

# **Myanmar Agriculture Development Support Project**

## **Environmental and Social Management Framework**

**Ministry of Agriculture and Irrigation  
The Union Government of Myanmar**

**Draft for Public Consultation**

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### **Abbreviation**

## 1. Background

Since democratic reform started in 2011, Government of Myanmar (GOM) has paid attention to improvement of socioeconomic condition of the country. In particular, Framework of Economic and Social Reform (FESR) was formulated in 2012 for setting up the development priorities and guiding principles for fulfilling the immediate and long term development needs of the country. In the pursuit of development measures strategized in FESR, it is expected that absolute poverty accounting of 26% of entire population could be reduced down to 15% by year 2015. Improving food security and agriculture growth is also seen as important bold step for uplifting the rural poor from the poverty line. This is to be done through boosting agriculture productivity with the increased farmer's access to extension service, government loan, agriculture inputs such as quality seed, fertilizer and pesticide, while removing barriers throughout the supply chain and promoting demand-oriented market support mechanisms, which will pave the way for long-term structural and institutional reforms needed in the sector.<sup>1</sup>

Alongside its dynamic socio-political changes in Myanmar, the relationship with international communities has been diplomatically improved in recent years. It results the increase of development cooperation with international development agencies such as International Monetary Fund, World Bank, Asia Development Bank, etc. Considering the development need of the country and the plight of the poor, most of the development agencies resume their development aids and loans particularly for development intervention conducive to poverty reduction. With regard to agriculture and rural development that might have greater impact to 70% of country population residing in rural area the Agriculture Development Support Project (ADSP) is proposed through a World Bank loan of US\$ 100 million. Ministry of Agriculture and Irrigation (MOAI) is the implementing agency for this project with the objective of increasing crop yields and cropping intensity in the selected existing irrigation systems in Bago East, Nay Pyi Taw, Mandalay, and Sagaing regions. This objective will be achieved through improved irrigation and drainage management and complementary farm advisory and technical services. The project intends to support modification, rehabilitation and modernization of existing irrigation systems that are located in the target regions and meet certain technical, environmental and socio-economic criteria. Specific sites for investments will be selected and identified during project implementation once the relevant feasibility studies and technical details and assessments are developed and available.

The proposed ADSP project includes four components with activities detailed as follows:

***Component 1: Irrigation and Drainage Management.*** The component aims to enhance more responsive and reliable provision of irrigation and drainage services in the project areas to enable an increase in irrigation area coverage, a resulting better farm productivity and better distribution of benefits between upstream and downstream users. It would address irrigation and drainage management through the following approach.

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<sup>1</sup> Government of Myanmar (2013), "Framework for Economic and Social Reforms", Policy priorities for 2012-2015 towards Long-Term Goals of the National Comprehensive Development Plan; [http://www.themimu.info/sites/themimu.info/files/documents/Ref%20Doc\\_FrameworkForEconomicAndSocialReform2012-15\\_Govt\\_2013%20.pdf](http://www.themimu.info/sites/themimu.info/files/documents/Ref%20Doc_FrameworkForEconomicAndSocialReform2012-15_Govt_2013%20.pdf)

Firstly, it would focus on institutional change required for the provision of farmer-responsive irrigation services. This is needed for the development of a new management paradigm which would include a more elevated role for water user groups (WUGs), combined with development and gradual introduction of more responsive water delivery systems, data collection and management information systems. The ADSP will support the development of irrigation and drainage management institutions, their human resources, data collection and management information systems and infrastructure. The project will support the establishment and development of about 280 WUGs in 8 irrigation sites, utilizing facilitators from civil society organizations. Capacity building and training will be provided at all levels of service delivery agencies, including WUGs and township-level government agencies. Facilitators will be trained in development of WUGs and creation of bridges between farmers and government agencies. WUGs and agency officials will be trained in new technologies and management approaches for improved service delivery and scheme management. In order to facilitate better information sharing and more reliable provision of irrigation and drainage services, the project will also strengthen the management capacity of the Department of Irrigation (ID) of MOAI through provision of management information and decision support systems, improvement of infrastructure and facilities and enhancing mobility of field staff.

Secondly, the component would finance the improvement and rehabilitation of irrigation and drainage infrastructure covering about 40,000 ha in up to 8 selected schemes in the selected regions. It would finance rehabilitation and improvement of main conveyance, flow control and sediment management systems and de-siltation of irrigation and drainage systems and dam safety enhancement measures. The project would also support improvement of farmer managed water management infrastructure and pilot land improvement in 2-3 selected systems, which is needed for creating cropping flexibility for the farmers, more equitable water distribution between upstream and tail end farmers, and ending their mutual dependence which exists in the traditional field to field (and plot to plot) water conveyance systems. The infrastructure rehabilitation investments will be based on special studies targeted at the selected irrigation schemes. These could include, inter alia, feasibility studies, environmental and social assessments, options for improved cost recovery, performance assessment benchmarking and scheme management improvement potential, asset management, disaster risk management, dam safety and drainage master planning.

Finally, the project will pay particular attendance to clarity of land tenure issues in the targeted irrigation and land improvement sites. The component would support inclusive land administration activities in the targeted irrigation sites. It will support production of new digital cadastral maps for the targeted irrigable areas based on international best practices in renewing cadastral maps and creating digital land records. New land user right certificates (LUCs) will be issued to the farmers based on these maps. International best practice approaches in land improvement will be piloted, starting from community engagement in order to generate rights-sensitive parcel layout plans, which minimize needs for transactions and land acquisition. Finally, the project will support community awareness raising campaigns to educate beneficiary farmers on operating in market economy with tradable land rights by educating farmers about the farmland values and options that the market economy provides. The aim is to protect farmers against uninformed or duress land transactions.

***Component 2: Farm Advisory and Technical Services.*** This component seeks to enhance MOAI technology development and farm advisory services at target townships which host selected irrigation schemes to increase farm productivity. An improvement of the selected irrigation schemes under Component 1 will result in improved water availability and water control. The production and extension of improved technologies and agronomic practices supported under Component 2 will enhance the economic and financial viability of

farming systems on these schemes. Farmers will have the capacity to improve cropping intensity and where feasible diversify to more water efficient crops such as legumes, oil seed crops and vegetables. Increasing awareness of costs and benefits of improved varieties, good seed, and upgraded fertilizer recommendations to take advantage of improved water conditions will also raise productivity as will the introduction of other agronomic and farm mechanization practices. These technologies will need to be adapted to the new agro-ecological environments in target irrigation schemes.

The component would support technology development and adoption activities in targeted irrigation schemes, which would increase farm productivity and reduce production costs of farming systems. It will build on the existing public extension system, which is relatively well staffed but lacks operational funds, knowledge in modern technologies and farm practices, and interaction skills with farmers. The component will address these weaknesses.

Functionally, it will support quality seed production (mainly rice, beans and pulses, and oil crops that are not produced by the private sector) by developing farmer-based seed multiplication infrastructure and facilities and strengthen seed supply chains. This will foster improvements in varietal development, on-farm seed multiplication, and distribution of improved seed to farmers. Improved fertilizer applications which will be adapted to the variability in soil types in targeted irrigation schemes are expected to increase yield response rates to appropriate nutrient applications to reach full potential of new varieties, while reducing fertilizer costs. The potential risk of crop losses due to insect pest and disease outbreaks will be addressed by improving the capacity of the MOAI and farmers to protect both public health and the environment through the adoption of Integrated Pest Management (IPM) techniques based on the specimen problem identification collections of pests in project townships. All these agricultural technology development activities and knowledge of improved farming practices will be disseminated to target farmers through improved farm advisory services which are based on farmers' needs and technical constraints, farming systems and market opportunities. The project will support rehabilitation of village extension education centers, establish field demonstration sites of improved technologies, expand training programs and provide operational and mobility support to MOAI extension staff and subject matter specialists.

The rising rural labor costs and increasing scarcity of hired labor is evidenced in the project locations at peak season times of planting and harvesting. The farmers experience also high post-harvest losses. The relatively large farm sizes of Myanmar smallholders create good preconditions for profitable farm mechanization in targeted irrigation schemes. However, Myanmar farmers lag significantly behind their peers in neighboring countries in the use of machinery. The private sector rarely provides mechanization services. The country does not have a strong vocational training system for farm machinery or engineering. The component would support training of MOAI mechanics, test and demonstrate new climate-smart technologies suitable for smallholder farming systems, and provide mechanization services in the target irrigation systems. It would upgrade the capacity of the Meikhtila Mechanization Training Center in Mandalay region through the introduction of modern training methodologies, materials, and upgrade repair workshops, in order to provide more and better vocational training to the staff of MOAI Mechanization Service Stations, farmers, and the private sector. It will also support four MOAI Mechanization Service Stations in the project areas, through procurement of machine packages and mobile repair workshops selected in collaboration with the private sectors in order to promote climate-smart mechanization technologies to farmers, provide cost-effective services suitable for smallholder farming systems in Dry Zone, and carry out farmer training.

***Component 3: Project Coordination and Management.*** The Project Management Unit (PMU) will be established in the MOAI. It will include technical and fiduciary MOAI staff who will be seconded to PMU at a full-time basis from the relevant implementing departments. The PMU will be responsible for the overall coordination of the project implementation and fiduciary arrangements, including procurement, financial management, management of safeguards issues, internal and external auditing and the establishment of the project Monitoring and Evaluation (M&E) system. Outside consultants will be recruited in areas which require strengthening of MOAI implementation capacity. The component would finance establishment of the M&E and Management Information Systems and associated Technical Advisory (TA) services; communication and consultation program; salaries of the externally recruited staff, related office equipment and mobility.

***Component 4: Contingent Emergency Financing.*** The objective of this zero component is to allow a rapid reallocation of loan proceeds from other components to provide emergency recovery and reconstruction support following an adverse natural event. The component would finance public and private sector expenditures on a positive list of goods and/or specific works, goods, services and emergency operation costs required for Myanmar's emergency recovery. A Contingency Emergency Response Component Operational Manual will apply to this component, detailing financial management, procurement, safeguard and any other necessary implementation arrangements.



## 2. Project Overview

### 2.1 Project investments and coverage

The proposed project will use a phased approach which allows flexible identification of the number and size of target gravity irrigation perimeters (Appendix I provides the details of the site selection criteria). It is suggested that the project implementation will start with smaller and technically relatively simple irrigation sites. It would be gradually scaled up to potentially larger systems or systems with more complex problems as the lessons from the initial pilot areas become available. Given the level of complexities inherent in historical displacement issues in Myanmar and the considerable costs to address active disputes that will likely far exceed the direct benefit of the project, the project will not include sites which have already been brought to the consideration of the Land Loss Enquiry Commission of the Parliament. The Project will however carry out the due diligence during implementation to assess how the project irrigation schemes including dams and reservoirs were originally built during implementation, and address land legacy issues that may exist over the project irrigation schemes according to the footprint of the project.

The targeted irrigation schemes are located in well-established agricultural production areas in the Nay Pyi Taw, Bago-East, Mandalay, and Sagaing regions. These regions account for about 75 percent of the country's areas equipped with irrigation and drainage infrastructure. The project would target about 8 irrigation schemes which cover some 40,000 ha of net irrigable area and which may span over 16 townships. However, the specific boundaries and features of the irrigation schemes within these sites will be determined during project implementation as an output of the technical feasibility studies, which include relevant environmental and social assessments to be prepared during the first year of the project implementation in line with provisions of this document.

The proposed project investments are expected to be designed to have positive social and environmental benefits and will trigger the following World Bank policies: *Environmental Assessment* (OP 4.01); *Natural Habitat* (OP 4.04); *Physical Cultural Resources* (OP 4.11); *Safety of Dams* (OP 4.37); *Pest Management* (OP 4.09), *Involuntary Resettlement* (OP 4.12) and *Indigenous People* (OP 4.10).<sup>2</sup> The project has been classified as environmental category "B" in accordance with the World Bank policy OP/BP 4.01 on Environmental Assessment primarily due to the rehabilitation nature of the proposed irrigation works, which will take place within footprint of existing irrigated systems on established agriculture lands, as well of the dam safety and operation improvement linked to existing irrigation dams (e.g., typical works on dam body will include repair of slopes and dam crest covers; repair of existing spillways; installation of monitoring equipment; repair of gate devices and provision of infiltration blankets to reduce seepage; and surfacing of access road where necessary). The impacts of these proposed activities on the environment are expected to be overall positive as the project, by design, puts strong emphasis on the development of sustainable and climate resilient agricultural production systems. Temporary

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<sup>2</sup>The project also triggers the policy on *Projects on International Waterways* (OP/BP 7.50) since some of the irrigation systems use the Ayeyarwady River as water source. Up to 99.7% of the Ayeyarwady River flow is accumulated within Myanmar, the river's downstream most riparian. Given the rehabilitation nature of the project activities, it is envisaged that the project will not adversely change the quality or quantity of water flows to the other riparians, and will not be adversely affected by the other riparians' possible water use. Thus, while the policy is triggered, it qualifies for an exception to the riparian notification requirement under para. 7(a) of OP 7.50 and no notification will be required.

negative impacts are related to small scale construction activities, which are limited to the rehabilitation and improvement of existing irrigated agriculture infrastructure.

The project will also finance small-scale constructions such as those of breeder seed store room, storage facilities for seed farms, and other relevant storage depot, which are all located on existing seed farms or land owned by Department of Agricultural Research (DAR) and Department of Agriculture (DOA). Further, the project will rehabilitate existing village extension education centers within the existing locations or newly established centers by rehabilitating or retrofitting existing government buildings on the state land.

Other activities supported by the project, such as the piloting of irrigation technologies; piloting of international best practices approaches in land consolidation, registration and property valuation systems; and the undertaking of feasibility study and design of irrigation schemes and dam safety feasibility as well as other studies will review and assess potential environmental and social impacts of the activities and alternatives considered on a case-by-case basis; such studies will be developed based on ToRs cleared by the Bank.

The project is known to utilize only surface water resources (reservoirs), from which water is delivered through gravity fed irrigation systems. While the project will not finance construction of new dams or structural changes in the existing ones, the irrigation systems financed by the project would draw water directly from specialized irrigation reservoirs formed by a number of existing dams. The project will not use groundwater resources. Due diligence on the operation and safety of dams linked to the project funded irrigations schemes has been done independently based on separate ToRs during project preparation; findings of this diligence are included in a separate project safeguard document prepared to meet the Bank's *Safety of Dams Policy* (OP 4.07), based on which corrective measures will be developed to address any safety risks of these dams during project implementation.

## **2.2 Environmental and Social Management Framework (ESMF) Scope and Objectives**

As the technical evaluation (e.g., proper site characterization, feasibility studies, detailed designs) and specific intervention locations under the project will not be ready and their specific impacts will not be known by project appraisal, the preparation of this ESMF, including a Resettlement Policy Framework (RPF) and an Indigenous Peoples Planning Framework (IPPF) describes the overall environmental and social safeguard procedures to be undertaken during project implementation. The purpose of this ESMF is to manage the potential adverse impacts by establishing a guide consisting of a set of procedures and measures to facilitate adequate environmental and social management, including risk management of environmental and social impacts, directed to the group of activities to be financed by the project and whose specific location is unknown and may change over project implementation.

Consequently, given that the detailed technical feasibility studies for the pre-selected sites in Mandalay, Sagaing, and Bago East regions will not be carried out by the project appraisal, the ESMF is the tool required for environmental and social assessment process to be undertaken during project implementation once the respective technical details are available (e.g., principles, rules and procedures to screen, assess, manage and monitor the mitigation measures of possible project environment and social impacts). The ESMF provides guidance to MOAI and other implementers (e.g., ID, DOA, AMD, DAR, SLRD, farmers) to ensure the environmental and social assessments and other safeguard requirements will be carried out in compliance with the national guidelines for conducting Environmental Impact Assessments (EIA), other environmental and social regulations and laws of Myanmar, and in

accordance with the World Bank Environmental Assessment (EA) and social policies and procedures as specified in the World Bank Group safeguard policies. Finally, this ESMF will be an integrated part of the Project Implementation Manual (PIM) and is applicable to all linked investments financed in the project areas regardless of their funding source or implementing agency.

### **2.3. General description of the project area and existing irrigation schemes**

At the time of preparing this document, four irrigation schemes are initially pre-selected for rehabilitation of irrigation canals in administrative division of Mandalay, Sagaing and East Bago, areas located in the central dry zone of Myanmar. Another two irrigation schemes are also reserved for consideration for project financing if the technical selection criteria (including environmental and social considerations) are met for these sites. The following paragraphs include succinct description of the above noted irrigation schemes.

#### *Sin The Irrigation Scheme (Appendix Ia)*

*Sin The* dam is located 16 miles far from Tutkone township at the west near the Mae Za Lee Kyin village. The irrigation scheme of this dam covers administrative area of Tatkone township in Ottara District of Nay PyiDaw Special Region. The dam was built across the Sinthe creek that is originated from the upper Begu Yoma (hill range) and merged with Ngalite creek at downstream near to Naung Pin Thar. The construction was started in 1994-1995 and completed in year 1999 – 2000. The type of dam is earth fill dam and total catchment area of the dam is estimated as 308 square mile. Dam storage capacity is estimated as 143,090 acre-feet with dead storage of 17303 acre-feet. At the downstream of Sinthe Dam near to Da Hat Kone village, a weir was constructed and water from dam is released for distribution of water to designated irrigated area. There are two main canals at the left and right of the weir for irrigation with the length of 41 miles in total. Irrigation scheme is designed for total net irrigable area of 32400 acres but due to lower rainfall during the last decade, actual irrigated areas in summer were merely around 10,000 acres in 2008, 2009 and 2011 accounting for one third of the total. There was also the case of no irrigation for summer growing period in 2010. From the data provided by Irrigation Department, it was found that the amount of designed inflow was fully received only in 5 years out of last 15 years. According to field observation and consultation with technical persons from Sin The dam, the low inflow and sliding along the Left Main Canal (LMC) that cause siltation and breaching the canal are considered the major technical problems for improving its irrigation efficiency in addition to increased sediment in the reservoir due to land degradation in upper catchment area. Therefore, proposed action of the project is to rehabilitate the LMC by cross-drainable provision, canal re-sectioning and improving canal structures.

#### *North Yamar Irrigation Scheme (Appendix Ib)*

*North Yamar* irrigation scheme is administratively located within Pale township of Yinmarbin District in Sagian Division (Map reference 84J/12K-010779). The source of water for this irrigation scheme is from North Yamar dam that was built in 1995 and completed in 1999. Dam construction was made across North Yamar creek that flow from western mountain range to northeastern direction where is merged with Chindwin river. The type of dam is earthen dam and total catchment area is 191 square mile. Upper North Yamar dam that was 6 miles far from North Yamar dam along the upstream water course near to Aint Ma village was also constructed in 2007 in order to store the excessive water for multipurpose uses. Dam storage capacity is estimated as total 136,957 acre-feet by combining 14,057 acre-feet of lower North Yamar and 122,900 acre-feet of upper North Yamar. Total net irrigable area for North Yamar at the downstream is 11,320 acres but actual irrigated area was

reportedly 5,900 acres. There is only one main canal for irrigation and total length of main canal is 15.87 miles. Although water storage capacity is sufficient for irrigating all targeted area, the poor drainage system prevent for doing it. Small canal size, frequent breakage and sedimentation along the main canal are the main problems of low actual irrigated areas. To maximize its irrigation potential, improving canal structure and drainage system are also required.

#### *Swa Chaung Irrigation Scheme (Appendix Ic)*

*Swa Chaung* Irrigation Scheme is located in administration area of Yedashe township within Taungo District of East Pago Division (Map Reference of 93(B-2) S-R-853018). Main source of water for this irrigation scheme is from Swar Chaung Dam, an earth-fill dam built in 2004 across Swar creek that flows from PeguYoma to Sittoun river at the east. Total catchment area of the dam is 403 square miles. According to engineering design, dam storage capacity is 216,350 acre-feet and it reached its maximum storage capacity as overflow from the spillway was annually reported. There is only one main canal with total length of 16.7 miles for irrigation. Net irrigable area is estimated as 23,467 acres but actual irrigated area was reportedly 20,670 acres accounting for 88% of its designated irrigable area. Erosion along the canal is considered main technical obstacle for increasing its irrigation efficiency. According to assistant engineer of the dam, there is also intention to construct a new canal for increasing coverage of irrigated agriculture area.

#### *Male Nattaung Irrigation Scheme (Appendix Id)*

This irrigation scheme is located in administration area of Singutownship within PyinOoLwin district of Mandalay Division. The dam (earth) was built in 2008 over the Male Nattaung creek that is originated from Shan Plateau at the east and flows to the flood plain area of Irrawaddy area at the South of Singu. Catchment area of the dam is 75 square miles and it was reported that there are several mining operations done by government and local people in the catchment area. Dam storage capacity is estimated as 57,470 acre-feet for net irrigable area of 6500 acres of which its 89% (5755 acres) were realized for irrigation. There are two main canals for irrigation at the left and right of the dam and total length is approximately 15 miles. Dam seepage, bank erosion along the canal and water quality due to mining operation in catchment area are considered as major problem for improving the efficiency of this irrigation scheme.

Additional technical information and parameters known for the above pre-selected 4 irrigation schemes are included in Appendix I (Table 1).

## **2.4. Brief Project area environmental and social baseline conditions**

Bio-physical and socioeconomic conditions of proposed project sites vary one from another at micro-level although common elements include location in semi-arid ecosystem and the presence of homogenous Buddhist-Burmese agrarian society. Site-specific secondary data available for biophysical conditions are very limited but this section attempts to capture those based on available information and direct observation during the ESMF preparation. Therefore, further data is subject to be updated when more accurate assessments are provided during project implementation.

### Physical environment

Proposed project irrigation schemes for Sin The and Swa are situated within Sittoun basin area while Male Nattuaung and North Yamar are lying under Irrawaddy basin area and Chindwin basin area, respectively. Therefore, physical environment of proposed sites are

attributed by geology and soil formation of those river basins. Topographically, irrigation schemes are lying under undulated hill and plain area that are located between the Main River and adjacent mountain range where tributaries of those rivers are originated and the dams were built. Existence of undulated landform with gentle slopes within irrigated area make irrigation difficult in some irrigation scheme such as North Yamar and Sin The.

Soil of irrigated area in the proposed project sites could be generally characterized by the observation of Fluvisol and Gleysol though slight variations exist site by site. Irrigated agriculture lands in Male Nattaung area are mostly sandy so that water-holding capacity appears to be low. None of the dams were reported about existence of Sodic soil in upper catchment area that affects quality of irrigated water. However, there are a few spots reportedly in North Yamar and northern part of Sinthe irrigated area for having salt and alkali in subsoil, which requires further investigation during project implementation.

Water resource used by irrigation schemes of proposed project sites are tributaries of Sittoung river (Sin The and Swa Chaung schemes), Chindwin river (North Yamar scheme) and Irrawaddy river (Male Nattaung scheme). Except for Swa Creek, hydrological characteristic of these tributaries are seasonal and only there is torrential rainwater flow during the wet season from May to October. From the available statistics from Irrigation Department, hydrological data related to dams are given in Appendix II (Table 2) and fluctuation of inflow appears to be sharpening in some years (Figure 1). If comparison is also to be made between annual inflow and maximum storage capacity of the dam, significant shortfalls are frequently observed for Sinthe dam and Male Nattaung dam indicating hydrological insufficiency for irrigation.

Water samples were collected during field observation and tested for some parameters such as pH, Turbidity, Hardness, Arsenic, Aluminum, Potassium, Iron, Chloride, Nitrite and Zinc concentrations. According to laboratory results (Appendix V), it was found that the pH value is relatively high in Sinthe irrigated area, while arsenic level appears to be high in Male Nattaung irrigated area. Although irrigated water is not for drinking, local community tends to collect it sometime for household use which could have some long-term adverse effect on human health.

### Meteorology

The weather situation in irrigated areas of Sinthe, North Yamar and Male Nattaung are typical to the semi-arid condition of higher temperature and erratic rainfall, whereas Swa irrigated area is characterized by higher rainfall. All of the proposed areas have three distant seasons throughout the year as Myanmar does. These are the summer season from March to May, the rainy season from June to October and the cold season from November to February. According to Irrigation Department's statistic, annual average rainfall is reportedly 34 inches in Sinthe and North Yamar, 84 inches in Swa and 44 inches in Male Nattaung. Available data suggests that rainfall pattern is binomial in term of having rainfall decline during the late July for short dry spell period and increase again in late August. Please see data related to seasonal rainfall, temperature and humidity in the project area (Appendix II).

Local weather condition is also subjective to climate change that affects Myanmar as a whole. According to climate scenario analysis of National Communication Report prepared by Department of Meteorology and Hydrology (DMH), average temperature is going to increase approximately with one degree Celsius within next 30 years (2010 – 2040) in most parts of the country that include proposed project location. Variably, the rainfall is also estimated to increase. However, the increased rainfall has to occur during shortening period of rainy day because total length of Monsoon period would be also reduced from 145 to 105 days. This may result in increase of rainfall intensity during the rainy season (more rainfalls

by lesser rainy days) as well as of longer hot and dry period during the off-rainy seasons that would cause higher evaporation in the dam structure. Particularly, extreme weather like severe drought is likely to happen quite frequently, while heavy rain and thunderstorm would occur due to sudden atmospheric changes during the pre-monsoon period (mid-April to end-May) and post-monsoon period (late September to end-October). Average annual rainfall in irrigated area of proposed project sites is reported in Table 3 (Appendix II).

#### Biological environment

The brief field visit revealed that there is no forest or any protected vegetation in irrigated area although different forest types are variably observed in upstream catchment area of each irrigation scheme such as the Moist Upper Mix Deciduous Forest, Dried Upper Mix Deciduous Forest and Dry Forest and Scrubland. These catchment forests are legally protected as forest reserve under the jurisdiction of Forest Department. From the available remote sensing data, rapid assessment was made to observe the forest cover changes in those catchment areas and forest losses are found to be high (e.g., 50% in Sin The (1990 vs 2013); 45% in North Yamar (2000 versus 2013); 19% in Swa (2000 versus 2013) and 12% in Male Nattaung (2002 vs 2013). Deforestation rate in the catchment areas of the existing irrigation schemes are presented in Appendix II (Table 4) and in related map (Appendix IV). This deforestation would cause higher erosion and siltation in the reservoir area of given irrigation scheme and irrigation efficiency would be also significantly affected. In addition, under the circumstances of extreme weather like heavy rain, the consequence of this deforestation is the risk for flooding the downstream area.

#### Fauna and flora

With regard to rare and endangered species, rapid assessment was made based on interview during the field visit and species information previously compiled by National Biodiversity Strategic Action Plan. The following observations are relevant to the project irrigated area: no plant, including aquatic and mammal species were reported; seasonally migratory birds could be found in the area; no insects, amphibian and reptile species were reported but this needs to be confirmed for known rare species such as star turtle, frog and lizard; no endangered fish species are known in the irrigated areas, however, commercially important freshwater species like Nga were found in North Yamar creek although population is declined already. Also, since Swa irrigated areas are interconnected with Sittoung river basin known for wetland areas where diversity of freshwater fish species is rich, precautionary approach is required for conserving those species to the extent possible. Appendix VI includes a list of globally endangered species known in Myanmar.

There are no ecologically sensitive areas in the proposed project area so far as it was observed but reservation is to be made in case of Male Nattaung irrigated area where a flood plain area connecting with Irrawaddy river is located at the end of Male Nattaung creek in Singu township. As flood plain area is important wetland for its ecosystem services, this requires further assessment during project implementation.

There are no forested areas in irrigation command areas so that the loss of forest biodiversity is not relevant nor conservation of large wild mammal in project area. According to limited available secondary data, none of the commercially important or globally endangered species of bird, reptile, rodent, insect, fish and aquatic plants are found so far in the areas of proposed project. Yet, some local villagers indicated the presence of fish species and birds that require further assessment during project implementation. However, North Yinmar is sharing the border of nationally prioritized bio-corridor of National Biodiversity Strategic Action Plan and Swa is part of the Sittoung river basin area that is ecologically crucial for species diversity of fishery and migratory birds.

### Socio-economic status

There are 276 villages in irrigation area of pre-identified project sites according to statistics provided by Irrigation Department. Approximately, half a million people are living in the project area and population breakdown by each irrigation scheme is presented in Table 5 (Appendix II). Majority of people living in the area is Burmese but there are a few Karen people living in Swa irrigation command area.

Major economic activity of the project area is agriculture and out of 57,159 total households 27,784 households are farming household with the average land holding of 5 acres in Sin The, 4 acres in North Yamar, 2.5 acres in Swa and 3 acres in Male Nattaung. However, average size of each farm plot hold by farmer is ranging from 0.2 (in Male Nattaung) to 1.5 acre per plot (North Yamar). It is considered small so that it may impose difficulty to farmers when they have to manage their farmland for irrigation drainage.

According to Farm Land law that was promulgated in 2012, all farmers in Myanmar need to apply for land use registration again. As being instructed by procedure in the law, minimum of 134 days are required for issuing land use registration by concerned government department, Settlement and Land Record Department (SLRD). The status of issuing land use certificate was also shown in Table 4 and as of data, above 90% of farmers had already received the certificate in project area. One obstacle in getting certificate is the requirement of having national registration card prior to application of land certificate.

Multiple cropping is now done by local farmers as a result of increase access to agriculture water under existing irrigation scheme in project area. At least, double cropping is practiced for growing monsoon paddy from July to December and summer paddy from January to April/May. The yield was reportedly ranged from 80 to 100 baskets for monsoon paddy and from 85 to 115 baskets for summer paddy. Depending on the availability of water, some place like the village in North Yamar also grow pre-monsoon crop such as green gram or sesame in between of summer paddy and monsoon paddy. The situation might be varied from one place to another however what is common in project area is that agriculture production was significantly boosted resulting increased household income and assets when access to irrigation water was not constraint. In particular, improvement of socio-economic wellbeing appears to be significant comparing to other sites. Out-migration from the village to other area for employment is considerably less in the village of irrigation command area unlikely to those adjacent villages that were not benefited from irrigation scheme.

According to the Social Assessment (SA), the proportion of landless household to total households is high representing of 39% (8,766 households) in Sinthe, 65% (8,100 households) in North Yamar, 35% (5,780 households) in Swa and 59% (3336 households) in Male Nattaung. On average, it accounts of 45% for the whole project area. On the other hand, farmers complained about their difficulty in hiring farm labor for some seasonal farming work. While there is lack of alternative income opportunities in many of these villages, agriculture development alone could not solve the problem of rural unemployment in the long run and it needs to be integrated with other development potentials.

During field observation in villages, views were expressed on possible speculation of land price which might become higher if agriculture fields alongside the accessible asphalted road are more accessible to irrigation. This point is important in respect with the farmer legal right given by Farmland Law (2012) to sale cultivated land to others according to prevailing market price.

### Physical Cultural Resources (PCRs)

Archaeological and cultural heritage sites have not been found in the project area, although there are religious buildings such as monasteries and pagodas in project villages. Relevant officials confirmed that there are no sacred sites, graveyards and/or burial places along the canal in the project areas. Further impact assessment on PCRs will be undertaken during site specific ESIA's for each of the irrigated schemes considered for financing under the project.

#### Other project background relevant aspects

At present, most of the irrigation schemes are facing sedimentation problem due to poor design and maintenance. Most of the canals are poorly constructed and there is seepage from irrigation canals to adjacent farmland causing water logging in irrigation command area. Due to lack of proper drainage ditches from irrigated farmland to natural watercourses, it was also observed water logging in depression area. Change in stream morphology (bank erosion, change in flow direction, etc.) observed in North Yamar creek and Swa creek (water source for the respective irrigation schemes) has been associated with the impact on abstraction of water for domestic use and stream ecology downstream.

## **2.5 Existing Legal and Institutional Framework**

### *Legal Framework concerning environmental management*

The environmental law, its regulation and implementation are weak in Myanmar although Government has made attempt to improve them in recent year. In this context, National Environmental Policy<sup>3</sup> forms the base for any project to consider integrating environmental aspects into economic development.

In 2012, National Environmental Law was enacted first time in Myanmar. By law, National Environmental Conservation Coordination Committee (NECCC) for effective coordination among stakeholders was formed with the senior officials from various agencies while Environmental Conservation Department is also newly created to regulate environmental situation in the country. Environmental quality standards are to be set up by government for monitoring the environmental performance and management throughout the country. It may require for new investment and development projects to conduct the environmental and social impact assessment (ESIA) as well. Details of those are to be specified in subsequent environmental regulation but this is yet to be officially published soon. Thus, the ESMF process must comply with those instructions made in upcoming regulation.

The Protection of Wildlife and Wild Plants and Conservation of Natural Areas Law (1994) contain the legal provision for protecting rare and endangered flora and fauna species in Myanmar. It requires updating the list of permanently and temporarily protected species in accordance with the list of species identified by CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora). There is also no provision for protected fish species.

As required by Forest Law (1992), Forest Department notified restricted tree species list for protecting them throughout the country. Regardless the area these trees are grown and found either in the Forest Estate that are legally protected under the jurisdiction of Forest Department, permission is required for cutting or exploiting them. For example, the species

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<sup>3</sup> NCEA (2006), Environmental Performance Assessment in Myanmar, Yangon.



like *Acacia Catachu* could be found in Sin The, Male Nattaung and North Yamar, therefore precaution need to be undertaken if those trees are unavoidably affected by civil works of rehabilitating irrigation canal and building construction.

Being a signatory member of United Nations Convention on Biological Diversity National Biodiversity Strategic Action Plan (NBSAP) was also formulated in Myanmar since 2011. Priority and strategy are set out for protecting key biodiversity area where rare and globally endanger species are inhabited in Myanmar. Irrigation command area of North Yamar share the border at the west with prioritized bio-corridor, precaution needs to be undertaken particularly for conserving of priority species such as endangered migratory birds.

There is also concern in Myanmar with regard to Climate Change. As Myanmar is signatory to United Nations Convention on Climate Change (UNFCCC), Myanmar had prepared first national communication report submittal to UNFCCC. Attempts were also made by government for not only estimating the greenhouse gas emission from various sources but also developing measures related to climate mitigation and adaptation. In responding to mitigation aspect, abatement strategy to reduce emission from its main sources such as deforestation, land use land cover change and paddy field were studied and formulated. Since methyl emission from irrigation reservoir and increased cultivation of paddy are responsible for GHG emission, it may also require take this into consideration for environmental and social safeguard measures of this project.

National Framework for Biosafety was also drafted in 2008 by Department of Agriculture Planning (DAP) under MOAI in accordance with the Cartagena Protocol on Biosafety, Cartagena, 2000. Therefore, if importing genetically modified seed for agriculture development is intended, it may require following the procedure and guidelines of biosafety framework procedures. If hybrid seeds and plant materials are to be imported, it also requires following to the procedure and guideline set up by The Plant Pest Quarantine Law (1993 revised in 2011) and The Seed Law (2011).

For those fertilizers that are to be used in irrigated area as part of agriculture development, it needs to be checked whether or not they are officially licensed, imported, transported and stored according to The Pesticide Law (1990) as well as to the international best practices. The current problem encountered in rural township is that there are illegally imported pesticides across the border and how pesticide law could be effectively enforced on ground level. The same is applied to the case of fertilizer imported from neighboring countries. Any fertilizer that are imported and used must be in conformity with The Fertilizer Law enacted in 2002.

There are also some regulations related to irrigation and drainage work that might be also relevant to dam safety and environmental and social safeguard of the proposed ADSP, including the Canal Act, 1905(Amendment in 1998); the Myanmar Embankment Act, 1909 (Amendment in 1998), and the Myanmar Irrigation Manual, 1945 (Revised & Edited).

#### *Legal framework concerning ethnic minorities*

According to Chapter 1, clause 22 of the 2008 Constitution of Myanmar, the Union Government of Myanmar is committed to assisting in developing and improving the education, health, language, literature, arts, and culture of Myanmar's "national races." It is stated, that the "Union shall assist:

- a) To develop language, literature, fine arts and culture of the National races;
- b) To promote solidarity, mutual amity and respect and mutual assistance among the National races;

- c) To promote socio-economic development including education, health, economy, transport and communication, [and] so forth, of less-developed National races.”

The constitution provides equal rights to the various ethnic groups included in the national races and a number of laws and regulations aim to preserve their cultures and traditions. This includes the establishment of the University for the Development of the National Races of the Union which was promulgated in 1991 to, among other things, preserve and understand the culture, customs and traditions of the national races of the Union, and strengthen the Union spirit in the national races of the Union while residing in a friendly atmosphere and pursuing education at the University.

#### *Legal framework concerning land acquisition*

The legal framework in Myanmar is evolving. Myanmar does not have a unitary land law but has several laws for different categories of land. All land belongs to the state under the current legal system, and land users receive certificates from the Settlement Land Records Department. The Land Acquisition Act (1894) provides certificates. When private land is acquired or private assets such as trees and standing crops are lost under public or private projects, compensation is paid at market value. The Act also provides that affected people with complaints can bring the case to court. A new Farmland Law was recently adopted which introduced various reforms such as the recognition that farmland owners are able to sell, mortgage, lease, exchange, inherit or donate all or part of their farmland. There is also the requirement that compensation be paid for both land and buildings attached to it. As for non-agricultural land in rural areas, the Village and Town Act are under revision. The Vacant, Fallow and Virgin Land Management Law, which was recently adopted, define legal provisions on unused land.

The Farmland Law enacted in 2012 includes the legal provision for allowing farmers to form a group as necessary. However, this has not been realized yet because many of farmer groups that are willing to form a farmer organization are facing difficulty to get clearance from concerned ministry for official registration. The gap of the law is lack of specific provision on how far these groups could take management responsibility for co-managing such an irrigation work in transparent and accountable manner.

#### *Present Institutional Framework relevant to project activities*

The Ministry of Environmental Conservation and Forestry (MOECAF) is the focal agency for overall environmental management in Myanmar. MOECAF's predecessor, the Ministry of Forestry (MOF) created in 1992, had been gradually taking over the coordination of environmental protection in Myanmar. In 2005, the MOF absorbed the 1990 National Commission for Environmental Affairs (NCEA), the main environmental authority at the time, composed by nineteen heads of departments from various sectoral ministries. In 2012, NCEA became one of the six departments under the MOECAF, the Environmental Conservation Department, which main objectives include: (i) implementing National Environmental Policy, strategy, framework, planning and action plan for the integration of environmental consideration into in the national sustainable development process; (ii) managing natural resources conservation and sustainable utilization, the pollution control on water, air and land for the sustainable environment; and (iii) cooperating with other government organizations, civil society, private sectors and international organizations concerning with environmental management.

The GoM established in 2004 the National Environmental Conservation Committee (NECC) aimed at consolidating the environmental conservation activities at local and national levels. NECC, chaired by the Ministry of Forestry, was reformed in April 2011 to include 21

members from 19 ministries. NECC is divided in four sub-committees, one of which aims at addressing the environmental problems in rivers and wetland areas.

MOECAF priority actions include creating: (i) guidelines for environmental quality standards and pollution control; (ii) EIA procedures and guidelines as well as review and monitoring institutions; (iii) Environmental related Water Management Master Plans; (iv) Climate Change strategy and Emergency Risk Management Plan; (v) Green Economy Strategy for low carbon development; and (vi) Environmental Monitoring programs and inspections rules and regulations. The principal constraints identified by MOECAF include: (i) lack of information, (ii) lack of technical expertise, (iii) lack of financial resources and sustainability, (iv) lack of coordination both within and between government institutions and well as national and local entities, (v) challenges around public participation, and (vi) time limits.

The MOAI will be the implementing agency of the proposed Project at the national level.

In recent years, the MOH has been incorporating environmental health activities such as surveying for toxic and hazardous materials, monitoring occupational health linked to environmental pollution, and improving clean water supply and sanitation.

### **World Bank Group Safeguard Policies**

The proposed project investments are expected to be designed to have positive social and environmental benefits. The Project triggers the following World Bank safeguard policies: *Environmental Assessment* (OP 4.01); *Pest Management* (OP 4.09); *Physical Cultural Resources* (OP 4.11); *Safety of Dams* (OP 4.37); *Involuntary Resettlement* (OP 4.12); and *Indigenous Peoples* (OP 4.10).<sup>4</sup> For detailed information on these policies applicable to the project please visit the referenced website.<sup>5</sup>

Currently, there is no regulation for environmental and social impact assessment framework in Myanmar. The GoM drafted in 2001 a set of Environmental Impact Assessment rules, but they have yet to be enacted. The 2012 Conservation Law provides a general mandate to MOECAF to produce an ESIA system but specific ESIA procedures and guidelines are yet to be endorsed. EIAs are conducted, however, on an ad hoc basis for projects funded by international organizations and some foreign corporations. The EIA challenges also expand into the institutional framework with a MOECAF with little technical and financial resources to review and monitor environmental and social performance of investment projects on the ground.

In addition, the Project investments will follow the WBG Environmental, Health, and Safety (EHS) Guidelines, which are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP). The applicability of the EHS Guidelines should be tailored to the hazards and risks established for each investment on

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<sup>4</sup>The project also triggers the policy on *Projects on International Waterways* (OP/BP 7.50). Up to 99.7% of the Ayeyarwady River flow is accumulated within Myanmar, the river's downstream most riparian. It is envisaged that the planned investment will not adversely change the quality or quantity of water flows to the other riparians, and will not be adversely affected by the other riparians' possible water use. Thus, while the policy is triggered, the project qualifies for an exception to the riparian notification requirement under para. 7(a) of OP 7.50 and no notification will be required. The Project will also comply with the Access to Information Policy.

<sup>5</sup> For more information on World Bank Safeguard Policies please visit <http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/EXTPOLICIES/EXTSAFEPOL/0,,menuPK:584441~pagePK:64168427~piPK:64168435~theSitePK:584435,00.html>

the basis of the results of an environmental assessment in which site-specific variables, such as local country context, assimilative capacity of the environment, and other sub-project factors, are taken into account. The assessment of the range of pollution prevention and control techniques available to an investment may include, but are not limited to, varying levels of environmental degradation and environmental assimilative capacity, as well as varying levels of financial and technical feasibility.

## **2.6 Project Implementation Arrangements, Capacity and Monitoring**

The MOAI will be the implementing agency of the ADSP under the overall guidance of the Project Director. The Project Director comes from the ranks of a senior management of the MOAI. The Project will be governed at the Union level by the National Project Steering Committee (NPSC) and at the township level by the Township Agricultural Coordination Committees (ACC). The main functions of the NPSC are to review project work plans and project progress, resolve implementation bottlenecks, and provide guidance on any other matters as requested by the Project Management Unit (PMU). It will also provide guidance to project implementation and resolve any issues of a policy nature that might arise during project execution. The PMU will be the NPSC's secretariat. The NPSC will be set-up before project start-up through a special order from the Minister of MOAI.

The ACCs are township level structural coordination bodies, which are responsible for the coordination of crop planning and extension activities and also make irrigation water allocation and distribution decisions. They also provide a platform for joint (MOAI-farmer) planning and monitoring of project activities in targeted irrigation schemes. Implementation of the project activities at the township level will be done by the Project Implementation Committee (PIC) which is a sub-committee under ACC, and it includes township level staff of the implementing MOAI departments (ID, DOA, DAR, AMD, and SLRD), except for the irrigation rehabilitation works which will be done by ID directly. The PIC works closely with WUGs in planning, implementation and monitoring of agreed project activities.

The project will be managed by the PMU, which will be integrated within the existing structures of ID.<sup>6</sup> The PMU will be located in Nay Pyi Taw in MOAI headquarters. The PMU will be managed by a Manager who will be recruited through competitive external recruitment process. The other PMU staff would include: national financial management specialist; national procurement specialist; Monitoring and Evaluation specialist; safeguard specialist; and technical support staff depending on the evolving needs. PMU would be responsible for day-to-day management and coordination of the project. It will be responsible for the project financial management (FM) and procurement functions together with the ID financial and procurement division who second their staff to the PMU. It will ensure that annual work plans are prepared, budgeted and implemented in a timely manner and that management of project funds is in line with the provisions of the project's eligibility guidelines. The PMU will be also responsible for the management of the Designated Accounts; disbursement of the project funds, replenishment of the bank accounts and submission of withdrawal applications; and consolidation of annual work plans, budget planning, arrange for project annual audit, project reporting and M&E.

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<sup>6</sup> It is expected that the ADSP PMU will coordinate its work with the International Fund for Agricultural Development (IFAD)'s FARM Project Coordination Unit.

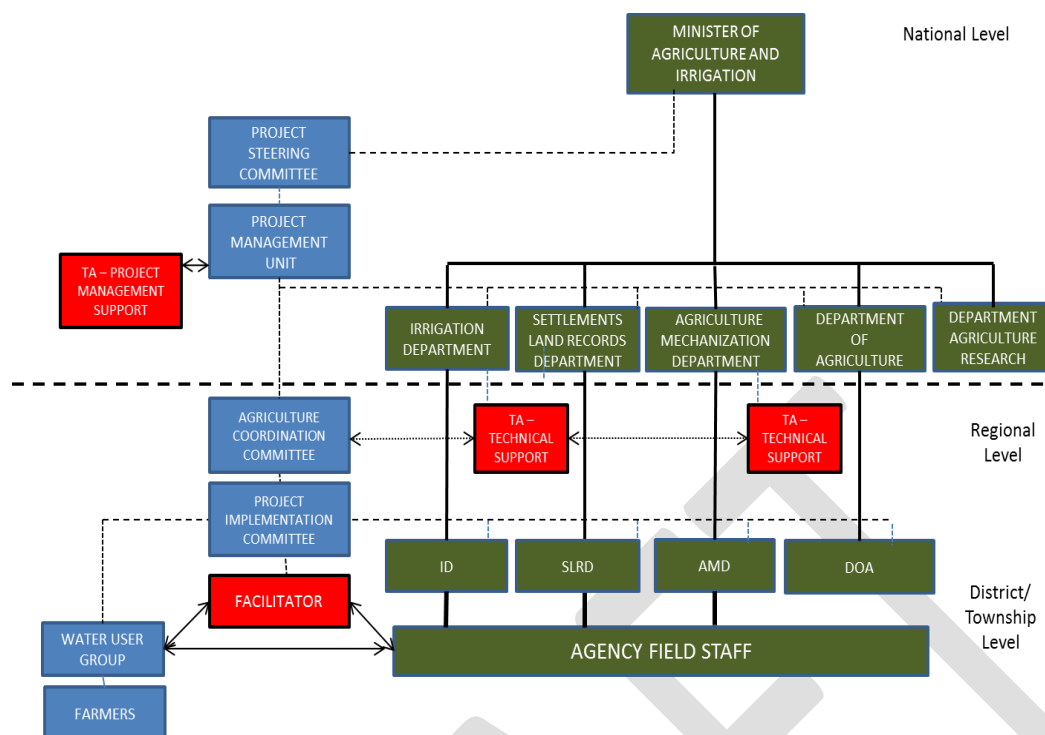
Implementation of the project activities will be carried out by five technical departments (ID, DOA, AMD, DAR, and SLRD) through their central, regional, district and township level structures. ID will be the lead agency for the implementation of the Component 1, with technical inputs from SLRD and AMD, and DOA would be the lead agency for Component 2, with technical inputs from DAR and AMD. These implementing departments will provide necessary technical expertise or recruit necessary expertise if needed to ensure smooth implementation of the project. They are responsible for the: (i) initiation of the procurement activities as per work plan, provision of technical specifications and TORs to PMU and serve as members of the evaluation committee; (ii) accounting for funds on their respective operating accounts and at district level accounts and provision of financial information to PMU for the compilation of the Interim Unaudited Financial Reports (IFRs); and (iii) preparation of the annual work plans of their respective sub-components and activities, and provision of information and indicators for the PMU for the consolidated project reporting. The implementation of field activities will be done by respective township level staff with the supervision and technical backstopping from the team of central/regional/district level Subject Matter Specialists (SMS), except for the irrigation rehabilitation works which will be done by ID directly.

The implementation arrangements for Component 4 (Contingent Emergency Financing) will be detailed in a specific Operations Manual. The Manual is a disbursement condition for this component.

PMU will monitor progress against the agreed performance indicators. Data will be collected for each of the indicators by PIUs who will be responsible for monitoring technical progress of their respective activities. The project's M&E system will focus on tracking and assessing project implementation progress, outputs, outcomes and impacts across all three components. During implementation, PMU will recruit dedicated staff to monitor project progress and update the project indicators. Quarterly progress reports (QPR) will be provided to the WB within 45 days from the end of each quarter. The QPRs include updates on the project implementation progress and up-to-date data on key performance indicators, financial and procurement information, and contract monitoring.

The Bank, together with MOAI, will carry out a mid-term review (MTR) to assess the status of the project as measured against the performance indicators. Such a review would include an assessment of: (i) the overall progress in implementation of the project; (ii) results of M&E activities and impact evaluation; (iii) progress on procurement, disbursement, and financial management; (iv) progress on the implementation of the Environmental and Social Management Framework (ESMF) and other safeguards measures; (v) implementation arrangements; and (vi) need for any project adjustments or reallocation of funds to improve performance. At least three-months prior to the mid-term review, PMU will provide the WB with a project progress report with updated results indicators, project cost and disbursement estimates, and plans for completion. This report will be reviewed with the WB and the NPSC to help PMU take measures required.

## Project Implementation Arrangements



The PMU will create a Safeguard Unit composed by an environmental and a social specialist. This Unit will be in charge of: screening and scoping, preparing terms of reference for environment and social issues to be included in feasibility studies, detailed screening of sub-projects identified in FS, preparing terms of reference for safeguard instruments as well as for the third party service provider<sup>77</sup>, reviewing and quality control of safeguard instruments produced for each sub-project, monitoring and follow up of safeguard implementation.

### 3. Addressing Environmental and Social Issues under the Project

#### Project Typology

The Project will finance the design, construction and supervision of civil works and detailed feasibility studies (including ESIA's with EMPs) for the potential project investments associated with:

- Rehabilitation of existing main conveyance, flow control and sediment management systems and de-siltation of irrigation and drainage systems;
- development of on-farm water management infrastructure and pilot land improvement in 2-3 selected systems; and
- Introduction of dam safety enhancement measures as monitoring instrumentation and remedial works.

<sup>77</sup> See Land Acquisition and Resettlement Policy Framework (LRPF), attached to this ESMF, for details about the tasks expected of the third party service provider.

The civil works for the irrigation system improvement will be different for each system and can only be described in detail after the feasibility studies have been completed. In general, the works in the primary and secondary canals consist of sediment removal, strengthening of embankments (against erosion and slope instabilities) with incidental provision of protective lining and repairs of structures and gates. All the works will be done in and limited to the existing canal system and no new canals will be developed. In some areas drainage canals will be cleaned up and improved to prevent and reduce water logging problems and to prevent sediment entering the irrigation canals. In the tertiary systems (the farmer managed systems on water course level and below) the works may consist of cleaning up water courses and if the farmers want, some extension of on farm canals can be implemented. In principle the works will be done by the farmers but the ID may provide support. For the pilots on land improvement the details need to be agreed first with the farmers/landowners. The works that can be expected are alignment of canals, drains and farm-roads. Structures may be small culverts, farm bridges and in some cases water division boxes.

Possible works related to dam safety and repairs would include: (i) embankment repairs which could include repair of gullies and erosion holes, repair of toe drainage/repair-modify drainage slope drainage/install relief wells, improve embankment surface protection, covering of crest with granular fill, installation of piezometers and surface measuring beacons and seepage measuring weirs; and (ii) spillway repairs, which could include improvement of the capacity of weirs and line chutes, repairs of the spillway chutes, side walls and baffle blocks, sediment management works and repairs of access road to dam sites. The final choice of dam safety repair works depends on the outcome of the technical feasibility studies.

Other recommendations for dam strengthening in the Independent Safety Assessment of Male Nattaung Dam, Upper and Lower North Yamar Dams, Sinthe Dam and Swa Dam include:

- Undertake bathymetric survey to assess actual sediment yield;
- Sediment dredging;
- Consider implementation of the catchment sediment management in order to prolong the lifespan of the dam, based on the results obtained in 1) and 2).
- Prepare Instrumentation Plan & Install Monitoring Instruments (benchmarks, piezometers and “V” notches),
- Prepare an O&M Plan and EPP
- Others: clear the trees and bushes at the downstream slope and toe area of the dams and limit

The final choice of dam safety repair works depends on the outcome of the technical feasibility studies.

## **Potential Project Environmental and Social Impacts**

Impact analysis of the Project at this point can be considered using only the limited available general information on the environmental and social situation at the project areas and the typical known impacts of suggested project activities. However, during the ESMF preparation, the Consultant used participatory assessment (e.g., village level assessment; social assessment, and available secondary data) to be able to understand potential general environmental and social impact of proposed project activities at this stage. Site specific impacts (during pre-/construction stages as well as operation stage) will be analyzed during

the feasibility and detailed design stage and included in the relevant ESIA, ECoPs and other safeguard instruments as needed. Typical Project Environmental and Social impacts for suggested Project activities are presented below.

### **Positive Impacts**

With proper design and commitment, the proposed project would positively impact on increase of food security; increase of household income; improved health condition by better access to water supply and sanitation; creation of rural employment; improved flood control; multiplier effect on local economic development and improving water governance.

Total population in Myanmar is approximately 52 million with the 1% per annum population growth rate. To feed increased population in Myanmar, agriculture production definitely needs to be boosted. Since agriculture land is limited itself for future expansion, agriculture intensification is essential for boosting agriculture production. In project village, it has been clearly observed that agriculture production has been significantly increased already under existing irrigation scheme. If efficiency of conveying water till to tail of irrigation canal is increased due to proposed project, not only paddy growing area but also paddy yield per acre would be increased. As project areas are located in central and upper Myanmar, increase of paddy production there would be greatly conducive to regional food supply, particularly to those upland areas where growing paddy is quite limited and transporting rice from lower Myanmar is quite costly.

As a result of existing irrigation scheme, it has been already observed increase of annual income of farmer household in project villages. It is no doubt about that this trend would continue alongside the increased efficiency due to rehabilitation of irrigation scheme. Even though income increase is subject to market situation of crop sown and produced like price fluctuation of paddy, farmer can alternatively switch one crop to another depending on market potential. For example, export market for pulse and bean has been well established in Myanmar and without much difficulty, local farmers could adapt to suitable cropping pattern if freedom of cropping choice is given and assured. Probably, agriculture extension that would be strengthened by proposed project would also enhance farmer capacity in managing associated risk.

Due to water shortage in the place like Dry Zone (Central part of Myanmar), improving access to sanitary toilet is always constrained. As consequences, public health condition was worsen by increased vulnerable to water-borne diseases that were one of the top five major killing diseases among the children aged under 5. Although intended intervention by the proposed project is not to supply drinking water to the community, it is witnessed that household access to water supply, at least for domestic use, was increased in the village under existing irrigation scheme because of the rise of ground water level resulting open dug well and tube well became more easily accessible than before.

In project villages, it was observed that migration to other areas for searching employment was relatively low comparing to other villages that were not covered by existing irrigation scheme. At least double cropping that was practiced in most of the project villages demanded farm laborer for farming operation throughout the year. Even though it is not full time job, it seemingly created substantial employment opportunity for those who were mostly landless in particular villages. Therefore, it is perceived that creation of rural employment would



continue as agriculture intensification by proposed project is to be enhanced than that of present situation in project areas.

Except for Swa irrigation scheme, the creeks that were utilized by existing irrigation scheme were by nature seasonal having the characteristic of torrential flood when there was heavy rain during the wet season. This caused severe damage to agriculture land, human settlement and infrastructure at downstream. Once after dam were constructed over these creeks, torrential flow are impounded in the reservoir of the irrigation scheme and regulate its flow to downstream. This relieves the damage at downstream as far as operation of the dam is well management.

It was observed that there were increasing economic activities in town adjacent to irrigation scheme. With the boom of agriculture production, the processing, marketing and transportation of agriculture products are becoming active and well-functioning in the area. Increase in purchasing power of farmers also stimulates the growth of other goods and services in the village as well as neighboring town. This trend is going to be continued when proposed project is implemented successfully.

People participation in irrigation management was not favorable in the past due to socio-politico-constraints at that time. Thus, limited farmer participation was partly responsible for lowering the irrigation efficiency in term of the ratio of irrigated area to irrigable area. Since proposed project is to promote participatory irrigation management, informed decision making process for effective and efficient management of water resources in greater transparency and accountability manner would be developed and implemented. It is most likely that success of the participatory development in irrigation management would be empirical for how such an experiential learning could be replicated and scaled up for improving water resource management as a whole with greater participation of all stakeholders.

## **Potential negative impacts**

### *Rehabilitation or Small scale construction*

The scale and duration of civil works for rehabilitation of existing irrigation systems and in particular the dams and related infrastructure and ancillary facilities are unknown at this moment. Although the irrigation schemes may be of small or medium scale direct physical impacts will likely include accessing and opening quarries and borrow pits, space for batch plants, work camps, equipment parks and laydown areas; access roads may be need (as in the case of works in one of the proposed dams). Some of the works proposed for the dams and reservoirs will entail dredging.

Most of these works will generate temporary and localized known construction impacts related primarily to air pollution/dust, noise, vibration, and access restriction; improper disposal of construction related waste; temporary pollution of soil and surface waters due to accidental spillage of fuel from construction activities; safety hazards including worker safety; damage to natural habitats, aquatic fauna, or existing vegetation, and impacts to physical cultural resources. Most of these impacts are related to construction activities. However, these should be prevented or reduced to acceptable levels by applying good international construction practices and planning. It is expected that the rehabilitation of drainage canals

would be done along the existing ones that are under the jurisdiction of ID. These impacts should be properly managed during the construction phase by the contractor and closely supervised by the PMU and the supervision engineer.

Larger works camps for workers from outside the area is there a possible influx of job and opportunity seekers that can contribute to conflicts with local people who may be ethnic minorities. Could the influx of outsiders contribute to the spread of communicable diseases, (such as HIV and STDs) or have effects on local commodity prices and commerce in local markets.

Typical impacts and mitigation measures are presented in the following table.

**Potential adverse impacts of project activities and known applicable mitigation measures during rehabilitation/small scale building construction works**

<b>Possible adverse impact</b>	<b>Activity description</b>	<b>Mitigation measures</b>
Noise, Vibration and Dust Borrow pits Disposal sites	Use of heavy machine (i.e. bulldozer, excavator) for rehabilitating drainage, access roads, borrow pits, disposal sites	<ol style="list-style-type: none"> <li>1. Good engineering practice and maintenance of vehicles would be required according Irrigation manual, occupational health safety instruction and World Bank’s guideline.</li> <li>2. Dust from handling or transportation of aggregates, cement, etc., should be minimized by sprinkling or other appropriate method; i.e. limit of excessive truckload, use of cover sheet.</li> <li>3. Restoration of borrow [its and disposal sites</li> </ol>
Presence of workers/worker’s camps Damage to farmland and environment (water quality) near to rehabilitated canal and disturbance to agriculture activity	Worker’s behavior Wastes (solid/liquid) from camps and working yards Due to excavated materials and civil works	<ol style="list-style-type: none"> <li>1. Camp management including Codes of Conduct</li> <li>2. Waste Management Plans</li> <li>1. Prior to operation, assess the operational area and collect information about the farmland area and farmers that would be potentially affected by operation (e.g. checklist).</li> <li>2. Raise people awareness through meeting and communication materials before boundary delineation between adjacent farmland and drainage system to avoid confusion and dispute</li> <li>3. Consult with farmers for identifying working zone of civil work (including damping site) and developing operational time schedules adjusting to farming seasons. Also, agree upon grievance procedures, compensation and communication channel as necessary.</li> </ol>
Accessibility constraint and personal safety Increased traffic, noise, and dust	Project vehicles may impose constraints to local villagers for having access to their farm and places they are used to commute. Traffic accidents could occur resulting in personal casualties and injuries.	<ol style="list-style-type: none"> <li>1. Assess local access route and consult with villagers for arrangement of temporary path if required</li> <li>2. Use warning signboard, prior notice, and announcement whenever heavy traffic is to be occurred.</li> <li>3. Develop/implement health and safety guidelines</li> </ol>
Disposal of dredged materials	Damage to farmlands from disposal of dredged materials	<ol style="list-style-type: none"> <li>1. Select site with approval/compensation for farmers</li> </ol>

from reservoirs

2. Monitor dredged material quality and design and implement proper treatment methods to ensure continuing use as farmland

Project technical studies and capacity building investments including Technical Assistance activities. Investments related to soil improvement and plant protection as well as extension of modern farming practices will be designed to consider sustainable pest management applications through implementation of an integrated Pest Management Plan. Other planned activities financing irrigation equipment and/or irrigation technology pilots as well as laboratory equipment (DAR) will be purchased and installed in line with technical specifications approved by the Bank that will take include environmental protection provisions and mitigation in addition to training on safe operation and sustainable maintenance during and beyond project duration.

### **Long-term and indirect environmental impacts**

**At present, an assessment of induced, long-term impacts has not been carried out. The following analysis is based on literature review and impacts that have been reported in irrigation projects. An adaptive management strategy to address these impacts is proposed in the next chapter.**

Typical long term impacts from operation of irrigation activities may include those related to low flow regime; flood risk under extreme weather; GHG emissions; soil salinity and decline of soil fertility; soil erosion and water logging; stream morphology changes; sedimentation; and increase of pest and weed. Further, it is known for example, that in irrigation areas, farmers normally use their farmland during the off-cropping season as a grazing ground for their cattle. As irrigation regime is going to be increased by the proposed project, loss of grazing land could occur, therefore, the project will promote using irrigated land to produce fodder, which can be used for pen-fed feeding of livestock. Also, excessive use of fertilizer and pesticide by farmers may impact the quality of water that drains from agriculture field to adjacent natural watercourses or the groundwater impacting long term drinking water sources located in the project sites.

A potential long term environmental impact is the possible raising of groundwater levels, a known effect of increased irrigation after rehabilitation and increased system utilization. Further, a potential indirect impact of the rehabilitated scheme could be on drinking water quality for villages that might use wells around the irrigation sites. Also, possible conflicts with other water source users may occur (dam/reservoir operation for other activities such as a hydropower station) as well as the risk of utilizing the allowed volume of water abstracted from water sources such as rivers and streams.

Further, since irrigation efficiency is improved by the proposed project, there could be a tendency of increase in cropping intensity in future. If farmers only grow paddy after paddy in their farmland where irrigation efficiency is improved without replenishing soil nutrients with fertilizers, soil fertility could gradually decline due to the changes of physical and chemical properties in the soil. Also, irrigation canal physical network could constrain villagers' accessibility, particularly to women and children, to commute from village settlement area to agriculture field if proper accessible lane or bridge are not constructed and maintained. In return, villagers' careless crossing the restricted canal area may also cause damage to canal.

Overall, the proposed Project is tackling and addresses some of these impacts through robust design of selected infrastructure interventions and detailed site assessment during implementation that targets, among other aspects, effectiveness of the agriculture extension system; responsible use of integrated organic fertilizers; and selection of suitable crops according to soil characteristics, all which cumulatively will mitigate various of the above mentioned impacts. In connection with agriculture extension program, project would also finance capacity building program for stakeholders at various level for wider dissemination of environmentally sound agriculture technology and integrated pest management.

Cumulative environmental impacts that might be generated at the project sites include possible water contamination downstream from reservoirs linked to rehabilitated irrigation schemes due to uncontrolled and unregulated activities such as mining and gold panning in the upper watershed. High arsenic levels were found in Male Nattaung dam and nitrate level exceeded maximum limit in water sample taken from the irrigated canal of Sinthe; such pollution if not addressed at source could affect quality of surface and ground water downstream despite rehabilitation of related irrigation schemes.

Further, while irrigation schemes are designed to serve for flood control downstream, it may bear the risk of flood when extreme weathers occur in the region. Consequently, potentially affected sites considered for investments need to be assessed in detail during project implementation and appropriate flood protection measures should be proposed (such as flood wall, levees, emergency sandbags, etc.).

People living near dam sites are concerned over the dam safety and collapse of dam when heavy rain occurs in the area, particularly in Male Nattaung and Swa downstream area. As extreme weather is expected to occur in the future according to climate change scenario analysis of national communication report on climate change, the concern over the collapse of dam and consequences at downstream due to unpredictable incidences should be taken into consideration for necessary measures.

#### **Land legacy issues in relation to the construction of the original irrigation schemes including dams and reservoirs.**

Many irrigation schemes in the project target townships were built some 10 – 20 years ago. The social assessment (SA) carried out during preparation found that some people were displaced when dams – and primary canals too to some extent – were originally built without adequate compensation. The SA did not carry out a thorough due diligence since it assessed only those four irrigation schemes that were pre-identified for potential funding under the project. Legacy issues will be approached differently under the Project depending on the footprint of the project. The land legacy issues related to dams and reservoirs will be dealt with through a combination of measures beyond the scope of the project, such as the support the Bank may provide to the ongoing National Land Commission, the Country Partnership Strategy (CPS) and larger country wide land related studies and recommendations. Potential project specific land legacy issues which relate directly to footprint of the selected irrigation schemes will be covered under the LRPF attached to this ESMF in accordance with OP 4.12 on Involuntary Resettlement.

Specifically, a thorough due diligence will be carried out during implementation as part of the Social Assessment (SA) to be carried out under FS to assess who were affected when project irrigation schemes were originally built, what compensation and assistance they received to restore livelihood, and what are their current level of livelihood. The third party service

provider who will be hired under the Project will lead the assessment, under the guidance of the project Safeguard Coordinator and the Bank task team. The findings of the due diligence will be used as an input for the Bank's planned policy dialogue with the Government of Myanmar on land issues and for the national level dialogue towards addressing the historical displacement that occurred under the previous regimes. Regarding the potential project specific land legacy issues which relate directly to the footprint of the selected irrigation schemes, the Land Acquisition Action Plan (LAAP), and the Indigenous Peoples Plan (IPP) if relevant, which will be developed during implementation, will include measures to restore the livelihood of affected people and close other gaps with the objective of the OP 4.12 as identified by SA.

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## 4. Procedures to Address Project Environmental and Social Issues

### Guiding Principles

Overall, the set of guiding principles for developing the EA instruments relevant to the ASDP project should encompass the following concepts:

- (i) *Integrate environmental and social objectives into the feasibility study process.* These studies often provide a significant opportunity to integrate environmental and social objectives as an integral part of the planning process. As such, ToRs to incorporate environmental and social objectives into the studies, plans and policy formulation should be included within the scope of work;
- (ii) *Promote transparency through stakeholder participation and public information disclosure.* Since many studies promote improved planning, this provides an excellent opportunity to promote broad stakeholder engagement and participation.
- (iii) *Promote analysis of alternatives*
- (iv) *Promote environmental and social capacity building and institutional strengthening.*

The Project will provide an opportunity to build counterpart capacity for integrating environmental and social concerns into their work. Support for capacity building will come in the form of training, monitoring and reporting.

### Basic Approach

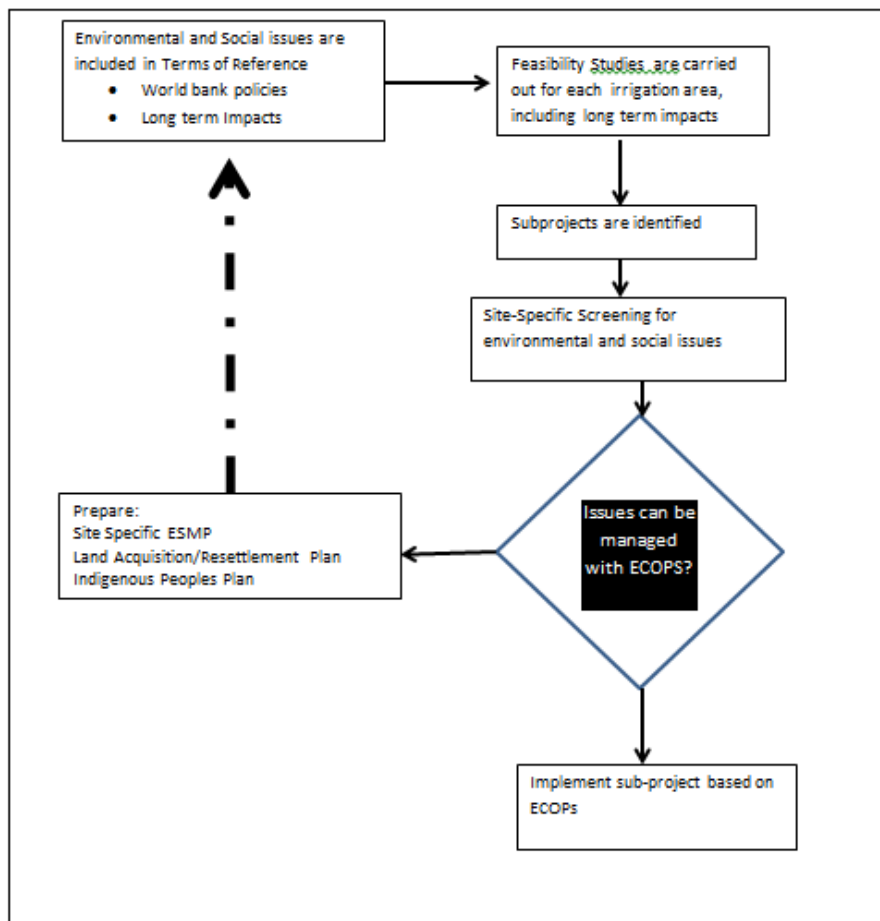
Each of the ADSP project investments, depending on its typology, will include a level of assessment of the potential social and environmental impacts and a specific Environmental Assessment (EA) safeguard tool consistent with Myanmar laws and standards (as applicable) and World Bank Group requirements. The Bank will review and clear all safeguards instruments during implementation including ToRs.

The project will have the following proposed approach for addressing environmental and social issues and will include the following safeguard instruments:

- This Environmental and Social Management Framework (ESMF) prepared prior to appraisal and approval of the ADSP Project, to inform the overall environmental and social performance of the Project;
- An iterative approach between the Feasibility Studies and the sub-projects will be implemented. An initial screening of identified sub-projects will identify issues to be included in the Terms of reference of Feasibility Studies. The ToRs for the Feasibility Studies will include provisions for environmental and social safeguards, including long-term impacts, so that the products (FS, design) will be prepared taking in consideration possible impacts on environment;
- During or after the Feasibility Studies are completed, additional screening of proposed sub-projects will be carried out to determine if 1. If the subprojects can be managed through the application of Environmental Codes of Practice; 2. Additional safeguard instruments are needed, mainly
  - Site Specific Environmental and social Management Plans:

- Land Acquisition Action Plan
- Indigenous Peoples Plan
- Feasibility studies will carry out necessary additional safeguard plans as needed.
- Specific Environmental and Social Impact Assessments (ESIAs) and/or Environmental and Social Management Plans (ESMPs), and other safeguard instruments as required (e.g. environmental checklists, Environmental Codes of Practice, Land Acquisition Action Plans, Indigenous Peoples Plans, Integrated Pest Management Plan) will be prepared for all investments once the Feasibility Studies are completed and technical details will be available during project implementation following the guidance established in this ESMF.
- The basic instrument will be Environmental Codes of Practice (ECOPs) to manage all construction related impacts. Additional screening of the project will determine whether or not additional instruments are needed

The proposed process is summarized in the following figure.



## Detailed Safeguard Process

### Step 1: Screening and Scoping

Screening is perhaps the most important step in safeguard management tool for the project. Screening will be based on an assessment of project components and site sensitivity. Initial screening will identify potential safeguard issues to be addressed in Feasibility Studies. Once sub-projects are identified, and enough details are known on their typology, detailed screening and scoping will be

carried out. Subproject screening is the responsibility of the PMU. As proposed above, this will be an iterative process.

**Step 2: Preparation of Terms of Reference**

Based on the initial screening, Terms of Reference for environmental and social safeguards will be prepared to be included in the Terms of Reference for the feasibility studies.

Detailed screening of identified sub-projects will result in Terms of Reference for the required safeguard instrument. Safeguard instruments could include:

- Full Environmental Impact Assessment:
- Environmental and Social Management Plans.
- Environmental Codes of Practice
- Land Acquisition Action Plans
- Indigenous Peoples Plan
- Physical Cultural Resources Plan.

Terms of reference for safeguard instruments are either carried out independently or included back into overall terms of reference for feasibility studies and/or design.

**Step 3 Site Sensitivity**

The required safeguard work will be commensurate with potential environmental and social impacts. The screening of projects and project sites will determine the sensitivity of the site. The following matrix should be applied for identifying potential issues.

*Table 4: Site Sensitivity and safeguard policies*

Safeguard Policy or Site Characteristic	SITE SENSITIVITY		
	Low Sensitivity	Medium Sensitivity	High Sensitivity
Natural Habitats (OP 4.04)	No natural habitats present of any kind	No critical natural habitats; other natural habitats occur	Critical natural habitats present
Resettlement (OP 4.12)	No new sites are required. Project site is already acquired and is free of squatter; legal tenure is well- defined.	Project site has tenant renters. Yet to be acquired.	Project site will entail resettlement of vulnerable
Indigenous Peoples (OP 4.10)	No indigenous population	Dispersed and mixed indigenous populations; mainstream (highly acculturated) indigenous populations	Indigenous territories and reserves; vulnerable indigenous populations
Natural hazards	Flat terrain; no potential	Medium slopes; some	Mountainous terrain; steep



vulnerability; floods, soil stability/erosion	stability/erosion problems; no known volcanic/seismic/flood risks	erosion potential. Medium risks to Volcanic/seismic/flood/hurricanes	slopes; unstable soils; high erosion potential; volcanic, seismic or flood risks
Physical Cultural Resources (OP 4.11)	No known or suspected cultural heritage sites	Suspected cultural heritage sites; known heritage sites in broader area of influence	Known heritage sites in project area

#### Step 4 Definition of (sub)-project Category

Projects may be Categorized as A or B, according to Bank policies. Project Category will be decided based on the scale of project components and the sensitivity of the site. Based on the assessment done at the level of this framework preparation, it is not expected that the project will finance category “A” investments. However, the following table provides guidance on the definition of project category based on project typology and site sensitivity (including category A and B), which will be screened during project implementation

Type of Project	Site Sensitivity		
	High Sensitivity	Medium Sensitivity	Low Sensitivity
Rehabilitation of existing main conveyance, flow control and sediment management systems and de-siltation of irrigation and drainage systems;	<b>A</b>	<b>B</b>	<b>B</b>
Development of on-farm water management infrastructure and pilot land improvement in 2-3 selected systems; and	<b>B</b>	<b>B</b>	<b>B</b>
Introduction of dam safety enhancement measures as monitoring instrumentation and remedial works.	<b>A</b>	<b>B</b>	<b>B</b>

#### Step 5 Definition of required Environmental and Social Safeguard Work

Based on the screening and scoping exercise and the project Category, the required environmental and social work that needs to be prepared needs to be determined. The following provides a list of required safeguard documents for Category A and B sub-projects in line with OP 4.01.

*Table 5: Definition of required subprojects’ safeguard documents work versus investment categorization*

Type of Project	Required Safeguard Instruments
-----------------	--------------------------------

Category A (if selected)	<p>Prepare Full ESIA and EMP Specific reports to address issues identified in the screening formats might be necessary.</p> <p>Resettlement Action Plans</p> <p>Indigenous Peoples</p> <p>Physical Cultural Resources</p>
Category B	<p>Use site screening criteria to prepare specific assessments and prepare ECOPs for construction.</p> <p>Prepare EIAs and/or EMPs where applicable</p> <p>Confirm the need for land acquisition and/or resettlement.</p> <p>If projects are to be built in areas with indigenous peoples undertake a social assessment and consultation process and prepare an Indigenous Peoples Plan</p> <p>Integrated Pest Management Plan</p>

## Tools Included in the ESMF

The ESMF includes:

- Screening and scoping criteria for individual investments that are assessed (Checklists are provided in Annex 1)
  - Use site screening criteria and Checklists to prepare specific assessments and prepare ESMPs for construction (e.g., see Annexes for Checklist for rehabilitating canal and drainage system and Checklist for construction of agriculture extension and seed storage facilities);
  - Confirm need for land acquisition and/or resettlement;
  - If projects are to be built in areas with ethnic minorities undertake a social assessment and consultation process and prepare an Indigenous Peoples Plan
  - Physical Cultural Resources Plan (if applicable). Chance finding procedures are included in the Environmental management of Construction (Annex 2)
- Environmental Code of Practices (ECoPs) for management of construction-related impacts (See Annex 2);
- A Resettlement Policy Framework for land acquisition and resettlement (See Annex 3)
- An Indigenous Peoples Planning Framework concerning ethnic minorities (See Annex 4)
- Guidance to ensure the participation of all eligible farmers in project activities (Annex 5)
- Guidance on how to implement the Pest management policy provisions including the pest management plan. An integrated Pest Management Plan will be implemented in all irrigation areas (See Annex 6).

## Addressing Indirect Long-Term Impacts

An adaptive management approach is proposed to address long-term impacts. General mitigation measures that are proposed to minimize some of the impacts are presented in the

following table. Monitoring of key parameters will ensure proper identification of raising issues in order to flag actions from relevant agencies.

Site-specific mitigation will be developed once the technical parameters and feasibility studies are prepared for the infrastructure investments during project implementation.

#### Management of Long Term Impacts

Issue	Proposed Mitigation Measures	Implementation Schedule	Source of Funding
Water contamination	Law enforcement in Catchment area Agriculture extension for integrated pest management Law enforcement for illegal pesticide	After catchment conservation action plan is developed & agriculture extension network & system are strengthened	Agriculture extension cost
Soil salinity	Canal lining for those canal sections affected by saline/akali soil and properly maintain Application of gypsum wherever available & feasible Agriculture extension for suitable cropping pattern and soil fertility management	Since project construction phase	Bill in quantity for canal rehabilitation  Agriculture extension cost
Water logging	Proper maintenance after good rehabilitation of canal and drainage system with people participation	Since construction phase	Annual maintenance
Sedimentation	Proper maintenance after good canal rehabilitation with appropriate sedimentation trap or extractor Flushing the canal as frequently as possible Develop and implement participatory operation and maintenance of canal an drainage system	Since construction phase	Annual maintenance
Increase of Pest and Weed	Effective agriculture extension for integrated pest management and cropping system management	When agriculture extension system is in place	extension cost
Accessibility constraint	Integrate accessibility pattern of local community into design and construction of canal rehabilitation Due diligent to maintain the accessibility options/route/bridge by both ID and community	Annually	annual maintenance

## **5. National and Local Institutional Arrangement and Capacity Building for ESMF Implementation and Monitoring**

The ESMP shall be implemented by the following organizations (limitation of the institution and the need of capacity building are also briefly presented):

### **Irrigation Department**

ID is responsible for construction and management of irrigation dam and scheme throughout the country. Limited budget and understaffing in existing irrigation schemes are major constraints for effective operation and maintenance of irrigation system (reported by social assessment team). As part of decentralization of the current political reform, management responsibilities of those irrigation schemes with less than 5,000 acres of irrigated area were transferred to regional government (State/Division). However, it would not effect on proposed irrigation scheme because the size of each irrigation scheme of proposed project are exceeding than 5,000 acres of irrigate area.

Technical training on environmental management and social mobilization for participatory development would be required to build the capacity of ID staff at operational and management level. Also, there might be need for training to improve technical skills in certain aspects for effective and irrigation management such as dam safety, hydrology and meteorology measurement and assessment, etc.

### **Department of Agriculture**

Major responsibility of DOA is to provide agriculture extension service to farmers for agriculture development. At local level, they also have to enforce the seed law, pesticide law and fertilizer law whether or not supply of these inputs to farmers are in accordance with the regulation and departmental instruction. To mitigate the environmental impacts, agriculture extension system needs to be very efficient and effective for technology diffusion among the farmers. Paradigm shift is strongly needed in agriculture extension for deliberating participatory process of farmer-driven technology innovation, adaptation and dissemination based on farmer's prioritized farming problems and needs rather than injection of agriculture scientist's thoughtful solutions to what may farmers need for solving their farming problems on ground. Farmer to farmer extension was to some degree introduced in DOA for certain crops. However, there are still lacks of concrete conceptual framework as well as procedure guidelines to scale up the farmer-led agriculture technology innovation and diffusion. Lack of human resources, physical resources and financial resources are also major constraints to invest in participatory action research for technology solutions to the problems small holding farmers are facing.

### **Township Agriculture Coordination Committee**

At present, Township Agriculture Coordination Committee (TACC) is formed in every township of existing irrigation scheme. The purpose of TACC is to enhance coordination among the government departments for boosting agriculture production in respected township. Township Staff in charge of Government Administration Department (GAD) chairs TACC and other members are Township Staff In Charge from Department of Agriculture (DOA), Settlement and Land Record Department (SLRD), National Planning Department (NPD), and Agriculture Mechanization Department (AMD). Major responsibility is to supervise the agriculture activity at the field level and to provide administrative and technical assistance to famers. Therefore, TACC is seen as an appropriate coordination body for township level coordination that is essential for execution of EMP. However, TACC lacks experiences in participatory informed decision-making and in environmental management.

Training workshop would be required to officials from various departments to increase their awareness and knowledge on participatory development, transparency and accountability for good governance and environmental management in relation with improved irrigation efficiency.

### **Coordination committees**

To implement ESMP, healthier coordination is essential. TACC would be a coordination body at township level yet, coordination needs to be strengthened at national level and regional level. At national level, forming the project steering committee is desirable not only for overseeing the project strategy, approach and progress but also for fostering coordination among government ministries for implementing EMP. Representative from Ministry of Agriculture and Irrigation would have to chair the steering committee. To increase awareness of regional stakeholders, the project will conduct regional project launching workshop in respected region.

### **Water User Group**

Water user group needs to be formed in each project village with those farmers who benefit from improved irrigation regime for agriculture intensification. In general, primary purpose of WUG is to pool resources, knowledge and skill for collective actions contributing to effective and efficient irrigation management.

### **ESMF Implementation**

Effective implementation of this ESMF will require technical capacity in the human resources of implementing institutions as well as logistical facilitation. Sufficient understanding of the mechanisms for implementing the ESMF will need to be provided to the various stakeholders implementing the ADSP investments. This will be important to support the TACC and stakeholders at local level in their role in providing supervision, monitoring and evaluation including environmental reporting on the projects activities.

In order to ensure that there is adequate capacity to implement and monitor the performance of this ESMF and its provisions, it is advised that environmental and social specialist/expertise be appointed as part of the PMU. Such expertise will have specific tasks such as: (i) Preparing, together with the implementing entities, of annual work programs and budgets linked to EMPs; (ii) Monitoring project progress as it relates to compliance with the ESMF guidelines, resolving implementation bottlenecks, and ensuring that overall project implementation proceeds smoothly; (iii) Collecting and managing information relevant to the project and accounts (i.e., environmental and social monitoring and audit reports); and (iv) Organizing and providing training sessions, including a training plan and its modules, in environmental screening and environmental management; similarly, training is also needed in land acquisition and involuntary resettlement safeguard policies for township field supervision staff, and farmers representatives to familiarize them with the principles and procedures as set out in the ESMF.

### **Capacity building and Training Plan**

The implementing agencies have little or no experience with the WBG safeguard policies, and have little capacity to implement and monitor them. The Environmental and Social specialist (if selected nationally) may need some specific training in the policy areas of environmental assessment as applied by the World Bank. The World Bank will assist to identify appropriate external training opportunities for the environmental and social specialist.

A series of training workshops on implementation of the ESMF will take place as part of the project launch workshop and during the initial year of implementation.. This training

will ensure that the main specialists are able to manage and monitor the environmental and social aspects of the ADSP activities. The workshops should be conducted by an external consultant with knowledge on the environmental management requirements for Myanmar, including substantial knowledge on World Bank and IFC safeguard policies and requirements (e.g., OHS standards). Adequate budget for this training will be included in project financing.

In addition, the project will provide technical assistance to the PMU during the first year of project implementation. This assistance will provide on-hands training to environmental and social staff, makes recommendations on screening process and formats, improve instruments such as ECOPs, and assist with the preparation of Terms of Reference and review of reports. About 3 man-months on international consultant are estimated for the first year, based on three visits to the country during that period.

**Budget for ESMF Implementation**

As the technical details have not yet been finalized for the project investments, an estimated lump sum amount has been designated to address the potential number of EIAs and ESMPs which will have to be prepared as well as monitoring requirements for the ESMF. This is an estimate (Table 12) and will need to be updated once the FS/design of project investments has been finalized during project implementation.

**Table 12 Proposed budgets for implementation of the ESMF**

<b>Activity</b>	<b>Budget</b>
Dam safety monitoring implementation	\$20,000/year/dam
Preparation of EIA/ESMP at FS/design stage	\$100,000/scheme
Budget for implementation of each ESMP, monitoring and reporting	\$25,000/year
Training on IPM implementation	\$10,000/year/scheme
Other related workshops (soil conservation; nutrient mgmt.)	\$150,000
1-day training for highlighting potential environmental impacts and mitigation measures (project launching workshop)	\$4,000/training
Safeguard specialists (2 salary expert in PMU)	\$84,000/year
Technical assistance (3 man-months international consultant)	\$60,000.00 for first year.

## 6. Environmental Monitoring

The monitoring program will concentrate on key indicators of the possible adverse impacts identified by the environmental impact assessments, in particular groundwater quality and levels warning of approaching water-logging problems and drainage effluent quality affecting downstream areas; water quality in public wells for drinking water supply; irrigation water quality including in main drains and monitoring (based on observations and sampling as necessary) of physical and chemical soil characteristics. The estimated annual cost of such monitoring program is about US\$25,000/scheme for small schemes.

Identification and quantification of environmental indicators will be done during project implementation once ESIA's are prepared. The monitoring program will be prepared in adequate detail, setting out the location and frequency of measurements, and the parameters to be measured and tested. Training and capacity building for EMP monitoring will be provided by Bank experts as well as international consultants.

The PMU will manage/supervise the implementation of the environmental management plan, and will contract qualified laboratory for the monitoring, including the testing analysis and reporting. The PMU will check with local environmental authorities to determine if the project implementation is meeting all specified ESMF, ESIA's, ESMP and related safeguard requirements (e.g. LPAP, IPP). They will also perform supervision site visits during works as well as operation stage of the project to confirm the ESMPs and related safeguard instruments are being adequately implemented. A supervision report covering the environmental and social management issues should be included in the overall site visit report; a summary of the environmental issues encountered should be reported in the bi-annual Implementation Report to the Bank. The Bank will also review these reports during the periodic supervision missions.

## 7. Grievance Redress Mechanism

1. Complaints and grievances in relation to the implementation of this ESMF will be dealt with under the project grievances redress mechanism. A summary of project grievance mechanism will be developed in both English and Myanma as well as relevant ethnic languages and made available through various media including written materials and internet. They will also be made available in locations convenient to local population and explained about during public consultations and meetings with WUGs, in order to ensure that project affected people are aware of the avenue to have their grievance redressed.

2. Under this project, the WUGs will serve as the first tier mechanism to handle complaints and grievances. The WUGs will be formed at the initial part of project implementation for respective irrigation schemes and land improvement pilots, well before civil works to be supported under the project are designed and implemented. The grievance focal point will be appointed within each WUG who will receive, address, and keep record of the complaints and feedbacks. The grievance focal point will first review the grievances submitted. If the grievances are found to be between farmers over farmland boundary setting, mutual assistance to mitigate impact over farmer managed systems, and other disputes between farmers, the grievance focal point will meet relevant farmers and seek to find resolutions in line with this ESMF, under the support of the third party service provider (see LRPF for details about the roles of the third party service provider). More details about the grievance procedures for disputes or complains between farmers are provided in the LRPF.

3. Aggrieved persons or parties to disputes may raise concerns or questions directly to the third party service provider who will be knowledgeable about the project safeguard approach and visit project sites frequently. The third party service provider will install sign posts in local areas with a clear indication of the contact information, and call for any people with grievances or questions to inform them. A consultation meeting will be held prior to the start of civil works in places and time convenient to local population including but not limited to water users and farmers. The environmental specialist and the social specialist who will be attached to the PMU will participate in such consultation meeting and explain about the nature of the civil works to be carried out, expected environmental and social impact, entitlements and grievance mechanisms will be explained to local people. The translation of the EMSF will be made available to participants of consultations and at the local office of PIC. The third party service provider will visit project sites regularly and receive inquiries or grievances directly from local people. Since the third party service provider will primarily focus on social issues, the environmental specialist attached to the PMU will provide necessary support and guidance to the third party service provider to ensure that grievances related to environmental issues are adequately handled. The third party service provider will provide WUGs necessary training and continuing capacity development throughout project implementation. Project's communication and information dissemination activities will include information about grievance redress mechanisms.

The participatory Monitoring and Evaluation (M&E) will be conducted, under the facilitation of the third party service provider, whereby affected people will assess the implementation of respective project activities and how environmental and social issues are handled under the project, report outstanding issues and air grievances or other issues people may have with the project. The meeting will be attended by township PIC members and village authorities who will assist participants in identifying resolutions for grievances that may be presented. The third party service provider will prepare minutes of the meeting that record the issues raised and how they will be addressed in the subsequent annual cycle. This record will be submitted to PMU through PIC.



## 8. Public Disclosure and Consultation Process

(to be completed after the public meeting)

According to the OP 4.01, the environmental assessment process should be available to the public, thus the borrower should consult all the involved parts on project safeguard documents at least once (for category B projects) during the process. The Public Consultation (PC) will provide a summary of the proposed project's objectives and a summary of the EA conclusions.

Invitations will be issued and documents circulated and posted on the MOAI website in both English and Myanmar language two weeks before the meetings. The meeting is scheduled in December 2014.

Guidance to ensure the participation of all eligible farmers in project activities is presented in Annex 5.

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## Annex 1: Project Screening Checklists

### Examining Vulnerable and Sensitive Sites at Downstream of Irrigation Scheme

Checklist for identifying downstream vulnerable and sensitive site subjective to water stress and risk of peak flood under extreme weather event

Name of village  
Date of Entry

Village Tract  
Entry by

Township  
Position

Checklist for examining	Yes (or) No
1. Are there people living along the creek within your village vicinity? If yes, No of household/family..... Population .....	
2. Are these people vulnerable to peak flood?	
3. Are there water sources along the creek supplying water for  Drinking use? Dependent Household .....	
Domestic use? Dependent Household .....	
Animal use?	
4. Are there alluvial cultivated land on stream bed or along the canal susceptible to water stress due to low flow regime? If yes, Estimated acre ..... Dependent farmers .....	
5. Are there agriculture land along the creek vulnerable to peak flood under extreme weather event? If yes, total acres likely to be affected .....	
6. Are there any bridges or infrastructures that are likely to be damaged by peak flood? If yes, no of bridge ..... no of infrastructure .....	
7. Are there any habitats important for locally important fish species that are likely to be affected by water stress or peak flood?	
8. Are there any habitats for reptile known to local people that are likely to be affected by water stress or peak flood?	
9. Are there any habitats for local birds that are likely to be affected by water stress or peak flood?	
10. Are there any habitats for seasonal/migratory birds that are likely to be affected by water stress or peak flood?	

## Checklist of environmental and social parameter for screening impact

	Parameter	Sin The	North Yamar	Swa	Male Nattaung
Hydrology	1-1 Low flow regime	③	②	②	③
	1-2 Flood regime (design/op)		①	②	
	1-3 Operation of dams				
	1-4 Fall of water table				
	1-5 Rise of water table	①	①	①	①
Pollution	2-1 Solute dispersion				
	2-2 Toxic substances	①	①	②	③
	2-3 Organic pollution				
	2-4 Anaerobic effects	②	②	②	②
	2-5 Gas emissions				
Soils	3-1 Soil salinity		①		
	3-2 Soil properties	①	①	①	①
	3-3 Saline groundwater				
	3-4 drainage/water logging		①	①	①
	3-5 Saline intrusion				
Sediments	4-1 Local erosion	①	①	①	①
	4-2 Hinterland effect				
	4-3 River morphology		②	②	②
	4-4 Channel regime	②	②	②	②
	4-5 Sedimentation	②	②	②	②
	4-6 Estuary erosion				
Ecology	5-1 Project lands	①	①	①	①
	5-2 Water bodies	①	①	①	①
	5-3 Surrounding area				
	5-4 Valleys & shores				
	5-5 Wetlands & plains				①
	5-6 Rare species				
	5-7 Animal migration		①	①	①
	5-8 Natural industry				
Socio-economic	6-1 Population change				
	6-2 Income & amenity	①①	①①	①①	①①
	6-3 Human migration				
	6-4 Resettlement				
	6-5 Women's role	①	①	①	①
	6-6 Minority groups				
	6-7 Sites of value				
	6-8 Regional effects	②	①		①
	6-9 User involvement	③	③	③	③
	6-10 Recreation				
Health	7-1 Water & sanitation	①	①	①	①
	7-2 Habitation				
	7-3 Health services				
	7-4 Nutrition				
	7-5 Relocation effect				
	7-6 Disease ecology	①	①	①	①
	7-7 Disease hosts				
	7-8 Disease control				
	7-9 Other hazards	①	①	①	①
Imbalances	8-1 Pests & weeds	②	②	②	②
	8-2 Animal diseases				
	8-3 Aquatic weeds	①	①	①	①
	8-4 Structural damage				
	8-5 Animal imbalances	①	①	①	①

Note: Checklist was adapted from FAO (1995) Guidelines for Interpretation of Water Quality for Irrigation and black circle refers to negative impact whereas white circle refers to positive impact. The number in circle refers to likelihood of the occurrence of the impact. (1 = less likely to occur, 2 = moderately likely to occur, 3 = most likely to occur)

## Checklist for Civil Work of Rehabilitating Canal and Drainage System

### Monthly Checklist for Screening Construction Impact by Rehabilitation of Canal and Drainage System

Name of village:

Prepared Date:

Name of village tract:

Prepared by:

Township:

Position held:

Sr No	Checklist	Response Yes (or) No
Q1	Have you done village meeting for informing about the plan for civil work of rehabilitating canal and drainage system?	
Q2	Are the villagers' attendances to village meeting exceeding than 70% of total households of the village? if (no), please organize the meeting again if (yes) please fill up the name of household in given format.	
Q3	(Show villagers a sketch map of canal/drainage that are to be rehabilitated) Have you checked with villagers whose farmlands share the border with the canal? If yes, tick off the name of farmer in given format	
Q4	Have you explained farmers about the law demarcating the canal area?	
Q5	Have you checked with farmer whom is likely to be affected by civil work of rehabilitation?	
Q6	Have you reached consensus with farmers whom are likely to be affected in order to mitigate damage to their farm? (loss of land temporary/permanent)	
Q7	Have you agreed with farmers on appropriate working time for civil work without affecting farm operation?	
Q8	Have you agreed with villagers/farmers for where to safely dispose waste from civil work? (Including clearance of grease, oil, lubricant)	
Q9	Have you agreed with villager/farmer for defining temporary accessible path if temporary area closure is needed during civil work?	
Q10	Have you satisfactorily explained farmers on how dust would be reduced from vehicle mobilization and civil work?	
Q11	Have you agreed with villagers/farmers on traffic safety?	
Q12	Have you consulted with villagers for where to construct passage and bridge crossing the canal according to their accessibility need?	
Q13	Have you informed villagers where they can make complain if not met their needs?	
Q14	Have you agreed with villagers how to settle complain and make compensation if necessary?	
Q15	Have you resolve the complaints satisfactorily?	
Q16	Have you reached consensus with villagers on how they would take responsibility to avoid damage of canal due to their causes?	
Q17	Will rehabilitation of canal and drainage system potentially cause (a) Damage to Religious site/Sacred place/Burial place? (b) Damage to trees restricted by Forest Department? (c) Damage to wildlife habitat? (bird, reptile, insect, fish)	

Note: Use separate sheet for mapping and recording the discussion and agreement as necessary  
Decision made

Approved by  
Village Administration

Approved by  
Irrigation Department

Inspected by  
Appointed Inspector

## Checklist for Construction of Agriculture Extension and Storage Facility

Checklist for screening construction impact by agriculture extension & storage facilities		
Name of village:	Prepared Date:	
Name of village tract:	Prepared by:	
Township:	Position held:	
Sr No	Checklist	Response Yes (or) No
Q1	Have you done village meeting for informing about the plan for civil work of rehabilitating canal and drainage system?	
Q2	Have you checked official document of land ownership (holding right) or community's recognition on present user? Does the land that would acquire for construction - (a) belong to one of the government institutions? (b) belong to a villager? (c) belong to a village? (village common land) (d) belong to farmland? (e) belong to vacant, fallow, virgin land? (f) belong to Permanent Forest Estate under jurisdiction of Forest Dept? (g) belong to land at government disposal? (i) belong to religious institution/organization? (j) belong to private individual?	
Q3	Have you reached written consensus with land owner (those with holding right) for transfer of land or use of land for stated purpose?	
Q4	Have you made public announcement for any complaint before acquiring land for construction? (at least one month in advance)	
Q5	Have you settled any dispute or complaint made by other over land acquisition?	
Q6	Have you made clear to all (both public and organization) about arrangement on holding right of land buildings or facilities are constructed?	
Q7	Have you made necessary arrangement with concerned authority for issuing /receiving tenure security certificate or equivalent of the land premises is constructed?	
Q8	Have you informed about the plan of civil work for constructing premises to the public/village community?	
Q9	Have you developed safety guidelines for construction to mitigate or avoid any negative impact to neighbors?	
Q10	Have you checked that acquiring/procurement of construction materials are from official sources? e.g: timber, gravel, sand, lime, etc.,) Attached official certificate of official sources	

## Checklist for Screening Environmental and Social Impact in Project Village During Operation Phase

No	Potential adverse impact	Magnitude of the impact			Remark (Area extent or No of Household to be affected (Small/Medium/Large)
		Low	Moderate	High	
1	GHG Emission from paddy field	a few irrigated field with inefficient water management	Some of the irrigated paddy field with inefficient water management	Most of the irrigated paddy field with inefficient water management	
2	Water contamination by pesticide use	None or water sources for animal use are subjective to contamination	Some water sources for drinking, household uses & animal uses are subjective to contamination	Main water sources for drinking, household use & animal use are subjective to contamination	
3	Soil salinity/alkali	None or slightly difficult for farming	Becoming difficult for farming	Impossible for continuing farming	
4	Decline of soil fertility	Crop yield decrease slightly	Crop yield gradually decrease	Crop yield sharply decrease	
5	Water logging	None or little farming constraint	Difficult for farming and damage to crop	Impossible for farming	
6	Soil erosion	Surface erosion in farmland	Rill erosion in farmland	Gullies in farmland	
7	Sedimentation	A few section of canal and distributaries are likely to be affected	Some section of canal and distributaries are likely to be affected	Most parts of canal & distributaries are likely to be affected	
8	Loss of grazing land	None or seasonally difficult for grazing	Difficult for grazing animal throughout the year	Impossible to keep grazing animal	
9	Threat to biodiversity (local/seasonal bird)	None of a few habitat to be damaged	Population affected due to habitat damaged	Population disappeared due to habitat losses	
10	Threat to biodiversity (reptile/fish)	None of a few habitat to be damaged	Population affected due to habitat damaged	Population disappeared due to habitat losses	
11	Increase pest & weed	Slightly increased cost	Moderate losses due to increased cost	Severe losses due to crop yield decrease & increased cost	
12	Aquatic weed invasion	Started invasion	Grow vigorously & Disturb irrigation system	Damage canal and farming	
13	Public health concern Water borne diseases & Mosquito infection	Morbidity same as other region	Higher morbidity rate compare to regional average	Higher morbidity and mortality rate compare to regional average	
14	Fear of dam collapse	No fear or a little concern	Fear when extreme weather	Fear all the time	
15	Accessibility constraint	None or inconveniences some time to commute	Difficult to commute	Unsafe to commute	
16	Weak people participation conducive to ineffective irrigation management	Trustworthy leadership but still low participation	Monopolistic factional leadership (two three capable people) within ale dominated committee and passive participation occasionally	No women executive, lack of people trust, one man show leadership	
17	Socio-politico tension	Frequent disputes among villagers	Growing conflicts of the factions within villages	Confrontation among the factions	

## **Annex 2: Environmental Management of Construction Activities (to be included in construction contracts)**

### **General**

The Contractor and his employees shall adhere to the mitigation measures set down in these specifications to prevent harm and nuisances on local communities, and to minimize the impacts in construction and operation on the environment.

Remedial actions which cannot be effectively carried out during construction should be carried out on completion of the works (and before issuance of the acceptance of completion of works):

- All affected areas should be landscaped and any necessary remedial works should be undertaken without delay, including grassing and reforestation;
- water courses should be cleared of debris and drains and culverts checked for clear flow paths;
- All sites should be cleaned of debris and all excess materials properly disposed; and
- Borrow pits should be restored.

### **Construction Activities and Environmental Rules for Contractors**

The following information is intended solely as broad guidance to be used in conjunction with local and national regulations. Before initiation of construction activities, the Contractor shall present the Project Engineer with a Construction Plan which explicitly states how he plans to abide by these specifications. After approval of such Plan by the Project Engineer, construction activities can proceed.

### **Prohibitions**

The following activities are prohibited on or near the project site:

1. Cutting of trees for any reason outside the approved construction area;
2. Hunting, fishing, wildlife capture, or plant collection;
3. Use of unapproved toxic materials, including lead-based paints, asbestos, etc.;
4. Disturbance to anything with architectural or historical value;
5. Building of fires;
6. Use of firearms (except authorized security guards);
7. Use of alcohol by workers.

### **Transport**

The Contractor shall use selected routes to the project site, as agreed with the Project Engineer, and appropriately sized vehicles suitable to the class of roads in the area, and shall restrict loads to prevent damage to local roads and bridges used for transportation purposes. The Contractor shall be held responsible for any damage caused to local roads and bridges due to the transportation of excessive loads, and shall be required to repair such damage to the approval of the Project Engineer.

The Contractor shall not use any vehicles, either on or off road with grossly excessive, exhaust or noise emissions. In any built up areas, noise mufflers shall be installed and maintained in good condition on all motorized equipment under the control of the Contractor.

Adequate traffic control measures shall be maintained by the Contractor throughout the duration of the Contract and such measures shall be subject to prior approval of the Project Engineer.

## **Workforce and Camps**

Siting and operation of work camps should be undertaken in consultation with neighboring communities.

To the extent possible, work camps should not be located in close proximity to local communities.

Local communities should be consulted to identify and pro-actively manage any potential conflicts between an external workforce and local people.

The Contractor should recruit unskilled or semi-skilled workers from local communities to the extent possible. Where and when feasible, worker skills training, should be provided to enhance participation of local people. All employees should be given appropriate training and equipment needed for worker health and safety.

The Contractor shall provide adequate lavatory facilities (toilets and washing areas) should be provided for the number of people expected to work in the work site. Toilet facilities should also be provided with adequate supplies of hot and cold running water, soap, and hand drying devices.

The Contractor shall install and maintain a temporary septic tank system for any residential labor camp and without causing pollution of nearby watercourses.

The Contractor shall establish a method and system for storing and disposing of all solid wastes generated by the labor camp and/or base camp.

The Contractor shall not allow the use of fuel wood for cooking or heating in any labor camp or base camp and provide alternate facilities using other fuels.

The Contractor shall ensure that site offices, depots, asphalt plants and workshops are located in appropriate areas as approved by the Project Engineer and not within 500 meters of existing residential settlements and not within 1,000 meters for asphalt plants.

The Contractor shall ensure that site offices, depots and particularly storage areas for diesel fuel and bitumen and asphalt plants are not located within 500 meters of watercourses, and are operated so that no pollutants enter watercourses, either overland or through groundwater seepage, especially during periods of rain. This will require lubricants to be recycled and a ditch to be constructed around the area with an approved settling pond/oil trap at the outlet.

The contractor shall not use fuel wood as a means of heating during the processing or preparation of any materials forming part of the Works.

## **Waste Management and Erosion:**

Solid, sanitation, and, hazardous wastes must be properly controlled, through the implementation of the following measures:

### *Waste Management:*

1. Minimize the production of waste that must be treated or eliminated.
2. Identify and classify the type of waste generated. If hazardous wastes are generated, proper procedures must be taken regarding their storage, collection, transportation and disposal.
3. Identify and demarcate disposal areas clearly indicating the specific materials that can be deposited in each.
4. Control placement of all construction waste (including earth cuts) to approved disposal sites (>300 m from rivers, streams, lakes, or wetlands). Dispose in authorized areas all of garbage, metals, used oils, and excess material generated during construction, incorporating recycling systems and the separation of materials.

### *Erosion Control:*

Disturb as little ground area as possible, stabilize that area as quickly as possible, control drainage through the area, and trap sediment onsite. Erect erosion control barriers around perimeter of cuts, disposal pits, and roadways



Conserve topsoil with its leaf litter and organic matter, and reapply this material to local disturbed areas to promote the growth of local native vegetation.

Apply local, native grass seed and mulch to barren erosive soil areas or closed construction surfaces.

Apply erosion control measures before the rainy season begins preferably immediately following construction. Install erosion control measures as each construction site is completed.

In all construction sites, install sediment control structures where needed to slow or redirect runoff and trap sediment until vegetation is established. Sediment control structures include windrows of logging slash, rock berms, sediment catchment basins, straw bales, brush fences, and silt

Control water flow through construction sites or disturbed areas with ditches, berms, check structures, live grass barriers, and rock

Maintain and reapply erosion control measures until vegetation is successfully established.

Spray water on dirt roads, cuts, fill material and stockpiled soil to reduce wind-induced erosion, as needed

#### *Maintenance:*

Identify and demarcate equipment maintenance areas (>15m from rivers, streams, lakes or wetlands). Fuel storage shall be located in proper areas and approved by the Project Engineer.

Ensure that all equipment maintenance activities, including oil changes, are conducted within demarcated maintenance areas; never dispose spent oils on the ground, in water courses, drainage canals or in sewer systems.

All spills and collected petroleum products shall be disposed of in accordance with standard environmental procedures/guidelines. Fuel storage and refilling areas shall be located at least 300m from all cross drainage structures and important water bodies or as directed by the Engineer.

#### **Earthworks, Cut and Fill Slopes**

All earthworks shall be properly controlled, especially during the rainy season.

The Contractor shall maintain stable cut and fill slopes at all times and cause the least possible disturbance to areas outside the prescribed limits of the works.

The Contractor shall complete cut and fill operations to final cross-sections at any one location as soon as possible and preferably in one continuous operation to avoid partially completed earthworks, especially during the rainy season.

In order to protect any cut or fill slopes from erosion, in accordance with the drawings, cut off drains and toe-drains shall be provided at the top and bottom of slopes and be planted with grass or other plant cover. Cut off drains should be provided above high cuts to minimize water runoff and slope erosion.

Any excavated cut or unsuitable material shall be disposed of in designated disposal areas as agreed to by the Project Engineer.

Disposal sites should not be located where they can cause future slides, interfere with agricultural land or any other properties, or cause soil from the dump to be washed into any watercourse. Drains may need to be dug within and around the tips, as directed by the Engineer

#### **Stockpiles and Borrow Pits**

Operation of a new borrowing area, on land, in a river, or in an existing area, shall be subject to prior approval of the Project Engineer, and the operation shall cease if so instructed by the Project Engineer. Borrow pits shall be prohibited where they might interfere with the natural or designed

drainage patterns. River locations shall be prohibited if they might undermine or damage the river banks, or carry too much fine material downstream.

The Contractor shall ensure that all borrow pits used are left in a trim and tidy condition with stable side slopes, and are drained ensuring that no stagnant water bodies are created which could breed mosquitoes.

Rock or gravel taken from a river shall be far enough removed to limit the depth of material removed to one-tenth of the width of the river at any one location, and not to disrupt the river flow, or damage or undermine the river banks.

The location of crushing plants shall be subject to the approval of the Engineer, and not be close to environmentally sensitive areas or to existing residential settlements, and shall be operated with approved fitted dust control devices.

In any borrow pit and disposal site, the Contractor shall:

1. Identify and demarcate locations for stockpiles and borrow pits, ensuring that they are 15 meters away from critical areas such as steep slopes, erosion-prone soils, and areas that drain directly into sensitive water bodies
2. Limit extraction of material to approved and demarcated borrow pits.
3. Stockpile topsoil when first opening the borrow pit. After all usable borrow has been removed, the previously stockpiled topsoil should be spread back over the borrow area and graded to a smooth, uniform surface, sloped to drain. On steep slopes, benches or terraces may have to be specified to help control erosion.
4. Excess overburden should be stabilized and re-vegetated. Where appropriate, organic debris and overburden should be spread over the disturbed site to promote re-vegetation. Natural re-vegetation is preferred to the extent practicable.
5. Existing drainage channels in areas affected by the operation should be kept free of overburden.
6. Once the job is completed, all construction -generated debris should be removed from the site.

### **Disposal of Construction and Vehicle Waste**

The Contractor shall establish and enforce daily site clean-up procedures, including maintenance of adequate disposal facilities for construction debris

Debris generated due to the dismantling of the existing structures shall be suitably reused, to the extent feasible, in the proposed construction (e.g. as fill materials for embankments). The disposal of remaining debris shall be carried out only at sites identified and approved by the Project Engineer. The contractor should ensure that these sites (a) are not located within designated forest areas; (b) do not impact natural drainage courses; and (c) do not impact endangered/rare flora. Under no circumstances shall the contractor dispose of any material in environmentally sensitive areas.

In the event any debris or silt from the sites is deposited on adjacent land, the Contractor shall immediately remove such, debris or silt and restore the affected area to its original state to the satisfaction of the Project Engineer.

All arrangements for transportation during construction including provision, maintenance, dismantling and clearing debris, where necessary, will be considered incidental to the work and should be planned and implemented by the contractor as approved and directed by the Engineer.

### **Safety During Construction**

The Contractor's responsibilities include the protection of every person and nearby property from construction accidents. The Contractor shall be responsible for complying with all national and local safety requirements as well as World Bank Environmental, Health and Safety guidelines and any other measures necessary to avoid accidents, including the following:

1. Carefully and clearly mark pedestrian-safe access routes;
2. If school children are in the vicinity, include traffic safety personnel to direct traffic during school hours;
3. Maintain supply of supplies for traffic signs (including paint, easel, sign material, etc.), road marking, and guard rails to maintain pedestrian safety during construction;
4. Conduct safety training for construction workers prior to beginning work;
5. Provide personal protective equipment and clothing (goggles, gloves, respirators, dust masks, hard hats, steel-toed and –shanked boots, etc.) for construction workers and enforce their use;
6. Post Material Safety Data Sheets for each chemical present on the worksite;
7. Require that all workers read, or are read, all Material Safety Data Sheets. Clearly explain the risks to them and their partners, especially when pregnant or planning to start a family. Encourage workers to share the information with their physicians, when relevant;
8. Ensure that the removal of asbestos-containing materials or other toxic substances be performed and disposed of by specially trained workers;
9. During heavy rains or emergencies of any kind, suspend all work.
10. Brace electrical and mechanical equipment to withstand seismic events during the construction.

### **Nuisance and Dust Control**

To control nuisance and dust the Contractor should:

1. Maintain all construction-related traffic at or below 15 mph on streets within 200 m of the site;
2. Maintain all on-site vehicle speeds at or below 10 mph.
3. To the extent possible, maintain noise levels associated with all machinery and equipment at or below 90 db.
4. In sensitive areas (including residential neighborhoods, hospitals, rest homes, etc.) more strict measures may need to be implemented to prevent undesirable noise levels.
5. Minimize production of dust and particulate materials at all times, to avoid impacts on surrounding families and businesses, and especially to vulnerable people (children, elders).
6. Phase removal of vegetation to prevent large areas from becoming exposed to wind.
7. Place dust screens around construction areas, paying particular attention to areas close to housing, commercial areas, and recreational areas.
8. Spray water as needed on dirt roads, cut areas and soil stockpiles or fill material.
9. Apply proper measures to minimize disruptions from vibration or noise coming from construction activities.

### **Demolition of Existing Infrastructure**

The Contractor shall implement adequate measures during demolition of existing infrastructure to protect workers and public from falling debris and flying objects. Among these measures, the Contractor shall:

1. Set aside a designated and restricted waste drop or discharge zones, and/or a chute for safe movement of wastes from upper to lower levels
2. Conduct sawing, cutting, grinding, sanding, chipping or
3. Chiseling with proper guards and anchoring as applicable
4. Maintain clear traffic ways to avoid driving of heavy equipment over loose scrap
5. Use of temporary fall protection measures in scaffolds and out edges of elevated work surfaces, such as hand rails and toe boards to prevent materials from being dislodged

6. Evacuate all work areas during blasting operations, and use blast mats or other means of deflection to minimize fly rock or ejection of demolition debris if work is conducted in proximity to people or structures
7. Provide all workers with safety glasses with side shields, face shields, hard hats, and safety shoes

### **Community Relations**

To enhance adequate community relations the Contractor shall:

1. Consult with local communities on the siting of work camps; especially with respect to potential local-outsider conflicts. (See section on work camps).
2. Raise local community awareness about sexually transmitted disease risks associated with the presence of an external workforce and include local communities in awareness activities.
3. Inform the population about construction and work schedules, interruption of services, traffic detour routes and provisional bus routes, blasting and demolition, as appropriate.
4. 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.
5. At least five days in advance of any service interruption (including water, electricity, telephone, bus routes) the community must be advised through postings at the project site, at bus stops, and in affected homes/businesses.

### **Physical Cultural Property Chance-finds Procedures**

If the Contractor discovers archeological sites, historical sites, remains and objects, including graveyards and/or individual graves during excavation or construction, the Contractor shall:

1. Stop the construction activities in the area of the chance find;
2. Delineate the discovered site or area;
3. Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be arranged until the responsible local authorities or the National Culture Administration take over;
4. Notify the supervisory Engineer who in turn will notify the responsible local authorities and the National Culture Administration immediately (within 24 hours or less);
5. Responsible local authorities and the National Culture Administration would be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed by the archeologists of National Culture Administration. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage; those include the aesthetic, historic, scientific or research, social and economic values;
6. Decisions on how to handle the finding shall be taken by the responsible authorities and National Culture Administration. This could include changes in the layout (such as when finding an irremovable remain of cultural or archeological importance) conservation, preservation, restoration and salvage;
7. Implementation for the authority decision concerning the management of the finding shall be communicated in writing by relevant local authorities; and
8. Construction work could resume only after permission is given from the responsible local authorities or National Culture Administration concerning safeguard of the heritage.

### **Hazardous Materials**

If the construction site is expected to have or suspected of having hazardous materials (asbestos containing materials in debris from demolished buildings) the Contractor will be required to prepare a Hazardous Waste Management Plan. To be approved by the Project Engineer. The plan should be made available to all persons involved in operations and transport activities. Removal and

disposal of existing hazardous wastes in project sites should only be performed by specially trained personnel following national or provincial requirements, or internationally recognized procedures

### **Health Services, HIV/AIDS Education**

The Contractor shall provide basic first aid services to the workers as well as emergency facilities for emergencies for work related accidents including as medical equipment suitable for the personnel, type of operation, and the degree of treatment likely to be required prior to transportation to hospital.

The Contractor shall be responsible for implementing an awareness program, including a voluntary option for the detection screening of sexually transmitted diseases, especially with regard to HIV/AIDS, amongst employees. Appropriate measures to raise awareness and measures to be taken among employees, in work camps, and in neighboring local communities about sexually transmitted diseases and the avoidance and mitigation of malaria and dengue fever should be carried out.

The Contractor shall include in his proposal the outline of a Health Plan. The Project Engineer will issue a certificate of compliance to the Contractor prior to the initiation of Construction.

### **Environmental Supervision during Construction**

The Project Engineer will supervise compliance with these specifications and report to the PMU in writing at least on quarterly basis. Major non-compliance by the Contractor will be cause for suspension of works and other penalties until the non-compliance has been resolved to the satisfaction of the Project Engineer. Contractors are also required to comply with national and municipal regulations governing the environment, public health and safety.

**Myanmar Agriculture Development Support Project**

**Land Acquisition and Resettlement  
Policy Framework**

**Ministry of Agriculture and Irrigation  
The Government of Myanmar**

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## Abbreviations and Acronyms

ACC	Agriculture Coordination Committee
ADSP	Agriculture Development Support Project
AMD	Agricultural Mechanization Department (in the Ministry of Agriculture and Irrigation)
DAR	Department of Agricultural Research (in the Ministry of Agriculture and Irrigation)
DOA	Department of Agriculture (in the Ministry of Agriculture and Irrigation)
FS	feasibility study
ID	Irrigation Department (in the Ministry of Agriculture and Irrigation)
LRPF	Land Acquisition and Resettlement Policy Framework
LUC	Land Use Certificate
MOAI	Ministry of Agriculture and Irrigation
OP	Operational Policy
PAP	project affected people
PIC	Project Implementation Committee
PMU	Project Management Unit
PSC	Project Steering Committee
LAAP	Land Acquisition Action Plan
SA	Social Assessment
SLRD	Settlement and Land Records Department (in the Ministry of Agriculture and Irrigation)
SA	Social Assessment
TA	Technical Assistance
TORs	Terms of Reference
WUG	Water User Group

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## **A. Background**

1. The Government of Myanmar agreed to receive funding from the World Bank for the Agriculture Development Support Project (ADSP). The Ministry of Agriculture and Irrigation (MOAI) is the Implementing Agency. This document provides policies and procedures to be taken under the project in relation to land and asset acquisition in order to ensure the Project fully complies with the World Bank Operational Policy (OP) 4.12 ‘Involuntary Resettlement’.

2. The project focuses on the rehabilitation of middle-scale surface irrigation schemes in four regions: Bago East, Nay Pyi Taw, Mandalay, and Sagaing. Up to eight such schemes will be supported by the project during its seven year implementation period. The irrigation schemes that will be rehabilitated under the project will be identified based on the feasibility studies (FS) that will be carried out after the project effectiveness. A Land Acquisition and Resettlement Policy Framework (LRPF) was prepared during preparation instead of a Resettlement Action Plan. Land Acquisition Action Plans (LAAP) will be developed in line with this LRPF and the Bank’s OP 4.12 during implementation.

3. This LRPF was developed based on the Social Assessment (SA) conducted during the project preparation to inform the design of the project, which assessed four pre-identified irrigation schemes in the four project target regions. These four irrigation schemes were selected because they demonstrate some characteristics typical of irrigation schemes in the four target regions. The project may rehabilitate any of these four schemes if its feasibility is ascertained under the FS to be conducted during the implementation based on a more detailed assessment of associated economic, technical, environment and social issues. A full Social Assessment (SA) will be conducted as part of Feasibility Studies (FS) during implementation in line with the Operation Policy 4.10, *Indigenous Peoples*, if the ethnic screening to be conducted during implementation under FS finds that ethnic minorities are present in or have collective attachment to the area of influence of the irrigation schemes that will be supported under the project.

4. The project falls under Environment Category B of the World Bank. Physical relocation of households or large-scale acquisition of land and/or assets is unlikely to occur. The project affected people (PAP) are mostly direct project beneficiaries, although some non farmers and those farmers who do not receive direct project benefits may also be affected under the rehabilitation of primary and secondary canals as well as under land improvement pilots.

## **B. The Project**

### *Project Development Objective*

5. The Project Development Objective of ADSP is to increase crop yields and cropping intensity in the selected existing irrigation systems in Bago East, Nay Pyi Taw, Mandalay, and Sagaing regions. This will be achieved through improved irrigation and drainage management and complementary farm advisory and technical services.

### *Project Components*

6. The proposed project has four components: (i) Irrigation and Drainage Management; (ii) Farm Advisory and Technical Services; (iii) Project Coordination and Management; and (iv) Emergency Contingency Response. Summary descriptions of each component are as follows.

#### Component 1: Irrigation and Drainage Management

7. The component aims to enhance more flexible and reliable provision of irrigation and drainage services in the project areas to enable an increase in irrigation area coverage and resulting farm productivity. It would address irrigation and drainage management through: (1) focusing on institutional change required for the provision of farmer-responsive irrigation services; and (2) financing the improvement and rehabilitation of irrigation and drainage infrastructure covering about 40,000ha within eight selected schemes in the selected regions.

8. The project's support to institutional improvements includes: development of irrigation and drainage management institutions, their human resources, data collection and management information systems and infrastructure; strengthening of the existing Agriculture Coordination Committees (ACCs) as decision making platform for irrigation management for farmers and service delivery agencies; and establishment and strengthening of Water User Groups (WUGs). Competent agencies with adequate technical skills would be hired to help farmers establish and strengthen WUGs. National or international NGOs with a proven experience in participatory approach and community engagement will be hired to monitor project implementation and carry out participatory Monitoring and Evaluation (M&E).

9. The project will also support development of on-farm water management infrastructure and pilot land improvements in 2-3 selected systems. These land improvement pilots will involve the adjustment of existing, irregularly shaped plots into equal-sized, regularly-shaped ones, combined with the land levelling and realignment, and construction of on-farm irrigation and drainage canals and access roads. A competent third-party organization (e.g. an NGO) will be engaged to ensure that all local population including but not limited to direct beneficiaries of the project will actively participate in project implementation and that negative impacts that may fall on them would be minimized or otherwise mitigated. Participatory monitoring and evaluation (M&E) will also be carried out so local population will be given avenues to voice grievances or inquiries directly to the project, under the facilitation of the third party service provider and the presence of local government officials. The third party service provider will work closely with the Department of Irrigation (ID), Settlement and Land Records Department (SLRD) and the Project Implementation Committee (PIC) of the township for all activities related to the land improvement pilots.

#### Component 2: Farm Advisory and Technical Services

10. This component facilitates agricultural technology development and adoption activities in the targeted irrigation schemes, which would increase farm productivity and reduce production costs. It will support quality seed production (mainly non-hybrid rice, beans and pulses, and oil crops that are not produced by private sector) by developing farmer-based seed multiplication infrastructure and facilities and strengthen seed supply chains, promote improved fertilizer applications which will be adopted to the variability in soil types in targeted irrigation schemes, help the MOAI and farmers improve the capacity for plant protection through the adoption of Integrated Pest Management techniques. All these agricultural technology development activities and knowledge of improved farming practices will be disseminated to target farmers through

improved farm advisory services which are based on farmers' needs and technical constraints, farming systems and market opportunities. The project will also support rehabilitation or construction of village extension education centers, establish field demonstration sites of improved technologies, expand training programs and provide operational and mobility support to MOAI extension staff and subject matter specialists.

11. In response to prevailing good preconditions for profitable farm mechanization in targeted irrigation schemes, the project provide supports farm mechanization through training of MOAI mechanics, testing and demonstration of new climate-smart technologies suitable for smallholder farming systems, and providing mechanization services in the target irrigation systems. The project will also upgrade the capacity of the Meikhtila Mechanization Training Center in Mandalay region through introduction of the modern training methodologies, materials, and upgrade repair workshops, in order to provide more and better vocational training to the staff of MOAI Mechanization Service Stations, farmers, and private sector. It will also support four MOAI Mechanization Service Stations in the project areas, through procurement of machine packages and mobile repair workshops selected in collaboration with the private sectors in order to promote climate-smart mechanization technologies to farmers, provide cost-effective services suitable for smallholder farming systems in Dry Zone, and carry out farmer training.

#### Component 3: Project Coordination and Management

12. The Project Management Unit (PMU) will be established. It will include technical and fiduciary MOAI staff who will be seconded to PMU at a full-time basis from the relevant implementing departments. The implementation of individual project components and sub-components is being carried out through departmental Project Implementation Units. The PMU will be responsible for the overall coordination of the project implementation and fiduciary arrangements, including procurement, financial management, management of safeguards issues, internal and external auditing and the establishment of the project Monitoring and Evaluation (M&E) system. Outside consultants will be recruited in areas which require strengthening of MOAI implementation capacity. The component would finance establishment of the M&E and Management Information Systems and associated Technical Advisory (TA) services including participatory M&E; communication and consultation program; salaries of the externally recruited staff, related office equipment and mobility.

#### Component 4: Emergency Contingency Response

13. The objective of this zero amount-budgeted component is to allow a rapid reallocation of loan proceeds from other components to provide preparedness and rapid response support to disaster, emergency and/or catastrophic events as needed.

#### *Institutional Arrangements*

14. The MOAI will be the implementing agency of the ADSP. A Project Steering Committee (PSC) for project governance and oversight will be established at the central level. At township level a coordination function will be assigned to the ACC.

15. A PMU will be established within MOAI which would be responsible for day-to-day management and coordination of the project (including safeguards). This PMU will be headed by a full time PMU Manager. The Safeguard Coordinator will be appointed at the PMU who will

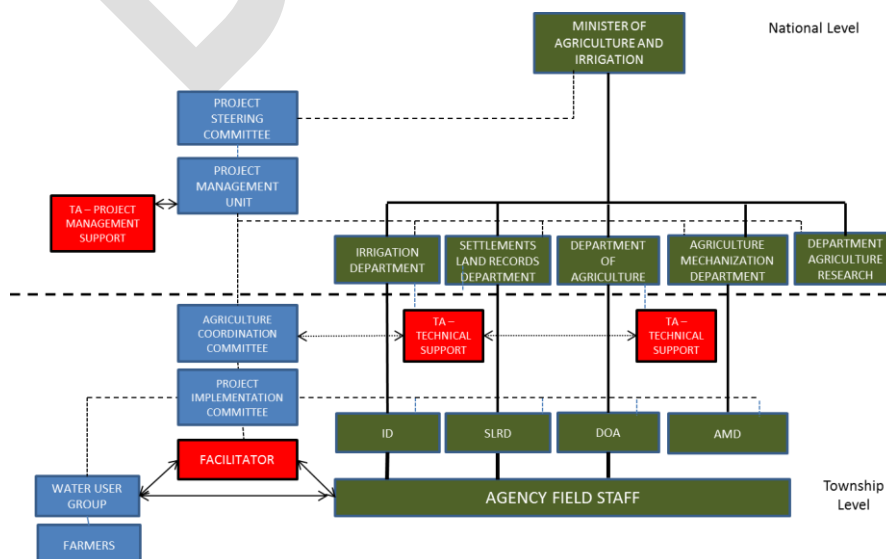
directly report to the PMU manager. The actual implementation of project activities will be carried out by Project Implementation Units (PIUs) in the MOAI departments with the necessary technical expertise and by third party implementation partners. The Irrigation Department (ID) will be responsible for the implementation of Component 1 with technical support from the Settlement and Land Records Department (SLRD) and the Agricultural Mechanization Department (AMD). Implementation of the Component 2 will be the responsibility of the Department of Agriculture (DOA) and its divisions, with technical support from the Department of Agricultural Research (DAR). AMD will be responsible for the implementation of farm mechanization activities under this component.

16. At township level, the Project Implementation Committees (PICs) will be responsible for the implementation of the agreed activities. They work under the guidance of ACCs. PICs will be made up by representatives of all implementing departments of MOAI and chaired by ID. PIC will include a Safeguard Focal Point who will be responsible for safeguard related issues at the township level, in close coordination with the third party service provider. The project will establish and support institutional strengthening of WUGs who will become the common platform for the planning, execution and monitoring of irrigation and extension activities at the community level as well as management of social risks.

17. Safeguard Coordinator in the PMU will be in charge of overall safeguard compliance including the implementation of this LRPF. PMU will be responsible for the overall coordination of the project implementation and fiduciary arrangements, including procurement, financial management, safeguards, internal and external auditing and the establishment of the project M&E system.

18. A third party service provider will be hired under the project who will facilitate beneficiary farmers during decision making processes, in partnership with technical specialists of DOI, to help them develop equitable and transparent mechanisms for the management of farmer owned systems. The third party service provider will also support the safeguard coordinator by monitoring safeguard implementation and compliance at the village level, including collecting grievances affected people may have and assisting farmers develop proper minutes of meetings. It is to note that their task will focus on the facilitation between beneficiary farmers as well as between them and concerned government agencies, and the provision of social inputs to technical design processes to ensure social impacts are fully taken into account in the technical design processes.

**Figure 1: Project Institutional Set-Up for Implementation**



## **C. Existing Legal and Institutional Frameworks**

### *Land Laws*

19. Farmland Law was adopted in March 2012. It affirms that the state is the ultimate owner of all land. It also provides a private use right over farmland that includes the right to sell, exchange, inherit, donate, lease and ‘pawn’ the land. The Farmland Law also covers conditions under which farmers can retain use-rights, the state’s power to rescind such rights, the process for settling land-related disputes, and basic requirements for compensation in the case the state acquires the land for public purposes.

20. The Vacant, Fallow and Virgin Lands Management Law was also enacted in 2012. It governs the allocation and use of virgin land and vacant or fallow land. This law provides establishment of the Central Committee for the Management of Vacant, Fallow and Virgin Lands (CCVFV), which is responsible for granting use rights for such lands.

21. The 1894 Land Acquisition Act remains the primary law governing compulsory land acquisition. The Act permits the government to acquire land for public purposes and requires it to compensate land users. Its provisions include the procedures for required notice for acquisition of land and objections or appeals, as well as land valuation methods.

### *Institutions*

22. The MOAI is the primary body responsible for farmland. The ministry has departments in charge of land-use planning, water resources, irrigation, mechanization, settlement and land records, among other matters. The Farmland Management Body (FMB) and the CCVFV, established by the above mentioned two laws enacted in 2012 respectively, are responsible for approving requests for land use rights governed by the respective law.

## **D. World Bank OP 4.12**

23. The World Bank OP 4.12 aims to achieve the following objectives:

(a) Involuntary resettlement should be avoided where feasible, or minimized, exploring all viable alternative project designs.

(b) Where it is not feasible to avoid resettlement, resettlement activities should be conceived and executed as sustainable development programs, providing sufficient investment resources to enable the persons displaced by the project to share in project benefits. Displaced persons should be meaningfully consulted and should have opportunities to participate in planning and implementing resettlement programs.

(c) Displaced persons should be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher.

24. The policy covers direct economic and social impacts that both result from Bank-assisted investment projects and are caused by the involuntary taking of land resulting in: (i) relocation or

loss of shelter; (ii) loss of assets or access to assets; or (iii) loss of income sources or means of livelihood, whether or not the affected persons must move to another location. It applies to all project activities that result in involuntary resettlement, regardless of the source of financing.

25. The policy requires the borrower to prepare a resettlement action plan or a resettlement policy framework that includes measures to ensure that affected people are informed about their options and rights; consulted on, offered choices among, and provided with technically and economically feasible resettlement alternatives; and provided prompt and effective compensation at full replacement cost for losses of assets and international valuation standards and principles.

26. The national legislation regarding compensation for loss of land and assets is similar to the key principle of OP 4.12 requiring compensation for lost assets at replacement cost. However, OP 4.12 is more detailed and includes a number of requirements not found in national legislation, such as preparation of a Resettlement Action Plan, consultations and public disclosure. Under this project, the provisions of this LRPF and the OP 4.12 will take precedence if gaps are found to exist.

### **E. Scope of Potential Impacts and Risks**

27. The predominant majority of Project Affected People (PAP) will be smallholders. The impact of land and asset acquisition in the project would be generally limited to those who participate in, and directly benefit from, the rehabilitation of irrigation and drainage infrastructure as well as land improvement pilots. The exception is that the rehabilitation of primary and secondary canals may impact owners of private assets who may not be farmers and thus will not benefit from the project, although it is unlikely that such cases would occur under the project in a large number. Social Assessment (SA) conducted during the project preparation found that the majority of them are ethnic Barma although some ethnically non Barma farmers may also be present in project areas and participate in the project. Special attention will be paid to such ethnic minority populations and female-headed smallholder families.

28. It is unlikely that the project will result in a large scale acquisition of private land. The project will rehabilitate existing irrigation and drainage infrastructure covering about 40,000ha along the existing alignments. Physical relocation of households is not anticipated. Village extension centers will be built on the state land. Works to improve the safety of dams would be limited to repair works on dam bodies and would not cause a loss of or access to land, or result in income loss. Most civil works will be undertaken in the crop idle seasons so as to avoid impact of temporary land occupation as much as possible. The village extension centres (VECs) would be built on the public (i.e. state owned) land.

29. Land acquisition and asset loss are grouped into two broad types according to the management responsibility of the structures (Government or communities), scale of impacts, ability of affected people to determine the scope of investments and their impact, and whether or not affected people would directly and tangibly benefit from the investments. The first category includes the impacts which arise from the improvements of main system canals (primary and secondary). The affected people will include but will not be limited to direct beneficiaries of the project or members of WUGs; some non farmers may also be negatively affected. The second category includes those impacts which occur in relation to land improvement pilots. For this category of impacts, all affected people are direct project beneficiaries and members of the WUG although some farmers may choose to opt out of the



pilot with compensation at replacement cost. Only those who have land or assets within the boundaries of the pilot land improvement scheme will be affected.

#### *Main Systems (Primary and Secondary Canal)*

30. The project will rehabilitate existing primary and secondary canals mostly along the existing alignment. The works to be carried out will include rehabilitation of existing main conveyance, flow control and sediment management systems and de-siltation of irrigation and drainage systems, strengthening of embankments (against erosion and slope instabilities) with incidental provision of protective lining and repairs of structures and gates. In some areas drainage canals will be cleaned up and improved to prevent and reduce water logging problems and to prevent sediment entering the irrigation canals. All the works will be done in and limited to the existing canal system and no new canals will be developed. Minor realignments of existing canals may be necessary however, works to be carried out will be on a small scale and will not require many external laborers. Potential impacts would include minor losses of private land and the limited loss of pre-existing private assets including trees, structures and fences along the canals as a result of the minor realignment of canals and the construction of access roads. In addition to those farmers who will directly benefit from the project through the improved access to irrigation water, non farmers may lose private assets along the canal embankments and where access roads will be built. Also, the rehabilitation of primary canals may also affect farmers who do not receive water from the secondary canals to be rehabilitated by the project and whose access to irrigation water may thus not be significantly improved as a result of the project. Those who will be affected by the rehabilitation of primary and secondary canals will receive compensation at replacement cost without depreciation for lost land and/or assets – either in cash or in kind. The implementing agency (MOAI) shall cover the cost.

#### *Land Improvements*

31. The land improvement pilot will support the readjustment and reconfiguration of farmlands owned by farmers, the construction of access roads and rehabilitation of watercourses and drainage. Two to three pilot sites would be identified during the implementation among those where the project will improve access to irrigation water. No civil works will be required outside the boundaries of the pilot sites, and works will include alignment of canals, drains and farm-roads, and construction of structures such as small culverts, farm bridges and in some cases water division boxes. No one outside the designated sites will likely be affected by a land improvement pilot, except that some lands outside the pilot sites may temporarily be occupied to store construction machinery and materials. No physical relocation of households is anticipated.

32. According to the current procedure, participating farmers are expected to negotiate with each other so those who lose more land would be compensated through cash or in-kind by fellow farmers. Also, all farmers within designated land improvement sites are required to reach an agreement on the terms of mutual assistance to be provided by fellow farmers and the particular reconfiguration of farmlands, before the implementation of land improvement can commence. Also, no land improvement is allowed if any farmer would lose more than 10 percent of his/ her irrigated land as a result of land improvement. Such practice is found to cause the following technical problems (see also the Figure 2 attached below):

- a. The requirement that no farmer should lose more than 10 percent of irrigated land often causes significant technical challenges or makes land improvement unviable depending on topographical or other conditions.

- b. Land improvement may be carried out even where some farmers actually lose more than 10 percent of irrigated land due to technical errors.
- c. The requirement that all farmers have to agree to the terms of compensation and the reconfiguration of improved land plots prior to the commencement of the land improvement activities is found to cause a significant delay.
- d. The negotiation between farmers to minimize and mitigate impacts may not always result in fair and transparent results due to local socioeconomic dynamics.

33. In order to address such challenges, the project will allow the land improvement pilot to be implemented even where some farmers within the boundaries of land improvement sites do not agree with the terms of mutual assistance or the designed reconfiguration of farmland, provided that impacts are compensated at a replacement value and in line with the policies and procedures provided in this LRPF. In other words, some farmers are allowed to “opt out” of the pilot and “sell” the land to WUGs at the value which is at least equal to the replacement value of the affected land. Also, the project will allow a land improvement pilot to proceed even where farmers lose more than 10 percent (but not more than 15 percent) of irrigated farmland, provided that (i) affected farmers agree to the assistance to be extended by fellow farmers, that (ii) the technical features of the pilot are such that income loss will likely be fully restored by the increased productivity within two cropping seasons, and that (iii) the affected farmers would receive income support in the event that their income is not recovered in two cropping seasons. The participatory SA facilitated by the third party service provider will help WUGs establish in a participatory manner the baseline income level, and project monitoring mechanisms including the participatory M&E will monitor the state of income restoration. The third party service provider will personally visit all affected farmers and confirm, in the absence of other farmers, the voluntary will to accept assistance from fellow farmers. Farmers will also be assisted to form WUGs and carry out participatory processes under the support of the third party service provider and minimize each other’s impact.

34. The project will develop detailed steps and technical parameters for the land improvement pilots during implementation, based on a more detailed analysis of the strengths and weaknesses of the existing procedures. More detailed steps to minimize and mitigate the impact of land improvement pilots will be developed in line with such detailed steps and technical parameters, as well as this LAAP, and will be described in the project Operations Manual (OM).

Figure 2 Steps of the land Improvement (LI) projects in Myanmar

Step	Current procedures	Implementing agency	Weaknesses identified	Proposed procedure
1	Identification of the potential LI site	SLRD/ID		No change is required
2	Expression of interest to a farm community in LI project and preliminary agreement with land users	SLRD	The LI practices, community participation and public displays are not established. They vary from place to place	Establish clear guidelines for all processes and share them with village communities approached for LI project before the start of the project
3	Checking of the existing land user right (LUR) certificates that are based on the cadastral Queen Maps. All land users shall have LUR certificates before the start of the project. The land improvement projects are not implemented in the areas with existing land conflicts.	SLRD	LUR may be accurate	LUR be verified or reissued based on steps 4 below
4	Preparation of the new cadastral maps with re-shaped/realigned land parcel layouts, infrastructure (water canals and farm access roads)	SLRD	Old Queen Maps are not reliable to produce new maps and issue new LUR certificates	Use the modern equipment and software to produce new Queen maps and LUR certificates, of which the accuracy will be verified by land users.
5	Open meeting(s) with all land users participating in the scheme (as long as it takes) to verify a new layout of their land parcel(s), loss of land and how they should be addressed (land donations or compensation). Land donations are allowed only if scale of loss is less than 10% of the productive land holding. A written agreement of all land users is required to move to the next step	SLRD	<ul style="list-style-type: none"> <li>- No procedures for compensation if land &gt; 10% has to be acquired</li> <li>- Unclear procedure for public display and consent</li> <li>- Absence of the impartial dispute resolution mechanism</li> </ul>	<ul style="list-style-type: none"> <li>- Develop the procedures for compensation of land above the agreed threshold</li> <li>- Publicly display all information</li> <li>- Develop a clear dispute resolution mechanism including the timeline before which farmers consent should be established</li> </ul>
6	Documentation of project impact, compensation strategy, grievance redress and monitoring mechanism, and other relevant information, their disclosure, and stakeholder consultations	SLRD (?)	- No documentation is required, disclosed or consulted with stakeholders	- A resettlement plan will be developed, disclosed and consulted with stakeholders in line with international good practice
7	Preparation and issuance of new LUR certificates, new cadastral maps, and new land revenue records	SLRD	- Grievance redress/ dispute resolution mechanism is not required to provide the avenue for disputes over LUC certification	<ul style="list-style-type: none"> <li>- Grievance redress/ dispute resolution mechanism will be established with the participation of WUG prior to LUC issuance.</li> <li>- No other change is required except to build on step 4</li> </ul>
8	Start of the civil works	ID/AMD	<ul style="list-style-type: none"> <li>- It is not clearly required that compensation has to be paid before civil works commence</li> <li>- It is not clearly required that grievance redress/ monitoring mechanisms should be established before compensation payment commence</li> </ul>	<ul style="list-style-type: none"> <li>- Compensation, if it has to be provided, has to be paid before civil works start</li> <li>- Grievance redress/ monitoring mechanism will be established before compensation payment commences in line with the resettlement plan.</li> </ul>

35. Other activities to be carried out under the project will unlikely cause a loss of private land or asset. However, they involve risks that, if not properly implemented, may cause adverse impact on local population. The sections that follow will describe such risks, for each type of civil works to be supported under the project, and how such risks will be managed and avoided under the project.

*Farmer owned and managed systems (tertiary canals and drainages, watercourses)*

36. The project would support the WUGs in the improvement of the farmer managed and owned parts of the irrigation and drainage systems such as repair or provision of water courses that serve several farms and small canals and structures like culverts and boxes. It is to note that farmers themselves will plan and design such civil works with the technical assistance of the irrigation department. The third party service provider will facilitate and coordinate between potential beneficiary farmers to assist them in the process.

37. No land acquisition or physical relocation of households will be necessary, however, minor readjustments, on-field extension and changes of land use may occur in order to address irrigation problem identified by WUGs within their respective watercourse units. The type of small works to improve on-farm irrigation at watercourse level will depend on the problems identified by the members of the WUGs, but they will typically include rehabilitation of culverts,

canals and ditches, the construction of pathways, cleaning up of watercourses and the digging of new canals and ditches within the farm plots that belong to farmers themselves. Almost all works will be carried out by the farmers but the ID may provide support. Such civil works will result in minor modifications and rationalizations of plot layouts which will not affect the land ownership or plot boundaries, as it will only involve the reconfigurations of existing farm plots. A very small size of farmland that beneficiary farmers currently use for farming may well be transformed to canals, ditches and pathways, should farmers choose to execute such small works. Also, some personal assets such as trees and structures may need to be removed to accommodate such small works if they elect that such works would be done. Farmers will continue to own and manage canals, ditches and pathways built within the reconfigured plots, as part of their own farm plots.

38. The size of land that farmers can use for farming may be slightly reduced depending on how plots are reconfigured, and income may be affected temporarily, however, such a temporary income loss will be more than compensated by the improved access to irrigation water managed by beneficiary farmers themselves. It is expected that works that will be carried out for farmer managed systems will be completed and production will be more than recovered after one cropping season or two. Farmers will be facilitated by the third party service provider and support each other to mitigate such temporary income losses. Also, the project will not be implemented if farmers do not reach a consensus on how they will mitigate potential negative impacts that may fall on fellow farmers through mutual assistance. The OP 4.12 will therefore not be triggered for this category of canals. The third party service provider will visit project sites at least on a monthly basis since the planning till 2 months after the completion of civil works and monitor how the consensus is established and implemented, and fill the farmer action plan to record the types and scope of impacts as well as the community consensus built on how to mitigate them, using the template attached in Annex 3 of this LRPF. In particular, the third party service provider will verify the following and record them in the farmer action plan: (i) all affected people directly benefit from the improvement in project interventions in farmer owned and managed systems; (ii) all affected people are aware that they have the right to opt out and refuse to participate in the project assisted improvement in farmer owned and managed systems; (iii) no one is forced to agree to the terms of mutual assistance or reconfiguration of farm plots; and (iv) technical features of the project activities are such that negative impact will be fully recovered from the increased income as a result of the project in about 2 cropping season.

39. The minutes of the meeting where the consensus is built should be attached to the farmer action plan, and DI will file them for random review by the World Bank. Participatory monitoring and evaluation (M&E) will be carried out with affected people through which affected farmers can raise complaints or grievances. In the event that the loss in production and the resultant loss in income are not recovered within two cropping season, the project will provide temporary income support.

*Village extension education centers, and seed storage and value added processing facilities*

40. This project would also rehabilitate existing village extension education centers within the existing locations or newly establish such centers by rehabilitating or retrofitting existing government buildings on the state land. No land acquisition or access loss would occur. Small facilities for seed storage and value added processing activities will also be built on community or farmers land. Very limited land will be necessary to house such facilities, which will be built only if direct beneficiary groups (WUGs or women's groups, as relevant) elect such facilities to

be built in their villages. Such beneficiary groups will be allowed to donate land to house such facilities, following the principles, procedures and processes provided in this LRPF.

*Works to improve the safety of dams*

41. Under the project, some civil works will also be carried out to improve the safety and operation of dams from which the project irrigation schemes will receive water, based on the recommendations of the dam safety study conducted during the preparation which assessed the four dams which provide water to the irrigation schemes assessed under the SA. Feasibility studies that will be carried out during implementation will identify the types and scale of civil works that the project will finance, but they will include (i) embankment repairs including repair of gullies and erosion holes, repair of toe drainage/repair, modification of drainage slope, drainage/install relief wells, improvement in embankment surface protection, covering of crest with granular fill, installation of piezometers and surface measuring beacons and seepage measuring weirs; and (ii) spillway repairs, including the improvement of the capacity of weirs and line chutes, repairs of the spillway chutes, side walls and baffle blocks, sediment management works and repairs of access road to dam sites.. Works or measures that may affect private land or access to natural resources such as fishery resources will not be financed, and management of reservoirs will unlikely altered. Private land will thus unlikely be affected, and access to natural resources will also not be affected. OP 4.12 is therefore not triggered for project activities in relation to the safety of dams.

42. Many irrigation schemes in the project target townships were built some 10 – 20 years ago. The social assessment (SA) carried out during preparation found that some people were displaced when dams – and primary canals too to some extent – were originally built without adequate compensation. The SA did not carry out a thorough due diligence since it assessed only those four irrigation schemes that were pre-identified for potential funding under the project. Legacy issues will be approached under the Project differently depending on the footprint of the project. The land legacy issues related to dams and reservoirs that typically reach far back into some 10 – 20 years ago will be dealt with through a combination of measures beyond the scope of the project, such as the support the Bank may provide to the ongoing National Land Commission, the Country Partnership Strategy (CPS) and larger country wide land related studies and recommendations. Potential project specific land legacy issues which relate directly to footprint of the selected irrigation schemes will be covered under this LRPF in accordance with OP 4.12 on Involuntary Resettlement.

43. Specifically, a thorough due diligence will be carried out during implementation as part of the Social Assessment (SA) to be carried out under FS to assess who were affected when project irrigation schemes were originally built, what compensation and assistance they received to restore livelihood, and what are their current level of livelihood. The third party service provider who will be hired under the Project will lead the assessment, under the guidance of the project Safeguard Coordinator and the Bank task team. The findings of the due diligence will be used as an input for the Bank’s planned policy dialogue with the Government of Myanmar on land issues and for the national level dialogue towards addressing the historical displacement that occurred under the previous regimes. Regarding the potential project specific land legacy issues which relate directly to the footprint of the selected irrigation schemes, the Land Acquisition Action Plan (LAAP) which will be developed during implementation, will include measures to restore the livelihood of affected people and close other gaps with the objective of the OP 4.12 as identified by SA.

## **F. Land Acquisition and Resettlement Policy Framework**

### *Objectives and Principles*

44. This Land Acquisition and Resettlement Policy Framework (LRPF) aims to ensure that the project will be implemented in line with the World Bank's OP 4.12, *Involuntary Resettlement*. Accordingly, the current LRPF encompasses key principles as follows:

- (a) Acquisition of land and other assets will be avoided where feasible or minimized to the extent possible. Physical relocation of households is not allowed.
- (b) All people who are found to be present in project affected areas on the cut-off-date and affected by the rehabilitation of the main systems (i.e. primary and secondary irrigation and drainage structures) as well as land improvement pilots are entitled for compensation at replacement value and in line with international valuation standards and principles for loss of land or assets.
- (c) Voluntary donations and in-kind assistance by fellow farmers are allowed under the project provided that: (i) affected people are the direct beneficiaries; (ii) know that they have the right to refuse to donate land or assets, or accept in-kind assistance offered by fellow farmers; (iii) agree to donate land or assets without coercion or under duress; (iv) will not lose more than 10 percent of their total irrigated land; and that (v) technical features of the project activities are such that negative impact will be fully recovered from the increased income as a result of the project in about 2 cropping season. For the land improvement pilot, an exception may be allowed and impacts may be addressed through mutual assistance by fellow farmers even if more than 10 percent (but not more than 15 percent) of irrigated lands is lost.
- (d) The third party service provider will develop the capacity of, and facilitate the discussion among, WUG members and help them collectively minimize and mitigate impacts through voluntary donations and in-kind assistance by fellow farmers in a transparent manner and without force or under duress. The third party service provider will document the process through which WUG members build the consensus on voluntary donation processes.
- (e) The third party service provider will ensure that all PAP including those who will not directly benefit from the project will be meaningfully consulted and given opportunities to participate in planning and implementing rehabilitation measures. Efforts will be made to ensure that adverse impacts are avoided or otherwise mitigated.
- (f) The project will strengthen WUGs to gradually establish inclusive and transparent internal decision mechanisms, based on the guidelines provided in the Annex 9 of the ESMF. WUGs will be assisted so their members provide inputs to the design of civil works. The third party service providers will support WUGs so as to ensure that affected farmers and local population have access to project information.

- (g) Feasibility Study (FS) will be carried out during implementation for respective schemes and the project irrigation schemes will be selected based on the result. Participatory Social Assessment (SA)<sup>8</sup> will be conducted as part of FS for each project scheme, which will establish social baseline including the population living in the command areas. Participatory SA will also be carried out for land improvement pilots. The participatory SA will include an assessment of the nature, scale and scope of displacement that occurred when the project irrigation schemes were originally built, and of the current state of the livelihood of the previously displaced people.
- (h) Land Acquisition Action Plan (LAAP) will be developed during implementation for the rehabilitation of primary and secondary canals and land improvement pilots in line with this LRPF and the Bank's OP 4.12, which should include all elements provided in paragraph 49 below.
- (i) Compensation should be fully paid in cash or in kind and voluntary donation processes should be completed at least one month prior to the start of the civil work. The timing of LAAP preparation, submission and approval should be linked to plans of civil work implementation to make sure the payments will be completed in time; and
- (j) PAP should be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-project levels.

45. The implementation of resettlement activities is linked to the implementation of the investment activities of the project to ensure that a temporary restriction of access to farmland or any other sources of income does not occur before mitigation measures are in place.

#### *Eligibility*

46. PAP entitled for rehabilitation or compensation under the project are as follows:
- 1) All families losing access to land, permanently or temporarily, over which they have legal use rights or traditional/customary use rights with or without legal status;
  - 2) Owners of affected buildings, crops, plants, or other objects attached to the land; and
  - 3) Members of the households losing business and income.

47. A cut-of date will be established for each investment activity that may involve land and asset acquisition in order to determine eligible PAPs. The cut-off date is the date when the social baseline is established as part of the participatory SA to be conducted under FS. Persons who start using the land or build structures in the proposed area after the cut-off date will not be eligible for compensation under the project.

#### *Implementation/ Land Acquisition Action Plan Procedures*

#### Primary and Secondary Canals

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<sup>8</sup> The participatory SA will serve as the Social Assessment under OP 4.10 where ethnic minorities are present.

**48. A participatory Social Assessment (SA)<sup>9</sup>** will be carried out as part of the Feasibility Study (FS) for each scheme. The participatory SA will start with information dissemination. The PMU and PIC with the support of the third party service provider will provide essential information about the project including land acquisition processes, entitlements, and grievances mechanisms. Special attention will be paid to ensure that information is fully shared with women and vulnerable groups. The participatory SA will also collect and analyze information on the population in the command areas, including their livelihoods. The nature, scale and scope of displacement that occurred when the project irrigation schemes were originally constructed, and the current state of the livelihood of the previously displaced people, will also be assessed. Social baseline (which will serve as the census defined in OP 4.12) will be established and the people potentially affected by the rehabilitation to be carried out for the concerned scheme will be identified based on the record of LSRD, field assessment and interview with local people. Free, prior and informed consultations with local affected people will also be conducted and vulnerable people will be identified under the participatory SA. The third party service provider will ensure that all local people potentially affected by the rehabilitation of respective primary and secondary canals, including non farmers and those farmers who do not take water from the respective primary or secondary canals to be rehabilitated, are included in the participatory SA.

**49. Scope of Impact and affected people will be identified.** Detailed engineering designs which will be carried out by the Design Branch of the ID will identify the scope of impact and potential PAP, and, under the guidance of the third party service provider, consult with PAP for proposed designs to seek for inputs to verify that no technically viable alternative option exists that would further reduce social impacts and to obtain their preliminary agreements in a written form. Land Use Certificate (LUC) of all people who will likely be affected will be checked and assessed based on the on-site survey to verify the accuracy, or they will be revised based on the result of the on-site measurement with the participation of land owners themselves.

**50. Draft Land Acquisition Action Plan (LAAP) will be developed.** The same design team of the ID with the assistance of the third party service provider will prepare a draft LAAP. The LAAP will include, at minimum:

- The description of the project objective and activities
- Potential impacts, and mechanisms to minimize negative impact
- Identification of vulnerable households
- Eligibility criteria
- Summary of participatory SA, characteristics of affected people including vulnerable people among them and issues related to land tenure
- Valuation and compensation for losses at replacement cost
- Programs for improvement or restoration of livelihoods and standards of living
- Institutional arrangement
- Consultation and participation arrangements

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<sup>9</sup> This SA will serve as a Social Assessment (SA) under OP 4.10 if ethnic minorities are found to be present in the catchment area of the irrigation scheme under study.



- Implementation schedule
- Grievance procedures, and monitoring and evaluation
- Cost and budget

51. **The draft LAAP will be consulted with the affected people**, under the support of the third party service provider, in locations convenient to local people and in a language that is understandable to them. The draft LAAP will also be posted in local language at suitable locations of township and villages for public disclosure. The ID under the assistance of the third party service provider will incorporate the comments received at consultation meetings and submit the revised draft LAAP to the Safeguard Coordinator who will, upon confirmation that it addresses all issues required for LAAP, seek for PMU Director's approval. PMU Director will submit it to the World Bank for no-objection.

52. **ID will implement LAAP** under the assistance of the third party service provider, following the clearance of LAAP by the Bank. Where grievances or inquiries are posted from affected people, ID representing the PIC as its chair and under the assistance of the third party service provider will respond as per the grievance mechanisms provided in this LRPF. Implementation will be closely monitored and documented by the third party service provider.

53. **Monitoring and evaluation.** Upon the completion of the LAAP implementation, the ID, under the assistance of the third party service provider, will conduct a LAAP implementation assessment to confirm that all affected people have received entitlements, and that outstanding grievances have been duly addressed as per the grievance mechanisms of this LRPF. As part of the assessment, participatory M&E will be carried out under the facilitation of the third party service provider (for details of participatory M&E, see the section below on grievance redress mechanism) Upon the confirmation, the third party service provider will advise ID to initiate civil works

#### Land Improvement Pilots

54. As was mentioned above, existing approaches to land improvement will be assessed and their strengths and gaps be identified, and an alternative approach that will be used under the project will be developed, during implementation. Detailed measures to minimize impacts and mitigate residual impacts, and their implementation procedures, will be developed during implementation, in line with the technical approach that will be developed for use under the project, but broadly, the following will summarize the processes and procedures to be taken to minimize and mitigate negative impacts:

#### **Identification of Land Improvement Pilots and Initial Community Consultations**

- a) The ID and SLRD will identify potential locations which, from the technical point of view, are suitable for land improvement pilots. The third party service provider will help the ID and the SLRD carry out free, prior and informed consultations with all farmers who use the pilot land improvement sites identified. They include those owner farmers and absentee owners who have a LUC on the land inside the pilot sites as well as shareholders, tenants and agricultural laborers who gain income from farming or working on parts of the pilot sites. Information about potential benefits and impacts,

implementation procedures and provisions of LRPF including grievance mechanisms will be fully explained in a language understandable to participants. In particular, overall implementation procedure, the principles of and conditions under which voluntary donations are allowed, entitlements for sharecroppers, tenants and agricultural laborers, and grievance mechanisms, will be clearly explained. It will also be clearly explained that those owner farmers who are not content with or do not wish to participate in the designed reconfiguration of farmland are entitled to opt out with compensation at replacement value.

- b) Should the broad community support of the people affected by land improvement pilots is ascertained, preparation of the land improvement pilot will proceed. If the broad community support is not ascertained, the project will identify alternative sites and no further action will be taken for the original site.

**55. Participatory Social Assessment (SA)**

- 1) Once the broad community support is established, all LUC holders at the respective pilot sites will, under the support of the third party service provider, form a WUG and start developing organizational and institutional capacity for land improvement planning and conflict resolutions. It is to note that, while the majority of rights holders are expected to join WUGs and participate in land improvement pilots, given the considerable potential benefits that may result, some may choose not to participate due to a variety of reasons including an unwillingness to accept the newly designed plot plans or terms of mutual assistance offered by fellow farmers. Such farmers are allowed to receive compensation for loss of land at replacement costs and opt out.
- 2) The third party service provider will prepare the local socioeconomic and demographic profile including the social baseline, current land holding and production/ productivity levels, using a participatory approach involving both rights holders and land users. Land Use Certificate (LUC) of all rights holders including those who elect to opt out will be checked and assessed based on the on-site survey to verify the accuracy, or they will be revised based on the result of the on-site measurement with the participation of rights holders themselves. Also, those tenants, sharecroppers and agricultural laborers who gain income from using parts of the pilot sites will be identified. They form the Project Affected People under the project. Vulnerable farmers/ land users (including ethnic minorities, if present) will be identified under the participatory SA and measures to ensure the full restoration of their income streams will be developed. The level of income that owner farmers/ absentee owners as well as land users gain from parts of the pilot sites will also be assessed on the basis of which compensation for income loss will be calculated.

**56. Consultation of Detailed Designs and Preparation of Land Acquisition Action Plan (LAAP)**

- 3) Detailed engineering designs for land improvement pilots will be developed by design consultants in collaboration with rights holders and land users. A map showing new boundaries will be produced after the detailed engineering design is completed. Based on the final engineering design, an inventory of changes in plot sizes with two maps (one showing the current plot boundaries and the other one showing the new ones), will be produced. They will be verified by rights holders and land users of the pilot sites, including those who elect to opt out of the pilot. Efforts will be made so participating rights holders and land users will participate in the process and help ensure that loss of land will be minimized.
- 4) Also, the loss of income for land users (sharecroppers, tenants and agricultural laborers) as a result of the reconfiguration of farmland which may result in a reduction of land for farming will be assessed.
- 5) The third party service provider will help rights holders and land users to mediate between themselves for land swaps and in-kind assistance to be provided by fellow farmers to help farmers with larger impacts restore their livelihood, till they reach a consensus. It is to note that the project impact would not go beyond the boundaries of the farmlands where the land improvement pilot will be implemented, and no physical relocation of households would likely occur. The third party service provider will visit each affected farmer and confirm individually and in the absence of fellow members if they willingly and knowingly agree to donate land or assets and accept in-kind assistance from fellow members. The third party service provider will also confirm for individual affected farmers that all conditions of voluntary donations provided in the Section F (c) of this LRPF are met. The exception is allowed for land improvement pilot and a loss of land is allowed up to 15 percent of land holding, however, the verification has to be established from engineers and agronomists that no viable alternatives exist to further reduce impact and that the technical features of the pilot are such that income will likely be restored within two cropping seasons. The affected farmers will be clearly informed that, in the event that income is not fully restored after two cropping seasons, they are entitled for temporary income support.
- 6) The inventory and entitlement forms (Annex 1) will be filled, and the consensus reached will be documented in a 1-2 page note which describes how negative impacts will be minimized and mitigated, grievances will be addressed and implementation be monitored. The third party service provider will submit forms filled and the note developed to PMU for review and clearance.
- 7) Those farmers who, after facilitated processes assisted by third party service provider, decide not to participate in the land improvement pilot are allowed to leave the farmland with compensation. Those farmers who opt out of the pilot are entitled for alternative farmland of the same size and productivity, or cash compensation at replacement value, and compensation at replacement values for all affected assets including trees, structures

and standing crops. If affected assets are movable without damage, and if affected people wish to continue to use them, transport cost and other costs to reinstall assets at new locations will be covered.

- 8) The Safeguard Coordinator will compile the forms and the notes submitted by the third party service provider and develop the Land Acquisition Action Plan (LAAP), based on the same format as the LAAP for primary and secondary canals. The LAAP will be consulted with local and affected people including land users and those who elect not to participate in the pilots, and their comments will be incorporated in the revised final LAAP. The copy of the draft LAAP will be posted locally at locations accessible and in a language that is understandable to local people.

#### **57. Finalization and Approval of LAAP**

- 9) The Safeguard Coordinator will seek approval of draft LAAP by PMU Director. If it is approved by the PMU Director, it will be submitted to the World Bank for no-objection.

#### **58. Implementation of the LAAP**

- 10) Upon the clearance by the World Bank of LAAP, ID and SLRD, under the assistance of the third party service provider, will start implementing the LAAP. Where grievances or inquiries are posted from affected people, ID and SLRD under the assistance of the third party service provider will respond quickly as per the grievance mechanisms under this LRPF. Implementation will be closely monitored and documented by the third party service provider. Throughout the process, the third party service provider will continue to support WUG members and develop their capacity through on the job training.

#### **59. Monitoring and evaluation**

- 11) Upon the completion of the LAAP, the ID and SLRD, under the assistance of the third party service provider, will carry out a post LAAP assessment to confirm that all affected farmers have received in-kind assistance as described in the note submitted by the potential members of WUGs. The post LAAP assessment will confirm that all impacts have been adequately and fully addressed. If the post LAAP assessment finds outstanding grievances or impacts that have not been adequately addressed, the ID and SLRD under the assistance of the third party service provider will swiftly address them. Civil works will start upon the confirmation that all outstanding issues have been resolved.
- 12) The third party service provider will continue to visit project sites after the completion of civil works, albeit less frequently, and inform the ID and the LSRD of the pace of income restoration, so that, in the unlikely event that income is not restored after two cropping seasons, income support will be provided to farmers.

#### *Institutional Arrangements and Responsibilities*

60. The overall responsibility of the implementation of this LRPF rests with the PMU under the assistance of the Safeguard Coordinator in the PMU. A competent person with a long experience in Bank safeguard policies will be hired as the Safeguard Coordinator who will ensure a full compliance of all actions taken at the central as well as township levels, and supervise the third party service provider. The safeguard capacity development plan will be shared with the Bank for review and comments. Safeguard Coordinator will also provide at the onset of the project implementation training on LRPF to other PMU staff, relevant MOAI department officers who will work on the project, and all ACC and PIC members. Refresher training will be organized at the mid-term. Refresher training will be organized at the mid-term.

61. At township level, the Project Implementation Committees (PICs) will assume the overall responsibility for the implementation of this LRPF. PIC will include a Safeguard Focal Point who will be responsible for safeguard related issues at the township level, in close coordination with the third party service provider and under the supervision of the Safeguard Coordinator.

62. The third party service provider will play a key role to minimize and mitigate social impacts under the project. A team of consultants with sufficient experience and qualification in Bank social safeguard policies, community consultation and participation, and dispute handling mechanisms will be hired. The Terms of Reference of the third party service provider will be reviewed by the Bank. The third party service provider will provide on-going capacity development of all project staff at the township level, and monitor safeguard implementation and compliance at the village level, including collecting grievances affected people may have and assisting farmers develop proper minutes of meetings. The third party service provider will also ensure that negative impacts that may fall on local people who may not directly benefit from the project and/ or who are not the members of WUG will be fully addressed.

63. The Water User Group (WUG) will be the main project counterpart on behalf of farmers and play a key role through representing owner farmers in the project implementation, mediating between farmers for internal disputes and conflicts, and mitigating negative impacts through mutual assistance under land improvement pilots. The project will develop their capacity through providing technical assistance and by on-going support of the third party service provider.

#### *Grievance Redress Mechanism*

64. Complaints and grievances in relation to land and asset acquisition will be dealt with under the project grievances redress mechanism. A summary of project grievance mechanism will be developed in both English and Myanma as well as relevant ethnic languages and made available through various media including written materials and internet. They will also be made available in locations convenient to local population and explained about during public consultations and meetings with WUGs, in order to ensure that project affected people are aware of the avenue to have their grievance redressed.

65. Under this project, the WUGs will serve as the first tier mechanism to handle complaints and grievances. The WUGs will be formed at the initial part of project implementation for

respective irrigation schemes and land improvement pilots, well before civil works to be supported under the project are designed and implemented. The grievance focal point will be appointed within each WUG who will receive, address, and keep record of the complaints and feedbacks. The grievance focal point will first review the grievances submitted. If the grievances are found to be between farmers over farmland boundary setting, mutual assistance to mitigate impact over farmer managed systems, and other disputes between farmers, the grievance focal point will meet relevant farmers and seek to find resolutions in line with this LRPF, under the support of the third party service provider.

66. If grievances or disputes between farmers cannot be solved at the WUG level within 30 days of the submission of the grievances, the issue will be brought to PIC for mediation. PIC is expected to inform aggrieved persons or parties to disputes of the resolution in 30 days. If still unsatisfied, aggrieved persons or parties to disputes will elevate the matter to the PMU at the national level which will make the final decision in consultation with the Safeguard Coordinator. The Bank task team will be consulted for all grievances that are elevated to the national level. The aggrieved people will be informed of the decision within 30 days of the submission to PMU which will be the final.

67. If the initial review by the grievance focal point of WUG finds that the grievances concern the rehabilitation of primary or secondary canals, civil works carried out by the project hired contractors, village extension education centers or other issues that go beyond the disputes between farmers, the grievance focal point will immediately inform the third party service provider who bring the issue to the PIC for mediation. PIC is expected to inform aggrieved people or parties to disputes of the resolution in 30 days. If still unsatisfied, aggrieved people or parties to disputes will elevate the matter to PMU at the national level which will make the final decision in consultation with the Safeguard Coordinator. The Bank task team will be consulted for all grievances that are elevated to the national level. The aggrieved people will be informed of the decision within 30 days of the submission to PMU which will be the final.

68. Aggrieved persons or parties to disputes are also allowed to directly contact the third party service provider and raise concerns or questions. The third party service provider will also install sign posts in local areas with a clear indication of the contact information, and call for any people with grievances or questions to inform them. A consultation meeting will be held prior to the start of civil works in places and time convenient to local population including but not limited to water users and farmers. The nature of the civil works to be carried out, expected impact, entitlements and grievance mechanisms will be explained to local people. The translation of this LRPF will be made available to participants of consultations and at the local office of PIC. The third party service provider will visit project sites regularly and receive inquiries or grievances directly from local people. The third party service provider will provide WUGs necessary training and continuing capacity development throughout project implementation. Project's communication and information dissemination activities will include information about grievance redress mechanisms.

69. The participatory Monitoring and Evaluation (M&E) will be conducted, under the facilitation of the third party service provider, whereby affected people will assess the implementation of respective project activities as well as this LRPF, report outstanding issues and air grievances or other issues people may have with the project. The meeting will be attended by township PIC members and village authorities who will assist participants in identifying resolutions for grievances that may be presented. The third party service provider will prepare minutes of the meeting that record the issues raised and how they will be addressed in the subsequent annual cycle. This record will be submitted to PMU through PIC.

*Project monitoring*

70. All PICs will have a LRPF focal point who will regularly supervise and monitor LAAP implementation. PIC focal points will report to PMU Director on LRPF related matters, and request support of the Safeguard Coordinator if needed. S/he will travel to the sites and spot check if the actions are taken and information provided in conformity with the LRPF. The participatory M&E will also be conducted as a means for local population, including both project beneficiaries and negatively affected people, to report project performance and issues they face. The project webpage will have a dedicated section where safeguard supervision monitoring reports to be prepared by PIC focal points and the results of participatory M&E will be disclosed.

*Budget*

71. Since the exact scale and scope of impact are not known till the feasibility studies are completed during project implementation, the costs of implementing this LRPF cannot be accurately estimated during project preparation. Based on the very rough estimation of likely impacts based on similar works carried out elsewhere, it is estimated that the cost will amount to about \$ 2 million, as indicated in the table below. The budget will be constantly reviewed during implementation especially in light of expected impacts, and more budgets may be provided if the scale of impacts make it necessary.

Activity	Estimated cost (USD)
The third party service provider (inc. costs of farmer consultations and facilitations)	1,945,000
The cost of compensation and rehabilitation	150,000
Total	2,095,000

*Entitlement Matrix*

<b>Type of Losses</b>	<b>Entitled Persons</b>	<b>Entitlements</b>	<b>Implementation Issues</b>
Loss of private land	Legal owners or occupants	Cash compensation at replacement cost, equivalent to the current market value of land within the village, of similar type, category and productive capacity, free from transaction costs (taxes, administration fees)	
	Affected persons without a legally recognizable right or claim to the land they are occupying	At minimum, rehabilitation assistance to at least restore their livelihoods and standards of living, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher)	
Loss of trees, structures and other private assets	All affected persons regardless of tenure status	Cash compensation at replacement cost Salvage materials will be handed over to affected people	If remaining parts of the structures are not sufficient for use, compensation will be paid for the entire affected buildings  The project will help salvage material transportation  Sharecroppers and tenants will be compensated for loss in standing crops and other assets they themselves invested in
Loss of income and standing crops	All affected persons regardless of tenure status	Civil works will be adjusted to avoid loss of income/ standing crops Existing contracts on sharecropping, tenancy and agricultural laboring will be honored	
Temporary land occupation	Legal owners or occupants	Cash compensation for loss of income or assets on a net basis  Reinstitute land to the original state after the completion of civil works	PIC, under the support of third party service provider, will monitor implementation



### Annex 1. Voluntary Donation of Land and Assets Agreement Form<sup>10</sup>

Name of land user:	NRC Number:	Beneficiary of the sub-project: Y/N		
Sex:	Age:	Occupation:		
Address:				
Description of land that will be taken by the sub-project:	Area affected:	Total irrigated area:	Ratio of land affected to total land held:	Map code:
Description of annual crops growing on the land now and project impact:				
	Details	Number		
- Trees that will be destroyed				
- Fruit trees				
- Trees used for other economic or household purposes				
- Mature forest trees				
- ...				
Describe any other assets that will be lost or must be moved to implement the project:				
Value of donated assets:				
Will affected people need to be physically relocated?				

By signing or providing thumb-print on this form, the land user or owner agrees to contribute assets to the project. The contribution is voluntary. If the land user or owner does not want to contribute his/ her assets to the project, he or she should refuse to sign or provide thumb print, and ask for compensation instead.

Date:.....

Date:.....

Village Project Support  
representative's signature

Committee Affected person signature  
(both husband and wife)

<sup>10</sup> This form can only be used for land improvement pilots, since voluntary donations are not allowed for irrigation improvements.

## Annex 2 Land Acquisition Forms

### Form 1: Inventory of Project Affected People

Region: \_\_\_\_\_ District: \_\_\_\_\_ Township: \_\_\_\_\_ Village Tract: \_\_\_\_\_ Village: \_\_\_\_\_

Type of Activity:  Primary/Secondary;  Land Improvement

Serial No.	Name of head of HH	No. of persons in HH	Total irrigated land (acre)	Agr. Land		Loss as % of total	Permanent structures (acre)	Temporary structures (acre)	Assets			Crop			Income/ Business loss	
				Land to be acquired (acre)	Land				Residential land (acre)	Other types of land (type, acre)	Other assets	Paddy (acre)	Field crops (acre)	Trees (no.)	Income type	Other losses

The filled form should be attached with minutes and all WUG members/ affected people should sign in it

**Form 2: Entitlement**

Region: \_\_\_\_\_ District: \_\_\_\_\_ Township: \_\_\_\_\_ Village Tract: \_\_\_\_\_ Village: \_\_\_\_\_

Type of Activity:  Primary/Secondary;  Land Improvement

Serial No.	Name of head of HH	No. of persons in HH	Quantity (acre)	Agr. Land			Assets			Crop		Other				
				Unit cost (Kyat)	Donation agreed <sup>11</sup>	Compensation in cash/in kind	Quantity (acre)	Unit cost (Kyat)	Compensation in cash/in Kind	Quantity	Unit cost (Kyat)	Compensation in cash/in kind	Quantity	Unit cost (Kyat)	Compensation in cash/in kind	

<sup>11</sup> Voluntary donations are allowed only for Land Improvement

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### Annex 3 Farmers Action Plan

- Is consensus built as the WUG that the designed improvements in irrigations provide best benefits to the members? Y/N
- Is consensus built as the WUG that the in-assistance from fellow farmers will be sufficient to mitigate income loss of negative affected farmers in one year? Y/N
- Will anyone’s residential plots be affected? Y/N
- Will anyone need to physically relocate? Y/N
- Are all members aware of the grievance mechanisms available under the project? Y/N
- Is it conceivable that anyone loses more than 10% of their income? Y/N

No	Name of husband and wife of HH	Facilities to be build that cause loss (canals, etc)	Approx land loss (acre)	Loss of permanent structures (type, acre)	Loss of temporary structures (type, acre)	loss of other assets (type, acre)	Estimated loss in paddy production (Kyat)	Estimated income loss from paddy (Kyat)	Estimated loss in production of other crops (Kyat)	Estimated income loss from other crops (Kyat)	Trees (type, number)	Estimated loss in other income (type, kyat)	Kin-kind assistance to be provided from fellow farmers	Agreement (signature by husband and wife)

- Briefly describe how negative impacts that may fall on farmers are addressed
- Describe examples of how larger negative impacts are to be addressed
- Describe alternatives to further reducing impacts discussed and why they were rejected

Minutes of the meeting where consensus is built on the Community Action Plan to mitigate temporary impacts should be attached.  
The Community Action Plan should be signed by the third party service provider, the representative of SLRD, village chief

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#### **Annex 4 Guidance to Ensure the Participation of All Eligible Farmers in Project Activities** (the Annex 9 of ESMF also provides the identical guidelines)

- a) Special attention will be paid to ensure that the vulnerable water users have a full access to all project-related information. For this purpose the project will engage a third party service provider to disseminate project information to all stakeholders.
- b) Scheme/ Site Specific Participatory Social Assessment (SA): will be carried out under FS for each irrigation scheme and pilot land improvement site. The SA will (i) identify vulnerable farmers; (ii) conduct free, prior and informed consultations with them including, if relevant, ethnic minority farmers; (iii) identify measures to enhance their participation in the management of farmer owned systems and the implementation of land improvement pilots; and (iv) assess local sociopolitical dynamics and the risk that they may be excluded from local decision processes<sup>12</sup>.
- c) Vulnerable water users should be allowed to meaningfully participate in the processes in which Water User Groups (WUGs) are formed and develop mechanisms for an equitable allocation of project benefits, minimize negative impacts on fellow water users and identify measures to mitigate residual impacts. The third party service provider will be hired and provide necessary support and guidance to beneficiary farmers so that they will form, gradually and over time, WUGs in an inclusive and equitable manner.
- d) Vulnerable water users should be allowed to receive training and other capacity development supports as do fellow water users.
- e) Grievances from people affected by the project and vulnerable water users will be addressed primarily through the WUG under the participatory mechanisms as per procedures described in this ESMF.

Vulnerable water users will participate in the monitoring of project implementation and be given opportunities to provide feedbacks. In particular, they will be allowed to participate in participatory Monitoring and Evaluation (M&E) to assess outstanding issues and identify measures to address them. Participatory M&E will seek to verify that farmer owned systems are rehabilitated and land improvement pilots are implemented in an incisive and equitable manner, and that negative impacts are addressed based on the consensus built among beneficiaries without causing significant impact on any member. The third party service provider hired under the project will regularly participate in the meeting of WUGs and monitor project implementation.
- f) Members of the project oversight and implementation entities at all levels will be made fully aware of the challenges and constraints of the vulnerable water users, and of the needs for specific actions for their inclusion and informed participation. The project implementation agencies and oversight bodies at all levels will be made aware of the project principles and procedures with regard to farmer participation in project activities. Field extension workers will also be trained and sensitized so they will respond to the needs of smallholders and vulnerable farmers including female and ethnic farmers
- g) All farmers should be allowed to select crops they grow.
- h) Detailed grievance procedure will be developed based on the procedures described in this ESMF so all complains made by anyone locally or regionally to the displacement that may occur under

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<sup>12</sup> Where ethnic minorities are present in project areas of influence, SA will address requirements provided in the Indigenous Peoples Planning Framework attached to this ESMF.



the project will be properly processed. Such a procedure can set a good precedent and contribute towards resolving this difficult issue that require a nation-wide dialogue and consensus building.

- i) The project will be implemented in sites that are free of land disputes brought to the consideration of the Land Loss Enquiry Commission of the Parliament.
- j) Farmers should be allowed to participate in the decision on the investments/activities.

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## Identification of Farmers likely to be affected by Construction

Checklist of farmers affected by civil work					
Name of village:			Prepared Date:		
Name of village tract:			Prepared by:		
Township:			Position held:		
Sr	Name of Household Head	Attend meeting	Share the border with canal?	Is likely to be affected by civil work	Is mitigation measure agreeable?
No	(list for all household registered in the village)	Yes (or) No	Yes (or) No	Yes (or) No	Signature (if yes)

## Complaint Form

Villager Complaint Form	
Action taken	
<input type="checkbox"/> Inform to concerned authority	<input type="checkbox"/> Check & verify by responsible person (Name)
.....	
<input type="checkbox"/> Pending (no response further	<input type="checkbox"/> Satisfactorily solved
Name of person complain	Village
Name of Household Head	Village Tract
National Identity	Township
Date of complain	Name of village administration
<u>Major complain</u> (losses, damage, dissatisfaction)	
<u>Analysis of the complaint</u> (To be written by verifier/responsible person)	
Signature of person complain	Signature of Village Administration

## Annex 4: Indigenous People Planning Framework

### *Introduction*

1. The Government of the Republic of the Union of Myanmar requested the World Bank to support irrigation development. In response to this, the World Bank and FAO have conducted scoping missions and several discussions with the Ministry. It has been proposed that a project called Agricultural Development Support Project will be implemented the Ministry of Agriculture and Irrigation with the technical and financial support of the FAO, World Bank and other international and local development partners.
2. The project aims to increase crop yields and irrigation coverage in the selected existing irrigation systems in Bago East, Nay Pyi Taw, Mandalay and Sagaing regions, focusing on the rehabilitation of middle-scale surface irrigation schemes in the four regions. Up to eight such schemes will be supported by the project during its six year implementation period. The irrigation schemes that will be rehabilitated under the project will be identified based on the feasibility studies (FS) that will be carried out after the project effectiveness. The project will also support the improvement in irrigation and drainage management and complementary farm advisory and technical services.
3. The proposed project has four components: (i) Irrigation and Drainage Management; (ii) Farm Advisory and Technical Services; (iii) Project Coordination and Management; and (iv) Emergency Contingency Response.

### *Component 1: Irrigation and Drainage Management*

4. The component aims to enhance more flexible and reliable provision of irrigation and drainage services in the project areas to enable an increase in irrigation area coverage and resulting farm productivity. It would address irrigation and drainage management through: (1) focusing on institutional change required for the provision of farmer-responsive irrigation services; and (2) financing the improvement and rehabilitation of irrigation and drainage infrastructure covering about 40,000ha within eight selected schemes in the selected regions.
5. The project's support to institutional improvements includes: development of irrigation and drainage management institutions, their human resources, data collection and management information systems and infrastructure; strengthening of the existing Agriculture Coordination Committees (ACCs) as decision making platform for irrigation management for farmers and service delivery agencies; and establishment and strengthening of Water User Groups (WUGs). Competent agencies with adequate technical skills would be hired to help farmers establish and strengthen WUGs. National or international NGOs with a proven experience in participatory approach and community engagement will be hired to monitor project implementation and carry out participatory Monitoring and Evaluation (M&E).

6. The project will also support development of on-farm water management infrastructure and pilot land improvements in 2-3 selected systems. These land improvement pilots will involve alignments of existing, irregularly shaped plots into equal-sized, regularly-shaped ones (the size depends on the local situation and would vary from 0.5-2 acres), combined with the land levelling and realignment, and construction of on-farm irrigation and drainage canals and access roads. A competent third-party organization (e.g. an NGO) will be engaged to facilitate land improvement planning processes which will involve active participation of the beneficiaries, as well as take the lead in participatory Monitoring and Evaluation (M&E). The organization will work closely with the ID, SLRD and the PIC of the township for all activities related to the land improvement pilots.

*Component 2: Farm Advisory and Technical Services*

7. This component facilitates agricultural technology development and adoption activities in the targeted irrigation schemes, which would increase farm productivity and reduce production costs. It will support quality seed production (mainly non-hybrid rice, beans and pulses, and oil crops that are not produced by private sector) by developing farmer-based seed multiplication infrastructure and facilities and strengthen seed supply chains, promote improved fertilizer applications which will be adopted to the variability in soil types in targeted irrigation schemes, help the MOAI and farmers improve the capacity for plant protection through the adoption of Integrated Pest Management (IPM) techniques. All these agricultural technology development activities and knowledge of improved farming practices will be disseminated to target farmers through improved farm advisory services which are based on farmers' needs and technical constraints, farming systems and market opportunities. The project will also support rehabilitation or construction of village extension education centers, establish field demonstration sites of improved technologies, expand training programs and provide operational and mobility support to MOAI extension staff and subject matter specialists.
8. In response to prevailing good preconditions for profitable farm mechanization in targeted irrigation schemes, the project provide supports to promote farm mechanization through training of MOAI mechanics, testing and demonstration of new climate-smart technologies suitable for smallholder farming systems, and providing mechanization services in the target irrigation systems. The project will also upgrade the capacity of the Meikhtila Mechanization Training Center in Mandalay region through introduction of the modern training methodologies, materials, and upgrade repair workshops, in order to provide more and better vocational training to the staff of MOAI Mechanization Service Stations, farmers, and private sector. It will also support four MOAI Mechanization Service Stations in the project areas, through procurement of machine packages and mobile repair workshops selected in collaboration with the private sectors in order to promote climate-smart mechanization technologies to farmers, provide cost-effective services suitable for smallholder farming systems in Dry Zone, and carry out farmer training.

### *Component 3: Project Coordination and Management*

9. The Project Management Unit (PMU) will be established. It will include technical and fiduciary MOAI staff who will be seconded to PMU at a full-time basis from the relevant implementing departments. The implementation of individual project components and sub-components is being carried out through departmental Project Implementation Units. The PMU will be responsible for the overall coordination of the project implementation and fiduciary arrangements, including procurement, financial management, management of safeguards issues, internal and external auditing and the establishment of the project Monitoring and Evaluation (M&E) system. Outside consultants will be recruited in areas which require strengthening of MOAI implementation capacity. The component would finance establishment of the M&E and Management Information Systems and associated Technical Advisory (TA) services including Third Party Service Provider; communication and consultation program; salaries of the externally recruited staff, related office equipment and mobility.

### *Component 4: Emergency Contingency Response*

10. The objective of this zero amount-budgeted component is to allow a rapid reallocation of loan proceeds from other components to provide preparedness and rapid response support to disaster, emergency and/or catastrophic events as needed.

### ***Objectives and Principles of the IPPF***

11. This IPPF aims to ensure that project financed activities provide culturally appropriate benefits to ethnic minorities and do not have adverse impacts on ethnic minorities or that such impacts, if unavoidable, are minimized and mitigated. It also aims to ensure that project activities affecting ethnic minorities, whether positively or adversely, are prepared and implemented in a participatory manner based on a social assessment and free, prior and informed consultations, and in line with the Bank Operational Policy 4.10, *Indigenous Peoples*.

### ***Ethnic minorities in the Project Areas***

12. A Social Assessment was conducted during the project preparation in order to: (1) collect and analyze socioeconomic data and information about the project's potential beneficiaries and the people who may be negatively affected by the project including but not limited to ethnic minorities; (2) inform the project design to maximize benefits to a broad spectrum of beneficiaries including ethnic minorities and minimize and mitigate negative impacts that may occur; and (3) provide inputs to the development of the project safeguard instruments, namely, Land Acquisition and Resettlement Policy Framework (LRPF) and the Environmental and Social Management Framework (ESMF) including this IPPF.
13. The social assessment focused on the area with existing irrigation schemes of the four project regions which constitute the potential project areas given the nature of the project which

rehabilitate existing irrigation schemes without expansion or major realignment.

Demographic, socioeconomic and other relevant data were collected for the potential project areas. Detailed field assessment was conducted in the catchment area of four pre-identified irrigation schemes in each of the four project regions, which included free, prior and informed consultations with representatives of ethnic minorities. These four irrigation schemes were selected because they demonstrate some characteristics typical of the irrigation schemes in respective target regions. The project may rehabilitate any of these four schemes if its feasibility is ascertained under the Feasibility Study (FS) to be conducted during the implementation based on a more detailed assessment of associated economic, technical, environment and social issues. A full Social Assessment (SA) will be conducted as part of the FS during implementation in line with the World Bank Operational Policy 4.10, if an ethnic screening to be conducted in the early part of the FS finds that ethnic minorities are present in or have collective attachment to the area of influence of project irrigation schemes.

14. The Social Assessment conducted during the preparation did not find ethnic minority communities in project areas except for Karan and Shan peoples in Yaetar Shay Township of East Bago region. This is because not many ethnic minorities live in low land with existing irrigation schemes which constitute potential project areas. Since the project will only rehabilitate existing irrigation schemes, it is unlikely that very many ethnic minorities are directly affected by the project or present in the project's area of influence. The exact irrigation schemes that will be rehabilitated under the project, however, will be determined during the implementation as part of FS, and ethnic minority communities may be present in the area of influence of the project irrigation schemes. This Indigenous Peoples Planning Framework (IPPF) was therefore developed in order to ensure that the project will be implemented in full compliance with the Bank's Operational Policy (OP) 4.10.
15. Many irrigation schemes in the project target townships were built some 10 – 20 years ago. The social assessment (SA) carried out during preparation found that some ethnic minorities may be displaced when dams were originally built without adequate compensation. The SA did not carry out a thorough due diligence since it assessed only those four irrigation schemes that were pre-identified for potential funding under the project. Legacy issues will be approached differently under the Project depending on the footprint of the project. The land legacy issues related to dams and reservoirs will be dealt with through a combination of measures beyond the scope of the project, such as the support the Bank may provide to the ongoing National Land Commission, the Country Partnership Strategy (CPS) and larger country wide land related studies and recommendations. Potential project specific land legacy issues which relate directly to footprint of the selected irrigation schemes will be covered under the LRPf attached to this ESMF in accordance with OP 4.12 on Involuntary Resettlement and OP 4.10 Indigenous Peoples.
16. Specifically, a thorough due diligence will be carried out during implementation as part of the Social Assessment (SA) to be carried out under FS to assess who were affected when

project irrigation schemes were originally built, whether the affected people include ethnic minorities who meet the eligibility criteria under OP 4.10, what compensation and assistance they received to restore livelihood, and what are their current level of livelihood. The third party service provider who will be hired under the Project will lead the assessment, under the guidance of the project Safeguard Coordinator and the Bank task team. The findings of the due diligence will be used as an input for the Bank's planned policy dialogue with the Government of Myanmar on land issues and for the national level dialogue towards addressing the historical displacement that occurred under the previous regimes. Regarding the potential project specific land legacy issues which relate directly to the footprint of the selected irrigation schemes, the Indigenous Peoples Plan (IPP) will include measures to restore the livelihood of affected ethnic minorities (if any) and close other gaps with the objective of the OP 4.12 and OP 4.10.

### ***Project Impacts on Ethnic minorities***

1. The overall impacts of the project on ethnic minority communities are positive: those ethnic farmers with access to project irrigation schemes will benefit from improved agricultural livelihoods and an increase in income opportunities through higher cropping intensities and better crop choices, and enhanced productivity due to increased use of high quality inputs and farming skills. They will also benefit from strengthened social inclusion especially where they share the same farmer owned canals with ethnic Bamar farmers as the project will form and develop the capacity of Water User Groups (WUG) in equitable and transparent management. If the land improvement pilots include plots used by ethnic farmers, they will also benefit from improved productivity and income as a result of land improvement.
2. The expected negative impact will include the minor loss of farm land and private assets such as trees and fences associated with the rehabilitation of irrigation canals and land improvement pilots. Since the project will rehabilitate existing irrigation schemes without major realignment, it is highly unlikely that a large scale displacement of ethnic minority communities would occur as a result of the project. Physical relocation of households is unlikely to occur. Similarly, land improvement pilots will involve the realignments and leveling of existing, irregularly shaped plots into equal-sized, regularly-shaped ones (the size depends on the local situation and would vary from 0.5-2 acres), and the construction of on-farm irrigation and drainage canals, and of access roads, which will unlikely cause physical relocation or major loss of land. Most civil works will be undertaken in the crop idle seasons so as to avoid temporary occupation of private land wherever possible. Negative project impact would be generally limited to those who participate in, and directly benefit from, the rehabilitation of irrigation and drainage infrastructure as well as land improvement pilots. The exception is that the rehabilitation of primary and secondary canals may impact owners of private assets who may not be farmers and thus will not benefit from the project, although it is unlikely that such cases would occur under the project in a large number.

3. The same participatory measures that the project will carry out to ensure a meaningful consultation with and an active participation of local population in project activities, as described in the Annex 9 of this ESMF, will apply to ethnic minorities present in the project areas of influence. This is because the types and scale of impacts, both positive and negative, and the risks associated with the project, are generally limited and similar for ethnic minorities and for ethnic Barman. However, a significant risk remains that ethnic farmers may not fully benefit from the project due to local social and inter-ethnic dynamics that may inhibit their full participation in WUGs or because they are induced to sell lands following the rehabilitation of irrigation or land improvements that will increase land prices. Also, some non farming ethnic minorities may be present along or near the primary and/ or secondary canals that will be rehabilitated by the project, but they may not be adequately consulted with due to local inter-ethnic dynamics, and negative impact that may fall on them may remain unaddressed. Social tensions and sense of unfairness may evolve within local communities if ethnic groups perceive that the project interventions widen income gaps. Measures are thus developed to provide additional protections to ethnic minorities and described in the following sections of this IPPF.

#### ***Legal, Policy and Institutional Framework***

4. According to official estimates, the population of Myanmar reached almost 60 million in 2010. The Bamar is the largest ethnic group, comprising around two-thirds of the population, and various ethnic minorities accounting for about one third. The majority Bamar population mainly lives in the central and delta regions (divided into seven Regions) while the ethnic minorities live mainly, however not exclusively, in the seven States (Kayah, Kayin, Kachin, Chin, Mon, Rakhine, and Shan) along the borders. The official population estimates of the main ethnic minority groups are roughly: Shan (9%), Kayin/Karen (7%), Rakhine (4.5%), Chin (2%), Mon (2%), Kachin (1.4%), Kayah (1%). The eight “ethnic races,” including the majority Bamar, are subdivided into 135 officially recognized ethnic groups and belong to five linguistic families (Tibeto-Burman, Mon-Khmer, Tai-Kadai, Hmong-Mien, and Malayo-Polynesian); there are no population figures for ethnic minority sub-groups.
5. According to Chapter 1, clause 22 of the 2008 Constitution of Myanmar, the Union Government of Myanmar is committed to assisting in developing and improving the education, health, language, literature, arts, and culture of Myanmar’s “national races.” It is stated, that the “Union shall assist:
  - To develop language, literature, fine arts and culture of the National races;
  - To promote solidarity, mutual amity and respect and mutual assistance among the National races; and
  - To promote socio-economic development including education, health, economy, transport and communication, [and] so forth, of less-developed National races.”



6. The constitution provides equal rights to the various ethnic groups included in the national races and a number of laws and regulations aim to preserve their cultures and traditions. This includes the establishment of the University for the Development of the National Races of the Union which was promulgated in 1991 to, among other things, preserve and understand the culture, customs and traditions of the national races of the Union, and strengthen the Union spirit in the national races of the Union while residing in a friendly atmosphere and pursuing education at the University.
7. There is no central government agency with the responsibility for addressing particular issues pertaining to ethnic minorities. The vast majority of Myanmar's ethnic minorities live in the seven States and these are in most cases led by the main ethnic minority in the respective States. In relation to previous ceasefire agreements, ethnic minority groups were granted authority over political and economic affairs in their areas, covering large areas of the States. Social and other public services were developed by ethnic authorities, often with support from NGOs, and are still operating in many areas.
8. Under the current government, free media is developing and ethnic parties and associations are politically active. Ethnic minority organizations may also play a stronger role going forward through the current Government's decentralization efforts which would afford States and Regions to play a more prominent role in decision-making and implementation of various policies and programs.

#### ***Project implementation procedure***

9. OP 4.10 requires that special planning measures be established to address particular issues concerning ethnic minorities. More specifically, the policy requires the undertaking of a social assessment and free, prior and informed consultation process leading to the broad community support by ethnic minorities for the project, and the development of an instrument for indigenous peoples in the form of an Indigenous Peoples Plan (IPP). Generally an IPP is prepared with appropriate measures identified during the social assessment and consultation process.
10. The following describes the processes and procedures that will be followed under the project in order to fully address the Bank's OP 4.10, *Indigenous Peoples*.

#### **Project Information Dissemination and Vulnerability Awareness Building**

11. Prior to the FS, the project will disseminate project information to all stakeholders through various means, such as mass media, project brochures/posters and a dedicated project site on the internet. Measures provided under this IPPF will be widely disseminated through such campaigns. The project, with the help of the Safeguard Coordinator and the Third Party Service Provider, will also develop the capacity of the project implementation agencies and oversight bodies at all levels at the onset of the project on safeguard issues relevant to the project including processes and required actions as well as responsibilities of the concerned parties.

## Ethnic screening

12. At the early stage of the FS, an ethnic screening will be conducted in order to determine if ethnic minorities are present or have collective attachment in the area of influence of the project irrigation schemes or pilot land improvement sites. The third party service provider will assist the FS team, under the supervision of the Safeguard Coordinator at the PMU, and ensure that ethnic screening would be conducted according to this IPPF and the Bank OP 4.10.
13. At the time of FS, only main canals and some parts of secondary canals may have been identified for rehabilitation under the project, and lower category canals may not have been identified. Ethnic screening should nonetheless cover the entire catchment area of the respective irrigation scheme, because the rehabilitation of the main canals will affect the entire canal systems within the scheme. FS will be separately conducted for Land Improvement pilots which may not have been identified when FSs for irrigation schemes are conducted.
14. Where ethnic minorities are found to be present or have collective attachment in the area of influence of the project irrigation schemes and/ or land improvement pilots, the steps that are described below will be taken. It is to note that the OP 4.10 will be triggered and the following steps will be taken if ethnic minorities are present in or have collective attachment in the areas of influence even if no negative impact is likely to occur.
15. Because ethnic minorities live within varying and changing historical, cultural, political and economic contexts, no precise and coherent term has been found to define them. Indigenous peoples, or ethnic minorities, may be referred to in different countries by such terms as "indigenous ethnic minorities," "hill tribes," "minority nationalities," and "tribal groups." Under OP 4.10, the determination as to whether a group is to be defined as indigenous peoples is made by reference to the presence (in varying degrees) of four identifying characteristics:
  - Self-identification as members of a distinct indigenous cultural group and recognition of this identity by others;
  - Collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories;
  - Customary cultural, economic, social, or political institutions that are separate from those of the dominant society and culture; and
  - An indigenous language, often different from the official language of the country or region.

## Participatory Social Assessment (SA) and Free, Prior and Informed Consultations

16. If ethnic screening finds an ethnic minority community to be present in or have collective attachment to the catchment area of the project irrigation schemes or the area of influence of land improvement pilots, a participatory Social Assessment (SA) that will be conducted as

part of FS will address all elements of Social Assessment (SA) defined under OP 4.10<sup>13</sup>, including, at minimum, the following:

- Identify key stakeholders of affected ethnic minorities and establish an appropriate framework for their participation in the selection, design, implementation, and monitoring and evaluation of the relevant project activities, in particular with regard to the establishment of Water User Groups (WUGs);
- Assess the demographic, socioeconomic, cultural and other relevant characteristics of affected ethnic minorities in the catchment area of the respective irrigation schemes/ land improvement sites, establish social baseline and identify potential barriers to their full participation in WUGs and benefiting from project activities;
- Review relevant legal and institutional framework applicable to ethnic minorities;
- Assess, based on free, prior, and informed consultation with the affected ethnic minorities, the potential impact of project activities and, where adverse impacts are identified, determine how they can be avoided, minimized, or substantially mitigated;
- Propose specific measures to ensure that affected ethnic minority people will, meaningfully and in a culturally appropriate manner, participate in WUGs, benefit from the project, and mitigate and mitigate negative impacts; and
- Develop institutional arrangements and implementation procedures to assist ethnic farmers to voice grievances and have them addressed in ways that are socially sound, in line with the procedures described in this ESMF.
- Assess the nature, scale and scope of displacement that occurred when the project irrigation schemes were originally constructed, as part of the due diligence of the original construction of project irrigation schemes. Assess also the current state of the livelihood of the formerly displaced ethnic minority population.

17. The third party service provider, under the guidance of Safeguard Coordinator at PMU, will provide necessary support to the FS team so that all requirements under OP 4.10 would be addressed in the respective SA. Free, prior and informed consultations with affected ethnic minorities will also be conducted as part of the SA. Notice of consultation meetings will be disseminated at least two weeks prior to the meetings and in a language or modes that are understandable to affected people. Care will be exercised so that not only beneficiary farmers but a broad range of local people will also be invited. The SA will cover the entire catchment area of the respective irrigation schemes given the potential impact of rehabilitating main canals on lower hierarchy canals, even if ethnic minorities are not

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<sup>13</sup> Scheme specific SA will be conducted without regard to the presence of ethnic minorities in respective irrigation scheme/ land improvement sites, in order to assess overall project impact on local population including but not limited to beneficiary farmers, socioeconomic characteristics of vulnerable farmers and develop measures to ensure their full participation in WUGs and in the planning and implementation of farmer owned systems and land improvement plots. See Annex 9 of this ESMF.

expected to be present near project main canals. Also, the SA will be conducted even if no negative impact is anticipated under the respective irrigation scheme/ land improvement pilot. The SA Report may bundle more than one irrigation scheme or land improvement site, depending on the proximities of schemes/ sites, similarities in socioeconomic impact, timing of investment preparation and financing, and other relevant conditions.

18. If broad community support cannot be ascertained from affected ethnic minority communities, the project activities will not be financed for the scheme/ site, as relevant.

#### Indigenous Peoples Plans (IPP)

19. On the basis of the SA and free, prior and informed consultation conducted as part of the process, an Indigenous Peoples Plan (IPP) will be prepared for each scheme/ site. The third party service provider, under the guidance of the PMU Safeguard Coordinator, will provide necessary support so that all requirements under OP 4.10 would be addressed in IPP(s). One IPP(s) may bundle more than one irrigation scheme or land improvement site, depending on the proximities of schemes/ sites, similarities in socioeconomic impact, timing of investment preparation and financing, and other relevant conditions. An IPP should include the following elements, as needed:

- The description of the project objective and activities, in particular on project activities that will be conducted for the scheme/ site;
- A summary of the SA including the results of the free, prior, and informed consultation with affected ethnic minority communities and verification of their broad community support for the project;
- Description of potential negative impacts and measures to address them;
- A framework to ensure that affected ethnic minority communities can meaningfully participate in WUGs, and in the process to minimize and mitigate negative impacts. Where ethnic farmers share the same farmer owned systems and participate in the same land improvement pilots, an integrated framework will be developed that will ensure both ethnic Barma and ethnic minority farmers would collaborate in minimizing and mitigating negative impacts for common benefits<sup>14</sup>.
- Mechanisms through which affected ethnic minority communities are able to voice concerns and grievances and have them addressed;
- Mechanisms and benchmarks for monitoring, evaluating, and reporting on the implementation of IPP; and
- The financing plan for IPP implementation.

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<sup>14</sup> A similar framework will be developed to help beneficiary farmers form WUGs, and minimize and mitigate, based on participatory processes, negative impacts that may fall on fellow members through in-kind assistance, and will be applied to all farmer owned irrigation systems and land improvement pilots supported under the project. More details are provided in the Section XX of this ESMF.

## Approval and Disclosure

20. Once the draft IPP(s) and the associated SA Report(s) are drafted, they will be submitted to DI for review and approval. DI will translate them into relevant ethnic languages, make them available in its website as well as in locations accessible to affected ethnic minorities, and consult them with affected ethnic minorities for comments. DI will also disclose them in DI's webpage, finalize them taking into account the comment received, and submit them to the Bank for review and clearance. The Bank will disclose the IPP(s) through the Infoshop as well as at the country office website.

## Implementation Arrangements

21. The overall responsibility of the implementation of this IPPF rests with the PMU under the assistance of the Safeguard Coordinator in the PMU. A competent person with a long experience in Bank safeguard policies will be hired as the Safeguard Coordinator who will ensure a full compliance of all actions taken at the central as well as township levels, and supervise the third party service provider. Safeguard Coordinator will prepare the safeguard capacity development plan at the beginning of the project in which existing capacity gaps to implement this IPPF are identified and measures to fill the gaps will be presented. The safeguard capacity development plan will be shared with the Bank for review and comments. Safeguard Coordinator will implement the safeguard capacity development plan to train other PMU staff, relevant MOAI department officers who will work on the project, and all ACC and PIC members. Refresher training will be organized at the mid-term.
22. At township level, the Project Implementation Committees (PICs) will assume the overall responsibility for the implementation of this IPPF. PIC will include a Safeguard Focal Point who will be responsible for safeguard related issues at the township level, in close coordination with the third party service provider and under the supervision of the Safeguard Coordinator.
23. The third party service provider will play a key role in identifying and consulting with affected ethnic minorities, and minimize and mitigate social impacts that may fall on them, if any. A team of consultants with sufficient experience and qualification in Bank OP 4.10, community consultation and participation, and dispute handling mechanisms will be hired. The Terms of Reference of the third party service provider will be reviewed by the Bank. The third party service provider will provide on-going capacity development of all project staff at the township level, and monitor safeguard implementation and compliance at the village level, including collecting grievances affected ethnic minorities may have and assisting farmers develop proper minutes of meetings. The third party service provider will also ensure that negative impacts that may fall on local ethnic minorities who may not directly benefit from the project and/ or who are not the members of WUG will be fully addressed.

24. The Water User Group (WUG) will be the main project counterpart on behalf of farmers and play a key role through representing owner farmers in the project implementation, mediating between farmers for internal disputes and conflicts, and mitigating negative impacts through mutual assistance under land improvement pilots. The project will develop their capacity through providing technical assistance and by on-going support of the third party service provider. Particular attention will be paid to ensure that ethnic farmers can meaningfully participate in a WUG, if they are present.

#### Monitoring and evaluation

25. Throughout the implementation of the project, the third party service provider under the guidance of the Safeguard Coordinator will monitor the project compliance with Bank safeguard policies. The third party service provider will visit at least on a monthly basis since the planning till 2 months after the completion of civil works the project sites and meet the affected ethnic minority communities including both the direct project beneficiaries (i.e. the users of project rehabilitated irrigation schemes and participants of land improvement pilots) and those who do not directly receive project benefits (i.e. non farmers, nonmembers of WUGs). Upon the completion of an IPP, the ID, under the assistance of the PMU Safeguard Coordinator, will carry out an IPP completion assessment to confirm that all measures under this IPP have been fully implemented and that the negative impacts on ethnic minority communities have been adequately addressed.

26. Monitoring group will be created in each WUG which will ensure that all actions would be undertaken in line with this IPPF and, in case of irregularities, contact the ACC. The participatory Monitoring and Evaluation (M&E) will be conducted, under the facilitation of the third party service provider, whereby affected people including both beneficiary farmers and non beneficiary ethnic minorities are encouraged and facilitated to report outstanding issues and air grievances. The meeting is attended by township PIC members and village authorities. The WUG prepares minutes of the meeting that record the issues raised and how they will be addressed in the subsequent annual cycle. This record will be submitted to PMU through PIC.

27. All PICs will have an IPPF focal point who will regularly supervise and monitor IPP implementation. PIC focal points will report to PMU Director on IPPF related matters, and request support of the Safeguard Coordinator if needed. S/he will travel to the sites and spot check if the actions are taken and information provided in conformity with the IPPF.

28. The project MIS system will collect key data on IPPF such as the presence and absence of ethnic minorities in the command areas of respective schemes, the number of ethnic population and their name of ethnicity, dates of consultation meetings conducted. The Third Party Service Provider will go to all project schemes at least on a monthly basis during and planning and implementation of civil works, prepare a back to office report upon return from the field, and develop the quarterly progress report. The Back to office reports during the report period will be attached to the quarterly progress report, which will be shared with the

Bank. The project webpage will have a dedicated section where such reports will be disclosed.

#### Grievance Redress Mechanism

29. Complaints and grievances in relation to land and asset acquisition will be dealt with under the project grievances redress mechanism. A summary of project grievance mechanism will be developed in English, Myanma and relevant ethnic languages and made available through various media including written materials and internet. They will also be made available in locations convenient to affected ethnic population and explained about during public consultations in a language understandable to ethnic minorities.
30. Under this project, the WUGs will serve as the first tier mechanism to handle complaints and grievances. The WUGs will be formed at the initial part of project implementation for respective irrigation schemes and land improvement pilots, well before civil works to be supported under the project are designed and implemented. The grievance focal point will be appointed within each WUG who will receive, address, and keep record of the complaints and feedbacks. The grievance focal point will first review the grievances submitted. If the grievances are found to be between farmers over farmland boundary setting, mutual assistance to mitigate impact over farmer managed systems, and other disputes between farmers, the grievance focal point will meet relevant farmers and seek to find resolutions in line with this LRPF, under the support of the third party service provider.
31. If grievances or disputes between farmers cannot be solved at the WUG level within 30 days of the submission of the grievances, the issue will be brought to PIC for mediation. PIC is expected to inform aggrieved persons or parties to disputes of the resolution in 30 days. If still unsatisfied, aggrieved persons or parties to disputes will elevate the matter to the PMU at the national level which will make the final decision in consultation with the Safeguard Coordinator. The Bank task team will be consulted for all grievances that are elevated to the national level. The aggrieved people will be informed of the decision within 30 days of the submission to PMU which will be the final.
32. If the initial review by the grievance focal point of WUG finds that the grievances concern the rehabilitation of primary or secondary canals, civil works carried out by the project hired contractors, village extension education centers or other issues that go beyond the disputes between farmers, the grievance focal point will immediately inform the third party service provider who bring the issue to the PIC for mediation. PIC is expected to inform aggrieved people or parties to disputes of the resolution in 30 days. If still unsatisfied, aggrieved people or parties to disputes will elevate the matter to the PMU at the national level which will make the final decision in consultation with the Safeguard Coordinator. The Bank task team will be consulted for all grievances that are elevated to the national level. The aggrieved people will be informed of the decision within 30 days of the submission to PMU which will be the final.

33. Aggrieved ethnic persons or parties to disputes are also allowed to directly contact the third party service provider and raise concerns or questions. The third party service provider will also install sign posts in local areas with a clear indication in of the contact information, and call for any people with grievances or questions to inform them. Where ethnic minorities are present, the information will be expressed in a relevant ethnic language. A consultation meeting will be held prior to the start of civil works in places and time convenient to local ethnic population. The nature of the civil works to be carried out, expected impact, entitlements and grievance mechanisms will be explained to affected ethnic people. The translation of this IPPF will be made available to participants of consultations and at the local office of PIC. The third party service provider will visit project sites regularly and receive inquiries or grievances directly from local ethnic people. The third party service provider will provide WUGs necessary training and continuing capacity development throughout project implementation. Project's communication and information dissemination activities will include information about grievance redress mechanisms.
34. The participatory Monitoring and Evaluation (M&E) will be conducted, under the facilitation of the third party service provider, whereby affected people will assess the implementation of respective project activities as well as this LRPF, report outstanding issues and air grievances or other issues people may have with the project. The meeting will be attended by township PIC members and village authorities who will assist participants in identifying resolutions for grievances that may be presented. The third party service provider will prepare minutes of the meeting that record the issues raised and how they will be addressed in the subsequent annual cycle. This record will be submitted to PMU through PIC.

### *Budget*

Implementation of IPPF is expected to cost \$2,660,000, which includes the following.

<b>Activity</b>	<b>Estimated cost (USD)</b>
The third party service provider (inc. costs of farmer consultations and facilitations)	1,945,000
The safeguard coordinator in the PMU	275,000
Total operating costs of the PMU, incl. on safeguards	350,000
Facilitation of participatory M&E	90,000
<b>Total</b>	<b>2,660,000</b>



**Appendix Guidance to Ensure the Participation of All Eligible Farmers in Project Activities** (the Annex 9 of ESMF also provides the identical guidelines)

- k) Special attention will be paid to ensure that the vulnerable water users have a full access to all project-related information. For this purpose the project will engage a third party service provider to disseminate project information to all stakeholders.
- l) Scheme/ Site Specific Participatory Social Assessment (SA): will be carried out under FS for each irrigation scheme and pilot land improvement site. The SA will (i) identify vulnerable farmers; (ii) conduct free, prior and informed consultations with them including, if relevant, ethnic minority farmers; (iii) identify measures to enhance their participation in the management of farmer owned systems and the implementation of land improvement pilots; and (iv) assess local sociopolitical dynamics and the risk that they may be excluded from local decision processes<sup>15</sup>.
- m) Vulnerable water users should be allowed to meaningfully participate in the processes in which Water User Groups (WUGs) are formed and develop mechanisms for an equitable allocation of project benefits, minimize negative impacts on fellow water users and identify measures to mitigate residual impacts. The third party service provider will be hired and provide necessary support and guidance to beneficiary farmers so that they will form, gradually and over time, WUGs in an inclusive and equitable manner.
- n) Vulnerable water users should be allowed to receive training and other capacity development supports as do fellow water users.
- o) Grievances from people affected by the project and vulnerable water users will be addressed primarily through the WUG under the participatory mechanisms as per procedures described in this ESMF.
- p) Vulnerable water users will participate in the monitoring of project implementation and be given opportunities to provide feedbacks. In particular, they will be allowed to participate in participatory Monitoring and Evaluation (M&E) to assess outstanding issues and identify measures to address them. Participatory M&E will seek to verify that farmer owned systems are rehabilitated and land improvement pilots are implemented in an incisive and equitable manner, and that negative impacts are addressed based on the consensus built among beneficiaries without causing significant impact on any member. The third party service provider hired under the project will regularly participate in the meeting of WUGs and monitor project implementation.
- q) Members of the project oversight and implementation entities at all levels will be made fully aware of the challenges and constraints of the vulnerable water users, and of the needs for specific actions for their inclusion and informed participation. The project implementation agencies and oversight bodies at all levels will be made aware of the project principles and procedures with regard to farmer participation in project activities.

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<sup>15</sup> Where ethnic minorities are present in project areas of influence, SA will address requirements provided in the Indigenous Peoples Planning Framework attached to this ESMF.

Field extension workers will also be trained and sensitized so they will respond to the needs of smallholders and vulnerable farmers including female and ethnic farmers

- r) All farmers should be allowed to select crops they grow.
- s) Detailed grievance procedure will be developed based on the procedures described in this ESMF so all complains made by anyone locally or regionally to the displacement that may occur under the project will be properly processed. Such a procedure can set a good precedent and contribute towards resolving this difficult issue that require a nation-wide dialogue and consensus building.
- t) The project will be implemented in sites that are free of land disputes brought to the consideration of the Land Loss Enquiry Commission of the Parliament.
- u) Farmers should be allowed to participate in the decision on the investments/activities.

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## Annex 5: Guidance to Ensure the Participation of All Eligible Farmers in Project Activities

- v) Special attention will be paid to ensure that the vulnerable water users have a full access to all project-related information. For this purpose the project will engage a third party service provider to disseminate project information to all stakeholders.
- w) Scheme/ Site Specific Participatory Social Assessment (SA): will be carried out under FS for each irrigation scheme and pilot land improvement site. The SA will (i) identify vulnerable farmers; (ii) conduct free, prior and informed consultations with them including, if relevant, ethnic minority farmers; (iii) identify measures to enhance their participation in the management of farmer owned systems and the implementation of land improvement pilots; and (iv) assess local sociopolitical dynamics and the risk that they may be excluded from local decision processes<sup>16</sup>.
- x) Vulnerable water users should be allowed to meaningfully participate in the processes in which Water User Groups (WUGs) are formed and develop mechanisms for an equitable allocation of project benefits, minimize negative impacts on fellow water users and identify measures to mitigate residual impacts. The third party service provider will be hired and provide necessary support and guidance to beneficiary farmers so that they will form, gradually and over time, WUGs in an inclusive and equitable manner.
- y) Vulnerable water users should be allowed to receive training and other capacity development supports as do fellow water users.
- z) Grievances from people affected by the project and vulnerable water users will be addressed primarily through the WUG under the participatory mechanisms as per procedures described in this ESMF.

Vulnerable water users will participate in the monitoring of project implementation and be given opportunities to provide feedbacks. In particular, they will be allowed to participate in participatory Monitoring and Evaluation (M&E) to assess outstanding issues and identify measures to address them. Participatory M&E will seek to verify that farmer owned systems are rehabilitated and land improvement pilots are implemented in an incisive and equitable manner, and that negative impacts are addressed based on the consensus built among beneficiaries without causing significant impact on any member. The third party service provider hired under the project will regularly participate in the meeting of WUGs and monitor project implementation.

- aa) Members of the project oversight and implementation entities at all levels will be made fully aware of the challenges and constraints of the vulnerable water users, and of the needs for specific actions for their inclusion and informed participation. The project implementation agencies and oversight bodies at all levels will be made aware of the project principles and procedures with regard to farmer participation in project activities. Field extension workers will also be trained and sensitized so they will respond to the needs of smallholders and vulnerable farmers including female and ethnic farmers
- bb) All farmers should be allowed to select crops they grow.

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<sup>16</sup> Where ethnic minorities are present in project areas of influence, SA will address requirements provided in the Indigenous Peoples Planning Framework attached to this ESMF.

- cc) Detailed grievance procedure will be developed based on the procedures described in this ESMF so all complains made by anyone locally or regionally to the displacement that may occur under the project will be properly processed. Such a procedure can set a good precedent and contribute towards resolving this difficult issue that require a nation-wide dialogue and consensus building.
- dd) The project will be implemented in sites that are free of land disputes brought to the consideration of the Land Loss Enquiry Commission of the Parliament.
- ee) Farmers should be allowed to participate in the decision on the investments/activities.

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## Annex 6: Pest Management Plan Framework Process

### Background

Agriculture intensification as a result of improved irrigation and drainage system may lead to excessive use of pesticides in the cultivated land of irrigation command areas of the proposed project areas. The situation could be worsening if farmer use the unregistered and unregulated pesticides that were poor quality and illegally imported from neighboring countries across international border. Farmer knowledge on the use of appropriate pesticide with careful handling are weak in Myanmar and they are misled by marketing agent of pesticide dealers to use stronger pesticides that are harmful to environment instead of following the principle and practice of integrated pest management.

The following are foreseeable consequences if improvement in pest management is not achieved: destruction of crop pollinators leading to poor crop yields; elimination of the natural enemies of crop pests and consequent loss of natural pest control that keeps the populations of crop pests very low; development of pest resistance to pesticides, encouraging further increases in the use of chemical pesticides; contamination of the soil and water bodies; toxicity to fish and birds; proliferation of aquatic weeds; pesticide poisoning of farmers and deleterious effects on human health; unacceptable levels of pesticide residues in harvested produce and in the food chain; and loss of biodiversity in the environment, particularly of the aquatic non-target species.

Integrated Pest Management (IPM) should be introduced in connection with effective farmer-to-farmer extension system in the project villages. IPM involves the integration of cultural, physical, biological and chemical practices to grow crops with minimal use of pesticides. Monitoring, sampling, and record keepings are used to determine when control options are needed to keep pests below an economically damaging threshold. The goal of IPM is thus managing pest but not unrealistically eradicating them. Implementation of IMP for the ADSP must be in conformity with existing legal framework of Myanmar and with best international practices.

### 8.2 The context of pest management in Myanmar

Myanmar has enacted the Pesticide Law since 1990 and the procedures relating to the Pesticide Law was also enacted in 1991. In accordance with the prescribed conditions in the procedures, the Pesticide Registration Board was formed in 1992. The law also contains general provision for legal requirement of two major components as far as pesticide management is concerned. The first one is registration scheme and the second is licensing program. Every pesticide intended to be used in Myanmar must undergo the registration process together with complete registration dossier and sample of the product apply for registration. For law enforcement, the Plant Protection Division of the Department of Agriculture has established Provincial and District level Plant Protection Teams with professional staff trained abroad and locally. The staffs are assigned as inspectors responsible for inspection of pesticide outlets in their respective regions. For every pesticide applied there is need to obtain registration from Pesticide Registration Board; the applicant shall require expressing the proposed used pattern stating effectiveness to the target pest species, toxicological studies consist of no adverse effects to non-target species and the environment. Myanmar still does not have pesticide-manufacturing plants for the time being. Department of Agriculture has a small-scale formulation plant as pilot plant granted by United Nations Industrial Development Organization (UNIDO). Private

entrepreneurs should formulate their pesticides only in that formulation plant. Myanmar does not have obsolete pesticides.

To void the development of resistance problems, attempt has been made for dissemination of appropriate technologies to the farmers through Plant Protection Clinics and also Farmers Field Schools in every States and Divisions by Department of Agriculture. Those pesticides granted registration in Myanmar must have conformity with prescribed conditions and guidelines dedicated by the Pesticides Manufacturing and Formulation Organization (Croplife formerly GIFAP). It comprises guideline for sound management of safe manufacturing, labeling, handling, storage and disposal. At the same time, Myanmar is cooperating in the use of International Code of Conduct for the Distribution and Use of Pesticides. Every pesticide must have proper label in Myanmar language so that farmers can easily thoroughly read and understand the label before use.

The pesticides categorized as Class I.a and I.b in WHO classification are considered as Extremely Hazardous Pesticides and are handled by Certified Pesticide Applicators. Those applicators are certified after completion of five days training course conducted by Plant Protection Division of Department of Agriculture. Out of more than 1,700 formulations registered in Myanmar, only few are under Class I.a and I.b. Most are Class II and III. Myanmar is also engaged in ASEAN Pesticide Regulatory Harmonization program.

### **8.3 Integrated Pest Management (IPM)**

IPM is a sustainable approach to managing damaging agents (pests and pathogens) by combining biological, cultural, physical and chemical tools in a way that minimizes economic, health, and environmental risks. In developing IPM, it is important to take into account: (i) Criteria for selection of suitable pesticides, and (ii) Procedure for management of the use of pesticides.

#### **(i) Criteria for selection of suitable pesticides**

In project areas major crop is paddy. To some degree depending on weather, availability of water and market condition, farmers also grow sesame and mung bean. According to farmers, it is witnessed that use of pesticide has been significantly increased after five years since the dam was constructed and they had practiced multiple cropping under existing irrigation scheme. Therefore, the use of pesticide would be inevitable in the future as well while integrated pest management is to be implemented. In general, those pesticides intended to use in the future need be effective against target species while having minimal effect on non-target species and bearing negligible adverse impacts to environment, human health and consumption. In selecting suitable pesticide, the need to prevent the development of resistance to pest should be taken into account. Table 9 lists common pest and diseases for major crops in project area and main criteria for their selection.

**Table 9. Criteria for selecting suitable pesticide**

Common crop by variety in the project area	Common pest and diseases	Criteria for selecting pesticides
Summer Paddy	<ul style="list-style-type: none"> <li>• Stem borer</li> <li>• Jassids</li> </ul>	<ol style="list-style-type: none"> <li>1. Pesticide shall be used in minimum quantity only after that efficacy of other controlling methods is limited.</li> <li>2. Pesticide shall be used only if are officially imported, licensed for sale and properly sealed and labeled in Myanmar language.</li> <li>3. Pesticide shall not be used if are included in <u>the banned list</u> of Plant Protection Division, DOA (Most of the WHO Class I(a) and I(b) are included in this list) – see Table 10 and Table 11 for list of restricted and banned pesticides in Myanmar</li> <li>4. Prior to use, the observation shall be taken by trained farmer or qualified technician/staff to verify pest or disease for selecting the appropriate pesticide.               <ol style="list-style-type: none"> <li>a. In the case of pest, economic threshold level (ETL) of pest occurrence shall be determined for the use of insecticide</li> <li>b. For diseases, the assistance from township DOA may require to determine the severity of disease (e.g: leaf area index) for the use of pesticide</li> </ol> </li> </ol>
<ul style="list-style-type: none"> <li>• Pale Thwe</li> <li>• Yadanar Toe</li> <li>• Yadanar Aung</li> <li>• Thee Dut Yin</li> </ul>		
Monsoon Paddy	<ul style="list-style-type: none"> <li>• Bacterial leaf blight</li> <li>• Stem borer</li> </ul>	
<ul style="list-style-type: none"> <li>• Ayar Min</li> <li>• Manaw Thukha</li> <li>• Shwe Ta Sok</li> <li>• Sin Thuka</li> <li>• Pale Thwe</li> </ul>		
Sesame	<ul style="list-style-type: none"> <li>• Leaf roller</li> <li>• Black (bacterial) stem</li> </ul>	
Mung bean	<ul style="list-style-type: none"> <li>• Pod borer</li> <li>• Leaf roller</li> </ul>	
<ul style="list-style-type: none"> <li>• Yezin 14</li> </ul>		

**Table 10. List of restricted Pesticides in Myanmar**

Pesticide Name	Group
Methyl Bromide	Fumigant
Phosphine	Fumigant
Bromadiolone	Coumarin
Zinc Phosphide	Inorganic
Brodifacoum	Coumarin
Fenthion	Organophosphorous
DDT	Organochlorine

**Table 11. List of banned Pesticides in Myanmar**

<b>Pesticide Name</b>	<b>Group</b>
Adrin	Organochlorine
EPN	Organophosphorus
BHC	Organochlorine
Inorganic Mercury compounds	Inorganic
Captafol	Phthalimide
Chlordane	Organochlorine
Organic mercury compound	Organic
Parathion ethyl	Organophosphorus
Chlordimeform	Formamidine
Strobane	
Cyhexatin	Organotin
2,4,5-T	Phenoxy
Dieldrin	Organochlorine
Toxaphene	Organochlorine
EDB	Dinosed
Endrin	Organochlorine
Dinosed	

**(ii) Procedure for management of the use of pesticide**

The notification of the procedures pertaining to Pesticide Law (1991) form a basic for the procedural framework of the project to follow as far as the manufacturing, labeling, handling, storage and disposal of pesticides are concerned. The following are excerpts from the notification relevant to these matters:

*Conditions for Compliance by the Pesticide Importer*

- (a) The imported pesticide or active ingredient, on arrival, shall be subjected to inspection by the DOA without failure in order to inspect the quality; the Inspector shall be permitted to draw the specified quantity or weight of sample according to the specified sampling method free of charge; the Inspector shall issue a Sampling Certificate in taking such samples;
- (b) The handling, transportation and storage of pesticides shall be made according to the safety guidelines issued by the Registration Board;
- (c) Pesticides shall be distributed and sold only to licensed sellers; sale vouchers shall be kept and sales register for different pesticides shall also be maintained;
- (d) The “**Danger**” sign shall be affixed conspicuously at the pesticide store;
- (e) The pesticide store shall be securely locked when loading and unloading is not in progress;
- (f) Pesticides shall be loaded and unloaded under the supervision of a person experienced in safe handling;
- (g) The nearest Fire Brigade Station shall be notified of the location of the pesticide store and its approximate quantity of storage;



- (h) No pesticides shall be stored in the living quarters;
- (i) Pesticides, active ingredients or packing materials to be disposed of due to any reasons, shall be done so according to the instructions of the DOA
- (j) If the stock of pesticides or active ingredients in the possession to have deteriorated in quality, its continued use and sale shall be made according to the instructions of the DOA;
- (k) The pesticides shall be sold safely packed and the damaged packing shall be repacked before sale;
- (l) No pesticide shall be falsely advertised for sale with respect to its efficacy; the advertisement for sale shall be made in manner approved by the Registration Board;
- (m) Inspection by the inspector shall be allowed and assistance necessary for inspection shall be rendered.

Conditions for Compliance by the License Holder

- (a) The license shall be affixed in a conspicuous place;
- (b) Only the pesticide or active ingredient permitted on the license shall be formulated, produced, repacked or sold;
- (c) The formulation or repacking of pesticides locally shall be undertaken in accordance with the provisions of the existing laws with respect to health and social aspects of workers;
- (d) The quality and the potency of formulated or repacked pesticides shall be guaranteed;
- (e) The handling, transportation and storage of pesticides shall be made according to the safety guidelines issued by the Registration Board;
- (f) Formulators, re-packers and wholesale dealers of pesticide shall also comply with the following conditions;
- (g) The “**Danger**” sign shall be affixed conspicuously at the pesticide store;
- (h) The pesticide store shall be securely locked when loading and unloading is not in progress;
- (i) Pesticides shall be loaded and unloaded under the supervision of a person who is experienced in handling;
- (j) The nearest Fire Brigade Station shall be notified of the location of the pesticide store and its approximate quantity of storage;
- (k) No pesticides shall be stored in the living quarters;
- (l) The pesticide shall be sold with labels and instruction for use translated into Myanmar Language for which approval has been obtained from the Registration Board;
- (m) The sale of pesticides restricted from time to time by the Registration Board shall be made only to persons with purchase permits issued by the relevant Managers or to certified pesticide applicators;

- (n) Whole or retail sale of pesticides shall be affected with vouchers and daily sales registers showing names of purchasers and type and quantity of pesticide being sold. Such vouchers and registers shall be made available for inspection by the respective Manager or Inspector.
- (o) Pesticide shall not be sold together with food-stuffs and medicines on the roadside;
- (p) Pesticides shall be sold safely packed and the damaged packing and containers shall be repacked securely before sale;
- (q) Pesticides shall not be sold without labels and instructions for use;
- (r) Pesticides, active ingredients or packing materials to be disposed of due to any reason shall be done according to instructions of the DOA;
- (s) If the stock of pesticides or active ingredients in the possession of license holder is found on inspection to have deteriorated in quality, its continued use and sale shall be made according to the instructions of the DOA;
- (t) Inspection of pesticide by respective Township Manager or Inspector shall be allowed and necessary assistance shall also be rendered;
- (u) If during inspection under sub-clause (p) the respective Manager or Inspector requires samples for quality analysis, the necessary quantity or weight taken according to the specified sampling method shall be made available free of charge; in taking such samples the respective Manager or Inspector shall issue a sampling certificate.

Conditions for compliance by the User

- (a) The pesticide prescribed on crop basis by the Registration Board shall only be used in the specified manner;
- (b) No pesticides other than those formulated for domestic use shall be kept in the living quarters.
- (c) Harvesting and sale of food crops shall be done only after the elapse of pre-harvest interval of pesticide application as prescribed by the Registration Board;
- (d) The required quantity or weight of crop samples for pesticide residue analysis taken according to the specified sampling method, shall be provided free of charge, if required by the respective Manager or Inspector; in taking such samples the respective Township Manager or Inspector; shall issue sampling certificate;
- (e) The decision of DOA based upon the opinion of the Director General of the Department of Health shall be complied with in respect to harvested food crop containing pesticide residue higher than the permitted level.

Law enforcement on pesticide sale and use at local level is vital for controlling undesirable impacts by improper use of pesticide on environment and human. As illegal and sale of unregistered pesticides are very common throughout the country, it may require developing procedures for check and balance system to enforce law as described below:

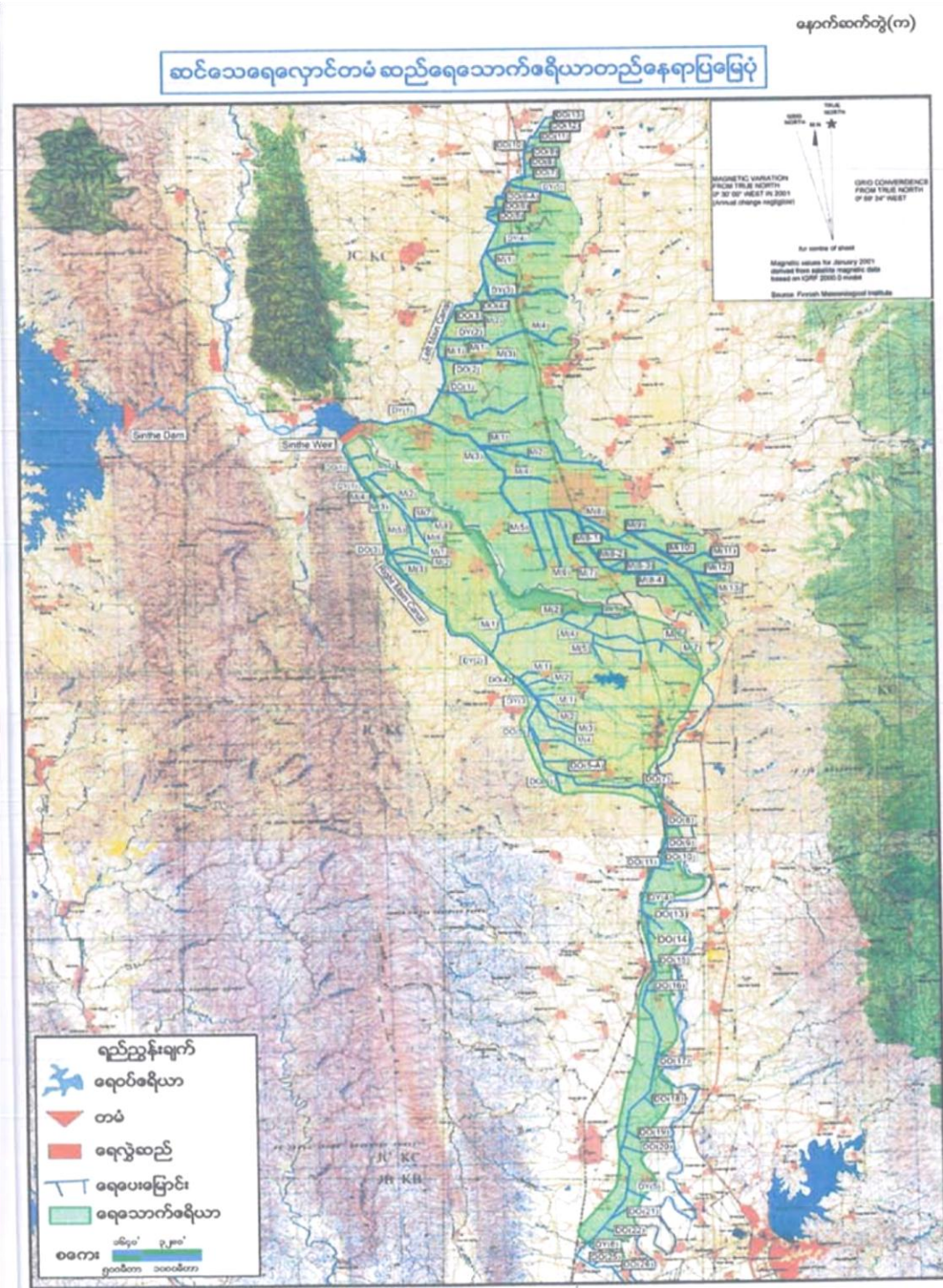
- i) At national level, project steering committee should discuss the matter related to establishment of mechanism for law enforcement and independent review.

- ii) At local level, TACC should play central role for promoting law enforcement and independent reviewing of pest management in the respected administrative area;
  - iii) TACC should also closely coordinate with police department and township judiciary department for their collaboration in effective law enforcement and litigation process for those cases suspect for breaching the law;
  - iv) Civil society and village fellows should be invited for participating in this process;
  - v) Checklist should be developed based on the compliances described above and used by those who would conduct independent assessment on quarterly basic;
  - vi) Report of quarterly independent assessment should be submitted to TACC and matter concerning with unlawful activities should be discussed for taking necessary actions;
  - vii) Education of farmers, pesticide dealers and the whole sale in the township should be done to understand the necessary compliances on the use of pesticides;
  - viii) Information, communication and education materials should be developed and disseminated to the users and relevant stakeholders for their compliance.
  - ix) The progress made in township level enforcement should be reported to bi-annual public forum held at regional level
  - x) Farmers should be also incentivized for compliance in pest management.
- Environmental auditor shall also review law enforcement and report it accordingly.

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# Appendix I: Maps of Irrigation Schemes

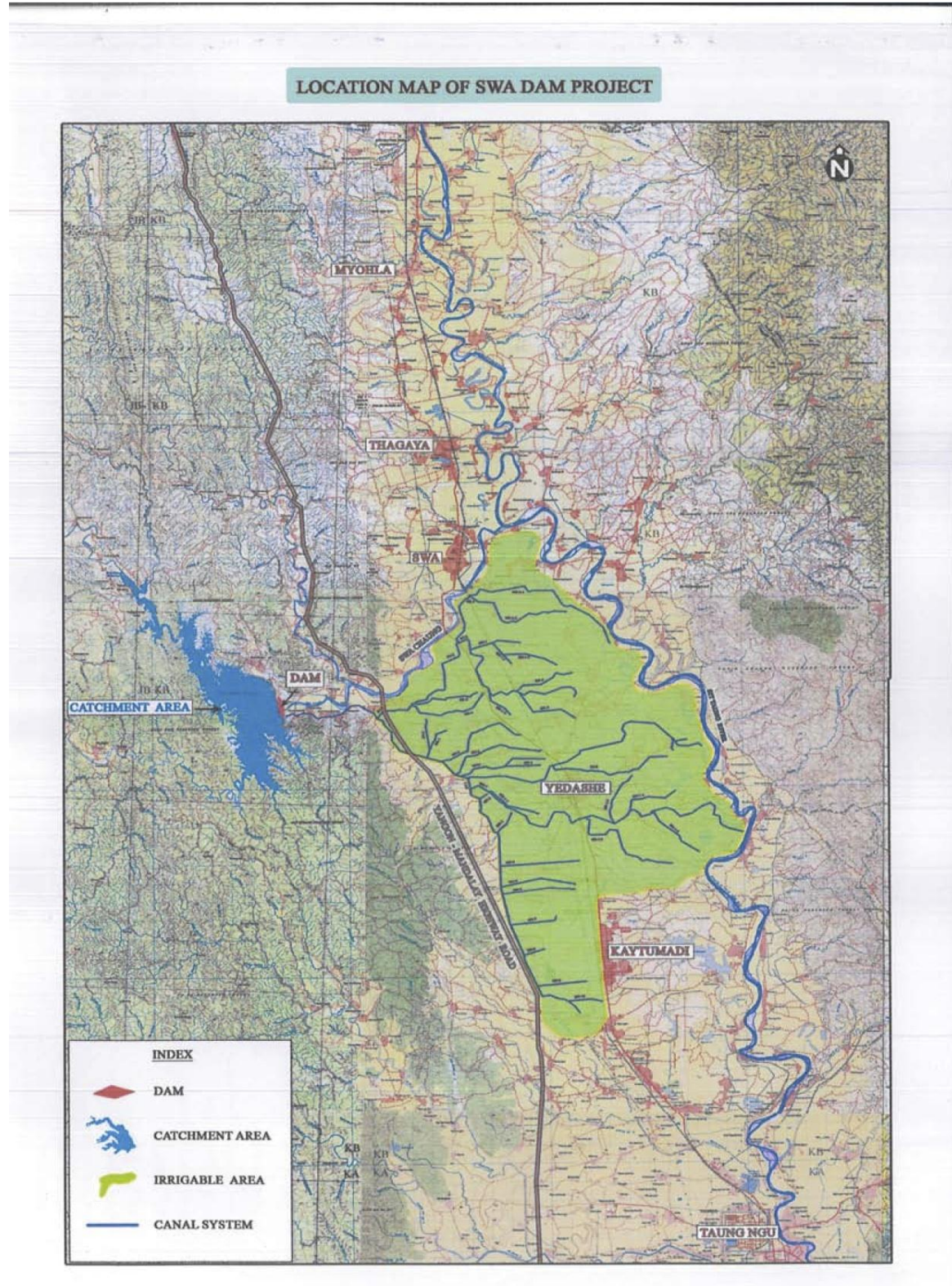
## Appendix I (a): Map of Sin The Irrigation Scheme



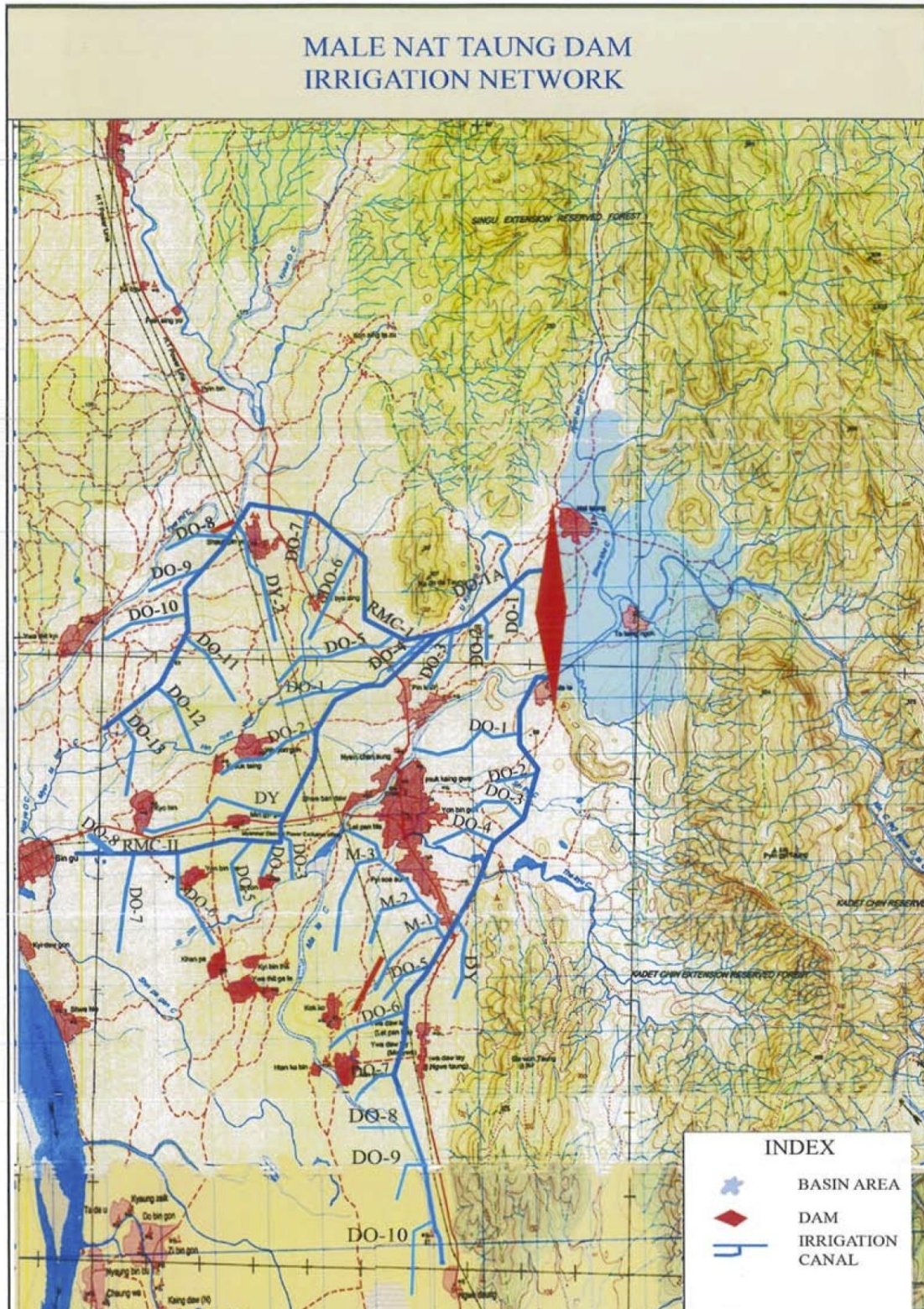
Appendix I (b): Map of North Yamar Irrigation Scheme



# Appendix I (c): Map of Swar Chaung Irrigation Scheme



Appendix I (d): Map of Male Nattaung Irrigation Scheme





## Key Selection Criteria for the Target Irrigation Schemes

Feasibility Area	Feasibility Criteria
Economic and Financial	<ul style="list-style-type: none"> <li>• Potential for significant incremental gains potential in productivity (yields) or cropping intensity (e.g., from 2 crops to 3 crops)</li> <li>• Areas where agricultural commercialization is progressing and there are readily accessible markets/distribution channels/roads.</li> </ul>
Technical	<ul style="list-style-type: none"> <li>• Individual system or autonomous part of larger system</li> <li>• Command Area between 500 and 5,000 ha</li> <li>• Existing irrigation system requiring rehabilitation work</li> <li>• Willingness of farmers/WUAs to take over/contribute to scheme maintenance works.</li> </ul>
Social	<p>The selected sites are free of land disputes brought to the consideration of the Land Loss Enquiry Commission of the Parliament</p> <ul style="list-style-type: none"> <li>• Farmers must be able to participate in the decision on the investments/activities.</li> </ul>
Environmental	<ul style="list-style-type: none"> <li>• Meets both Myanmar and WB environmental requirements/standards for projects with no irreversible effects.</li> <li>• Not an area affected by water contaminants from mining/industry</li> </ul>

## Appendix II: Climatic Data of Irrigation Scheme Areas

**Table 1: Technical information of selected existing irrigation schemes**

Description	Name of Dam			
	Sin The	North Yamar	Swa	Male Nattaung
Map reference	93D/4-475455	84J/12K- 010779	94A/4V 645280	93 (B-2) S.R-853018
Longitude	96 degree 2 minutes	94 degree 34 minutes	96 degree 12 minutes	96 degree 6 minutes
Latitude	20 degree 9 minutes	21 degree 59 minutes	19 degree 11 minutes	22 degree 34 minutes
Type of dam	Zone Earth Fill Dam	Earthen	Earth Fill Dam	Earthen
Catchment area (sq mile)	308	191	403	75
Height of dam (ft)	109	65	97 (Main dam) 40 (saddle dam)	72
Length of dam (ft)	1350	10400	6600 (Main dam) 16900 (saddle dam)	11850
Dam Storage:				
Total: acre feet	143,090	14,057	216,350	57,470
Live: acre feet	125,787	11,221	188,180	50,060
Dead: acre feet	17,303	2,836	28,170	7,410
Average Annual Rainfall (inches)	33.74	34	83.75	43.6
Average Annual Inflow (Ac-ft)	110000	66430	312040	65000
Total reservoir command area				
Gross (acres)	25,416	31,000	35,000	10,000
Net (acres)	15,218	30,320	23,467	6,500
Hydropower: installed capacity	0	0/250kW	0	5kW in canal
Domestic water supply	30 households	0	0	0
Groundwater use	100 acres	0	0	0
Type of Conduit	Reinforced Cement Concrete	Reinforced Cement Concrete	Reinforced Cement Concrete	Reinforced Cement Concrete
Size of Conduit	6ft x 4ft (2 Nos) (1.83m x 1.22m) (2 Nos)	6ft x 4ft (2 Nos)	6ft x 4ft (3 Nos)	Left: 3' .Ø (1 No) Right: 6ft x 4ft (1 No)
Length of Conduit (ft)	-	258	362	Left: 251 Right: 221
Conduit Design Discharge (Cusecs)	-	240	750	Left: 50 Right: 200

**Table 1: Technical information of existing irrigation scheme (Contd.)**

Description	Name of Dam			
	Sinthe	North Yamar	Swa	Male Nattaung
Type of Spillway	Ogee Type Reinforced Concrete	Cement Reinforced Concrete	Cement Duckbill Type Reinforced Concrete	Cement Reinforced Concrete
Length of Spillway (ft)	510	413	-	-
Width of Spillway (ft)	110	100	400	-100
Spillway Design Discharges (Cusecs)	18490	7500	52500	8000
Length of Emergency Spillway (ft)	-	341	-	-
Width of Emergency Spillway (ft)	-	500	-	-
Length of Main Canal (miles)	Left: 12 Right: 29	15.87	16.67 (1 Nos)	Left: 5 Right: 10
Main Canal Discharges (Cusecs):	Left: 500 Right: 312	-	-	-
Length of Distributaries (miles):	-	30.4	41.94 (8 Nos)	-
Canal Structures	-	487 Nos	916 Nos	Left: 50 Nos Right: 84 Nos
Irrigable Area (acres)				
(Gross):	25,416 (32400)	12,000	35,000	10,000
(Net):	15,218	11,320	23,467	6,500
Irrigated Area: acres	12,712 (16032)	5,900	20,670	5,755

**Source:** Irrigation Department (2014), Data compiled and shared to ADP technical survey team, Yangon

**Note:** Gross irrigable area is the total area within system boundaries including villages, roads and non-irrigable areas as marshes and uplands; Net irrigable area: Total service area that can be provided with irrigation water; Irrigated area is the net irrigable area that actually receives irrigation water

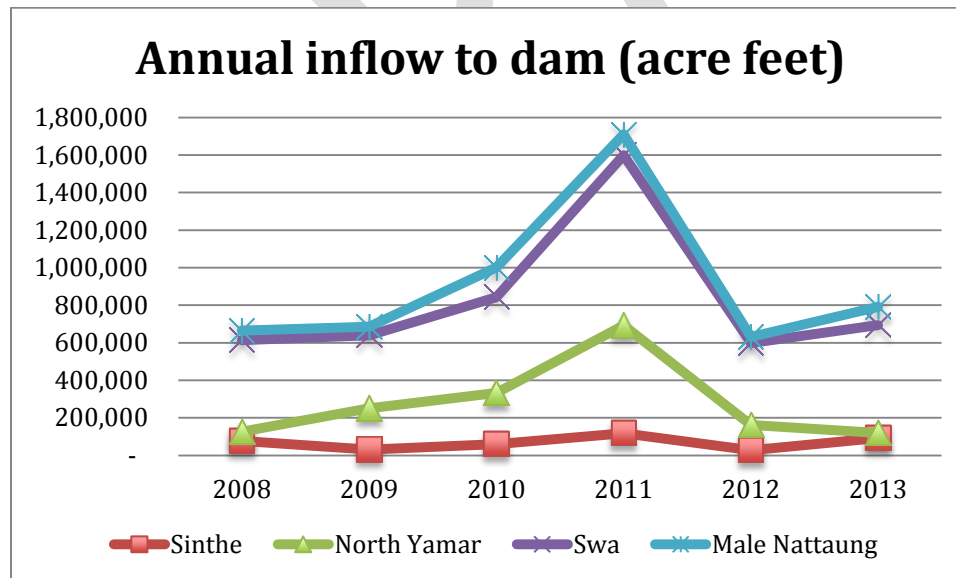
**Table 2: Annual volume of water inflow to dam (acre-feet)**

Year	Sin The Dam (143,090)	North Yamar Dam (14,057)	Swa Dam (216,350)	Male Nattaung Dam (57,470)
2000	125,094	-	-	-
2001	113,869	-	-	-
2002	114,577	-	-	-
2003	81,703	-	-	-
2004	33,718	-	594,385	-
2005	133,678	281,177	750,216	-
2006	57,590	38,557	725,755	-
2007	91,019	191,303	676,896	-
2008	77,174	49,474	487,714	50,084
2009	31,704	219,199	389,218	44,825
2010	60,603	272,826	509,056	159,016
2011	117,490	575,299	906,789	109,435
2012	27,169	135,044	435,708	33,214
2013	92,481	26,809	574,642	97,553

**Source:** Irrigation Department (2014)

**Note:** (i) Figure in parentheses refer to maximum water storage capacity of given dam. (ii) Data for North Yamar were combined of data from both upper and lower dams that built across North Yamar Creek.

**Figure 1: Annual inflow of dam (Year 2008 – 2013)**



**Table 3: Average annual rainfall in irrigated area of proposed project sites**

Year	Sin The Dam	North Yamar Dam	Swa Dam	Male Nattaung Dam
1999	39.83	n.a	n.a	n.a
2000	22.49	n.a	n.a	n.a
2001	35.12	n.a	n.a	n.a
2002	9.12	n.a	n.a	n.a
2003	14.35	n.a	n.a	n.a
2004	11.21	n.a	61.14	n.a
2005	23.58	24.22	51.8	n.a
2006	33.85	24.52	81.45	n.a
2007	22.48	23.15	47.59	n.a
2008	21.32	28.35	43.85	30.33
2009	7.25	41.69	38.77	29.43
2010	20.39	50.64	63.2	67.51
2011	23.72	51.14	110.91	56.94
2012	15.65	28.22	84.82	29.8
2013	23.38	14.08	100.08	42.43

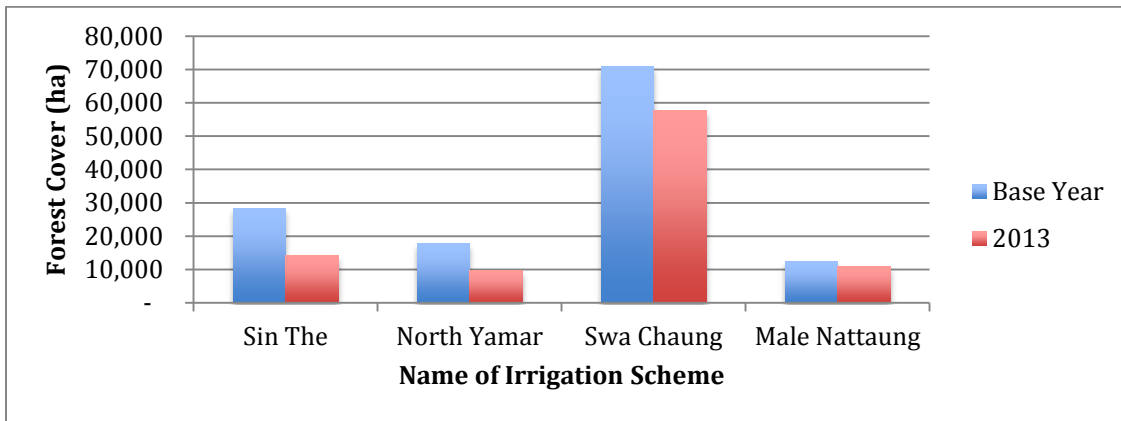
Source: Irrigation Department (2014), Note: n.a refer to not available

**Table 4 Deforestation rate of catchment areas of existing irrigation scheme**

Name of Irrigation Scheme	Forest Cover (ha)		Interval Year	Forest Loss (ha)	Annual Forest Cover Loss (ha)	% Change
	Base Year	2013				
a	b	c	d	e = a-b	f = e/d	(f/a)*100
Sin The	28,329	14,103	23	14,226	619	2.18
North Yamar	17,678	9,804	13	7,874	606	3.43
Swa Chaung	70,845	57,655	13	13,190	1,015	1.43
Male Nattaung	12,354	10,816	8	1,538	192	1.56

Source: EcoDev (2014): Analysis of Land Cover Change for Irrigation Schemes from Available Remote Sensing Data, Yangon.

**Figure 2: Forest cover change of catchment area of existing irrigation scheme**



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**Table 5: Socio-economic data of project area**

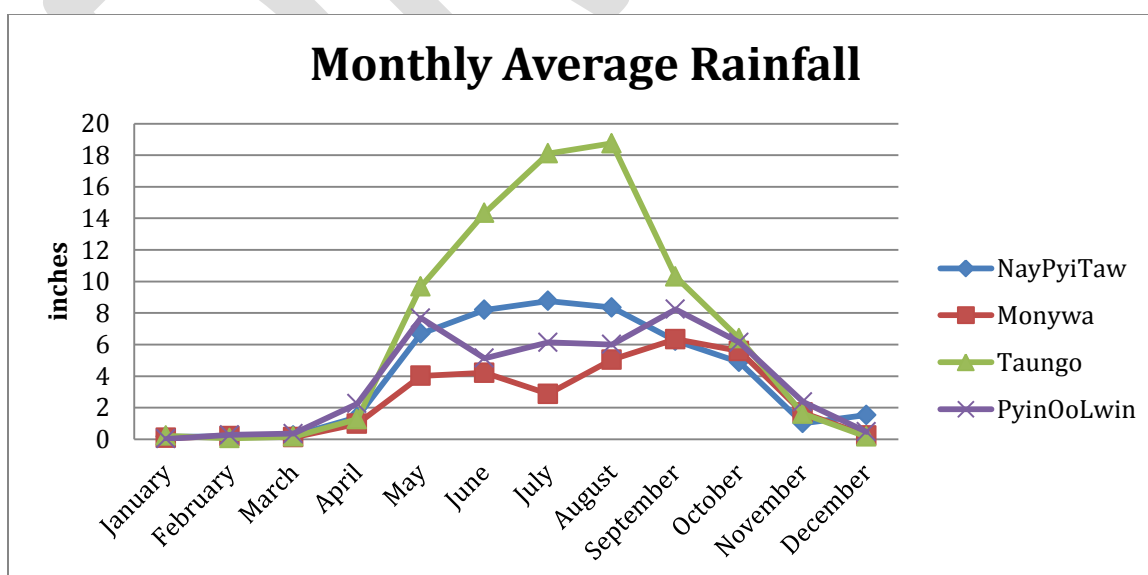
Description	Name of Dam			
	Sinthe	North Yamar	Swa	Male Nattaung
Number of village tracts	33	17	24	10
Number of villages	78	35	133	30
Population in command area (person)	107,926	69,500	80,009	22,800
Number of households (Nos)	22,640	12,500	16,319	5,700
Number of farmers (Nos)	5,420	3,000	17,000	2,364
Number of farmers (Nos)	8,766	8,100	5780	3336
Number of landless households	nil	nil	Karen spread over the area	nil
Ethnic minorities in command area:				
Average holding size of farmland (acre/household)	5	4	2.5	3
Maximum holding	10	6	20	6
Minimum holding	1.5	2	1.5	2
Average farm plot size (acres),	0.75	0.875	0.5	0.25
Maximum plot size	1.25	1.5	0.85	.5
Minimum plot size	0.25	0.25	0.25	.2
Percent coverage of issuing land use certificate to farmer	93.38%	100%	90%	90%
Crop Sown Area (acres)				
Monsoon Paddy	16,032	5,900	23,467	5755
Summer Paddy	5,000	1,185	20,670	1000
Others crop	11,032	1,000	150	560
Yield of major crop sown				
Monsoon Paddy (Basket/acre)	100	80	80	80
Summer Paddy (Basket/acre)	115	90	85	120

## Appendix II (a): Monthly Average Rainfall Data of Irrigation Scheme Areas

Month	Sin The	North Yamar	Swar Chaung	Male Nattaung
	Nay Pyi Taw	Mon Ywa	Taungo	Pyin Oo Lwin
	(inches)	(inches)	(inches)	(inches)
January	0.17	0.08	0.23	0.02
February	0.18	0.2	0.06	0.28
March	0.24	0.12	0.17	0.36
April	1.39	0.98	1.27	2.25
May	6.69	4.02	9.67	7.68
June	8.19	4.21	14.34	5.13
July	8.76	2.87	18.11	6.14
August	8.35	5.04	18.75	6
September	6.24	6.34	10.3	8.24
October	4.89	5.59	6.39	6.14
November	1.02	1.69	1.61	2.37
December	1.53	0.24	0.16	0.47

Source: Irrigation Department (2014), Report on Dam and Irrigation System of Proposed Project Areas: Data provided by Irrigation Department, Ministry of Agriculture and Irrigation, Nay Pyi Daw (In Myanmar)

## Appendix II (b): Chart showing monthly average rainfall in irrigation scheme areas



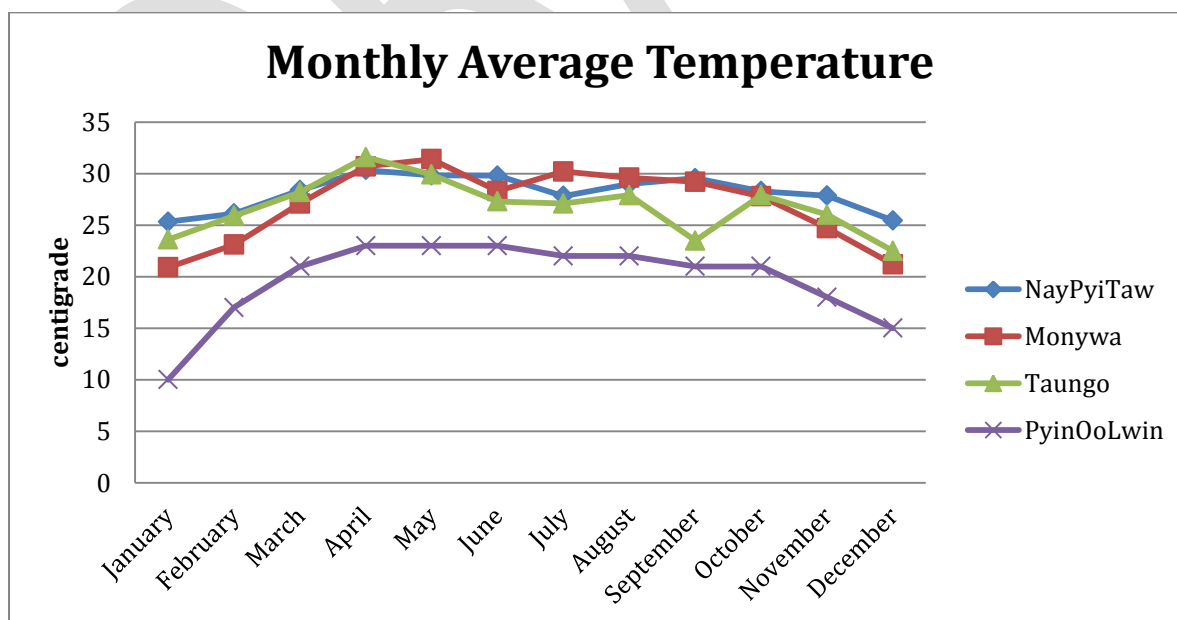


## Appendix II (c): Average temperature data of irrigation scheme areas

Month	Sin The	North Yamar	Swar Chaung	Male Nattaung
	Nay Pyi Taw	Monywa	Taungo	Pyin Oo Lwin
	(Centigrade)	(Centigrade)	(Centigrade)	(Centigrade)
January	25.32	20.9	23.6	10
February	26.11	23.1	25.9	17
March	28.38	27.1	28.2	21
April	30.33	30.7	31.6	23
May	29.83	31.4	29.9	23
June	29.79	28.3	27.3	23
July	27.82	30.2	27.1	22
August	28.99	29.6	27.9	22
September	29.55	29.2	23.5	21
October	28.29	27.8	27.9	21
November	27.86	24.7	26	18
December	25.45	21.2	22.5	15

Source: Irrigation Department (2014), Report on Dam and Irrigation System of Proposed Project Areas: Data provided by Irrigation Department, Ministry of Agriculture and Irrigation, Nay Pyi Daw (In Myanmar)

## Appendix II (d): Chart showing monthly average temperature in irrigation scheme areas

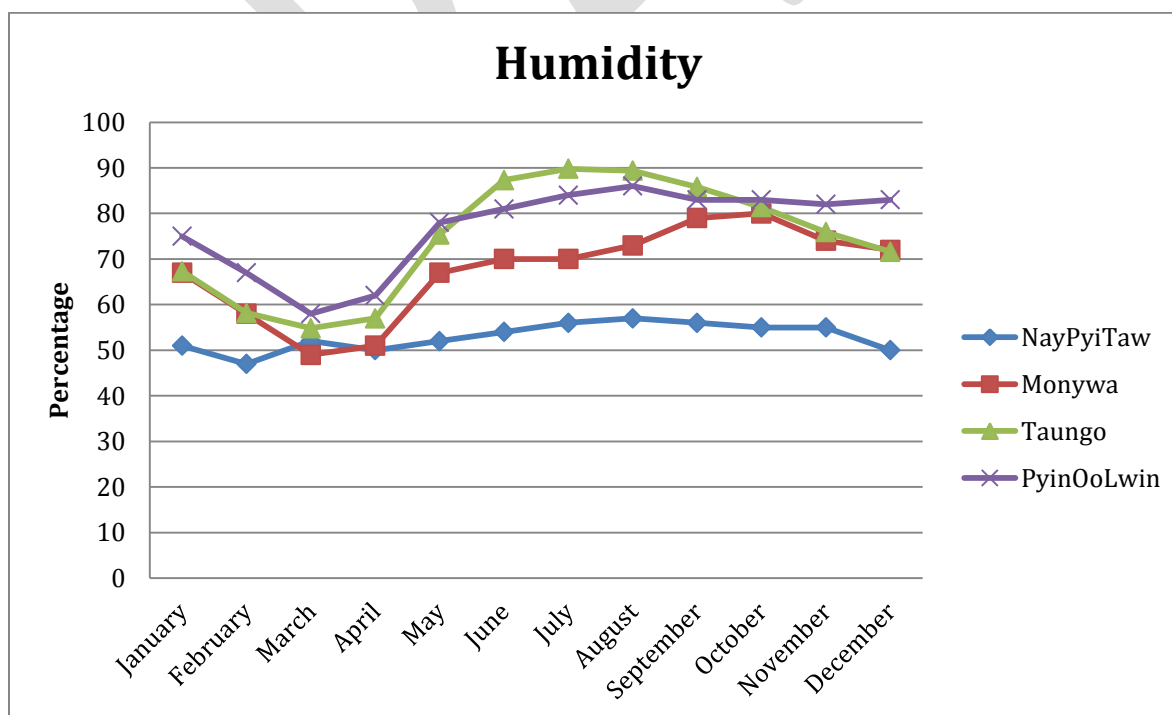


## Appendix II (e): Average humidity data of irrigation scheme areas

Month	Sin The	North Yamar	Swar Chaung	Male Nattaung
	Nay Pyi Taw	Mon Ywa	Taungo	Pyin Oo Lwin
	(Percentage)	(Percentage)	(Percentage)	(Percentage)
January	51	67	67.3	75
February	47	58	58.2	67
March	52	49	54.8	58
April	50	51	57	62
May	52	67	75.4	78
June	54	70	87.3	81
July	56	70	89.8	84
August	57	73	89.4	86
September	56	79	85.8	83
October	55	80	81.4	83
November	55	74	75.9	82
December	50	72	71.6	83

Source: Irrigation Department (2014), Report on Dam and Irrigation System of Proposed Project Areas: Data provided by Irrigation Department, Ministry of Agriculture and Irrigation, Nay Pyi Daw (In Myanmar)

## Appendix II (f): Chart showing average humidity in irrigation scheme areas



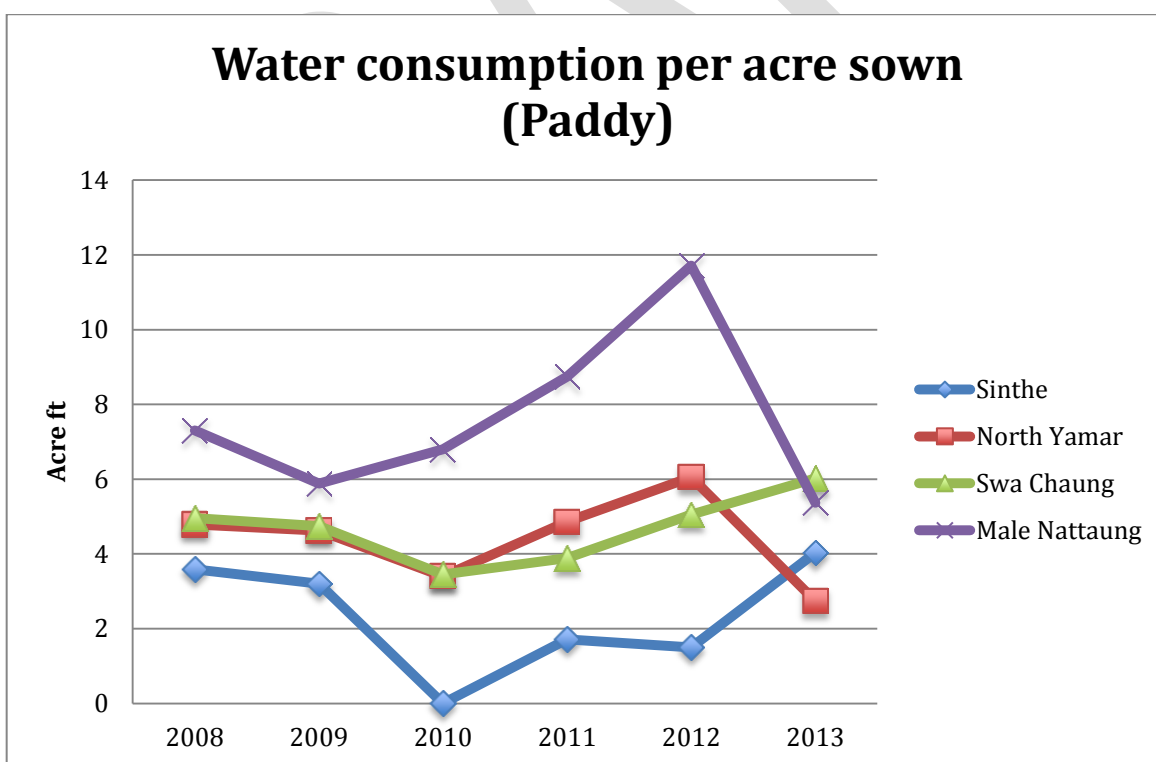
## Appendix III: Comparison of Water Consumption in Irrigation Scheme

### Appendix III (a): Per acre-feet water consumption for growing paddy

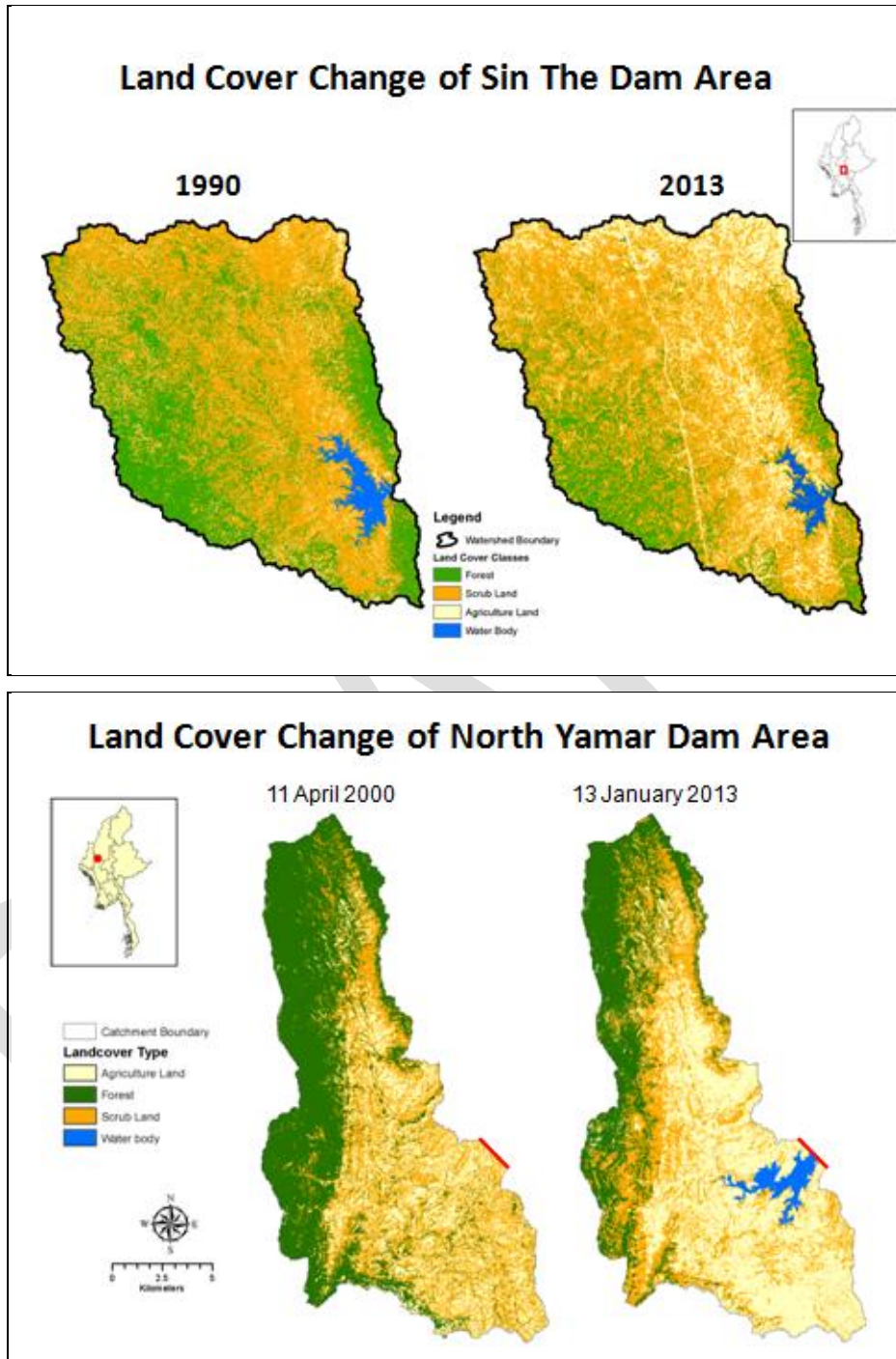
Year	Irrigation Scheme			
	Sin The	North Yamar	Swar Chaung	Male Nattaung
2008	3.6	4.8	5.0	7.3
2009	3.2	4.6	4.7	5.9
2010	-	3.4	3.5	6.8
2011	1.7	4.9	3.9	8.7
2012	1.5	6.0	5.1	11.7
2013	4.0	2.7	6.0	5.4

Source: Irrigation Department (2014), Report on Dam and Irrigation System of Proposed Project Areas: Data provided by Irrigation Department, Ministry of Agriculture and Irrigation, Nay Pyi Daw (In Myanmar)

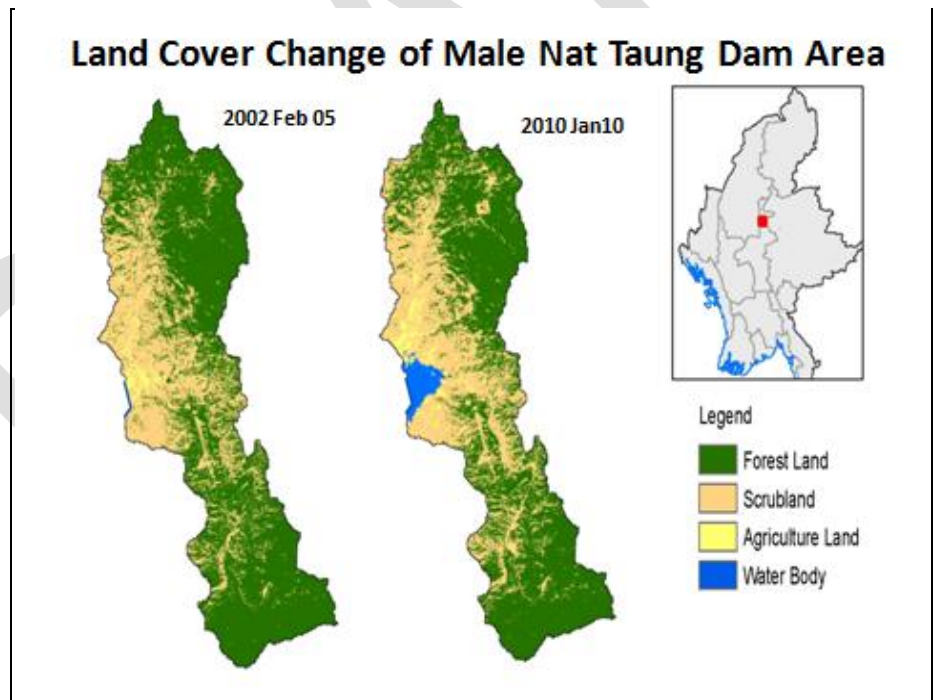
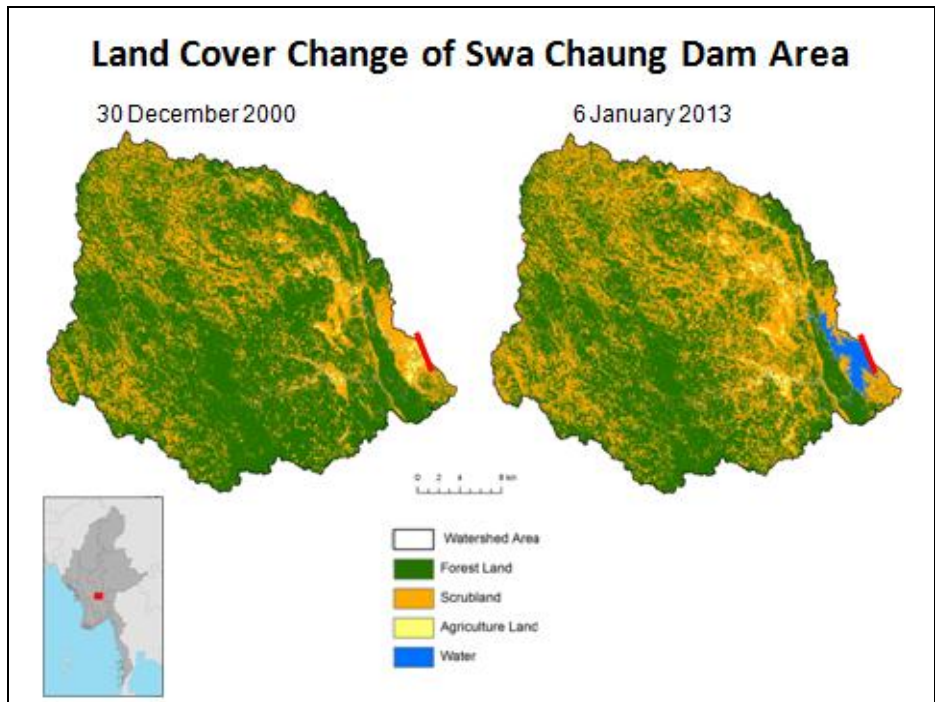
### Appendix III (b): Chart showing water consumption for growing paddy (Acre Feet)



**Appendix IV (a): Map showing land use and land cover change in catchment of studied areas**



Source: EcoDev (2014), Analysis of land use land cover changes in catchment of irrigation scheme areas based on available remote sensing data, Yangon.



Source: EcoDev (2014), Analysis of land use land cover changes in catchment of irrigation scheme areas based on available remote sensing data, Yangon.

## Appendix IV (b): Matrix of land use land cover change in studied areas

### Sin The Dam's Catchment Area (1990 Versus 2013)

		Year 2013				
	Land Class Area (ha)	Forest Land	Scrub Land	Agriculture Land	Water Body	Grand Total
Year 1990	1. Forest	11009	15641	1669	10	28329
	2.Scrub	3094	28050	12953	16	44113
	3.Agriculture Land			5343		5343
	4.Water Body		613		1180	1793
	<b>Grand Total</b>	<b>14103</b>	<b>44304</b>	<b>19965</b>	<b>1206</b>	<b>79578</b>

Source: EcoDev (2014), Analysis of land use land cover changes in catchment of irrigation scheme areas based on available remote sensing data, Yangon.

### North Yamar Dam's Catchment Area (2000 Versus 2013)

		Year 2013				
	Land Class Area (ha)	Forest Land	Scrub Land	Agriculture Land	Water Body	Grand Total
Year 2000	1. Forest	9804	6353	1449	72	17678
	2.Scrub		6351	6503	475	13329
	3.Agriculture Land			9836	456	10292
	4.Water Body				28	28
	<b>Grand Total</b>	<b>9804</b>	<b>12704</b>	<b>17788</b>	<b>1031</b>	<b>41327</b>

Source: EcoDev (2014), Analysis of land use land cover changes in catchment of irrigation scheme areas based on available remote sensing data, Yangon.

### Swar Chaung Dam's Catchment Area (2000 Versus 2013)

		Year 2013				
	Land Class Area (ha)	Forest Land	Scrub Land	Agriculture Land	Water Body	Grand Total
Year 2000	1. Forest	57655	12779	203	208	70845
	2. Scrub		31472	788	996	33256
	3. Agriculture Land			1123		1123
	4. Water Body				351	351
	<b>Grand Total</b>	<b>57655</b>	<b>44251</b>	<b>2114</b>	<b>1555</b>	<b>105575</b>

Source: EcoDev (2014), Analysis of land use land cover changes in catchment of irrigation scheme areas based on available remote sensing data, Yangon.

### Male Nat Taung Dam's Catchment Area (2002 Versus 2010)

		Year 2010				
	Land Class Area (ha)	Forest Land	Scrub Land	Agriculture Land	Water Body	Grand Total
Year 2002	1. Forest Land	10816	1490	31	17	12354
	2. Scrub Land		4569	322	251	5142
	3. Agriculture Land			998	156	1154
	<b>Grand Total</b>	<b>10816</b>	<b>6059</b>	<b>1351</b>	<b>424</b>	<b>18650</b>

Source: EcoDev (2014), Analysis of land use land cover changes in catchment of irrigation scheme areas based on available remote sensing data, Yangon.

## Appendix V: The result of water quality testing for sample water collected from irrigation scheme areas

Sr.	Parameter	Sin The		North Yamar		Swar Chaung			Male Nattaung				Standard Limit	
		Site (1) Water from Weir	Site (2) Water from Dam	Site (3) Left canal No.1 near Tat Kone	Site (1) Water from main canal	Site (1) Water from Dam	Site (2) Distributary (A Mat Gyi Khone village)	Site (3) Distributary near Yedashe	Site (1) Canal at Lat Pan Hla Village	Site (2) Water from Dam	Site (3) Seepage from Dam	Site (4) Seepage from Dam	Drinking	Irrigation
1	pH	7.8	8.7*	8.4	7.9	8.2	8.1	6.6	8.3	7.8	8.5	7.7	6.5 – 8.5 <sup>a</sup>	6.5 - 8.4 <sup>f</sup>
2	Turbidity (FAU)	< 5	< 5	7	< 5	< 5	< 5	< 5	< 5	< 5	94*	< 5	< 10 FAU <sup>d</sup>	-
3	Hardness (mg/L)	140*	140*	58.5	150*	100*	100*	31.5	110*	180*	31.5	72*	< 60 mg/L <sup>c</sup>	-
	Carbonate (me/L)	3.5*	3.5*	1.46	3.75*	2.5*	2.5*	0.79	2.75*	4.5*	0.79	1.8*	-	< 1.5 me/L <sup>f</sup>
4	Arsenic (ppb)	< 4	< 4	-	< 4	< 4	< 4	-	140*	120*	-	-	< 10 ppb <sup>a</sup>	-
5	Aluminum (mg/L)	0.02	0.02	< 0.01	0.02	0.02	0.02	< 0.01	0.02	0.03	< 0.01	0.02	< 0.2 mg/L <sup>a</sup>	-
6	Potassium (mg/L)	9.2	11	49*	2.8	2.6	2.0	35*	2.3	1.6	22*	22*	< 20 mg/L <sup>c</sup>	-
7	Iron (mg/L)	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.36*	< 0.1	< 0.2 mg/L <sup>b</sup>	-
8	Chloride (me/L)	0.20	0.41	2.51	0.61	0.20	0.51	0.46	0.61	0.61	1.14	0.46	-	< 4 me/L <sup>f</sup>
9	Nitrite (mg/L)	< 0.01	< 0.01	-	< 0.01	< 0.01	< 0.01	-	< 0.01	< 0.01	-	-	< 0.5 mg/L <sup>b</sup>	-
10	Zinc (mg/L)	< 0.02	< 0.02	-	0.09	< 0.02	< 0.02	-	0.19	0.15	-	-	< 3 mg/L <sup>a</sup>	-



*Source: Laboratory Analysis Reports from Eco-Lab (2014)*

Note: Figures with asterisk show the above limit situation comparing to the respected standard limit

a WHO standard for Drinking Water (1993)

b EU Standard for Drinking Water

c Other Standards

d USGS Water-Quality Information

e Michigan Water Quality Standards (Rule 64)

f FAO (1995) Guidelines for Interpretation of Water Quality for Irrigation, FAO Irrigation and Drainage Paper 53, Rome

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### Appendix VI (a): Globally endangered species in Myanmar (Reptile)

No	Common name	Scientific name	Status
1	Four-toed Terrapin	<i>Batagur baska</i>	Critically Endangered
2	Leatherback	<i>Dermochelys coriacea</i>	Critically Endangered
3	Burmese Starred Tortoise	<i>Geochelone platynota</i>	Critically Endangered
4	Arakan Forest Turtle	<i>Heosemys depressa</i>	Critically Endangered
5	Hawksbill Turtle	<i>Eretmochelys imbricata</i>	Critically Endangered
6	Gharial	<i>Gavialis gangeticus</i>	Critically Endangered
7	Burmese Peacock Soft shell	<i>Nilssonia formosa</i>	Endangered
8	Frog-faced Soft shell Turtle	<i>Pelochelys cantorii</i>	Endangered
9	Big-headed Turtle 10	<i>Platysternon</i>	Endangered
10		<i>Enhydriis vorisi</i>	Endangered
11	Yellow-headed Tortoise	<i>Indotestudo elongata</i>	Endangered
12	Burmese Roofed Turtle	<i>Batagur trivittata</i>	Endangered
13	Green Turtle	<i>Chelonia mydas</i>	Endangered
14	Burmese Mountain Tortoise	<i>Manouria emys</i>	Endangered
15	Indian Narrow-headed Soft shell	<i>Chitra indica</i>	Endangered
16	Jagged-shelled Turtle	<i>Cuora mouhotii</i>	Endangered
17	Bengal Eyed Terrapin	<i>Morenia ocellata</i>	Vulnerable
18	King Cobra	<i>Ophiophagus hannah</i>	Vulnerable
19	Impressed Tortoise	<i>Manouria impressa</i>	Vulnerable
20	Southeast Asian Soft shell Turtle	<i>Amyda cartilaginea</i>	Vulnerable
21		<i>Siebenrockiella crassicollis</i>	Vulnerable
22	Olive Ridley	<i>Lepidochelys olivacea</i>	Vulnerable
23	Southeast Asian Box Turtle	<i>Cuora amboinensis</i>	Vulnerable
24	Giant Asian Pond Turtle	<i>Heosemys grandis</i>	Vulnerable

Source: Forest Department (2011), National Biodiversity Strategy and Action Plan, Myanmar; Ministry of Environmental Conservation and Forestry, The Republic of The Union of Myanmar, Nay Pyi Daw

## Appendix VI (b): Globally endangered species in Myanmar (Bird)

No	Common name	Scientific name	Status
1	White-bellied Heron	<i>Ardea insignis</i>	Critically Endangered
2	Spoon-billed Sandpiper	<i>Eurynorhynchus pygmeus</i>	Critically Endangered
3	Pink-headed Duck	<i>Rhodonessa caryophyllacea</i>	Critically Endangered
4	Red-headed Vulture	<i>Sarcogyps calvus</i>	Critically Endangered
5	Baer's Pochard	<i>Aythya baeri</i>	Endangered
6	White-winged Duck	<i>Cairina scutulata</i>	Endangered
7	Masked Fin foot	<i>Heliopais personatus</i>	Endangered
8	Greater Adjutant	<i>Leptoptilos dubius</i>	Endangered
9	Scaly-sided Merganser	<i>Mergus squamatus</i>	Endangered
10	Green Peafowl	<i>Pavo muticus</i>	Endangered
11	Gurney's Pitta	<i>Pitta gurneyi</i>	Endangered
12	White-browed Nuthatch	<i>Sitta victoriae</i>	Endangered
13	Spotted Greenshank	<i>Tringa guttifer</i>	Endangered
14	Rufous-necked Hornbill	<i>Aceros nipalensis</i>	Vulnerable
15	Plain-pouched Hornbill	<i>Aceros subruficollis</i>	Vulnerable
16	Greater Spotted Eagle	<i>Aquila clanga</i>	Vulnerable
17	Indian Spotted Eagle	<i>Aquila hastata</i>	Vulnerable
18	Pale-capped Pigeon	<i>Columba punicea</i>	Vulnerable
19	Yellow-breasted Bunting	<i>Emberiza aureola</i>	Vulnerable
20	Lesser Kestrel	<i>Falco naumanni</i>	Vulnerable
21	Sarus Crane	<i>Grus antigone</i>	Vulnerable
22	Pallas's Fish-eagle	<i>Haliaeetus leucoryphus</i>	Vulnerable
23	Lesser Adjutant	<i>Leptoptilos javanicus</i>	Vulnerable
24	Sclater's Monal	<i>Lophophorus sclateri</i>	Vulnerable
25	Nicobar Megapode	<i>Megapodius nicobariensis</i>	Vulnerable
26	Wallace's Hawk-eagle	<i>Nisaetus nanus</i>	Vulnerable
27	Great Bustard	<i>Otis tarda</i>	Vulnerable
28	White-fronted Scops-owl	<i>Otus sagittatus</i>	Vulnerable

29	Straw-headed Bulbul	<i>Pycnonotus zeylanicus</i>	Vulnerable
30	Indian Skimmer	<i>Rynchops albicollis</i>	Vulnerable
31	Beautiful Nuthatch	<i>Sitta formosa</i>	Vulnerable
32	Giant Nuthatch	<i>Sitta magna</i>	Vulnerable
33	Black-headed Ibis	<i>Threskiornis melanocephalus</i>	Vulnerable
34	Blyth's Tragopan	<i>Tragopan blythii</i>	Vulnerable
35	Large Green-pigeon	<i>Treron capellei</i>	Vulnerable
36	Grey-sided Thrush	<i>Turdus feae</i>	Vulnerable

Source: Forest Department(2011), National Biodiversity Strategy and Action Plan, Myanmar; Forest Department, Ministry of Environmental Conservation and Forestry, The Republic of The Union of Myanmar, Nay Pyi Daw

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