals, mostly fishers; however alternate sites that are regularly used by fishers are available during the period of dredging and therefore the micro projects are unlikely to have a major impact on the fisher’s livelihoods.

3.2 Specific impacts and mitigation measures by Micro Project Component

A risk assessment was undertaken to assess the likelihood (rare, unlikely, possible, likely, almost certain) and the consequence of each impact (trivial, minor, moderate, major, severe). From this, a significance value was attributed to the potential impact (low, medium, high and extreme). Mitigation measures are proposed for each site. The risk assessment indicated that with appropriate mitigations the micro-projects will have extremely minimal impact.

		Consequence				
		Trivial	Minor	Moderate	Major	Severe
Likelihood	Almost certain	L	H	H	E	E
	Likely	L	M	H	H	E
	Possible	L	M	M	H	E
	Unlikely	L	M	M	H	H
	Rare	L	L	M	M	H

Figure 10 Risk Assessment Matrix

Table 4 provides an overview of the likely environmental and social impacts (likelihood and consequence) for each component are summarized below along with the proposed actions to avoid or mitigate the impact. The risk is identified post avoidance and mitigation measures are included. Additional details are contained in Annex 1.

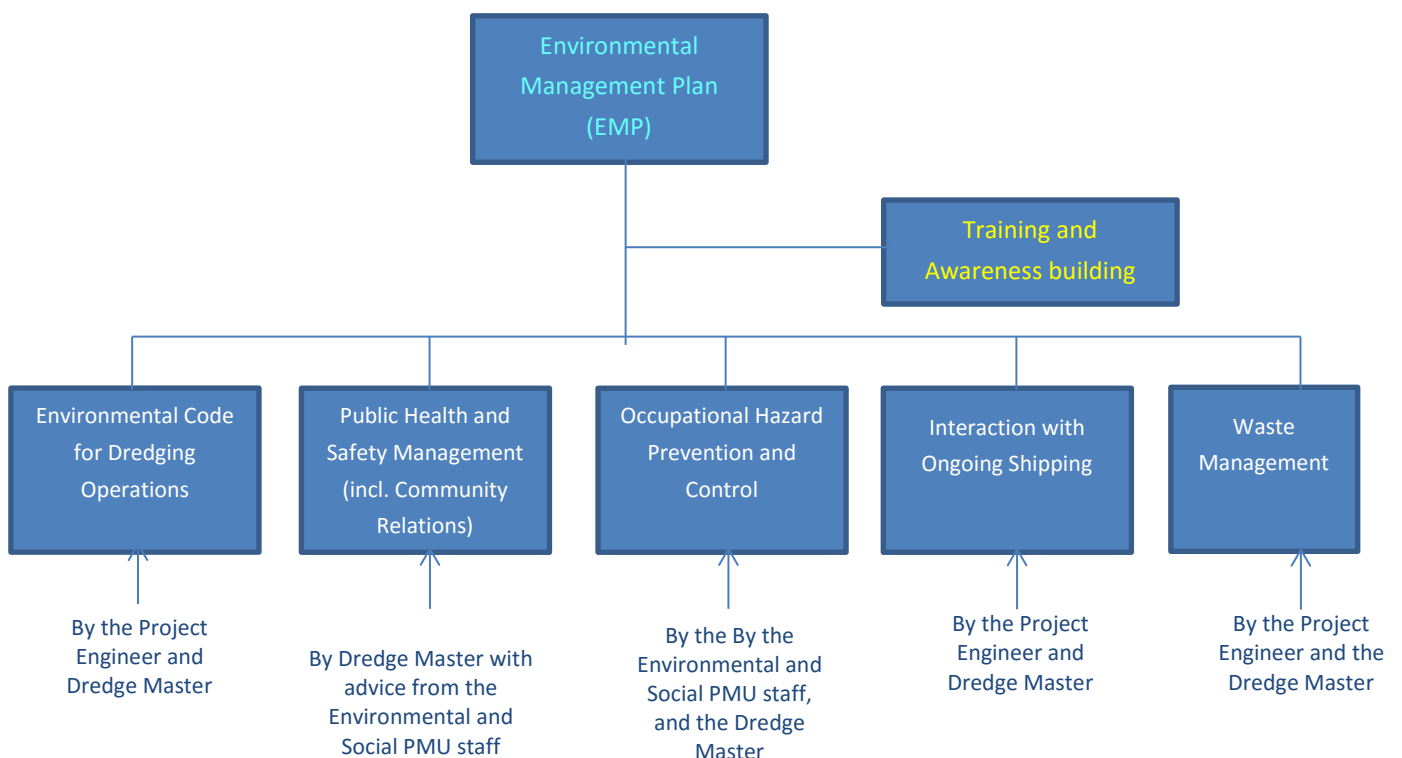
Comp . no.	Type of Works	Unmitigated Impacts	Probability Impact and Significance	Avoidance and Mitigation Measures	Probability Impact and Significance post measures
A	Wooden Groynes at Nyaung U Waterway	The micro-project was to construct the groynes from the river bank across the small inlet, over the sand island to the east and then into the main stream. The construction would have resulted in the loss of access to the inlet that is used by the local community. The construction of the groyne would have impacts on the local fisher undertaking an aquaculture scheme.	Almost Certain; Major; Extreme	The Groyne design has been changed so the groynes commence construction on the sand bar to the east of the inlet. This change in design allows for full access of boats and fish in and out of the inlet. The micro-project has prepared an ARAP to compensate for the temporary impacts on the fisher.	Rare, Trivial; Low
B	Dredging at Nyaung U (Northern Channel)	A tent was observed during on field trip on the disposal site; however it was not observed during a second field trip. This is quite normal for fishers to move their camp throughout the dry season. Agricultural fields were observed on the south west of the island.	Possible; Moderate; Medium	The dredged material will be disposed away from the observed agricultural fields. During consultations, project design was presented to local communities. Community was advised not to set temporary camping on the project site	Rare, Minor; Low
C	Dredging at Nyaung U (Southern Channel)	Dredging disposal could potentially affect a deep pool regarded by local fisherman as a good fishing spot.	Almost Certain; Major; Extreme	In order to preserve the deep pool, the dredged material will be disposed directly downstream.	Rare; Trivial; Low
D	Dredging at Pakkoku East Waterway (Upstream)	No social or environmental impacts are likely to occur.	Rare, Minor; Low		
E	Dredging at Pakkoku West Waterway (Downstream)	No environmental impacts were identified. There is the potential need to compensate three fishing families temporarily camping on the edge of the dredge site.	Possible; Moderate; Medium	The micro-project has prepared an ARAP to compensate for lost income due to disruption of fishing pool.	Unlikely, Minor; Medium

Table 4 Potential Environmental and Social Impacts for all components

4. Environmental and Social Management Plan

An Environmental and Social Management Plan (ESMP) includes: i) Project Description and rationale; ii) Analysis of environmental and social Impacts; iii) Mitigations Measures; iv) Monitoring Plan) Environmental Code of Practice for Dredging Operations adapted for a Myanmar context (Annex 2); vi) Guidelines for an Abbreviated Resettlement Action Plan (ARAP) - see Annex 3 and Annex 7); and vii) general guidelines for community consultation (Annex 4); viii) Annex 5 record of Public Consultations.

The ESMP identifies the principles, procedures and methods that will be used to control and minimize the environmental and social impacts of the construction and operation activities associated with the Micro Projects. The ESMP also covers how the dredge vessels, their crew and other aspects have to respond to certain standards of safety in order to avoid accidents and save life in case of emergencies.



As part of the continuous commitment to environmental and social performance for inland waterways projects, DWIR will ensure the following:

- a) Fulfill the environmental and social requirements included in this ESMP;
- b) Develop, promote and foster a shared sense of responsibility for environmental and social performance of the project;
- c) Promote environmental awareness and understanding among employees and contractors;
- d) Through training, identification of roles and responsibilities towards environmental and social management and linking project performance to overall environmental performance;
- e) Encourage an understanding of social and cultural sensitivities in local communities and the importance of minimizing project impacts on local lifestyles and culture;
- f) Monitor environmental and social performance throughout the project and implement an adaptive management approach to continuous improvement;
- g) Work with local communities and project-affected stakeholders to ensure that they benefit as a result of project development; and
- h) Maintain an on-going commitment to informing, engaging and involving local stakeholders.

5. Implementation Arrangements

The dredge master will be responsible for ensuring compliance with the ESMP. The dredge master will provide advice on effective environmental management of the project to the DWIR engineers and all construction site personnel. The dredge master together with PMU Environmental and Social Staff will ensure the environmental awareness of project personnel is maintained through appropriate training. A compliance report on mitigation measures will be submitted to DWIR by the site supervisor/PMU Social and Environmental Specialist at the beginning of the works, mid-term and at the end of the construction.

Environmental Code of Practices procedures provide a written method describing how the management objectives for a particular environmental element are to be obtained. They contain the necessary detail to be site or activity-specific and are required to be followed for all construction works. Site and activity-specific work plans and instructions are to be issued through the following methods:

Any incidents, including non-conformances to the procedures of the ESMP are to be recorded using an Incident Record and the details entered into a register. For any incident that causes or has the potential to cause material or serious environmental harm, the site supervisor shall notify DWIR as soon as possible. The dredge master must cease work until remediation has been completed as per the approval of DWIR.

A complaints register will be established to record any concerns raised by the community during construction. Any complaint will be advised to DWIR within 24 hours of receiving the complaint. The complaint will be investigated and following the investigation, if it relates to a significant incident, the matter will be referred to DWIR for commentary and/or advice.

In addition, the AIRBM PMU team includes two full time local environmental and social specialists and a part time International Safeguard Advisor. The AIRBM PMU will supervise the implementation of the works, and the interventions according to this Environmental and Social Management Plan.

6. Environmental and Social Monitoring Program

The Environmental and social monitoring plan includes the following criteria:

Physical Monitoring

1. DWIR to carry out a bathymetric survey of the dredging areas one year after to verify if the project geomorphological objectives were achieved.
2. DWIR to carry out a bathymetric survey of the dredge deposit site to observe the movement of the material and any potential impacts.
3. DWIR to carry out a bathymetric and water level survey of the North Channel to understand the impact of the groynes on the water level in this area.
4. DWIR to carry out a turbidity monitoring at least once a day during operations approximately 100 meters from dredging boat and compared with the baseline condition (i.e. before dredging). A Nephelometer or similar instrument should be used following standard procedures.

Biological monitoring

1. During construction and dredging operations, if dolphins are seen in close proximity, work shall be stopped until they have moved away from the area.

Social monitoring

1. ARAPs provide for monitoring of measures taken to address economic displacement of fishers and physical displacement of temporary fishing camps.
2. DWIR will register and address complaints from project-affected fishermen or other river/water users.
3. DWIR to monitor of the water way in the groynes during the low level water to confirm that public transportation from or to the village is possible through the structure.

7. Summary of consultations

DWIR led two rounds of consultations on the Micro projects. The first consultations was carried out in January 11th-13th, 2016, at the same time as the environmental and social baseline survey, and focused on project affected people. The second round of consultations, carried out on February 12-14 was expanded to key riverine villages. The consultations objectives were to inform the community of the proposed micro projects, record feedback and address concerns, and to incorporate communities' feedback into project design. During consultation, the team could observe the overall support of the communities to the Project. In addition, some key individuals were able to describe what they saw as the possible impacts of the Micro project on their livelihood. The technical description of the consultations is included in section 2 environmental and social baseline and a record of the Micro Projects consultations was included in Annex 6.

IV. Cost Estimates

1. Comparison the costs with Market Prices

It can be confirmed that the unit prices are calculated at the correct rate. At the time of writing (2 February 2016) the Government rate for Fuel Oil per Gallon is 3,200 Kyat, for Engine Oil per Gallon is 15,000 Kyat, for Hydraulic Oil per Gallon is 14,000 Kyat, and Grease per pound is 2,000 Kyat.

In their 2015 Feasibility Study Report of the Improvement of the Ayeyarwady River Navigation, Royal Haskoning Consultants used a **unit price of USD \$6/m³ dredging**. In the case of this Micro-Project the unit price maintained is **less than \$1/m³ dredging**. The reason for this is that the main costs are consumables. Capital costs for purchasing the equipment and depreciation are not included.

2. Summary of Construction and Dredging Costs

Micro Project	Description of Works	Volume of Works	Estimate Cost – Kyat	Estimated Cost - USD
A1	Wooden Groyne at Nyaung U	420m	112,883,277	87,000
A2	Wooden Groyne at Nyaung U	550m	138,823,087	107,000
B	Dredging at Nyaung U – Northern Section	286,000 m ³	319,263,144	246,000
C	Dredging at Nyaung U – Southern Section	290,000 m ³	342,317,716	264,000
D	Dredging at Pakkoku – Eastern Section	635,756 m ³	426,530,010	350,800
E	Dredging at Pakkoku – Western Section	177,700 m ³	231,287,100	190,200
			1,571,104,334	1,245,000

3. ESMP Implementation Costs

A. Site visits

Trip 1 At commencing of works (2 days) : PMU Environmental Staff (2); Airfare, Accommodation USD \$800

Trip 2 Mid way (2 days): PMU Environmental Staff (2); Airfare; Accommodation USD \$800

Trip 3 Finalization of works (1 day): PMU Environmental Staff (2); Airfare USD \$400

B. Training

Training on ESMP – On day workshop USD \$500

C. Monitoring Material

Water turbidity Monitoring USD \$500

Subtotal USD \$3,000

Contingency 15% USD \$450

TOTAL USD \$3,450

V. Conclusion

DWIR has a long history of undertaking dredging projects in the Ayeyarwady River to maintain safe navigation and more importantly, public safety when using the River. This ESMP has undertaken a systematic assessment of potential environmental and social impacts. Where impacts have been identified, the micro projects have been re-designed to avoid impacts. The micro projects impacts are considered to be temporary, small and reversible and mitigation measure are readily available. Importantly, the works are considered to be **dynamic, temporary and reversible**. This Micro Project is line with historical dredging and groyne construction undertaken by DWIR since 1972, but will be including for the first time environmental and social considerations included in the World Bank Environmental and Social Operational Policies and Myanmar EIA Procedures.

By complying with the ESMP, the Micro will achieve its objective to provide the people of Myanmar with safer for navigation while minimizing its environmental and social impacts.

ANNEX 1: RESULTS OF THE SOCIO-ENVIRONMENTAL SCREENING

Nyaung U

Environmental and Social impacts and mitigation measures

The groynes will cross a small inlet used as passage by the nearby Zeetaw, Yele kyun and Lapbankyun Village. The area also features a fishing camp operated as a baited fish trap (15) and a fishing camp (2) directly downstream. The original proposed groynes, while permeable and temporary to facilitate water flow, will restricted boat access to the nearby Zeetaw, Yele kyun and Lapbankyun village and reduce the ability of fishers to enter the channel. It is not expected that the groynes will cause the drying of the channel. Based on consultation with the local community, the groyne design was changed so as it commenced on the sandbar east of the inlet. This change avoided impacts and allowed free access in and out of the inlet. Further, the change allowed the fisher undertaking his aquaculture activities to continue these with relatively limited impacts except for noise during construction.

Construction materials will be transported mostly by boat, minimizing the use of the unpaved road crossing the agricultural fields in the mainland adjacent to the project area. The transportation of construction material could cause a temporary disruption of access to the channel but it is expected to be temporary and minor. Worker camps are likely to be located on the sand bar nearby the main channel, instead of on the agricultural land, to minimize disruption of agricultural activities in the area adjacent to the project. Worker camps will include sanitation facilities with refuse being transported from site via the vessel. There is the potential that some construction material could be deposited on the project area. The impact is expected to be low and temporary and the construction material will be removed after construction.

The impacts on ecosystem are considered low, due to the limited footprint of the construction in the context of the extremely dynamic Ayeyarwady River and its species. The Project could have minor impacts on nearby pools – which can be productive for invertebrates' production and may be feeding grounds for other species – but these impacts are not expected to be irreversible or significant.

The project has the potential to temporally disrupt the access to river in the fishing camp (2). The project will communicate the construction schedule to this fishing camp so they can plan accordingly. In addition, the proposed groynes construction could potentially affect the inlet operated as a baited fish trap (15). This fishing scheme is operated by a single fisher who regularly feeds the fish with agricultural byproducts and animal parts. As the water level decreases, the fisher closes the channel and charges other fishers to fish by the hour. The scheme was reported to be profitable by this particular fisher. This scheme is not supported by regular licenses issued by the Fisheries Department. Further consultations will be held to better understand the impacts on this individual fisher; however the groyne design has been changed to avoid any impacts.

Dredging activities

The dredging works are located downstream to the groynes in the center and on the left side of the river. The objective of the dredging is to provide a safer and more reliable navigation channel by increasing the depth of the channel. The dredging activities will be carried out in the period of two months utilizing a backhoe dredger with split barge and Cutter Suction Dredger.

Environmental and Social Impacts and mitigation measures

The main impacts associated with the dredging activities are the potential impacts of disposing of the dredged material. It is considered good practice to dispose of the dredging material within the river system so as not to cause a net loss of sediments. The micro-project has considered four feasible disposal sites (DS). The disposal sites for the dredging materials have been weighed against sustainability criteria (technical, economic, environmental and social). The DS-1 and DS-4 sites are considered optimal technical and economically while minimizing impact on communities and the environment.

Description of the Disposal sites

Site 1 (DS-1) is located on the sand bank in the middle of the river in close proximity to the dredge. The 286,000m³ of dredged materials could be deposited here.

There are a number of advantages of using DS-1. The site is very close to the dredging area, optimizing transportation costs and time. There is a large surface available for disposal with some small agricultural fields located in the south-west corner. It is likely there will be no impact on fishing communities or on areas under agriculture, which can be avoided. Ecological impact is considered reversible as the benthos community lost in dredging would probably recover in less than three years.

There are a number of disadvantages of using DS-1. The site is located upstream of the dredging area, so there is a possibility that the disposed materials may later migrate downstream into the dredged area. There is a fishing camp, a single temporary dwelling with a few livestock on the north of the area which could be affected; and accordingly, an ARAP has been prepared. Further, the cultivated areas in the south-west corner of the disposal site shall not be included in the disposal site as this could impact local farmers.

Site 2 (DS-2) is located south-west of the proposed dredging area and features a deep (21 meter) pool. No dredged materials will be disposed of in the deep pool, as it would appear this provides a critical refuge habitat for fish and other aquatic animals during the dry season, offering shelter from the flow and from predators, and possibly also providing a thermal refuge for some species. Deep pools are considered strategic refuge habitats in nearby similar ecosystems, such as the Mekong. Since the relative importance of this deep pool in the Ayeyarwady is unknown, the micro-project will take a precautionary approach and avoid this as a disposal area. However, some 80,000 m³ may be disposed at the transition area of DS2 and DS4, which further avoid influencing on the deep pool.

There are a number of advantages of using DS-2. This site is comparatively although further away than DS-1. While transportation costs are comparatively higher; this option is nevertheless feasible. Dredging materials will be deposited downstream of the dredging site, increasing the technical sustainability of the investment because the dredged material can migrate downstream, although it is unclear how the sediments will behave after disposal.

The disadvantages of using DS-2 include the presence of a potentially ecologically important deep pool. This particular site features an apparently high productivity in terms of reported fish catch and fishers using this area.

Site 4 (DS-4) is also located to the south-west of the proposed project site, although further downstream. The water depth is 4-5 meters and approximately 205,000m³ of dredged material could be deposited here. The advantages of using DS-4 include that dredge materials will be deposited downstream, increasing the technical sustainability of the investment. No deep pools exist in this location. The disadvantage of DS-4 is that it is the most expensive option in terms of transportation costs and time, however it is still a feasible option.

Site 3 (DS-3) is situated north-east of the proposed dredging site just downstream of the proposed groynes location. No dredged materials will be deposited hereto avoid impacting the fishing camp

which uses DS-3 as a put in point to access the river. Access could be limited during dredging activities. It is unclear how the sediments will behave after disposal but there is likelihood that the sediments could affect a channel with some deep pools directly west to the project site, or even be re-deposited in the dredged area in the south east.

The environmental impact of disposing the dredging material in DS-1 (286,000m³) and DS-4 (285,000m³) is considered small scale, localized and reversible. DS-1 specifically excludes an agriculture area and DS-4 specifically excludes a deep pool area to minimize impacts on the nearby community (including farmers, fishers) and the environment.

Agriculture and fisheries: Part of the DS-1 disposal site is used for agriculture. The project will use a specific area to avoid any impacts on agriculture. There is a small fishing camp near the disposal area and close to the dredging works, which includes a single temporary dwelling with livestock. An ARAP has been prepared to further understand the impacts to these individuals and compensate them appropriately as required. The dredging area does not appear to be significant for fishing; however some minor fisheries activities were observed along the shore. Access-related impacts to this area are considered temporary and after the dredging activities the fisheries may resume.

Water quality: Dredging activities and disposal could temporarily increase turbidity. The Ayeyarwady River is the fifth larger river in terms of sediment load and turbidity is normally high in the river. Observation of dredging activity underway in the vicinity did not show a significant increase in turbidity.

Fish populations: The proposed disposal sites do not feature significant characteristics in terms of important or critical habitats. The nearby fisher community did not consider these sites particularly important in terms of their fish catches.

Benthos: Impacts are likely to be temporary and highly localized. Research indicated that the benthos will recover quickly through recolonization. It is not expected that the loss of benthos will cause an irreversible or notable impact on the ecosystem. No mitigation is proposed.

Sediment composition: Dredging material observed consist mainly of sand with a small amount of silt. No gravel or clay was observed in the analysis of sediment samples obtained during the site visit.⁶ Sand material generally had a minimum capacity to retain pollution including heavy metals. No industrial activities are located near the site. The nearest industrial zone is located in Mandalay, over 100km upstream the project area. Mining activities are mostly located significantly further upstream near the border with China, although a few small scale placer mining vessels were observed during the field visit.

Threatened or endangered species: According to IUCN, there are no other Threatened (Vulnerable (VU); Endangered (EN); or Critically Endangered (CR)) species of aquatic fauna or flora at the project location. The range of the population of the Critically Endangered Irrawaddy Dolphin is reported to now lie between Mingun and Bhamo (about 380km upstream of Mandalay). The project itself has a low potential of direct injuries to these animals but may have temporary effects on habitats and/or migration due to increased turbidity and noise.⁷ Visual observations will be undertaken during dredging to ensure no Irrawaddy Dolphin are within proximity of the dredge when it is working.

⁶ The AIRBM project is supporting the Ayeyarwady State of the Basin Report (ASoBR), aimed at laying out the environmental, social and economic baseline of the entire basin. The ASoBR is expected to be finalized by mid-2017, and will inform the Ayeyarwady River Basin Management Plan. It is expected that as part of the ASoBR a more comprehensive sediment and water quality survey will be carried out.

⁷ It is expected that the ASoBR will help to describe the ecological status of the River as well as identify critical ecosystems.

Pakkoku Dredging Activities

The Pakkoku sub-project is a stretch of the river some 3.5km long which is located about 1km downstream of the Pakkoku Bridge. The objective of the sub-project is to open up a secondary channel so that the river will naturally scour a new east-west alignment by dredging the most easterly side of the channel. The amount of dredging material in total is around 813,500m³. The dredging will be carried out over the period between late March and June 2016. The disposal site is on the existing island located directly to the south of the dredged area. There is no cultivation or vegetation at the disposal site. A backhoe dredger and a cutter suction dredger with pipes will be utilized to undertake the dredging. There is a seasonal fishing camp holding a temporary fishing license. An ARAP assessed the likely impacts and provided a compensation scheme.

Environmental and Social Impacts and mitigation measures

Fisheries: The Ayeyarwady River in this section is more than 3km wide, and the habitat for fish is diversified. The impact on fisheries is considered extremely minor as the channel does not feature any sites significant for fisheries such as deep pools, spawning areas, or significant vegetation.

Benthos: Impacts are likely to be temporary and highly localized. It is not expected that the loss of benthos will cause an irreversible or notable impact in the ecosystem. No mitigation is proposed.

Sediment composition: Dredging material consists mostly of sand with a small amount of silt. No gravel or clay was observed in the analysis of sediment samples collected during the site visit.⁸ Sand material generally has a low capacity to retain pollution including heavy metals. No industrial activities are found near the site. The nearest industrial zone is located in Mandalay, over one hundred kilometer upstream the project area. Mining activities are mostly located farther upstream in the border with China, although some small scale placer mining operations on mounted on small vessels was observed while travelling on the Ayeyarwady River.

Threatened or endangered species: Please refer to the information contained for Nyaung U.

Livelihoods: The dredging site features a temporary fishing camp comprised of four family groups (25 people). The fishers at this camp hold a tender license reportedly valued at 2.5 million Kyats (approximately \$2,000). Peak fishing yields are anticipated in March, which could coincide with the commencement of dredging work. The micro-project could potentially affect this community's livelihood for the remaining of their fishing license and could require compensation including possible assistance to return to their permanent houses. This impact will be addressed in conformity with World Bank OP 4.12 (Involuntary Resettlement) and the project ARAP. Given the small number of people affected, an ARAP has been prepared to compensate the tender-holder and camp members.

Environmental and Social Monitoring Program

Physical Monitoring

During the dredging campaigns and after the event, the following will be physically monitored:

- (a) Bathymetric survey of the dredging areas one year after to verify if the project geomorphological objectives were achieved;
- (b) Bathymetric survey of the dredge deposit site to observe the movement of the material and any potential impacts;
- (c) Bathymetric and water level survey of the north channel to understand the impact of the groynes on the water level in this area; and

⁸ The AIRBM project is supporting the Ayeyarwady State of the Basin Report (ASoBR), aimed at laying out the environmental, social and economic baseline of the basin. The ASoBR is expected to be finalized by mid-2017, and will inform the Ayeyarwady River Basin Management Plan. It is expected that as part of the ASoBR a more comprehensive sediment and water quality survey will be carried out.

- (d) Water Quality: Turbidity monitoring should be undertaken at least once a day during operations approximately 100m from dredging boat and compared with the baseline condition (i.e. before dredging). A Nephelometer or similar instrument should be used following standard procedures.

Biological monitoring

During construction and dredging operations, if dolphins are seen in close proximity, work shall be stopped until they have moved away from the area.

Social monitoring

During the dredging campaigns and after the event, the following will be adhered to:

- (a) ARAPs provided for monitoring of measures taken to address economic displacement of fishers and physical displacement of temporary fishing camps;
- (b) Complaints from project-affected fishers or other river/water users will be registered and addressed; and
- (c) Monitoring of the water way in the groynes during the low level water to confirm that public transportation from or to the village is possible through the structure.

ANNEX 2: ENVIRONMENTAL CODE OF PRACTICE FOR DREDGING

Good industry practice involves minimizing the impacts at and near the dredging and disposal sites. It is expected that the forward-looking DWIR will be committed to continuous improvement through a total quality management approach.

The persons in charge will be the Site Supervisor/Project Engineer and Dredge Master.

a. Public consultation

It is essential that the DWIR discusses the dredging proposal with all parties in the surrounding communities, as early as possible as has been undertaken in the preparation of this ESMP. The DWIR has consulted with people most likely to be affected, whether or not they have been asked to give formal notice and/or consult with these people by the responsible planning authority. Effective public consultation takes time, and accordingly, the AIRBMP commenced consultation with communities in late 2015. More precise instructions are included in the Public Health and Safety Management (incl. Community Relations)

b. Minimize the Need for Dredging and Spoil Disposal

The proposed amount of dredging has been justified. As dredging is costly, DWIR needs to make a strong economic incentive to minimize dredging while at the same time ensuring safe navigation and public safety. A satisfactory means of disposal of spoil from dredging must be determined before the works are approved. Erosion in catchments is a major source of sediments that must eventually be dredged from rivers. All recognize that controls on inputs from catchments are largely outside the control of dredging proponents, but all options to reduce inputs should be explored.

Any increase in the depth and width of channels should be justified. The amount of dredging and the volume of spoil also depend on the width and profile of channels. In this case, namely shipping channels, these are determined by Classification Standards. The depths and widths of channels maintained for small vessels must also be justified in terms of the needs of the local boating community. Where there is evidence that realignment of a channel would reduce the need for maintenance dredging, this option will be investigated.

c. Double handling of spoil

Discharged spoil at a temporary spoil site before it is removed and placed at its final disposal site should be avoided, as this method typically doubles the bed area impacted by spoil. Where a temporary disposal site can be confidently confined to an area of low environmental value or to an area that will soon be dredged anyway, use of such a temporary disposal site may be acceptable. Double handling of spoil is also acceptable where there is no practical alternative, for example, where a land disposal site is beyond pumping distance of a dredger and sediments must be dried before transport to their final destination.

d. Minimize Physical Effects of Spoil Disposal

The total area covered by spoil should be minimized. The selection of appropriate dredging and disposal methods is critical to achieving this objective. The volume of spoil to be placed on a spoil ground should be estimated, including an allowance for over-dredging and bulking.

e. Beneficial Use of Spoil

Whenever possible, dredge spoil should be treated as a resource. At an early stage in the planning of each dredging project, any beneficial uses that may be appropriate for the spoil should be identified. To date, beneficial uses that have been found for spoil include land reclamation for port development, construction material, raising the level of residential land. In general, coarse grained sediments are suitable for a wide range of beneficial uses; however fine-grained dredge material may only be suitable for lightweight structures that require only weak foundations. Contaminated spoil is not suitable for many beneficial uses. Logistical factors that need to be considered include distance between the dredging project and the proposed beneficial use, site accessibility, dredging equipment required versus equipment required to transport material to site, size of project versus size of disposal site or beneficial use, and the compatibility of timing between the needs of the beneficial use and the need for dredging. Where disposal is to land, there must be a site near the dredge site suitable for sediment dewatering where the high salt content of the sediment and leachate will not cause other environmental problems.

f. Timing of Dredging

If possible, dredging should occur when the environment is least vulnerable. Dredging in particular seasons may have impacts on aquaculture operations and fish communities. Impacts on other biota can be minimized by careful timing of dredging.

g. Optimize Dredging and Disposal Methods

The dredging and disposal methods selected often have a very large effect on the environmental outcome of a dredging proposal. Methods chosen affect:

- (a) the physical effects of spoil (spoil fluidity, spoil ground stability; area impacted by spoil);
- (b) the effects of sediment contamination (confinement of contaminated spoil, material handling problems with contaminated spoil); and
- (c) water quality (turbidity, contaminant release).

The type of dredge chosen for the work should be justified for each project, particularly those involving fine or contaminated sediments. The work method chosen is often the key decision as far as the cost and the environmental outcomes of a dredging project are concerned; it should therefore be taken with some care. In large dredging projects, there is often greater flexibility in choice of method, as dredges must normally be brought from overseas. In addition to any other environmental standards, the proponent's preferred dredging method(s) and disposal method(s) should be discussed.

The most appropriate disposal site depends on both environmental impacts and costs. The degree of contamination is a major factor in site selection, as the impact on the disposal site and the likely cumulative impacts of its continued use can be significant. The three broad alternatives are:

- (a) disposal back into the river;
- (b) disposal in bank enclosures; and
- (c) disposal to land.

Near-bank enclosures are considered as a means of dewatering sediment prior to land disposal. Land disposal is preferable where spoil is seriously contaminated, and when fine sediments are likely to impact sensitive marine environments. When chemical contaminants exceed the low screening level, and toxicity, an assessment of the costs and benefits of a range of disposal options, including land disposal may be required. When chemical contaminants exceed the maximum screening level, DWIR will be required to assess the costs and benefits of a range of disposal options, including land disposal. For land disposal to be practical when using a cutter suction dredge, a site must be available and meet the following requirements:

- (a) Occur within approximately 4 km;
- (b) Have little value in its existing state;
- (c) Be able to be secured so that quicksand-like properties of fine sands present no safety risks;
- (d) Be acceptable to remain in a degraded state for up to 12 months if not becoming submerged;
- (e) Be sited so that it is practical for the water to be discharged back into the river; and
- (f) Be acceptable to the informed public (considerable consultation with those parties that may be affected is necessary).

h. Noise Reduction

Because of the high potential for noise to affect riparian population, management should give high priority to liaising with the local community so that it can be aware of, and resolve noise issues. The disturbing effects of noise depend on the level of the noise and its character, such as tones, intermittency, etc. Higher-frequency tones are more disturbing than lower-frequency tones. Lower frequency tones are not easily controlled and can penetrate houses. Noise can cause physical and psychological stress in both employees and riparian population. Noise may also disturb animals, but the extent of disturbance is difficult to estimate.

Major noise sources may be:

- (a) engine noise;
- (b) generators;
- (c) opening and closing gates;
- (d) radios; and
- (e) reverse warning devices.

Noise abatement can often be achieved by relatively simple measures, such as:

- (a) fit efficient muffling devices to all engines;
- (b) locate noisy equipment away from potential sources of conflict or behind sound barriers;
- (c) use enclosed generators;
- (d) position access and exit points away from sources of conflict;
- (e) use optical alarms in preference to audible alarms; and
- (f) Limit operations to between 0700 and 1800 if other noise mitigation measures are inadequate, and if the riparian community is complaining.

Public Health and Safety Management

Public health impacts are mainly generated during the dredging/excavating activities. In general, the dredging/excavating will generate suspended materials, dust and noise, can cause harmful effects on health safety of local communities, and could hinder ongoing river transport. The steps below need to be followed, and planned well in advance.

The persons in charge will be the Health and Safety Officer, and Medical Service Provider, assisted by a Communications Officer.

a. Public Consultation and Community relations

DWIR shall:

- (a) Maintain open communications with the local communities;
- (b) Disseminate project information to the communities (for example local authority, enterprises and affected households, etc.) through community meetings before dredging commencement;
- (c) Inform local residents about dredging and work schedules, interruption of services, traffic management routes as appropriate;
- (d) Provide a community relations contact from whom interested parties can receive information on the site activities;

- (e) Provide all information, especially technical findings, in a language that is understandable to the general public;
- (f) Monitor community concerns and information requirements as the project progresses, and respond in a timely and accurate manner;
- (g) Limit construction activities at night. When necessary ensure that night work is carefully scheduled and the community is properly informed so they can take necessary measures;
- (h) Inform the community at least a week before the works start if the pipe installation work caused disruption to existing infrastructure, resources or public services. When the dredging is completed, the contractor will restore all positions; and
- (i) notify the users of river water for drinking, agriculture and aquaculture activities of the land surrounding at least a week before dredging and address any concerns to satisfy the requirements of supervision.

b. Public Health Management

DWIR shall:

- (a) Provide periodical health check to construction workers to ensure their health and well-being, and avoid possible transfer of disease including respiratory diseases such as tuberculosis, or STDs such as HIV/AIDS;
- (b) Dredgers shall be off-limits to non-workers, warning signs shall be conspicuously posted along the site periphery; and
- (c) Disposal sites of dredged material shall be off-limits to people.

c. Workers Health and Safety Management

DWIR shall:

- (a) Provide appropriate information and education to the workforce on basic personal hygiene;
- (b) Provide periodical health check to construction workers to ensure their health and well-being, and avoid possible transfer of disease including respiratory diseases such as tuberculosis, or STDs such as HIV/AIDS;
- (c) Before the operations, identify the local clinics to evacuate the victims to when accidents happen. Ensure a speedboat is close at hand to bring the victim to the shore.
- (d) Provide basic first aid services to the workers as well as emergency facilities for emergencies for work related accidents including medical equipment suitable for the personnel, type of operation, and the degree of treatment likely to be required prior to transportation to hospital;
- (e) Replace expired medicines and supplement new ones;
- (f) Ensure there is plenty of drinking water, and of good quality, check every 2 days;
- (g) Provide adequate sanitary facilities including bathrooms, toilets (with septic tank) for the workers at the construction site and on board the dredgers;
- (h) Include a Pest Control for the construction areas, including construction work camp; and
- (i) Ensure correct maintenance of water and water treatment plants to prevent the breeding of mosquitoes.

d. Work Force and Workers Camp

DWIR shall:

- (a) Be encouraged to hire local labor to carry out simple manual works
- (b) Not hire children;
- (c) Register the temporary residence of the engineer and workers with the local authority;
- (d) Whenever possible, rent houses nearby. Otherwise, suitable accommodations will be provided for the workforce. Workers' camps will be located at appropriate areas away from villages, and schools;
- (e) Camp areas shall be located to allow effective natural drainage;
- (f) Provide potable water safe for human consumption at camps, site offices, and other areas;
- (g) Provide a medical and first aid facilities and first aid boxes in each camp site;

- (h) Make available hygiene facilities in the camps;
- (i) Not allow cutting of trees for any reason outside the camp site;
- (j) Not allow hunting, fishing, wildlife capture;
- (k) Not allow use of firearms (except authorized security guards);
- (l) Not allow use of illegal drugs
- (m) Not allow doing maintenance (change of oils and filters) of cars and equipment outside authorized areas:
- (n) Not allow disposing trash in unauthorized places;
- (o) Not allow driving in an unsafe manner in local roads; and
- (p) Ensure that the land will be returned to the public or landholder who can then resume the former productive use of the land. As such, the contractor should remove all equipment, structures, rubbish and obstructions and restore the land to its condition prior to use for construction. The contractor will also be responsible to repair the damages.

e. Cultural Integration and Moral Code of Conduct

DWIR shall:

- (a) The ship's crew and workers shall never disturb the local communities;
- (b) Organize awareness programs on communication and social disturbances that may result from bad manners from construction workers or crew;
- (c) Update knowledge on HIV/AIDS for the collective of workers in the field.
- (d) Establish a Code of Conduct to outline the importance of appropriate behavior, drug and alcohol abuse, respect for local communities, and compliance with relevant laws and regulations. Each employee shall be informed of The Code of Conduct and bound by it while in the employment of the DWIR;
- (e) DWIR shall contact the local community to determine if there are important historical or cultural locations to avoid damage to the area;
- (f) DWIR shall have an agreement with Chief of the local communities on the evaluation and use of local resources;
- (g) Limit or control disposal of dredge material or waste near the garden, fields and water sources.
- (h) Ensure that no worker conduct fishing with nets, mines, or electrical impulses;
- (i) Prohibit consumption of wild animals/wild animal products;

Occupational Hazard Prevention and Control

Dredging activities are considered hazardous and risky. Accident can happen and workers who are not trained, do not wear protective clothing or who are not prepared well are more vulnerable, and can become victims of accidents.

The person in charge here will be the Health and Safety Officer (HSO) and Dredge Master.

a. Directly related to the Work Force

DWIR shall:

- (a) Ensure that the HSO and assistants must be present in the project area at all times;
- (b) The HSO will supervise occupational safety every day;
- (c) Provide information and training session about labor risks to the workers by DWIR;
- (d) Prohibit use of illegal drugs/alcohol on board;
- (e) Any problem that occurs must be solved and recorded by the HSO;
- (f) Provide personal protective equipment (PPE) to protect worker health and safety such as hardhat, goggles, gloves, insulated shoes, steel-toed boots, eyes protection glasses (for welders), toxic/dust face mask, respirators for construction workers and enforce their use. DWIR will ensure the workers wear the adapted protection equipment and know how to use them. Priority is given to collective protection means when possible;

- (g) Safety rules/recommendations will be permanently screened on board and explained to the workers. Regularly training session must be organized;
- (h) Ensure that all equipment, vehicles operating in the construction should be registered and have operational permits. DWIR should ensure all vehicles are functional and maintained regularly;
- (i) Electricity plugs used outdoor need to be water-resistant and splash-proof;
- (j) In case of heavy rain, difficult working conditions, bad visibility or an emergency situation, the operators will suspend all work;
- (k) In case of working at night, the contractor will install the lights; and
- (l) Ensure to have the following types of insurance:
 - (i) Insurance for all risks in construction;
 - (ii) Insurance for laborers;
 - (iii) Insurance for responsibility of the third party; and
 - (iv) Insurance for vehicles, equipment.

b. Related to the Vessel and Equipment

DWIR shall:

- (a) Do regular maintenance and repair schedules for equipment and implement as required;
- (b) Regularly check technical and operational specifications of all machinery, both directly and indirectly taking part in activities;
- (c) Ensure that any lifting equipment and cranes should be located on the ground with solid structure or on a floating system with sufficient pressure bearing capability, be stable and be anchored by firm anchoring system;
- (d) Ensure that transferring, handling and storage of equipment and supplies should be conducted carefully during construction; ensuring items are able to bear weights and are not affected by components under construction or still to be built;
- (e) Ensure that electricity cables serving construction and residential quarters must be located in appropriate locations, unaffected by working equipment. At working locations, ground wire and automatic circuit breakers must be installed. Electric cables must be sized to provide sufficient handling capacity. Joints of electric cables must be appropriately joined and sealed with insulated waterproof materials. Electric equipment must have signs, ground wire and appropriately shielded;
- (f) Use waterproof/outdoor plugs and lights;
- (g) National certificates (safety construction, safety equipment, load lines, ship safety, safe manning, etc.) for inland waterway vessels for class, tonnage, construction and equipment must be on board and must be valid;
- (h) Crew certificates must be on board and must be valid;
- (i) Life-saving appliances (life buoys, life jackets, etc.) must be in a good state, sufficient quantity and accessible according to national regulations;
- (j) Complete system of life-saving appliances must be fully checked before the dredging operations;
- (k) Fire-fighting equipment (fixed and portable fire extinguishers, fire hoses, fire hydrants, fire boxes, fire alarms, fire pumps, muster list, etc.) must be in a good state, sufficient quantity and accessible according to national regulations;
- (l) Complete system of fire-fighting equipment must be fully checked before the dredging operations;
- (m) Where applicable smoking requirements, "No smoking" signs, are posted and well known by crew. Designated areas are known;
- (n) There are no slippery surfaces on deck and in the engine room;
- (o) The lights on deck and in ER provide sufficient light for safe working on deck and in engine room;
- (p) Executing hot works (like welding) must be planned in advance, with permission;
- (q) Executing hot work in enclosed spaces need special attention from the responsible officer;
- (r) Stairs, handrails or walkways satisfactory condition;
- (s) All manholes are fully bolted;

- (t) There is a bilge alarm available and in good working order;
- (u) Bilge in the engine room is not full and contains no or only small amounts of oil or sludge;
- (v) There is evidence that bilges are **NOT** pumped overboard;
- (w) There is a main fuel emergency stop;
- (x) Emergency exits are clearly marked;
- (y) The engine room alarm is available and in good working order
- (z) Main and auxiliary machinery are satisfactory. Propulsion engines and generators are well maintained;
- (aa) Steering gear satisfactory;
- (bb) Anchor winches and mooring ropes in good condition;
- (cc) The general alarm is available and works properly;
- (dd) The vessel is equipped with an emergency steering device and instructions how to switch over from normal to emergency steering; and
- (ee) Emergency Preparedness is there: musters, exercises, equipment ready in case of man-over board, fire, grounding, pollution, collision, abandon ship, etc.

Interaction with Ongoing Shipping Activities

Dredging is taking place in a busy shipping route. Therefore navigation of the ongoing traffic should not be disturbed or endangered. Certain preparations and procedures need to be followed.

The persons in charge will be the Project Engineer and Dredge Master.

DWIR shall:

- (a) Place warning signs for speed limit, before and after dredging area and traffic adjustment;
- (b) Installation of signage for dredging operations;
- (c) Carefully check the anchor system of floating equipment and vessels and signal systems such as floating beacons, signs, and signal lights both on the river and on shore;
- (d) Ensure that other vessels do not moor alongside the dredge or close to the site works during the course of construction;
- (e) Identify the boundaries of the dredging site and install appropriate signage. On the river side, appropriate signs and navigation aids should be placed to define the navigation channel area and ensure navigation safety. It is critical to keep vehicles or shipping from entering the construction area, interfering with construction activities or endangering workers.
- (f) Coordinate with the Inland Waterways Administration, provincial Ministries of Transport and relevant River Management Stations to ensure navigation safety in relevant areas of the river;
- (g) Ensure that shipping is not inadvertently diverted to non-navigable areas or involved in accidents;
- (h) Ensure that river traffic is controlled using buoys and lights to ensure vessels can operate safely;
- (i) Ensure that anchored vessels and other equipment do not impede passing vessels;
- (j) Ensure that the vessels must be located, with appropriate safety equipment according to current regulations and instructions.
- (k) Ensure that all barges to transport dredged materials, tug boats and other vessels related to dredging will be equipped with signal light while anchoring and moving on the river, pursuant to the rules and regulations; and
- (l) Coordinate with Waterways police and River management stations to regulate traffic properly during the construction process. All vessels should strictly follow river traffic laws and regulations.

Waste Management

The crew and shore personnel should be made aware of the consequences of pollution, the importance of pollution prevention, the necessity of garbage disposal ashore and the need to separate the garbage. Compliance of the vessel with local regulations regarding waste disposal should be verified on board.

On a ship, oil leaks from engine and machinery spaces or from engine maintenance activities and mixes with water in the bilge, the lowest part of the hull of the ship. Oil, gasoline, and byproducts from the biological breakdown of petroleum products can harm fish and wildlife and pose threats to human health. Even in minute concentrations, oil can kill fish or have various sub-lethal chronic effects. Bilge water also may contain solid wastes and pollutants containing high amounts of oxygen-demanding material, oil and other chemicals. Different studies have indicated that about 1% of the daily marine diesel oil consumption leaks in the bilges of the engine room of the barges and mixes up with water, the so called bilge water or sludge.

The Project Engineer or Dredge Master should explain the different methods for dealing with waste and motivate crew and shore personnel to cooperate.

a. Waste Management

DWIR shall:

- (a) Ensure that the bilge content from the engine room should be pumped over to a slop tank or other means, which should then be pumped ashore to a reception facility. In a typical vessel, the main sources of contamination in bilge water and bilge holding tanks include:
 - (i) Sludge from decanting/bottom draining storage and sludge tanks. Lube oil and fuel oil purification (oily water);
 - (ii) Fuel oil storage and settling tanks (oily water);
 - (iii) Lube oil and fuel oil filtration (oil);
 - (iv) Machinery leakages;
 - (v) Condensate from air compressors and compressed air systems;
 - (vi) Equipment and engine-room washing;

Some or all of these contaminants can be present in the bilge at any time. Solvents, detergents, and soot are often found after equipment cleaning in machinery spaces. Iron oxide particles and biological are common in older ships (leaking pipes, rusting equipment and hull) or when bilge treatment systems have not been operated regularly.

- (a) Ensure that dangerous and hazardous goods such as diesel oil and gasoline are stored properly and have warning signs;
- (b) Post prohibition signs for waste disposal into the river;
- (c) Put garbage bins at various relevant locations on board;
- (d) Put oil drums to collect used oil and other harmful liquids and make provisions to limit the impact of (small) oil spills resulting from leaks;
- (e) Dispose hazardous wastes in authorized disposal facilities;
- (f) All construction waste in the site will be collected in bins and will be transported to the designated garbage sites at least twice per week;
- (g) Domestic waste shall be transported to the approved refuse disposal site in covered containers or trucks;
- (h) Metal waste could be collected by a contract buyer; and
- (i) Areas designed for fuel transfer (truck to vessel) for bunkering or cargo operations, or considering waste, require additional provisions and equipment to prevent oil spills including drip trays, drums with lids to collect oil contaminated rags, contaminated saw dust as well as drums to collect small amounts of cargo (gasoline, oil) that ends up in the drip tray when connecting or disconnecting the cargo hose.

b. Carriage and Handling of Dangerous Goods

DWIR shall

- (a) Located the Dangerous Goods in a place so that management and/or security personnel may keep them under continuous observation;
- (b) Dangerous goods cargo areas should have separate areas with all necessary facilities appropriate to the hazards emanating from the cargoes that are stored. Where appropriate these facilities should include separate ventilation, drainage, fire resistant walls and ceilings;
- (c) Dangerous cargo areas should be so constructed that in case of emergency, adequate access is provided for handling equipment, emergency services, etc;
- (d) Adequate emergency facilities should be provided. These facilities should be appropriate to the hazards of the dangerous cargoes to be stored/handled;
- (e) Special areas for damaged dangerous cargoes and waste contaminated with dangerous goods should be provided. These areas should be covered, have a sealed floor or ground, separate drainage systems with shut-off valves, sumps or basins and means to discharge contaminated water to special facilities in order to safeguard the port area and the environment;
- (f) The port operator should ensure that areas where packaged dangerous goods or cargo transport units are kept are properly supervised and all packages and cargo transport units are regularly inspected for leakage or damage. Any leaking package or CTU should only be handled under supervision of a responsible person;
- (g) All cargo handling equipment for dangerous goods should be of an approved type, properly maintained and tested in accordance with national requirements; and
- (h) Adequate lighting should be provided to all areas and access ways where dangerous goods are stored or handled.

ANNEX 3: GUIDELINES FOR PREPARATION OF AN ABBREVIATED RESETTLEMENT ACTION PLAN

Introduction

World Bank Operational Policy 4.12 and the Resettlement Policy Framework (RPF) for the AIRBMP requires the use of an ARAP where a small number (<200 people,) are economically or physically affected by the project.

Guidance in this ToR is provided specifically for the project's river navigation component for which the placement of groynes, river-training or erosion protection structures, and channel dredging are the principal works to be undertaken. Overall the types of impacts foreseen in the river navigation component appear to be localized and transitory, in some cases affecting small numbers of people. In spite of making every reasonable effort to avoid impacts on people and their land and livelihoods, project works may affect land use for agriculture where access roads or temporary worksites are needed, such as for the construction of groynes and anti-erosion structures. Dredging and dredged material disposal may also affect land-based activities as well as fisheries access in submerged areas.

Purpose / Objectives

The purpose of an ARAP is to ensure that project impacts on land, including effects on submerged areas, which affect the livelihoods and property of people, are mitigated and compensated in a timely and effective way in compliance with World Bank OP 4.12, on Involuntary Resettlement. The key objectives are to ensure that avoidance or minimization of impacts is considered in the approach and implementation of works; that those who are affected are identified early, and that they are consulted, compensated, and provided with any other assistance needed to redress losses in income or property.

ARAP preparation and content

The following key tasks are to be carried out in preparation and implementation of an ARAP. These are discussed in detail:

Task 1: Census survey: the ARAP team (described in more detail in Task 5,) prepared a census list of all persons to be affected adversely by project works. This group may include agricultural families, such as those cultivating land on flood plains in proximity to riverbank work sites; fishers who establish seasonal camps near fishing areas, or others. The census should list affected people by name, age, and gender; their home villages and contact locations. Where family groups are affected, the census should identify the household head and family members linked to the household head.

Task 2: Valuation of lost income or assets: the ARAP describes and assessed the types and duration (permanent or temporary) of impacts affecting incomes of affected people. Where crops are lost to make way for access roads or work areas, compensation is paid based on yield data for each crop and the market value of the crop. Where fishers will lose access to fishing areas, calculation of compensation is based on typical catch rates per boat type⁹ and market prices. The ARAP team will consult with agricultural and fisheries experts to ensure that sound data are used for the estimation of lost yield and earnings. Where people have invested with materials and labor for construction of shelters or other infrastructure needed to facilitate agricultural, fishing or other activities, compensation will be paid at full replacement cost if these assets are lost. Assistance (in kind or in cash) based on time and labor costs, in lieu of compensation; is to be provided where such structures and related infrastructure can be shifted to another site.

⁹Typical fishing effort (Catch x Effort= CPUE).

Task 3: Consultations with affected people: It is important during the process of preparation of the census list and assessment of impacts and losses to ensure open and constructive consultation with affected people. The ARAP team will engage with affected persons to ensure their views are included in decision-making about compensation and assistance. Affected people often provide insights which help with mutually acceptable solutions and sometimes benefit from temporary employment in project works. The ARAP documented the dates and venues, individuals consulted, and salient details of consultations with affected persons.

Task 4: Description of compensation and other assistance to be provided: The ARAP will provide a schedule or entitlement matrix showing the specific typology of impacts to be addressed, compensation amounts to be paid, and any other assistance (in cash or in kind) to be provided to affected people. The matrix will be supported by a description of the factors and values used in the calculations of compensation and determination of any other assistance to be provided.

Task 5: Implementation responsibilities and procedures for grievance redress: The project will assign a staff member to lead and manage preparation and implementation of the ARAP. The ARAP team will at a minimum include two members of which the team leader will ideally have a background in rural sociology or economics. He or she will be assisted by another team member with a technical background in agriculture or fisheries. Basic report writing skills will be required. The team leader will engage the services of relevant government departments' personnel to assist with specific issues related to agricultural and fisheries production and marketing in the area. The use of the services of local non-governmental organizations or community service groups is not precluded if their skills and objectives coincide with ARAP needs.

The ARAP specified the affected persons and relevant stakeholders and that they will be informed of the ARAP contact person and their contact co-ordinates in the event of grievances or other issues which may arise during ARAP preparation and implementation. The ARAP contact person will seek reasonable solutions and record all grievances and issues raised by affected persons. The World Bank Task Team will be informed of any grievances or difficult issues and will work with the ARAP team on solutions, if needed.

Task 6: Arrangements for monitoring and closure: The ARAP will specify follow-up actions and monitoring to be carried out to verify that compensation and other assistance was provided in advance of project works and was effective in ensuring that affected persons have successfully re-adapted and sustained their livelihoods. A short closure report confirming provision of all entitlements and identifying any significant project impact-related issues affecting sustainability of livelihoods will be prepared six months after completion of the works and provided to the World Bank Task Team.

Task 7: Timetable and budget: The ARAP will provide an implementation timetable for the above actions and a simple budget summarizing the costs of compensation, any other assistance, personnel, and logistics.

ANNEX 4: GUIDELINES FOR COMMUNITY CONSULTATION

Stakeholder consultations will adhere to the following guidelines:

- 1) **Stakeholder Identification and Analysis:** Invest time in identifying and promoting stakeholders and assessing their interests and concerns.
- 2) **Information Disclosure:** Communicate information to stakeholders early in the decision making process in ways that are meaningful and accessible, and continue this communication throughout the project life.
- 3) **Stakeholder Consultation:** Plan out each stakeholder consultation process, consult inclusively, document the process, and communicate follow-up.
- 4) **Negotiation and Partnerships:** For complex issues enter into good faith negotiations that satisfy the interests of all parties, add value to mitigation measures or project benefits by forming strategic partnerships.
- 5) **Grievance Management:** Establish accessible and responsive means for stakeholders to raise concerns and issues about the project throughout its life.
- 6) **Stakeholder Involvement in Project Monitoring:** Involve directly affected stakeholders in monitoring project impacts, mitigation and benefits and involved external monitors where they can enhance transparency and credibility.
- 7) **Reporting to Stakeholder:** Report back to stakeholders on environmental, social, and economic performance, including both those consulted and those with a more general interest in the project.
- 8) **Management Functions:** Build and maintain sufficient capacity within the project to manage the process of stakeholder engagement, track commitments, and report on progress.

Further reference: Stakeholder Engagement: A Good Practice Handbook, IFC 2007.

ANNEX 5: METHODOLOGY FOR DREDGING DISPOSAL SITE SELECTION

To objectively select potential disposal sites for dredge spoil we first selected indicators to describe the technical and economic merits of each site, and the likelihood of social or environmental (ecological) impacts. Indicators were scored on a 3 point ordinal scale for each potential disposal site). Indicators were weighted to sum to one within their respective Indicator Group (Technical, Economic, Ecological and Social Impacts), so that each Group was equally weighted in the assessment. Scores were then summed to select the best site(s).

A total of four sites have been studied. Table 1 presents a comparison of technical, economic, social and ecological characteristics of these sites. The sites DS-1 and DS-2 present the best options in this analysis. The DS-1 is very interesting because it is near to the working area, so the costs are low and it will not affect fish habitats. The results show that it is the best; however the surface area of this site may not be adequate for disposal of all the material. The second best site is the DS-2A. Located further downstream, this site can receive most of the sand dredge material. Even if there is some impact on fish and fisheries, the impacts are low when compared to the others sites.

Unweighted Scores

Group	Indicator	NU-DS1	NU-DS2	NU-DS3	NU-D4
Technical	Total Absorption Capacity	3	3	1	2
Economic	Construction/logistic Cost	3	2	2	1
Technical	Technical Sustainability	1	3	2	3
Ecological	Fisheries Impact	3	1	2	3
Ecological	Threats to Potential Critical Habitats	3	1	2	3
Social	Impact on Livelihoods (Fisheries & Agriculture)	3	1	2	3
Social	Impact on access to livelihoods	3	3	1	3
Ecological	Duration of ecological Impact	3	2	2	3
		22	16	14	21

Standardised to number of indicators

Group	Indicator	NU-DS1	NU-DS2	NU-DS3	NU-DS-2A	Weighting
Technical	Total Absorption Capacity	1,5	1,5	0,5	1,0	0,5
Economic	Construction/logistic Cost	3,0	2,0	2,0	1,0	1,0
Technical	Technical Sustainability	0,5	1,5	1,0	1,5	0,5
Ecological	Fisheries Impact	1,0	0,3	0,7	1,0	0,3
Ecological	Threats to Potential Critical Habitats	1,0	0,3	0,7	1,0	0,3
Social	Impact on Livelihoods (Fisheries & Agriculture)	1,5	0,5	1,0	1,5	0,5
Social	Impact on access to livelihoods	1,5	1,5	0,5	1,5	0,5
Ecological	Duration of ecological Impact	1,0	0,7	0,7	1,0	0,3
		11	8	7	9	4

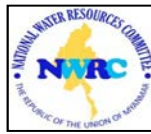
Intermediate calculation

NU-DS1	NU-DS2	NU-DS3	NU-DS-2A
2	3	1,5	2,5
3	2	2	1
3	2	1,5	3
3	1	2	3
11	8	7	9

Weighted standardised indicators

NU-DS1	NU-DS2	NU-DS3	NU-DS-2A	Weighting
2	3	1,5	2,5	1
3	2	2	1	1
3	2	1,5	3	1
3	1	2	2,997	1
11	8	7	9	

ANNEX 6: RECORD OF MICRO PROJECT CONSULTATION



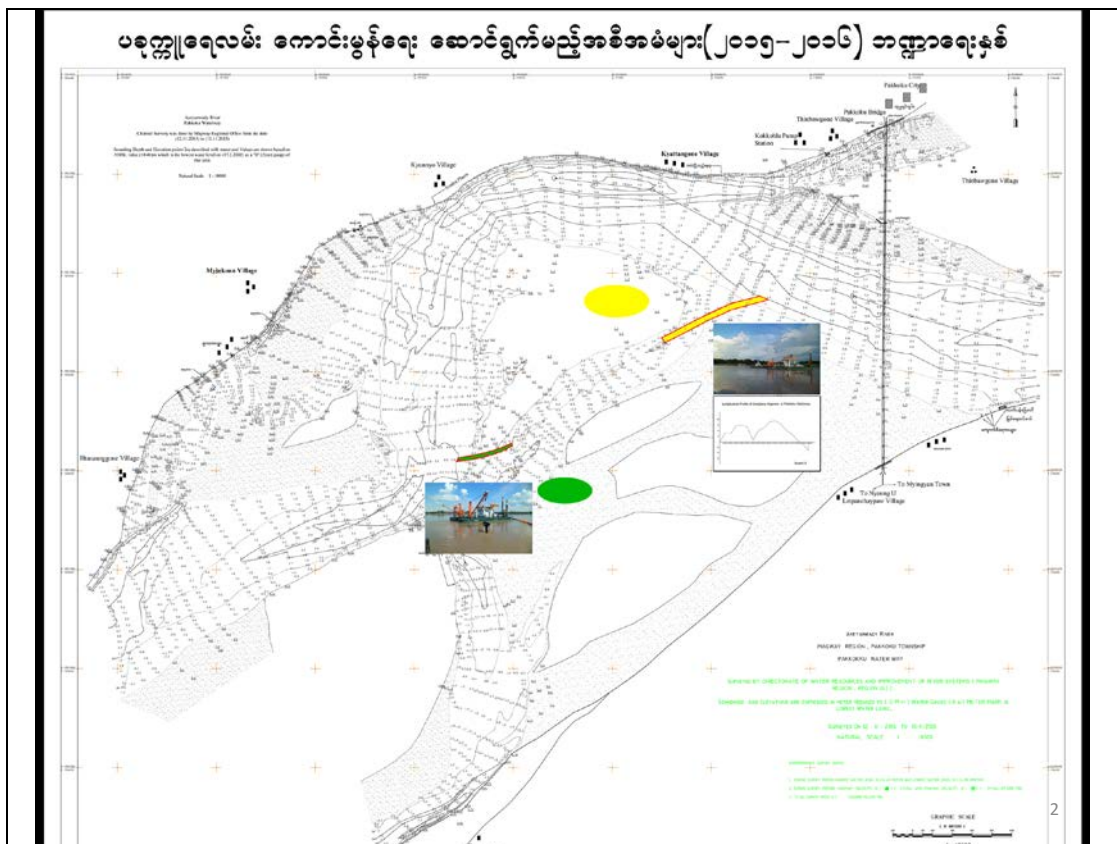
Ayeyarwady Integrated River Basin Management (AIRBM) Project

Consultation Result at Micro Project

1. U Aung Myo Khaing (Component 3 Director)
2. U Sai Kyaw Tun Oo (National Social Officer)
3. Officer from Nyaung U DWIR

From 12.2.2016 to 14.2.2016

Presented by
Aung Myo Khaing
Component 3, Director



Pakkoku Waterway Upstream Portion

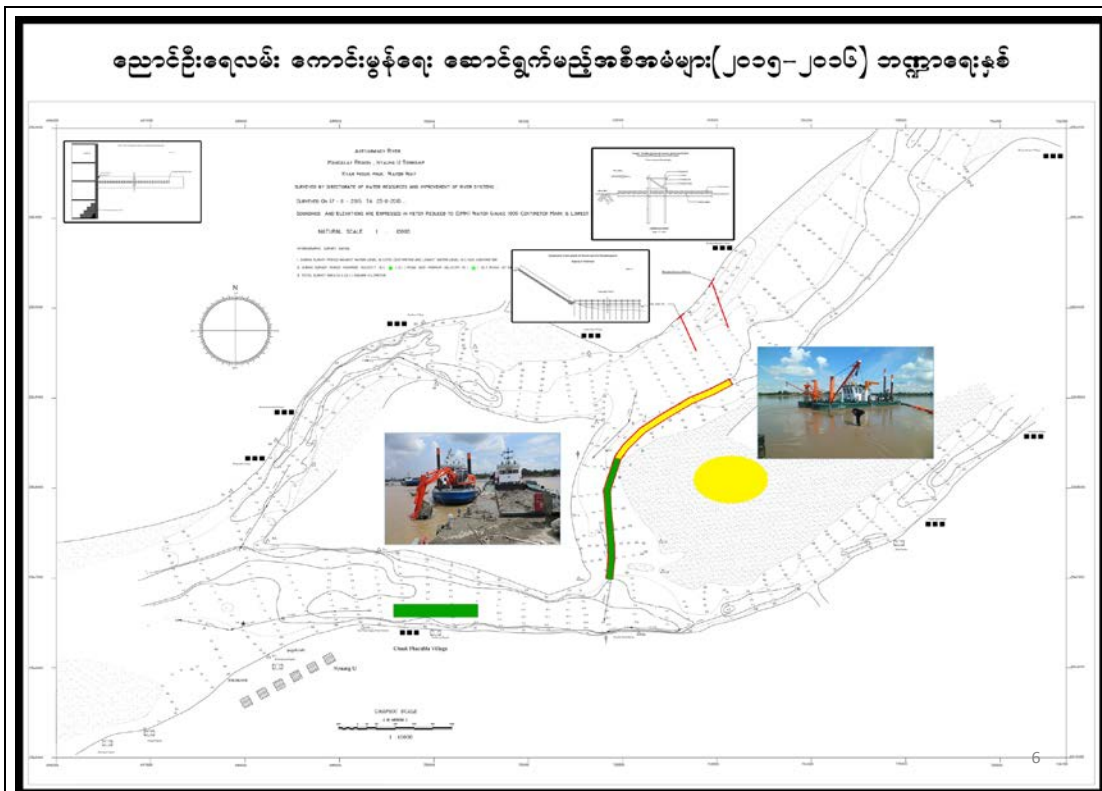


**Pakkoku Waterway Consultation with fishermen (License)
(Downstream Portion)**



Summary of Consultation at Pakkoku Waterway

- Tender license will finish at March 31, 2016 but they will continue catching
- If the dredging helps not to loose water from pool, it is acceptable
- If water from pool will reduce, we should pay “Compensation” to them
- “Compensation” based on how much fish they can get from pool
- According to their calculation, total estimated amount = 450000/-Kyats (500 \$)
- Resettlement for fish camp is not so difficult for them
- All huts are temporary and made with bamboo and bamboo mattress
- All people are flexible situation
- Total of 18 people live in that place



Nyaung U Waterway (Downstream) Temporary camp



Summary of Consultation at Nyaung U Waterway

(Fisherman with Net License)

- Fishermen at downstream of Nyaung U waterway said no problem
- Their huts are temporary (they will be there only for 3 months at that place)
- They will move to other place (near farms) during harvest
- Many fish boats are because they are relatives (same village) from Pakkoku township
- They catch fish at the places where the fishes found
- Total of 12 people live temporarily at that place

Zeetaw Village & Lapan Kyun Village Consultation



Summary of Consultation at Nyaung U Waterway Villages

- Explain and inform about our objectives of construction of groynes
- Consider their concern (how goods / how bad) by that
- Zeetaw village, villagers wish not to close the channel for their daily travel
- We agreed to open the groyne for their travel, it is OK
- They like the construction of groyne to safe their river bank (protect from erosion)
- Most of them belong agricultural farms on the islands in the river
- Farmers on the slope of river bank, will harvest in March, it is OK
- No impacts to villages because of groyne construction

10

Consultation with Fishermen (Tender) at Nyaung U Waterway



Summary of Consultation at Nyaung U Waterway Fisherman with license

- Fisherman bought a tender license from Fishery Department, Pakkoku
- Tender License start on April/ May of 2015 and will finish on March 31, 2016
- If we construct groyne at the pool, fish will not enter into the pool
- They can be impact during groyne construction
- We should consider compensation for fisherman if we make noise near the pool
- 15000 Kyats can be reduced because of noise from groyne construction
- After groyne, it will be as usual, fish will come again as normal

12

ANNEX 7: ABBREVIATED RESETTLEMENT ACTION PLAN

National Water Resources Committee (NWRC)

Ayeyarwady Integrated River Basin Management (AIRBM) Project

Abbreviated Resettlement Action Plan (ARAP) for Micro Projects

Introduction

Two Micro Projects which include dredging and the construction of open wooden pile groynes under Component 3 will be implemented in the Pakkoku and Nyaung U waterway.

At Pakkoku, there are four families of fishers temporarily staying at the sand bar. The fishing license was bought from the Fishery Department at the Pakkoku (PKU) waterway where the Project will be undertaken. The total number of people in the area that will be effected by the micro project will be the 25 from 4 families (component E).

At Nyaung U, there is one fishing tender holder and people from villages located at Zeetaw, Yele kyun and Lapbankyun who normally use the waterway in proximity to the groyne construction. Among them, the one fishing tender holder at the groyne area will be paid some compensation. No other part will be affected and therefore no compensation is required for those parties. For villagers from Zeetaw, Yele kyun and Lapban kyun villages, based on the redesign of the groyne component of the project, other parties will be not be affected as they will continue to be able to use that channel for their daily activities of traveling to agricultural land in the Ayeyarwady river.

Objectives

The objectives of this Abbreviated Resettlement Action Plan (ARAP) are to:

1. calculate the compensation amount for fish tender holder at Pakkoku and Nyaung U;
2. to mitigate the impacts to affected people at the two sites;
3. to provide additional supports for the resettlement of tents at Pakkoku waterway downstream;
4. to provide transportation for people from Zeetaw, Yele kyun and Lapbankyun village; and
5. to compensate fishermen with license at Nyaung U waterway.

ARAP Methodology

The methodology for this ARAP can be classified into two specific areas, as the situations are different for Pakkoku and Nyaung U.

In relation to the fishers at the Pakkoku waterway:

1. Calculate the amount of income from the deep pool/day where they actively fish (the pool will impacted by the dredging);
2. Identify the people directly or indirectly affected by the project;
3. Undertake a census of the affected people and their families;
4. Prepare and sign agreements with the affected people;
5. Provide support (cash/ nets / fishing boat,) and compensation; and
6. Assist with relocation of tents / temporary structures if required.

The implementation plan for the ARAP is provided below.

Item	Particular	2016, February				2016, March				2016, April			
		First week	Second week	Third week	Fourth week	First week	Second week	Third week	Fourth week	First week	Second week	Third week	Fourth week
1	Field trip (first time)												
2	Consultation meeting with people at the area												
3	Calculation, detail list down,												
4	Agreement with the people												
5	Locating the dredger												
6	Fixing the dredging alignment												
7	Compensation (pay them and signed)												
8	Resettlement of tents												
9	Continuous Dredging												

Compensation for fishers at Pakkoku waterway

U Khine Moe Win (national identity – 8/Pa Kha Ka (Naing)-173794) (mobile – 09 4420 93559), is actively catching fish at Pakkoku waterway under a tender license from Fishery Department, Pakkoku,

The results of the consultation indicated that the fishermen would need to be compensated for the cash they would receive for the fish they would catch normally in March. This amount is easily calculated to provide an estimate for compensation. The fishers feed the fishes in the pool and allow them to develop into bigger fish. Currently the price of fish is low; however it will be valuable in the festival time in April, 2016. At that time, the price will likely double but only on festival days. The price of fish is 3000 kyats for 1 viss (1 viss= 3.6 lb = 1.636 Kg) now, but during festival days, the price becomes 6000 Kyats for 1 viss (information from February 27 & 28 consultations).

Compensation for fishers with tender (calculation is based only on the lost production of fish from the pool)

1. They normally get 20 viss to 30 viss daily in March. Say average amount (25 viss) per day.
2. The normal price is 3000 kyats for 1 viss
3. The total price for one day = $25 \times 3000 = 75000$ Kyats
4. The estimated starting date (depend on World Bank's no objection) 20.3.2016
5. Estimated starting date is (20.3.2016), days upto 31.3.2016 is (12-days)
6. Total estimated cost (fishers can reduce) = $12 \text{ days} \times 75000/\text{kyat} = \mathbf{900,000 \text{ kyats}}$

This is the compensation amount for U Khine Moe Win who is tender owner at Pakkoku waterway.

Calculation of compensation amount for fishermen staying downstream of Pakkoku

There are three other families staying temporarily with tender holder. The families are relatives (cousin, brother, sister, etc..) of U Khine Moe Win and his wife. The census is attached at the annex to this ARAP. The three fishers use long nets from a boat inside the deep pool. As a result of the dredging, they will lose their daily income. The estimated cost for these families is:

1. The three families can get 4 to 6 viss per fishing trip (use a mean of 5 viss/trip);
2. The fishers undertake three trips/week = $5 \times 3 = 15$ viss;
3. Four weeks in one month = 4×15 viss = 60 viss;
4. Total income in one month = $60 \text{ viss} \times 3500 \text{ kyats/viss} = 210000$ kyats/month;
5. Daily income = $210000 \text{ kyat} / 30 \text{ days} = 7000$ kyats/ day;
6. They normally sell fishes themselves to the near villages, so, they got more price (500 kyat/viss) than the tender holder;
7. If the dredging start at 20.3.2016, the including days up to March 31, (12) days; and
8. The total income for 3 families, 12 days = $3 \times 12 \times 7000 = \mathbf{252000 \text{ Kyats}}$ (for the three families).

Calculation of resettlement of the tents, fishing nets & small animals

The four families may need to resettle/ move the tents from the existing place to another place because of dredging. PMU should pay the charges for moving tents according to their proposed rate. They proposed that, 10 labors (workers) have to use to move all their belongings. So, the total costs are

1. To move one tent from the existing place to another = 10 workers is needed;
2. The local rate for worker for 1 day = 5000 kyats;
3. The cost for moving 1 tent = $10 \times 5000 = 50000$ kyats; and
4. There are 4 families including tender holder = $4 \times 50000 = 200,000$ kyats.

Therefore, the total cost for relocating of 4 tents at Pakkoku waterway is 200,000/- kyats.

Compensation for fisherman at Nyaung U Waterway

U Kyi Naing (National ID card, 8/Pa kha ka (naing)- 127970) bought his license tender from Fishery Department, Pakkoku. His area is relatively large from upstream of Nyaung U (Kyar kyun) to downstream of Bagan (None pot pump station). He holds the rights to to the Pakkoku side (northern side of the river). U Kyi Naing normally feed fishes in the secondary channel and then catch fishes by inviting fishermen with nets.

U Kyi Naing explained that the fishes would be impacted by the noise of construction of groyne at the secondary channel. After construction, the fish will come into the channel as normal. Under the ARAP, compensation should be paid for the impact on the loss of fishes using the area based on U Kyi Naing's experience and his description.

Cost estimation for U Kyi Naing (tender holder) at Nyaung U waterway

1. Estimated amount of fish that will be reduced by construction of groyne = 5 to 10 viss/ day (mean = 7.5 viss/day);
2. Price of fish for 1 viss = 2000 kyat (Nyaung U);
3. Total amount for one day = $7.5 \times 2000 = 15000$ kyat/day;
4. Estimated starting date (20.3.2016) to 31.3.2016 (12 days); and
5. Total amount for compensation for U Kyi Naing = $12 \text{ days} \times 15000 / \text{kyat} = 180000$ kyats

There is no need to relocate people in this location due to the groyne construction. Work will start groyne construction from the outer side of the sandbar and as such, there will be no impacts to fisher outside the side channel. The format of compensation for U Kyi Naing is attached in Annex A-2 and his family list is also attached in Annex B-2. The type of compensation can be given in cash (or) fishing net (or) fishing boat (or) other helps according to World Bank's policies.

Compensation agreement form (Form – 1)

(AIRBM Project)

Compensation for affected peoples on Pakkoku waterway

Date; -----

Ministry of Transport, Directorate of Water Resources and Improvement of River Systems is implementing AIRBM Project with the credit of World Bank. DWIR is responsible for smoothness of commodities transportation and navigation of vessels along the Ayerwaddy River. DWIR will undertake the dredging on Pakkoku waterway as requirement. Hence, valuation of the loss of catching fish and resettlement is undertaken as follow;

Total amount of fish caught = ----- viss/day

Current local fish price = -----Kyat/ Viss

Amount of lost in MMK= -----Kyat/day

Total amount of lost for (-----) days= ----- Kyat

Cost for relocation of huts= -----Kyat

Amount of compensation in grand total = ----- kyat

Directorate of Water Resources and Improvement of River Systems has provided the compensated amount of the lost that caused by dredging activities to fisherman who is household head namely ---- at the amount of ----- Kyats (in words -----) was paid by ----- in front of -----, ----- village.

Witness

Receiver

Signature-----

Signature -----

Name -----

Name-----

NRC No.-----

NRC No. -----

-

Address -----

Address -----

Compensation agreement form (Form – 2)

(AIRBM Project)

Compensation for affected peoples on Nyaung U waterway

Date; -----

The Ministry of Transportation, Directorate of Water Resources and Improvement of River Systems (DWIR) is implementing AIRBM Project with the credit of World Bank. DWIR is responsible for smoothness of commodities transportation and navigation of vessels along the Ayerwaddy River.

DWIR will undertake the dredging and construction of groynes at Nyaung U waterway as requirement. Hence, valuation of the loss of catching fish due to implementing project activities is undertaken as follow;

Amount of fish that can be lost =-----Viss/ day

Current local fish price = -----Kyat/ Viss

Amount of lost in MMK=-----Kyat/day

Total amount of lost for (-----) days=-----Kyat

Directorate of Water Resources and Improvement of River Systems has provided the compensated amount of the lost that caused by construction of groynes activities to fisherman who is household head namely ----- at the amount of ----- (in words -----). It was given by ----- from DWIR in front of -----, ----- village.

Witness

Receiver

Signature-----

Signature -----

Name -----

Name -----

NRC No.-----

NRC No. -----

Address -----

Address -----

Item	Name	Sex	Age	Occupation	Education level	Relationship to HH head	Address	Contact Number	Benefit type
1	U Khaing Moe Win	M	38	fisherman	Level-4	Tender holder Household head	Aye Kyun village, Pakkoku Township	09-442093559	Share the benefits to share holders
2	Daw Than Kyi	F	42	Dependant	Level -4	Wife	<input type="checkbox"/>	-	-
3	Ma Shan Shan Moe	F	17	Student	1 st year University	Daughter	<input type="checkbox"/>	-	-
4	Ma EiEiNyein	F	14	Student	Level -4	Daughter	<input type="checkbox"/>	-	-
5	SaiSaiNyi	M	11	Fishing	Level-3	Son	<input type="checkbox"/>	-	-
6	U Win Ko	M	27	Fisherman	Level-5	Cousin	<input type="checkbox"/>	-	-
7	U Chit Ko	M	23	Fisherman	Level-4	Brother in law	ThitHtaunt village, Nyaung U Township	-	-
8	DawKyaing	F	25	<input type="checkbox"/>	Level-4	Sister	<input type="checkbox"/>	-	-
9	U MaungMaung	M	38	<input type="checkbox"/>		Brother in law of Tender holder	<input type="checkbox"/>	09777781685	<input type="checkbox"/>
10	Daw Aye MyintKyi	F	37	<input type="checkbox"/>	Level-3	Wife	<input type="checkbox"/>	-	<input type="checkbox"/>
11	Mg Shine Ko	M	17	<input type="checkbox"/>	Level-3	Son	<input type="checkbox"/>	-	<input type="checkbox"/>
12	Ma KhaingZin New	F	13	Student	Level-6	Daughter	<input type="checkbox"/>	-	<input type="checkbox"/>
13	Ma KhaingHninnWai	F	8	Student	Level-2	Daughter	<input type="checkbox"/>	-	<input type="checkbox"/>
14	Maung Shine HtetAung	M	5	Student	Level-1	Son	<input type="checkbox"/>	-	<input type="checkbox"/>
15	U Myint U	M	35	Fisherman	Level-3	Brother in law of U Khine Moe Win (tender holder)	Aye Kyun village, Pakkoku township	09442363091	<input type="checkbox"/>
16	Daw Mar Khaing	F	35	Fishing	Level-5	Wife	<input type="checkbox"/>	-	<input type="checkbox"/>

17	MaungKyawZin Win	M	4	Dependent	-	Son	<input type="checkbox"/>	-	<input type="checkbox"/>
18	Ma Hnin Si Khaing	F	2	Dependent	-	Daughter	<input type="checkbox"/>	-	<input type="checkbox"/>
19	U Tin Nyunt	M	35	Fisherman	Level-3	Brother in law of (Tender holder)	<input type="checkbox"/>	09789615572	<input type="checkbox"/>
20	DawMyintMyint Win	F	33	Fisherman	Level-3	Wife	<input type="checkbox"/>	-	<input type="checkbox"/>
21	Maung Than Naing Win	M	20	Fisherman	Level-4	Son	<input type="checkbox"/>	-	<input type="checkbox"/>
22	Than Khaing Win	M	18	Fisherman	Level-4	Son	<input type="checkbox"/>	-	<input type="checkbox"/>
23	Mg Zaw Zaw	M	15	Fisherman	Level – 6	Son	-	-	-
24	Aung Kyaw Phyo	M	10	Student	Level-3	Son	-	-	-
25	Kaung Myat Min	M	2	-	-	Son	-	-	-

The list of U Kyi Naing's family, Fisherman with tender license

Annex B-2

Item	Name	Sex	Age	Occupation	Education level	Relationship to HH head	Address	Contact Number	Benefit type
1	U Kyi Naing	M	43 yrs	Fisherman	Level – 4	Tender Owner	Htauk shar bin village, Pakkoku		
2	Tin Tin Mar	F	35	Dependent	Level – 3	Wife	-		
3	Than Htike Oo	M	20	Fisherman	Level-8	Son	-		
4	Moe Win	M	16	Student	Level-10	Son	-		
5	Aung Phyo Wai	M	13	Fisherman	Level – 8	Son	-		
6	Myint Myint Mu	F	11	Student	Level-6	Daughter	-		

ဧရာဝတီမြစ်ဝှမ်း ဘက်စုံစီမံခန့်ခွဲမှုစီမံကိန်း (AIRBM Project)
 ပခုက္ကူရေလမ်းတွင် နစ်နာကြေး ပေးအပ်ရန် သဘောတူညီချက်

ရက်စွဲ ၁၁-၃-၂၀၁၆

ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများဖွံ့ဖြိုးတိုးတက်ရေးဦးစီးဌာန၊ ဧရာဝတီမြစ်ဝှမ်း ဘက်စုံစီမံခန့်ခွဲမှုစီမံကိန်း (AIRBM Project) မှ ပြောင်းရွှေ့ခြင်းအတွက်

(ဃ) စုစုပေါင်း ပေးအပ်ရမည့် နစ်နာကြေး = အမှတ်စဉ်

ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများဖွံ့ဖြိုးတိုးတက်ရေး ဝန်ထမ်းများအတွက် ငါးဖမ်းလုပ်ငန်း (ငါးဖမ်းလုပ်သား) မိသားစု သို့မဟုတ် ဖော်ပြပါ ငွေကြေးများအား သောင်တူးလုပ်ငန်းတွင် ပေးချေပါမည်။ ငွေပေးချေပြီးနောက် တဲများ ပြောင်းရွှေ့ပေးရန်ဖြစ်ပြီး သောင်တူးလုပ်ငန်းနှင့် လွတ်ဆောင်ရွက်ရမည် ဖြစ်ပါသည်။

ဖော်ပြပါအချက်များအား သဘောတူညီကြောင်း လက်မှတ်ရေးထိုးပါ

၁) ကျပ် + အမှတ်စဉ် (၈) (ကျပ်)
 ဦးစီးဌာနမှ ပခုက္ကူရေလမ်းအတွင်း
 ဆောင်ရွက်နေသူ ဦးမောင်မောင်
 တူးလုပ်ငန်းမစတင်မီ တစ်ပတ် (၇-
 အား သောင်တူးနေသောနေရာမှ
 သောနေရာများတွင်သာ ငါးဖမ်းခြင်း
 သည်။

သည် ဆောင်ရွက်လျက်ရှိ
 သင်္ဘောများအဆင်ပြေစွာ
 ဘင်ရွက်ရန် တာဝန်ရှိပါသည်။
 ညှင်ညှိခြင်းဖြင့် နစ်နာဆုံးရှုံး
 ဘိုးအား အောက်ပါအတိုင်း

ဧရာဝတီမြစ်ဝှမ်း ဘက်စုံစီမံခန့်ခွဲမှုစီမံကိန်းအား အကောင်အ
 ပါသည်။ ဧရာဝတီမြစ်အတွင်း ကုန်စည်စီးဆင်းမှု လုံခြုံချောမွေ့စေရေး
 သွားလာနိုင်ရန်အတွက် ရေလမ်းကောင်းမွန်ရေးလုပ်ငန်းများ
 သောင်တူးလုပ်ငန်းကြောင့် ဦးမောင်မောင် (သစ်ထောင့်ကျေးရွာ၊
 သွားနိုင်သည့် ငါးတန်ဖိုးနှင့် တဲပြောင်းရွှေ့ခြင်းအတွက် နစ်နာ
 တွက်ချက်၍ ပေးအပ်မည်ဖြစ်ပါသည်။

(က) တစ်ရက်လျှင် နစ်နာမည်ပမာဏ = ၇၀၀၀ ကျပ် / ရက်
 (ခ) စုစုပေါင်း () ရက်အတွက် သင့်ငွေ = _____ ရက် x ၇၀၀၀
 (လုပ်ငန်းစတင်သည့်ရက်မှ မတ်လ ၃၀-ရက်အထိ သာလျှင် တွက်ချက်ပါမည်။)

၆၆၁၄

လက်မှတ် _____
 အမည် ဦးမောင်မောင်
 နိုင်ငံသားစိစစ်ရေးကတ်ပြားအမှတ် ၉၂ ၂၃၃ (၉၆) ၁၄၃၀၈၉
 လိပ်စာ သစ်ထောင့် (ကျေးရွာ) ကျေးရွာ
ရဟန်း ဦးဖြူ ၃၆


လက်မှတ် _____
 အမည် ဦးညိုညို
 နိုင်ငံသားစိစစ်ရေးကတ်ပြားအမှတ် _____
၉၂ ၇၈၁ (၉၆) ၀၀၃၄၂၃
 လိပ်စာ ၈၅/၆၆/ဖြူ
ရဟန်း ဦးဖြူ


ဧရာဝတီမြစ်ဝှမ်း ဘက်စုံစီမံခန့်ခွဲမှုစီမံကိန်း (AIRBM Project)
ညောင်ဦးရေလမ်းတွင် နစ်နာကြေး ပေးအပ်ရန် သဘောတူညီချက်


ရက်စွဲ ၁၁.၃.၂၀၁၆

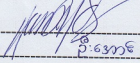
ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများဖွံ့ဖြိုးတိုးတက်ရေးဦးစီးဌာနသည် ကမ္ဘာ့ဘဏ်ချေးငွေဖြင့် ဧရာဝတီမြစ်ဝှမ်းဘက်စုံစီမံခန့်ခွဲမှုစီမံကိန်းအား အကောင်အထည်ဖော်ဆောင်ရွက်လျက်ရှိပါသည်။ ဧရာဝတီမြစ်အတွင်း ကုန်စည်စီးဆင်းမှုလုံခြုံချောမွေ့စေရေးနှင့် သင်္ဘောများအဆင်ပြေစွာ သွားလာနိုင်ရန်အတွက် ရေလမ်းကောင်းမွန်ရေးလုပ်ငန်းများ ဆောင်ရွက်ရန်တာဝန်ရှိပါသည်။ ရေကာတည်ဆောက်ခြင်းလုပ်ငန်းကြောင့် ဇီးတောကျေးရွာ၊ ဘုံတာကျေးရွာနှင့် ရေလည်ကျွန်းကျေးရွာတို့မှ ကျေးရွာနေပြည်သူများ ရေလမ်းသွားလာရေးအခက်အခဲ မဖြစ်ပေါ်စေရန် ရေကာအား အကျယ် (၁၀)ပေခန့် ရေပေါက်ချန်လှပ်၍ တည်ဆောက်သွားမည်ဖြစ်ပါသည်။ အဆိုပါရေပေါက်အား မြစ်ရေတက်ချိန်၊ ကျေးရွာနေပြည်သူများ အခြားတစ်နေရာမှ ရေလမ်းသွားလာလွယ်ကူသည့်အချိန်တွင် ပြန်လည်ပိတ်ဆို့သွားမည် ဖြစ်ပါသည်။

ရေကာတည်ဆောက်ခြင်းကြောင့် မြစ်ကမ်းပါးများထိန်းသိမ်းနိုင်မည်ဖြစ်ပြီး၊ လက်ရှိ အသုံးပြုနေသောရေလမ်းအား အနှောက်အယှက် မဖြစ်စေခြင်းကြောင့် ရေကာတည်ဆောက်ခြင်းလုပ်ငန်းအား ဇီးတော၊ ဘုံတာ၊ ရေလည်ကျွန်းကျေးရွာနေပြည်သူများမှ သိရှိ၊ သဘောတူညီပါကြောင်း အောက်တွင် လက်မှတ်ရေးထိုးပါသည်။

လက်မှတ်  _____
 အမည် ဦးကျော်စိုးသောင်း _____
 နိုင်ငံသားစိစစ်ရေးကတ်ပြားအမှတ် _____
၈/၂၀၁၀၂၂၁ ၁၈၀၅၂၁
 လိပ်စာ မရကု၊ မြို့နယ်၊ ဧရာဝတီ၊ မြောက် _____
ချောင်း မြို့နယ် _____

လက်မှတ်  _____
 အမည် ဦးညို _____
 နိုင်ငံသားစိစစ်ရေးကတ်ပြားအမှတ် _____
၆/၂၀၁၀၂၂၁ ၀၀၄၄၂၃
 လိပ်စာ ၈၇/၆၅/၆ _____
ဘောင် _____

လက်မှတ်  _____
 အမည် ဦးမြတ်စိန် _____
 နိုင်ငံသားစိစစ်ရေးကတ်ပြားအမှတ် _____
၈/၂၀၁၀၂၂၁ ၁၈၀၅၂၁
 လိပ်စာ မရကု၊ မြို့နယ်၊ ဧရာဝတီ၊ မြောက် _____
ချောင်း မြို့နယ် _____

လက်မှတ်  _____
 အမည် ဦးအောင်စိုး _____
 နိုင်ငံသားစိစစ်ရေးကတ်ပြားအမှတ် _____
၆/၂၀၁၀၂၂၁ ၀၀၄၄၂၃
 လိပ်စာ ၈၇/၆၅/၆ _____
ဘောင် _____

ဧရာဝတီမြစ်ဝှမ်း ဘက်စုံစီမံခန့်ခွဲမှုစီမံကိန်း (AIRBM Project)
ညောင်ဦးရေလမ်းတွင် နစ်နာကြေး ပေးအပ်ရန် သဘောတူညီချက်


ရက်စွဲ ၁၁.၃.၂၀၁၆


ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများဖွံ့ဖြိုးတိုးတက်ရေးဦးစီးဌာနသည် ကမ္ဘာ့ဘဏ်ချေးငွေဖြင့် ဧရာဝတီမြစ်ဝှမ်းဘက်စုံစီမံခန့်ခွဲမှုစီမံကိန်းအား အကောင်အထည်ဖော်ဆောင်ရွက်လျက်ရှိပါသည်။ ဧရာဝတီမြစ်အတွင်း ကုန်စည်စီးဆင်းမှုလုံခြုံချောမွေ့စေရေးနှင့် သင်္ဘောများအဆင်ပြေစွာ သွားလာနိုင်ရန်အတွက် ရေလမ်းကောင်းမွန်ရေးလုပ်ငန်းများ ဆောင်ရွက်ရန်တာဝန်ရှိပါသည်။ ရေကာတည်ဆောက်ခြင်းလုပ်ငန်းကြောင့် ငါးဖမ်းတင်ဒါဖြင့်လုပ်ကိုင်နေသူ ဦးကြည်နိုင် (ထောက်ရွှာပင်ကျေးရွာ၊ ပခုက္ကူမြို့နယ်) နစ်နာဆုံးရှုံးသွားနိုင်သည်။ ငါးဖမ်းကိရိယာများ နစ်နာကြေးအား အောက်ပါအတိုင်း တွက်ချက်၍ ပေးအပ်သွားမည်ဖြစ်ပါသည်။

- (က) နေ့စဉ် လျော့နည်းသွားမည့် ငါးပမာဏ = ၇.၅ ပိဿာ / တစ်ရက်
 - (ခ) လက်ရှိဒေသ၏ ငါး ဈေးနှုန်း (ညောင်ဦး) = ၂၀၀၀ - ကျပ် / ပိဿာ
 - (ဂ) တစ်ရက်လျှင် နစ်နာမည့်ပမာဏ = ၁၅၀၀၀ - ကျပ် / ရက်
 - (ဃ) စုစုပေါင်း () ရက်အတွက် သင့်ငွေ = ----- ရက် x ၁၅၀၀၀/- = ----- ကျပ်
- (လုပ်ငန်းစတင်သည့်ရက်မှ မတ်လ ၃၀-ရက်အထိ သာလျှင်တွက်ချက်ပါမည်။)
- (င) စုစုပေါင်း ပေးအပ်ရမည့် နစ်နာကြေး = အမှတ်စဉ်(ဃ) ကျပ်

ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများဖွံ့ဖြိုးတိုးတက်ရေးဦးစီးဌာနမှ ညောင်ဦးရေလမ်းအတွင်း ရေကာတည်ဆောက်ခြင်းလုပ်ငန်းကြောင့် နစ်နာဆုံးရှုံးမှုများအတွက် တင်ဒါဖြင့် ငါးဖမ်းလုပ်ငန်း ဆောင်ရွက်နေသူ ဦးကြည်နိုင် (နိုင်ငံသားစိစစ်ရေးကော်မရှင်အမှတ်-၈/၂၀၁၆(၇၆) ၁၂၇၆၅၀) မိသားစု သို့ ၊ ဖော်ပြပါငွေကြေးများအား ရေကာတည်ဆောက်ခြင်းလုပ်ငန်းမစတင်မီ တစ်ပတ် (၇-ရက်)အလိုတွင် ပေးချေပါမည်။ ငွေပေးချေပြီးနောက် ရေကာတည်ဆောက်ခြင်းလုပ်ငန်းနှင့် လွတ်သောနေရာများတွင်သာငါးဖမ်းခြင်း ဆောင်ရွက်ရမည် ဖြစ်ပါသည်။

ဖော်ပြပါအချက်များအား သဘောတူညီကြောင်းလက်မှတ်ရေးထိုးပါသည်။

လက်မှတ် 
 အမည် ဦးကြည်နိုင်
 နိုင်ငံသားစိစစ်ရေးကော်မရှင်အမှတ် ၈/၂၀၁၆(၇၆) ၁၂၇၆၅၀
 လိပ်စာ ထောက်ရွှာပင်ကျေးရွာ
ပခုက္ကူမြို့နယ်

လက်မှတ် 
 အမည် ဦးဦးမိ
 နိုင်ငံသားစိစစ်ရေးကော်မရှင်အမှတ် ၉/၂၀၁၆(၈၆) ၀၀၁၄၂၁
 လိပ်စာ ကျောက်ဖြူ
မောင်ဦးမြို့နယ်

ဧရာဝတီမြစ်ဝှမ်း ဘက်စုံစီမံခန့်ခွဲမှုစီမံကိန်း (AIRBM Project)

ပခုက္ကူရေလမ်းတွင် နစ်နာကြေး ပေးအပ်ရန် သဘောတူညီချက်

ရက်စွဲ ၁၁.၇.၂၀၁၆

ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများဖွံ့ဖြိုးတိုးတက်ရေးဦးစီးဌာနသည် ကမ္ဘာ့ဘဏ်ချေးငွေဖြင့် ဧရာဝတီမြစ်ဝှမ်းဘက်စုံစီမံခန့်ခွဲမှုစီမံကိန်းအား အကောင်အထည်ဖော်ဆောင်ရွက်လျက်ရှိပါသည်။ ဧရာဝတီမြစ်အတွင်း ကုန်စည်စီးဆင်းမှုလုံခြုံရေးအဖွဲ့ဝေရေးနှင့် သင်္ဘောများအဆင်ပြေစွာ သွားလာနိုင်ရန်အတွက် ရေလမ်းကောင်းမွန်ရေးလုပ်ငန်းများ ဆောင်ရွက်ရန်တာဝန်ရှိပါသည်။ ရေလမ်းကောင်းမွန်ရေးဆောင်ရွက်ရန် လိုအပ်လျက်ရှိသော ပခုက္ကူရေလမ်းတွင် သောင်တူးလုပ်ငန်းများအား ပူးတွဲဖော်ပြပါရေလမ်းမြေပုံတွင်ပါရှိသည့်အတိုင်း ဆောင်ရွက်သွားမည်ဖြစ်ပါသည်။ သို့ဖြစ်ပါ၍ သောင်တူးလုပ်ငန်းကြောင့် နစ်နာဆုံးရှုံးသွားနိုင်သည့် ငါးတန်ဖိုးနှင့် တဲမြောင်းရွှေ့ရခြင်းအတွက် နစ်နာကြေးအား အောက်ပါအတိုင်း တွက်ချက်၍ပေးအပ်မည်ဖြစ်ပါသည်။

- (က) နေ့စဉ်ပွန် ဖမ်းယူရရှိမည့် ငါးပမာဏ = ၂၅ ပိဿာ / တစ်ရက်
- (ခ) လက်ရှိ ဒေသ၏ ငါး ဈေးနှုန်း = ၃၀၀၀ - ကျပ် / ပိဿာ
- (ဂ) တစ်ရက်လျှင် နစ်နာမည့်ပမာဏ = ၇၅၀၀၀ ကျပ် / ရက်
- (ဃ) စုစုပေါင်း () ရက်အတွက် သင့်ငွေ = _____ ရက် x ၇၅၀၀၀/- = _____ ကျပ်
(လုပ်ငန်းစတင်သည့်ရက်မှ မတ်လ ၃၀-ရက်အထိ သာလျှင်တွက်ချက်ပါမည်။)
- (င) နေအိမ် / တဲ ရွှေ့ပြောင်းရခြင်းအတွက် = ၅၀၀၀၀- ကျပ်
- (စ) စုစုပေါင်း ပေးအပ်ရမည့် နစ်နာကြေး = အမှတ်စဉ်(ဃ) ကျပ် + အမှတ်စဉ် (င) (ကျပ်)

ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများဖွံ့ဖြိုးတိုးတက်ရေးဦးစီးဌာနမှ ပခုက္ကူရေလမ်းအတွင်း သောင်တူးလုပ်ငန်းတွင် ပျက်စီးဆုံးရှုံးမှုများအတွက် ငါးဖမ်းလုပ်ငန်း ဆောင်ရွက်နေသူ ဦးခိုင်မိုးဝင်း (တင်ဒါပိုင်ရှင်) မိသားစု သို့ ဖော်ပြပါငွေကြေးများအား သောင်တူးလုပ်ငန်းမစတင်မီ တစ်ပတ် (၇-ရက်)အလိုတွင် ပေးချေပါမည်။ ငွေပေးချေပြီးနောက် တဲများအား သောင်တူးနေသောနေရာမှ ပြောင်းရွှေ့ပေးရန်ဖြစ်ပြီး၊ သောင်တူးလုပ်ငန်းနှင့် လွတ်သောနေရာများတွင်သာငါးဖမ်းခြင်း ဆောင်ရွက်ရမည် ဖြစ်ပါသည်။

ဖော်ပြပါအချက်များအား သဘောတူညီကြောင်းလက်မှတ်ရေးထိုးပါသည်။

လက်မှတ် _____
 အမည် ဦးစိုစိုမိုးဝင်း
 နိုင်ငံသားစိစစ်ရေးကော်မရှင်အမှတ် ၈/မ.၁.က(၉၆)
၁၅.၇.၂၀၁၆
 လိပ်စာ အားကျွန်း-အေးရွာ-ပခုက္ကူမြို့နယ်

လက်မှတ် _____
 အမည် ဦးစိုစို
 နိုင်ငံသားစိစစ်ရေးကော်မရှင်အမှတ် _____
၉/၅၁၁(၉၆) ၀၀၄၂၃
 လိပ်စာ ၈၅/၆၆/၆-၊ အောင်မြေမြို့

နစ်နာကြေးပေးစဉ်အသုံးပြုမည့် ပုံစံ (Form - 1)

ဧရာဝတီမြစ်ဝှမ်း ဘက်စုံစီမံခန့်ခွဲမှုစီမံကိန်း (AIRBM Project)

ပခုက္ကူရေလမ်းတွင် နစ်နာကြေး ပေးအပ်မည့်ပုံစံ

ရက်စွဲ ၂၃-၃-၂၀၁၆

ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများဖွံ့ဖြိုးတိုးတက်ရေးဦးစီးဌာနသည် ကမ္ဘာ့ဘဏ်ချေးငွေဖြင့် ဧရာဝတီမြစ်ဝှမ်းဘက်စုံစီမံခန့်ခွဲမှုစီမံကိန်းအား အကောင်အထည်ဖော်ဆောင်ရွက်လျက်ရှိပါသည်။ ဧရာဝတီမြစ်အတွင်း ကုန်စည်စီးဆင်းမှုလုံခြုံချောမွေ့စေရေးနှင့် သင်္ဘောများအဆင်ပြေစွာ သွားလာနိုင်ရန်အတွက် ရေလမ်းကောင်းမွန်ရေးလုပ်ငန်းများ ဆောင်ရွက်ရန်တာဝန်ရှိပါသည်။ ရေလမ်းကောင်းမွန်ရေးဆောင်ရွက်ရန် လိုအပ်လျက်ရှိသော ပခုက္ကူရေလမ်းတွင် သောင်တူးလုပ်ငန်းများအား ပူးတွဲဖော်ပြပါရေလမ်းမြေပုံတွင်ပါရှိသည့်အတိုင်း ဆောင်ရွက်သွားမည်ဖြစ်ပါသည်။ သို့ဖြစ်ပါ၍ သောင်တူးလုပ်ငန်းကြောင့် နစ်နာဆုံးရှုံးသွားနိုင်သည့် ငါးတန်ဖိုးနှင့် တဲပြောင်းရွှေ့ရခြင်းအတွက် နစ်နာကြေးအား အောက်ပါအတိုင်း တွက်ချက်၍ပေးအပ်ပါသည်။

- နေ့စဉ်ပုံမှန် ဖမ်းယူရရှိမည့် ငါးပမာဏ = ၂ ပိဿာ/ တစ်ရက်
- လက်ရှိ ဒေသ၏ ငါး ဈေးနှုန်း = ၃၅၀၀၀/ကျပ် / ပိဿာ
- တစ်ရက်လျှင် နစ်နာမည့်ပမာဏ = ၇၀၀၀ ကျပ် / ရက်
- စုစုပေါင်း (၅) ရက်အတွက် သင့်ငွေ = ၃၅၀၀၀ ကျပ်
- နေအိမ် / တဲ ရွှေ့ပြောင်းရခြင်းအတွက် = ၅၀၀၀၀ ကျပ်
- စုစုပေါင်း ပေးအပ်ရမည့် နစ်နာကြေး = ၈၅၀၀၀ ကျပ်

ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများဖွံ့ဖြိုးတိုးတက်ရေးဦးစီးဌာနမှ ပခုက္ကူရေလမ်းအတွင်း သောင်တူးလုပ်ငန်းတွင် ပျက်စီးဆုံးရှုံးမှုများအတွက် ငါးဖမ်းလုပ်ငန်း ဆောင်ရွက်နေသူ ဦးစင်မြင့် မိသားစု သို့ ၊ ငွေ ကျပ် ၈၅၀၀၀ (စာဖြင့် ရှစ်ဆယ့်ငါးထောင် ကျပ်တိတိ) အား ဦးစင်မြင့် ၏ ရွှေ့မှောက်တွင် ဦးစင်မြင့် ကိုယ်တိုင် ပေးချေလိုက်သည်။

အသိသက်သေ

လက်ခံရရှိသူ

လက်မှတ် [Signature]
 အမည် ဦးကျော်စော
 နိုင်ငံသားစိစစ်ရေးကိစ္စများအမှတ် ၈/၁၁၁၈(၂၆) ၂၀၂၀၂၂
 လိပ်စာ ၀၂၂/၂၂
မန္တလေး

လက်မှတ် [Signature]
 အမည် ဦးစင်မြင့်
 နိုင်ငံသားစိစစ်ရေးကိစ္စများအမှတ် ၈/၁၁၁၈(၂၆) ၂၀၂၀၂၂
 လိပ်စာ ၀၂၂/၂၂
မန္တလေး

နစ်နာကြေးပေးစဉ်အသုံးပြုမည့် ပုံစံ (Form - 1)

ဧရာဝတီမြစ်ဝှမ်း ဘက်စုံစီမံခန့်ခွဲမှုစီမံကိန်း (AIRBM Project)

ပခုက္ကူရေလမ်းတွင် နစ်နာကြေး ပေးအပ်မည့်ပုံစံ



ရက်စွဲ ၂၃.၇.၂၀၁၆

ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများဖွံ့ဖြိုးတိုးတက်ရေးဦးစီးဌာနသည် ကမ္ဘာ့ဘဏ်ချေးငွေဖြင့် ဧရာဝတီမြစ်ဝှမ်းဘက်စုံစီမံခန့်ခွဲမှုစီမံကိန်းအား အကောင်အထည်ဖော်ဆောင်ရွက်လျက်ရှိပါသည်။ ဧရာဝတီမြစ်အတွင်း ကုန်စည်စီးဆင်းမှုလုံခြုံချောမွေ့စေရေးနှင့် သင်္ဘောများအဆင်ပြေစွာ သွားလာနိုင်ရန်အတွက် ရေလမ်းကောင်းမွန်ရေးလုပ်ငန်းများ ဆောင်ရွက်ရန်တာဝန်ရှိပါသည်။ ရေလမ်းကောင်းမွန်ရေးဆောင်ရွက်ရန် လိုအပ်လျက်ရှိသော ပခုက္ကူရေလမ်းတွင် သောင်တူးလုပ်ငန်းများအား ပူးတွဲဖော်ပြပါရေလမ်းမြေပုံတွင်ပါရှိသည့်အတိုင်း ဆောင်ရွက်သွားမည်ဖြစ်ပါသည်။ သို့ဖြစ်ပါ၍ သောင်တူးလုပ်ငန်းကြောင့် နစ်နာဆုံးရှုံးသွားနိုင်သည့် ငါးတန်ဖိုးနှင့် တဲပြောင်းရွှေ့ရခြင်းအတွက် နစ်နာကြေးအား အောက်ပါအတိုင်း တွက်ချက်၍ပေးအပ်ပါသည်။

- နေ့စဉ်ပုံမှန် ဖမ်းယူရရှိမည့် ငါးပမာဏ = ၂၅ ----- ပိဿာ/ တစ်ရက်
- လက်ရှိ ဒေသ၏ ငါး ဈေးနှုန်း = ၃၀၀၀ ----- ကျပ် / ပိဿာ
- တစ်ရက်လျှင် နစ်နာမည့်ပမာဏ = ၇၅၀၀၀ ----- ကျပ် / ရက်
- စုစုပေါင်း (၅)ရက်အတွက် သင့်ငွေ = ၃၇၅၀၀၀ ----- ကျပ်
- နေအိမ် / တဲ ရွှေ့ပြောင်းရခြင်းအတွက် = ၅၀၀၀၀ ----- ကျပ်
- စုစုပေါင်း ပေးအပ်ရမည့် နစ်နာကြေး = ၄၂၅၀၀၀ ----- ကျပ်

ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများဖွံ့ဖြိုးတိုးတက်ရေးဦးစီးဌာနမှ ပခုက္ကူရေလမ်းအတွင်း သောင်တူးလုပ်ငန်းတွင် ပျက်စီးဆုံးရှုံးမှုများအတွက် ငါးဖမ်းလုပ်ငန်း ဆောင်ရွက်နေသူ ဦးခိုင်မျိုးဝင်း ----- မိသားစု သို့ ၊ ငွေ ကျပ် ၄၂၅၀၀၀/- (စာဖြင့် ငါးဆယ်သိန်းငါးပိတ်ဆယ်) အား ဦးဝင်းကျော် ----- ၏ ရွှေ့မှောက်တွင် ဦးဝင်းမျိုးခိုင် ----- ကိုယ်တိုင် ပေးချေလိုက်သည်။

အသိသက်သေ လက်ခံရရှိသူ

လက်မှတ်  ----- လက်မှတ်  -----
 အမည် ဦး ကိုကျော်စွာ ----- အမည် ဦး ခိုင်မျိုးဝင်း -----
 နိုင်ငံသားစိစစ်ရေးကတ်ပြားအမှတ် ၈၂၁၈၃ (၁၆) ----- နိုင်ငံသားစိစစ်ရေးကတ်ပြားအမှတ် -----
 လိပ်စာ ----- လိပ်စာ -----
 ----- လိပ်စာ -----

OA. ၄၄၂၀၉၃၅၅၉

နစ်နာကြေးပေးစဉ်အသုံးပြုမည့် ပုံစံ (Form - 1)

ဧရာဝတီမြစ်ဝှမ်း ဘက်စုံစီမံခန့်ခွဲမှုစီမံကိန်း (AIRBM Project)

ပခုက္ကူရေလမ်းတွင် နစ်နာကြေး ပေးအပ်မည့်ပုံစံ

ရက်စွဲ ၂၃.၇.၂၀၁၆


ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများဖွံ့ဖြိုးတိုးတက်ရေးဦးစီးဌာနသည် ကမ္ဘာ့ဘဏ်ချေးငွေဖြင့် ဧရာဝတီမြစ်ဝှမ်းဘက်စုံစီမံခန့်ခွဲမှုစီမံကိန်းအား အကောင်အထည်ဖော်ဆောင်ရွက်လျက်ရှိပါသည်။ ဧရာဝတီမြစ်အတွင်း ကုန်စည်စီးဆင်းမှုလုံခြုံချောမွေ့စေရေးနှင့် သင်္ဘောများအဆင်ပြေစွာ သွားလာနိုင်ရန်အတွက် ရေလမ်းကောင်းမွန်ရေးလုပ်ငန်းများ ဆောင်ရွက်ရန်တာဝန်ရှိပါသည်။ ရေလမ်းကောင်းမွန်ရေးဆောင်ရွက်ရန် လိုအပ်လျက်ရှိသော ပခုက္ကူရေလမ်းတွင် သောင်တူးလုပ်ငန်းများအား ပူးတွဲဖော်ပြပါရေလမ်းမြေပုံတွင်ပါရှိသည့်အတိုင်း ဆောင်ရွက်သွားမည်ဖြစ်ပါသည်။ သို့ဖြစ်ပါ၍ သောင်တူးလုပ်ငန်းကြောင့် နစ်နာဆုံးရှုံးသွားနိုင်သည့် ငါးတန်ဖိုးနှင့် တဲပြောင်းရွှေ့ရခြင်းအတွက် နစ်နာကြေးအား အောက်ပါအတိုင်း တွက်ချက်၍ပေးအပ်ပါသည်။

- နေ့စဉ်ပုံမှန် ဖမ်းယူရရှိမည့် ငါးပမာဏ = ၂ ပိဿာ/ တစ်ရက်
- လက်ရှိ ဒေသ၏ ငါး ဈေးနှုန်း = ၃၅၀၀၂ ကျပ် / ပိဿာ
- တစ်ရက်လျှင် နစ်နာမည့်ပမာဏ = ၇၀၀၀ ကျပ် / ရက်
- စုစုပေါင်း (၅)ရက်အတွက် သင့်ငွေ = ၃၅၀၀၀ ကျပ်
- နေအိမ် / တဲ ရွှေ့ပြောင်းရခြင်းအတွက် = ၅၀၀၀၀ ကျပ်
- စုစုပေါင်း ပေးအပ်ရမည့် နစ်နာကြေး = ၈၅၀၀၀ ကျပ်

ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများဖွံ့ဖြိုးတိုးတက်ရေးဦးစီးဌာနမှ ပခုက္ကူရေလမ်းအတွင်း သောင်တူးလုပ်ငန်းတွင် ပျက်စီးဆုံးရှုံးမှုများအတွက် ငါးဖမ်းလုပ်ငန်း ဆောင်ရွက်နေသူ ဦးစောစောမောင် မိသားစု သို့ ၊ ငွေ ကျပ် ၈၅၀၀၀ (စာဖြင့် နှစ်သောင်းငါးဆယ့်ငါးထောင်ကျပ်တိတိ) အား ဦးစောစောမောင် ၏ ရွှေ့မှောက်တွင် ဦးစောစောမောင် ကိုယ်တိုင် ပေးချေလိုက်သည်။

အသိသက်သေ

လက်ခံရရှိသူ

လက်မှတ်  -----
 အမည် ဦးကျော်စော -----
 နိုင်ငံသားစိစစ်ရေးကတ်ပြားအမှတ် ၈/၂၁၈၇(၂၆) -----
 ၀၀၂၁၀၅ -----
 လိပ်စာ ဗဟိုရေလမ်းဝန်ဆောင်မှုဦးစီးဌာန -----
 ၅၀-၂၀-၂၀၁၆ -----

မောင် -----
 လက်မှတ် -----
 အမည် ဦးစောစောမောင် -----
 နိုင်ငံသားစိစစ်ရေးကတ်ပြားအမှတ် ၉/၂၃၃၇(၂၆) -----
 ၃၄၃၀၅၀ -----
 လိပ်စာ ဗဟိုရေလမ်းဝန်ဆောင်မှုဦးစီးဌာန -----
 ၅၀-၂၀ -----

နစ်နာကြေးပေးစဉ်အသုံးပြုမည့် ပုံစံ (Form - 1)

ဧရာဝတီမြစ်ဝှမ်း ဘက်စုံစီမံခန့်ခွဲမှုစီမံကိန်း (AIRBM Project)

ပခုက္ကူရေလမ်းတွင် နစ်နာကြေး ပေးအပ်မည့်ပုံစံ

ရက်စွဲ ၂၃-၇-၂၀၁၈

ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများဖွံ့ဖြိုးတိုးတက်ရေးဦးစီးဌာနသည် ကမ္ဘာ့ဘဏ်ချေးငွေဖြင့် ဧရာဝတီမြစ်ဝှမ်းဘက်စုံစီမံခန့်ခွဲမှုစီမံကိန်းအား အကောင်အထည်ဖော်ဆောင်ရွက်လျက်ရှိပါသည်။ ဧရာဝတီမြစ်အတွင်း ကုန်စည်စီးဆင်းမှုလုံခြုံချောမွေ့စေရေးနှင့် သင်္ဘောများအဆင်ပြေစွာ သွားလာနိုင်ရန်အတွက် ရေလမ်းကောင်းမွန်ရေးလုပ်ငန်းများ ဆောင်ရွက်ရန်တာဝန်ရှိပါသည်။ ရေလမ်းကောင်းမွန်ရေးဆောင်ရွက်ရန် လိုအပ်လျက်ရှိသော ပခုက္ကူရေလမ်းတွင် သောင်တူးလုပ်ငန်းများအား ပူးတွဲဖော်ပြပါရေလမ်းမြေပုံတွင်ပါရှိသည့်အတိုင်း ဆောင်ရွက်သွားမည်ဖြစ်ပါသည်။ သို့ဖြစ်ပါ၍ သောင်တူးလုပ်ငန်းကြောင့် နစ်နာဆုံးရှုံးသွားနိုင်သည့် ငါးတန်ဖိုးနှင့် တဲပြောင်းရွှေ့ရခြင်းအတွက် နစ်နာကြေးအား အောက်ပါအတိုင်း တွက်ချက်၍ပေးအပ်ပါသည်။

- နေ့စဉ်ပုံမှန် ဖမ်းယူရရှိမည့် ငါးပမာဏ = ၂ ပိဿာ/ တစ်ရက်
- လက်ရှိ ဒေသ၏ ငါး ဈေးနှုန်း = ၃၅၀၀ ကျပ် / ပိဿာ
- တစ်ရက်လျှင် နစ်နာမည့်ပမာဏ = ၇၀၀၀ ကျပ် / ရက်
- စုစုပေါင်း (၅)ရက်အတွက် သင့်ငွေ = ၃၅၀၀၀ ကျပ်
- နေအိမ် / တဲ ရွှေ့ပြောင်းရခြင်းအတွက် = ၅၀၀၀၀ ကျပ်
- စုစုပေါင်း ပေးအပ်ရမည့် နစ်နာကြေး = ၈၅၀၀၀ ကျပ်

ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများဖွံ့ဖြိုးတိုးတက်ရေးဦးစီးဌာနမှ ပခုက္ကူရေလမ်းအတွင်း သောင်တူးလုပ်ငန်းတွင် ပျက်စီးဆုံးရှုံးမှုများအတွက် ငါးဖမ်းလုပ်ငန်း ဆောင်ရွက်နေသူ ဦးမင်းဦး မိသားစု သို့ ၊ ငွေ ကျပ် ၈၅၀၀၀ (စာဖြင့် ရှစ်အထိငါးဆောင် ကျပ်တိတိ) အား ဦးပိုင်မျိုးဝင်း ၏ ရွှေ့မှောက်တွင် ဦးမင်းမျိုးဝင်း ကိုယ်တိုင် ပေးချေလိုက်သည်။

အသိသက်သေ

လက်ခံရရှိသူ

လက်မှတ် [Signature]
 အမည် ဦးကျော်မင်း
 နိုင်ငံသားစိစစ်ရေးကတ်ပြားအမှတ် ၈/၁၃၃၄(၂၆)
၀၀၂၁၀၅
 လိပ်စာ DWAR မန္တလေးမြို့

လက်မှတ် [Signature]
 အမည် ဦးမင်းဦး
 နိုင်ငံသားစိစစ်ရေးကတ်ပြားအမှတ် -----
၈/၁၃၃၄(၂၆) ၁၈၇၇၃၃
မန္တလေးမြို့
ပခုက္ကူမြို့နယ်

နစ်နာကြေးပေးစဉ်အသုံးပြုမည့် ပုံစံ (Form - ၂)

ဧရာဝတီမြစ်ဝှမ်း ဘက်စုံစီမံခန့်ခွဲမှုစီမံကိန်း (AIRBM Project)

ညောင်ဦးရေလမ်းတွင် နစ်နာကြေး ပေးအပ်မည့်ပုံစံ

ရက်စွဲ ၂၄.၇.၂၀၁၆

ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများဖွံ့ဖြိုးတိုးတက်ရေးဦးစီးဌာနသည် ကမ္ဘာ့ဘဏ်ချေးငွေဖြင့် ဧရာဝတီမြစ်ဝှမ်းဘက်စုံစီမံခန့်ခွဲမှုစီမံကိန်းအား အကောင်အထည်ဖော်ဆောင်ရွက်လျက်ရှိပါသည်။ ဧရာဝတီမြစ်အတွင်း ကုန်စည်စီးဆင်းမှုလုံခြုံချောမွေ့စေရေးနှင့် သင်္ဘောများအဆင်ပြေစွာ သွားလာနိုင်ရန်အတွက် ရေလမ်းကောင်းမွန်ရေးလုပ်ငန်းများ ဆောင်ရွက်ရန်တာဝန်ရှိပါသည်။ ရေလမ်းကောင်းမွန်ရေးဆောင်ရွက်ရန် လိုအပ်လျက်ရှိသော ညောင်ဦးရေလမ်းတွင် သောင်တူးလုပ်ငန်းနှင့် ရေကာတည်ဆောက်ခြင်းလုပ်ငန်းများအား ပူးတွဲဖော်ပြပါရေလမ်း မြေပုံတွင်ပါရှိသည့် အတိုင်း ဆောင်ရွက်သွားမည်ဖြစ်ပါသည်။ သို့ဖြစ်ပါ၍ ရေကာတည်ဆောက်ခြင်းလုပ်ငန်းကြောင့် နစ်နာဆုံးရှုံး သွားနိုင်သည့် ငါးတန်ဖိုးအတွက် နစ်နာကြေးအားအောက်ပါ အတိုင်းတွက်ချက်ပေးအပ်ပါသည်။

နေ့စဉ်ပုံမှန် လျှော့နည်းသွားနိုင်သည့် ငါးပမာဏ = ၇၅ ပိဿာ / တစ်ရက်
လက်ရှိ ဒေသ၏ ငါး ဈေးနှုန်း = ၂၀၀၀ ကျပ် / ပိဿာ
တစ်ရက်လျှင် နစ်နာမည့်ပမာဏ = ၁၅၀၀၀၀ / ကျပ် / ရက်
စုစုပေါင်း (၇၀)ရက်အတွက်ပေးအပ်ရမည့် နစ်နာကြေး = ၁၅၀၀၀၀၀ / ကျပ်

ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများဖွံ့ဖြိုးတိုးတက်ရေးဦးစီးဌာနမှ ညောင်ဦးရေလမ်းအတွင်း ရေကာလုပ်ငန်းတွင် နစ်နာဆုံးရှုံးမှုများအတွက် ငါးဖမ်းလုပ်ငန်း ဆောင်ရွက်နေသူ ဦးမြင့်မြင့် (မိသားစုသို့ ၊ ငွေ ကျပ် ၁၅၀၀၀၀၀ / (စာဖြင့် တစ်ဆိုး ၊ ငါးသောင်း ဝေ) ကျပ်တိတိ) အား ဦးစွန်းကျော်အောင်၏ ရွှေမှောက်တွင် ဦးကျော်မြင့်နှင့် ကိုယ်တိုင် ပေးချေလိုက်သည်။

အသိသက်သေ	လက်ခံရရှိသူ
လက်မှတ် _____	လက်မှတ် _____
အမည် ဦးစွန်းကျော်အောင်	အမည် ဦးမြင့်မြင့်
နိုင်ငံသားစိစစ်ရေးကတ်ပြားအမှတ် ၁၃/၂၀၁၈ (၂၆) - ၀၀၀၁၀၀	နိုင်ငံသားစိစစ်ရေးကတ်ပြားအမှတ် ၈/၂၀၁၈ (၂၆) - ၁၂၇၉၅၀
လိပ်စာ ၈၁၄ (၁၃) ၂၀၇၀၈(၃၆) ၆၀၀၀၅၂၁၁၊ မင်္ဂလာတောင်ညွန့်၊ ပျံချ	လိပ်စာ ၈၀၀၀၅၂၁၁၊ မင်္ဂလာတောင်ညွန့်၊ ပျံချ

