Chapter10 ENVIRONMENTAL AND SOCIAL CONSIDERATIONS

10.1 Outline of Environmental and Social Condition[40]

10.1.1 Natural Condition

(1) Physical Feature

The topography of Myanmar can roughly be divided into three parts: the Western Hills Region, the Central Valley Region and the Eastern Hill Region.

(2) Topography, Geology and Hydrology

Myanmar is characterized by topographic features including mountain ranges in the north, east and west, and a long coastal strip in the south. Steep mountainous ranges traverse the entire western border of Myanmar with India and Bangladesh. Their average elevation is approximately 1,800 meters and the highest point is the top of Mt. Hkakaborazi reaching 5,881 meters above sea level. Myanmar has five main rivers: Ayeyarwady, Chindwin, Salween, Sittaung and Tenasserim; the Ayeyarwady River (approximately 2,170 kilometers long) running through the country into the Gulf of Martaban is the longest among them. The East-West Economic Corridors crosses the Sittaung River, the Salween River, the Attran River, the Gyaing River, the Than Lwin River and the Salween River.

(3) Climate

The climate of Myanmar is roughly divided into three seasons: summer, rainy season and cold season. The summer months are from March to mid-May are summer months; the rain falls from mid-May to the end of October, and the cold season starts in November and ends in February.

Generally, Myanmar enjoys a tropical monsoon climate. However, climatic conditions differ widely from place to place due to widely differing topographical situations. For instance, central Myanmar has an annual rainfall of less than 40 inches while the Rakhine coast gets about 200 inches. Besides, the average highest temperature in central Myanmar during the summer months of March and April is above 43.3 C° while in northern Myanmar, it is about 36.1 C° and on the Shan Plateau between 29.4 C° and 35 C°. Temperature of towns varies according to their location and elevation. The average monthly temperature and precipitation of Nay Pyi Taw are shown in Figure 10-1-2.

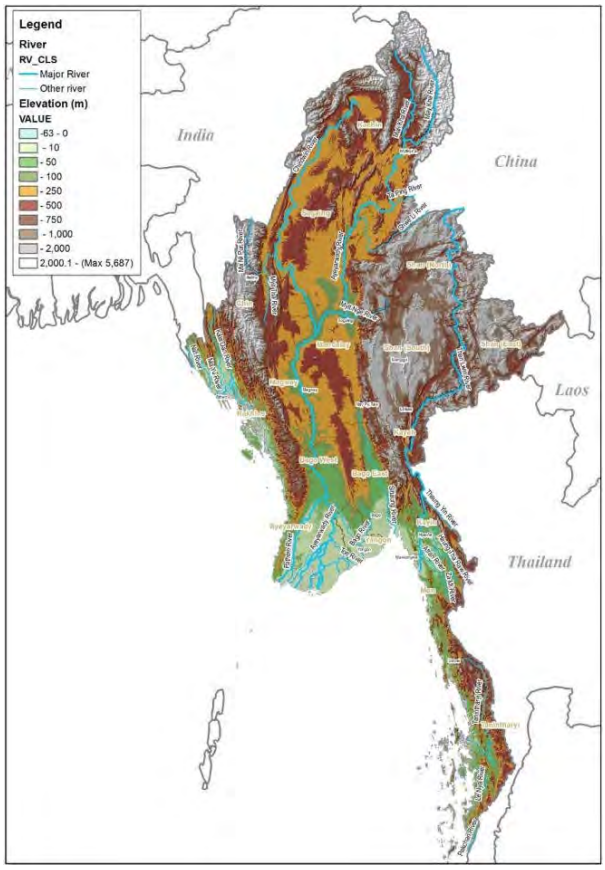

Figure 10-1-1 Topographic and Hydrological Feature

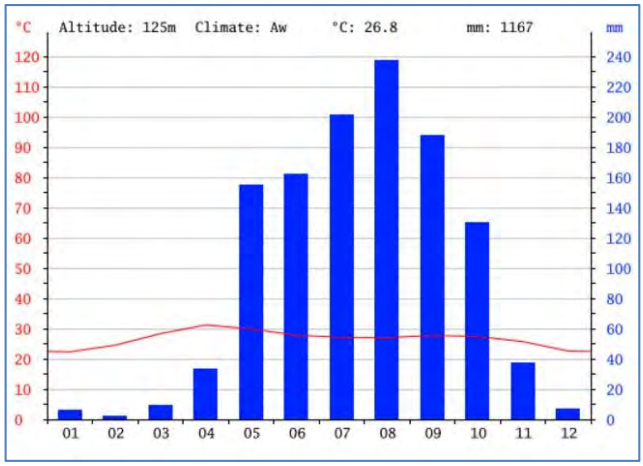

Figure 10-1-2 Temperature and Rainfall in Nay Pyi Taw

Source: Climate Data Org.

[40] Central Statistical Organization (http://www.csostat.gov.mm/)

(4) Flora and Fauna

Myanmar is endowed with a rich diversity of habitat types arising largely from its unusual ecological diversity. It is home to nearly 300 known mammal species, 300 reptiles, and about 100 bird species. The country is also a haven for about 7,000 species of plants. The potential worth of plant species in Myanmar is considerable. Since Myanmar considers such a rich pool of biodiversity as an important national asset, the government of the Union of Myanmar has drawn up strict regulations to protect its reservoir of biodiversity and biological resources.

(5) Protected Area

There are around 33 protected areas in Myanmar. These conservation zones are declared by laws as national parks, watershed reserves, wildlife preserves and sanctuaries.

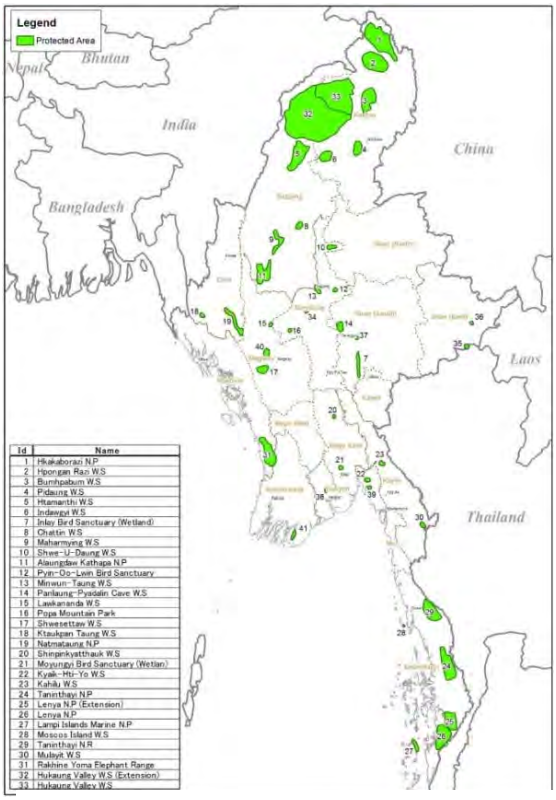

Figure 10-1-3 Protected Area in Myanmar
Source: MoNREC

10.1.2 Social Condition

Myanmar has an estimated population of 51.4 million, consisting of diverse ethnic groups speaking over 100 languages and dialects. It is ranked 150 out of 187 countries on the Human Development Index. Economic growth has averaged 5 percent in recent years with a per capita income of USD$702. Socio-economic characteristic in Myanmar is as shown in Table 10-1-1.

Table 10-1-1 Outline of Socio-Economic Characteristic in Myanmar

Item	Description
Area (km^2) / Population (mil)	676,578 km^2 / 51.4 million people ※1
Rural Population (%)	70 % ※1
Poverty Rate (%)	25.6 % ※2
Ethnic groups (%)	Burma 68%, Shan 9%, Kayin 7 %, Rakhine 3.5 %, Chinese 2.5 %, Mon 2 %, Kachin 1.5 % and other 135 small ethnic groups.
Religion (%)	Buddhism 74 %, Protestant 6 %, Islam 3%, Hinduism 2 %, other 11 % (2005)
Population by Industry (%)	Primary 62.8 %, Secondary 11.9 %, Tertiary 25.3% (1998)
Land Use (%)	Agricultural Land 12 mil ha (18.7%), Forest 31,7 mil ha (48.6 %)
Export (2010): *92 hundred million USD*	Natural Gas 38.5%, Pearl 24.5 %, Beans 9.8 %, Timber 7.7 %, Cloths 4.4 % (to Thailand 41.7 %, Hong Kong 21.1 %, India 12.6 %, China 6.2 %, Singapore 3.6%)
Import (2010): *90 hundred million USD*	Oil 21.9 %, Machines 14.0 %, Iron & Steel 9.0 %, Textile 7.1 %, Electric Machine 5% (from China 27.1 %, Singapore 27.0 %, Thailand 11.4 %, S. Korea 6.1 %, Japan 5.3 %)

Source: Data book of the world 2014
※1 Population and Housing Census of Myanmar 2014 / Ministry of Immigration and Population
※2 Poverty Rate : Statistical Year Book for Asia and the Pacific 2013

10.1.3 Legal and Administrative System of Myanmar

The government body with primary responsibility for ensuring and promoting soundness of the environment in Myanmar is MoNREC (Ministry of Natural Resources and Environmental Conservation) although other Ministries such as the Ministry of Agriculture, Livestock and Irrigation also share certain level of responsibility. MoNREC was recently reformed in April 2016 from former MoECAF (Ministry of Environmental Conservation and Forestry), which was also established in September 2011, replacing the Ministry of Forestry. The MoNREC, since the time of MoECAF, has been the focal point and coordinating agency for environmental management.

While the role of MoECAF is not specified by law, responsibility of its predecessor (i.e., the Ministry of Forestry) is stipulated in the Forest Policy (1995) as forest land management; environmental protection; timber extraction; and forest policy in Myanmar. The structure of the Ministry has been modified only once since its establishment, i.e., in October 2012 by adding the ECD (Environmental Conservation Department) based on the Environmental Conservation Law. The ECD is the department responsible for managing the EIA (Environmental Impact Assessment) process in Myanmar. In December 2015, ECD under MoECAF have finalized the EIA procedures (2015) and Myanmar National Environmental Quality Emission Guidelines (2015), and the Union Parliament (Pyidaungsu Hluttaw) have approved and enacted those procedures and guidelines in 2015. The role of MoNREC in environmental conservation can be therefore considered greater than before. The organization chart of MoNREC is in Figure 10-1-4.

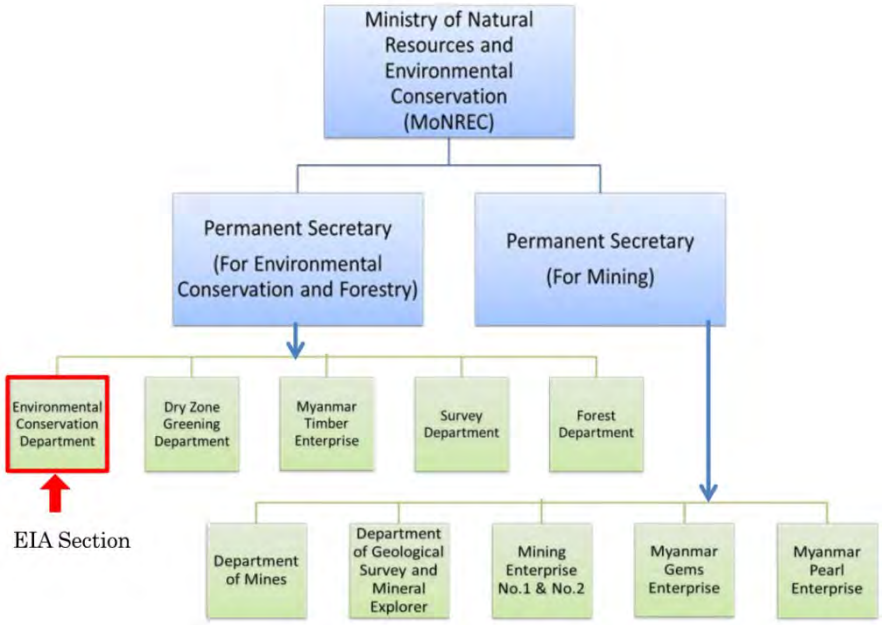

Figure 10-1-4 Organization Chart of MoNREC

Source: MoNREC

10.1.4 Related Laws and Regulation

(1) Environmental Conservation Law (2012)

The principal law governing environmental management in Myanmar is the Environmental Conservation Law, which was issued in March, 2012 (The Pyidaungsu Hluttow Law No. 9/20/2130rh). The law stipulates government bodies in charge of environmental conservation as well as their relevant roles and responsibilities. It touches on water, noise, vibration and solid waste qualities but does not provide specific standards to be met. It also mentions both environmental and social impact assessments. In the context of project development, it is important to note that the law adopts the notion of 'polluter/beneficiary pays principle' as it implies that the project promoters are responsible for covering all environmental and social costs generated by the project. The law serves as the basis for the founding of the ECD under MoNREC, both of which will be explained later. Environmental Conservation Rules and EIA Procedures form core framework of the Environmental Conservation Law.

(2) Environmental Conservation Rules

Environmental Conservation Rules have been promulgated in 2014 and provides a platform to bridge the Environmental Conservation Law with more specific and practical rules and guidelines including EIA Procedures and environmental quality standards. However, specific guidelines for each responsible organizations, detailed guidelines, environmental standards and criteria of EIA and IEE (Initial Environmental Examination) will be provided after 2015 in the “EIA Procedure”.

(3) Environmental Impact Assessment (EIA) Procedures

The EIA Procedure was approved by the cabinet in January 2016. It stipulates the conditions under which EIA is required and the steps to be followed in conducting and assessing the EIA. Under the Procedures, the Ministry sets an Environmental Conservation Committee which makes recommendations from an environmental point of view on whether to approve the EIA reports. IEE and EIA include an Environmental Management Plan (EMP). The assessment procedure also includes a clause about public participation in implementing the IEE, EIA, and EMP. It also describes the notion of precautionary principle and touches on climate change, and also includes Strategic Environmental Assessment.

The Project proponent should submit the Project proposal to the Department (ECD) for screening. The ECD categorizes the project as one of the following types: 1) EIA Type Project, or 2) IEE Type Project or 3) non-EIA, non- IEE Type Project. The non-EIA, non-IEE categorized projects are not required to undertake any environmental assessment.

Regarding IEE, prior to the commencement of an IEE, the project proponent should inform the ECD in writing as to the identity of the organization(s) and/or person(s), who will undertake the IEE and reporting. The project proponent may carry out the IEE and reporting by itself or may appoint a registered consultant. Within seven (7) working days of its receipt of information about the identity of any proposed organization(s) and/or person(s) selected by the project proponent to undertake the IEE, the ECD should confirm whether such organization(s) and/or person(s) is/are in good standing with the Department. The project proponent should undertake the public consultation in regard to an IEE type project. Process of screening and the IEE investigation/review is shown in Figure 10-1-5.

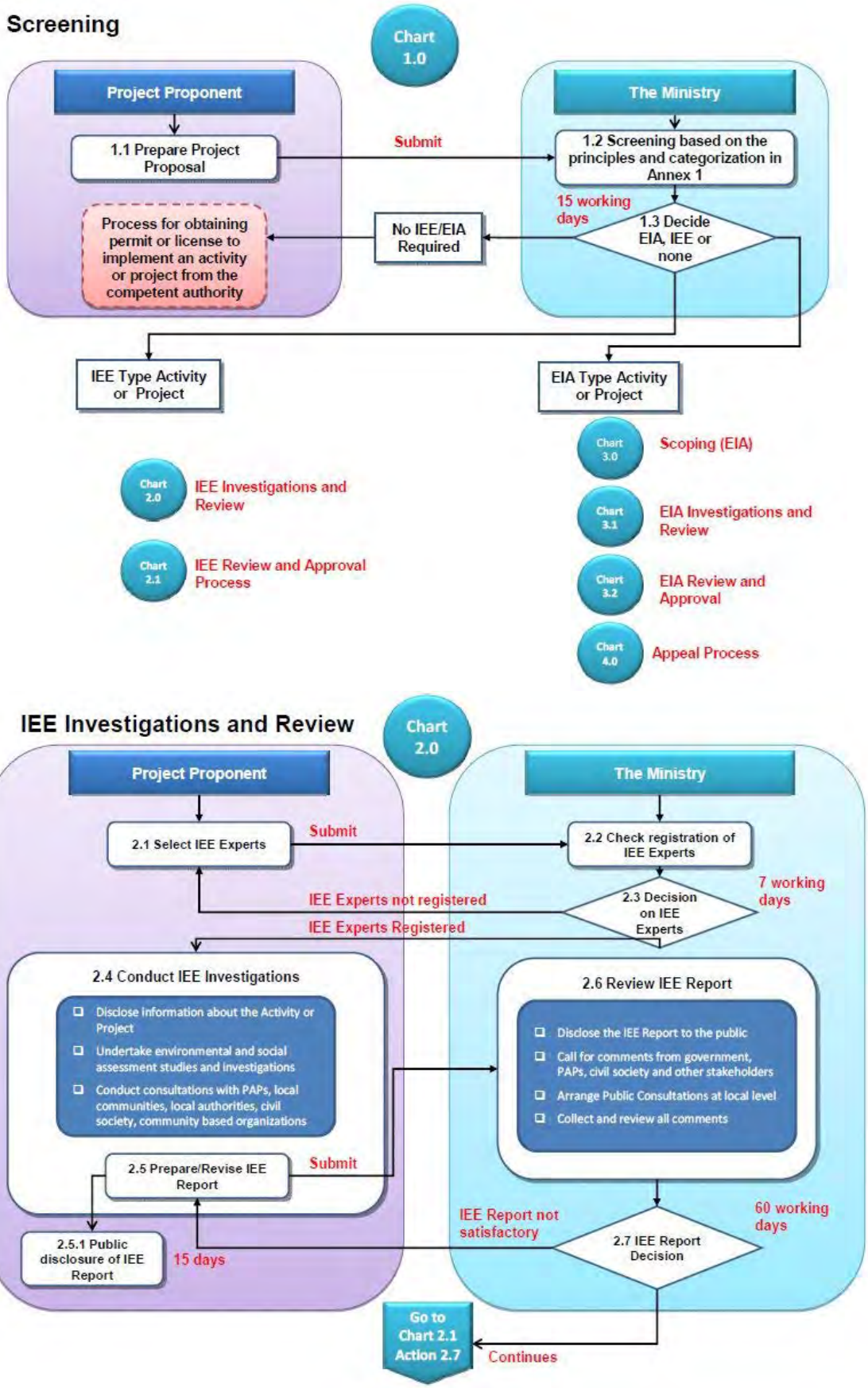

Figure 10-1-5 Screening Process

Source: EIA Procedure 2015

With regard to EIA, all EIA type projects should undergo scoping. The project proponent shall be responsible for ensuring that the scoping and the preparation of the TOR for the EIA report are undertaken in a professional manner. As part of the scoping, the project proponent shall also ensure that the public consultation and participation are carried out.

Based on the Scoping, the Project Proponent shall prepare the TOR for the EIA investigations in accordance with applicable guidelines issued or adopted by the Ministry. The project proponent shall submit the completed scoping report and TOR to the ECD for review and approval.

The project proponent shall ensure that the EIA investigation properly addresses all adverse impacts and is undertaken in accordance with the TOR approved by the ECD. And EIA investigations shall consider all biological, physical, social, economic, health, cultural and visual components of the study area, together with all pertinent legal matters relating to the environment, people and communities that may be affected by the Project during all project phases, the investigations shall also identify and assess all adverse impacts, risks, cumulative impacts and residual impacts for environment, society and, if relevant, health issues that could possibly arise from the project. The investigations shall include all necessary data collection, technical studies, modeling, field surveys, field sampling, laboratory analysis, engineering designs and calculations including alternative analysis. The EIA procedure also stipulates the consultation process of EIA investigation.

10.1.5 Gap between JICA Guideline and Myanmar Legislation

Regarding policies for environmental and social considerations, those of JICA guidelines are basically the same as those of World Bank and ADB. Table 10-1-2 shows the results of comparison between the policies of Myanmar legislations including the EIA procedures and those of JICA guidelines. It is found that there are still considerable gaps between them.

Table 10-1-2 Gaps between JICA Guidelines and Myanmar Legislation on EIA

JICA Guidelines/WB OP4.12	Legislation of Myanmar	Gaps between JICA Guidelines/WB OP4.12 and Myanmar Legislation
(1) Underlying Principles		
1. Environmental impacts that may be caused by projects must be accessed and examined in the earliest possible planning stage. Alternatives or mitigation measures to avoid or minimize adverse impacts must be examined and incorporated into the project plan.	Procedures (A 9, 35, 62)	Article 9 of the Procedures requires IEE or EIA for proposed projects based on types of activities according to the defined thresholds. Article 35, 62 of the Procedures stipulates the analysis of feasible alternatives as well as mitigation measures.
2. Such examinations must be endeavored to include an analysis of environment and social costs and benefits in the most quantitative terms possible, as well as a qualitative analysis; these must be conducted in close harmony with the economic, financial, institutional, social and technical analyses of projects.	Procedures (A 36, 63)	Article 43, 69 of the Procedure stipulates to conduct of project analysis in close harmony with the society and economy.
3. The findings of the examination of environmental and social considerations must include alternatives and mitigation measures, and must be recorded as separate documents or as a part of other documents. EIA reports must be produced for projects in which there is a reasonable expectation of particularly large adverse environmental impacts.	Procedures (A 9, 35, 62)	Article 9 of the Procedures requires IEE or EIA for proposed projects based on types of projects activities according to the defined thresholds. Article 35, 62 of the Procedure stipulates the analysis of feasible alternatives as well as mitigation measures.
4. For projects that have a particularly high potential for adverse impacts or that are highly contentious, a committee of experts may be formed so that JICA may seed their opinions, in order to increase accountability.	Procedures (A 3)	Article 3 of the Procedures requires the establishment of Environmental Conservation Committee composed of at least five persons with necessary expertise. And the committee's duty is to recommend approval of the submitted IEE/EIA and EMP.

JICA Guidelines/WB OP4.12	Legislation of Myanmar	Gaps between JICA Guidelines/WB OP4.12 and Myanmar Legislation
(2) Examination of Measures		
1. Multiple alternatives must be examined in order to avoid or minimize adverse impacts and to choose better project options in terms of environment and social considerations. In the examination of measures, priority is to be given to avoidance of environmental impacts; when this is not possible, minimization and reduction of impacts must be considered next. Compensation measures must be examined only when impacts cannot be avoided by any of the aforementioned measures.	Procedures (A 35, 62)	Article 35, 62 of the Procedures stipulates the investigation of all potential environmental impacts including an analysis of feasible alternatives and mitigation measures. Conduct of compensation measure is not stipulated in the Procedures.
2. Appropriate follow-up plan and system, such as monitoring plans and environmental management plans, must be prepared; the costs of implementing such plans and systems, and the financial methods to find such costs, must be determined. Plans for projects with particularly large potential adverse impact must be accompanied by detailed environmental management plans.	Procedures (A35,36,62,63)	Article 35, 62 of the Procedures stipulates the analysis of feasible alternatives, mitigation measure as well as cost & benefit. Article 26, 63 of the Procedures requires the preparation of EMP for IEE/EIA-required projects.
(3) Scope of Impacts to Be Assessed		
1. The impacts to be accessed with regard to environmental and social considerations include impacts on human health and safety, as well as on the natural environment, that are transmitted through air, water, soil, waste, accident, water usage, climate change, ecosystem, fauna and flora, including trans-boundary or global scale impacts. These also include social impacts, including migration of population and involuntary resettlement, local economy such as employment and livelihood , utilization of land and local resources, social institution such as social capital and local decision-making institution, existing social infrastructure and services, vulnerable social groups such as poor and indigenous peoples, equality of benefits and losses and equality in the development process, gender, children's rights, cultural heritage, local conflicts of interest, infectious diseases such as HIV/AIDS, and working conditions including occupational safety. Items to be addressed in the specific project are narrowed down to the needed ones through the scoping process.	Procedures (A 56)	Article 56 of the Procedures stipulates that EIA investigation shall consider all biological, physical, social, economic, health, cultural and visual components of the study area, together with all pertinent legal matters relating to the environment, people and communities (including land use, resources use, and ownership of and rights to land and other resources) that may be affected by the Project during all project phases including pre-construction, construction, operation, decommissioning, closure, and post-closure, and shall identify and assess all Adverse Impacts, risks, Cumulative Impacts and Residual Impacts for environment, social and, if relevant, health that potentially could arise from the Project.
2. In addition to the direct and immediate impacts of projects, their derivative, secondary, and cumulative impacts as well as the impacts of projects that are indivisible from the project are also to be examined and assessed to a reasonable extent. It is also desirable that the impacts that can occur at any time throughout the project cycle should be considered throughout the life cycle of the project.	None	No laws were identified, which mentioned assessment and examination of derivative, secondary, and cumulative impacts? as well as the impacts of projects which are indivisible from the project.
(4) Compliance with Laws, Standards, and Plans		
1. Projects must comply with the laws, ordinances, and standards related to environmental and social considerations established by the governments that have jurisdiction over project sites (including both national and local governments). They must also conform to the environmental and social consideration policies and plans of the governments that have such jurisdiction.	The Environmental Conservation Law 2012 (A 28, 29)	No law directly prescribes the project's compliance with the laws, ordinances, and standards related to environmental and social considerations. Article 28 of The Environmental Conservation Law prescribes that "*No one shall, without the prior permission, operate business, work-site or factory, workshop which is required to obtain the prior permission under this Law*"

JICA Guidelines/WB OP4.12	Legislation of Myanmar	Gaps between JICA Guidelines/WB OP4.12 and Myanmar Legislation
		Article 29 of the law stipulated that "*No one shall violate any prohibition contained in the rules, notifications, orders, directives and procedures issued under this Law*."
(5) Social Acceptability		
1. Projects must be adequately coordinated so that they are accepted in a manner that is socially appropriate to the country and locality in which they are planned. For projects with a potentially large environmental impact, sufficient consultations with local stakeholders, such as local residents, must be conducted via disclosure of information at an early stage, at which time alternatives for project plans may be examined. The outcome of such consultations must be incorporated into the contents of project plans.	Procedures (A 16,36)	Article 16 of the Procedures stipulates that the EIA Review body shall have responsibility to make sure the EIA report complies with the Procedure (including public participation during the conduct of IEE/ EIA and EMP.
		Article 36 of the Procedures stipulates that EIA report shall contain the results of the public consultation and public participation processes, recommendations received from the public, and the Project Proponent's written responses to comments received during these processes.
2. Appropriate consideration must be given to vulnerable social groups, such as women, children, the elderly, and the poor and ethnic minorities, all members of which are susceptible to environmental and social impacts and may have little access to decision-making processes within society.	Procedures (A 7)	Article 7 of the Procedures prescribes the implementation of necessary actions for the project which potentially gives adverse impact on indigenous people and causes involuntary resettlement. However, the details of actions are not provided in the Procedures.
(6) Ecosystem and Biota		
1. Projects must not involve significant conversion or significant degradation of critical natural habitats and critical forests.	The Environmental Conservation Law 2012 (A 18)	The Environmental Conservation Law prescribes that relevant government departments/organizations shall carry out conservation, management, beneficial/sustainable use and enhanced regional cooperation of environmental natural resources.
	The Forest Law 1992 (A 40)	Article 40 of the Forest Law (1992) prescribes that causing any damage to reserved forest and its environment is prohibited and will be punished.
	The Protection of Wildlife and Conservation of Natural Areas Law 1994 (A 36)	Article 36 of The Protection of Wildlife and Conservation of Natural Areas Law prescribes that causing any damage to protected areas is prohibited and will be punished.
2. Illegal logging of forests must be avoided. Project proponents etc. are encouraged to obtain certification by forest certification systems as a way to ensure the prevention of illegal logging	The Forest Law 1992 (A 17, 40)	The Law stipulates that forest produce may only be extracted after obtaining a permit.
(7) Involuntary Resettlement		
1. Involuntary resettlement and loss of means of livelihood are to be avoided when feasible by exploring all viable alternatives. When, after such an examination, avoidance is proved unfeasible, effective measures to minimize impact and to compensate for losses must be agreed upon with the people who will be affected.	Procedures (A 7)	The Procedures prescribes implementation of necessary actions for the project which potentially cause involuntary resettlement. However, the details of actions are not provided in the Procedures.

JICA Guidelines/WB OP4.12	Legislation of Myanmar	Gaps between JICA Guidelines/WB OP4.12 and Myanmar Legislation
2. People who must be resettled involuntarily and people whose means of livelihood will be hindered or lost must be sufficiently compensated and supported by project proponents etc. in a timely manner. Prior compensation, at full replacement cost, must be provided as much as possible. Host countries must make efforts to enable people affected by projects and to improve their standard of living, income opportunities, and production levels, or at least to restore these to pre-project levels. Measures to achieve this may include: providing land and monetary compensation for losses (to cover land and property losses), supporting means for an alternative sustainable livelihood, and providing the expenses necessary for the relocation and re-establishment of communities at resettlement sites.	Land Acquisition Act 1894 (A 3)	Article 3 of the Land Acquisition Act stipulates that a person who has a land right would be entitled to claim a compensation if the land were acquired for the project.
	Farmland Rules 2012 (A 64)	Article 64 of Farmland Rules stipulates compensation in farmland acquisition for the interest of the State or public.
	Land Acquisition Act 1894 (A 23)	Article 23 of the Act stipulates that damages on standing crops and trees, on land, on properties, incidental to relocate residence or business and losses of profits due to land acquisition are considered for compensation although it does not clearly state to support PAPs can improve or at least restore their standard of living. These laws do not clearly state any more details of compensation and supporting measures.
3. Appropriate participation by affected people and their communities must be promoted in the planning, implementation, and monitoring of resettlement action plans and measures to prevent the loss of their means of livelihood. In addition, appropriate and accessible grievance mechanisms must be established for the affected people and their communities.	Procedures (A 15)	Article 15 of the Procedures describes that relevant agencies, institutions, civil society organizations, and project-affected persons are invited as appropriate to provide comments and suggestions on the IEE/ EIA/ EMP reports. However, it does not describe grievance mechanism.
	Land Acquisition Act 1894 (A 5A, 18)	Article 5A of the Land Acquisition Act stipulates that any person whose land is affected (acquired) can claim the objection for the land acquisition within thirty days.
4. For projects that will result in large-scale involuntary resettlement, resettlement action plans must be prepared and made available to the public. In preparing a resettlement action plan, consultations must be held with the affected people and their communities based on sufficient information made available to them in advance. When consultations are held, explanations must be given in a form, manner, and language that are understandable to the affected people. It is desirable that the resettlement action plan include elements laid out in the World Bank Safeguard Policy, OP4.12, Annex A.	None	No laws specifically mention about the requirement of resettlement action plans for large-scale involuntary resettlement.
		According to GAD (General Administration Department) of MoHA (Ministry of Home Affairs), Land Acquisition and Resettlement Action Plan (LARAP) will be required for the large-scale developments and it will be approved by the GAD.
(8) Indigenous People		
1. Any adverse impacts that a project may have on indigenous peoples are to be avoided when feasible by exploring all viable alternatives. When, after such an examination, avoidance is proved unfeasible, effective measures must be taken to minimize impacts and to compensate indigenous people for their losses.	Procedures (A 7)	The Procedures prescribes implementation of necessary actions for the project which potentially gives impacts on indigenous people but without the details.
2. When projects may have adverse impacts on indigenous people, all of their rights in relation to land and resources must be respected in accordance with the spirit of relevant international declarations and treaties, including the United Nations Declaration on the Rights of indigenous Peoples. Efforts must be made to obtain the consent of indigenous peoples in a process of free, prior, and informed consultation.	Procedures (A 7)	The Procedures prescribes implementation of necessary actions for the project which potentially gives impacts on indigenous people but without the details.
3. Measures for the affected indigenous peoples must be prepared as an indigenous peoples plan (which	Procedure (A7)	The procedure prescribes that project proponent shall additionally comply with separate procedure

JICA Guidelines/WB OP4.12	Legislation of Myanmar	Gaps between JICA Guidelines/WB OP4.12 and Myanmar Legislation
may constitute a part of other documents for environmental and social consideration) and must be made public in compliance with the relevant laws and ordinances of the host country. In preparing the indigenous peoples plan, consultations must be made with the affected indigenous peoples based on sufficient information made available to them in advance. When consultations are held, it is desirable that explanations be given in a form, manner, and language that are understandable to the people concerned. It is desirable that the indigenous peoples plan include the elements laid out in the World Bank Safeguard Policy, OP4.10, Annex B.		when Indigenous People might be affected.
(9) Monitoring		
1. After projects begin, project proponents etc. monitor whether any unforeseeable situations occur and whether the performance and effectiveness of mitigation measures are consistent with the assessment's prediction. They then take appropriate measures based on the results of such monitoring.	Procedures (A 3, 71-75)	The Procedures prescribes that a project proponent shall prepare and submit an EMP with the IEE/ EIA reports. Environmental Conservation Committee shall carry out monitoring of the implementation of the approved EMP by the project proponent although there was little information regarding the method or terms of conducting monitoring
2. In cases where sufficient monitoring is deemed essential for appropriate environmental and social considerations, such as projects for which mitigation measures should be implemented while monitoring their effectiveness, project proponents etc. must ensure that project plans include feasible monitoring plans.	Procedures (A 3)	The Procedures prescribes that a project proponent shall prepare and submit an EMP with the IEE/ EIA reports.
3. Project proponents etc. should make efforts to make the results of the monitoring process available to local project stakeholders.	None	There are no laws identified which state that project proponents etc. should make efforts to make the results of the monitoring process available to local project stakeholders.

Note: JICA - JICA Guidelines for Environmental and Social Considerations, WB - World Bank Safeguard Policy, Procedures - Environmental Impact Assessment Procedures (2015), A - Article.
Source: JICA Guidelines for Environmental and Social Considerations (2010.4) and World Bank OP 4.12 and relevant Myanmar legislation

10.1.6 Responsibility of Related Organizations

For sub-projects of road and bridge sector, the implementing and responsible agency is the MoC (Ministry of Construction), which controls all environmental management and monitoring process of sub-projects. To share the information between MoC and MoNREC (i.e., by attending meetings regarding environmental issues) and to prepare the environmental reports (i.e. IEE and EIA), the MoC assigns a contact person. Regarding the power supply sector, the ESE is responsible for On-grid projects while DRD is responsible for off-grid projects. The DRD is also the implementing and responsible agency for the water supply sector.

10.2 Road and Bridge Sector

10.2.1 Outline of the Project

The outline of sub-projects of Road and Bridge sector is shown in Table 10-2-1 below.

Table 10-2-1 The Outline of Sub-Project of the Road and Bridge sector (As of April 2016)

No.	Project Component	State/Region	Length
1	MoC-03: Road Improvement(2) Bridge construction or renovation/ Reinforced bridge construction (7) Box Culvert construction(1) Drainage(1) Retaining wall(1) Guard rail(1)	Kayin	77.76 km
2	MoC-05: Road Improvement(2) Bridge construction or renovation/ Reinforced bridge construction (6)	Sagaing	52.96 km
3	MoC-06: Road Improvement(2)	Bago	16.64 km
4	MoC-07: Road Improvement(2) Bridge construction or renovation/ Reinforced bridge construction (1) Box Culvert construction(9) Drainage(1)	Magway	14.72 km
5	MoC-17: Road Improvement(2) Bridge construction or renovation/ Reinforced bridge construction (5) Box Culvert construction(34) Drainage(1) Retaining wall(1) Guard rail(1)	Shan	39.20 km
6	MoC-18: Road Improvement(3) Box Culvert construction(17) Drainage(1) Retaining wall(1) Guard rail(1)	Ayeyarwady	32.32 km
7	MoC-22: Road Improvement(2) Box Culvert construction(13)	Shan	14.60km

Source: The Preparatory Survey Team

10.2.2 Environmental Screening of the Project

The categorization of IEE and EIA based on the EIA procedure is shown in Table 10-2-2.

Table 10-2-2 Categorization of IEE and EIA (Transportation)

No.	Type of Investment Project	Size of Project which requires IEE	Size of Project which requires EIA
127	Bridges, River Bridges and Viaducts (New construction)	Length ≥ 0.2 km but < 2 km	Length ≥ 2 km
128	Bridges, River Bridges and Viaducts (Upgrading)	Length ≥ 300m	All activities where the Ministry requires that the Project shall undergo EIA
130	Expressways and Highways (ASEAN Highway Standard; new construction or widening with one lane or more)	Length ≥ 2 km but < 50 km	Length ≥ 50 km
131	Other Roads (state, region, urban; new construction or widening ≥ one lane)	Length ≥ 50 km but < 100 km	Length ≥ 100 km
132	**Road improvement (national, provincial and district roads)**	**Length ≥ 50 km**	**All activities where the Ministry requires that the Project shall undergo EIA**

Source: Environmental Impact Assessment Procedures (2015)

Based on the discussion with and confirmation by the ECD (MoNREC), it is necessary to consider some of the road sub-projects as one route when they are linked together (see Table 10-2-3). And IEE study is

required for Rd-01 and Rd-05 because the total length of each road is over 50 km. The remaining sub-projects necessitate neither IEE nor EIA.

According to the JICA Guideline (2010), there is no large-scale sub-projects (not sensitive sector), or no sub-project has sensitive character or is inside a sensitive area.

Table 10-2-3 Environmental Condition of each Sub-Project

No	Name of the Road	Road No.	State/Region	Length in Kilometer
Rd-01	Taungoo – Laiktho – Yardo – Loikaw - Hopon Road	MoC 03+ 06+17	Kayin + Bago + Shan	133.6
Rd-02	Gangaw – Aika Road	MoC 07	Magway	14.72
Rd-03	Nga Thaing – Gwa Road	MoC 18	Ayeyarwady	32.32
Rd-04	Tat Kone – Highway Connecting Road	MoC 22	Shan	14.60
Rd-05	Mandalay - Dagaung - Bhamaw - Myitkyina Road	MoC5	Sagaing	56.2

Source: the Preparatory Survey Team

10.2.3 Alternatives

Since all sub-projects are to improve the existing roads, alternative routes are not considered.

10.2.4 Scoping Results

The scoping result of the sub-projects are shown in Table 10-2-4.

Table 10-2-4 Scoping Results of Road and Bridge Sector

	№	Evaluation Item (from the JICA Guidelines)	Rating		Reason of the Rating
			Pre/During Construction	Operation Phase	
Pollution	1	Air pollution	B－	C	**Construction phase:** Temporary negative impact is expected on air quality due to the use of construction machines and equipment. **Operation phase:** Some negative impact is expected due to the increase in traffic number. However, expected impact is very limited because the all site are located in mountainous or rural areas.
	2	Water pollution	B－	D	**Construction phase:** Turbid water may be generated by earth works and excavation in the river where bridge construction is planned. Additionally, organic polluted water may be discharged from base camp. **Operation phase:** No impact is expected
	3	Waste	B－	D	**Construction phase:** Construction waste such as waste soil and cutting trees are expected. Additionally, domestic waste and night soil may be generated from construction base camp. **Operation phase:** No impact is expected
	4	Soil contamination	D	D	**Construction and Operation phase:** No impact is expected
	5	Noise and vibration	B－	C	**Construction phase:** Noise is expected to be generated due to works of construction machines and equipment. **Operation phase:** Noise generation is expected because of the increase in traffic number and travelling speed. However, the expected impact is very limited because the all site are located in mountainous or rural areas
	6	Ground subsidence	D	D	**Construction and operation phase:** No impact is expected since activities which cause ground subsidence is not expected.
	7	Odor	D	D	**Construction and operation phase:** No impact is expected since activities which cause odor are not expected.
	8	Bottom Sediment	D	D	**Construction and Operation phase:** No impact is expected
Natural environment	9	Protected area	B－	D	**Construction phase:** There is conservation forests/plantation (not national parks) along the road. Although a large-scale tree cutting is not planned, some negative impact is expected. **Operation phase:** No impact is expected
	10	Ecosystem	C	C	**Construction and Operation phase:** The extent of impact is unknown at this stage.
	11	Hydrology	D	D	**Construction and Operation phase:** No activities cause negative impact on hydrological situation of river.
	12	Topography and geology	C	C	**Construction and operation phase:** Cutting of land is expected. However, no notable topographical and geological sites are located in the project area and the impact is limited.
Social environment	13	Involuntary resettlement	B－	D	**Pre-Construction phase:** No resettlement is expected but land acquisition along some routes may be caused. **Operation phase:** No impact is expected
	14	The poor	C	B＋	**Construction phase:** Some positive impacts (e.g. increased working opportunities) are expected. **Operation phase:** Some impacts are expected by improvement of access
	15	Indigenous and ethnic people	C	B＋	**Construction phase:** Some positive impacts (e.g. increased working opportunities) are expected. **Operation phase:** Some impacts are expected by improvement of access
	16	Local economy such as employment and livelihood	D	B＋	**Pre-construction phase:** Some shops are observed in the project area. However, the number of residents and workers affected is limited. **Operation phase:** Some impacts are expected.
	17	Land use and utilization of local resources	C	D	**Pre-construction phase:** Some impacts are expected due to the land acquisition of agricultural land etc. **Operation phase:** No impact is expected.
	18	Water usage	D	D	**Construction phase:** No impact is expected **Operation phase:** No impact is expected

	№	Evaluation Item (from the JICA Guidelines)	Rating		Reason of the Rating
			Pre/During Construction	Operation Phase	
	19	Existing social infrastructures and services	B－	B＋	**Pre-Construction and Construction phase:** Traffic restriction might give impact on the access to emergency services and social infrastructure (e.g. school, hospital etc.). **Operation phase:** Few positive impact is expected (e.g. improvement of access to social services etc.).
	20	Social institutions such as local decision making institutions	D	D	**Construction and operation phase:** No impact is expected, since local decision-making institutions at a village, township and State level will continue after the construction.
	21	Misdistribution of benefit and damage	D	D	**Construction and operation phase:** No misdistribution of benefit and damage by the road construction is expected.
	22	Local conflict of interests	D	D	**Construction and operation phase:** Local conflict of interests caused by this project is not expected.
	23	Cultural heritage	D	D	**Pre-Construction, construction and operation phase:** Religious and cultural facilities are not observed at the project site.
	24	Landscape	D	D	**Construction and operation phase:** No impact is expected because those projects are to improve the existing roads.
	25	Gender	D	D	**Construction and operation phase:** No negative impacts specifically on women are expected.
	26	Right of children	D	D	**Construction and operation phase:** No negative impacts specifically on children's right are expected.
	27	Infectious diseases such as HIV/AIDS	D	D	**Construction and operation phase:** No impact is expected because all routes are domestic road, and not international corridor.
	28	Labor environment	D	D	**Construction and operation phase:** No impact is expected.
Others	29	Accidents	B－	C	**Construction phase:** Construction vehicles may use existing local road near residential areas, thus the number of traffic accident may increase. **Operation phase:** Although an increase of travelling speed is expected, the alignment will be better.
	30	Cross boundary impacts and climate change	D	D	**Construction and operation phase:** No impact is expected

Note:

A+/-: Significant positive/negative impact is expected. B+/-: Some positive/negative impact is expected.

C: Extent of impact is unknown at this stage D: No impact is expected.

Source: the Preparatory Survey Team

10.2.5 Approach for Environmental and Social Considerations

In order to minimize environmental effects, specifically the resettlement of people, the width of road pavement can be reduced up to 26 feet considering the small number of the traffic of proposed sub-projects. Meanwhile, the Preparatory Survey Team needs to have adequate and continuous discussion with the MoC over environmental matters.

At the same time, even with the said minimum road width (26 feet), some houses might need to be resettled. Therefore, the Preparatory Survey Team will prepare Resettlement Action Plan (RAP) in accordance with JICA guidelines and assist DoH in MoC.

During the construction and operation stage, periodical environmental monitoring is necessary. In order for MoC to duly monitor the condition of pollutants such as SO2, NO2 CO etc., it is recommended that the contract between MoC and contractor includes (1) installment of measurement equipment before construction by the contractor and (2) contractor's obligation to implement periodical monitoring.

10.2.6 Prediction of Environmental Impact

The prediction of environmental impact of the Road and Bridge sector sub-projects is shown in the following table.

Table 10-2-5 Prediction of Environmental Impact for Road and Bridge Sector

	Items		Situation and Prediction
Pollution	1	Air Pollution	Machines and vehicles used during construction are likely to generate air pollution, most prominently in the form of dispersal of sandy dust. Normal measures can reduce the negative impacts.
	2	Water Contamination	Most of the sub-projects cross a number of streams and creeks. But agricultural land and forest land are mostly located next to those streams and creeks. People take water mostly from those rivers and streams as well as from dug wells and tube wells. No major work is planned for bridges (i.e. a few culverts and/or small bridges), so no significant negative impact is expected. Nevertheless, the above areas should be kept in mind so that construction works do not result in soil or water contamination.
	3	Waste	Significant amount of general wastes such as pet bottles, plastics and kitchen wastes was not observed at project sites. Waste condition is good enough so far, because all the sub-projects are located in rural or less-populated areas. Construction workers and camps are likely to generate waste to some extent, but due to relatively less population and poor economic activities no significant adverse impact is expected.
	4	Soil Pollution	No major work is planned for bridges (i.e. a few culverts and/or small bridges), so no significant negative impact is expected. Nevertheless, the above areas should be kept in mind so that construction works do not result in soil or water contamination.
	5	Noise and Vibration	Noise and vibration level could temporarily be higher during construction due to operation of vehicles and use of construction equipment. In the operation phase, impact of the noise could be accelerated due to an increase in the frequency and speed of vehicles. Normal measures can reduce those adverse impacts.
	6	Ground subsidence	The survey record shows no ground subsidence is expected in all sub-project sites, but embankment widening is likely to cause ground subsidence unless the work is properly done.
	7	Odor	sub-project sites are in environmentally sound areas. Although some bad odor from asphalt pavement works during the construction may temporarily affect people, no other significant negative impact is expected.
	8	Bottom Sediment	No major work is planned for large-scaled bridges, so no significant negative impact is expected.
Natural Environment	**9**	Protection Area	The sub-project site (existing road) passes through reserved forests, public protected forest and some natural forested areas. And some road widening works, which would affect nearby mountain sides to some extent, in those forests and natural areas are planned. MoC-03, MoC-17 and MoC-18 are expected to affect environment (mountain sides) but it is not very significant (up to 10 or 20 feet) because they are just a rehabilitation work and the existing formation width is mostly 40 feet, which is the maximum requirement of the sub-project. Therefore, no significant impact is expected.
	10	Fauna, Flora and Biodiversity	No wildlife or tree species that require special attention/ protection has been identified within the sub-project sites. But there are many forest plantations (both government and private) and natural forests along the project sites (MoC-03, MoC-17 and MoC-18). Construction works may affect those plantations and natural forests, especially if earthwork matters from embankment widening are disposed of carelessly.
	11	Hydraulic Situation	All other sub-projects cross a number of streams and creeks along the sites. But no significant changes are expected.
	12	Topography and Geology	The soil types mainly found in the site are (1) clay and clay swampy soils, (2) swampy soils, (3) lateritic soils, and (4) yellow brown forest soils. No large-scale land alteration is expected due to construction work.
Social Environment	13	Involuntary Resettlement	No involuntary resettlement is expected, because the sub-projects are just a rehabilitation work of the existing roads. Formation width is mostly more than 40 feet even in some resident areas (i.e. villages).
	14	Poor	Most of the people living in the project sites are ethnic people and earn very low income from traditional agriculture business. It is expected after the implementation of sub-projects that they will get better access to main townships and benefit from improved goods' flow, better health care and other socio-economic improvements.

	Items		Situation and Prediction
	15	Indigenous or Ethnic people	Most of the people who live in project sites are ethnic minorities such as Kayin and Shan. This is because all the sub-projects are located in regional areas where most of the residents are ethnic minority.
	16	Local Economies, such as employment, livelihood	Economy in the project areas is largely dependent on agriculture (i.e. rice, corn, banana and sugar cane) and some businesses (e.g. sugar milling and Nickel mining) and grocery shop management. No alteration is expected for the local economy. During construction, some people are likely to be employed as a work force for road construction. Food and drink shops are also expected to benefit from an increase in demand.
	17	Land use and utilization of local resources	Paddy fields, banana and sugar cane farms, reserved forests and public protected forests occupy sub-project sites. No change is expected for the current state since the sub-projects are the rehabilitation projects.
	18	Usage of water and water right	People take water mainly from wells and some villages from river. No water right issue is found in the sub-project sites. Neither any change nor negative impact is expected by the sub-project.
	19	Existing social infrastructure and services	There are some social infrastructures in all sub-project sites, such as public hospital, primary schools, churches, Buddhist monasteries and Pagodas. sub-projects are not expected to affect those social infrastructures.
	20	Social Institution such as local decision-making institution	Kayan Pyi Thit Party in Shan State (MoC-17) is found as a strong decision-making institution, but no such kind of strong institutions are identified in other sub-project sites.
	21	Misdistribution of benefits and damages	Misdistribution of benefits and damages is unlikely to happen among local communities or regional institutions.
	22	Local conflict of interest	Though all the sub-project sites are under the control of the Government of Myanmar (road management under DoH, MoC), sub-projects (MoC-03) is in ethnic areas. For these projects, it is still necessary to take careful approach and issue timely security alert during the implementation and monitoring of sub-project works.
	23	Cultural Heritage	No cultural heritage is identified in the project sites.
	24	Landscape	As it is a rehabilitation work, sub-projects are not expected to negatively affect the beauty of existing landscape (crops and farmlands, river, natural forests and forest plantations, forest mountains and rock mountains).
	25	Gender	According to normal measures in compliance with the JICA guidelines, no gender inequality is expected to be generated by the implementation works of sub-projects.
	26	Children's Right	According to normal measures in compliance with JICA guidelines, no children' right is affected by the implementation works of the sub-projects.
	27	Infection diseases such as HIV/AIDS	Sub-Projects are not expected to induce the infectious diseases such as HIV/AIDS.
	28	Work Environment	According to normal measures in compliance with JICA guidelines, no notable damage in the work environment is expected to happen.
Others	29	Accident	Increase in the number and the speed of vehicles may induce traffic accidents.
	30	Global Warming	As it is a rehabilitation work, sub-projects are not expected to contribute to global warming in a significant scale.

Source: The Preparatory Survey Team

10.2.7 Evaluation of Environmental Impact

The possible impacts of the road and bridge sector sub-projects are identified and the extent of each impact by rating for the 30 environmental items (of pollution, natural environment and social environment) is shown below. The results are shown together with the scoping results in Table 10-2-6.

Table 10-2-6 Evaluation of Environmental Impact

	No	Evaluation Item (from JICA Guidelines)	Scoping Result		Evaluation		Reasons of Evaluation
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	
Pollution	1	Air pollution	B-	C	B-	D	**Construction phase:** Temporary negative impact is expected on air quality due to construction machines and equipment. **Operation phase:** Negative impact is expected due to the increase in traffic number. However, expected impact is very limited.
	2	Water pollution	B-	D	B-	D	**Construction phase:** Turbid water may be generated by earth works and excavation in the river where bridges are planned. Additionally Organic polluted water may be discharged from base camp. **Operation phase:** No serious impact is expected
	3	Waste	B-	D	B-	D	**Construction phase:** Construction waste such as waste soil and cutting trees are expected. Additionally domestic waste and night soil may be generated from construction base camp. **Operation phase:** No serious impact is expected
	4	Soil contamination	D	D	D	D	**Construction phase:** No impact is expected. **Operation phase:** No impact is expected.
	5	Noise and vibration	B-	C	B-	D	**Construction phase:** Noise generation is expected due to works of construction machines and equipment. **Operation phase:** Noise generation is expected because of the increase in traffic number and travelling speed. However, the expected impact is very limited.
	6	Ground subsidence	D	D	D	D	**Construction and operation phase:** No impact is expected since activities which cause ground subsidence not expected.
	7	Odor	D	D	D	D	**Construction and operation phase:** No impact is expected since activities which cause odor are not expected.
	8	Bottom Sediment	D	D	D	D	**Construction phase:** No impact is expected since there are not any polluted lands nearby project area. **Operation phase:** Road operation which causes impacts on sediment quality is not expected.
Natural environment	9	Protected area	B-	D	B-	D	**Construction phase:** There are forest reserves and public protected forest along roads. Cutting many tree will not be expected but some negative impact is expected. **Operation phase:** No impact is expected during operation.
	10	Ecosystem	C	C	D	D	**Construction and Operation phase:** Any designated protected areas and considerable species habitats have not been identified in the sub-project area.
	11	Hydrology	D	D	D	D	**Construction and Operation phase:** No activities give negative impact to hydrological situation of the rivers.
	12	Topography and geology	C	C	D	D	**Construction and operation phase:** Cutting land is expected. However, considerable topography and geological sites are not located in the project area and the impact is limited.
Social environment	13	Involuntary resettlement	B-	D	B-	D	**Pre-Construction phase:** No resettlement is expected. But land acquisition of only one area may be caused. **Operation phase:** No impact is expected
	14	The poor	C	B+	B+	B+	**Pre-Construction phase:** Few positive impacts are expected such as working opportunity. **Operation phase:** Few positive impact is expected by improvement of access
	15	Indigenous and ethnic people	C	B+	D	D	**Pre-Construction phase:** There are indigenous or ethnic people at the sub-project site. But no serious impact is expected. **Operation phase:** No obvious impact is expected

	No	Evaluation Item (from JICA Guidelines)	Scoping Result		Evaluation		Reasons of Evaluation
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	
	16	Local economy such as employment and livelihood	D	B+	D	B+	**Pre-construction phase:** Some shops are observed in sub-project sites. However the number of residents and workers affected is limited. **Operation phase:** Few impacts are expected.
	17	Land use and utilization of local resources	C	D	D	D	**Pre-construction phase:** Few impacts are expected. **Operation phase:** Few impacts are expected.
	18	Water usage	D	D	D	D	**Construction phase:** No impact is expected. **Operation phase:** No impact is expected.
	19	Existing social infrastructures and services	B-	B+	B-	B+	**Pre-Construction and Construction phase:** Traffic restriction might give impact on the access to such as emergency services. **Operation phase:** Few positive impact is expected
	20	Social institutions such as local decision making institutions	D	D	D	D	**Construction and operation phase:** No impact is expected, since local decision making institute represented by village, township and state will continue after the construction.
	21	Misdistribution of benefit and damage	D	D	D	D	**Construction and operation phase:** Misdistribution of benefit and damage caused by the road construction is not expected.
	22	Local conflict of interests	D	D	D	D	**Construction phase:** No impact is expected. **Operation phase:** No impact is expected
	23	Cultural heritage	D	D	D	D	**Pre-Construction and Construction Phase:** Religious and cultural facility are not observed at the project site. **Operation phase:** No impact is expected
	24	Landscape	D	D	D	D	**Construction phase:** Few impact is expected **Operation phase:** There are no law-based designated landscape areas around project area.
	25	Gender	D	D	D	D	**Construction and operation phase:** Negative impacts specified for women are not expected.
	26	Right of children	D	D	D	D	**Construction and operation phase:** Negative impacts specified for children are not expected.
	27	Infectious diseases such as HIV/AIDS	D	D	D	D	**Construction phase:** Few impact is expected. **Operation phase:** Operation which causes infectious diseases is not expected.
	28	Labor environment	D	D	D	D	**Construction phase:** Construction work environment needs to be considered in accordance with relevant laws and regulations. **Operation phase:** No impact is expected.
Others	29	Accidents	B-	C	B-	D	**Construction phase:** Construction vehicles may use existing local road near residential areas, thus number of traffic accident may increase. **Operation phase:** Although the increased of travelling speed is expected, the alignment will be better.
	30	Cross boundary impacts and climate change	D	D	D	D	**Construction phase:** Significant deforestation is not expected on this project, and number of construction machines is limited, thus few impact is expected. **Operation phase:** No impact is expected.

Source: JICA Preparatory Survey Team

10.2.8 Mitigation Measure

Mitigation measures, which avoid, minimize, eliminate and/or reduce above-mentioned negative impacts, were examined for respective items. They cover the whole stages (from planning, construction to operation stage) in order for the Project to achieve the intended objectives with minimum environmental impacts. The measure are summarized in Table 10-2-7 below.

Table 10-2-7 Mitigation Measure against Negative Impact and Environmental Management Plan

	No	Evaluation Item (from JICA Guidelines)	Major Mitigation Measures		Responsibility	
			Pre and During Construction phase	Operation phase	Implementation Agency	Responsible Agency
Pollution	1	Air pollution	[Dust] ✓ Water sprinkling near residential area ✓ 20 kph speed limit for construction machines at construction sites adjacent to settlement areas ✓ Use of low-emission construction machinery to minimize the emission of exhaust gases	Not required	Contractor	DoH, MoC
	2	Water pollution	[Turbid water and other items] ✓ Discharge through sedimentation pond and silt fence ✓ Installation of portable toilet for workers ✓ Appropriate management of waste and construction machines ✓ Appropriate explanation and response given to affected fishermen, if necessary	Not required	Contractor	DoH., MoC
	3	Waste	[Construction waste (trees and waste soil)] ✓ Consideration of the possibility of reuse before the construction waste is disposed of at disposal site [Garbage from base camp] ✓ Garbage at workers camp and waste oil shall be brought to disposal site or facility [Night soil] ✓ Introduction of temporary sanitation facility such as septic tank to the workers camp. ✓ Disposal of earthwork matters from embankment widening at the specific disposal sites after the confirmation with and getting permission from Forest Department or relevant community.	✓ Demolished waste concrete shall be reused and/or disposed of in designated disposal sites.	[Const.] Contractor [Operation] DoH, MoC	DoH, MoC
	5	Noise and vibration	[Construction noise] ✓ Installation of noise barrier and selection of low-noise equipment ✓ Avoidance of the use of heavy equipment during night time ✓ Notice of the construction schedule to surrounding communities to obtain their consensus	Not required	Contractor	DoH, MoC
Natural environment	10	Ecosystem	✓ Construction development area shall be marked and not be disturbed ✓ Proper storing of hazardous waste material properly before final disposal	✓ Appropriate land use management not to develop natural area along the road ✓ Set up of sign boards where animals cross the	[Const.] Contractor [Operation] Local	DoH, MoC

	№	Evaluation Item (from JICA Guidelines)	Major Mitigation Measures		Responsibility	
			Pre and During Construction phase	Operation phase	Implementation Agency	Responsible Agency
			✓ Planting trees, vegetation, sodding in the public space. ✓ Installation of sediment to ponds, silt fence and portable toilet not to disturb habitats of aquatic lives	road from the view of natural conservation	government	
	11	Hydrology	✓ Design of bridges with sufficient capacity ✓ Installation of sufficient drainage facilities on bypass ✓ Secure waterways in construction area	Not required	Contractor	DoH, MoC
Social environment	13	Involuntary resettlement	✓ Appropriate compensation and social assistance in accordance with A-RAP	✓ Assessment of whether resettlement was conducted properly with regards to relevant people's livelihood and their restoration and/or enhancement of living standards in accordance with RAP	Settlement & Land Record Department (SLRD under MoALI), DoH, GAD	DoH, MoC
	14	The poor	✓ Appropriate social assistance in accordance with A-RAP	✓ Assessment of whether resettlement was conducted properly with regards to relevant people's livelihood and their restoration and/or enhancement of living standards in accordance with RAP	SLRD, DoH, GAD	DoH, MoC
	16	Local economy such as employment and livelihood	✓ Appropriate compensation and social assistance in accordance with A-RAP	✓ Assessment of whether resettlement was conducted properly with regards to relevant people's livelihood and their restoration and/or enhancement of living standards in accordance with RAP	SLRD, DoH, GAD	DoH, MoC
	17	Land use and utilization of local resources	✓ Appropriate land acquisition and compensation for agricultural areas ✓ Assistance with the establishment of land use map in every township	✓ Management of appropriate land use in accordance with land use plan newly approved and established in every township and village	[Const.] SLRD, MOALI, consultants [Operation] Local government	DoH, MoC
	18	Water usage	✓ The preparation of drainage facility, sedimentation pond and sheet in accordance with the site condition to prevent turbid water generated by earthwork ✓ Proper collection of domestic waste and other construction waste and disposal of them in the designated dumping site. ✓ Installation of portable toilet	Not required	[Const.] Contractor	DoH, MoC
	19	Existing social infrastructures and services	✓ Construction of diversion road and the connection of existing community roads to new bypass.	Not required	Contractor	DoH, MoC
	22	Local conflict of interests	✓ Local workforce prioritized for construction of road and bridges ✓ Implementation of appropriate education for hired workers from other areas	Not required	Contractor	DoH, MoC

	№	Evaluation Item (from JICA Guidelines)	Major Mitigation Measures		Responsibility	
			Pre and During Construction phase	Operation phase	Implementation Agency	Responsible Agency
	27	Infectious diseases such as dengue and HIV/AIDS	✓ Installation of sufficient drainage facilities not to provide habitat for vector mosquito ✓ Provision of adequate temporary sanitation facilities ✓ Enforcement of medical screening and periodical medical check-ups ✓ Awareness raising of labor about the prevention of spread of infectious diseases such as HIV/AIDS	Not required	Contractor	DoH, MoC
Others	29	Accidents	✓ Deployment of flagmen at the gate and crossing points of the construction vehicles ✓ Installation of safety sign board ✓ Installation of fence around the construction site to keep out local people such as children ✓ Installation of lightning in the night time ✓ Installation of parking for idling construction machines ✓ Restriction on mobilization speed in the construction site ✓ Safety training for the workers ✓ Safety patrol at the construction site by supervisors	Not required	Contractor	DoH

Source: the Preparatory Survey Team

10.2.9 Environmental Monitoring Plan

The environmental monitoring of regional roads will be undertaken by the Department of Highways in MoC. The Environmental Management Plan (EMP), which incorporates mitigation measures, monitoring as well as the roles of implementing, responsible and supervising organizations, is prepared as shown in Table 10-2-8. DoH is responsible for ensuring that the contractor complies with the each mitigation measure specified in the EMP of the Project during the construction period. The compliance of the Contractor could be presented in a tabulated form showing each mitigation measure, corresponding level of compliance (*yes, no or partial*), and remarks justifying *"no" or "partial"* Compliance level. The corrective actions are presented in matrix form with the following details: (i) non-compliance/implementation of mitigation measures, (ii) issues and concerns, (iii) responsibility for implementation of recommended actions. The DoH will prepare a monthly monitoring report which is submitted to supervision consultants (JICA and Project Management Unit) and then delivered to the Project Monitoring Committee (as an independent group). The Project Monitoring Committee will be formed at grass-root level by the GAD, community leaders, and other concerned parties within each sub-project site.

Table 10-2-8 Environmental Monitoring Plan (Road and Bridge sector)

Category	Item	Method of Monitoring	Monitoring Place/Point	Frequency (Period)	Referable Standards and Legislation	Implementing Organization	Responsible and/or Supervising Organization	Responsible Agency for monitoring Cost
(I) Planning Stage								
1) Approval/ permission etc.	Permission of Project Implementation and Environmental Clearance Certificate	1) Permission procedures of projects for public purpose 2) Environmental Clearance Certificate by MoNREC	FERD, MoC, MoNREC	Before commencement of construction work	1) Environmental Conservation Law (2012), 2) Environmental Conservation Rules and Regulation (2015)	MoC, DoH	FERD, MoC, DoH, MoNREC	MoC, DoH
2) Social Environment	Implementation of compensation and resettlement assistance to PAPs, and resulting existing living condition and livelihood of PAPs	Interview survey on PAPs and PAUs	PAPs and PAUs in all project areas	Before commencement of construction work	1) Land-related legislation of Myanmar 2) JICA guidelines	MoC, DoH	GAD	MoC, DoH
	Securing necessary land clearance for the project site	Site observation	Areas to be secured	Before commencement of construction work	Land-related legislation of Myanmar	MoC, DoH	GAD	MoC, DoH
	Designs and Specifications adaptable to climate change	Verifying designs and specifications	MoC	Before commencement of construction work	The Highways Law (2000)	MoC, DoH	Consultants, DoH and MoC	MoC, DoH
	Stakeholders' Meetings and Information Disclosures	Explanation of project plans and getting public opinions about their concerns, suggestions and requests.	All project sites	Before commencement of construction work	1) Myanmar Environmental Conservation Rules and Regulations (2015) 2) JICA guidelines	MoC, DoH	Consultants, DoH and MoC	MoC, DoH
(II) Construction Stage								
1) Social Environment	Increase in traffic congestion and disturbance of access to public facilities, etc.	1) Collection of complaints 2) Physical observation of road traffic	Construction sites and surroundings	Daily at construction work	N/A	CT	CT, DoH, GAD, MC, Consultants	CT

Category	Item	Method of Monitoring	Monitoring Place/Point	Frequency (Period)	Referable Standards and Legislation	Implementing Organization	Responsible and/or Supervising Organization	Responsible Agency for monitoring Cost
		condition 3) Hearing 4) Warning signs						
	Safety, Public health and Sanitation	1) Assignment of full-time HSE officers 2) Safety plan, fire protection plan, control of hazardous materials, PPEs 3) Warning signs 4) Sanitary toilets, garbage bins, runoff controls, waste management in camps	Construction sites and surroundings	Depends on the symptom of workers and inhabitants within and around construction site	Health Law, Labour Safety Law	CT	CT, DoH, GAD, MC, Consultants	CT
	Infectious Diseases such as HIV/AIDS	Medical examination of construction workers and people making contact with HIV/AIDS sufferers, if any	Construction sites and surroundings	Before and after construction stage as required	Health Law, Labour Safety Law, Prevention of HIV/AIDS Law	CT	CT, DoH, GAD, MC, Consultants	CT
	Working condition	1) Medical check-ups and symptom of workers 2) First Aid Cases	Construction sites and surroundings	As required	Labour Safety Law	CT	CT, DoH, GAD, MC, Consultants	CT
	Natural disaster/risks	Records of natural disaster and hazards in the project area	Construction sites and surroundings	Daily	Disaster Prevention Law	CT	CT, , GAD, DoH, MC, Consultants	CT
	Accident	Records of accidents in the project area	Construction sites and surroundings	Daily	Labour Law, Labour Safety Law	CT	CT, DoH, GAD, MC, Consultants	CT

Category	Item	Method of Monitoring	Monitoring Place/Point	Frequency (Period)	Referable Standards and Legislation	Implementing Organization	Responsible and/or Supervising Organization	Responsible Agency for monitoring Cost
	Social issues	1) Collection of complaints, requests 2) Hearing	Construction sites and surroundings	As required	N/A	CT	CT, DoH, GAD, MC, Consultants	CT
2) Natural Environment	Replanting trees	1) Physical observation 2) Hearing	Construction sites and surroundings	As required	N/A	CT	CT, DoH, GAD, MC, Consultants	CT
3) Environmental Pollution	Air pollution	1) Complaints 2) Physical observation 3) Dust Control 4) Air quality measurement (SO2, NO2, PM10)	1) & 2) Construction site and surroundings 3) Air quality measurement (3 locations)	1), 2) & 3) : Daily 4) Three times/year; construction period-year	Community perception	CT, MoC, Consultants	CT, DoH, GAD, MC, Consultants	CT
	Water pollution	1) Complaints 2) Physical observation 3) Wastewater analysis (pH, BOD, COD, TS, SS)	1) & 2) Construction site and surroundings; 3) Wastewater analysis (critical areas)	1) Daily (physical observation), 2) Wastewater analysis (as required)	Community perception	CT, MoC, Consultants	CT, DoH, GAD, MC, Consultants	CT
	Soil Contamination	Physical observation	Construction site and surroundings	Daily	Community perception	CT	CT, DoH, GAD, MC, Consultants	CT
	Sold waste management	Record of collection, transportation and disposal	Construction site and surroundings	Daily	Community perception	CT	CT, DoH, GAD, MC, Consultants	CT
	Noise	1) Complaints 2) Physical observation 3) Noise level measurement	1) & 2) Construction site and surroundings 3) Two locations (sensitive receptor or background)	1) & 2) : Daily 3) Three times/year	Community perception	CT	CT, DoH, GAD, MC, Consultants	CT

Category	Item	Method of Monitoring	Monitoring Place/Point	Frequency (Period)	Referable Standards and Legislation	Implementing Organization	Responsible and/or Supervising Organization	Responsible Agency for monitoring Cost
(III) Operation Stage								
1) Social Environment	Traffic Volume increased and Accidents	1) Collection of complaints 2) Physical observation/ road traffic surveys 3) Hearing 4) Warning signs and barricades	Project area	1), 3) & 4) as required 2) Three times per year	Disaster Prevention Law	DoH, MoC	DoH, MoC	DoH, MoC
2) Environmental pollution	Water pollution	1) Complaints 2) Physical observation, 3) Wastewater analysis (pH, BOD, COD, SS, TS)	Discharged points from wastewater treatment plant of depot	Three times /year for 2 years after operation	Environmental Emission Standards (2015) of Myanmar Government, WHO and Japan Standards	DoH, MoC	DoH, MoC	DoH, MoC

Source: The Preparatory Survey Team

Note 1: Monitoring cost in the Construction Stage will be covered by the Constructors (CT). Cost for air quality measurements is estimated at USD 30,000 per year per road that is at least 50 kilometers long.

Note 2: CT: Contractor, MoC: Ministry of Construction, DoH: Department of Highways, FERD: Foreign Economic Relations Department, GAD: General Administration Department, MoNREC: Ministry of Natural Resources and Environmental Conservation, MC: Monitoring Committee (formed by ESE, GAD and community elders or honourable persons).

10.2.10 Implementation System

This subsection deals with implementation system for the environmental management and monitoring during construction and operation. Table 10-2-9 shows relevant organizations for environmental management and monitoring and their responsibilities. All planned mitigation measures are carried out by the contractors and reported to DoH, the supervision consultants and the project management unit (PMU). The monitoring results are reviewed and corrective and preventive actions are taken, if necessary.

Table 10-2-9 Implementation System of Environmental Management and Monitoring

Stage	Name of Organization	Role and Responsibility
Pre-Construction and during Construction	Land Acquisition Team (DoH, SLRD and Detailed design consultant)	• Overseeing the updates of the Abbreviated Resettlement Action Plan (A-RAP) after the detailed design • Monitoring actual payments of compensation to affected landowners, structure owners, and crops/trees owners • Other necessary roles upon finalization of the A-RAP during the detailed design
	Consultant for Construction Supervision	• Inspection of mitigation measures and environmental monitoring conducted by the Contractor based on the approved EIA • Reporting of monitoring result to DoH and donor (JICA) by monthly report
	Road and Bridge Construction Committee (DoH, Local Government, contractor, supervision consultant, local NGO such as farmer association, religious group, peace group and political group etc.)	• Overseeing the implementation of the EMP by the Contractor • Evaluation of environmental monthly report and responding with necessary actions • Validation as to whether Project complies with the conditions stipulated in the EIA and A-RAP • Receipt of complaints, gathering of relevant information to help determine the validity of complaints or concerns about the Project, and timely implementation of DoH-recommended measures to the complaints • Preparation and dissemination of simplified validation reports to community stakeholders • Compilation of monitoring data gathered by the Contractors and supervision on the preparation of semi-annual monitoring reports to be submitted to the DoH
	Contractor	• Implementation of mitigation measures and monitoring based on the approved EMP on EIS and A-RAP • Submission of report on all the mitigation measures and monitoring conducted
Operation	DoH and Local Government	• (DoH) Monitoring on the approved IEE and A-RAP and reporting to ECD and Local Government Environmental Section (the result of monitoring shall be disclosed in DoH and Local Government offices) • Regular inspection and maintenance of bypass roads and bridges • Planned monitoring is carried out for two (2) years after construction of the bypass

Source: The Preparatory Survey Team

10.3 Power Supply Sector

10.3.1 Outline of the Project

The outline of shortlisted sub-project is described as the following Table 10-3-1.

Table 10-3-1 Outline of Sub-Projects of the Power Supply Sector (As of April 2016)

Group	Project Component	States and Regions : the number of townships
On-Grid	(1) 66kV/33kV and 66kV/11kV substations (2) 33kV/11kV substations (3) 66kV /33kV transmission lines (4) 11kV/0.4kV distribution lines (5) Distribution transformer	Kachin: 1, Kayin: 1, Chin: 1 ,Mon: 1 , Rakhine: 2, Shan: 1, Sagaing: 6, Bago: 6, Tanintharyi: 2, Ayeyarwady: 2, Magway: 2, Mandalay: 7 TOTAL 32

Source: The Preparatory Survey Team

Sample/Model of Substation

Candidate site for Substation (Ayeyarwady)

Sample/Model of Power line

Source: Photos taken by the Preparatory Survey Team

10.3.2 Environmental Screening of the Project

For Power Supply projects, the categorization of IEE and EIA based on the 2015 EIA procedure is shown in Table 10-3-2 below. According to the categorization, preparation of IEE is not necessary for all the on-grid sub-projects because the capacity of their power lines is under 115kV.

Table 10-3-2 Categorization of IEE and EIA (Power Supply)

No	Type of investment project	Size of project which requires IEE	Size of project which requires EIA
23	Electrical Power Transmission line ≥ 115kV<230kV	≥ 50 km	All activities where the Ministry requires that the Project shall undergo EIA
24	Electrical Power Transmission Line ≥ 230kV	All sizes	All activities where the Ministry requires that the Project shall undergo EIA

No	Type of investment project	Size of project which requires IEE	Size of project which requires EIA
25	High Voltage transformer substation	10h > IEE Radius Size	10h < IEE Radius Size

Source: Environmental Impact Assessment Procedures (2015)

10.3.3 Alternatives

An alternative project to each sub-project is considered, as each sub-project is evaluated according to the selection criteria explained in Chapter 3.

10.3.4 Scoping Results

The result of scoping on-gird projects is shown in the Table 10-3-3.

Table 10-3-3 Scoping Results of On-grid Projects

	No	Evaluation Item (from JICA Guidelines)	Rating		Reasons of the Rating
			Pre/ During Construction	Operation Phase	
Pollution	1	Air pollution	C	D	**Construction phase:** Temporary limited impact is expected on air quality due to the use of construction machines and equipment. **Operation phase:** No impact is expected or expected impact is very limited because facilities size is small.
	2	Water pollution	D	D	**Construction and operation phase:** No impact is expected.
	3	Waste	C	D	**Construction phase:** Domestic waste and night soil may be generated from construction base camp. **Operation phase:** No impact is expected
	4	Soil contamination	D	D	**Construction and Operation phase:** No impact is expected.
	5	Noise and vibration	C	D	**Construction phase:** Noise generation is expected due to works of construction machines and equipment. **Operation phase:** No impact is expected.
	6	Ground subsidence	D	D	**Construction and operation phase:** No impact is expected since activities which cause ground subsidence are not planned.
	7	Odor	D	D	**Construction and operation phase:** No impact is expected since activities which cause odor are not planned.
	8	Bottom Sediment	D	D	**Construction and Operation phase:** No impact is expected.
Natural environment	9	Protected area	D	D	**Construction phase:** No impact is expected because the project sites are located inside towns/villages. **Operation phase:** No impact is expected.
	10	Ecosystem	D	D	**Construction and Operation phase:** No impact is expected.
	11	Hydrology	D	D	**Construction and Operation phase:** No activities give negative impact to hydrological situation of river.
	12	Topography and geology	D	D	**Construction and operation phase:** No impact is expected.
Social environment	13	Involuntary resettlement	B－	D	**Pre-Construction phase:** No resettlement is expected but land acquisition close to the project site may be caused. **Operation phase:** No impact is expected
	14	The poor	C	B＋	**Construction phase:** Few positive impacts (e.g. increased working opportunities) are expected. **Operation phase:** Few impact is expected by improvement of access
	15	Indigenous and	C	B＋	**Construction phase:** Few positive impacts (e.g. increased working

	№	Evaluation Item (from JICA Guidelines)	Rating		Reasons of the Rating
			Pre/ During Construction	Operation Phase	
		ethnic people			opportunities) are expected. **Operation phase:** Few impact is expected by improved access to electricity
	16	Local economy such as employment and livelihood	C	B＋	**Pre-construction phase:** Few positive impacts (e.g. increased working opportunities) are expected. **Operation phase:** Few impact is expected.
	17	Land use and utilization of local resources	C	D	**Pre-construction phase:** Few impact is expected due to the land acquisition of agricultural land, etc. **Operation phase:** No impact is expected.
	18	Water usage	D	D	**Construction phase:** No impact is expected. **Operation phase:** No impact is expected.
	19	Existing social infrastructures and services	D	B＋	**Construction phase:** No impact is expected **Operation phase:** Few positive impact is expected (e.g. improved access to social services, etc.)
	20	Social institutions such as local decision making institutions	D	D	**Construction and operation phase:** No impact is expected, since local decision-making institutions at a village, township and State level will remain the same after the construction.
	21	Misdistribution of benefit and damage	D	D	**Construction and operation phase:** No misdistribution of benefit and damage by this project is expected.
	22	Local conflict of interests	D	D	**Construction and operation phase:** No local conflict of interests is expected.
	23	Cultural heritage	D	D	**Pre-Construction, construction and operation phase:** Religious and cultural facilities are not observed at the project site.
	24	Landscape	C	D	**Construction and operation phase:** Landscape change is expected but limited.
	25	Gender	D	D	**Construction and operation phase:** No negative impacts specifically on women are expected.
	26	Right of children	D	D	**Construction and operation phase:** No negative impacts specifically on children are expected.
	27	Infectious diseases such as HIV/AIDS	D	D	**Construction and operation phase:** No impact is expected.
	28	Labor environment	D	D	**Construction and operation phase:** No impact is expected.
Others	29	Accidents	C	C	**Construction phase:** Construction vehicles may use existing local roads near residential areas, thus the number of traffic accident may increase. **Operation phase:** Although an increase of travelling speed is expected, the alignment will be better.
	30	Cross boundary impacts and climate change	D	D	**Construction and operation phase:** No impact is expected.

Note:

A+/-: Significant positive/negative impact is expected. B+/-: Some positive/negative impact is expected.

C: Extent of impact is unknown at this stage D: No impact is expected.

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10.3.5 Prediction of Environmental Impact

The prediction of environmental impact of the power supply sector sub-projects is shown in the following table.

Table 10-3-4 Prediction of Environmental Impact for Power Supply Sector

	Items		Situation and Prediction
Pollution	1	Air Pollution	Machines and vehicles used during construction are likely to generate air pollution, most prominently in the form of dispersal of sandy dust. Normal measures can reduce the negative impacts.
	2	Water Contamination	For water bodies in sub-project, some streams and rivers are located close to the proposed sites. Agricultural land and forest land are located next to the streams and rivers. People take water mostly from the wells and some take from the river. No Only small civil work such as construction of foundation is planned, so no significant negative impact is expected. Nevertheless, the above areas should be kept in mind so that construction works do not result in soil or water contamination.
	3	Waste	General wastes such like a pet bottle, plastics, kitchen wastes, are not significantly bad at project site. Waste condition is good enough so far. Waste from the construction workers and comps are likely to generate the waste to some extent, but due to relatively less population and poor economic activities no significant adverse impact is expected.
	4	Soil Pollution	No major work is planned for the construction of substations, transmission lines and distribution lines, so no significant negative impact is expected. Nevertheless, the above areas should be kept in mind so that construction works do not result in soil or water contamination.
	5	Noise and Vibration	Noise and vibration level could temporarily be higher during construction due to operation of vehicles and use of construction equipment. In the operation phase, no impact of the noise is expected.
	6	Ground subsidence	There was no such case in record. No serious ground subsidence is expected since the substation construction work is small scale.
	7	Odor	The sub-project sites are an environmentally sound area. There is no work causing a bad odor during the construction. Therefore, no other significant negative impact is expected.
	8	Bottom Sediment	No major work is planned for using bottom sediment, so no significant negative impact is expected.
Natural Environment	9	Protection Area	The transmission lines and distribution lines, such as ESE 0401, 0602, 0809, 0812, 0813 etc., may pass through the reserved forests and public protected forest, which will affect some area in the reserved forests and public protected forest. However, the subproject is expected to affect the environment not very significantly, because these lines occupy the very small area within the ROW (right of way). Therefore, no notable impact is expected
	10	Fauna, Flora and Biodiversity	No wildlife or tree species that require special attention/ protection has been identified either within the sub-project site. But there are many forest plantations (both government and private) and natural forests along the project site. Construction works could affect those plantations and natural forests. But it is a few trees and plants.
	11	Hydraulic Situation	Some rivers and streams are located close to the sib-project sites.
	12	Topography and Geology	Nearly 70 % of sub-project sites are located in the low land central dry zone area and the remaining 30% spread throughout the country. ESE 0501, 0901 and 0902 in located in southern part, coastal region to Andaman Sea. ESE 1201and 1206 are in Ayeyarwady Delta region. ESE 0703 is in Shan Plateau. ESE 0401is located in Chin State mountain ranges. The soil types mainly found in the site are (1) Clay and clay swampy soils, (2) Swampy soils, (3) lateritic soils, and (4) Yellow brown forest soils. Since all the sub-projects are just small scale of civil work, no large-scale land alteration is expected due to construction work.

	Items		Situation and Prediction
Social Environment	13	Involuntary Resettlement	No involuntary resettlement is expected, but land acquisition is needed for substation construction, setting power line and power pole in some sub-projects.
	14	Poor	Some of the people living in the sub-projected area have very low income from traditional agriculture business. It is expected after the completion of sub-project; they will get access to electricity and get better life (e.g. light and electrical instrument) and benefit from the improvement of standard of living, better health care, and other socio-economic improvements.
	15	Indigenous or Ethnic people	Chin, Mon and Shan people are major, especially living near the project sites.
	16	Local Economies, such as employment, livelihood	Economy in the areas is largely dependent on agriculture (i.e. rice, corn, banana, sugar cane, bean, chilly, different garden fruits, etc.) and some businesses (e.g. sugar milling and rice milling) and shop/store management to which, no -alteration is expected. During construction, some people are likely to be employed as a work force for water treatment plant and distribution of pipe line construction. Food & drink shops are also expected to benefit from an increase in demand.
	17	Land use and utilization of local resources	Paddy fields, Banana and Sugar Cane farms, Reserved Forests and Public Protected Forests occupy the area in the sub-project sites. No significant change of land use is expected to the current state since it is a small scale civil construction project.
	18	Usage of water and water Right	People take water mainly from the wells and some villages from the river. No water Right issue is found in the sub-project sites. Neither any change nor any negative impact is expected by the sub-project.
	19	Existing social infrastructure and services	Through the implementation of the Project, it is expected that medical facilities will improve their service levels due to the accelerated introduction of advanced medical facilities and personal computers. Ensuring a stable power supply is indispensable at hospitals and medical centers, especially for night-time medical treatment of patients and for those who are pregnant. It becomes possible to prevent the degradation of medicine or vaccines with the stable power supplied to refrigerators used as storage. Considering the above circumstances, the beneficial effects brought in by the implementation of the Project to medical facilities is significant. Un-electrified schools have many problems. For example, without stable electric lighting, teachers find it difficult to prepare educational materials during early hours in the morning before sunrise. In addition, the introduction of electrical facilities essential for education of recent years - such as computers, projectors, photocopy machines and lightings - are also expected to enhance the education system in the country. Therefore, significant positive impact is expected by the sub-projects
	20	Social Institution such as local decision making institution	Not such kind of strong institutions are identified in the project site.
	21	Misdistribution of benefits and damages	Misdistribution of benefits and damages between local communities or regional institutions is not likely to happen.
	22	Local conflict of interest	Most of sub-project sites are all located within the municipal areas of the towns, so it won't be big problem. If any, extra cautions to these area will be given for implementation and monitoring of the sub-project works.
	23	Cultural Heritage	Any negative impact is not expected by the sub-project. No cultural Heritage is identified in other project sites.
	24	Landscape	As it is small scale of construction work, the sub-projects do not expected to negatively affect the beauty of existing landscape (crops and farmlands, river, natural forests and forest plantations, forest mountains and rock mountains),.
	25	Gender	According to normal measures in compliance with JICA guidelines, gender inequality in the sub-project implementation works is not likely to happen.

	Items		Situation and Prediction
	26	Children's Right	According to normal measures in compliance with JICA guidelines, Children' Right is not expected to be affected in the sub-project implementation works.
	27	Infection diseases such as HIV/AIDS	It is not also expected to induce the infection of diseases such as HIV/AIDS by the sub-project.
	28	Work Environment	According to normal measures in compliance with JICA guidelines, notable damage to the work environment is not expected.
Others	29	Accident	Increase of accident is not expected by sub-projects.
	30	Global Warming	As a small scale of civil work, the impacts by the sub-project are not expected to contribute any significant damages to or increase in Global Warming.

Source: The Preparatory Survey Team

10.3.6 Evaluation of Environmental Impact

Possible impacts of the Power Supply sector's sub-projects are identified and the extent of each impact by rating on the 30 environmental items (of pollution, natural environment and social environment) is shown below. The results are shown together with the scoping results in Table 10-3-5.

Table 10-3-5 Evaluation of Environmental Impact

	No	Evaluation Item (from JICA Guidelines)	Scoping Result		Evaluation		Reasons of Evaluation
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	
Pollution	1	Air pollution	C	D	D	D	**Construction phase:** Temporary negative impact is expected on air quality due to construction machines and equipment but it is minor. **Operation phase:** No impact is expected.
	2	Water pollution	D	D	D	D	**Construction phase:** Turbid water may be generated by earth works and excavation work and building of water treatment plant are planned. Additionally Organic polluted water may be discharged from base camp. **Operation phase:** No serious impact is expected
	3	Waste	C	D	D	D	**Construction phase:** Construction waste such as waste soil and cutting trees are expected. Additionally domestic waste and night soil may be generated from construction base camp. **Operation phase:** No serious impact is expected
	4	Soil contamination	D	D	D	D	**Construction phase:** No impact is expected. **Operation phase:** No impact is expected
	5	Noise and vibration	C	D	D	D	**Construction phase:** Noise generation is expected due to works of construction machines and equipment. **Operation phase:** Noise may generate during operation of treatment plant. However, the expected impact is very limited.
	6	Ground subsidence	D	D	D	D-	**Construction and operation phase:** No Serious impact of ground subsidence is expected.
	7	Odor	D	D	D	D	**Construction and operation phase:** No impact is expected since activities which cause odor are not expected.
	8	Bottom Sediment	D	D	D	D	**Construction phase:** No impact is expected since there are not any polluted lands nearby project area. **Operation phase:** Water facility operation which causes impacts on sediment quality is not expected.

	No	Evaluation Item (from JICA Guidelines)	Scoping Result		Evaluation		Reasons of Evaluation
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	
Natural environment	9	Protected area	D	D	D	D	**Construction phase:** There is no protected area in the sub-project area. Cutting many trees will not be expected but some negative impact is expected. **Operation phase:** No impact is expected during operation.
	10	Ecosystem	D	D	D	D	**Construction and Operation phase:** Any designated protected areas and considerable species habitats have not been identified in the sub-project area.
	11	Hydrology	D	D	D	D	**Construction and Operation phase:** No activities give negative impact to hydrological situation of the rivers.
	12	Topography and geology	D	D	D	D	**Construction and operation phase:** Cutting land is expected. However, considerable topography and geological sites are not located in the project area and the impact is limited.
Social environment	13	Involuntary resettlement	B-	D	B-	D	**Pre-Construction phase:** No resettlement is expected. But land acquisition of some area may be caused. **Operation phase:** No impact is expected
	14	The poor	B+	C	B+	D	**Pre-Construction phase:** Few positive impacts are expected such as working opportunity. **Operation phase:** Few positives impacts are expected by improvement of power supply.
	15	Indigenous and ethnic people	C	D	D	D	**Pre-Construction phase:** There are indigenous or ethnic people at the sub-project site. But no serious impact is expected. **Operation phase:** No obvious impact is expected
	16	Local economy such as employment and livelihood	C	B+	D	B+	**Pre-construction phase:** No obvious impact is expected. **Operation phase:** Few positive impact is expected by the improvement of power supply condition in target area
	17	Land use and utilization of local resources	C	D	D	D	**Pre-construction phase:** Few impacts are expected. **Operation phase:** No impact is expected
	18	Water usage	D	D	D	D	**Construction phase:** No impact is expected. **Operation phase:** No impact is expected.
	19	Existing social infrastructures and services	D	B+	D	B+	**Pre-Construction and Construction phase:** No impact is expected. **Operation phase:** Few positive impacts are expected since power supply can improve the social facilities.
	20	Social institutions such as local decision making institutions	D	D	D	D	**Construction and operation phase:** No impact is expected, since local decision making institute represented by village, township and state will continue after the construction.
	21	Misdistribution of benefit and damage	D	D	D	D	**Construction and operation phase:** Misdistribution of benefit and damage caused by the water facility construction is not expected.
	22	Local conflict of interests	D	D	D	D	**Construction phase:** No impact is expected. **Operation phase:** No impact is expected
	23	Cultural heritage	D	D	D	D	**Pre-Construction and Construction Phase:**

	No	Evaluation Item (from JICA Guidelines)	Scoping Result		Evaluation		Reasons of Evaluation
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	
							Religious and cultural facility are not observed at the project site. **Operation phase:** No impact is expected
	24	Landscape	D	D	D	D	**Construction phase:** Few impact is expected **Operation phase:** There are no law-based designated landscape areas around project area.
	25	Gender	D	D	D	D	**Construction and operation phase:** Negative impacts specified for women are not expected.
	26	Right of children	D	D	D	D	**Construction and operation phase:** Negative impacts specified for children are not expected.
	27	Infectious diseases such as HIV/AIDS	D	D	D	D	**Construction phase:** Few impacts are expected. **Operation phase:** Operation which causes infectious diseases is not expected.
	28	Labor environment	D	D	D	D	**Construction phase:** Construction work environment needs to be considered in accordance with relevant laws and regulations. **Operation phase:** No impact is expected.
Others	29	Accidents	D	D	D	D	**Construction phase:** No serious impact is expected.. **Operation phase:** No impact is expected.
	30	Cross boundary impacts and climate change	D	D	D	D	**Construction phase:** No impact is expected. **Operation phase:** No impact is expected.

Source: The Preparatory Survey Team

10.3.7 Mitigation Measure

Mitigation measures, which avoid, minimize, eliminate and/or reduce above-mentioned negative impacts, were examined for respective items. They cover whole stages - from planning, construction to operation stage - in order for the Project to achieve intended objectives with minimum environmental impacts. They are summarized in Table 10-3-6 below.

Table 10-3-6 Mitigation Measure against Negative Impact and Environmental Management Plan

	No	Evaluation Item (from JICA Guidelines)	Major Mitigation Measures		Responsibility	
			Pre and During Construction phase	Operation phase	Implementation Agency	Responsible Agency
Pollution	4	Air pollution	[Dust] ✓ Water sprinkling near residential area ✓ 20 kph speed limit for construction machines at construction sites adjacent to settlement areas ✓ Use of low-emission construction machinery to minimize the emission of exhaust gases	Not required	Contractor	ESE
	5	Water pollution	[Turbid water and other items] ✓ Discharge through sedimentation pond and silt fence ✓ Installation of portable toilet for workers ✓ Appropriate management of waste and construction machines ✓ Appropriate explanation and response given to affected fishermen, if necessary	Not required	Contractor	ESE

	№	Evaluation Item (from JICA Guidelines)	Major Mitigation Measures		Responsibility	
			Pre and During Construction phase	Operation phase	Implementation Agency	Responsible Agency
	6	Waste	[Construction waste (trees and waste soil)] ✓ Consideration of the possibility of reuse before the construction waste is disposed of at disposal site [Garbage from base camp] ✓ Garbage at workers camp and waste oil shall be brought to disposal site or facility [Night soil] ✓ Introduction of temporary sanitation facility such as septic tank to the workers camp.	✓ Demolished waste concrete shall be reused and/or disposed in designated disposal site.	[Const.] Contractor [Operation] ESE	ESE
	5	Noise and vibration	[Construction noise] ✓ Installation of noise barrier and selection of low-noise equipment. ✓ Avoidance of the use of heavy equipment during night time. ✓ Notice of the construction schedule to surrounding communities to obtain their consensus.	Not required	Contractor	ESE
Natural environment	10	Ecosystem	✓ Construction development area shall be marked and not be disturbed ✓ Proper storing of hazardous waste material properly before final disposal ✓ Planting trees, vegetation, sodding in the public space. ✓ Installation of sediment to ponds, silt fence and portable toilet not to disturb habitats of aquatic lives	✓ Appropriate land use management not to develop natural area along the road ✓ Set up of sign boards where animals cross the road from the view of natural conservation	[Const.] Contractor [Operation] Local government,	ESE
	11	Hydrology	✓ Design of bridges with sufficient capacity ✓ Installation of sufficient drainage facilities on bypass ✓ Secure waterways in construction area	Not required	Contractor	ESE
Social environment	13	Involuntary resettlement	✓ Appropriate compensation and social assistance in accordance with A-RAP ✓ Implementation of public consultation for all Townships before start construction ✓ Preparation of agreement for land acquisition	✓ Assessment of whether resettlement was conducted properly with regards to relevant people's livelihood and their restoration and/or enhancement of living standards in accordance with RAP	Settlement & Land Record Department (SLRD under MOALI), ESE, GAD	ESE
	14	The poor	✓ Appropriate social assistance in accordance with A-RAP	✓ Assessment of whether resettlement was conducted properly with regards to relevant people's livelihood and their restoration and/or enhancement of living standards in accordance with RAP	SLRD, ESE, GAD	TDC
	16	Local economy such as employment and	✓ Appropriate compensation and social assistance in accordance with A-RAP	✓ Assessment of whether resettlement was conducted properly with regards to relevant	SLRD, ESE, GAD	ESE

	№	Evaluation Item (from JICA Guidelines)	Major Mitigation Measures		Responsibility	
			Pre and During Construction phase	Operation phase	Implementation Agency	Responsible Agency
		livelihood		people's livelihood and their restoration and/or enhancement of living standards in accordance with RAP		
	17	Land use and utilization of local resources	✓ Appropriate land acquisition and compensation for agricultural areas ✓ Assistance with the establishment of land use map in every township	✓ Management of appropriate land use in accordance with land use plan newly approved and established in every township and village	[Const.] SLRD, MoALI, consultants [Operation] Local government	ESE
	18	Water usage	✓ The preparation of drainage facility, sedimentation pond and sheet in accordance with the site condition to prevent turbid water generated by earthwork ✓ Proper collection of domestic waste and other construction waste and disposal of them in the designated dumping site. ✓ Installation of portable toilet	Not required	[Const.] Contractor	ESE
	19	Existing social infrastructures and services	✓ Construction of diversion road and the connection of existing community roads to new bypass, if necessary	Not required	Contractor	ESE
	22	Local conflict of interests	✓ Local workforce prioritized for construction works ✓ Implementation of appropriate education for hired workers from other areas	Not required	Contractor	ESE
	27	Infectious diseases such as dengue and HIV/AIDS	✓ Installation of sufficient drainage facilities not to provide habitat for vector mosquito ✓ Provision of adequate temporary sanitation facilities ✓ Enforcement of medical screening and periodical medical check-ups ✓ Awareness raising of labor about the prevention of spread of infectious diseases such as HIV/AIDS	Not required	Contractor	ESE
Others	29	Accidents	✓ Deploying flagman at the gate and crossing points of the construction vehicles ✓ Installation of safety sign board ✓ Installing fence around the construction site to keep out local people such as children ✓ Installation of lightning in the night time ✓ Installation of parking for idling construction machines ✓ Restricting mobilization speed in the construction site ✓ Safety trainings for Construction Work and Trainings for Electrical Safety Basics, as necessary ✓ Safety patrol at the construction site by supervisors ✓ Using enough PPEs (Personal	✓ Awareness and Trainings for Electrical Safety Basics, as necessary ✓ Ensuring good control of hazardous energy (Log out/ Tag out – safeguard the workers from unexpected energization or startup of machinery or equipment, or the release of hazardous energy during service or maintenance service)	[Const.] Contractor [Operation] ESE	ESE

	No	Evaluation Item (from JICA Guidelines)	Major Mitigation Measures		Responsibility	
			Pre and During Construction phase	Operation phase	Implementation Agency	Responsible Agency
			Protective Equipment), such as boots, helmets, gloves, etc., relating to Electrical Safety ✓ Using enough Fall Protection Equipment whenever necessary ✓ Ensuring good control of hazardous energy (Log out/ Tag out – safeguard the workers from unexpected energization or startup of machinery or equipment, or the release of hazardous energy during service or maintenance service)			

Source: The Preparatory Survey Team

10.3.8 Environmental Monitoring Plan

The environmental monitoring of rural electrification projects will be undertaken by the Electricity Supply Enterprise (ESE). The Environmental Management Plan (EMP), which incorporates mitigation measures, monitoring as well as the roles of implementing, responsible and supervising organizations, is prepared as shown in Table 10-3-7. ESE is responsible for ensuring that the Contractor complies with each mitigation measure specified in the Environmental Management Plan of the project during the construction period. The compliance of the Contractor could be presented in a tabulated form showing each mitigation measure, corresponding level of compliance *(Yes, No or Partial)*, and remarks justifying *"No" or "Partial"* compliance level. The corrective actions are presented in matrix form with the following details: (i) non-compliance/implementation of mitigation measures, (ii) issues and concerns, (iii) responsibility for implementation of recommended actions.

Table 10-3-7 Environmental Monitoring Plan (Power Supply sector)

Category	Item	Method of Monitoring	Monitoring Place/Point	Frequency (Period)	Referable Standards and Legislation	Implementation Organization	Responsible and/or Supervising Organization	Responsible Agency for monitoring Cost
(I) Planning Stage								
1) Approval/ permission etc.	Permission of Project Implementation and Environmental Clearance Certificate	1) Permission procedures of projects for public purpose 2) Environmental Clearance Certificate by MoNREC	FERD, MoEE, ESE, MoNREC	Before commencement of construction work	1) Environmental Conservation Law (2012) 2) Environmental Conservation Rules and Regulations (2015) 3) JICA guidelines	ESE	FERD, MoEE, ESE, MoNREC	ESE
2) Social Environment	Implementation of compensation and resettlement assistance to PAPs, and resulting existing living condition and livelihood of PAPs	Interview survey on PAPs and PAUs	PAPs and PAUs in all project areas	Before commencement of construction work	1) Land related legislation of Myanmar, 2) JICA Guidelines	ESE	ESE, GAD	ESE
	Securing necessary land clearance for the project site	Site observation	Areas to be secured	Before commencement of construction work	Land related legislation of Myanmar	ESE	ESE, GAD	ESE
	Designs and Specifications adaptable to climate change	Verifying designs and specifications	ESE	Before commencement of construction work	1) Environmental Conservation Law (2012), 2) Environmental Conservation Rules (2015) 3) JICA guidelines	ESE	Consultants and ESE	ESE
	Stakeholders' Meetings and Information Disclosures	Explanation of project plans and getting public opinions about their concerns, suggestions and requests.	All project sites	Before commencement of construction work	1) Environmental Conservation Law (2012), 2) Environmental Conservation Rules and Regulations (2015) 3) JICA Guidelines	ESE	Consultants and ESE	ESE
(II) Construction Stage								
1) Social Environment	Safety, Public health and Sanitation	1) Assignment of full-time HSE officers 2) Safety plan, fire protection plan, control of hazardous materials, PPEs 3) Warning signs	Construction sites and surroundings	Depends on the symptom of workers and inhabitants within and around construction site	Health Law, Labour Safety Law	CT	CT, ESE, GAD, MC, Consultants	CT

Category	Item	Method of Monitoring	Monitoring Place/Point	Frequency (Period)	Referable Standards and Legislation	Implementation Organization	Responsible and/or Supervising Organization	Responsible Agency for monitoring Cost
		4) Sanitary toilets, garbage bins, runoff controls, waste management in camps						
	Implementation of construction mitigation measures	Compliance to construction specifications	Construction sites	Daily	1) Environmental Conservation Rules and regulations (2015) 2) JICA guidelines	CT	CT, ESE, GAD, MC, Consultants	CT
	Working condition	1)Medical checkups and symptom of workers 2)First Aid Cases	Construction sites and surroundings	As required	Labour Safety Law	CT	CT, ESE, GAD, MC, Consultants	CT
	Natural disaster/risks	Records of natural disaster and hazards in the project area	Construction sites and surroundings	Daily	Disaster Prevention Law	CT	CT, ESE, GAD, MC, Consultants	CT
	Accident	Records of accidents in the project area	Construction sites and surroundings	Daily	Labour Law, Labour Safety Law	CT	CT, ESE, GAD, MC, Consultants	CT
	Social issues	1) Collection of complaints and requests 2) Hearing	Construction sites and surroundings	As required	N/A	CT	CT, ESE, GAD, MC, Consultants	CT
	Infectious Diseases such as HIV/AIDS	Medical examination of construction workers and peoples making contact with HIV/AIDS sufferers, if any	Construction sites and surroundings	Before and after construction stage as required	Health Law, Labour Safety Law, Prevention of HIV/AIDS Law	CT	CT, ESE, GAD, MC, Consultants	CT
2) Natural Environment	Replanting trees	1) Physical observation 2) Hearing	Construction sites and surroundings	As required	N/A	CT	CT, ESE, GAD, MC, Consultants	CT
3) Environmental Pollution	Air pollution	1) Complaints 2) Physical observation 3) Dust Control 4) Air quality measurement (SO2, NO2, PM10)	Construction sites and surroundings;	1) & 2) Daily , 3) & 4) as required	Community perception	CT, ESE, Consultants	CT, ESE, GAD, MC, Consultants	CT

Category	Item	Method of Monitoring	Monitoring Place/Point	Frequency (Period)	Referable Standards and Legislation	Implementation Organization	Responsible and/or Supervising Organization	Responsible Agency for monitoring Cost
	Water pollution	1) Complaints 2) Physical observation 3) Wastewater analysis (pH, BOD, COD, TS, SS)	1) & 2) Construction sites and surroundings; 3) Wastewater analysis (critical areas)	1) Daily (physical observation) 2) Wastewater analysis (as required)	Community perception	CT, ESE, Consultants	CT, ESE, GAD, MC, Consultants	
	Soil Contamination	Physical observation	Construction sites and surroundings	Daily	Community perception	CT	CT, ESE, GAD, MC, Consultants	CT
	Sold waste management	Record of collection, transportation and disposal	Construction sites and surroundings	Daily	Community perception	CT	CT, ESE, GAD, MC, Consultants	CT
	Noise	1) Complaints, 2) Physical observation, 3) Noise level measurement	Construction sites and surroundings;	1) & 2) Daily; 3) As required	Community perception	CT	CT, ESE, GAD, MC, Consultants	CT
(III) Operation Stage								
1) Social Environment	Electric Hazards (Electrical Shocks/ burns, fire, explosion, etc.)	1) Complaints 2) Physical Observation	Project areas	1) all times 2) monthly	1) Community perception 2) MoEE Guidelines	ESE	ESE	ESE
2) Environmental pollution	Water pollution and waste management	1) Complaints, 2) Physical observation, 3) Wastewater analysis (pH, BOD, COD, SS, TS)	Sub-station areas	1) & 2) all times 3) as required	Environmental Emission Standards (2015) of Myanmar Government, WHO and Japan Standards	ESE	ESE	ESE

Source: The Preparatory Survey Team

Note: 1) Monitoring cost in the Construction Stage will be covered by the Constructors (CT). Cost for the measurement of air quality and water quality parameters is estimated at USD 3,000 per each sub-project.

2) CT: Contractor, MoEE: Ministry of Electricity and Energy, ESE: Electricity Supply Enterprise, FERD: Foreign Economic Relations Department, GAD: General Administration Department, MoNREC: Ministry of Natural Resources and Environmental Conservation, MC: Monitoring Committee (formed by ESE, GAD and community elders or honourable persons).

10.3.9 Implementation System

This subsection deals with the implementation system for the environmental management and monitoring during construction and operation. Table 10-3-8 shows relevant organizations for the environmental management and monitoring and their responsibilities. All planned mitigation measures are carried out by the contractors and reported to ESE, the supervision consultants and the project management unit (PMU). The monitoring results are reviewed and corrective and preventive actions are taken, if necessary.

Table 10-3-8 Implementation System of Environmental Management and Monitoring

Stage	Name of Organization	Role and Responsibility
Pre-Construction and during Construction	Land Acquisition Team (ESE, Land Record Department, and Detailed design consultant)	• Overseeing the updates of the Abbreviated Resettlement Action Plan (A-RAP) after the detailed design • Monitoring actual payments of compensation to affected landowners, structure owners, and crops/trees owners • Other necessary roles upon finalization of the A-RAP during the detailed design
	Consultant for Construction Supervision	• Inspection of mitigation measures and environmental monitoring conducted by the contractor based on the approved IEE • Reporting of monitoring result to ESE and donor (JICA) by monthly report
	Electrification Facility Construction Committee or Project Monitoring Committee (ESE, Local Government, contractor, supervision consultant, local NGO, religious group, peace group and political group etc.)	• Overseeing the implementation of the EMP by the Contractor • Evaluation of environmental monthly report and responding with necessary actions • Validation as to whether Project complies with the conditions stipulated in the EIA and A-RAP • Receipt of complaints, gathering of relevant information to help determine the validity of complaints or concerns about the Project, and timely implementation of ESE-recommended measures to the complaints • Preparation and dissemination of simplified validation reports to community stakeholders • Compilation of monitoring data gathered by the Contractors and supervision on the preparation of semi-annual monitoring reports to be submitted to ESE
	Contractor	• Implementation of mitigation measures and monitoring based on the approved EMP on EIS and A-RAP • Submission of report for all conducted mitigation measures and monitoring
Operation	ESE. and Local Government	• ESE shall conduct monitoring on the approved IEE and A-RAP, and reporting to ECD and Local Government Environmental Section • The result of monitoring shall be disclosed in ESE and Local Government offices • Regular inspection and maintenance of the power supply facilities • Planned monitoring is carried out for two (2) years after construction of the power supply facilities.

Source: The Preparatory Survey Team

10.4 Water Supply Sector

10.4.1 Outline of the Project

As of January 2015, the outline of sub-project of water supply sector was as described in the Table 10-4-1.

Table 10-4-1 Outline of Sub-Projects of the Water Supply Sector (As of April 2016)

Project Component	States or Region (the No. of Township/Village)
- Water Treatment Plant (WTP) (including Slow Sand filter/Rapid Sand Filter, Chlorine facility) - Water Pipe Line Water Conveyance line, Water Transmission line Water Distribution line - Transformer 400V electrical line - Pump, Pump House, Pump Station - Pontoon - Tube Well (Deep well, Dug well) - Intake facility / Weir	Rakhine (1), Magway (5), Mandalay (2) Kayin (2), Ayeyarwady (3), Bago (2), Tanintharyi (2), Shan (3), Mon (2), TOTAL 22 sub-projects

Source: The Preparatory Survey Team

Gravel filling work (Phase-I project)	Pressure tank (Phase-I project)
	

Source: Photos taken by the Preparatory Survey Team

10.4.2 Environmental Screening of the Project

The categorization of IEE and EIA based on the 2015 EIA Procedure is shown in Table 10-4-2.

Table 10-4-2 Categorization of IEE and EIA (Water Supply)

No	Type of investment project	Size of project which requires IEE	Size of project which requires EIA
111	Groundwater Development for industrial, agricultural or urban water supply	< 4,500 m^3/d	> 4,500 m^3/d

Source : Environmental Impact Assessment Procedures (2015)

As for water supply sector, only the above-mentioned type of project is mentioned in the EIA Procedure. On the other hand, according to the Director of ECD in former MoECAF, the MoNREC would decide the category of other project types after the proposal is submitted, in case IEE or EIA is necessary according to the Article 26 of the EIA Procedure. Article 26 seats the following:

- *Notwithstanding any categorization set forth in Annex 1 'Categorization of Economic Activities for Assessment Purposes', the Department reserves the right, if the Department determines that special circumstances so warrant: (i) to require a project or activity that would otherwise be required to complete and submit an IEE to complete and submit an EIA instead, (ii) to allow a project or activity that would otherwise be required to complete and submit an EIA to complete and submit an IEE instead, and (iii) to exempt from completing any IEE or EIA assessment a project or activity that would otherwise be required to complete and submit such an assessment.*

10.4.3 Alternatives

An alternative project to each sub-project is considered, as each sub-project is evaluated according to the selection criteria explained in Chapter 3.

10.4.4 Scoping Results

The scoping result of the sub-projects of Water Supply sector is shown in following Table 10-4-3.

Table 10-4-3 Scoping Results of Water Supply Sector

	№	Evaluation Item (from JICA Guidelines)	Rating		Reasons of the Rating
			Pre/ During Construction	Operation Phase	
Pollution	1	Air pollution	B－	D	**Construction phase:** Temporary negative impact is expected on air quality due to the use of construction machines and equipment. **Operation phase:** No impact is expected
	2	Water pollution	C	D	**Construction phase:** Extent of impact is unknown at this stage. Turbid water may be generated by earth works and excavation. **Operation phase:** No impact is expected
	3	Waste	B－	D	**Construction phase:** Construction waste such as waste soil and cutting trees are expected. Additionally, domestic waste and night soil may be generated from construction base camp. **Operation phase:** No impact is expected
	4	Soil contamination	D	D	**Construction and Operation phase:** No impact is expected.
	5	Noise and vibration	B－	C	**Construction phase:** Noise is expected to be generated due to works of construction machines and equipment. **Operation phase:** No impact is expected
	6	Ground subsidence	D	D	**Construction and Operation phase:** No impact is expected since activities which cause ground subsidence are not expected.
	7	Odor	D	D	**Construction and Operation phase:** No impact is expected since activities which cause odor are not expected.
	8	Bottom Sediment	D	D	**Construction and Operation phase:** No impact is expected
Natural environment	9	Protected area	D	D	**Construction phase:** As none of the project sites is in protected area, no impact is expected. **Operation phase:** No impact is expected
	10	Ecosystem	D	D	**Construction and Operation phase:** No impact is expected
	11	Hydrology	D	D	**Construction and Operation phase:** No activities give negative impact on hydrological situation of river.
	12	Topography and geology	D	D	**Construction and Operation phase:** No activities give negative impact on topography and geology.
Social environment	13	Involuntary resettlement	B－	D	**Pre-Construction phase:** No resettlement is expected but land acquisition may be caused. **Operation phase:** No impact is expected
	14	The poor	C	B＋	**Construction phase:** Expected impact is unknown at this stage. Some positive impacts (e.g. increased working opportunities) are expected. **Operation phase:** Some positive impacts are expected by improvement of access to clean water
	15	Indigenous and ethnic people	C	B＋	**Construction phase:** Expected impact is unknown at this stage. Some positive impacts (e.g. increasing working opportunities) are expected. **Operation phase:** Some impacts are expected by improvement of access
	16	Local economy such as employment and livelihood	D	B＋	**Pre-construction phase:** Some positive impacts (e.g. increased working opportunities) are expected, although the extent is unknown at this stage. **Operation phase:** Some impacts are expected.
	17	Land use and utilization of local resources	C	D	**Pre-construction phase:** Some impacts are expected due to the land acquisition of agricultural land, etc. **Operation phase:** No impact is expected.
	18	Water usage	D	B＋	**Construction phase:** No impact is expected. **Operation phase:** By construction and installment of water supply facilities, people can use water without any limitation. Positive impact is

	No	Evaluation Item (from JICA Guidelines)	Rating		Reasons of the Rating
			Pre/ During Construction	Operation Phase	
					expected.
	19	Existing social infrastructures and services	D	B+	**Pre-Construction and Construction phase:** Traffic restriction might give impact on the access to emergency services and social infrastructure (e.g. school, hospital, etc.). **Operation phase:** Some positive impact is expected (e.g. improvement of access to water facilities, etc.).
	20	Social institutions such as local decision making institutions	D	D	**Construction and Operation phase:** No impact is expected, since local decision-making institutions at a village, township and State level will remain the same after the construction.
	21	Misdistribution of benefit and damage	D	D	**Construction and Operation phase:** No misdistribution of benefit and damage by this project is expected.
	22	Local conflict of interests	D	D	**Construction and Operation phase:** No local conflict of interests is expected.
	23	Cultural heritage	D	D	**Pre-Construction, Construction and Operation phase:** Religious and cultural facilities are not observed at the project site.
	24	Landscape	D	D	**Construction and Operation phase:** No impact is expected.
	25	Gender	D	D	**Construction and Operation phase:** No negative impacts specifically on women are expected.
	26	Right of children	D	D	**Construction and Operation phase:** No negative impacts specifically on children are expected.
	27	Infectious diseases such as HIV/AIDS	D	D	**Construction and Operation phase:** No impact is expected
	28	Labor environment	D	D	**Construction and Operation phase:** No impact is expected.
Others	29	Accidents	D	D	**Construction and Operation phase:** No impact is expected.
	30	Cross boundary impacts and climate change	D	D	**Construction and Operation phase:** No impact is expected.

Note) Rating:
A+/-: Significant positive/negative impact is expected. B+/-: Some positive/negative impact is expected.
C: Extent of impact is unknown at this stage D: Few impacts are expected.
Source: The Preparatory Survey Team

10.4.5 Approach for Environmental and Social Considerations

Two things to be noted about social consideration in Water Supply sector are (1) Land acquisition and (2) Water rights. As for the former, there are some cases where some TDCs have not finalized the sub-project plan due to land acquisition issues or they have not prepared agreement for land acquisition yet. The Preparatory Survey Team requested TDCs to prepare agreement if they plan to construct facilities in privately-owned areas. It is recommended not to acquire private land without paying compensation even if the land owners donate it. When land acquisition is difficult with the original plan, TDCs shall revise it so that they can use available land. Regarding the water right, in case TDCs have a plan to develop water sources which have been utilized for other purposes, TDCs shall sign an agreement.

10.4.6 Prediction of Environmental Impact

The prediction of environmental impact of the water supply sector sub-projects is shown in Table 10-4-4.

Table 10-4-4 Prediction of Environmental Impact of the Water Supply Sector

	Items		Situation and Prediction
Pollution	1	Air Pollution	Machines and vehicles used during construction are likely to generate air pollution, most prominently in the form of dispersal of sandy dust. Normal measures can reduce the negative impacts.
	2	Water Contamination	Some water treatment plants will be constructed near rivers. Thus river water contamination may happen temporarily during the construction work. No major construction work is planned for the treatment plan (i.e. water reservoirs and/or pumping stations), so no significant negative impact is expected. Nevertheless, the above areas should be kept in mind so that construction works do not result in soil or water contamination.
	3	Waste	General wastes such like a pet bottle, plastics, kitchen wastes, are not significantly bad at project site. Waste condition is good enough so far. Waste from the construction workers and comps are likely to generate the waste to some extent, but due to relatively less population and poor economic activities no significant adverse impact is expected.
	4	Soil Pollution	No major work to use the toxic chemicals into ground is planned. so no significant negative impact is expected. Nevertheless, the above areas should be kept in mind so that construction works do not result in soil or water contamination.
	5	Noise and Vibration	Noise and vibration level could temporarily be higher during construction due to operation of vehicles and use of construction equipment. In the operation phase, impact of the noise could be accelerated due to an increase in the frequency and speed of vehicles.
	6	Ground subsidence	In some sub-project, groundwater will be used as a water source. Continuous pumping groundwater may cause ground subsidence in some area. But does not expect serious subsidence.
	7	Odor	The sub-project sites are an environmentally sound area. Although some bad odor from asphalt pavement works during the construction may temporarily affect the people, no other significant negative impact is expected.
	8	Bottom Sediment	No major work is planned for ground foundation and embankment works, so no significant negative impact is expected.
Natural Environment	9	Protection Area	There is no protected area in sub-project sites, although some water sources of sub-projects such as TDC 37, 38, 44 are springs located near the natural forested areas. But no major construction works will be implemented in those forested areas. Therefore, no notable impact is expected.
	10	Fauna, Flora and Biodiversity	No wildlife or tree species that require special attention/ protection has been identified either within the sub-project site. But there are some trees needed to cut in the sub-project sites.
	11	Hydraulic Situation	Most of the sub-project sites are located close to the lakes/Dams/Reservoir/Rivers. TDC 4, and 8 are very close to Ayeyarwady River. TDC 25, 28 and 29 are located in the Ayeyarwady Delta Region in which a large number of creeks, streams and rivers are present. TDC 30 and 32 are close to Bago River, and TDC 34 and 36 are close to the Andaman Sea. But as all the sub-projects are not large-scaled projects, no significant changes are expected.
	12	Topography and Geology	TDC 1 is located in western part of the country, the famous Rakhine Yoma (i.e., Ranges). TDC 4, 5, 6, 8 and 11 are located in the low land central dry zone area. TDC 37, 38 and 44 are located in eastern part of the Country (Shan Plateau). TDC 25, 28 and 29 are located in the Ayeyarwady Delta Region. TDC 54, 58, 34 and 36 are located in southern part, coastal region to Andaman Sea. TDC 16 and 18 are located in high land area of Kayin State which is part of the Shan Plateau.

	Items		Situation and Prediction
			The soil types mainly found in the sites are (1) Clay and clay swampy soils, (2) Swampy soils, (3) lateritic soils, and (4) Yellow brown forest soils. No large-scale land alteration is expected due to construction work.
Social Environment	13	Involuntary Resettlement	No involuntary resettlement is expected.
	14	Poor	It is expected after the sub-project, that they will get better access to safe drinking water and benefit from improved water supply system, better health, and other socio-economic improvements.
	15	Indigenous or Ethnic people	Shan, Kayin, and Mon people are major indigenous, There is some sub-projects in Shan state.
	16	Local Economies, such as employment, livelihood	Economy in the areas is largely dependent on agriculture (i.e. rice, corn, banana, sugar cane, bean, chilly, different garden fruits, etc.) and some businesses (e.g. sugar milling and rice milling) and shop/store management to which, no -alteration is expected. During construction, some people are likely to be employed as a work force for water treatment plant and distribution of pipe line construction. Food & drink shops are also expected to benefit from an increase in demand.
	17	Land use and utilization of local resources	Many of proposed lands for the construction are not in-used. Only a few lands are used for paddy field, No change is expected to the current state since majority of the land is not used.
	18	Usage of water and water Right	People take water mainly from the private tube wells and some villages from the river or streams. No water Right issue is found in the sub-project sites. Neither any change nor any negative impact is expected by the sub-project.
	19	Existing social infrastructure and services	There are social infrastructures near the site, such as public hospital, primary schools; Buddhist Monasteries and Pagodas. Those social infrastructures are not expected to be affected by the sub-projects
	20	Social Institution such as local decision making institution	Not such kind of strong institutions are identified in the project site.
	21	Misdistribution of benefits and damages	The misdistribution of benefits and damages between local communities or regional institutions is not likely to happen.
	22	Local conflict of interest	All sub-project sites are all located within the municipal areas of the towns, so it will not be big problem. Extra cautions to these area will be given for implementation and monitoring of the sub-project works.
	23	Cultural Heritage	No cultural heritage is identified in the project site.
	24	Landscape	The sub-project is not expected to negatively affect the beauty of existing landscape (crops and farmlands, river, natural forests and forest plantations, forest mountains and rock mountains), because all the sub-projects are not large-scale projects.
	25	Gender	According to normal measures in compliance with JICA guidelines, gender inequality in the sub-project implementation is not likely to happen.
	26	Children's Right	According to normal measures in compliance with JICA guidelines, Children' Right is not expected to be affected in the sub-project implementation works.
	27	Infection diseases such as HIV/AIDS	It is not also expected to induce the infection of diseases such as HIV/AIDS by the sub-project.
	28	Work Environment	According to normal measures in compliance with JICA guidelines, notable damage to the work environment is not expected.

	Items		Situation and Prediction
Others	29	Accident	According to normal measures in compliance with JICA guidelines, notable accidents are not expected in the sub-project implementation works.
	30	Global Warming	As a water supply project, the impacts by the sub-project are not expected to contribute any significant damages to or increase in Global Warming.

Source: The Preparatory Survey Team

10.4.7 Evaluation of Environmental Impact

Possible impacts of the Power Supply sector's sub-projects are identified and the extent of each impact by rating to the 30 environmental items (of pollution, natural environment and social environment) is shown below. The results are shown together with the scoping results in Table 10-4-5.

Table 10-4-5 Evaluation of Environmental Impact

	№	Evaluation Item (from JICA Guidelines)	Scoping Result		Evaluation		Reasons of Evaluation
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	
Pollution	1	Air pollution	B-	D	B-	D	**Construction phase:** Temporary negative impact is expected on air quality due to construction machines and equipment. **Operation phase:** No impact is expected.
	2	Water pollution	C	D	B-	D	**Construction phase:** Turbid water may be generated by earth works and excavation work and building of water treatment plant are planned. Additionally Organic polluted water may be discharged from base camp. **Operation phase:** No serious impact is expected
	3	Waste	B-	D	B-	D	**Construction phase:** Construction waste such as waste soil and cutting trees are expected. Additionally domestic waste and night soil may be generated from construction base camp. **Operation phase:** No serious impact is expected
	4	Soil contamination	D	D	D	D	**Construction phase:** No impact is expected. **Operation phase:** No impact is expected
	5	Noise and vibration	B-	C	B-	D	**Construction phase:** Noise generation is expected due to works of construction machines and equipment. **Operation phase:** No serious impact is expected
	6	Ground subsidence	D	B-	D	B-	**Construction and operation phase:** Impact by groundwater extraction is unknown. There is a possibility of ground subsidence due to groundwater pumping by tube wells.
	7	Odor	D	D	D	D	**Construction and operation phase:** No impact is expected since activities which cause odor are not expected.
	8	Bottom Sediment	D	D	D	D	**Construction phase:** No impact is expected since there are not any polluted lands nearby project area. **Operation phase:** Sub-station operation which causes impacts on sediment quality is not expected.
Natural environment	9	Protected area	D	D	D	D	**Construction phase:** There is no protected area in the sub-project area. Cutting many trees will not be expected but some negative impact is expected. **Operation phase:** No impact is expected during operation.
	10	Ecosystem	D	D	D	D	**Construction and Operation phase:** Any designated protected areas and considerable species habitats have not been identified in the sub-project area.

	No	Evaluation Item (from JICA Guidelines)	Scoping Result		Evaluation		Reasons of Evaluation
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	
	11	Hydrology	D	D	D	D	**Construction and Operation phase:** No activities give negative impact to hydrological situation of the rivers.
	12	Topography and geology	D	D	D	D	**Construction and operation phase:** Cutting land is expected. However, considerable topography and geological sites are not located in the project area and the impact is limited.
Social environment	13	Involuntary resettlement	B-	D	B-	D	**Pre-Construction phase:** No resettlement is expected. But land acquisition of only one area may be caused. **Operation phase:** No impact is expected
	14	The poor	C	B+	D	D	**Pre-Construction phase:** Few positive impact is expected such as working opportunity.. **Operation phase:** Few positive impact is expected by improvement of water quality.
	15	Indigenous and ethnic people	D	B+	D	D	**Pre-Construction phase:** There are indigenous or ethnic people at the sub-project site. But no serious impact is expected.. **Operation phase:** No obvious impact is expected
	16	Local economy such as employment and livelihood	D	B+	D	D	**Pre-construction phase:** No obvious impact is expected. **Operation phase:** Few impact is expected by the improvement of drinking water quality.
	17	Land use and utilization of local resources	C	D	D	D	**Pre-construction phase:** No impact is expected **Operation phase:** No impact is expected
	18	Water usage	D	B+	D	B+	**Construction phase:** No impact is expected. **Operation phase:** Distribution of safe drinking water by new water treatment plant can give positive impact for water usage.
	19	Existing social infrastructures and services	D	B+	D	B+	**Pre-Construction and Construction phase:** No impact is expected. **Operation phase:** Few positive impact is expected
	20	Social institutions such as local decision making institutions	D	D	D	D	**Construction and operation phase:** No impact is expected, since local decision making institute represented by village, township and state will continue after the construction.
	21	Misdistribution of benefit and damage	D	D	D	D	**Construction and operation phase:** Misdistribution of benefit and damage caused by the water facility construction is not expected.
	22	Local conflict of interests	D	D	D	D	**Construction phase:** No impact is expected. **Operation phase:** No impact is expected
	23	Cultural heritage	D	D	D	D	**Pre-Construction and Construction Phase:** Religious and cultural facility are not observed at the project site. **Operation phase:** No impact is expected
	24	Landscape	D	D	D	D	**Construction phase:** Few impact is expected **Operation phase:** There are no law-based designated landscape areas around project area.
	25	Gender	D	D	D	D	**Construction and operation phase:** Negative impacts specified for women are not expected.
	26	Right of children	D	D	D	D	**Construction and operation phase:** Negative impacts specified for children are not expected.

	No	Evaluation Item (from JICA Guidelines)	Scoping Result		Evaluation		Reasons of Evaluation
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	
	27	Infectious diseases such as HIV/AIDS	D	D	D	D	**Construction phase:** Few impacts are expected. **Operation phase:** Operation which causes infectious diseases is not expected.
	28	Labor environment	D	D	D	D	**Construction phase:** Construction work environment needs to be considered in accordance with relevant laws and regulations. **Operation phase:** No impact is expected.
Others	29	Accidents	D	D	D	D	**Construction phase:** Construction vehicles may use existing local road near residential areas, thus number of traffic accident may increase but not serious.. **Operation phase:** No impact is expected.
	30	Cross boundary impacts and climate change	D	D	D	D	**Construction phase:** No impact is expected. **Operation phase:** No impact is expected.

Source: The Preparatory Survey Team

10.4.8 Mitigation Measure

Mitigation measures, which avoid, minimize, eliminate and/or reduce above-mentioned negative impacts, were examined for respective items. They cover the whole stages - from planning, construction to operation stage - in order for the Project to achieve intended objectives with minimum environmental impacts. They are summarized in Table 10-4-6 below.

Table 10-4-6 Mitigation Measure against Negative Impact and Environmental Management Plan

	No	Evaluation Item (from JICA Guidelines)	Major Mitigation Measures		Responsibility	
			Pre and During Construction phase	Operation phase	Implementation Agency	Responsible Agency
Pollution	1	Air pollution	[Dust] ✓ Water sprinkling near residential area ✓ 20 kph speed limit for construction machines at construction sites adjacent to settlement areas ✓ Use of low-emission construction machinery to minimize the emission of exhaust gases	Not required	Contractor	TDC
	2	Water pollution	[Turbid water and other items] ✓ Discharge through sedimentation pond and silt fence ✓ Installation of portable toilet for workers ✓ Appropriate management of waste and construction machines ✓ Appropriate explanation and response given to affected fishermen, if necessary	Not required	Contractor	TDC
	3	Waste	[Construction waste (trees and waste soil)] ✓ Consideration of the possibility of reuse before the construction waste is disposed of at disposal site [Garbage from base camp] ✓ Garbage at workers camp and waste oil shall be brought to disposal site or facility [Night soil] ✓ Introduction of temporary sanitation facility such as septic tank to the workers camp.	✓ Demolished waste concrete shall be reused and/or disposed in designated disposal site.	[Const.] Contractor [Operation] TDC	TDC

	№	Evaluation Item (from JICA Guidelines)	Major Mitigation Measures		Responsibility	
			Pre and During Construction phase	Operation phase	Implementation Agency	Responsible Agency
	5	Noise and vibration	[Construction noise] ✓ Installation of noise barrier and selection of low-noise equipment. ✓ Avoidance of the use of heavy equipment during night time. ✓ Notice of the construction schedule to surrounding communities to obtain their consensus.	Not required	Contractor	TDC
Natural environment	10	Ecosystem	✓ Construction development area shall be marked and not be disturbed ✓ Proper storing of hazardous waste material properly before final disposal ✓ Planting trees, vegetation, sodding in the public space. ✓ Installation of sediment to ponds, silt fence and portable toilet not to disturb habitats of aquatic lives	✓ Appropriate land use management not to develop natural area along the road ✓ Set up of sign boards where animals cross the road from the view of natural conservation	[Const.] Contractor [Operation] Local government,	TDC
	11	Hydrology	✓ Design of bridges with sufficient capacity ✓ Installation of sufficient drainage facilities on bypass ✓ Secure waterways in construction area	Not required	Contractor	TDC
Social environment	13	Involuntary resettlement	✓ Appropriate compensation and social assistance in accordance with A-RAP	✓ Assessment of whether resettlement was conducted properly with regards to relevant people's livelihood and their restoration and/or enhancement of living standards in accordance with RAP	Settlement & Land Record Department (SLRD under MoALI), TDC, GAD	TDC
	14	The poor	✓ Appropriate social assistance in accordance with A-RAP	✓ Assessment of whether resettlement was conducted properly with regards to relevant people's livelihood and their restoration and/or enhancement of living standards in accordance with RAP	SLRD, TDC GAD	TDC
	16	Local economy such as employment and livelihood	✓ Appropriate compensation and social assistance in accordance with A-RAP	✓ Assessing whether resettlement have been met, particularly with regards to livelihood and restoration and/or enhancement of living standards in accordance with RAP	SLRD, TDC, GAD	TDC
	17	Land use and utilization of local resources	✓ Appropriate land acquisition and compensation for agricultural area ✓ Assistance of establishment of land use map in every township	✓ Management of appropriate land use in accordance with approved established new land use plan in every township and village	[Const.] SLRD, MoALI, consultants [Operation] Local government	TDC
	18	Water usage and right	✓ For water usage only; The preparation of drainage facility, sedimentation pond and sheet in accordance with the site condition to prevent turbid water generated by earthwork ✓ Proper collection of domestic waste and other construction waste and disposal of them in the designated dumping site.	✓ For water right only; Consultations with beneficiaries and other water users	[Const.] Contractor	TDC

	No	Evaluation Item (from JICA Guidelines)	Major Mitigation Measures		Responsibility	
			Pre and During Construction phase	Operation phase	Implementation Agency	Responsible Agency
			✓ Installation of portable toilet			
	19	Existing social infrastructures and services	✓ Construction of diversion road and existing community road will be connected with new bypass if necessary	Not required	Contractor	TDC
	22	Local conflict of interests	✓ Local workforce prioritized for construction works ✓ Implementation of appropriate education for hired workers from other areas	Not required	Contractor	TDC
	27	Infectious diseases such as dengue and HIV/AIDS	✓ Installation of sufficient drainage facilities not to provide habitat for vector mosquito ✓ Provision of adequate temporary sanitation facilities ✓ Enforcement of medical screening and periodical medical check-ups ✓ Awareness raising of labor about the prevention of spread of infectious diseases such as HIV/AIDS	Not required	Contractor	TDC
Others	29	Accidents	✓ Deployment of flagmen at the gate and crossing points of the construction vehicles ✓ Installation of safety sign board ✓ Installation of fence around the construction site to keep out local people such as children ✓ Installation of lightning in the night time ✓ Installation of parking for idling construction machines ✓ Restriction on mobilization speed in the construction site ✓ Safety training for the workers ✓ Safety patrol at the construction site by supervisors	Not required	Contractor	TDC

Source: The Preparatory Survey Team

10.4.9 Environmental Monitoring Plan

The environmental monitoring of regional water supply projects will be undertaken by TDC(s). The Environmental Management Plan (EMP), which incorporates mitigation measures, monitoring as well as the roles of implementing, responsible and supervising organizations, is prepared as shown in Table 10-4-7. TDCs are responsible for ensuring that the Contractor complies with each mitigation measure specified in the Environmental Management Plan of Project during the construction period. The compliance of the Contractor could be presented in tabulated form showing each mitigation measure, corresponding level of compliance *(yes, no or partial)*, and remarks justifying *"no" or "partial"* compliance level. The corrective actions are presented in matrix form with the following details: (i) non-compliance/implementation of mitigation measures, (ii) issues and concerns, (iii) responsibility for implementation of recommended actions.

Table 10-4-7 Environmental Monitoring Plan (Water Supply sector)

Category	Item	Method of Monitoring	Monitoring Place/Point	Frequency (Period)	Referable Standards and Legislation	Implementation Organization	Responsible and/or Supervising Organization	Responsible Agency for monitoring Cost
Design & Pre-construction Phase								
Water pollution	pH, biological oxygen demand (BOD), dissolved oxygen (DO), chemical oxygen demand (COD), & Total Coliform	Collection of samples and laboratory analysis	Selected sample sites in the project area	One month prior to construction Quarterly	1) Environmental Conservation Law (2012), 2) Environmental Conservation Rules and Regulations (2015) 3) JICA guidelines	TDC	TDC and independent monitoring agency	TDC
Adequacy of quantity of water supply	Opinions of Beneficiaries and other water users	Consultations with Beneficiaries and other water users	Project area	Once during design	Community Perception	TDC	TDC	TDC
Construction Phase								
Contamination of pathogens of the water source	pH, biological oxygen demand (BOD), dissolved oxygen (DO), chemical oxygen demand (COD), & Total Coliform	Collection of samples and laboratory analysis	Selected sample sites in the project area	At the beginning and the end of construction		CT	TDC and independent monitoring agency	CT
Implementation of construction, mitigation measures detailed in the EMP	Design and Construction Specifications	Compliance to design and Construction Specifications	All work sites	Once per week	1) Environmental Conservation Law (2012), 2) Environmental Conservation Rules and Regulation (2015) 3) JICA guidelines	CT	TDC, CT	CT
Safety, health and welfare of workers and the public	Health, Safety and Environmental Guidelines	Compliance to Health, Safety and Environmental Guidelines	All work sites, workers' Camp	Once per week	Health Law, Labour Safety Law, Prevention of HIV/AIDS Law	CT	TDC, CT	CT
Operation Phase								

Category	Item	Method of Monitoring	Monitoring Place/Point	Frequency (Period)	Referable Standards and Legislation	Implementation Organization	Responsible and/or Supervising Organization	Responsible Agency for monitoring Cost
Contamination of water supply	pH, biological oxy-gen demand (BOD); chemical oxygen demand (COD); Total Coliform	Collection of samples and laboratory analysis	Selected sample sites in the command area	Once per year	1) Environmental Conservation Law (2012), 2) Environmental Conservation Rules and Regulations (2015) 3) JICA guidelines	TDC	TDC and independent monitoring agency	TDC
Adequacy and efficiency of the of water supply	Opinions/complaints of all water users; Changes as perceived by the users	Consultations with Beneficiaries and other water users	Project area	Twice per year	Community Perception	TDC	TDC	TDC

Source: The Preparatory Survey Team

Note: Abbreviation for Implementing organizations, responsible and supervising organizations: CT - Contractor, TDC – Township Development Committee

10.4.10 Implementation System

This subsection deals with implementation system for the environmental management and monitoring during construction and operation. Table 10-4-8 shows relevant organizations for environmental management and monitoring and their responsibilities. All planned mitigation measures are carried out by the Contractors and reported to ESE, the supervision Consultants and the Project Management Unit (PMU). The monitoring results are reviewed and corrective and preventive actions are taken, if necessary.

Table 10-4-8 Implementation System of Environmental Management and Monitoring

Stage	Name of Organization	Role and Responsibility
Pre-Construction and during Construction Pre-Construction and Construction Phases	Land Acquisition Team (TDC Land Record Department-Detailed design consultant)	• Overseeing the updates of the Abbreviated Resettlement Action Plan (A-RAP) after the detailed design • Monitoring actual payments of compensation to affected landowners, structure owners, and crops/trees owners • Other necessary roles upon finalization of the A-RAP during the detailed design
	Consultant for Construction Supervision	• Inspection of mitigation measures and environmental monitoring conducted by the contractor based on the approved EIA • Reporting of monitoring result to TDC and donor (JICA) by monthly report
	Water Supply Facility Construction Committee (TDC, Local Government, contractor, supervision consultant, local NGO, religious group, peace group and political group etc.)	• Overseeing the implementation of the EMP by the Contractor • Evaluation of result of environmental monthly report and respond necessary action • Validate project compliance with the conditions stipulated in the EIA and RAP; • Receipt of complaints, gathering of relevant information to help determine the validity of complaints or concerns about the Project, and timely implementation of TDC-recommended measures to the complaints • Prepare, integrate and disseminate simplified validation reports to community stakeholders; and • Compilation of monitoring data gathered by the Contractors and supervision on the preparation of semi-annual monitoring reports to be submitted to TDC
	Contractor	• Implementation of mitigation measures and monitoring based on the approved EMP on EIS and RAP • Submission of report for all conducted mitigation measures and monitoring
Operation	TDC and Local Government	• (TDC) Monitoring on the approved IEE and A-RAP, and reporting to ECD and Local Government Environmental Section (the result of monitoring shall be disclosed in ESE and Local Government offices) • Regular inspection and maintenance of the power supply facilities • Planned monitoring is carried out for two (2) years after construction of the power supply facilities.

Source: The Preparatory Survey Team

10.5 Stakeholders Meetings and Information Disclosure

10.5.1 Road and Bridge Sector

Stakeholders meetings were held twice on Road and Bridge Sector.

The first stakeholder meeting was held in Sibu village, Phekon Township, Shan State, on the 11 March 2016 with 76 participants including community elders, etc. The second stakeholder meeting was held in Laiktho Sub-township, Kayin State, on the 12 March 2016 with 51 participants from government organization, NGOs, community elders, etc. In both meetings, the DoH and the Preparatory Survey Team explained an outline of the sub-project proposed and answered to questions and comments from the attending stakeholders.

10.5.1.1 First Stakeholders Meeting

The outline of the first meeting is as shown in the following table.

Table 10-5-1 Outline of the 1st Stakeholders Meeting (Road and Bridge)

Source: The Preparatory Survey Team

10.5.1.2 Second Stakeholders Meeting

The outline of the second meeting is as shown in the following table.

Table 10-5-2 Outline of the 2nd Stakeholders Meeting (Road and Bridge)

Source: The Preparatory Survey Team

10.5.2 Power Supply Sector

Stakeholders meetings were held twice on Power Supply Sector.

The first stakeholder meeting was held in Myaungmya Township, Ayeyarwady Region on the 27 February 2016 with 200 participants including community elders, personnel from Government organization and NGOs, etc. Second stakeholder meeting was held in Thayetchaung Township, Taninthari Region, on the 4 March 2016, with 92 participants including personnel from government organization, NGO, etc. In both meetings, the ESE and the Preparatory Survey Team explained an outline of the sub-project proposed and answered to questions and comments from the attending stakeholders.

10.5.2.1 First Stakeholders Meeting

The outline of the first meeting is as shown in the following table.

Table 10-5-3 Outline of the 1st Stakeholders Meeting (Power Supply)

Source: The Preparatory Survey Team

10.5.2.2 Second Stakeholders Meeting

The outline of the second meeting is as shown in the following table.

Table 10-5-4 Outline of the 2nd Stakeholders Meeting (Power Supply)

Source: The Preparatory Survey Team

10.5.3 Water Supply Sector

Stakeholders meetings were held twice on Water Supply Sector.

The first stakeholder meeting was held in Pathein Township, Ayeyarwady Region on the 26 February 2016 with 60 participants including community elders, personnel from government organization and NGOs, etc. The second stakeholder meeting was held in Launglon Township, Taninthari Region, on the 4 March 2016, with 51 participants including personnel from Government organization, NGO, etc. In both meetings, the TDC and the Preparatory Survey Team explained an outline of the sub-project proposed and answered to questions and comments from the attending stakeholders.

10.5.3.1 First Stakeholders Meeting

The outline of the first meeting is as shown in Table 10-5-5.

Table 10-5-5 Outline of the 1st Stakeholders Meeting (Water Supply)

Source: The Preparatory Survey Team

10.5.3.2 Second Stakeholders Meeting

The outline of the second meeting is as shown in Table 10-5-6.

Table 10-5-6 Outline of the 2nd Stakeholders Meeting (Water Supply)

Source: The Preparatory Survey Team

10.6 Effort on Gender Consideration through Sub-Project Development

10.6.1 Current Situation and Issue of Women's Social Participation

10.6.1.1 Current Situation of Women's Social Participation

(1)Employment Condition

Those women taken higher education in regional urban areas have more opportunities to work for companies or government agencies. On the other hand those who do not have enough education have only chance to work for low-wage occupations in agricultural production, weaving (traditional textile business), or temporary employment only. There are many women running unstable small business to sell water in villages or wards where there is no access to water, such as deep well or city water supply. Those water selling women, in order to keep their small business, have to go to river or lake to fetch water to sell.

According to the hearings from Planning Department of States and Regions, it is identified that women in, especially, suburban areas and rural areas have sever situation with unemployment, and they do not have much opportunity for jobs.

There is the national law of Minimum Wage Act in Myanmar to protect workers in the companies with employment of more than 15 employees, however the same law is not applicable for the companies with less than 15 workers, and there is a large gap in daily basis wages between male and female accounting over 2,000 to 3,000 Kyat. This should be considered as major gender gap in the country.

(2) Women's Participation in Decision Making in Communities

There is a community meeting about once a month in regional suburban areas or rural areas to discuss about the regional or community development[41]and others. Participants to these meetings or gatherings are mainly male residents, and commonly major decisions for their communities are made by those men, although women has right to participate and comment.

10.6.1.2 Major Constraints against Women's Social Participation

The Project Team has conducted community meetings in the target areas for sub-project(s) including water supply sector during the second survey, and made hearings to dig out the constraints over women's social participation and women's intention for their future participation.

According to the hearings, major constraints that those women are concerned about were "limited job opportunity and unemployment for women." All women participated for the hearing strongly expressed that they really want to participate in the social economic activities, if they have employment opportunities in any business field or industry. Besides, many women in regional suburban areas and rural areas have not attended schools for enough education, so that there is a large need of technical and know-how transfer to them along with creating more job opportunities in wider industrial fields.

In addition to the above concern, there are some comments given by female participants stating that the old tradition and customs still living with the Burma people in some States and Regions hinder women's independence and social participation, as women have been traditionally considered for no need of education and work.

10.6.2 Realistic Effort toward Gender Consideration

Through understanding of current situations and issues of women's participation in society in regional urban areas, realistic effort which should contribute to gender equality and women's empowerment as a part of Sub-Project implementation are considered for actual actions as proposed hereafter.

① Include the gender consideration related sections and descriptions in the contract document for the Sub-Project construction contractor agreement considering priority employment of women and /or equal wage and working condition assurance compared with male worker\.

② Provide priority for job opportunities for women to support women who are in the households subject to the resettlement due to the Sub-Project implementation.

[41] Communities in regional areas normally hold meetings to discuss details of demand, when the community(s) tends to request TDC for development or installation of necessary public services and facilities, such as road and water supply infrastructure as well as school.

③ Employ women more actively for water and electricity charge and fee collection works under the electricity and water supply sectors.

④ Set up “Safe Water Sales Business” and employ women to run the business under the TDC’s operation in order to make women participating in regional safe water distribution for community people in cities and villages along with the regional water supply Sub-Projects.

The Preparatory Survey Team has made a discussion with the concerned government agencies in order to evaluate reality of above noted gender consideration efforts. The agencies responded to the first point (①) with the comment that the employment condition is a matter and right that the hired company(s) has so that such effort may not be easy to achieve. The second and third points (② ③) were considered possible effort that the government achieve because these are directly under the agency’s control. Especially TDC is very ambitious for the fourth (④) effort, however they also realized that there are several actions, such as coordination with other entities and stakeholders as well as developing detailed action plans, necessary to realize the women’s empowerment, and TDC noted to study in more details.

Chapter 11 ABBREVIATED RESETTLEMENT ACTION PLAN

11.1 Purpose of Preparation of A-RAP

According to the JICA Guidelines, if the occurrence of involuntary resettlement, namely land acquisition and/or resettlement is anticipated, Resettlement Action Plan (RAP) or Abbreviated Resettlement Action Plan (A-RAP) should be prepared by the Project's Implementation Agencies depending on the number of Project Affected Persons (PAPs) to be resettled.

Based on the preliminary analysis, the number of anticipated PAPs to be resettled is less than 200. Therefore, the Project proponent is required to prepare an A-RAP. The A-RAP should be prepared for the resettlement activities implemented by MoC, ESE, DRD and concerned local governments under the existing laws and regulations in Myanmar.

Objectives of the A-RAP are summarized as follows:

- To protect communities and people from possible losses and other disadvantages caused by the Project
- To establish compensation policies for the sake of PAPs based on their existing socio-economic conditions
- To arrange necessary budget of MoC, ESE and DRD for the resettlement and other associated activities
- To provide guidance with PAPs and the concerned local governments in arranging the resettlement, helping the execution of a series of necessary treating the PAPs in a fair and facilitated manner with transparency

11.2 Necessity of Land Acquisition and Resettlement

11.2.1 Anticipated Land Acquisition and Resettlement

In the case of Road and Bridge Sector, Right of Way (ROW) is set at 150 feet[42] for rural road and divisional road. Thus, all the lands are public land and no land acquisition is required for the project. However, there are some buildings such as houses and shops along the roads of some sub-project sites, and they may be affected by the project.

Regarding Power Supply Sector and Water Supply Sector, ESE and DRD (TDC) have tried to find sites for the Sub-Projects at their own land. However, it is difficult to install all facilities in their land because some Sub-Projects require larger land than the lands that ESE and DRD (TDC) own, and it is better to use other land considering the length of power line, distance to target townships, access to water resource, etc. Using private land is expected for some sub-projects. In addition, land donation by Ministry of Natural Resources and Environment Conservation (MoNREC), Ministry of Agriculture, Livestock and Irrigation (MOALI), military, monasteries and villages are also expected for sub-projects of both power supply sector and water supply sector.

Therefore, the occurrence of involuntary resettlement and generation of Project Affected Persons (PAPs) are anticipated. Accordingly, some losses of structures, assets, business activities are expected, and thus appropriate compensation and resettlement assistance for Project Affected Units (PAUs) and PAPs are required with respect to extent and kind of the losses:

[42] Source: Notice of setting road boundaries of the roads development by Department of Highways, Ministry of Construction. Width of road boundary for State/Region connecting roads (2 or 4 lanes) and District/Township connecting roads (2 lanes) is 150ft (45.75m), and Township/village connection roads (1 lane) is 100ft (30.5m).

11.2.2 Initial Efforts to avoid/minimize Resettlement and Land Acquisition

To avoid and minimize involuntary resettlement and land acquisition, MoC, ESE and DRD are considering the following measures;

- In order to reduce the amount of resettlement or land acquisition, the width of road has been changed to 18 feet (1.5 lanes), although the initial request from MoC was 24 feet (2 lanes). The change is made in the places where a lot of resettlement and land acquisition are expected, and is already agreed by MoC.
- ESE and DRD (TDC) are trying to find their own land or public land for donation for all sub-projects at first.
- If it is difficult to find public land, ESE and DRD (TDC) will try to find private lands considering their compensation.
- ESE and DRD (TDC) will consider the design for Substation or Water Treatment Plant (WTP) which will not have a large-scale negative impact.

If an owner does not agree to sell his/her private land for the use of a sub-project, ESE and DRD (TDC) will try to find alternative sites, or continue to negotiate with the owner until agreement is reached.

11.3 Legal and Policy Framework for Land Acquisition and Resettlement

11.3.1 Laws and Regulation related to Land Acquisition and Resettlement

There are many significant laws which govern land issues, land administration and land ownership in Myanmar such as Land Nationalization Act (1953), Disposal of Tenancies Law (1963), Land Acquisition Act (1894), Forest Law (1992), Farm Land Law (2012), and so on. Among them, the Land Acquisition Act (1894) is the core law of land acquisition.

The Land Acquisition Act 1894 promulgated in the British Colonial Era is even now the core law for land acquisition and resettlement in Myanmar. A new effectual system has not been established until the end of 2015. Ministry of Home Affairs, Settlement and Land Record Department and Forest Department are expected to update a better system in near future. The flow of Land Acquisition under Myanmar Legislation is shown in Figure 11-3-1. The process is summarized as the following 5 steps;

(1) Preliminary investigation,

A notification is publicized in gazette and the substance of public notice is given at convenient places. Preliminary investigations are conducted, which include surveys, digging/boring, delineation of the land boundaries.

(2) Public Hearing for objections,

Objections to land acquisition are collected in writing within 30 days from the notification. The Collector[43] examines the objections and makes necessary solutions in order to reach agreement over the issue. A report containing recommendations on the objections is submitted to the President of Union for the decision, if the Collector finds necessary to do so.

(3) Declaration of intended acquisition,

The declaration of land acquisition is publicized in the gazette, and stated at the district or other territorial division in which the land is situated. The declaration includes the purposes, approximate size of the area, location and plan.

(4) Enquiry into measurements, value and claims, and award by the collector

[43] The expression "Collector" includes any officer specially appointed by the President of the Union to perform the functions of a Collector under this Act (Part1: Preliminary, Land Acquisition Act 1894)

1) The Collector marks out and measures the land, and give the public notice at convenient places near the land. The notice is also provided to persons known or believed to be interested in the land.
2) Examination of Award (Area of Land and Compensation)

The Collector proceeds to inquire into objections to the measurement, the value of the land at the date of the publication of the notification, the respective eligibilities to claim the compensation and examines an award. The award is examined based on the area of the land, compensation including opinions of PAPs and the apportionment of compensation among PAPs. The award is filed for conclusive evidence between the Collector and the persons interested in the land. The Collector immediately notifies the awards to the absentees or their representatives when the award made. The Collector makes all efforts to answer the enquiry or settle the issues.

3) Grievance

If deliberation reaches agreement, Award Committee issues the decision concerning the type and amount of compensation. The deliberation is continued until agreement is reached between the affected people and Award Committee, but GAD can intermediate in case they cannot conclude alone.

4) Reference to Court

Any person interested in the land who do not accept the award can require that the matter be referred by the Collector for the determination of the Court with written application, whether the objection to the measurement of the land, the amount of the compensation, the person to whom it is payable, or the apportionment of the compensation among the persons interested are appropriate. If the persons agree to the compensation, the particular details are specified in the award for conclusive evidence. If any dispute arises, the Collector may refer the disputes to the decisions of the Court.

(5) Payment and Taking possession of land

The Collector pays compensation and takes possession of the land. The Collector gives the persons sufficient time to remove their property without inconvenience before taking possession.

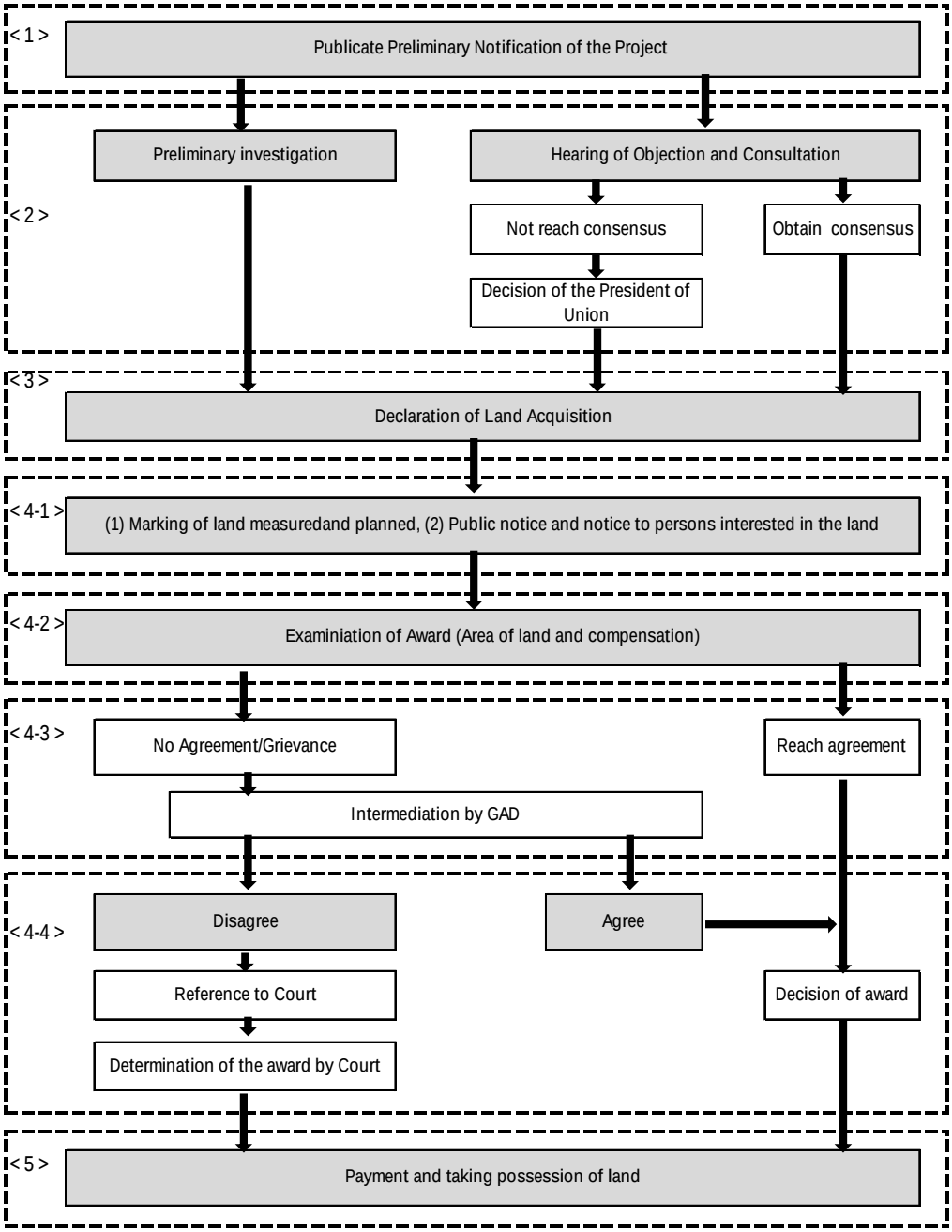


Figure 11-3-1 Flow of Land Acquisition in Myanmar

Source: the Preparatory Survey Team

11.3.2 Policy in JICA Guideline

According to JICA Guidelines, the key principles of JICA's policy on involuntary resettlement and land acquisition are as below.

(a) Involuntary resettlement and loss of means of livelihood are to be avoided when feasible by exploring all viable alternatives.

(b) When, population displacement is unavoidable, effective measures to minimize the impact and to compensate for losses should be taken

(c) People who must be resettled involuntarily and people whose means of livelihood will be hindered or lost must be sufficiently compensated and supported, so that they can improve or at least restore their standard of living, income opportunities and production levels to pre-project levels.

(d) Compensation must be based on the full replacement cost as much as possible.

(e) Compensation and other kinds of assistance must be provided prior to displacement.

(f) For projects that entail large-scale involuntary resettlement, resettlement action plans must be prepared and made available to the public. It is desirable that the resettlement action plan include elements laid out in the World Bank Safeguard Policy, OP 4.12, Annex A.

(g) In preparing a resettlement action plan, consultations must be held with the affected people and their communities based on sufficient information made available to them in advance. When consultations are held, explanations must be given in a form, manner, and language that are understandable to the affected people.

(h) Appropriate participation of affected people must be promoted in planning, implementation, and monitoring of resettlement action plans.

(i) Appropriate and accessible grievance mechanisms must be established for the affected people and their communities.

(j) Affected people are to be identified and recorded as early as possible in order to establish their eligibility through an initial baseline survey (including population census that serves as an eligibility cut-off date, asset inventory, and socioeconomic survey), preferably at the project identification stage, to prevent a subsequent influx of encroachers of others who wish to take advantage of such benefits.

(k) Eligibility of Benefits include, the PAPs who have formal legal rights to land (including customary and traditional land rights recognized under law), the PAPs who don't have formal legal rights to land at the time of census but have a claim to such land or assets and the PAPs who have no recognizable legal right to the land they are occupying.

(l) Preference should be given to land-based resettlement strategies for displaced persons whose livelihoods are land-based.

(m) Provide support for the transition period (between displacement and livelihood restoration.

(n) Particular attention must be paid to the needs of the vulnerable groups among those displaced, especially those below the poverty line, landless, elderly, women and children, ethnic minorities etc.

(o) For projects that entail land acquisition or involuntary resettlement of fewer than 200 people, abbreviated resettlement plan is to be prepared.

In addition to the above core principles, JICA's guideline also lays emphasis on a detailed resettlement policy inclusive of all the following points; project specific resettlement plan; institutional framework for implementation; monitoring and evaluation mechanism; time schedule for implementation and detailed Financial Plan etc.

11.3.3 Comparison between JICA Guidelines and Myanmar Legislation

Table 11-3-1 shows the comparison of the JICA guidelines and Myanmar legislation and measures for gaps.

Table 11-3-1 Comparison of the JICA Guideline and Myanmar Legislation

No	JICA Guidelines	Laws and Guidelines in Myanmar	Gap relative to JICA GL	Project Policy
1	Involuntary resettlement and loss of means of livelihood are to be avoided when feasible by exploring all viable alternatives. (JICA GL)	Not applicable	There is no regulation which mentions or requests to avoid or minimize involuntary resettlement and loss of livelihood means.	Follow JICA GL
2	When, population displacement is unavoidable, effective measures to minimize impact and to compensate for losses should be taken. (JICA GL)	Compensation or indemnity is provided for farmland acquisition for the interest of the State or public (Farmland Law (2012) Art. 26, Farmland Rules (2012) Art. 64).	There is no difference.	Same as JICA GL

No	JICA Guidelines	Laws and Guidelines in Myanmar	Gap relative to JICA GL	Project Policy
3	People who must be resettled involuntarily and people whose means of livelihood will be hindered or lost must be sufficiently compensated and supported, so that they can improve or at least restore their standard of living, income opportunities and production levels to pre-project levels. (JICA GL)	Damages to standing crops/trees, lands, movable/immovable properties, relocation cost, economic activities are requested to compensate. (Land Acquisition Act (1894) Art. 23, Farmland Rules (2012) Art. 67)	There is no stipulation of improving or at least restoring living standard, income opportunities, and production levels to pre-project levels in the Myanmar legal framework.	The project considers the assistance to improve or restore the livelihood.
4	Compensation must be based on the full replacement cost as much as possible. (JICA GL)	Compensation at three times of the value calculated based on the average production of crops in the current market price of that area is provided. (Farmland Rules (2012) Art. 67)	There is no significant difference.	Same as JICA GL
5	Compensation and other kinds of assistance must be provided prior to displacement. (JICA GL)	When compensation is not paid on or before land acquisition, compensation amount awarded with interest rate must be paid.	There is no clear indication about timing of compensation payment in the Myanmar legal framework.	The project supports the compensation process so that the compensation and other kinds of assistance to be provided prior to displacement.
6	For projects that entail large-scale involuntary resettlement, resettlement action plans must be prepared and made available to the public. (JICA GL)	Not applicable	There is no regulation requesting to prepare resettlement action plan.	The project prepares abbreviated resettlement action plan and make available to the public.
7	In preparing a resettlement action plan, consultations must be held with the affected people and their communities based on sufficient information made available to them in advance. (JICA GL)	Not applicable	There is no regulation requesting to organize consultations with PAPs.	The project holds the consultations with the affected people and their communities on sufficient information made available to them in advance.
8	When consultations are held, explanations must be given in a form, manner, and language that are understandable to the affected people. (JICA GL)	Not applicable	Ditto	The project considers appropriate explanation when consultations are holds.
9	Appropriate participation of affected people must be promoted in planning, implementation, and monitoring of resettlement action plans. (JICA GL)	Not applicable	There is no regulation requesting participation of PAPs into planning, implementation, and monitoring of resettlement action plans.	The project considers the appropriate participation of affected people.
10	Appropriate and accessible grievance mechanisms must be established for the affected people and their communities. (JICA GL)	1) Notice of compensation amount to PAPs directly: appeal to the court within 6 weeks from the date of compensation award 2) Notice of compensation amount to representatives of PAPs: i) within 6 weeks of receipt of compensation notice,	The procedure of grievance in the Myanmar context is direct settlement at the court, which is not necessarily easy or accessible to PAPs	The project considers the grievance redress mechanism by utilizing the existing administration system to be convenient for PAPs.

No	JICA Guidelines	Laws and Guidelines in Myanmar	Gap relative to JICA GL	Project Policy
		or ii) within 6 months from the from the date of compensation award, whichever period shall be first expire (Land Acquisition Act (1894) Art. 18)		
11	Affected people are to be identified and recorded as early as possible in order to establish their eligibility through an initial baseline survey (including population census that serves as an eligibility cut-off date, asset inventory, and socioeconomic survey), preferably at the project identification stage, to prevent a subsequent influx of encroachers of others who wish to take advance of such benefits. (WB OP 4.12 Para. 6)	A notification of land acquisition or public purposes is published in the Gazette, which is also published at the convenient place in the concerned municipality. (Land Acquisition Act (1894) Article 4)	There is no specific description of identifying affected people as early as possible in the national law.	The project identifies and records the affected people at the project identification stage.
12	Eligibility of benefits includes, the PAPs who have formal legal rights to land (including customary and traditional land rights recognized under law), the PAPs who don't have formal legal rights to land at the time of census but have a claim to such land or assets and the PAPs who have no recognizable legal right to the land they are occupying. (WB OP 4.12 Para. 15)	Occupiers/stakeholders of lands to be acquired are explained about acquisition and claims to compensations. (Land Acquisition Act (1894) Article 9)	Detail procedures as well as eligibility criteria are not clearly defined. Also there is no specific indication about displaced persons without titles.	The project considers eligibility for assistance to all households whose income sources or assets are confirmed as affected due to project implementation.
13	Preference should be given to land-based resettlement strategies for displaced persons whose livelihoods are land-based. (WB OP 4.12 Para. 11)	Not Applicable	There is no regulation stipulating to give land-based resettlement strategies.	The project considers the land-based resettlement strategies.
14	Provide support for the transition period (between displacement and livelihood restoration). (WB OP 4. 12, para.6)	Not Applicable	There is no regulation stipulating to provide support for the transition period.	The project considers the support for the transition period.
15	Particular attention must be paid to the needs of the vulnerable groups among those displaced, especially those below the poverty line, landless, elderly, women and children, ethnic minorities etc. (WB OP 4.12 Para. 8)	Not Applicable	There is no regulation stipulating to provide particular attention to the vulnerable groups.	The project pays particular attention to vulnerable groups if needed.
16	For projects that entail land acquisition or involuntary resettlement of fewer than 200 people, abbreviated resettlement plan is to be prepared. (WB OP4.12 Para.25)	Not Applicable	There is no regulation stipulating to develop an A-RAP for a project with involuntary resettlement of fewer than 200 people.	Same as JICA GL

Source: Land Acquisition Act (1894), Farmland Rules (2012), Farm Land Law (2012), JICA Guidelines (2010.4) and World Bank OP 4.12

11.3.4 Institutional Framework for Land Acquisition and Resettlement

In general, issues of land acquisition and resettlement are complicated in Myanmar due to various issues such as entangled legislation and divided administrative structures. Roles and functions of organizations in implementing land acquisition and resettlement are shown in the following table.

Table 11-3-2 Role of Organization in Implementing Land Acquisition and Resettlement

Organization	Role and Function
Land Administration Department (LAD)	1) For non-agricultural land, LAD at township level investigates land use, area size, landownership and tenant, and prepares necessary documents and maps for land acquisition. 2) The LAD routinely handles transfer of land titles or subdivisions of plots, etc. and prepares land lease certificates.
Settlement and Land Record Department (SLRD), Ministry of Agriculture, Livestock and Irrigation (MoALI)	1) For agricultural lands, the SLRD under the MoALI at township level investigates area size and land ownership, prepares necessary documents and maps for land acquisition. 2) The SLRD surveys market prices of lands, buildings, crops and trees for compensation.
Award Committee	The Award Committee chaired by the respective Township Administrators is established to examine the award (i.e. entitlement, amount of compensation).
District Administrator	The District Administrator issues land lease grant for land not exceeding one (1) acre (The Lower Burma Town and Village Lands Manual, 1899).
General Administration Department (GAD), Ministry of Home Affairs (MoHA)	The GAD issues land lease grant for land exceeding five (5) acres (The Lower Burma Town and Village Lands Manual, 1899)

Source: the Preparatory Survey Team

11.3.5 Resettlement Policy

11.3.5.1 General Considerations

The policy regarding the replacement of structures and resettlement caused by the project implementation needs to take both the JICA guidelines and the Myanmar Legislation into consideration. However, considering that gaps exist between the JICA guidelines and the Myanmar Legislation as shown in Table 11-3-1, and that the former is comparatively comprehensive, the policy for this particular project shall be primarily based on the JICA guidelines (2010).

11.3.5.2 Replacement Costs

The compensation to the eligible PAPs, namely, those who meet the cut-off date, shall be made based on the principles stated below. The necessary compensation amount for the replacement, which is needed to replace the affected assets without depreciation and deduction for taxes and/or costs of transaction, is calculated before the displacement.

(a) Productive Land (agricultural, aquaculture, garden and forest): based on the actual current market prices that reflect recent land sales in the area, and in the absence of such recent sales, based on the recent sales in comparable locations with comparable attributes; fees and taxes; or in the absence of such sales, based on the productive value.

(b) Residential Land: based on the actual current market prices that reflect recent land sales, and in the absence of such recent land sales, based on the prices of recent sales in comparable locations with comparable attributes, fees and taxes.

(c) Existing regulations of local government regarding the calculation of compensation for building, crops and trees shall be used wherever available.

(d) Houses and other related structures: based on the actual current market prices of affected materials.

(e) Annual crops: cash compensation for the replacement should be in line with local government regulations if available, or equivalent to the current market value of crops at the time of compensation.

(f) Perennial crops: cash compensation for the replacement should be in line with local government regulations if available, or equivalent to the current market value of crops at the time of compensation

(g) For timber trees: cash compensation for the replacement should be in line with local government regulations if available, or equivalent to the current market value. Value is decided by type, age and relevant productive value at the time of compensation based on the diameter at breast height of each tree

11.3.5.3 Complementary Compensation

MoC, ESE and DRD and the responsible agencies are requested to follow the JICA guidelines as well as the existing laws and regulations in the country in compensating PAPs in this particular project. In the case that an amount of compensation does not meet the JICA's requirement, all the relevant agencies are requested to prepare complementary compensation.

11.3.5.4 Eligibility Cut-off-date for Land Acquisition

A cut-off date is set to identify and differentiate genuine eligible PAPs from non-eligible people, thereby reducing possible conflict. For this project, the cut-off date has been set to be the time of social survey implementation based on the agreement among expected affected people, Implementing Agencies (DoH, ESE or TDC) and the General Administrative Department (GAD) at each Township. The basic environmental conditions (including land-use, socio-economic situation, and wildlife, the proximity to protected areas, reserved forests, sensitive receptors, and water resources) were explained at that time.

The period of social survey for the 3 sectors (Road and Bridge, Power Supply and Water Supply) is as follows, and explanation about cut-off date during the social survey has been completed:

- Road and Bridge: from 25 January 2016 to 28 January 2016 (4 days)
- Power Supply: from 9 February 2016 to 26 February 2016 (4 days)
- Water Supply: from 2 February 2016 to 26 February 2016 (10 days)

In addition, with the purpose of explaining and letting the local people know about the project including the cut-off date, Stakeholders Meetings have been held in 6 Township for all sectors. The following are the dates and places of the Stakeholders Meetings:

- Road and Bridge: On 11 March in Leiktho (Kayin), and on 12 March in Seebu (Shan)
- Water Supply: On 26 February in Pathein (Ayeyarwady), and on 3 March at Langlon (Tanintharyi)
- Power Supply: On 27 February at Myaungmya (Ayeyarwady), and on 4 March at Thayetchanung (Tanintharyi)

Figure 11-3-2 Stakeholders Meeting (SHM) at Pathein (26-Feb) and Document for SHM

Source: the Preparatory Survey Team

11.4 Scope of Land Acquisition and Resettlement

11.4.1 Summary of Land Ownership

The Land Ownership for sub-projects is shown in Table 11-4-1.An A-RAP Study (i.e. census, asset and socio-economic study, etc.) has been conducted for sub-projects which are expected to involve the acquisition of private land. In addition to this, it is necessary to confirm the situations in accordance

with World Bank Operational Policy regarding the sub-projects which are expected to involve land donation from village or monastery.

Table 11-4-1 Summary of Land Ownership

	No	Project No.	Region/State	Township	Condition, Name of Owner or Agencies
ROAD	1	MoC-03	Kayin	Mat Thalay Chaung village	2 shops is affected
	2	MoC-05	Sagaing	Mandalay-Mytkyina	No land acquisition & resettlement is expected
	3	MoC-06	Bago	Htone Bo Gyi village	A shop affected
	3	MoC-06	Bago	(Non-village Area)	A shop affected
	4	MoC-07	Magway	GanGaw- Aika	No land acquisition & resettlement is expected
	5	MoC-17	Shan	(Non-village Area)	A house affected
	5	MoC-17	Shan	BC Kone village	A shop affected
	5	MoC-17	Shan	Thar Yu village	A house affected
	5	MoC-17	Shan	Ka Fu Village	A store affected
	6	MoC-18	Ayeyarwady	Out of village (7/6-7/7)	A temporary house affected
	6	MoC-18	Ayeyarwady	Out of village (15/6-18-1)	2 temporary houses affected
	6	MoC-18	Ayeyarwady	Out of village (18/1-19/1)	4 temporary houses and 1 house affected
	7	MoC-22	Shan	Han Myintmo-Aung Pan Road	No land acquisition & resettlement is expected
POWER	1	ESE-0101	Kachin	Waing Maw	ESE land
	2	ESE-0303	Kayin	Pinekyon	ESE land
	3	ESE-0401	Chin	Teetain	ESE land
	4	ESE-0501	Mon	Saung Naung Gyi (Kyaikhto)	Private land
	5	ESE-0601	Rakhine	Ann (Kazukain)	Private land
	6	ESE-0602	Rakhine	Thandwe Kyaunkgyi	ESE land
	7	ESE-0703	Shan	Kalaw (Heho)	ESE land
	8	ESE-0802	Sagaing	Ohmtaw-Myinmu	ESE land
	9	ESE-0805	Sagaing	Watlat (Saingnaingkwe)	Village land (Donation)
	10	ESE-0808	Sagaing	Khin Oo (Chay Myint Kyin)	Private land
	11	ESE-0809	Sagaing	Depayin (Myae)	Monastery land (Donation)
	12	ESE-0812	Sagaing	Kani	ESE land
	13	ESE-0813	Sagaing	Butalin (Maungtaung)	ESE land
	14	ESE-0901	Tanintharyi	Launglon (Zalot Village)	Private land
	15	ESE-0902	Tanintharyi	Thayeychaung (Mindut Village)	Private land
	16	ESE-1006	Bago	Tharyarwady	Private land
	17	ESE-1008	Bago	No (4) Oakthar	ESE land
	18	ESE-1011	Bago	Htantabin (Zayatgyi)	ESE land
	19	ESE-1013	Bago	Yadashe (Myohla)	ESE land
	20	ESE-1014	Bago	Sinmeeswe	ESE land
	21	ESE-1016	Bago	Othegon	ESE land
	22	ESE-1101	Magway	Chauk (Gway Cho Village)	Private land
	23	ESE-1102	Magway	Taungdwingyi (Satthwa)	Village land (Donation)
	24	ESE-1201	Ayeyarwady	Pathein	Private land
	25	ESE-1206	Ayeyarwady	Einme	ESE land
	26	ESE-1305	Mandalay	Taungthar – Myingyan	MESC
	27	ESE-1309	Mandalay	Nyaung Oo	MESC
	28	ESE-1317	Mandalay	PyinOoLwin	MESC
	29	ESE-1318	Mandalay	Mcik Htilar	MESC
	30	ESE-1319	Mandalay	Thar Si	MESC
	31	ESE-1321	Mandalay	Kyauk Pa Taung	MESC
	32	ESE-1322	Mandalay	TharSi T/S (Myoma S/S)	MESC
WATER	1	TDC-1	Rakhine	Sittwe	Private land
	2	TDC-4	Magway	Chauk	TDC land
	3	TDC-5	Magway	Taungdwingyi	TDC land
	4	TDC-6	Magway	Minbu	TDC land
	5	TDC-8	Magway	Thayet	TDC land
	6	TDC-11	Magway	Pokokku	TDC land
WATER	7	TDC-13	Mandalay	Myingyan	TDC land
	8	TDC-16	Kayin	Than Daung Gyi	MOECAF
	9	TDC-18	Kayin	Kyainseikgyi	TDC land
	10	TDC-25	Ayeyarwady	Wakema	TDC land
	11	TDC-28	Ayeyarwady	Pathein	TDC, Monastery & Private (Donation)
	12	TDC-29	Ayeyarwady	Myaungmya	MoNREC and TDC land
	13	TDC-30	Bago	Bago	Ministry land (MOALI)

	No	Project No.	Region/State	Township	Condition, Name of Owner or Agencies
	14	TDC-32	Bago	Gyobingauk	TDC land
	15	TDC-34	Tanintharyi	Launglon	TDC & Monastery land (Donation)
	16	TDC-36	Tanintharyi	Bokpyin	TDC land
	17	TDC-37	Shan	Taunggyi	TDC land
	18	TDC-38	Shan	Aungpan	TDC land
	19	TDC-44	Shan	Lashio	TDC and MoNREC land
	20	TDC-54	Mon	Thanbyuzayat	MOALI & MoNREC land
	21	TDC-57	Mandalay	Meikhtila	TDC land
	22	TDC-58	Mon	Mawlamyine	TDC land
14 sub-projects			Required Private Land and include in A-RAP as PAPs.		
5 sub-projects			Required Land Donation from monastery or villages.		

Source: the Preparatory Survey Team

Note: For Road Sector, the Table shows the lands of affected areas only, not of all along the routes.

11.4.2 Project Affected Person (PAPs) &Project Affected Unit (PAU).

Table 11-4-2 shows the number of PAUs and PAPs. There are twenty-six (26) households (Project Affected Persons: PAPs) affected by the fourteen (14) sub-projects of 3 sectors in total.

Table 11-4-2 Expected PAPs and Affected Units (PAUs) and the Land Sizes

Sectors	Affected HHs	Project Affected Persons	PAUs					
			No. of Buildings	No. of land plots	Total Land Area (m2)	No. of Tube wells	No. of Dug wells	No. of Valuable Trees
Road & Bridge	15	57	17	-	388	-	-	-
Power Supply	9	35	-	8	44,951	-	-	-
Water Supply	2	8	1	2	4,067	1	1	15

Source: the Preparatory Survey Team

The corresponding number of Project Affected Persons (PAPs) is enumerated by the census survey carried out from January, 2016 to July, 2016 by the Preparatory Survey Team. It should be noted that some trees, electric poles and mountain-side areas in Road and Bridge project sites are supposed to be removed and/or replaced by this Project. The DoH, the proponent, needs to obtain approval from the concerned agencies (i.e. GADs, Forest Department in MoNREC and ESE in MoEE, etc.) to do such works before the construction.

According to the evaluation criteria of the JICA guidelines for Environmental and Social Considerations (2010), the Project can be categorized as “Category B”; this means that the number of expected PAPs is less than 200 and the adverse impacts are expected to some extent but not so significant. The tables (Table 11-4-3, 11-4-4 and 11-4-5) below show the brief account on the PAPs and PAPs for each sector. More detailed information about each PAU is shown in the attachment of this chapter (see Subsection 10-6-1: List of Affected Land and Unit).

Table 11-4-3 PAPs and PAUs in Road and Bridge Sector

Table 11-4-4 PAPs and PAUs in Power Supply Sector

Table 11-4-5 PAPs and PAUs in Water Supply Sector

11.4.3 Socio-Economic Situation of PAPs

The census survey conducted by the Preparatory Survey Team from January to July 2016 includes interviews with 26 respondents (household heads). The socio-economic situation of the PAPs will be evaluated based on the information obtained from these interviews, whose results are briefly outlined in the following tables.

Table 11-4-6 Age and Gender of Family Members (Road and Bridge)

Table 11-4-7 Age and Gender of Family Members (Power Supply)

Table 11-4-8 Age and Gender of Family Members (Water Supply)

Table 11-4-9 Occupation, Income and Expenditure of the PAPs (Road and Bridge)

Table 11-4-10 Occupation, Income and Expenditure of the PAPs (Power Supply)

Table 11-4-11 Occupation, Income and Expenditure of the PAPs (Water Supply)

Ethnicity, Religion, Education level, and means of transportation of the PAPs are shown in following table.

Table 11-4-12 Ethnicity, Religion, Education and Transportation of PAPs (All three sectors)

	 Measuring the distance between house and road (MatThalayChang)
 Petroleum stall within the Road Formation Width	 House within the Road Formation Width (Lay Eain Su)
	 House within the Road Formation Width (Htone Bo Gyi)

Source: the Preparatory Survey Team

11.4.4 Land Donation

There are 5 sub-projects in power supply and water supply sectors which are expected to involve land donation from villages (public area) and monastery. These sub-projects are shown in the following table.

Table 11-4-13 List of Land Donation (Power Supply and Water Supply Sector)

Project No.	Region	Township	Owner Name
ESE-0805	Sagaing	Watlat (Saingnaingkwe)	Village land (Donation)
ESE-0809	Sagaing	Depayin (Myae)	Monastery land (Donation)
ESE-1102	Magway	Taungdwingyi (Satthwa)	Village land (Donation)
TDC-28	Ayeyarwady	Pathein	TDC, Monastery & Private (Donation)
TDC-34	Thanintharyi	Launglon	TDC & Monastery land (Donation)

Source: the Preparatory Survey Team

It is necessary to confirm the conditions of the land, owner and procedure etc., according to the World Bank Guideline[39], even if the donations are voluntary. If determining informed consent can be difficult, the following criteria are suggested in the guidelines:

WB-1: The infrastructure must not be site specific.

WB-2: The impacts must be minor, that is, involve no more than 10 percent of the area of any holding and require no physical relocation.

WB-3: The land required to meet technical project criteria must be identified by the affected community, not by line agencies or project authorities (nonetheless, technical authorities can help ensure that the land is appropriate for project purposes and that the project will produce no health or environmental safety hazards).

WB-4: The land in question must be free of squatters, encroachers, or other claims or encumbrances.

WB-5: Verification (for example, notarized or witnessed statements) of the voluntary nature of land donations must be obtained from each person donating land.

WB-6: If any loss of income or physical displacement is envisaged, verification of voluntary acceptance of community-devised mitigatory measures must be obtained from those expected to be adversely affected.

WB-7: If community services are to be provided under the project, land title must be vested in the community, or appropriate guarantees of public access to services must be given by the private titleholder.

WB-8: Grievance mechanisms must be available.

Please see the subsection 10.6.2 (the attachment to this chapter) for more detailed information about the condition of land donation for each sub-project.

[39] P22-23, Involuntary Resettlement Source Book, Planning and Implementation in Development Project, The World Bank

11.4.5 Entitlement Matrix

An entitlement matrix serves as a tool for evaluating the possible losses caused by the Project, namely it identifies eligibility of PAPs and provides a basis for necessary compensation and resettlement assistance with the PAPs. Table 11-4-14 summarizes the Entitlement Matrix designed for this Project.

In the case that the gaps exist between the JICA Guidelines and the Myanmar Legislation about the way of setting eligibility or identifying eligible persons, this entitlement matrix should be used according to the JICA Guidelines.

Table 11-4-14 Entitlement Matrix

Type of Loss	Eligible Entity	Compensation Policy	Responsible Organization
Immovable Assets (e.g. fixed assets such as houses, structures, buildings, wells, etc.)	Owners of the Assets	Cash compensation worth either the value of the assets lost or twice their value measured in market price as replacement cost.	DoH and MoC, ESE and MoEE, and TDC, in cooperation with local and Regional/ State Governments
Movable Assets (e.g. transportation cost)	Owners of the Assets	Movable assets are not subject to compensation in principle. However, if costs for transporting the assets are required, such transportation costs or transportation mode to transfer the assets shall be provided.	DoH and MoC, ESE and MoEE, and TDC, in cooperation with local and Regional/ State Governments
Private Land (e.g. farmland, residential land, commercial land)	Owners of the Assets	Cash compensation worth the value of the assets measured in market price as replacement cost.	DoH and MoC, ESE and MoEE, and TDC in cooperation with SLRD, local and Regional/ State Government
Crops, and Valuable Plants/Trees	Owners of the Assets	Cash compensation that is worth three years the expected earnings accrued from farming measured in market price as replacement cost.	DoH and MoC, ESE and MoEE, and TDC, in cooperation with local and Regional/ State Governments
Job Opportunity	Labors, Traders such as vendors, stallers, shop keepers	1. Support in finding new jobs, restarting existing businesses and so on through measures such as micro credit and subsidies 2. Provision of prioritized employment opportunity in construction-related works of the project	DoH, ESE, TDC, in cooperation with local and Regional/State Governments

Source: the Preparatory Survey Team

11.4.6 Compensation and Budget

The following tables show the initial estimate of the cost required for compensation for all three concerned sectors.

11.4.6.1 Estimation of Compensation Amount for Road and Bridge Sector

Table 11-4-15 Estimation of DoH Budget for Structures Replacement and Resettlement

Table 11-4-16 House Type

Therefore total size of land for each unit is follows; Type I is 114 m^2, Type II is 40 m^2, Type III is 189 $m^2$and Type IV is 45 m^2.

Table 11-4-17 Estimated Value of a Typical Affected House (Type I)

Table 11-4-18 Estimated Value of a Typical Affected house (Type II)

Table 11-4-19 Estimated Value of a Typical Affected house (Type III)

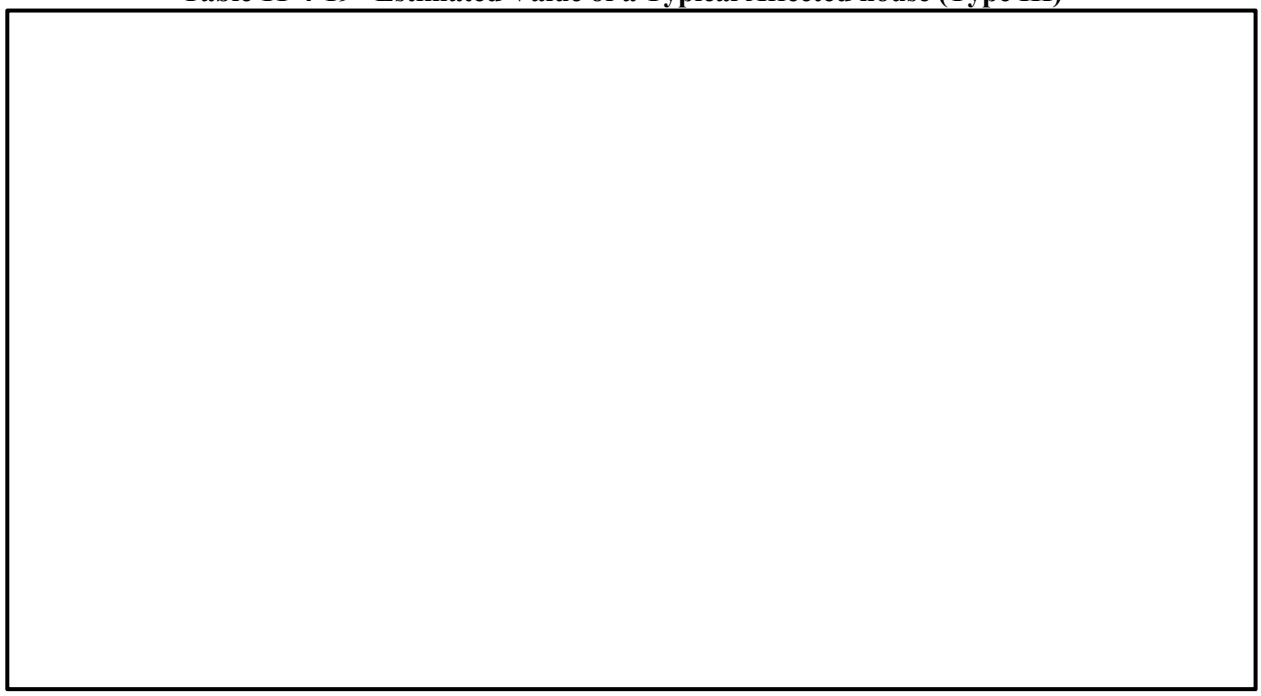
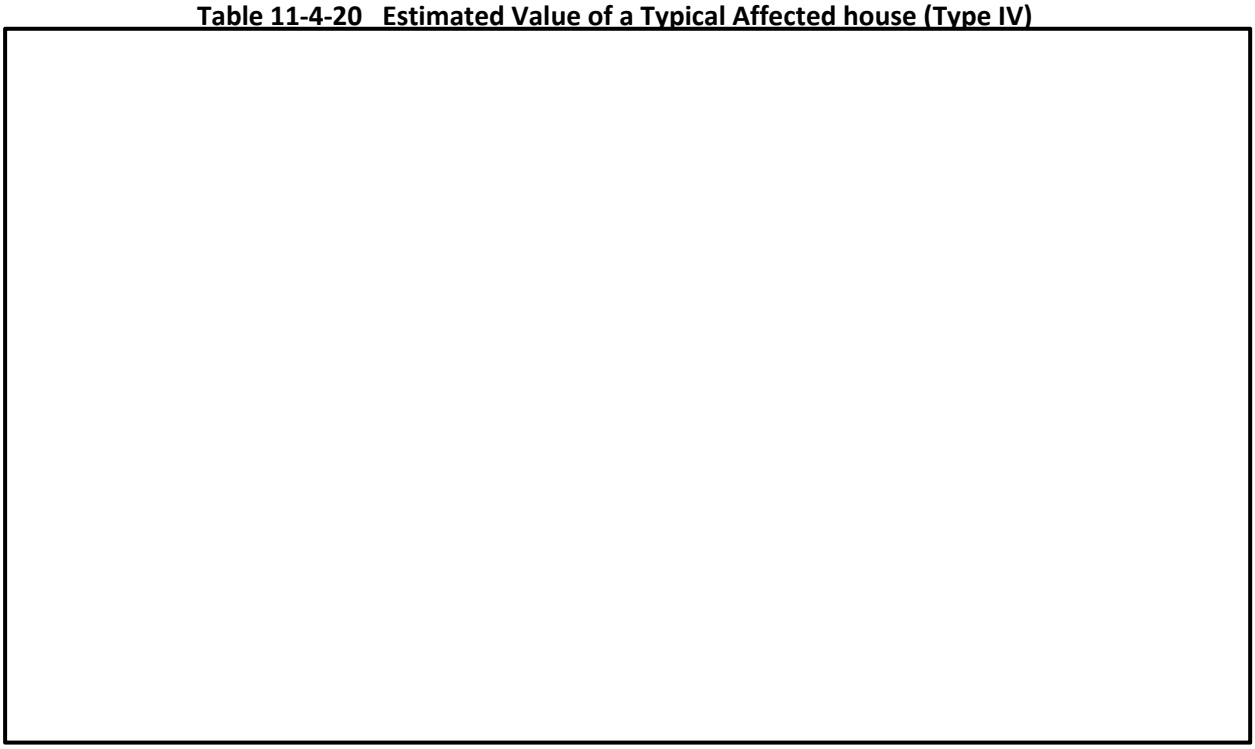


Table 11-4-20 Estimated Value of a Typical Affected house (Type IV)



11.4.6.2 Estimation of Compensation Amount for Power Supply Sector

Table 11-4-21 Estimation of ESE Budget for Structures Replacement and Resettlement

11.4.6.3 Estimation of Compensation Amount for Water Supply Sector

Table 11-4-22 Estimation of TDC Budget for Structures Replacement and Resettlement

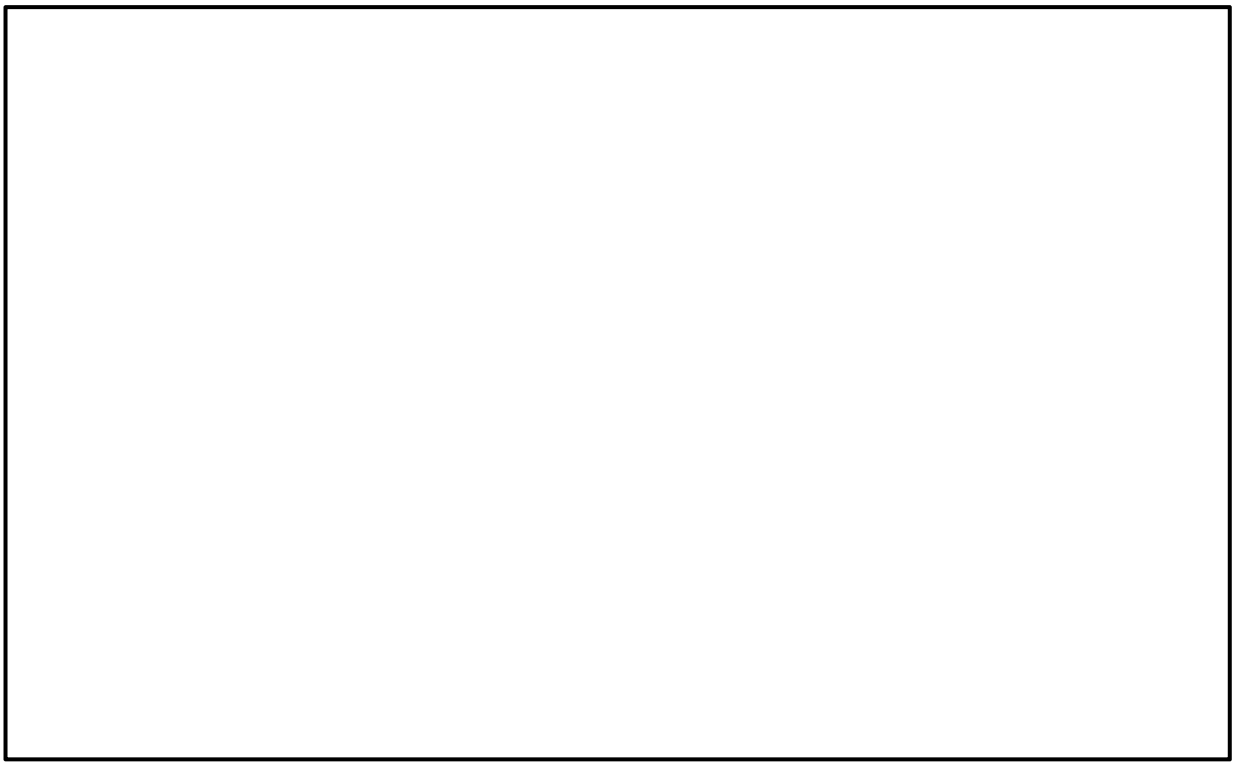


Table 11-4-23 Estimated Value of a Typical Tube Well

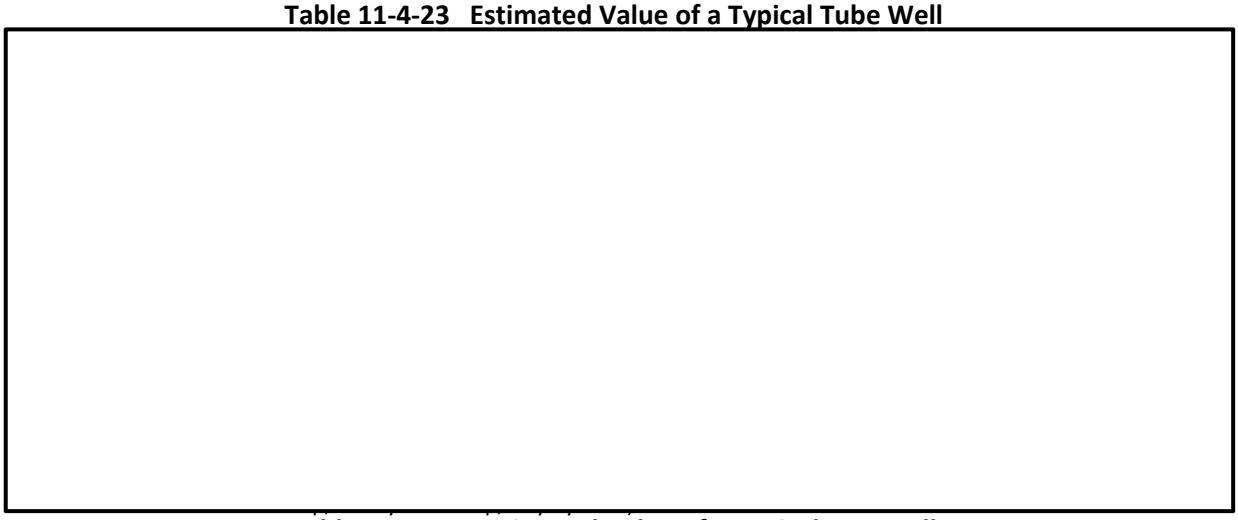
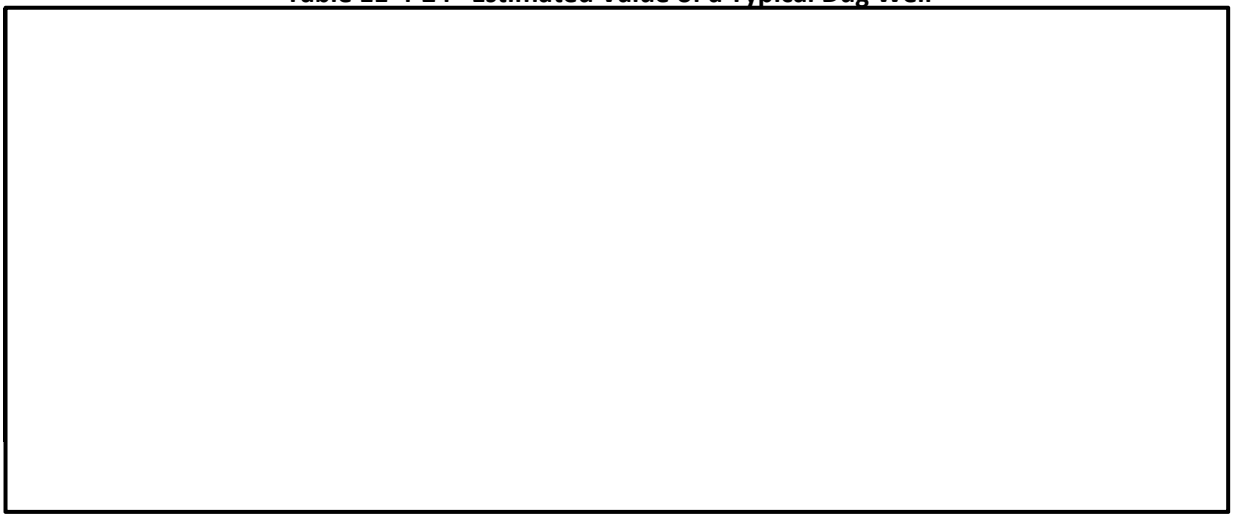


Table 11-4-24 Estimated Value of a Typical Dug Well



11.4.7 Arrangement for Implementation of A-RAP

For A-RAP implementation, DoH, ESE and TDC should build up the A-RAP task force team and assign the following personnel.

(a) Supervising manager: to supervises overall implementation process of A-RAP.

(b) Task management officer: to ensure the smooth and timely implementation of A-RAP and to manage and support the tasks in DoH, ESE and TDC relating to A-RAP.

(c) Grievance redress officer: to ensure good relations with both the PAPs and community-based organizations for adequate response to grievance from PAPs.

(d) Accounting officer: to manage compensation payment process and the expense in A-RAP implementation.

11.4.8 Concerned Organizations with the Implementation of A-RAP

Anticipated major organizations concerned with implementation of the A-RAP are shown in Table 11-4-25-Table 11-4-27.

Table 11-4-25 Concerned Organizations with the Implementation of the A-RAP (Road and Bridge)

Organization	Role	Responsibility and Duty
MoC (Ministry of Construction)	Line ministry of DoH and DoB	Approval of structures removing and resettlement for sub-project
DoH (Department of Highways)	Proponent of the Project	1) Identification of data on structures removing and resettlement 2) Formation and management of CFC (Compensation Fixation Committee) 3) Close communication with PAPs, GAD, State/Regional Government etc. 4) Negotiation, payment and making agreement with PAPs for process and cost of respective compensation and resettlement assistance 5) Adequate response for grievance from PAPs with ongoing interaction 6) Support of livelihood of PAPs during the transition period 7) Internal monitoring of A-RAP implementation
GAD (General Administration Department)	Leading authority of Land Acquisition Act	1) Guide and recommendations for the procedures of structures removing and resettlement in the Project, based on the Land Acquisition Act and case experiences in GAD. 2) Support to arrange relocation or reconstruction place 3) Support to determine compensation rate 4) Intermediation between PAPs and DoH in the case they cannot reach agreement between them.
Other organizations - Settlement and Land Record Department (SLRD), Department of Human Settlement and Housing Development (DHSHD), NGOs, etc.	Support / consultation for DoH	Support and consultation for DoH

Note: Organizations making up the CFC will be concerned in addition to those shown above.
Source: The Preparatory Survey Team

Table 11-4-26 Concerned Organizations with the Implementation of the A-RAP (Power Supply)

Organization	Role	Responsibility and Duty
MoEE (Ministry of Electricity and Energy)	Line Ministry of ESE	Approval of structures removing and resettlement for sub-project
ESE (MESC)	Proponent of the Project	1) Identification of data on structures removing and resettlement 2) Formation and management of CFC (Compensation Fixation Committee) 3) Close communication with PAPs, GAD, State/Regional Government etc. 4) Negotiation, payment and making agreement with PAPs for process and cost of respective compensation and resettlement assistance 5) Adequate response for grievance from PAPs with ongoing interaction 6) Support of livelihood of PAPs during the transition period **7)** Internal monitoring of A-RAP implementation
GAD (General Administration Department)	Leading authority of Land Acquisition Act	1) Guide and recommendations for the procedures of structures removing and resettlement in the Project, based on the Land Acquisition Act and case experiences in GAD. 2) Support to arrange relocation or reconstruction place 3) Support to determine compensation rate 4) Intermediation between PAPs and ESE in the case they cannot reach agreement between them.
Other organizations - Settlement and Land Record Department (SLRD), Department of Human Settlement and Housing Development (DHSHD), NGOs, etc.	Support / consultation for ESE	Support and consultation for ESE

Note: Organizations making up the CFC will be concerned in addition to those shown above.
Source: the Preparatory Survey Team

Table 11-4-27 Concerned Organizations with the Implementation of the A-RAP (Water Supply)

Organization	Role	Responsibility and Duty
DRD (Department of Rural Development), MoALI	Authorizing ministry	Approval of structures removing and resettlement for sub-project
TDC (Township Development Committee)	Proponent of the Project	1) Identification of data on structures removing and resettlement 2) Formation and management of CFC (Compensation Fixation Committee) 3) Close communication with PAPs, GAD, State/Regional Government etc. 4) Negotiation, payment and making agreement with PAPs for process and cost of respective compensation and resettlement assistance 5) Adequate response for grievance from PAPs with ongoing interaction 6) Support of livelihood of PAPs during the transition period **7)** Internal monitoring of A-RAP implementation
GAD (General Administration Department)	Leading authority of Land Acquisition Act	1) Guide or recommendations for the procedures of Structures removing and Resettlement in the Project, based on the Land Acquisition act and case experiences in GAD. 2) Support to arrange relocation or reconstruction place 3) Support to determine compensation rate 4) In the case that PAPs and TDC cannot reach agreement, GAD will intermediate between them.
Other organizations - Settlement and Land Record Department (SLRD), Department of Human Settlement and Housing Development (DHSHD), NGOs, etc.	Support / consultation for TDC	Support and consultation for TDC

Note: Organizations making up the CFC will be concerned in addition to those shown above.
Source: The Preparatory Survey Team

11.4.9 Grievance Redress Mechanism

Disputes may inevitably happen during the implementation of A-RAP. It is therefore important to establish a clear grievance procedure for PAPs so that concerns and disagreements regarding the resettlement process and compensation can be addressed satisfactorily. The success of a grievance mechanism is dependent on how swiftly such issues are resolved.

PAPs should be notified (e.g. handed a letter of notification that is explained to those who cannot read by a trusted intermediary) about the grievance mechanism. In addition, the grievance redress officer should be responsible for receiving and processing grievance complaints from PAPs. The name and contact information for this person should be given to the all relevant PAPs.

Under this grievance mechanism, if a PAP is dissatisfied with a resettlement or compensation measure or the delivery of entitlements, he/she must lodge a complaint in first instance to the grievance redress officer, and the grievance redress officer must answer no later than 7 days (one week) after receiving the complaint. All complains and respective actions must be recorded.

If a dispute cannot be resolved within a stated period of fourteen (14) days, it should be referred to the A-RAP Implementation Team Manager, and he/she, in cooperation with other team members of the A-RAP Task Force, must answer within another established period of twenty-one (21) days. Compensation will be paid upon resolution of the grievance or dispute.

In case the complaint is not satisfied with the decision made by A-RAP Implementation Team Manager, the PAP(s) has a right to lodge the complaint to the Court. The grievance procedure should not replace the existing legal processes, but will provide a consensus-based grievance mechanism that would seek to resolve issues rapidly in order to expedite the receipt of compensation without expensive and time-consuming legal options.

A possible scheme for grievance redress mechanism is illustrated in Figure 11-4-1.

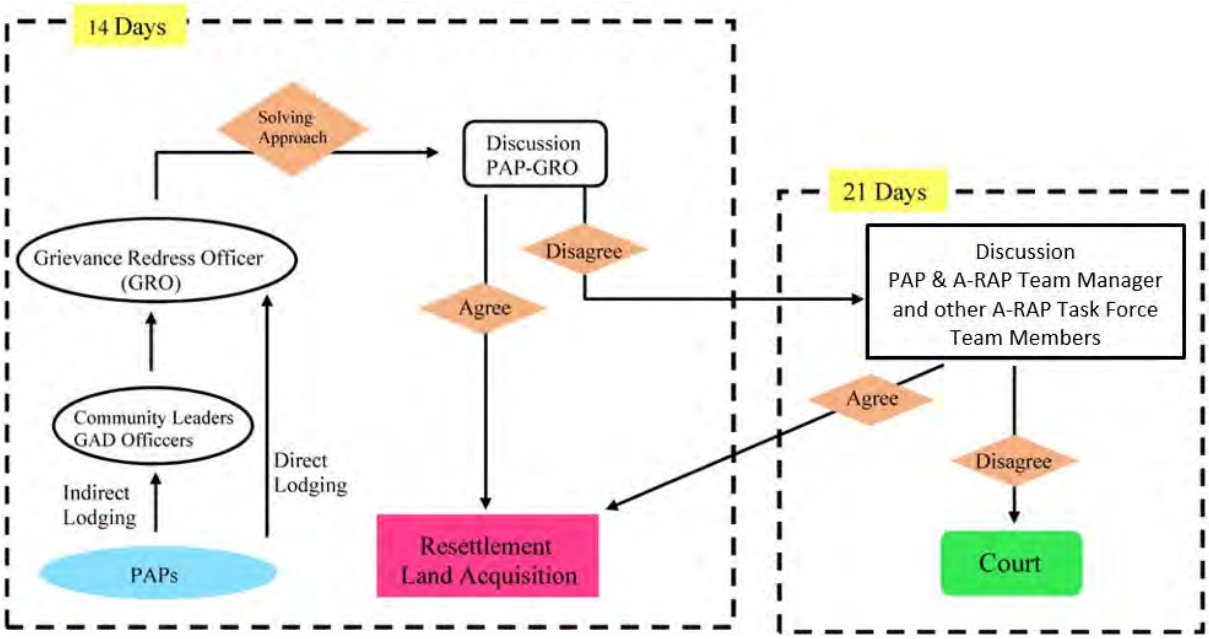


Figure 11-4-1 Scheme for Grievance Redress Mechanism (Proposed)

Source: the Preparatory Survey Team

11.4.10 Monitoring for Implementation of A-RAP

It is required to monitor the implementation of the A-RAP from stage of consultation and agreement with PAPs for compensation and resettlement assistance to the stage after implementation. Monitoring will be implemented to investigate, analyze and evaluate the resettlement activities in a fair and facilitated manner with transparency.

It is necessary that project proponents (DoH, ESE, MESC, and TDC) together with State/Regional Governments, and the all concerned ministries of the Project (MoPF - PD/FERD, MoC, MoEE, MoALI - DRD), establish special task force teams in order to monitor the resettlement activities. Those teams shall be a single window to respond to problems with regard to the resettlement activities of the Project, and is expected to report the progress of the resettlement activities to the project proponents and concerned authorities such as State/Regional Governments.

NGOs can also be involved as the third party in the monitoring activities as per necessity. A flow chart for proposed monitoring system is illustrated in Figure 11-4-2. For a reference, Resettlement Monitoring Sheet used for the precedent Phase-I Project is shown Table 11-4-28.

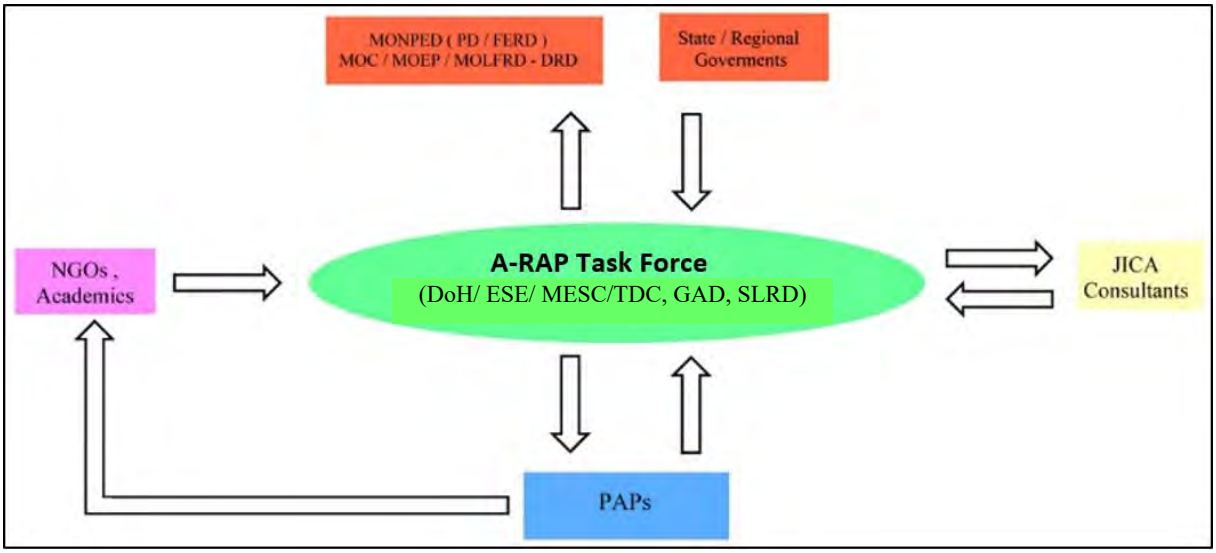


Figure 11-4-2 A-RAP Monitoring System
Source : the Preparatory Survey Team

Table 11-4-28 Resettlement Monitoring Sheet

Resettlement Monitoring Sheet

Name of HH Head : _____

1. Progress of Resettlement

Progress	Date	Checked	Remark
Official Notice			
Confirmation on result of census survey			
Survey relocation if any			
Negotiation 1st time 2nd time 3rd time 4th time 5th time			
Agreement on compensation and relocation			
Securing of Land			

2. Post Resettlement Monitoring

Date	Location	Occupation (if changed)	Income Level	Perception	Remarks

Note: 2 times in the first year and 1 time in the second year after relocation.

3. Record of Grievance / Perception and Redress

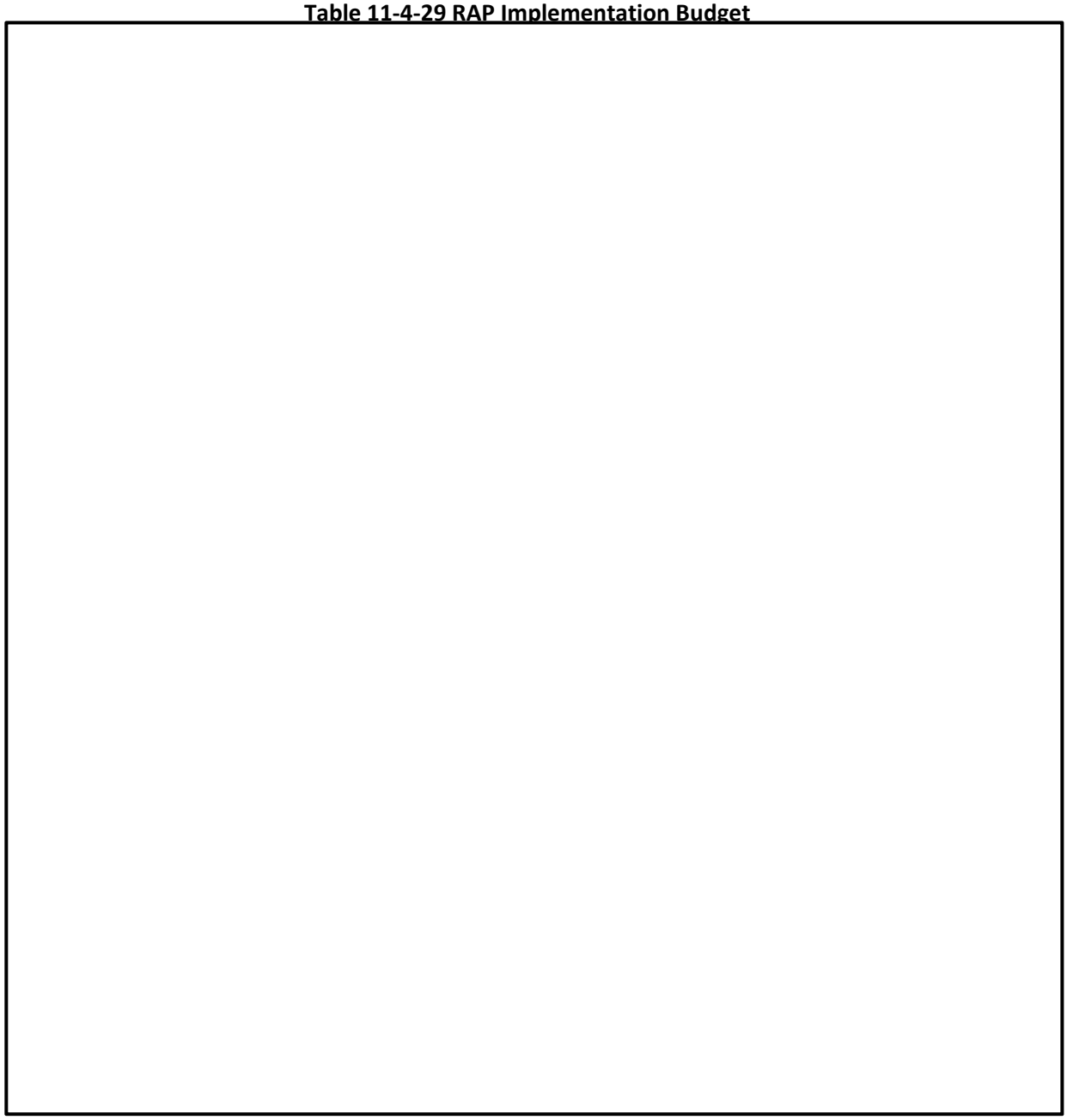
Date	Grievance	Redress	Results	Checked by independent Org. (if any)

Source: provided by the Phase-I (MYP-I) consultants

11.4.11 Cost and Budget (Final Report)

The estimated RAP implementation budget for sub-projects is summarized in Table 11-4-29. DoH, ESE and DRD are responsible for providing adequate funds for land acquisition and resettlement related to the project. It is important to note that these figures need to update during updating of the RAP in the detailed engineering stage.

Table 11-4-29 RAP Implementation Budget



11.4.12 Implementation Schedule of A-RAP

A draft implementation schedule of A-RAP is summarized in Table 11-4-30. A series of environmental and social impact study, including the census survey on PAPs will complete in April, 2016. Stakeholders meetings (SHMs), in which the PAPs, concerned local governments, parliament members and other interest persons were invited, were held twice for each sector in February and March, 2016. The public notification of sub-projects and the official cut-off date have been made between from November, 2015 to April, 2016. Compensation committees will be established in November or December, 2016 for each sector. The operation of the committee will start accordingly until completion of the Project in 2019/2020.

Table 11-4-30 Implementation Schedule (Tentative)

No.	Implementation Schedule / years	2015			2016					2016	2017	2018	2019	2020
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun - Dec				
Construction of the Sub-Projects														
1	Environmental and Social Impact Surveys (including census surveys)													
2	Stakeholder Meeting (PAPs are invited.)													
3	Establish A-RAP Implementation System in Ministries (MoC, MoEE, MoALI), as initiation of action													
4	Public Notification of the sub-projects Public Notification of Cut-Off Date													
5	Finalize A-RAP report by DoH, ESE, and TDCs, and Submission to JICA													
6	Establish a Compensation Committee													
7	Operation of the committee grievance redress													
8	Establishment of Policy and procedures for compensation													
9	Estimation of compensation amount for each PAP Conduct supplementary surveys if necessary													
10	Clarify with PAPs													
11	Fix compensation (cash and assistance) and agreement with PAPs													
12	Cash Disbursement to PAPs													
13	Removal of Structures, and Construction at Relocation Sites, as necessary													
14	Completion of A-RAP Process													
15	Monitoring of PAPs													

Source: the Preparatory Survey Team

11.5 Public Consultation

For Road and Bridge sector, public consultations were held in villages along Tuangoo – Laiktho – Yado – Loikaw - Hopone road (MoC 06+02+03+17) and Gangaw-Aika road (MoC 04+07). The purpose of those public consultations is to disclose the information about the sub-projects up to the grass-root level communities.

As for MoC 06+02+03+17, public consultations were held on the 26th and 27th of January, 2016 in some villages of three townships along the road - Phae Khon Township (South Shan State), Than Daung Gyi Township (Kayin State) and Taungoo Township (Bago Region). Five local members of the Preparatory Survey Team, in cooperation with DoH officers, have met village administrators, PAPs and other key persons as shown in Table 11-5-1.

Table 11-5-1 Participant List of Public Consultation (1st time)

The Survey members and DoH officers have explained the sub-project's designs, schedules and public monitoring system, possible environmental and social impacts as well as the measures to reduce them.

Common Opinions and Suggestions by local community people

- Community people welcome this road-upgrading project. They agreed that the road was to be improved necessarily for many reasons – transportations, easy access to township, livelihood enhancement, improved local economy.
- Most of the administrators requested that DoH or the contractor inform them in advance about the place for earth disposal into the downside cliffs, because there would be many private farmland and garden areas along the road.

- Village administrators responded that they would support the project as much as they could. And they also said that DoH or contractors would need to use warning signboard or crash barrier in some places of the road because there were curves and hidden corners in many places.
- Job opportunity for local people is also one of their concerns. Community people wanted the contractors to give chances to them.

For MoC 04+07, public consultations were held on the 22nd and 23rd of January, 2016, in some villages of two townships along the road - Gangaw Township (Magaw Region) and Matupi Township (Chin State). Five local members of the Preparatory Survey Team, in cooperation with DoH officers, have met village administrators and other key persons as shown in Table 11-5-2.

Table 11-5-2 Participant List of Public Consultation (2nd time)

The Survey members and DoH officers have explained the sub-project's designs, schedules and public monitoring system, possible environmental and social impacts as well as the measures to reduce them.

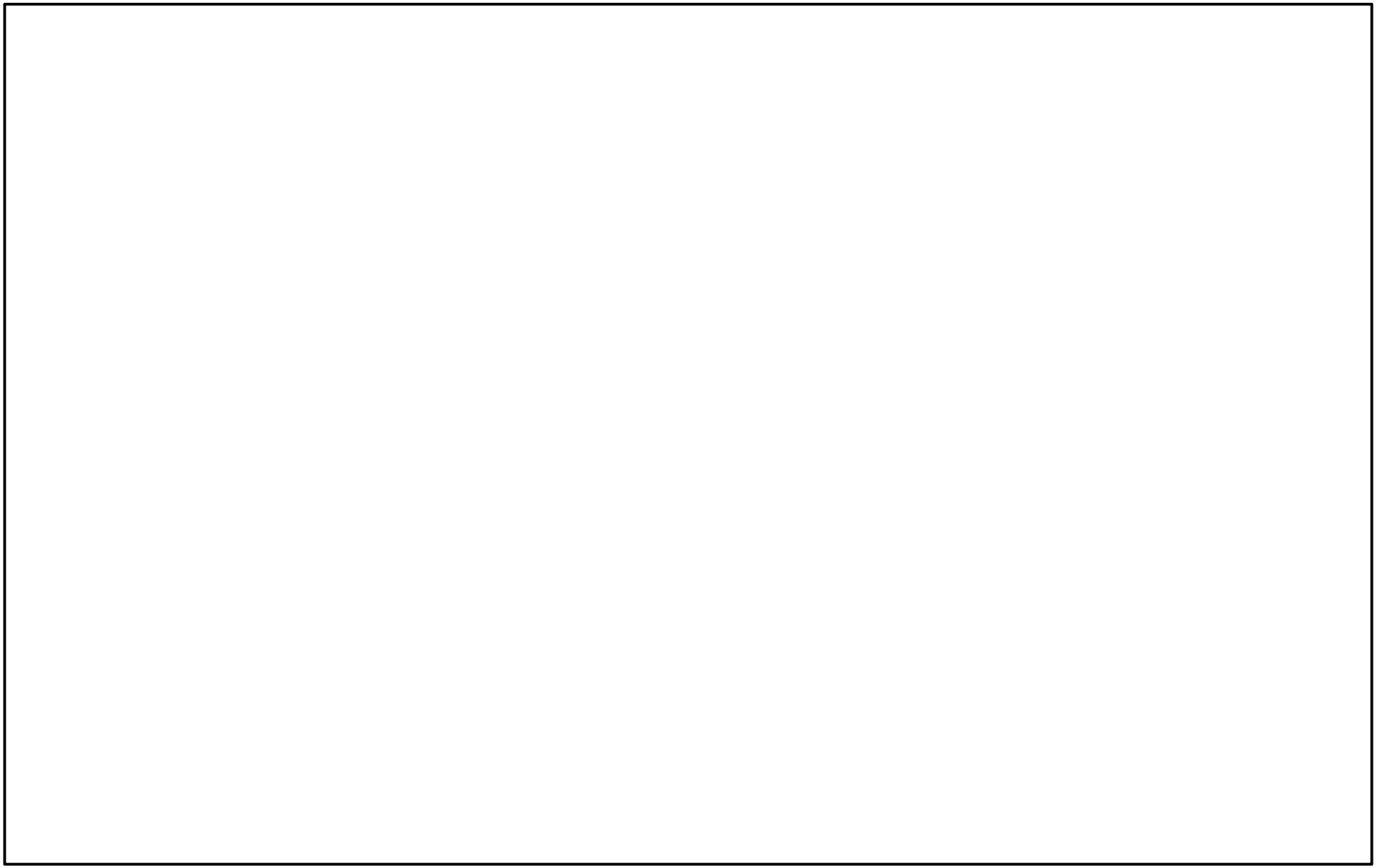
Common Opinions and Suggestions by local community people

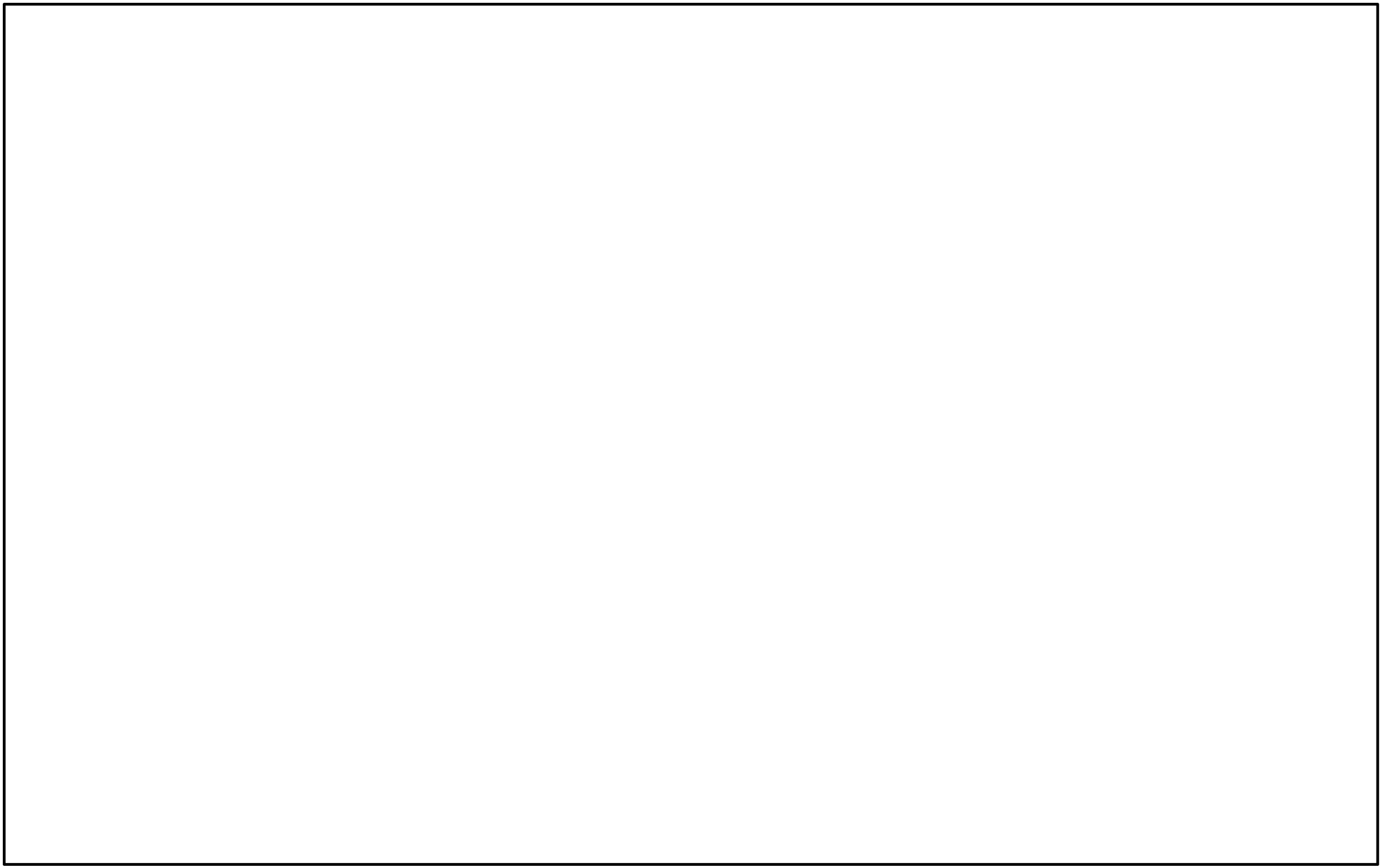
- Community people welcome this road-upgrading project. They agreed that the road was to be improved necessarily for many reasons – transportations, easy access to township, livelihood enhancement, improved local economy.
- One of the village administrators suggested that if the existing road would be upgraded, the drainage system would be needed especially in the village areas. He also requested that DoH would need to use warning signboard within the villages.
- Village administrator from Chin state said that he would like to request that DoH or contractor would make sure the quality of the road and good drainage system beside the road. Their village is located on the edge of the Matupi Township so they would expect a high quality good road which provides easy access to township.

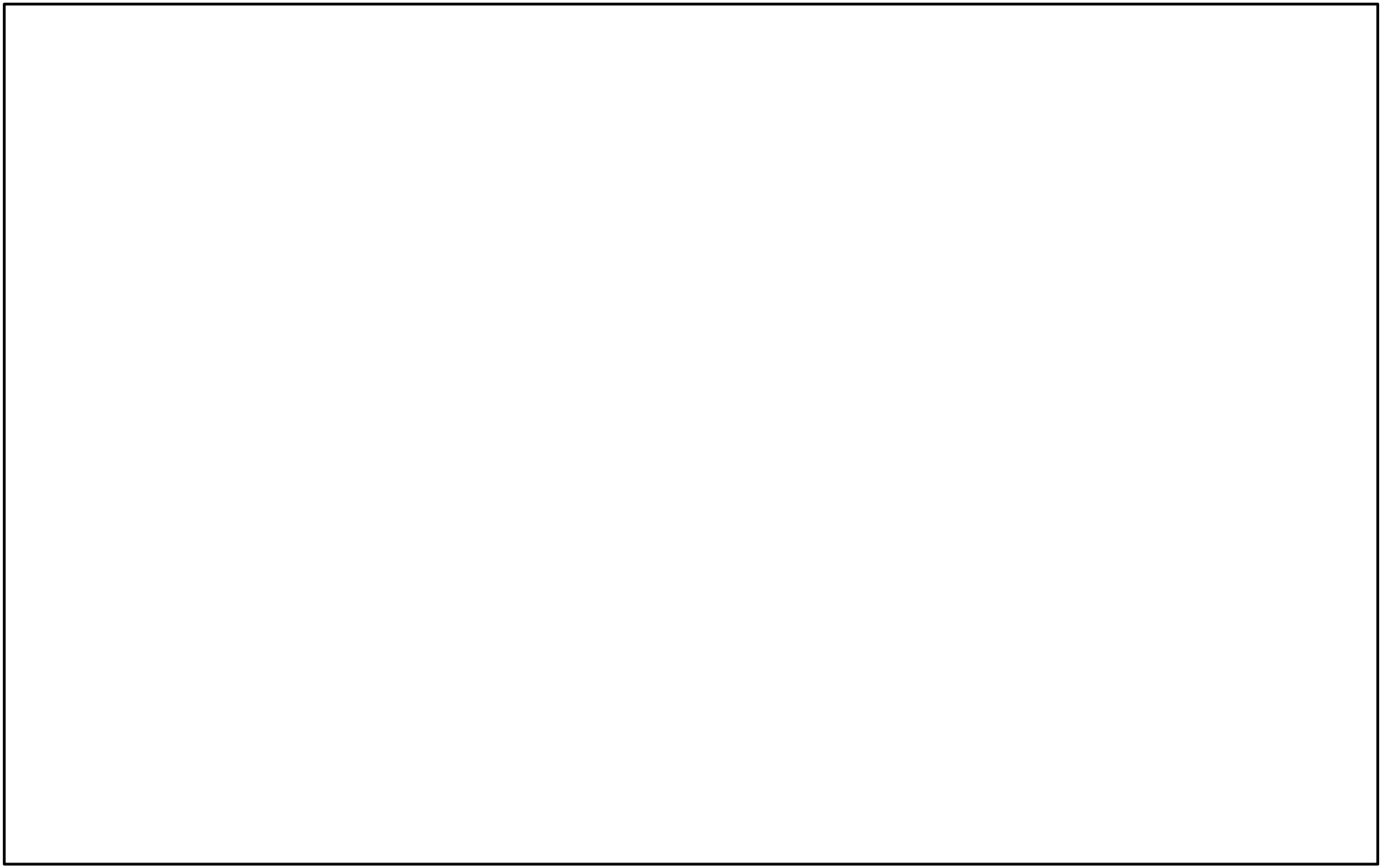
Village administrator of the Aika village said that they would be very thankful for the road upgrading project in their region and they would support in that project as much as they could. They had big difficulties before, such as landslides and the loss of access to the nearest town even for a few months. So they would like to request that DoH or contractor would do their best in road widening, construction of retaining walls and box culverts.

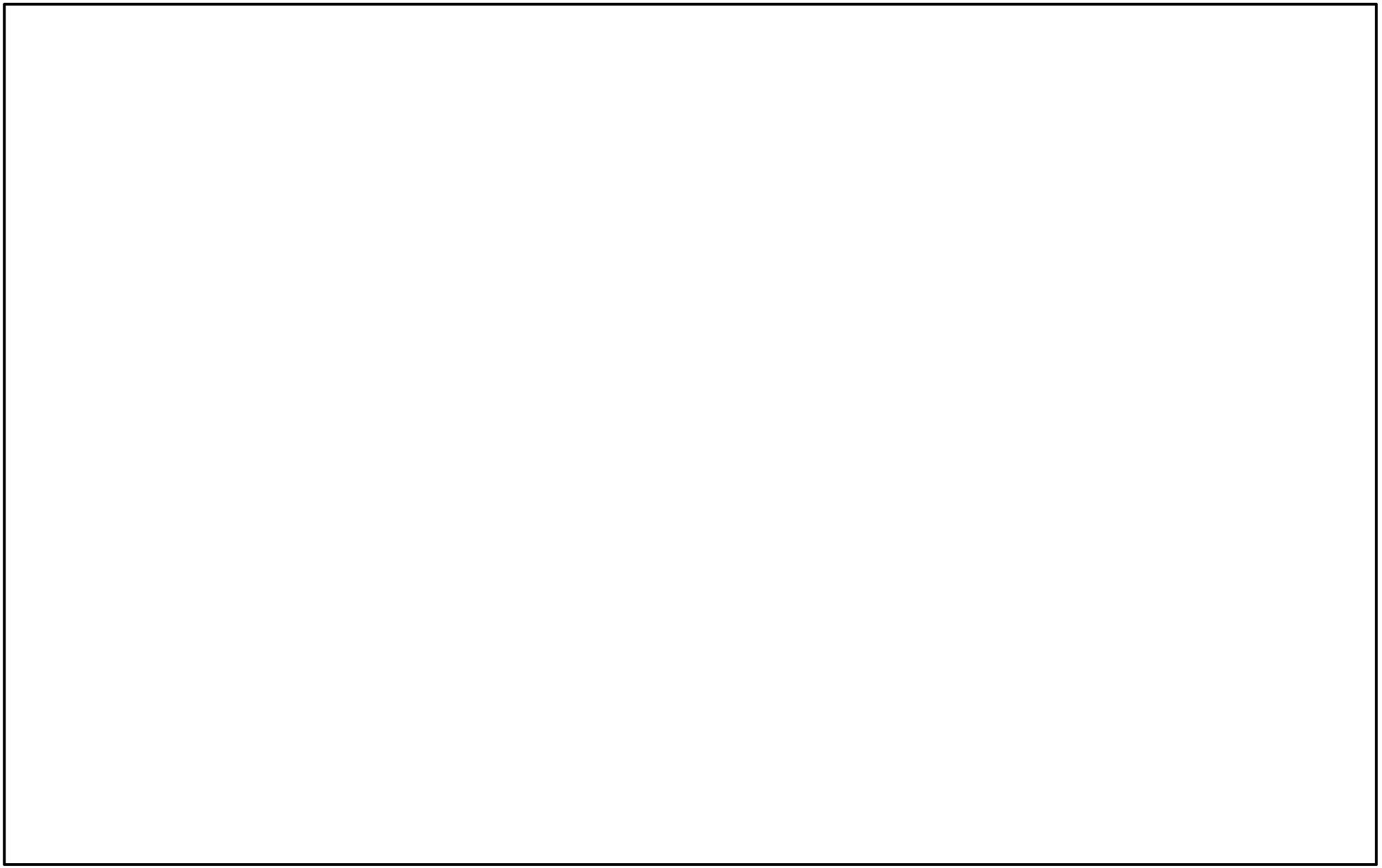
11.6 Attachment to A-RAP

11.6.1 List of Affected Land and Unit









11.6.2 Situation of Land Acquisition and Donation

Donation List (Power Supply and Water Supply Sector)

Project No.	Region	Type
ESE-0805	SAGAING Watlat (Saingnaingkwe)	Village
ESE-0809	SAGAING Depayin (Myae)	Monestry
ESE-1102	MAGWAY Taungdwingyi	Village
TDC-28	AYEYARWADY Pathein	Monestry
TDC-34	TANINTHARYI Langlon	Monestry

Involuntary Resettlement Source Book (World Bank)

Voluntary Land Donations for Community Projects

WB-1: The infrastructure must not be site specific.

WB-2: The impacts must be minor, that is, involve no more than 10 percent of the area of any holding and require no physical relocation.

WB-3: The land required to meet technical project criteria must be identified by the affected community, not by line agencies or project authorities (nonetheless, technical authorities can help ensure that the land is appropriate for project purposes and that the project will produce no health or environmental safety hazards).

WB-4: The land in question must be free of squatters, encroachers, or other claims or encumbrances.

WB-5: Verification (for example, notarized or witnessed statements) of the voluntary nature of land donations must be obtained from *each* person donating land.

WB-6: If any loss of income or physical displacement is envisaged, verification of voluntary acceptance of community-devised mitigatory measures must be obtained from those expected to be adversely affected.

WB-7: If community services are to be provided under the project, land title must be vested in the community, or appropriate guarantees of public access to services must be given by the private titleholder.

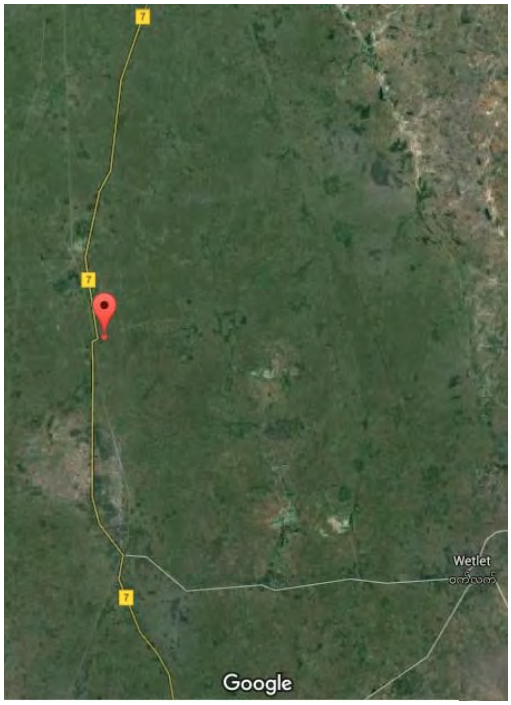
WB-8: Grievance mechanisms must be available.

Project No. & Name	**(ESE-0805) 33/11kV, 5MVA Substation**
Location	Saing Naing Kwe Village, Watlet Township, SAGAING
Date for site visit	20th November 2015
Surveyor/Confirmed by	Mr. Junya Shinohara, Mr. San Maung Maung, Mr. Aung San and ESE Township Engineer and Township Administrator of Watlet Township
Land Type and Owner	Private Land (U Myint Aung)
Required Land Size	Around 1 Acre

WB-1	This is not location-specific infrastructure project.
WB-2	Candidate area for this project is the rice field. The local business people invest the money (10 million kyat) and bought this land to donate our project. The previous farm owner will move to another farm after the harvest time.
WB-3	The purpose of this project is to extend the National Grid and provide electricity to rural areas. The local residents believe that after our project they will receive the electricity and they can start running new business like rice mill by using electricity. So that they can have more job opportunities and the project area can develop rapidly.
WB-4	There are no squatters, encroachers, or other claim or encumbrances.
WB-5	The Township Engineer and Administrator verified the ownership of the land and they already have an agreement with land owner to donate this land for 33/11kV 5MVA Substation project.
WB-6	Loss of income or physical displacement is not expected. The previous land owner agreed to move to another place after the harvest time because he already sold the land willingly to U Myint Aung for 33/11kV 5MVA Substation Project.
WB-7	Land titles will be changed to ESE according to the procedure of Settlement of Land Record Department (SLRD) in Myanmar.
WB-8	See attached document.

Sub-Project Site

Location (22°26'21.7"N 95°40'26.7"E)



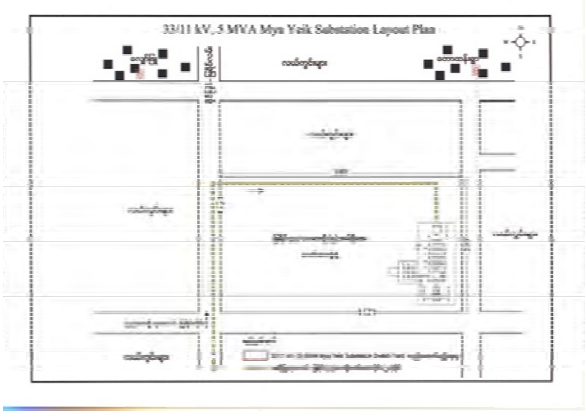
Project No. & Name	**(ESE-0809) 33/11kV, 5MVA Substation**
Location	Myae Village, Depayin Township, SAGAING
Date for site visit	19th November 2015
Surveyor/Confirmed by	Mr. Junya Shinohara, Mr. San Maung Maung, Mr. Aung San and ESE Township Engineer and Land Owner "Batdanta Khay Mar Saryar Bi Won Tha"
Land Type and Owner	Private/Monastery Land (Owner : Batdanta Khay Mar Saryar Bi Won Tha)
Required Land Size	Around 2 Acre

WB-1	This is not location-specific infrastructure project.
WB-2	Candidate area for this project is the Monastery Area, not expected to physical relocation. Currently the land is not using for any business purpose and nobody is living on that land.
WB-3	The purpose of this project is to extend the National Grid and provide the electricity to the rural area.
WB-4	There are no squatters, encroachers, or other claim or encumbrances.
WB-5	The Township Engineer and Administrator verified the ownership of the land and they already have an agreement with land owner to donate this land for 33/11kV 5MVA Substation project.
WB-6	Loss of income or physical displacement is not expected. The project area is currently not being used by anyone for any purpose.
WB-7	Land titles will be changed to ESE according to the procedure of Settlement of Land Record Department (SLRD) in Myanmar.
WB-8	See attached document.

Sub-Project site

Location (22°30'32.6"N 95°20'31.4"E)

Layout plan



Project No. & Name	**(ESE-1102) 66/11kV, 5MVA Substation**
Location	Satthwa Village, Taungdwingyi Township, MAGWAY Region
Date for site visit	18th November 2015
Surveyor/Confirmed by	Mr. Junya Shinohara, Mr. San Maung Maung, Mr. Aung San and ESE Township Engineer and Village Chief
Land Type and Owner	Private Land (Land Owner : U Pite Pite Village Chief)
Required Land Size	Around 2 Acre

WB-1	This is not location-specific infrastructure project.
WB-2	Candidate area for this project is Private area owned by Village Chief, not expected to physical relocation. Currently the land is not using for any business purpose and nobody is living on that land.
WB-3	The purpose of this project is to extend the National Grid and provide the electricity to the rural area.
WB-4	There are no squatters, encroachers, or other claim or encumbrances.
WB-5	The Township Engineer and Administrator verified the ownership of the land and they already have an agreement with land owner (Village Chief) to donate this land (2Acre) for 33/11kV 5MVA Substation project.
WB-6	Loss of income or physical displacement is not expected. The project area is currently not being used by anyone for any purpose.
WB-7	Land titles will be changed to ESE according to the procedure of Settlement of Land Record Department (SLRD) in Myanmar.
WB-8	See attached document.

Sub-Project Site

Location (19°52'08.2"N 95°32'47.5"E)

Project No. & Name	**(TDC-28) New Construction**
Location	Pathein Township, AYEYARWADY Division
Date for site visit	23rd November 2015 / 28th February 2016
Surveyor/Confirmed by	Mr. Katsumi Fujii, Mr. Hein Htet Linn and TDC staff from Pathein
Land Type and Owner	Monastery land (Monastery name: **Kuthein Nayone Pagota**)
Required Land Size	Around 50ft*60ft(15m*18m=270 m^2) for Ground Tank 3

WB-1	This is not location-specific infrastructure project.
WB-2	Candidate area for this project occupies less than 10% of total Monastery area, and not expected physical relocation.
WB-3	The purpose of this project is poverty reduction for rural communities in Myanmar. The project criteria such as size of facilities and target area are considering based on the discussion between communities and TDC. And monastery side has agreed to use their space.
WB-4	There are no squatters, encroachers, or other claim or encumbrances.
WB-5	TDC has asked Monastery to prepare the agreement on 28th February, and Monastery has agreed to prepare it.
WB-6	Loss of income or physical displacement is not expected because project site locates in Monastery land.
WB-7	Land titles remain in this Monastery.
WB-8	See Attached document.

Kuthein Nayone Pagota

A part of the land of Pagota

Project No. & Name	**(TDC-34) Extension**
Location	Langlon Township, TANINTHARYI Division
Date for site visit	11th February 2016 / 2nd March and 3rd March 2016
Surveyor/Confirmed by	<Monastery 1> Mr. Ye Soe Oo, Mr. Khun Set Thar, Mr. Htet Thu Soe, and TDC staff from Launglon (11 February) <Monastery 2> Mr. Seigo Goto, Mr. Aung Aung, TDC staff from Langlon (3 March) Ms. Mitsue Umiguchi, Mr. Bo Bo Han, Mr. Ye Soe Oo, Mr. Ye Wing Aung (2 March)
Land Type and Owner	Monastery Land (2 Place) Monastery name 1: Aung Tha Pyay Monastery / 2: Htain Thit
Required Land Size	Monastery1: around 1 acre for reservoir and WTP Monastery2: around 1 acre for reservoir and WTP

WB-1	This is not location-specific infrastructure project.
WB-2	Candidate area for this project occupy less than 10% of total Monastery area, and not expected physical relocation but it may be necessary to cut some trees.
WB-3	The purpose of this project ispoverty reduction for rural communities in Myanmar. The project criteria such as size of facilities and target area are considering based on the discussion between communities and TDC. And both monasteries side have agreed to use their space.
WB-4	There are no squatters, encroachers, or other claim or encumbrances.
WB-5	TDC has asked both Monasteries to prepare the agreement on 11 February and 3 March, and Monasteries have agreed to prepare it.
WB-6	Loss of income or physical displacement is not expected because both project sites locate in Monasteries.
WB-7	Land titles remain in both Monasteries.
WB-8	See Attached document.

Monastery 1:
Aung Tha Pyay

Monastery 2:
Htain Thit
Monastery

11.6.3 List of Concerned Ministry

No	Project No	Region/State	Township	Item	Ministry	Size
1	TDC-16	Kayin	Than Daung Gyi	Extension (60000 G/day)	Ministry of Environmental Conservation and Forestry (MoNREC)	100 m^2 and 200 m^2 (2 Pump House)
2	TDC-29	Ayeyarwady	Mayungmya	New (0 G/day)	Ministry of Environmental Conservation and Forestry and Ministry of Electricity and Energy (MoNREC & MoEE)	1.7 Acre(MoNREC) 0.7 Acre (MoEE)
3	TDC-30	Bago	Bago	Extension (1064000 G/day)	Ministry of Agriculture and Irrigation (MOALI)	1.5 Acre
4	TDC-44	Shan	Lashio	Extension (2900000 G/day)	Ministry of Environmental Conservation and Forestry (MoNREC)	1 Acre
5	TDC-54	Mon	Thanbyuzayut	Extension (16000 G/day)	Ministry of Environmental Conservation and Forestry & Ministry of Agriculture and Irrigation (MoNREC & MOALI)	200' *300' (WTP) MOAI (Intake)

ANNEX

ANNEX1 Rural Electrification Project by Donors

Donor	WB	ADB	KfW(Germany)	ICDF(Taiwan)	India(India)	JICS(Japan)	JICA
Project Name	National Electrification Project	Off-Grid Renewable Energy Demonstration Project	Rural Electrification Programme - Component Solar Home System (DRD name: Rural Electrification Program)	Non-disclosure (DRD name: Pilot Project)	Unknown	The Project for Electrification of Rural Villages in the Republic of the Union of Myanmar under Japan's Grant Aid	Preparatory Survey for Regional Development Project for Poverty Reduction Phase II
NEP or not	NEP		NEP	NEP	NEP		NEP
Status	Approved	Approved	Under F/S	Planed to implement in 2016 (Under discussion of MOU)	Under discussion of LA	Under Constrution	Preparatory survey
Project Cost 1USD=120.30Yen 1Euro=131.90Yen	10.83 Billion Yen (90 MUSD)	0.24 Billion Yen (2 MUSD)	1.19 Billion Yen (9 MEuro)	0.04 Billion Yen (350,000USD)	8.29 Billion Yen (68.89 MUSD)	0.99 Billion Yen (994MJPY)	To be determined
Loan or Grant	Loan	Grant	Grant	Grant	Loan (Left over)	Grant	Loan
Reimbursement	DRD Budget	-	-	-		-	DRD Budget
Contents	SHS, Public Facilities, Mini-Grid	Mini-Grid	SHS	Mini-Grid	Mini-Grid	Mini-Grid	SHS, Public Facilities, Mini-Grid
Cost Burden	WB:45%, DRD:45% User:10%	ADB:80% User:20%	KfW:80~90% User:20~10%	ICDF:100%	Unknown	JICS:100%	JICA:80~90% User:20~10%
Collected by	VEC	Not Described	VEC	-	VEC	-	VEC
Charge for use	-	Maximum 1,500K/Month	-	To be determined	Unknown	500K/Month	-
Collected by	-	Not Described	-	To be determined	Unknown	VEC	-
Cost for renewal Obtained by user	Not Described	-	10% of the Battery cost	To be determined	Unknown	-	Approximately 1,000K/Month for 20Ah battery
Implementation Agency	*1 Project Management Office (PMO) DRD Union, District, Township	DRD Union, District, Township	Same as *1	Same as *1	Unknown	DRD Union, District, Township	*1 Project Management Office (PMO) DRD Union, District, Township
O&M (Planned)	Not Described	Not Described	①Collection of used batteries and subsidy of battery cost by DRD ②Extension of lifespan of battery by supplying 2 batteries (one is for replacement and procured after one is used up)	-	Unknown	①Guarantee of supply of spare parts by supplier ②Establishment of emergency contact system(included in the provision)	①Monitoring by DRD (Union→District→Township) ②Support of DRD for fixation (DRD Township office contacts to supplier) ③Establishment of Organization for battery replacement
Capacity Development (Planned)	To be determined	①Hands-on Training (site inspection, commissioning) ②Development of guidebook on Mini-Grid	Not Described	-	Unknown	①Hands-on Training (Understanding of System, O&M, Fixing) ②Distribution of Manual and Guidance Document	①OJT of Monitoring ②OJT of fixation of equipment ③OJT of battery replacement
Target		DRD Union, District & Township				User	DRD Union, District & Township
Regulatory Framework (Planed)	To be determined	①Stakeholder Meeting (DRD,MOEP, Off-Grid Operator, etc) ②Workshop (Sharing experiences of other country's Mini-Grid, discussion on barriers and opportunities in the Myanmar context) ③Recommendations on regulations for off-grid and the integration of mini-grids into the main grid	Not Described	-	Unknown	Not Described	
Target area	Kayin, Chin, Sagaing, Tanntharyi, Rakhine, Shan, Ayeyawaddy	Mandalay, Sagaing, Magway	Shan	-	Magway, Bago, Ayeyarwady, Mon, Shan, Kayin	Chin, Shan	Magway, Sagaing, Bago, Mon, Nay Pyi Taw, Yangon, Mandalay
Policy	Villages with less electrification rate and far from the existing grid are selected. Villages are selected by DRD	Region or State where the irradiation is high	Other project is implemented in Shan by KfW. Villages are selected by DRD.	Villages are selected by DRD			Take some part of NEP

ANNEX2 Prospective Contribution to Regional Development

The current poverty condition of each State and Region as well as the possible effect to the regional development through the Project implementation based on the State/Region government hearing results are summarized herewith.

Local administrative jurisdiction is divided in State, Region, District and Township, and ward and village are designated in township. According to the hearing to DRD, there specific 16 criteria[1] to meet in order to be status elevated from village to ward.

The road and bridge projects are mainly concerned of the ones crossing between the State, Region as well as Districts. The beneficially under the On-Grid projects is mainly village people in the project target ward or village in a Township. The beneficially of Water Supply projects is people living in the target ward of a target Township.

1. Kachin State

（1）Profile

As the large stretch of the State border faces China and India, the State highly consider international trade with the neighboring countries, especially at Lwekyae, Momauk and Kanpaitte, Waingmaw. Besides the trading industry, tourism industry in Myitkina, Puta-O and Mohnyin Districts are also targeted for development. Large production industry still depends on primary sector with rice and at the largest on mining sector with jade stone, however the transportation network is quite weak to support these product distribution in the State. The states are faces major problems with domestic conflicts with armed minority groups in areas.

（2）Poverty Rate

According to the "IHLCA survey 2004-2005" and "IHLCA Survey 2009-2010", poverty rate in 2010 and rate of those categorized into chronic poor were slightly higher than the Union's average.

Vulnerable Groups: Goldmine workers, Loggers, Timber smugglers,Truckers,Drug addicts,Migrants,Seasonal labors,Low land population and Farmers

（3）Poverty Reduction and Infrastructure Development

The State considers the importance of livelihood improvement for better economic activities. The healthcare and educational services should be strengthened for more sustainable society and economic activities. Educated people should have more opportunity of work.

（4）Prospective Contribution to Regional Development

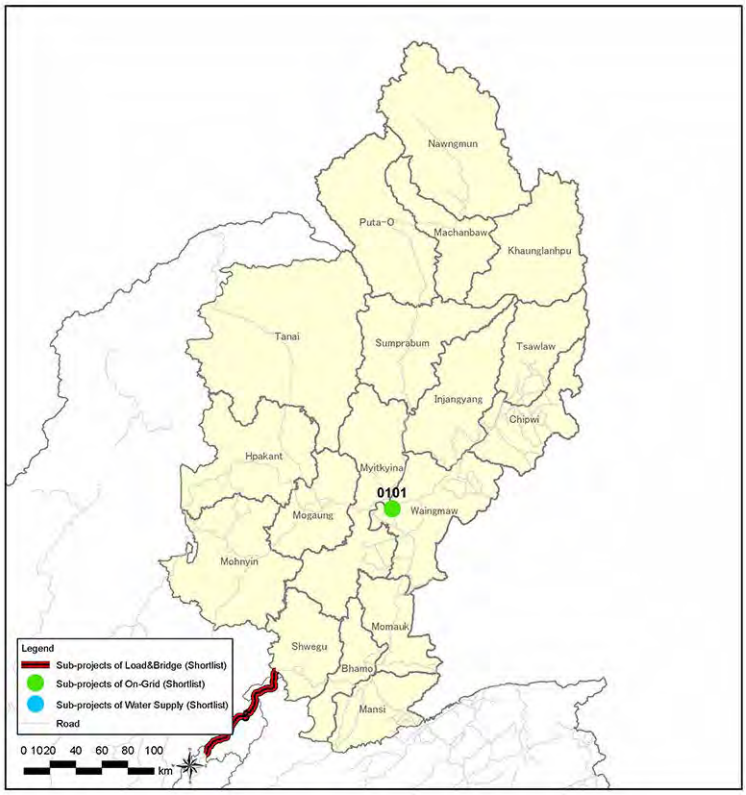
Kachin State is the north most state of the country bordering China and India. International trade with these countries is highly important for Kachin as "service industry" is highlighted as the State's target

[1] The criteria for status elevation from village to ward is described hereafter.

- There is a main road of over 30 feet (approx. 9m) of length.
- Sub roads, connected to the main road, have more than 20 feet (approx. 6 m) of length.
- The width of the roads is 12 feet (approx. 6m) or over.
- There are trees on the both sides of the main road.
- There are drainage along both main and sub roads.
- There is a playground larger than 5.5 acres (approx. 2.2 ha)
- There is a hospital or healthcare facility which has the capacity of 16～25 beds.
- There is a toilet in each house.
- There are 20 gallons of water (approx. 90ℓ per person per day), including that from rainwater, river, or deep well, reserved for drinking and domestic use.
- There is a religious establishment.
- There is a market
- There are street lights on the roads.
- There is at the entrance.
- There is a patch of symbol trees which is over 2 acres (approx. 0.8 ha) at the entrance.
- At the entrance, there is a notice board showing the number of population and of household.
- There is a cemetery.

development area under the NCDP. The State's main industries are textile industry with growing weaving productions, along with agro-production, mineral resource mining and tourism development. Power supply through ESE-0101(Waing Maw) is expected to contribute to the trading with China, especially by encouraging the export of textile and agricultural products produced locally.

Myitkina as one of the most important gateway to China is the target junction to develop international market for industries in Waing Maw and other areas of Kachin State; there are a wide range of mining resources such as stone and gem stone which can be marketable internationally. Since tourism industry is also considered prospective by the State, other kind of productions, such as wine and handicraft, would be expanded further for State's development.



Project No	Sub-project Name
ESE-0101	Waing maw

Figure 2-1 Shortlisted Sub-Projects in Kachin State
Source: The Preparatory Survey Team

2. Kayah State

(1) Profile

It is isolated in land region with mountain land profile which allows to variety of agriculture and production in ranges. In some areas in the mountain areas, some natural and mineral resources are identified, however investment is enough to develop this area of industry. Women in the region in its history have been discriminated in the region; such circumstance is still remaining in the region, and it brings the opportunity to improve women's living condition. Timber business is also potential of the state, but there is a need of larger investment for expansion if the industry will develop.

(2) Poverty Rate

According to the "IHLCA survey 2004-2005" and "IHLCA Survey 2009-2010", poverty rate in 2010 and rate of those categorized into chronic poor were lower than the Union's average, and the rate in rural areas were also lower than the Union's average.

Vulnerable Groups: Internally displaced population (IDP), Woman and Children

(3) Poverty Reduction and Infrastructure Development

The region demands are larger investment to stabilize economic activities as there is not enough industries to support people with income generation. Because, isolated situation in rural areas, interaction with other regions is so weak and such condition also contributes increase in poverty due to less employment opportunities. Strengthen resource oriented industries to support local population to make more income to reduce poverty. Women and children are easily fell into poverty and they should be protected by improving more social service infrastructure development such as education and healthcare.

（4）Prospective Contribution to Regional Development

Timber and mineral resources have high potential for industrial development for the state, thus more job creation could be made through the related industries. Primary and secondary processing industries in mining, timber and agro-products should be considered for more investment with infrastructure preparation. In earlier time, excavation for mining site caused major land disaster, stabilizing the land and road network is important aspect to strengthen the economic development and activities in the area. Power and water supply is important for new processing industries. Infrastructure development in general is very poor and delayed because of distance among other states in the eastern region. The State is considering China and Thailand trading through Shan State, and better road network and services should be provided.

There is no sub-project in the shortlist.

3. Kayin State

（1）Profile

The State borders with Thailand at long stretch to the east, and major production depends on rubber plantation and rice farming in large area. Textile industry is growing in the state besides the primary sector. However, insufficient job opportunities in the State in general impacts largely to the people's working habit and large number of young age people go to Thailand to seek better job opportunity, thus many families depend on their foreign remittance. Because, low family income, young family members should work helping family instead of attending schools, so the school enrollment rate is low.

（2）Poverty Rate

According to the "IHLCA survey 2004-2005" and "IHLCA Survey 2009-2010", poverty rate in 2010 and rate of those categorized into chronic poor were lower than the Union's average.

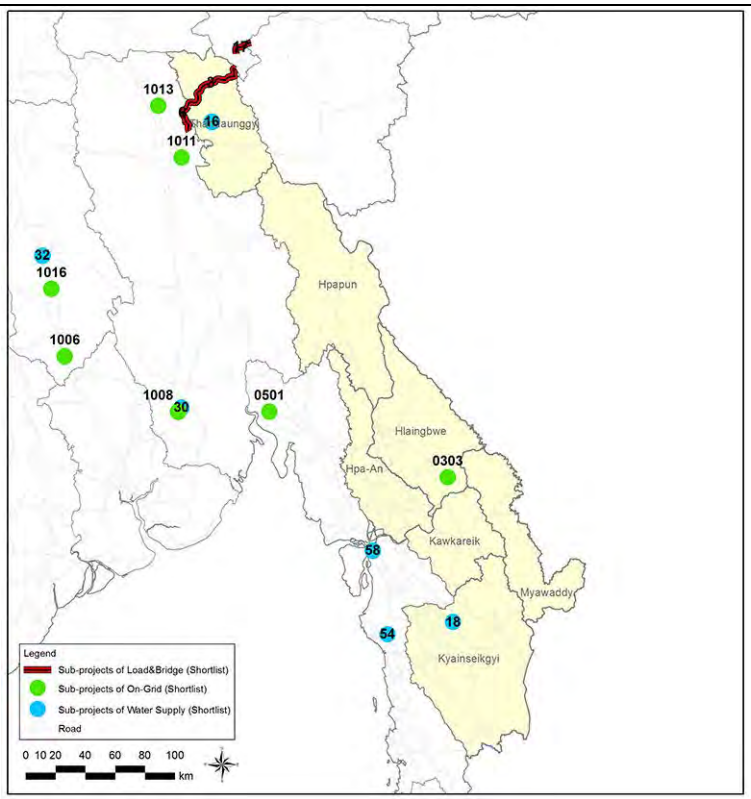
Vulnerable Groups: Young people

（3）Poverty Reduction and Infrastructure Development

Agricultural development support with sufficient infrastructure should be made for job creation which stable income to the people and families should be made. In order to support working families and their children in the State that better healthcare and educational facilities and services are necessary to achieve poverty reduction.

（4）Prospective Contribution to Regional Development

The industry in Kayin State today is limited in rubber and a few agro-productions, except recent industrial zone development in Phaan. As, the State is located between Yangon-Bago industrial center and Thailand border, "service industry", especially upgraded transportation, is highlighted as the target development area under the NCDP. The MoC-03 (Taungoo-Leik Tho-Yar Do-Loikaw-Ho Pone Road) should then link not only Kayin but also Kayah for increased economic activities. Coffee and tea productions in the north of the State including Than Daung Gyi (TDC-16) are expected to enjoy better quality production, and the products would be distributed to larger markets. Pinekyon with Sub-Project ESE-0303(Pinekyon) will be developing self-sustaining community with production improvement, while the area still has convenient distance from Pha An and border to Thailand expecting wider market options.



Project No	Sub-project Name
MoC-03	Taungoo - Leik Tho - Yar Do - Loikaw - Ho Pone Road
ESE-0303	Pinekyon
TDC-16	Than Daung Gyi
TDC-18	Kyainseikgyi

Figure2-2 Shortlisted Sub-Projects in Kayin State
Source: The Preparatory Survey Team

4. Chin State

（1）Profile

It is in general mountainous region where rainfall causes major disaster, especially current damage is huge. Major industry is agriculture producing rice, corn and beans under the double cropping. However, industry is vulnerable, people struggle with job opportunity, and many young people go out to India, for instance, seeking better jobs in the foreign market. Thus many families depend on the overseas remittance to keep family living.

（2）Poverty Rate

According to the “IHLCA survey 2004-2005” and “IHLCA Survey 2009-2010”, poverty rate in 2010 and rate of those categorized into chronic poor were much higher than the Union’s average, and the rate in rural areas were also much higher than the Union’s average.

Vulnerable Groups: Travelers, migrants; general population; poor , poorest; truckers; traders; farmers

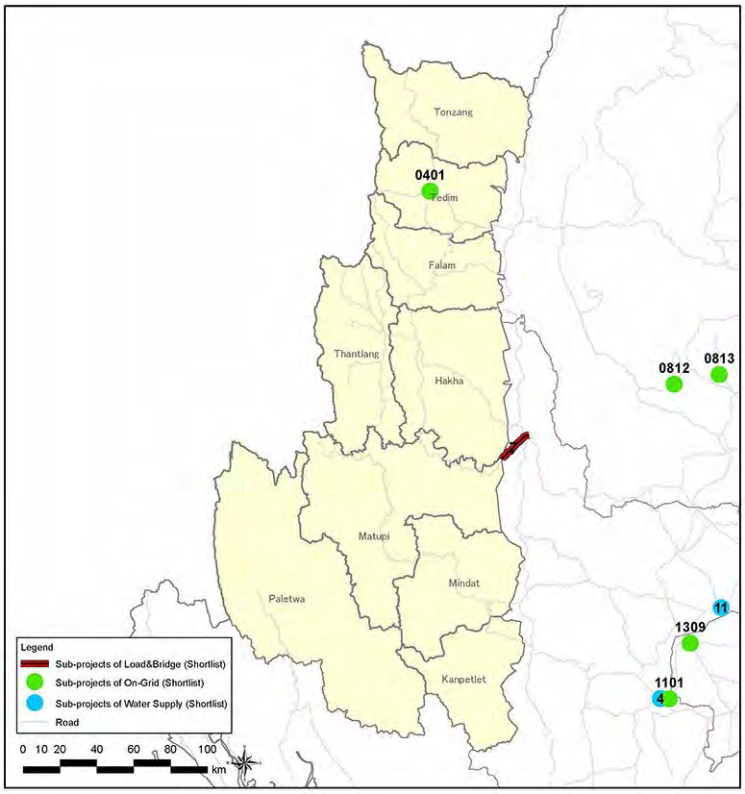
（3）Poverty Reduction and Infrastructure Development

Cause of its geographical constraints, industry is not developing as the region is isolated from the other regions, cause of such reasons; economic activities are much locally oriented. Natural disaster causes serious problems to many rural communities that protect the sustainability of the road network. It is necessary to improve livelihood and reduce poverty.

（4）Prospective Contribution to Regional Development

Chin State borders Bangladesh and India, and populated areas are all isolated in mountains. The State’s target development area under the NCDP is “agricultural industry”, which may support the export of agricultural products such as rice, grains and vegetables, to India. Tamu, which is west of Kalaymyo, is the western gateway of international trade (specifically with India) connected through the east-west economic corridor. As a Sub-Project, ESE-0401 (Teetain) is located nearby this international gateway and thus

possibly contribute to the supply of agricultural and other products to Indian markets as well as to domestic cities, such as Kalaymyo and Mandalay. From the view of economic corridor development as well as domestic network, production activities in Chin's agriculture would be enhanced by road development, while power supply would assist some productive activities in cottage industry.



Project No	Sub-project Name
ESE-0401	Teetain

Figure 2-3 Shortlisted Sub-Projects in Chin State
Source: The Preparatory Survey Team

5. Sagaing Region

（1）Profile

Sagaing Region is one of the highest rice exporting Region in the country, and it is exported to India and China. There are also product such as grain (beans, etc.) as the region is good for double cropping in variety. Therefore, road for transportation enhancement and other infrastructure development for general primary sector improvement are necessary.

（2）Poverty Rate

According to the "IHLCA survey 2004-2005" and "IHLCA Survey 2009-2010", poverty rate in 2010 and rate of those categorized into chronic poor were lower than the Union's average, but poverty rate in rural areas indicate much higher rate than the Union's average.

Vulnerable Groups: Leadless and marginal farmers in dry zone as well as people along riverside

（3）Poverty Reduction and Infrastructure Development

Healthcare service and educational system should be strengthened for better social activities and poverty reduction in the Region. When heavy rainfall happens, the Region should also be damaged by any disaster, so that such disaster damage protective measures should be considered to protect people keeping them away from falling into poor.

（4）Prospective Contribution to Regional Development

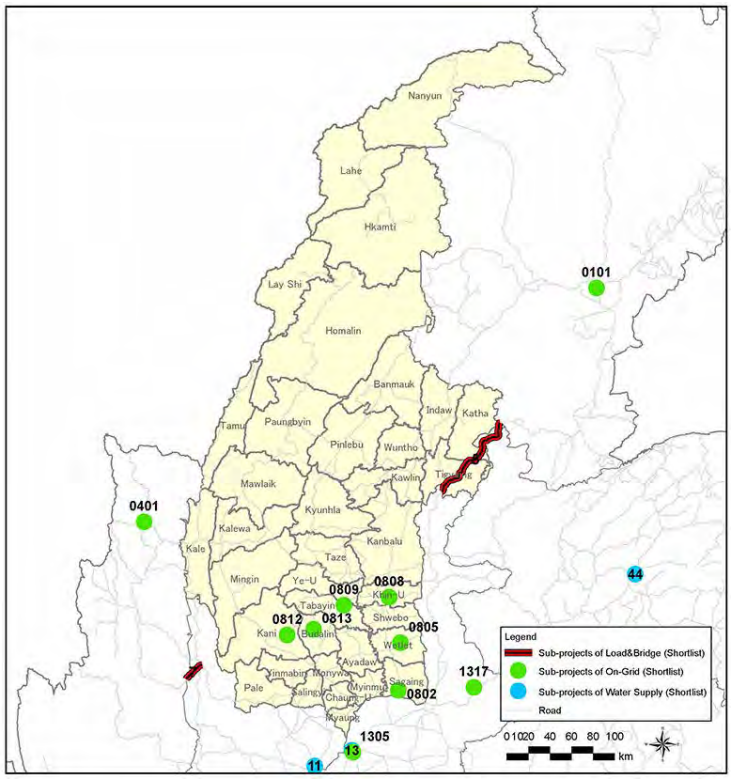
Sagaing Region is the one of the largest agro-producers in the country, and NCDP emphasizes "agricultural

industry" as target os development. As a large Region surrounded by Mandalay, Kachin, Chin and Magway, Sagaing should be sharing major economic corridors to the west (India) and to the north (China) with these surrounding States and Regions, to distribute large amount of rice products, for instance. The Region Government has also been supportive of developing service industries for better economic activities.

There area a number of power supply Sub-Projects located nearby NCDP's development nodes, such as Kalaymyo, Monywa and Mandalay and along economic corridors. They are expected to contribute to the increased working opportunities, through providing extra time and easing production activities of agro-product processing as well as other manufacturing in cottage industry of the Region. Namely, ESE-0802 (Ohmtaw), ESE-0805 in (Watlat, Sinnaingkwe) and ESE-0826 (Myinmu) will link their industrial activities with Mandalay market. Also, ESE-0809 (Depayin:Myae) and ESE-0813 (Batalin:Maung Tauung) will link their industrial activities with Monywa market.

Monywa, in particular, would have much larger opportunity to expand production through the extended utilization of industrial zone. Then these products will be distributed through the economic corridor to larger markets. The MoC-05 (Mandalay-Dagaung-Bhamaw-Mytkyina Road, Mya Taung-Tharyar Gone Section) in the northern part of the Region would largely contribute to the realization of north-south economic corridor passing through Mandalay, Sagaing and Kachin. This corridor is expected to enhance the trading (exporting) of agro-product and other manufactured products to China.

Meanwhile, many townships at remote areas will also be provided with power supply - in ESE-0808 (Khin Oo: Chay Myint Kyin) and ESE-0812 (Kani). Increased time and energy created through power supply development will contribute to the generation of wider industrial production activities in each township, and to improve community level livelihood instead of pursuing larger market activities.



Project No	Sub-project Name
MoC-05	Mandalay - Dagaung - Bhamaw - Myitkyina Road (Mya Taung-Tharyar Gone) Section
ESE-0802	Ohmtaw-Myinmu
ESE-0805	Watlat(Sinnaingkwe)
ESE-0808	Khin Oo (Chay Myint Kyin)
ESE-0809	Depayin (Myae)
ESE-0812	Kani
ESE-0813	Batalin(MaungTaung)

Figure2-4 Shortlisted Sub-Projects in Sagaing Region
Source: The Preparatory Survey Team

6. Tanintharyi Region

（1）Profile

The Tanintharyi Region is at southern end of the country. They received less infrastructure development in the past. The Region is sharing long border with Thailand that is targeted for major economic corridor development tying with other Indochina countries. Primary sector development including fishery industry and food processing sector is considered in the next five years development. Rubber and coco palm plantation should be expanded which product need investment more than now. The Region should be gradually developed instead of drastically developed with transportation network with northern areas of the country. Recent Dawei industrial park (SEZ) development is one of the key developments to improve the regional economy.

（2）Poverty Rate

According to the "IHLCA survey 2004-2005" and "IHLCA Survey 2009-2010", poverty rate in 2010 and rate of those categorized into chronic poor were higher than the Union's average. The rate in rural area is much higher than the Union's average.

Vulnerable Groups: Not specified

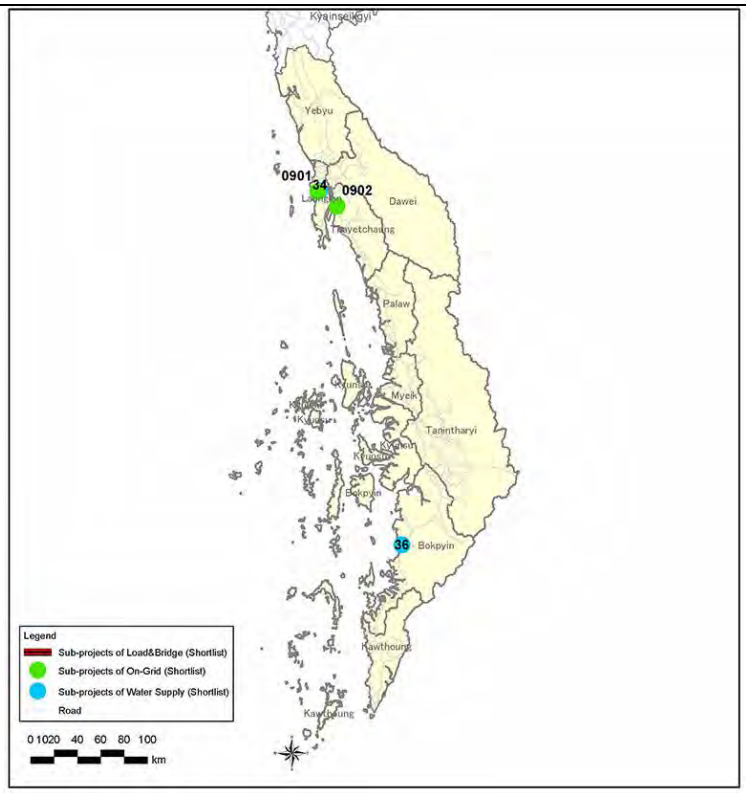
（3）Poverty Reduction and Infrastructure Development

Improving educational facilities and services are at higher priority to improve social condition with local people, especially young people, and better job creation is necessary to reduce young migration to Thailand. Through better education system, need more job skills that will provided to the people.

（4）Prospective Contribution to Regional Development

Tanintharyi Region has been relatively undeveloped in the past, and it is stressed in the NCDP that the Region needs to expand its "agricultural productions and services". There is an ongoing development of Dawei industrial zone with southern corridor connected to Asian countries in the east and this is expected to change the role of the area soon.

There are Sub-Projects ESE-0901 (Launglon:Zalot Village) and ESE-0902 (Thayetchaung:Mindut) as well as Sub-project TDC-34 (Launglon) near Dawei. They would help strengthen agro-productions and related processing activities as well as fishery-related industry in the areas supporting small and private manufacturing in relation to the future industrial development in SEZ. Existing rubber industry may also gain benefit from these infrastructure projects through larger and quality production, and opportunity to expand market (such as Thailand). TDC-36 (Bokpyin) in the southern Tanintharyi, on the other hand, is remotely located and its water supply project will directly relate to the livelihood of people and people's increased productive activities in the township.



Project No	Sub-project Name
ESE-0901	Launglon(Zalot village)
ESE-0902	Thayetchaung(Mindut)
TDC-34	Launglon
TDC-36	Bokpyin

Figure 2-5 Shortlisted Sub-Projects in Thanintharyi Region
Source: The Preparatory Survey Team

7. Bago Region

（1）Profile

Bago region gear the improving of infrastructure concerning with farming by sowing quality seeds, transforming the ways of plantation scientifically, and cooperating with foreign companies to transform contract farming systems.

（2）Poverty Rate

According to the “IHLCA survey 2004-2005” and “IHLCA Survey 2009-2010”, poverty rate in 2010 was considerably lower than union’s average. Also rate of chronic poor was low and rate escaped from poverty was quite large meaning that considerable chances for escaping from poverty existed in this region.

（3）Poverty Reduction and Infrastructure Development

There is not much flooding, but similar disaster and its impact that results impassible of road network in this area, as no major natural disaster is listed. Besides, the region has problems with lack of job opportunities, and people from this area are migrating to Yangon for seek their jobs. Farmers have dream of production for export, however they need to have better knowledge and technical assistance for production improvement. Mango and water melon from the region are transported by trucks through Lashio, Shan and exported to Chinese market.

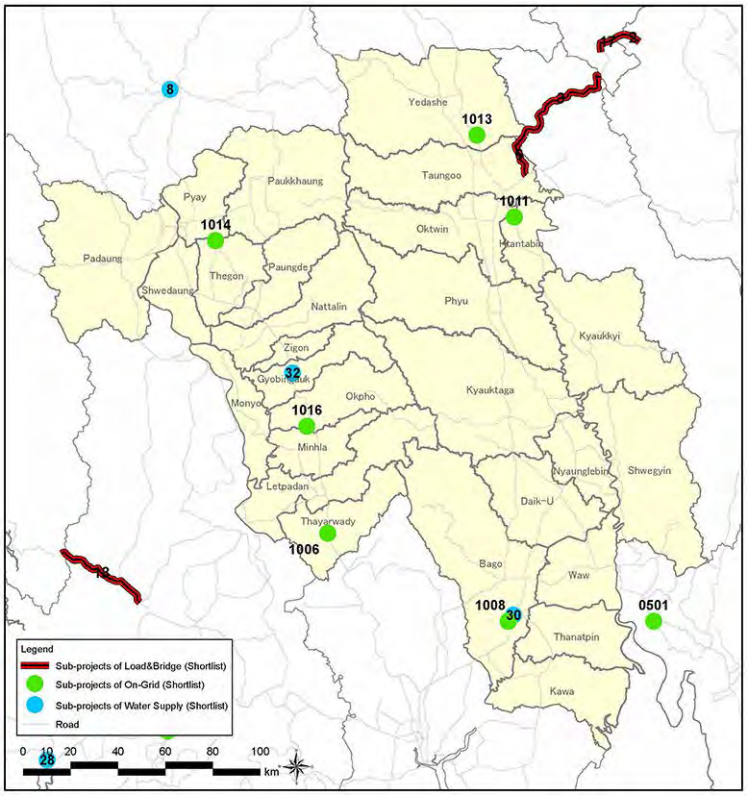
（4）Prospective Contribution to Regional Development

Bago Region has strong a potential in economic development through industrial activities in relation to neibouring Yangon Region. The NCDP states that Bago should primarily develop “industry and agriculture” as it is located along the north-south economic corridor and major industrial zones.

In particular, ESE-1008 (Bago No-4: Oakthar), ESE-1011 (Htantabin) and TDC-30 (Bago) along economic corridor passing through the Region and located close to industrial or development centers. Therefore, these

townships would benefit from increased production and industrial activities targeting major markets near industrial zones in Bago and Yangon. Thanks to their proximity to the industrial zones, manufacturing activities from existing cottage industries may be strengthened.

On the other hand, ESE-1006 (Tharyarwad), ESE-1014 (Sinmeeswe) , ESE-1016 (Othegon) and TDC-32 (Gyobingauk) are located in Bago West, and agricultural production, the main economic activity in these areas, would be able to enjoy mechanization, productivity increase and quality improvement. MoC-06 (Taungoo-Leik Tho-Yar Do-Loikaw-Ho Pone Road) will enhance connection to Kayah and East Shan, and these neibouring areas are expected to develop trading network with Thailand and China.



Project No	Sub-project Name
MoC-06	Taungoo - Leik Tho - Yar Do - Loikaw - Ho Pone Road
ESE-1006	Tharyarwad
ESE-1008	Bago(N0-4 (Oakthar)
ESE-1011	Htantabin (Zayatgyi)
ESE-1013	Yedashe (Myohla)
ESE-1014	Sinmeeswe
ESE-1016	Othegon
TDC-30	Bago
TDC-32	Gyobingauk

Figure 2-6 Shortlisted Sub-Projects in Bago Region
Source: The Preparatory Survey Team

8. Magway Region

(1) Profile

Magway Region has potential for transporting oil related products and various kind of beans to the other regions. Fishery, natural resources, kerosene and natural gas are also advantageous products for the region. The region is also gearing to establish industrial zone within the region for economic development.

(2) Poverty Rate

According to the "IHLCA survey 2004-2005" and "IHLCA Survey 2009-2010", poverty rate in 2010 was almost same as union's average. However, rate of chronic poor was higher than union's average.

Vulnerable Groups: Landless/marginal farmers, truckers, boatman, workers (timber processing/oil fields), migrants, students and sex workers (Source: "Poverty, Food Insecurity and Vulnerability: Issues and Strategies" (UNDP, 20007))

(3) Poverty Reduction and Infrastructure Development

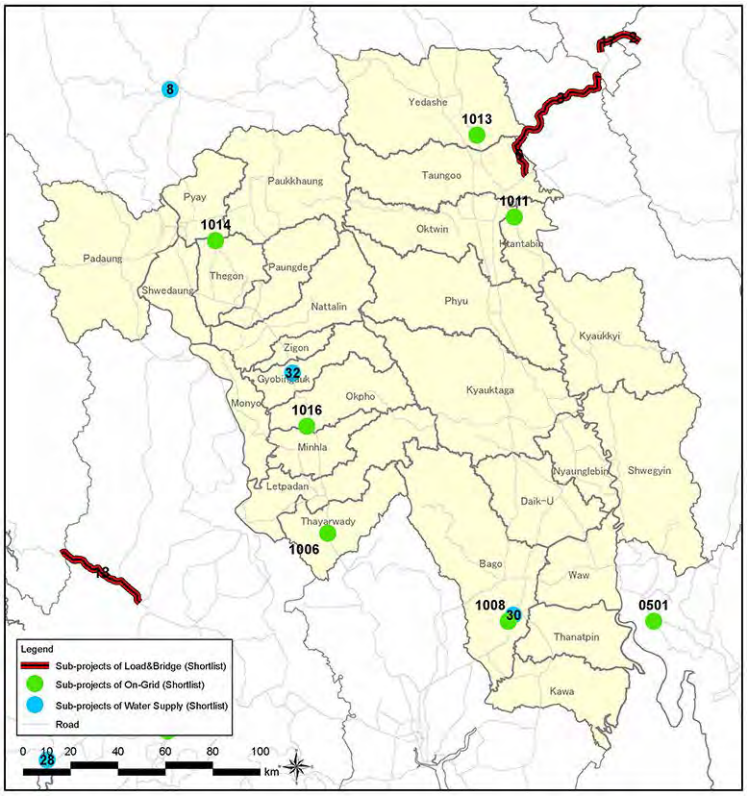
Center of the region is quite hot in summer season and serious draught disaster occurs. This has major cause

of poverty increase in especially farmers. Very poor farmers shift their occupation to other temporary works in larger cities, such as Yangon and Mandalay. Irrigation project for the regional agricultural industry is the must to fight with draught disaster in turn to reduce poverty.

(4) Prospective Contribution to Regional Development

Magway Region is located along the Mandalay-Rakhine economic corridor, in which international gateway development in Kyauk Phyu (Rakhine) is envisioned. Agriculture is Region's main target for development under NCDP. There are several secondary development nodes and industrial zones, and ESE-1101 (Chauk: GwePin Village), TDC-04 (Chauk) and TDC-11(Pakokku) will be economically linked to Pakokku market. ESE-1102 (Taungdwingyi: Bawethano), TDC-05 (Taungdwingyi), TDC-06 (Minbu) are located around Taungdwingyi market area along the economic corridor.

These townships will also have opportunity in relation to the development of Magway city market. Gas and oil industries in Chauk and Minbu areas may benefit from an enlarged scale of productive activities. On the other hand, TDC-08 (Thayet) will then enhance existing agro-productions enabling self-sustaining development because of their remote condition. MoC-07 (Gan Gaw-Aika Road) will improve network among Chin, Magway and Mandalay contributing to the increased production with wider marketing and tourism activities.



Project No	Sub-project Name
MoC-07	Gan Gaw – AiKa Road
ESE-1101	Chauk (GwePin Village)
ESE-1102	Taungdwingyi (Satthwa Village)
TDC-04	Chauk
TDC-05	Taungdwingyi
TDC-06	Minbu
TDC-08	Thayet
TDC-11	Pakokku

Figure2-7 Shortlisted Sub-Projects in Magway Region
Source: The Preparatory Survey Team

9. Mandalay Region

(1) Profile

Mandalay region is located in the place where road, water way and airways are connected, so the region is one of the major cities for trading. The industries based on agriculture products, and having historical heritages and many famous historical places can encourage all-round development of the region in terms of farming, fisheries, industries, hotel and tourism industry and trading.

(2) Poverty Rate

According to the "IHLCA survey 2004-2005" and "IHLCA Survey2009-2010", poverty rate in 2010 was almost same as union's average. However, rate of chronic poor was slightly lower than union's average.

Vulnerable Groups: River side residents, landless/marginal farmers (Source: "Poverty, Food Insecurity and Vulnerability: Issues and Strategies" (UNDP, 20007))

(3) Poverty Reduction and Infrastructure Development

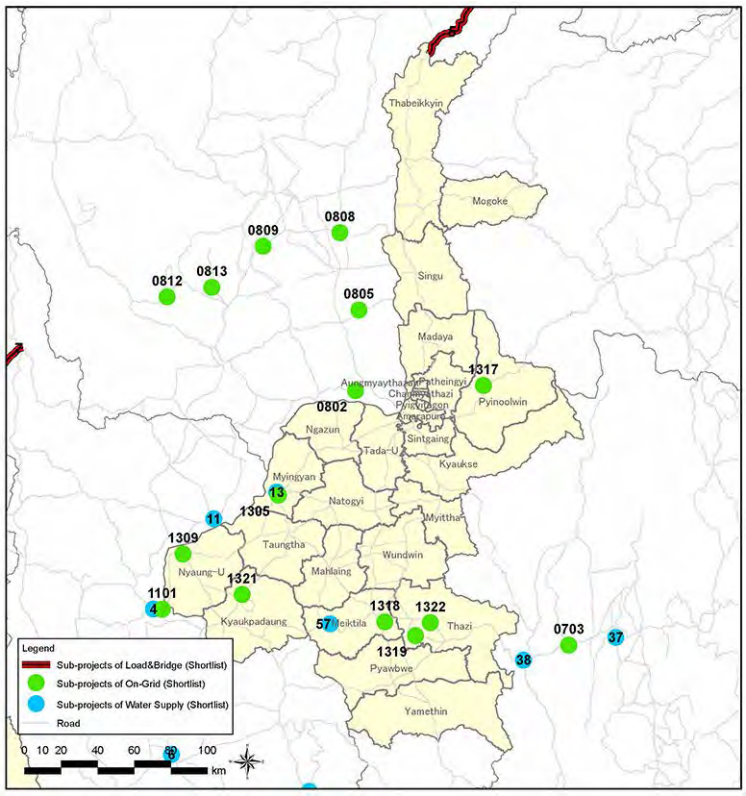
Major income of residents comes from farming, fishery and livestock. Some famers suffer from the reduction of price, especially when they export the products to China. So it is very important for them to have sustainable market for their products.

(4) Prospective Contribution to Regional Development

In NCDP, Mandalay Region is designated as the one of the two poles of "Growth Center" of Myanmar, and is located at the intersection of major economic corridors. Because of its major role in the nation's economic development, industrial activities with strong transportation services are expected within the Region. Meanwhile, existing agricultural industry, food processing industry, and other manufacturing industries should be strengthened by the improvement of water and power supply.

ESE-1305(Myingyan T/S:Myingyan-Taungthat, Myingyan S/S), ESE-1309 (Nyungoo T/S:Wetgyinn), ESE-1317 (Pyin Oo Lwin T/S: Ahne Sakahan-Myoma, Myoma S/S), TDC-13 (Myingyan) and TDC-57 (Meiktila) are all located in the convenient and close proximity to the NCDP-projected economic activity center of Pakokku as well as close enough to Mandalay. Therefore, existing agro-productions in these areas could benefit from the integrated economic activities from these markets. Moreover, existing cottage industry type business may get opportunities to extend their market when their production is expanded or quality improved, because of the proximity to the economic network.

ESE-1318 (McikHtilar T/S), ESE-1319 (TharSi T/S), ESE-1321 (Kyauk Pa Taung T/S) and ESE-1022 (TharSi T/S (Myoma S/S)) will then enhance existing agro-productions enabling self-sustaining development because of their remote condition.



Project No	Sub-project Name
ESE-1305	Myingyan T/S (Myingyan - Taungthar, Myingyan S/S)
ESE-1309	Nyungoo T/S (Wetgyinn)
ESE-1317	Pyin Oo Lwin T/S (Ahne Sakahan-Myoma, Myoma S/S)
ESE-1318	McikHtilar T/S (near Nyaung Myint Village)
ESE-1319	TharSi T/S (TharSi-Nyaung Yan, Nyaung Yan S/S)
ESE-1321	Kyauk Pa Taung T/S
ESE-1322	TharSi T/S (Myomo S/S)
TDC-13	Myingyan
TDC-57	Meiktila

Figure 2-8 Shortlisted Sub-Projects in Mandalay Region
Source: The Preparatory Survey Team

10. Mon State

（1）Profile

The State's main industry is rubber plantation followed by rice production. The State borders with Thailand at east side, and many young people go to Thailand for better working environment and job opportunities rather than staying in the State. Large numbers of local families are depending on foreign remittance from those young workers. The government has implemented several funding programs as well as training programs, however the effect is not largely observed in the markets and communities. Young people must support their families instead of attending schools so educational level is quite low thus they cannot benefit of employment opportunity.

（2）Poverty Rate

According to the "IHLCA survey 2004-2005" and "IHLCA Survey 2009-2010", poverty rate in 2010 and rate of those categorized into chronic poor were lower than the Union's average.

Vulnerable Groups: Community , Woman

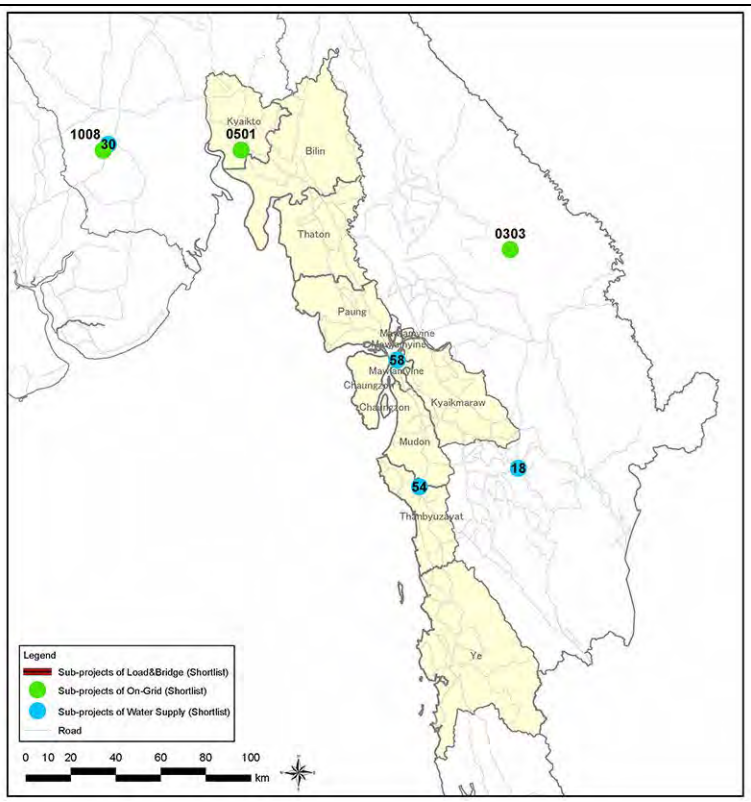
（3）Poverty Reduction and Infrastructure Development

In order to provide better working environment and job opportunities, society and communities need to be healthier in terms of educational service environment; therefore educational system should be well developed, while healthcare service needs to be more distributed with better and well quality services.

（4）Prospective Contribution to Regional Development

Mon State will be a major transportation center among industrial zones and international gateways after actual industrial production activities in these areas are started and international road networks are opened. Besides, the transport network being important, the NCDP identifies that "service and agriculture" industry are main development targets. The main livelihood of Sub-Project areas in the State is agro-productions (rubber, betel nut and rice farming), as well as fishery, manufacturing and tourism. It can be expected that the products can be marketed in a larger scale to the whole State or even to Thailand.

ESE-0501 (Saung Naing Gyi :Kyaikhto) will contribute to tourism industry by sustaining existing cultural heritage and food processing with local agro-products, and since the Sub-Project is on the north-south economic corridor, it may bring more visitors utilizing the regional network connecting to Yangon and Bago. Local agricultural production and other manufacturing around TDC-54 (Thanbyuzayat) and TDC-58 (Mawlamyine) will benefit from close proximity to the international gateway of Myawaddy to Thailand.



Project No	Sub-project Name
ESE-0501	Saung Naing Gyi (Kyaikhto)
TDC-54	Thanbyuzayat
TDC-58	Mawlamyine

Figure 2-9 Shortlisted Sub-Projects in Mon State
Source: The Preparatory Survey Team

11. Rakhine State

（1）Profile

Rakhine State is geographically bounded by Bangladesh and India and situated in the coastal area of Bay of Bengal which is politically and economically important place for the country. The major economy of the state is farming, fishery and transportation. Furthermore electricity supply is also the major concern for the state.

For social and economic development of the state, improvement of farming and industrial area and all-round development, reduction of poverty rate, achieving full electricity rate which is the most significant need of the state, improving transportation routes, and creating job opportunities for the local residents are undertaking in the state.

（2）Poverty Rate

According to the “IHLCA survey 2004-2005” and “IHLCA Survey 2009-2010”, both poverty rate in 2010 and rate of those categorized into chronic poor were higher than union’s average.

Vulnerable Groups: Farmers, fishermen, inhabitants of low-lying areas/riverbanks, fishpond owners, casual laborers, Muslim community poor, fire-wood collectors: (Source: “Poverty, Food Insecurity and Vulnerability: Issues and Strategies” (UNDP, 20007))

（3）Poverty Reduction and Infrastructure Development

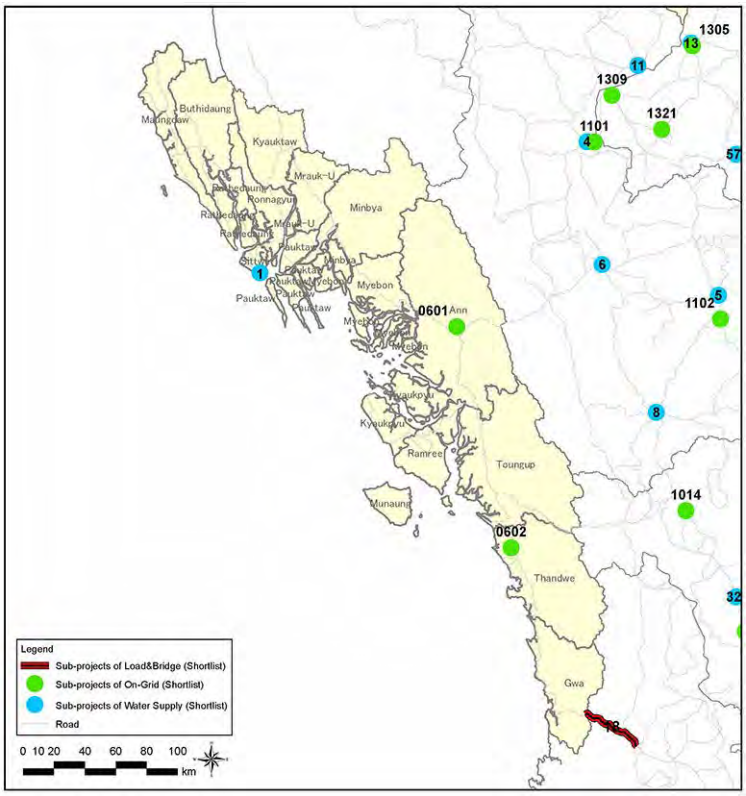
With regards to the causes of poverty, the major problems are migrant people from Bangladesh who are mostly jobless and also lack of job opportunities for local residents.

Rakhine state grows rice and other raw materials for oil. The production of rice is just enough for the state. The oil is surplus exported outside the state and nearby countries.

（4） Prospective Contribution to Regional Development

Rakhine State has rich resources from ocean and agricultural and mineral resources from mother earth. It is stated in the NCDP that "agro-production" should be focusd as the main target for development. Rakhine State is also highly expected to play a significant role as an international gateway, with a main beach tourism utilizing rich and long coastline. One major development node at Sittwe and Kyauk Phyu is to be connected with major cities through economic corridors for more enhanced trading and transporting activities.

TDC-1 (Sittwe) will be a major economic contributor to the development of State through the improved network with other development centers of the country. ESE-0601 (Ann:Kazukain) will promote its stone mining and agriculture industries, and the products will contribute to increased tourism and international trading activities in Sittwe and Kyauk Phyu as well as along the coastline. ESE-0602 (Thandwe: Kyaunkgyi) will strengthen tourism, fishery, pearl production and food processing industries (including potable water) contributing to improved economic activities along the coast connected to Yangon.



Project No	Sub-project Name
ESE-0601	Ann(kazukain)
ESE-0602	Thandwe (Kyaunkgyi)
TDC-1	Sittwe

Figure2-10 Shortlisted Sub-Projects in Rakhine State
Source: The Preparatory Survey Team

12. Yangon Region

（1） Profile

Yangon is the commercial city of Myanmar and it occupies 20% of the country's GDP including service sector. Yangon has potential for the economic development. By achieving its potential fully, it can create a good opportunity for the country. By establishing industrial zones and trying to find ways to connect with local production network, it can help the development of local community and infrastructure in rural areas.

（2） Poverty Rate

According to the "IHLCA survey 2004-2005" and "IHLCA Survey 2009-2010", both poverty rate in 2010 and rate of those categorized into chronic poor were lower than union's average.

（3） Poverty Reduction and Infrastructure Development

Generally, Yangon regional is not suffered from any significant disasters. Since Yangon has many job opportunities, people from all over the country migrants into the city. These people don't have land and they are considered as the major group in poverty people at Yangon.

（4）Prospective Contribution to Regional Development

There is no sub-project in the shortlist.

13. Shan State

（1）Profile

Shan is the largest State of the nation having agricultural production, tourism based on activities and trading industry with China and Thailand. Due to its mountainous natural profile, it is not easy for power supply, but water resource helps agro-production. There are three internal regions in the State and each has slight different industrial activities, but Chinese or Thailand trading is the same view for the better development in industry and economy of the State. Because, the indigenous tribe related conflicts still exists in the region including national border and state border issues, the region has unrest condition. There are many natural resources possibly utilized for primary industry as well as tourism sector, and infrastructure development in wide range is in need.

（2）Poverty Rate

According to the "IHLCA survey 2004-2005" and "IHLCA Survey 2009-2010", poverty rate in 2010 and rate of those categorized into chronic poor were higher than the Union's average, and the rate in rural areas were much higher than the Union's average.

Vulnerable Groups: People in high rainfall area, soil erosion area; households with malaria or HIV

（3）Poverty Reduction and Infrastructure Development

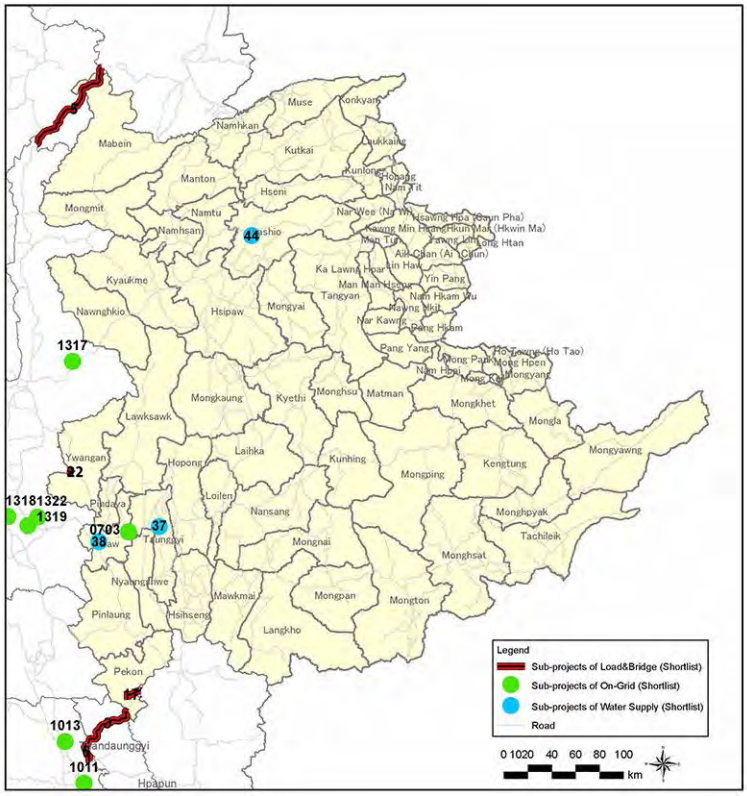
There number of communities and population without power supply thus weak industrial structure and less job opportunity makes poverty increase in remote areas. Any infrastructure development that should contribute those population in rural areas without proper infrastructure will make their livelihood better, thus poverty reduction could be achieved. If SHS type power supply is provided to the villages, the people could benefit night time for extra activities that may result in additional income generation and such, to change the lives better.

（4）Prospective Contribution to Regional Development

Shan State is a major agro-product producer in the country, and the NCDP also identifies its importance to develop "agriculture services." At the same time, Shan State has a major advantage in international trading because it is bordering China, Thailand and Lao.

In addition, the State also has a developed domestic network for goods transportation. The east-west economic corridor ties the State to Mandalay, which is then connected to neighboring countries. Another economic corridor ties Shan to Rakhine in the west. Knowing this, TDC-38 (Aungpan) is expected to further develop agro-productions and social services delivering products and services to large center city of Taunggyi (this is a project site of TDC-37 (Taunggyi), where major industrial productions are taking place.). These townships are also linked to Meiktila market. Thus, many products from these townships could be concentrated for mass-processing for international market trading through the economic corridor to China, Lao, Thailand and others. Tourism industry among these areas will also be encouraged by the development of economic corridor. ESE-0703(Kalow) is located near sightseeing areas where many hotels and restaurants recently opened. Besides, road development along MoC-17 (Taungoo-LeikTho-TaDo-Hopone) will contribute largely in interstate network in the southern Shan connecting the area to Bago and Yangon better for transportation improvement, and MoC-22 (Han Myintmo-Myo Gyi-Yuar Ngan-Aung Pan) will enhance north-south transoport network in the western Shan connecting large markets, such as Taunggyi and Mandalay faster.

The Sub-Project TDC-44 (Lashio) is located along the possible international trading route to China, and agro-products from these areas will be packaged in larger quantity for Chinese market demand in addition to the Lashio market itself. These townships are also connected with Phin Oo Lwin, which is a likely tourism destination.



Project No	Sub-project Name
MoC-17	Taungoo – LeikTho – YaDo – Hopone Road
MoC-22	Han Myintmo-Myo Gyi-Yuar Ngan-Aung Pan Road
ESE-0703	Kalaw(Heho)
TDC-37	Taunggyi
TDC-38	Aungpan
TDC-44	Lashio

Figure 2-11 Shortlisted Sub-Projects in Shan State
Source: The Preparatory Survey Team

14. Ayeyawady Region

（1）Profile

Ayeyawady Region is a delta region and very appropriate place for agriculture purpose. Fishery products are also surplus in the region. Furthermore, there are beautiful beaches in Chaung Tha and Ngwe Saung beaches can help the economic development of the region.

（2）Poverty Rate

According to the “IHLCA survey 2004-2005” and “IHLCA Survey 2009-2010”, poverty rate in 2010 and rate of those categorized into chronic poor were a little higher than union’s average.

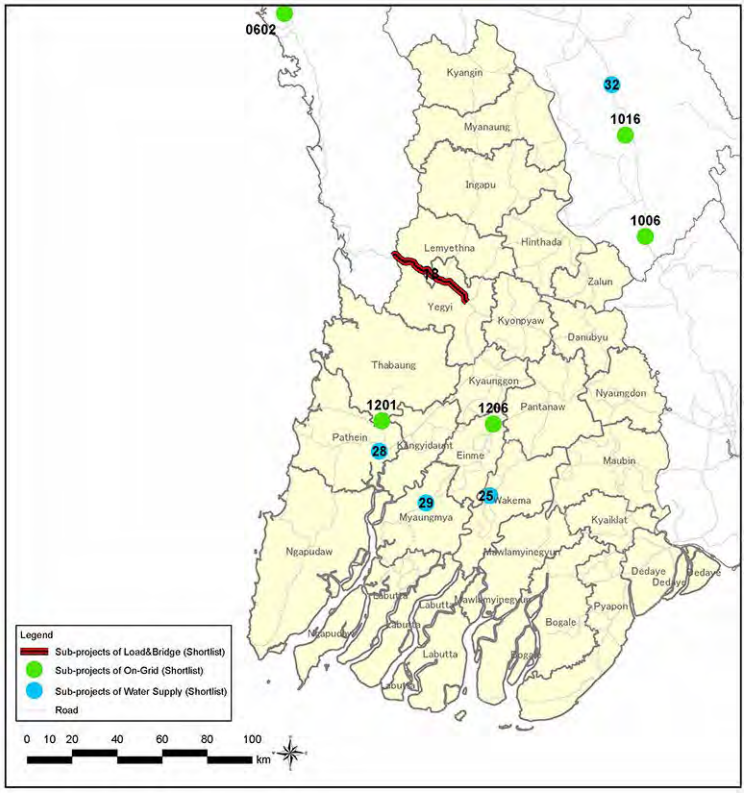
Vulnerable Groups: Fishermen, Fisheries workers, marginal farmers and agricultural workers, households in flood prone areas (Source: “Poverty, Food Insecurity and Vulnerability: Issues and Strategies” (UNDP, 20007))

（3）Poverty Reduction and Infrastructure Development

Underground water in inland Ayeyawady consists of less salt content, so that underground water, rain water and surface water are used for many purposes. The underground water in the area around Ayeyawady River consists of high content of salt, so that several reservoir for rain water and surface water reserve are under construction in the region. Since there is no water supply system installed, people in the area have to go to water collection point and this task consumes valuable time and energy of people.

(4) Prospective Contribution to Regional Development

Ayeyawady Region has both a high poverty rate and large number of poverty population, and thus job opportunities need to be created through the infrastructure development. As the NCDP identifies, Ayeyawady Region has a potential in "agriculture services" with its fertile land. Although the Region is adjacent to Yangon Region, economic network is still weak and there is a plenty of room for improvement, although there are several industrial zones developed in, for instance, Pathein for manufacturing industry. In order to strengthen road network with Rakhine, the sub-project MoC-18 (Nga Thine Chaung - Gwa Road) will be connecting areas for better transportation. The Regional capital of Pathein, with ESE-1201 and TDC-28, will be equipped with better infrastructure which may contribute to the expansion of industrial zone and the improvement of production. With these Sub-Projects, manufactured products will be distributed to the surrounding localized markets. Electricity and water supply through ESE-1202 (Pyapone), ESE-1203 (Myaungmya:Pyin Village), TDC-29 (Myaungmya), ESE-1206 (Enme) and TDC-25 (Wakema) will reduce housekeeping tasks such as water fetching, and increase time for more productive activities – especially night time – which may bring additional incomes to individuals. Such changes in living environment would contribute to additional job creation in the Region. Thus, there may be expanded production in agriculture and fishery in many Townships.



Project No	Sub-project Name
MoC-18	Nga Thine Chaung - Gwa Road
ESE-1201	Pathein
ESE-1206	Einme
TDC-25	Wakema
TDC-28	Pathein
TDC-29	Myaungmya

Figure 2-12 Shortlisted Sub-Projects in Ayeyarwady Region
Source: The Preparatory Survey Team

ANNEX3 Longlist of Off-Grid Sub-Projects

The list of Off-Grid projects which was submitted by Myanmar counterparts are shown hereafter.

Project Code	State/Region	Name of Subproject (Village Name)	Item
DRD-1085	Bago	Htan Pin Gone	Waw TS SHS (S:40HH / M:0HH / L:0HH) Mini-G:0
DRD-1086	Bago	Ma War Tae Su	Waw TS SHS (S:82HH / M:0HH / L:0HH) Mini-G:0
DRD-1087	Bago	Kalar Tae Su	Waw TS SHS (S:21HH / M:0HH / L:0HH) Mini-G:0
DRD-1088	Bago	Myount Ta Htay Gone	Waw TS SHS (S:148HH / M:0HH / L:0HH) Mini-G:0
DRD-1090	Bago	Kyun Gyi	Tha Nat Pin TS SHS (S:12HH / M:24HH / L:359HH) Mini-G:0
DRD-1091	Bago	Hnat Pyaw Taw	Tha Nat Pin TS SHS (S:4HH / M:8HH / L:55HH) Mini-G:0
DRD-1092	Bago	Kalar Chaung Lay	Tha Nat Pin TS SHS (S:9HH / M:6HH / L:44HH) Mini-G:0
DRD-1093	Bago	A Htet Kyon Par	Tha Nat Pin TS SHS (S:50HH / M:50HH / L:200HH) Mini-G:0
DRD-1094	Bago	Wae Pyan	Tha Nat Pin TS SHS (S:46HH / M:50HH / L:264HH) Mini-G:0
DRD-1095	Bago	Nyaung Pin Su	Tha Nat Pin TS SHS (S:0HH / M:0HH / L:93HH) Mini-G:0
DRD-1096	Bago	A Nyar Su	Tha Nat Pin TS SHS (S:9HH / M:0HH / L:36HH) Mini-G:0
DRD-1097	Bago	Out Thaung	Tha Nat Pin TS SHS (S:18HH / M:8HH / L:47HH) Mini-G:0
DRD-1098	Bago	Sal A Ka	Tha Nat Pin TS SHS (S:21HH / M:20HH / L:57HH) Mini-G:0
DRD-1099	Bago	San Pya	Tha Nat Pin TS SHS (S:12HH / M:18HH / L:11HH) Mini-G:0
DRD-1100	Bago	Bo Taw Su	Tha Nat Pin TS SHS (S:0HH / M:0HH / L:3HH) Mini-G:0
DRD-1103	Bago	Ywar Houng	Tha Nat Pin TS SHS (S:0HH / M:100HH / L:200HH) Mini-G:0
DRD-1104	Bago	Ta KhonTine(Ya)	Tha Nat Pin TS SHS (S:0HH / M:50HH / L:50HH) Mini-G:0
DRD-1105	Bago	Nat Yae Kan	Tha Nat Pin TS SHS (S:6HH / M:23HH / L:481HH) Mini-G:0
DRD-1106	Bago	A Lan Pya	Tha Nat Pin TS SHS (S:0HH / M:0HH / L:105HH) Mini-G:0
DRD-1107	Bago	Kan Pyoe	Tha Nat Pin TS SHS (S:0HH / M:0HH / L:120HH) Mini-G:0
DRD-1108	Bago	Kha Lat Su	Tha Nat Pin TS SHS (S:0HH / M:0HH / L:415HH) Mini-G:0
DRD-1109	Bago	Shwe Owe	Tha Nat Pin TS SHS (S:4HH / M:50HH / L:80HH) Mini-G:0
DRD-1110	Bago	Ka Thit Khone	Tha Nat Pin TS SHS (S:165HH / M:200HH / L:0HH) Mini-G:0
DRD-1111	Bago	Ka Pin	Tha Nat Pin TS SHS (S:21HH / M:0HH / L:55HH) Mini-G:0
DRD-1112	Bago	Aung Bone Gyi	Tha Nat Pin TS SHS (S:34HH / M:25HH / L:121HH) Mini-G:0
DRD-1113	Bago	Kyae Pin Su	Tha Nat Pin TS SHS (S:0HH / M:150HH / L:352HH) Mini-G:0
DRD-1114	Bago	Kan Gyi Wine	Tha Nat Pin TS SHS (S:0HH / M:50HH / L:170HH) Mini-G:0
DRD-1116	Bago	Kyun Gyi	Kyauk Gyi TS SHS (S:26HH / M:28HH / L:40HH) Mini-G:0
DRD-1119	Bago	San Taw Po(Myanmar)	Yay Tar Shae TS SHS (S:40HH / M:0HH / L:0HH) Mini-G:0
DRD-1120	Bago	San Taw Po (Kayin)	Yay Tar Shae TS SHS (S:9HH / M:0HH / L:0HH) Mini-G:0
DRD-1121	Bago	Hlae Pwel Kyi	Yay Tar Shae TS SHS (S:79HH / M:0HH / L:0HH) Mini-G:0
DRD-1122	Bago	Ta Tan Khone (Htet)	Yay Tar Shae TS SHS (S:127HH / M:0HH / L:0HH) Mini-G:0
DRD-1123	Bago	Ta Tan Khone (Out)	Yay Tar Shae TS SHS (S:42HH / M:0HH / L:0HH) Mini-G:0
DRD-1124	Bago	Sate Sinn	Yay Tar Shae TS SHS (S:17HH / M:0HH / L:0HH) Mini-G:0
DRD-1125	Bago	Chauk Myaung	Yay Tar Shae TS SHS (S:49HH / M:0HH / L:0HH) Mini-G:0
DRD-1126	Bago	Za Win	Yay Tar Shae TS SHS (S:93HH / M:0HH / L:0HH) Mini-G:0
DRD-1128	Bago	Kan Kyin	Pauk Khoung TS SHS (S:120HH / M:50HH / L:130HH) Mini-G:0
DRD-1129	Bago	Myae Ni Gone	Pauk Khoung TS SHS (S:55HH / M:60HH / L:95HH) Mini-G:0
DRD-1130	Bago	Kyu Wot	Pauk Khoung TS SHS (S:203HH / M:72HH / L:160HH) Mini-G:0
DRD-1131	Bago	Chaung Phaut	Pauk Khoung TS SHS (S:63HH / M:19HH / L:52HH) Mini-G:0
DRD-1132	Bago	Zwe Kwin	Pauk Khoung TS SHS (S:28HH / M:10HH / L:1HH) Mini-G:0
DRD-1135	Bago	Thit Ngoat To	Pauk Khoung TS SHS (S:15HH / M:10HH / L:9HH) Mini-G:0
DRD-1136	Bago	Inn Tine Gone	Pauk Khoung TS SHS (S:45HH / M:15HH / L:20HH) Mini-G:0
DRD-1137	Bago	Kayin Ta Bee	Pauk Khoung TS SHS (S:7HH / M:12HH / L:9HH) Mini-G:0
DRD-1138	Bago	Nyaung Pin Thar	Pauk Khoung TS SHS (S:69HH / M:15HH / L:55HH) Mini-G:0
DRD-1139	Bago	Kaught Ma	Pauk Khoung TS SHS (S:113HH / M:0HH / L:5HH) Mini-G:0
DRD-1140	Bago	Nyaung Woon	Pauk Khoung TS SHS (S:315HH / M:25HH / L:3HH) Mini-G:0
DRD-1141	Bago	Gon Min Khone	Pauk Khoung TS SHS (S:192HH / M:10HH / L:0HH) Mini-G:0
DRD-1142	Bago	Paw Lan Gyi	Pauk Khoung TS SHS (S:75HH / M:0HH / L:0HH) Mini-G:0
DRD-1143	Bago	Taung Shwe Laung	Pauk Khoung TS SHS (S:46HH / M:20HH / L:21HH) Mini-G:0
DRD-1144	Bago	Taung Pyauh	Pauk Khoung TS SHS (S:86HH / M:22HH / L:16HH) Mini-G:0
DRD-1145	Bago	A Lal Ywar	Pauk Khoung TS SHS (S:185HH / M:26HH / L:48HH) Mini-G:0
DRD-1146	Bago	Zee Gone	Pauk Khoung TS SHS (S:67HH / M:20HH / L:70HH) Mini-G:0
DRD-1147	Bago	Chaung Kyoe	Pauk Khoung TS SHS (S:83HH / M:13HH / L:19HH) Mini-G:0
DRD-1148	Bago	Owe Tinn Gone	Pauk Khoung TS SHS (S:102HH / M:8HH / L:30HH) Mini-G:0
DRD-1149	Bago	Lal Ti	Pauk Khoung TS SHS (S:49HH / M:47HH / L:44HH) Mini-G:0
DRD-1150	Bago	Ni Par Say	Pauk Khoung TS SHS (S:48HH / M:40HH / L:62HH) Mini-G:0
DRD-1154	Bago	Aung Chan Thar Ywar Thit	Pauk Khoung TS SHS (S:66HH / M:32HH / L:32HH) Mini-G:0
DRD-1158	Bago	Gat It Gone	Pauk Khoung TS SHS (S:79HH / M:22HH / L:28HH) Mini-G:0
DRD-1160	Bago	Salon San	Pauk Khoung TS SHS (S:64HH / M:6HH / L:10HH) Mini-G:0
DRD-1161	Bago	Lal Lu	Pauk Khoung TS SHS (S:5HH / M:3HH / L:4HH) Mini-G:0
DRD-1162	Bago	I Nyi Naung	Pauk Khoung TS SHS (S:31HH / M:9HH / L:19HH) Mini-G:0
DRD-1163	Bago	Lal Khoat Pin	Pauk Khoung TS SHS (S:22HH / M:0HH / L:4HH) Mini-G:0
DRD-1164	Bago	Dee Doat	Pauk Khoung TS SHS (S:11HH / M:3HH / L:0HH) Mini-G:0

Project Code	State/Region	Name of Subproject (Village Name)	Item
DRD-1165	Bago	Ngwe Twin Too	Pauk Khoung TS SHS (S:19HH / M:24HH / L:22HH) Mini-G:0
DRD-1166	Bago	Ka Took Taung	Pauk Khoung TS SHS (S:27HH / M:21HH / L:1HH) Mini-G:0
DRD-1170	Bago	Khoat Chaung	Pauk Khoung TS SHS (S:50HH / M:50HH / L:55HH) Mini-G:0
DRD-1171	Bago	Inn Mee	Pauk Khoung TS SHS (S:41HH / M:9HH / L:4HH) Mini-G:0
DRD-1172	Bago	Myay Nat Taung	Pauk Khoung TS SHS (S:30HH / M:0HH / L:10HH) Mini-G:0
DRD-1173	Bago	San Ma Gyi	Pauk Khoung TS SHS (S:120HH / M:0HH / L:0HH) Mini-G:0
DRD-1174	Bago	Thi Tin Pin	Pauk Khoung TS SHS (S:21HH / M:2HH / L:19HH) Mini-G:0
DRD-1175	Bago	Za Lon Gone	Pauk Khoung TS SHS (S:20HH / M:1HH / L:0HH) Mini-G:0
DRD-1176	Bago	Warr Yone Pin Lal	Pauk Khoung TS SHS (S:98HH / M:15HH / L:31HH) Mini-G:0
DRD-1177	Bago	Ku Tin Ngar Sint	Pauk Khoung TS SHS (S:80HH / M:31HH / L:27HH) Mini-G:0
DRD-1178	Bago	Pae Ma Sin	Pauk Khoung TS SHS (S:20HH / M:1HH / L:2HH) Mini-G:0
DRD-1179	Bago	Thit Seint Pin	Pauk Khoung TS SHS (S:0HH / M:0HH / L:141HH) Mini-G:0
DRD-1180	Bago	Pyin Thar	Pauk Khoung TS SHS (S:0HH / M:0HH / L:70HH) Mini-G:0
DRD-1181	Bago	Mee To	Pauk Khoung TS SHS (S:0HH / M:0HH / L:58HH) Mini-G:0
DRD-1182	Bago	I Wine	Pauk Khoung TS SHS (S:53HH / M:9HH / L:16HH) Mini-G:0
DRD-1184	Bago	Tha Yet Ta Pin	Pauk Khoung TS SHS (S:52HH / M:101HH / L:50HH) Mini-G:0
DRD-1190	Bago	Sin Htoe I	Paung Tae TS SHS (S:37HH / M:0HH / L:0HH) Mini-G:0
DRD-1191	Bago	Pyin Pin Hla	Paung Tae TS SHS (S:6HH / M:0HH / L:0HH) Mini-G:0
DRD-1194	Bago	Thein Gone	Paung Tae TS SHS (S:298HH / M:0HH / L:0HH) Mini-G:0
DRD-1195	Bago	Lal Pin	Paung Tae TS SHS (S:149HH / M:0HH / L:0HH) Mini-G:0
DRD-1196	Bago	Ngar Shint Kwin	Paung Tae TS SHS (S:130HH / M:0HH / L:0HH) Mini-G:0
DRD-1197	Bago	Shwe Mya Kwin	Paung Tae TS SHS (S:41HH / M:0HH / L:0HH) Mini-G:0
DRD-1198	Bago	Yoke Saing	Paung Tae TS SHS (S:143HH / M:0HH / L:0HH) Mini-G:0
DRD-1199	Bago	A Lal Ywar	Paung Tae TS SHS (S:129HH / M:0HH / L:0HH) Mini-G:0
DRD-1200	Bago	Gway Tauk Kwin	Paung Tae TS SHS (S:72HH / M:0HH / L:0HH) Mini-G:0
DRD-1201	Bago	Kyaut Ta Khar	Paung Tae TS SHS (S:141HH / M:0HH / L:0HH) Mini-G:0
DRD-1202	Bago	Bant Bway Kan	Paung Tae TS SHS (S:309HH / M:0HH / L:0HH) Mini-G:0
DRD-1203	Bago	Shwe Gae Pauk	Paung Tae TS SHS (S:163HH / M:0HH / L:0HH) Mini-G:0
DRD-1205	Bago	Nyaung Pin I	Kyoe Pin Kauk TS SHS (S:70HH / M:0HH / L:0HH) Mini-G:0
DRD-1207	Bago	Aye Ywar Lay	Kyoe Pin Kauk TS SHS (S:39HH / M:0HH / L:0HH) Mini-G:0
DRD-1215	Bago	Ma Yin Nge	Moe Nyo TS SHS (S:13HH / M:4HH / L:55HH) Mini-G:0
DRD-1216	Bago	Gon Nyin Tan	Moe Nyo TS SHS (S:107HH / M:50HH / L:180HH) Mini-G:0
DRD-1217	Bago	Than Pu Yar Khone	Moe Nyo TS SHS (S:32HH / M:69HH / L:217HH) Mini-G:0
DRD-1218	Bago	Sin Gaung	Moe Nyo TS SHS (S:104HH / M:19HH / L:182HH) Mini-G:0
DRD-1219	Bago	Yae Owe Sin Gone	Moe Nyo TS SHS (S:8HH / M:1HH / L:26HH) Mini-G:0
DRD-1220	Bago	Koe Htaung Ma	Moe Nyo TS SHS (S:17HH / M:23HH / L:36HH) Mini-G:0
DRD-1221	Bago	Moe Nyo Lay	Moe Nyo TS SHS (S:116HH / M:26HH / L:67HH) Mini-G:0
DRD-1222	Bago	Phayar Htu	Moe Nyo TS SHS (S:45HH / M:10HH / L:60HH) Mini-G:0
DRD-1223	Bago	Hlay Yin	Moe Nyo TS SHS (S:64HH / M:25HH / L:88HH) Mini-G:0
DRD-1224	Bago	Hlay Yin Ywar Thit	Moe Nyo TS SHS (S:29HH / M:18HH / L:17HH) Mini-G:0
DRD-1225	Bago	Sin Gaung Ywar Thit	Moe Nyo TS SHS (S:11HH / M:0HH / L:20HH) Mini-G:0
DRD-1226	Bago	Taung Yar Phar	Moe Nyo TS SHS (S:22HH / M:14HH / L:22HH) Mini-G:0
DRD-1235	Bago	Ka Tai Sein	Thar Yar Waddy TS SHS (S:0HH / M:0HH / L:79HH) Mini-G:0
DRD-1236	Bago	Thu Htay Gone	Thar Yar Waddy TS SHS (S:0HH / M:0HH / L:133HH) Mini-G:0
DRD-1237	Bago	Yoe Gyi	Thar Yar Waddy TS SHS (S:89HH / M:0HH / L:87HH) Mini-G:0
DRD-1238	Bago	Lay Too	Thar Yar Waddy TS SHS (S:0HH / M:0HH / L:65HH) Mini-G:0
DRD-1239	Bago	Phayar Gone	Thar Yar Waddy TS SHS (S:26HH / M:0HH / L:16HH) Mini-G:0
DRD-1240	Bago	Zin Pyoun Gone	Thar Yar Waddy TS SHS (S:70HH / M:0HH / L:30HH) Mini-G:0
DRD-1241	Bago	Mu Soe Gone	Thar Yar Waddy TS SHS (S:22HH / M:0HH / L:4HH) Mini-G:0
DRD-1242	Bago	Inn Lal	Thar Yar Waddy TS SHS (S:22HH / M:0HH / L:30HH) Mini-G:0
DRD-1243	Bago	Yae Mee Nin	Thar Yar Waddy TS SHS (S:34HH / M:0HH / L:24HH) Mini-G:0
DRD-1244	Bago	Wae Dauk	Thar Yar Waddy TS SHS (S:1HH / M:0HH / L:23HH) Mini-G:0
DRD-1245	Bago	Pa Lin Wa	Thar Yar Waddy TS SHS (S:0HH / M:0HH / L:8HH) Mini-G:0
DRD-1246	Bago	Kone Tan Gyi	Thar Yar Waddy TS SHS (S:3HH / M:0HH / L:14HH) Mini-G:0
DRD-1247	Bago	Sein Ka Taw	Thar Yar Waddy TS SHS (S:0HH / M:0HH / L:99HH) Mini-G:0
DRD-1248	Bago	Inn Pu Nyar (Out Su)	Thar Yar Waddy TS SHS (S:0HH / M:0HH / L:74HH) Mini-G:0
DRD-1249	Bago	Inn Pu Nyar Ywar Gyi	Thar Yar Waddy TS SHS (S:0HH / M:0HH / L:133HH) Mini-G:0
DRD-1250	Bago	Warr Nat Gone	Thar Yar Waddy TS SHS (S:0HH / M:0HH / L:144HH) Mini-G:0
DRD-1251	Bago	Nyaung Gone	Thar Yar Waddy TS SHS (S:0HH / M:0HH / L:94HH) Mini-G:0
DRD-1252	Bago	Min Gyi Gone	Thar Yar Waddy TS SHS (S:0HH / M:0HH / L:54HH) Mini-G:0
DRD-1253	Bago	Za Loat	Thar Yar Waddy TS SHS (S:0HH / M:0HH / L:53HH) Mini-G:0
DRD-1254	Bago	A Ma Lock	Thar Yar Waddy TS SHS (S:0HH / M:0HH / L:90HH) Mini-G:0
DRD-1255	Bago	Ywar Thit Gone	Thar Yar Waddy TS SHS (S:0HH / M:0HH / L:74HH) Mini-G:0
DRD-1256	Bago	Kan Thone Sint	Thar Yar Waddy TS SHS (S:1HH / M:0HH / L:45HH) Mini-G:0

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DRD-1257	Bago	Ka Nyin Ta Pin	Thar Yar Waddy TS SHS (S:206HH / M:0HH / L:0HH) Mini-G:0
DRD-1258	Bago	Bant Bway Gone	Thar Yar Waddy TS SHS (S:84HH / M:0HH / L:0HH) Mini-G:0
DRD-1259	Bago	Pat Taw	Thar Yar Waddy TS SHS (S:129HH / M:0HH / L:0HH) Mini-G:0
DRD-1260	Bago	Tha Pyay Gone	Thar Yar Waddy TS SHS (S:86HH / M:0HH / L:0HH) Mini-G:0
DRD-1261	Bago	Thet Kal Gone	Thar Yar Waddy TS SHS (S:26HH / M:0HH / L:0HH) Mini-G:0
DRD-1262	Bago	Pyae Zin Gone	Thar Yar Waddy TS SHS (S:125HH / M:0HH / L:0HH) Mini-G:0
DRD-1263	Bago	Kya Byae A Htet	Thar Yar Waddy TS SHS (S:0HH / M:0HH / L:40HH) Mini-G:0
DRD-1264	Bago	Kya Byae Out	Thar Yar Waddy TS SHS (S:0HH / M:0HH / L:24HH) Mini-G:0
DRD-1265	Bago	Thar Yar Gone	Thar Yar Waddy TS SHS (S:0HH / M:0HH / L:120HH) Mini-G:0
DRD-1266	Bago	Nyaung Lay Pin	Thar Yar Waddy TS SHS (S:46HH / M:0HH / L:0HH) Mini-G:0
DRD-1267	Bago	Thit Seint Gone	Thar Yar Waddy TS SHS (S:0HH / M:0HH / L:57HH) Mini-G:0
DRD-1268	Bago	Sar Phyu Su	Thar Yar Waddy TS SHS (S:0HH / M:0HH / L:90HH) Mini-G:0
DRD-1269	Bago	Tal Taw Kwae	Thar Yar Waddy TS SHS (S:0HH / M:0HH / L:47HH) Mini-G:0
DRD-1270	Bago	Mal Taw Kwae	Thar Yar Waddy TS SHS (S:0HH / M:0HH / L:30HH) Mini-G:0
DRD-1271	Bago	Kyee Chaung	Thar Yar Waddy TS SHS (S:0HH / M:0HH / L:110HH) Mini-G:0
DRD-1272	Bago	Gway Tauk Gone	Thar Yar Waddy TS SHS (S:0HH / M:0HH / L:165HH) Mini-G:0
DRD-1273	Bago	Kyan Taw	Thar Yar Waddy TS SHS (S:0HH / M:22HH / L:7HH) Mini-G:0
DRD-1274	Bago	Di Gaung	Thar Yar Waddy TS SHS (S:0HH / M:8HH / L:1HH) Mini-G:0
DRD-1275	Bago	Ohm Pin Su	Thar Yar Waddy TS SHS (S:0HH / M:0HH / L:26HH) Mini-G:0
DRD-1276	Bago	Ma Kyee Tan	Thar Yar Waddy TS SHS (S:24HH / M:0HH / L:11HH) Mini-G:0
DRD-1277	Bago	A Lal Su	Thar Yar Waddy TS SHS (S:8HH / M:0HH / L:17HH) Mini-G:0
DRD-1278	Bago	Thein Gone	Thar Yar Waddy TS SHS (S:5HH / M:0HH / L:8HH) Mini-G:0
DRD-1281	Bago	Lat Pa Taw (W)	Oat Pho TS SHS (S:0HH / M:0HH / L:57HH) Mini-G:0
DRD-1285	Bago	Thet Kal Chin Gone	Oat Pho TS SHS (S:0HH / M:0HH / L:311HH) Mini-G:0
DRD-1287	Bago	Kine Taw Su	Oat Pho TS SHS (S:0HH / M:0HH / L:221HH) Mini-G:0
DRD-1288	Bago	Wine	Oat Pho TS SHS (S:0HH / M:0HH / L:259HH) Mini-G:0
DRD-1289	Bago	Yae Tar	Oat Pho TS SHS (S:0HH / M:0HH / L:165HH) Mini-G:0
DRD-1290	Bago	Ywar Thit	Oat Pho TS SHS (S:0HH / M:0HH / L:99HH) Mini-G:0
DRD-1291	Bago	Chaung Sout	Oat Pho TS SHS (S:0HH / M:0HH / L:293HH) Mini-G:0
DRD-1292	Bago	Kyoe Pin Wine	Oat Pho TS SHS (S:0HH / M:0HH / L:65HH) Mini-G:0
DRD-1293	Bago	Chaung Nar	Oat Pho TS SHS (S:0HH / M:0HH / L:65HH) Mini-G:0
DRD-1294	Bago	Kyoe Koe Pin	Oat Pho TS SHS (S:0HH / M:0HH / L:285HH) Mini-G:0
DRD-1295	Bago	Kyae Phyu Ma	Oat Pho TS SHS (S:0HH / M:0HH / L:280HH) Mini-G:0
DRD-1297	Bago	Ma Aue Tan	Oat Pho TS SHS (S:0HH / M:0HH / L:300HH) Mini-G:0
DRD-1299	Bago	Gway Cho Kwin	Oat Pho TS SHS (S:0HH / M:0HH / L:72HH) Mini-G:0
DRD-2001	Mandalay	Ywar Thit	Meik Hti Lar TS SHS (S:59HH / M:0HH / L:0HH) Mini-G:0
DRD-2002	Mandalay	War Thone Taw	Meik Hti Lar TS SHS (S:84HH / M:0HH / L:0HH) Mini-G:0
DRD-2003	Mandalay	Yay Ngan	Meik Hti Lar TS SHS (S:124HH / M:0HH / L:0HH) Mini-G:0
DRD-2004	Mandalay	inn Yin	Wan Twin TS SHS (S:175HH / M:0HH / L:0HH) Mini-G:0
DRD-2005	Mandalay	Ba Din (Na)	Wan Twin TS SHS (S:35HH / M:0HH / L:0HH) Mini-G:0
DRD-2006	Mandalay	Pauk Kan	Wan Twin TS SHS (S:63HH / M:0HH / L:0HH) Mini-G:0
DRD-2007	Mandalay	Yay Aye	Thar Si TS SHS (S:35HH / M:0HH / L:0HH) Mini-G:0
DRD-2008	Mandalay	Ka Bar Ni	Thar Si TS SHS (S:37HH / M:0HH / L:0HH) Mini-G:0
DRD-2009	Mandalay	Kone Baung	Thar Si TS SHS (S:62HH / M:0HH / L:0HH) Mini-G:0
DRD-2010	Mandalay	Lal Pyin	Thar Si TS SHS (S:275HH / M:0HH / L:0HH) Mini-G:0
DRD-2011	Mandalay	Yay Pu	Thar Si TS SHS (S:102HH / M:0HH / L:0HH) Mini-G:0
DRD-2012	Mandalay	Pin Mone	Thar Si TS SHS (S:128HH / M:0HH / L:0HH) Mini-G:0
DRD-2013	Mandalay	Ywar Thit	Thar Si TS SHS (S:68HH / M:0HH / L:0HH) Mini-G:0
DRD-2014	Mandalay	Kone Hla	Thar Si TS SHS (S:41HH / M:0HH / L:0HH) Mini-G:0
DRD-2015	Mandalay	Kyaut Pa Chote	Thar Si TS SHS (S:74HH / M:0HH / L:0HH) Mini-G:0
DRD-2016	Mandalay	37 Miles	Thar Si TS SHS (S:86HH / M:0HH / L:0HH) Mini-G:0
DRD-2017	Mandalay	Kyat Sa Khan	Thar Si TS SHS (S:237HH / M:0HH / L:0HH) Mini-G:0
DRD-2018	Mandalay	Thit Pa Lway	Thar Si TS SHS (S:119HH / M:0HH / L:0HH) Mini-G:0
DRD-2019	Mandalay	Lal Khaung	Thar Si TS SHS (S:101HH / M:0HH / L:0HH) Mini-G:0
DRD-2020	Mandalay	Sint Ku	Thar Si TS SHS (S:102HH / M:0HH / L:0HH) Mini-G:0
DRD-2021	Mandalay	Thet Kal Date	Thar Si TS SHS (S:138HH / M:0HH / L:0HH) Mini-G:0
DRD-2022	Mandalay	Myat Ni Kyin	Thar Si TS SHS (S:130HH / M:0HH / L:0HH) Mini-G:0
DRD-2023	Mandalay	Phoe Thar Nine	Thar Si TS SHS (S:75HH / M:0HH / L:0HH) Mini-G:0
DRD-2024	Mandalay	Khway Yote	Thar Si TS SHS (S:108HH / M:0HH / L:0HH) Mini-G:0
DRD-2025	Mandalay	Sin Taung	Thar Si TS SHS (S:317HH / M:0HH / L:0HH) Mini-G:0
DRD-2026	Mandalay	Wah Ywat	Thar Si TS SHS (S:54HH / M:0HH / L:0HH) Mini-G:0
DRD-2027	Mandalay	Ngat Pyaw Taw	Thar Si TS SHS (S:170HH / M:0HH / L:0HH) Mini-G:0
DRD-2028	Mandalay	Chay Pu Kan	Nyung U TS SHS (S:151HH / M:0HH / L:0HH) Mini-G:1
DRD-2029	Mandalay	Ywar Thit Taung	Nyung U TS SHS (S:125HH / M:0HH / L:0HH) Mini-G:0

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DRD-2030	Mandalay	Taung B Ywar Thit	Nyung U TS SHS (S:264HH / M:0HH / L:0HH) Mini-G:0
DRD-2031	Mandalay	Thet Yar Chaung	Nyung U TS SHS (S:192HH / M:0HH / L:0HH) Mini-G:0
DRD-2032	Mandalay	Si Pin Thar	Nyung U TS SHS (S:95HH / M:0HH / L:0HH) Mini-G:0
DRD-2033	Mandalay	Ah Yar Taw	Nyung U TS SHS (S:330HH / M:0HH / L:0HH) Mini-G:0
DRD-2034	Mandalay	Sa Par Thin	Nyung U TS SHS (S:358HH / M:0HH / L:0HH) Mini-G:0
DRD-2035	Mandalay	Kyo Pin Thar	Nyung U TS SHS (S:110HH / M:0HH / L:0HH) Mini-G:0
DRD-2036	Mandalay	Sin Lu Ai	Nyung U TS SHS (S:62HH / M:0HH / L:0HH) Mini-G:0
DRD-2037	Mandalay	Tha Pot Su	Nyung U TS SHS (S:103HH / M:0HH / L:0HH) Mini-G:0
DRD-2038	Mandalay	Thit Daunt Kyun	Nyung U TS SHS (S:98HH / M:0HH / L:0HH) Mini-G:0
DRD-2039	Mandalay	Tha Pyay Ai	Nyung U TS SHS (S:418HH / M:0HH / L:0HH) Mini-G:0
DRD-2040	Mandalay	Kone Shae	Nyung U TS SHS (S:179HH / M:0HH / L:0HH) Mini-G:1
DRD-2041	Mandalay	Pan Kone Pin	Nyung U TS SHS (S:109HH / M:0HH / L:0HH) Mini-G:0
DRD-2042	Mandalay	Kan Ma	Nga Tha Yaut TS SHS (S:269HH / M:0HH / L:0HH) Mini-G:0
DRD-2043	Mandalay	Ai Kyi	Nga Tha Yaut TS SHS (S:52HH / M:0HH / L:0HH) Mini-G:0
DRD-2044	Mandalay	Khat Hlan Kan	Nga Tha Yaut TS SHS (S:308HH / M:0HH / L:0HH) Mini-G:0
DRD-2045	Mandalay	Ku Ywar	Kyaut Pa Daung TS SHS (S:77HH / M:0HH / L:0HH) Mini-G:0
DRD-2046	Mandalay	Thit Cho Kone	Kyaut Pa Daung TS SHS (S:58HH / M:0HH / L:0HH) Mini-G:0
DRD-2047	Mandalay	Ho Laik	Pyin Oo Lwin TS SHS (S:72HH / M:0HH / L:0HH) Mini-G:1
DRD-2048	Mandalay	Kyaing Taung	Pyin Oo Lwin TS SHS (S:68HH / M:0HH / L:0HH) Mini-G:1
DRD-2049	Mandalay	Nar Ku	Pyin Oo Lwin TS SHS (S:85HH / M:0HH / L:0HH) Mini-G:1
DRD-2050	Mandalay	Pyin Kyi	Pyin Oo Lwin TS SHS (S:389HH / M:0HH / L:0HH) Mini-G:1
DRD-2051	Mandalay	Ban Thar	Pyin Oo Lwin TS SHS (S:71HH / M:0HH / L:0HH) Mini-G:1
DRD-2052	Mandalay	Nyaunt Htaut (N)	Moe Goke TS SHS (S:28HH / M:0HH / L:0HH) Mini-G:0
DRD-2053	Mandalay	Nar Yaw	Moe Goke TS SHS (S:29HH / M:0HH / L:0HH) Mini-G:0
DRD-2054	Mandalay	Kone San	Moe Goke TS SHS (S:55HH / M:0HH / L:0HH) Mini-G:0
DRD-2055	Mandalay	Gaw Ra Khar Kone San	Moe Goke TS SHS (S:27HH / M:0HH / L:0HH) Mini-G:0
DRD-2056	Mandalay	Pan Taw (Gaw)	Moe Goke TS SHS (S:7HH / M:0HH / L:0HH) Mini-G:0
DRD-2057	Mandalay	Net Phate	Moe Goke TS SHS (S:40HH / M:0HH / L:0HH) Mini-G:0
DRD-2058	Mandalay	Lay Thar Taung	Moe Goke TS SHS (S:41HH / M:0HH / L:0HH) Mini-G:0
DRD-2059	Mandalay	Mat Khaut Taung	Moe Goke TS SHS (S:13HH / M:0HH / L:0HH) Mini-G:0
DRD-2060	Mandalay	Lay Thar Ka Lar	Moe Goke TS SHS (S:6HH / M:0HH / L:0HH) Mini-G:0
DRD-2061	Mandalay	Net Sar (Li)	Moe Goke TS SHS (S:15HH / M:0HH / L:0HH) Mini-G:0
DRD-2062	Mandalay	Thein Kone	Pyaw Bwal TS SHS (S:39HH / M:0HH / L:0HH) Mini-G:0
DRD-2063	Mandalay	Oung Kone	Pyaw Bwal TS SHS (S:285HH / M:0HH / L:0HH) Mini-G:0
DRD-2064	Mandalay	Taung Chaung	Pyaw Bwal TS SHS (S:384HH / M:0HH / L:0HH) Mini-G:0
DRD-2065	Mandalay	Gway Kyi	Pyaw Bwal TS SHS (S:117HH / M:0HH / L:0HH) Mini-G:0
DRD-2066	Mandalay	Ywar Thit	Pyaw Bwal TS SHS (S:202HH / M:0HH / L:0HH) Mini-G:0
DRD-2067	Mandalay	Paw Ai Yoe	Pyaw Bwal TS SHS (S:109HH / M:0HH / L:0HH) Mini-G:0
DRD-2068	Mandalay	Kyaung Ywar	Pyaw Bwal TS SHS (S:220HH / M:0HH / L:0HH) Mini-G:0
DRD-2069	Mandalay	Ma Kyee Kone	Pyaw Bwal TS SHS (S:108HH / M:0HH / L:0HH) Mini-G:0
DRD-2070	Mandalay	Da Het Tan	Pyaw Bwal TS SHS (S:136HH / M:0HH / L:0HH) Mini-G:0
DRD-2071	Mandalay	Myauk Kan Kyi	Pyaw Bwal TS SHS (S:291HH / M:0HH / L:0HH) Mini-G:0
DRD-2072	Mandalay	Ma Au Taw	Pyaw Bwal TS SHS (S:107HH / M:0HH / L:0HH) Mini-G:0
DRD-2073	Mandalay	Kan Tae	Pyaw Bwal TS SHS (S:410HH / M:0HH / L:0HH) Mini-G:0
DRD-2074	Mandalay	Wae Laung	Pyaw Bwal TS SHS (S:371HH / M:0HH / L:0HH) Mini-G:0
DRD-2075	Mandalay	Pauk Kha Nee	Pyaw Bwal TS SHS (S:322HH / M:0HH / L:0HH) Mini-G:0
DRD-2076	Mandalay	Lat Pa Dine	Pyaw Bwal TS SHS (S:202HH / M:0HH / L:0HH) Mini-G:0
DRD-2077	Mandalay	Nat Sone Mhaw	Pyaw Bwal TS SHS (S:440HH / M:0HH / L:0HH) Mini-G:0
DRD-2078	Mandalay	Ywar Thit	Pyaw Bwal TS SHS (S:242HH / M:0HH / L:0HH) Mini-G:0
DRD-2079	Mandalay	Kyaut Phyar	Pyaw Bwal TS SHS (S:132HH / M:0HH / L:0HH) Mini-G:0
DRD-2080	Mandalay	Thit Hla Kyin	Pyaw Bwal TS SHS (S:342HH / M:0HH / L:0HH) Mini-G:0
DRD-2081	Mandalay	Kyat Phyu Kone	Pyaw Bwal TS SHS (S:226HH / M:0HH / L:0HH) Mini-G:0
DRD-2082	Mandalay	Ngat Mee	Pyaw Bwal TS SHS (S:147HH / M:0HH / L:0HH) Mini-G:0
DRD-2083	Mandalay	Kyaut Oh	Pyaw Bwal TS SHS (S:72HH / M:0HH / L:0HH) Mini-G:0
DRD-2084	Mandalay	Taung Ni	Pyaw Bwal TS SHS (S:130HH / M:0HH / L:0HH) Mini-G:0
DRD-2085	Mandalay	Mi Pha Yar Kone	Pyaw Bwal TS SHS (S:163HH / M:0HH / L:0HH) Mini-G:0
DRD-2086	Mandalay	Shan Su Kone	Pyaw Bwal TS SHS (S:201HH / M:0HH / L:0HH) Mini-G:1
DRD-2087	Mandalay	Bo Kone	Pyaw Bwal TS SHS (S:70HH / M:0HH / L:0HH) Mini-G:0
DRD-2088	Mandalay	Myin Tae	Pyaw Bwal TS SHS (S:376HH / M:0HH / L:0HH) Mini-G:1
DRD-2089	Mandalay	Myin Tae (South)	Pyaw Bwal TS SHS (S:130HH / M:0HH / L:0HH) Mini-G:1
DRD-2090	Mandalay	Kyi Tai Kone	Pyaw Bwal TS SHS (S:368HH / M:0HH / L:0HH) Mini-G:1
DRD-2091	Mandalay	Hlaing Pan	Pyaw Bwal TS SHS (S:381HH / M:0HH / L:0HH) Mini-G:0
DRD-2092	Mandalay	Khat Lan Kyin	Pyaw Bwal TS SHS (S:404HH / M:0HH / L:0HH) Mini-G:0
DRD-2093	Mandalay	Lat Thae Kyo	Pyaw Bwal TS SHS (S:340HH / M:0HH / L:0HH) Mini-G:0

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DRD-2094	Mandalay	Htan Pin	Pyaw Bwal TS SHS (S:302HH / M:0HH / L:0HH) Mini-G:0
DRD-2095	Mandalay	Inn Kone	Pyaw Bwal TS SHS (S:163HH / M:0HH / L:0HH) Mini-G:0
DRD-2096	Mandalay	Aung Chan Thar	Pyaw Bwal TS SHS (S:108HH / M:0HH / L:0HH) Mini-G:0
DRD-2097	Mandalay	Thee Pin	Pyaw Bwal TS SHS (S:153HH / M:0HH / L:0HH) Mini-G:0
DRD-2098	Mandalay	Tae Kyi Kone	Pyaw Bwal TS SHS (S:305HH / M:0HH / L:0HH) Mini-G:0
DRD-2099	Mandalay	Set Toe Paut	Ya Mae Thin TS SHS (S:165HH / M:0HH / L:0HH) Mini-G:0
DRD-2100	Mandalay	Aung Chan Thar	Ya Mae Thin TS SHS (S:113HH / M:0HH / L:0HH) Mini-G:0
DRD-2101	Mandalay	Myaing Thar Yar	Ya Mae Thin TS SHS (S:175HH / M:0HH / L:0HH) Mini-G:0
DRD-2102	Mandalay	Za Loat Kyi	Ya Mae Thin TS SHS (S:217HH / M:0HH / L:0HH) Mini-G:0
DRD-2103	Mandalay	Yone Taw	Ya Mae Thin TS SHS (S:78HH / M:0HH / L:0HH) Mini-G:0
DRD-2104	Mandalay	Nat Inn	Ya Mae Thin TS SHS (S:77HH / M:0HH / L:0HH) Mini-G:0
DRD-2105	Mandalay	Saung Phyu	Ya Mae Thin TS SHS (S:28HH / M:0HH / L:0HH) Mini-G:0
DRD-2106	Mandalay	Zee Phyu Kone	Ya Mae Thin TS SHS (S:96HH / M:0HH / L:0HH) Mini-G:0
DRD-2107	Mandalay	Thar Si	Ya Mae Thin TS SHS (S:212HH / M:0HH / L:0HH) Mini-G:0
DRD-2108	Mandalay	Hpa Yar Kyi	Ya Mae Thin TS SHS (S:40HH / M:0HH / L:0HH) Mini-G:0
DRD-2109	Mandalay	Khin Thar	Ya Mae Thin TS SHS (S:97HH / M:0HH / L:0HH) Mini-G:0
DRD-3001	Yangon	Hmoe Kone Thar	Thone Khwa TS SHS (S:162HH / M:0HH / L:0HH) Mini-G:0
DRD-3002	Yangon	Min Ywar Ah Thin	Thone Khwa TS SHS (S:185HH / M:0HH / L:0HH) Mini-G:0
DRD-3003	Yangon	Pite See	Thone Khwa TS SHS (S:113HH / M:0HH / L:0HH) Mini-G:0
DRD-3004	Yangon	Hna Khwa	Thone Khwa TS SHS (S:218HH / M:0HH / L:0HH) Mini-G:0
DRD-3005	Yangon	Nyunt Paung	Thone Khwa TS SHS (S:96HH / M:0HH / L:0HH) Mini-G:0
DRD-3006	Yangon	Aw Bar Nyunt	Thone Khwa TS SHS (S:177HH / M:0HH / L:0HH) Mini-G:0
DRD-3008	Yangon	Bate Theik	Thone Khwa TS SHS (S:157HH / M:0HH / L:0HH) Mini-G:0
DRD-3009	Yangon	Bar Thar Myaing	Thone Khwa TS SHS (S:217HH / M:0HH / L:0HH) Mini-G:0
DRD-3010	Yangon	Aung Pan Sein	Thone Khwa TS SHS (S:401HH / M:0HH / L:0HH) Mini-G:0
DRD-3011	Yangon	Tha MA Seil Ta	Thone Khwa TS SHS (S:231HH / M:0HH / L:0HH) Mini-G:0
DRD-3012	Yangon	Hay Ma Za Lar	Thone Khwa TS SHS (S:223HH / M:0HH / L:0HH) Mini-G:0
DRD-3013	Yangon	Zaw Ti Ka	Thone Khwa TS SHS (S:220HH / M:0HH / L:0HH) Mini-G:0
DRD-3014	Yangon	Kyaung Su	Ton Tae TS SHS (S:137HH / M:0HH / L:0HH) Mini-G:0
DRD-3015	Yangon	Hta Nee Bat	Ton Tae TS SHS (S:148HH / M:0HH / L:0HH) Mini-G:0
DRD-3016	Yangon	Phoe Ta Ser Phyu Su	Ton Tae TS SHS (S:105HH / M:0HH / L:0HH) Mini-G:0
DRD-3017	Yangon	Kyun Ka Lay	Ton Tae TS SHS (S:94HH / M:0HH / L:0HH) Mini-G:0
DRD-4001	Magway	Kyun Pyar	Minbu TS SHS (S:458HH / M:53HH / L:219HH) Mini-G:0
DRD-4002	Magway	Dat Kone	Minbu TS SHS (S:42HH / M:1HH / L:133HH) Mini-G:0
DRD-4003	Magway	Wat Myay Kan	Minbu TS SHS (S:32HH / M:12HH / L:10HH) Mini-G:0
DRD-4004	Magway	Kine Ma Kyi	Minbu TS SHS (S:160HH / M:4HH / L:7HH) Mini-G:0
DRD-4005	Magway	Pataung	Minbu TS SHS (S:154HH / M:11HH / L:103HH) Mini-G:0
DRD-4006	Magway	Ban Ten	Minbu TS SHS (S:19HH / M:6HH / L:46HH) Mini-G:0
DRD-4007	Magway	Thee Kone	Minbu TS SHS (S:9HH / M:5HH / L:46HH) Mini-G:0
DRD-4008	Magway	Hpa Yar	Minbu TS SHS (S:80HH / M:80HH / L:0HH) Mini-G:0
DRD-4009	Magway	Than Pa Yar Kine	Minbu TS SHS (S:80HH / M:0HH / L:0HH) Mini-G:0
DRD-4010	Magway	Min Hla Kyin	Minbu TS SHS (S:51HH / M:23HH / L:115HH) Mini-G:0
DRD-4012	Magway	Yay Cho Twin	Minbu TS SHS (S:129HH / M:9HH / L:53HH) Mini-G:0
DRD-4013	Magway	Mong Taung	Minbu TS SHS (S:105HH / M:61HH / L:200HH) Mini-G:0
DRD-4014	Magway	Mong Taung Ywar Ma	Minbu TS SHS (S:201HH / M:19HH / L:169HH) Mini-G:0
DRD-4015	Magway	Myaung U	Minbu TS SHS (S:20HH / M:25HH / L:44HH) Mini-G:0
DRD-4016	Magway	Nyung Kaing	Minbu TS SHS (S:25HH / M:0HH / L:40HH) Mini-G:0
DRD-4017	Magway	Ka Tin Kone	Minbu TS SHS (S:50HH / M:0HH / L:40HH) Mini-G:0
DRD-4018	Magway	Yay Ngan	Minbu TS SHS (S:30HH / M:18HH / L:65HH) Mini-G:0
DRD-4019	Magway	Pat Pal	Minbu TS SHS (S:94HH / M:17HH / L:154HH) Mini-G:0
DRD-4020	Magway	Yay Paw Kyi	Minbu TS SHS (S:40HH / M:22HH / L:128HH) Mini-G:0
DRD-4021	Magway	Yay Paw Lay	Minbu TS SHS (S:110HH / M:83HH / L:117HH) Mini-G:0
DRD-4023	Magway	Ma Kyee Thone Pin	Minbu TS SHS (S:182HH / M:125HH / L:243HH) Mini-G:0
DRD-4024	Magway	Thee Kone	Minbu TS SHS (S:233HH / M:33HH / L:336HH) Mini-G:0
DRD-4025	Magway	Kan Thar Yar (Kha Yu Kan)	Minbu TS SHS (S:209HH / M:18HH / L:113HH) Mini-G:0
DRD-4026	Magway	Ai Ma	Minbu TS SHS (S:54HH / M:19HH / L:14HH) Mini-G:0
DRD-4027	Magway	Oh Pyin Mae	Minbu TS SHS (S:91HH / M:5HH / L:74HH) Mini-G:0
DRD-4028	Magway	Lat Pan Taw	Minbu TS SHS (S:147HH / M:0HH / L:87HH) Mini-G:0
DRD-4029	Magway	U Yin	Minbu TS SHS (S:108HH / M:0HH / L:30HH) Mini-G:0
DRD-4030	Magway	Laut Pale	Minbu TS SHS (S:31HH / M:0HH / L:21HH) Mini-G:0
DRD-4058	Magway	Ngar Lan	Yay Sa Kyo TS SHS (S:25HH / M:0HH / L:200HH) Mini-G:0
DRD-4059	Magway	Hnaung Ba	Yay Sa Kyo TS SHS (S:0HH / M:0HH / L:171HH) Mini-G:0
DRD-4060	Magway	Nwe Ni	Yay Sa Kyo TS SHS (S:0HH / M:0HH / L:250HH) Mini-G:0
DRD-4061	Magway	Nwe Ni Kyun	Yay Sa Kyo TS SHS (S:19HH / M:0HH / L:170HH) Mini-G:0

Project Code	State/Region	Name of Subproject (Village Name)	Item
DRD-4062	Magway	Tha Yet Pin Kan	Yay Sa Kyo TS SHS (S:0HH / M:0HH / L:103HH) Mini-G:0
DRD-4063	Magway	Ywar Thar Aye	Yay Sa Kyo TS SHS (S:0HH / M:0HH / L:76HH) Mini-G:0
DRD-4064	Magway	Htan Pin Chaung	Yay Sa Kyo TS SHS (S:0HH / M:0HH / L:110HH) Mini-G:0
DRD-4065	Magway	Lay Yar Pyae	Yay Sa Kyo TS SHS (S:39HH / M:0HH / L:146HH) Mini-G:0
DRD-4067	Magway	Yat Thar	Yay Sa Kyo TS SHS (S:0HH / M:0HH / L:153HH) Mini-G:0
DRD-4068	Magway	Bone Ma Kyun	Yay Sa Kyo TS SHS (S:0HH / M:0HH / L:102HH) Mini-G:0
DRD-4069	Magway	Ni Pa Say Taw	Yay Sa Kyo TS SHS (S:50HH / M:0HH / L:300HH) Mini-G:0
DRD-4070	Magway	Min Ywar	Yay Sa Kyo TS SHS (S:115HH / M:0HH / L:120HH) Mini-G:0
DRD-4071	Magway	Kyaung Kone	Nat Mauk TS SHS (S:0HH / M:0HH / L:170HH) Mini-G:0
DRD-4072	Magway	Lin Ka Toe	Nat Mauk TS SHS (S:0HH / M:0HH / L:170HH) Mini-G:0
DRD-4073	Magway	Baw Ai	Nat Mauk TS SHS (S:0HH / M:0HH / L:113HH) Mini-G:0
DRD-4074	Magway	Pate Chin Taw	Nat Mauk TS SHS (S:0HH / M:0HH / L:143HH) Mini-G:0
DRD-4075	Magway	Htone Paul Chai	Nat Mauk TS SHS (S:0HH / M:0HH / L:367HH) Mini-G:0
DRD-4076	Magway	Myin Thar	Nat Mauk TS SHS (S:0HH / M:0HH / L:82HH) Mini-G:0
DRD-4077	Magway	Nyung Kone	Nat Mauk TS SHS (S:0HH / M:0HH / L:312HH) Mini-G:0
DRD-4078	Magway	Hpan Khar San	Nat Mauk TS SHS (S:0HH / M:0HH / L:288HH) Mini-G:0
DRD-4079	Magway	Kyun Pho San	Nat Mauk TS SHS (S:0HH / M:142HH / L:0HH) Mini-G:0
DRD-4080	Magway	Sel Lel	Nat Mauk TS SHS (S:0HH / M:0HH / L:287HH) Mini-G:0
DRD-4081	Magway	Kyee Kan (Ma)	Nat Mauk TS SHS (S:0HH / M:0HH / L:146HH) Mini-G:0
DRD-4082	Magway	Kan Oo Kone	Nat Mauk TS SHS (S:0HH / M:0HH / L:106HH) Mini-G:0
DRD-4083	Magway	Ban Kone	Nat Mauk TS SHS (S:0HH / M:164HH / L:0HH) Mini-G:0
DRD-4084	Magway	Kyaut Khwat	Nat Mauk TS SHS (S:0HH / M:228HH / L:0HH) Mini-G:0
DRD-4085	Magway	Phyote Sate Kone	Nat Mauk TS SHS (S:0HH / M:55HH / L:0HH) Mini-G:0
DRD-4086	Magway	San Kone	Nat Mauk TS SHS (S:0HH / M:0HH / L:141HH) Mini-G:0
DRD-4087	Magway	Yone Pin Khwat	Nat Mauk TS SHS (S:0HH / M:0HH / L:102HH) Mini-G:0
DRD-4088	Magway	Hpat Than Taung	Nat Mauk TS SHS (S:0HH / M:0HH / L:350HH) Mini-G:0
DRD-4089	Magway	Pinn Kyaing Ywar Thit	Nat Mauk TS SHS (S:0HH / M:0HH / L:70HH) Mini-G:0
DRD-4090	Magway	Gwe Kan (Ta)	Nat Mauk TS SHS (S:0HH / M:0HH / L:100HH) Mini-G:0
DRD-4091	Magway	Gwe Kan (Ma)	Nat Mauk TS SHS (S:0HH / M:0HH / L:126HH) Mini-G:0
DRD-4092	Magway	Paut Kan	Nat Mauk TS SHS (S:0HH / M:0HH / L:220HH) Mini-G:0
DRD-4093	Magway	Si Sone Kone	Nat Mauk TS SHS (S:0HH / M:0HH / L:140HH) Mini-G:0
DRD-4094	Magway	San Kan	Nat Mauk TS SHS (S:0HH / M:0HH / L:242HH) Mini-G:0
DRD-4095	Magway	Dant Da Lon Pin	Nat Mauk TS SHS (S:0HH / M:0HH / L:527HH) Mini-G:0
DRD-4096	Magway	Tae Kyi	Nat Mauk TS SHS (S:0HH / M:0HH / L:263HH) Mini-G:0
DRD-4097	Magway	Ywar Thar Lay	Nat Mauk TS SHS (S:0HH / M:0HH / L:77HH) Mini-G:0
DRD-4098	Magway	Shaw Chaung Lay	Nat Mauk TS SHS (S:0HH / M:0HH / L:269HH) Mini-G:0
DRD-4099	Magway	Padaut Kone	Nat Mauk TS SHS (S:0HH / M:0HH / L:119HH) Mini-G:0
DRD-4100	Magway	Myat Yae Kan	Nat Mauk TS SHS (S:0HH / M:0HH / L:180HH) Mini-G:0
DRD-4101	Magway	Kyaung Ywar Lay	Nat Mauk TS SHS (S:0HH / M:0HH / L:111HH) Mini-G:0
DRD-4102	Magway	Ka Paung Kone Kyi	Nat Mauk TS SHS (S:0HH / M:0HH / L:460HH) Mini-G:0
DRD-4103	Magway	Kyaut Pone	Nat Mauk TS SHS (S:0HH / M:0HH / L:170HH) Mini-G:0
DRD-4104	Magway	Ni Par Taung	Aung Lan TS SHS (S:43HH / M:0HH / L:5HH) Mini-G:0
DRD-4105	Magway	Ka Thit San	Aung Lan TS SHS (S:8HH / M:24HH / L:33HH) Mini-G:0
DRD-4106	Magway	Thone Ywar Sine	Aung Lan TS SHS (S:61HH / M:46HH / L:23HH) Mini-G:0
DRD-4107	Magway	Lat Pan Khone	Aung Lan TS SHS (S:5HH / M:80HH / L:5HH) Mini-G:0
DRD-4108	Magway	Yay Aye	Aung Lan TS SHS (S:26HH / M:33HH / L:16HH) Mini-G:0
DRD-4109	Magway	Tha Pyay San	Aung Lan TS SHS (S:3HH / M:69HH / L:13HH) Mini-G:0
DRD-4110	Magway	Koe Pin	Aung Lan TS SHS (S:2HH / M:0HH / L:75HH) Mini-G:0
DRD-4111	Magway	Hlay Done	Aung Lan TS SHS (S:3HH / M:2HH / L:75HH) Mini-G:0
DRD-4112	Magway	Kyaut Tan	Aung Lan TS SHS (S:33HH / M:27HH / L:43HH) Mini-G:0
DRD-4113	Magway	Tha Phan San	Aung Lan TS SHS (S:7HH / M:40HH / L:88HH) Mini-G:0
DRD-4114	Magway	Kyaut Oh (Ya)	Aung Lan TS SHS (S:21HH / M:10HH / L:10HH) Mini-G:0
DRD-4115	Magway	U Yin	Aung Lan TS SHS (S:33HH / M:30HH / L:40HH) Mini-G:0
DRD-4116	Magway	Thee Kone	Aung Lan TS SHS (S:27HH / M:24HH / L:112HH) Mini-G:0
DRD-4117	Magway	Than Pa Yar Khone	Aung Lan TS SHS (S:24HH / M:22HH / L:27HH) Mini-G:0
DRD-4118	Magway	Ka Din Kyee	Aung Lan TS SHS (S:16HH / M:15HH / L:61HH) Mini-G:0
DRD-4119	Magway	Yay Twin Kyee	Aung Lan TS SHS (S:10HH / M:10HH / L:20HH) Mini-G:0
DRD-4120	Magway	Lel Ti	Aung Lan TS SHS (S:2HH / M:20HH / L:12HH) Mini-G:0
DRD-4121	Magway	Ma Kyee Yone	Aung Lan TS SHS (S:0HH / M:100HH / L:35HH) Mini-G:0
DRD-4122	Magway	Kyaut Ka Lat	Aung Lan TS SHS (S:12HH / M:22HH / L:25HH) Mini-G:0
DRD-4123	Magway	Kyu Wut	Aung Lan TS SHS (S:2HH / M:60HH / L:50HH) Mini-G:0
DRD-4124	Magway	Tone Kyo (Kyaut Pone)	Aung Lan TS SHS (S:3HH / M:0HH / L:32HH) Mini-G:0
DRD-4125	Magway	Pyin Pone	Aung Lan TS SHS (S:3HH / M:42HH / L:23HH) Mini-G:0
DRD-4126	Magway	Ywar Ma Htone	Aung Lan TS SHS (S:58HH / M:68HH / L:410HH) Mini-G:0

Project Code	State/Region	Name of Subproject (Village Name)	Item
DRD-4127	Magway	Ah Lel Ywar	Aung Lan TS SHS (S:4HH / M:0HH / L:250HH) Mini-G:0
DRD-4128	Magway	Kyar Thay Ywar	Aung Lan TS SHS (S:2HH / M:0HH / L:190HH) Mini-G:0
DRD-4129	Magway	Hlan Tin	Aung Lan TS SHS (S:37HH / M:20HH / L:175HH) Mini-G:0
DRD-4130	Magway	Than Chate	Aung Lan TS SHS (S:40HH / M:40HH / L:102HH) Mini-G:0
DRD-4131	Magway	Let Pa Tone	Aung Lan TS SHS (S:270HH / M:89HH / L:126HH) Mini-G:0
DRD-4132	Magway	Kyaung Su	Aung Lan TS SHS (S:3HH / M:22HH / L:22HH) Mini-G:0
DRD-4133	Magway	Myo Thit	Aung Lan TS SHS (S:0HH / M:100HH / L:200HH) Mini-G:0
DRD-4134	Magway	Shwe Pan Taw Lay	Aung Lan TS SHS (S:0HH / M:74HH / L:150HH) Mini-G:0
DRD-4135	Magway	Ta Lote Chaung	Aung Lan TS SHS (S:0HH / M:0HH / L:180HH) Mini-G:0
DRD-4136	Magway	Lat Pan Hla	Aung Lan TS SHS (S:4HH / M:36HH / L:135HH) Mini-G:0
DRD-4137	Magway	Pya Kyee	Aung Lan TS SHS (S:14HH / M:32HH / L:49HH) Mini-G:0
DRD-4138	Magway	Si Ywar	Aung Lan TS SHS (S:19HH / M:30HH / L:387HH) Mini-G:0
DRD-4139	Magway	Pa Dae	Aung Lan TS SHS (S:2HH / M:0HH / L:146HH) Mini-G:0
DRD-4140	Magway	Inn Kyee	Aung Lan TS SHS (S:9HH / M:0HH / L:116HH) Mini-G:0
DRD-4141	Magway	Won Chone	Paut TS SHS (S:4HH / M:0HH / L:203HH) Mini-G:0
DRD-4142	Magway	Chai Zaut (Ta)	Paut TS SHS (S:60HH / M:115HH / L:0HH) Mini-G:0
DRD-4143	Magway	Kin Ma	Paut TS SHS (S:0HH / M:215HH / L:0HH) Mini-G:0
DRD-4144	Magway	Ka Bar Phyu	Paut TS SHS (S:0HH / M:0HH / L:135HH) Mini-G:0
DRD-4145	Magway	Kan Thit	Paut TS SHS (S:0HH / M:0HH / L:137HH) Mini-G:0
DRD-4146	Magway	Say Pin Kyi	Paut TS SHS (S:0HH / M:0HH / L:151HH) Mini-G:0
DRD-4147	Magway	Kyaut Lone	Paut TS SHS (S:0HH / M:0HH / L:93HH) Mini-G:0
DRD-4148	Magway	Yay Yin (Ma)	Paut TS SHS (S:16HH / M:0HH / L:18HH) Mini-G:0
DRD-4149	Magway	Yay Yin (Ta)	Paut TS SHS (S:46HH / M:0HH / L:50HH) Mini-G:0
DRD-4150	Magway	Kyaung Kone	Paut TS SHS (S:139HH / M:0HH / L:86HH) Mini-G:0
DRD-4151	Magway	Yay Ni	Paut TS SHS (S:15HH / M:0HH / L:80HH) Mini-G:0
DRD-4152	Magway	Kyaut Khwat	Paut TS SHS (S:3HH / M:0HH / L:67HH) Mini-G:0
DRD-4153	Magway	Lel Yar	Paut TS SHS (S:26HH / M:0HH / L:140HH) Mini-G:0
DRD-4154	Magway	Tha Phan Chaut	Paut TS SHS (S:0HH / M:0HH / L:56HH) Mini-G:0
DRD-4155	Magway	Taung Bat	Paut TS SHS (S:125HH / M:0HH / L:55HH) Mini-G:0
DRD-4156	Magway	Zee Taw	Paut TS SHS (S:23HH / M:0HH / L:145HH) Mini-G:0
DRD-4157	Magway	In Nge Daunt	Paut TS SHS (S:0HH / M:0HH / L:25HH) Mini-G:0
DRD-4158	Magway	Chaung Sone	Paut TS SHS (S:10HH / M:0HH / L:95HH) Mini-G:0
DRD-4159	Magway	Kyaut Oh	Paut TS SHS (S:0HH / M:0HH / L:55HH) Mini-G:0
DRD-4160	Magway	Set Twar	Paut TS SHS (S:0HH / M:0HH / L:22HH) Mini-G:0
DRD-4161	Magway	Yin Kae	Saw TS SHS (S:0HH / M:57HH / L:198HH) Mini-G:0
DRD-4162	Magway	Nat Kaung Kyin	Saw TS SHS (S:0HH / M:0HH / L:35HH) Mini-G:0
DRD-4163	Magway	Yaw Lat Pan	Saw TS SHS (S:0HH / M:0HH / L:50HH) Mini-G:0
DRD-4164	Magway	Saw Lat Pan	Saw TS SHS (S:0HH / M:0HH / L:50HH) Mini-G:0
DRD-4165	Magway	Pale	Saw TS SHS (S:5HH / M:0HH / L:85HH) Mini-G:0
DRD-4166	Magway	Phan	Saw TS SHS (S:14HH / M:0HH / L:30HH) Mini-G:0
DRD-4167	Magway	Kan Lae	Saw TS SHS (S:9HH / M:0HH / L:30HH) Mini-G:0
DRD-4168	Magway	Man	Saw TS SHS (S:0HH / M:0HH / L:397HH) Mini-G:0
DRD-4169	Magway	Kan Oh	Saw TS SHS (S:0HH / M:0HH / L:90HH) Mini-G:0
DRD-4170	Magway	Paut Pan Sai	Saw TS SHS (S:23HH / M:40HH / L:20HH) Mini-G:0
DRD-4171	Magway	Lel Yin	Saw TS SHS (S:0HH / M:0HH / L:96HH) Mini-G:0
DRD-5001	Sagaing	Moe Tar Kyi Wat Khaut	Ka Thar TS SHS (S:450HH / M:0HH / L:0HH) Mini-G:0
DRD-5002	Sagaing	Sa Kar Kone	Ka Thar TS SHS (S:257HH / M:0HH / L:0HH) Mini-G:0
DRD-5003	Sagaing	Thar Yar Kone	Ka Thar TS SHS (S:245HH / M:0HH / L:0HH) Mini-G:0
DRD-5004	Sagaing	Tha Pyay Pin	Ka Thar TS SHS (S:322HH / M:135HH / L:0HH) Mini-G:0
DRD-5005	Sagaing	Myay Nu	Ka Thar TS SHS (S:147HH / M:0HH / L:0HH) Mini-G:0
DRD-5006	Sagaing	Sit Kone	Ka Thar TS SHS (S:190HH / M:0HH / L:0HH) Mini-G:0
DRD-5007	Sagaing	Bwat	Ka Thar TS SHS (S:371HH / M:0HH / L:0HH) Mini-G:0
DRD-5008	Sagaing	Kin Poon Chone	Ka Thar TS SHS (S:245HH / M:0HH / L:0HH) Mini-G:0
DRD-5009	Sagaing	Sel Sote	Ka Thar TS SHS (S:198HH / M:0HH / L:0HH) Mini-G:0
DRD-5010	Sagaing	Doe Pin	Ka Thar TS SHS (S:582HH / M:0HH / L:0HH) Mini-G:0
DRD-5011	Sagaing	Ai Kyi	Kaw Lin TS SHS (S:140HH / M:0HH / L:0HH) Mini-G:0
DRD-5012	Sagaing	Ma Kyee Pin Su	Kaw Lin TS SHS (S:115HH / M:0HH / L:0HH) Mini-G:0
DRD-5013	Sagaing	Kyar Inn Kone	Kaw Lin TS SHS (S:182HH / M:0HH / L:0HH) Mini-G:0
DRD-5014	Sagaing	Inn Tet Kone	Kaw Lin TS SHS (S:191HH / M:0HH / L:0HH) Mini-G:0
DRD-5015	Sagaing	Shwe Pyi Thar	Kaw Lin TS SHS (S:60HH / M:0HH / L:0HH) Mini-G:0
DRD-5016	Sagaing	Wae Kyi	Htee Chaint TS SHS (S:178HH / M:0HH / L:0HH) Mini-G:0
DRD-5017	Sagaing	Bo Kone	Htee Chaint TS SHS (S:100HH / M:0HH / L:0HH) Mini-G:0
DRD-5018	Sagaing	Mya Kan Thar	Htee Chaint TS SHS (S:68HH / M:0HH / L:0HH) Mini-G:0
DRD-5019	Sagaing	Kyat Ta Kaung	Htee Chaint TS SHS (S:1008HH / M:0HH / L:0HH) Mini-G:0

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DRD-5020	Sagaing	Ma Au Kone	Htee Chaint TS SHS (S:249HH / M:0HH / L:0HH) Mini-G:0
DRD-5021	Sagaing	Mae Hin	Htee Chaint TS SHS (S:229HH / M:0HH / L:0HH) Mini-G:0
DRD-5023	Sagaing	Buu Kyi Kone	Htee Chaint TS SHS (S:82HH / M:0HH / L:0HH) Mini-G:0
DRD-5024	Sagaing	Wae Kyi	Htee Chaint TS SHS (S:560HH / M:0HH / L:0HH) Mini-G:0
DRD-5025	Sagaing	Hin Thar	Htee Chaint TS SHS (S:87HH / M:0HH / L:0HH) Mini-G:0
DRD-5026	Sagaing	Ni Tar	Htee Chaint TS SHS (S:328HH / M:0HH / L:0HH) Mini-G:0
DRD-5027	Sagaing	Yay Pyan	Htee Chaint TS SHS (S:147HH / M:0HH / L:0HH) Mini-G:0
DRD-5029	Sagaing	Nan Tet	Pin Lae Bu TS SHS (S:139HH / M:0HH / L:0HH) Mini-G:0
DRD-5030	Sagaing	kYar Inn Khone	Pin Lae Bu TS SHS (S:173HH / M:0HH / L:0HH) Mini-G:0
DRD-5031	Sagaing	Kyaut Oh	Pin Lae Bu TS SHS (S:68HH / M:0HH / L:0HH) Mini-G:0
DRD-5032	Sagaing	Oat Shit Kone	Pin Lae Bu TS SHS (S:47HH / M:0HH / L:0HH) Mini-G:0
DRD-5033	Sagaing	Khu Pan	Pin Lae Bu TS SHS (S:36HH / M:0HH / L:0HH) Mini-G:0
DRD-5034	Sagaing	Pain Taw	Pin Lae Bu TS SHS (S:162HH / M:0HH / L:0HH) Mini-G:0
DRD-5035	Sagaing	Myo Ma	Pin Lae Bu TS SHS (S:139HH / M:0HH / L:0HH) Mini-G:0
DRD-5036	Sagaing	Chaung Kway	Pin Lae Bu TS SHS (S:110HH / M:0HH / L:0HH) Mini-G:0
DRD-5037	Sagaing	Kyoe Kyar Win	Pin Lae Bu TS SHS (S:85HH / M:0HH / L:0HH) Mini-G:0
DRD-5038	Sagaing	Naung yin	Pin Lae Bu TS SHS (S:183HH / M:0HH / L:0HH) Mini-G:0
DRD-5039	Sagaing	Kyaut U	Pin Lae Bu TS SHS (S:83HH / M:0HH / L:0HH) Mini-G:0
DRD-5040	Sagaing	Nyung Site	Pin Lae Bu TS SHS (S:115HH / M:0HH / L:0HH) Mini-G:0
DRD-5041	Sagaing	Chaung Paut	Pin Lae Bu TS SHS (S:39HH / M:0HH / L:0HH) Mini-G:0
DRD-5042	Sagaing	Tain Pin	Pin Lae Bu TS SHS (S:47HH / M:0HH / L:0HH) Mini-G:0
DRD-5043	Sagaing	Naung Kin	Pin Lae Bu TS SHS (S:87HH / M:0HH / L:0HH) Mini-G:0
DRD-5044	Sagaing	Kyae Tae	Pin Lae Bu TS SHS (S:46HH / M:0HH / L:0HH) Mini-G:0
DRD-5045	Sagaing	Kyar Inn	Pin Lae Bu TS SHS (S:51HH / M:0HH / L:0HH) Mini-G:0
DRD-5046	Sagaing	Hinn Nu Paut	Pin Lae Bu TS SHS (S:34HH / M:0HH / L:0HH) Mini-G:0
DRD-5047	Sagaing	Moe Par	Pin Lae Bu TS SHS (S:21HH / M:0HH / L:0HH) Mini-G:0
DRD-5048	Sagaing	Naung Taw	Pin Lae Bu TS SHS (S:34HH / M:0HH / L:0HH) Mini-G:0
DRD-5049	Sagaing	Pin Kon	Pin Lae Bu TS SHS (S:38HH / M:0HH / L:0HH) Mini-G:0
DRD-5050	Sagaing	Kai U	Pin Lae Bu TS SHS (S:37HH / M:0HH / L:0HH) Mini-G:0
DRD-5051	Sagaing	Hin Nu Kyi	Pin Lae Bu TS SHS (S:30HH / M:0HH / L:0HH) Mini-G:0
DRD-5052	Sagaing	Naung Ka Phar	Pin Lae Bu TS SHS (S:50HH / M:0HH / L:0HH) Mini-G:0
DRD-5053	Sagaing	Ka Yar	Pin Lae Bu TS SHS (S:34HH / M:0HH / L:0HH) Mini-G:0
DRD-5054	Sagaing	Maut Lat	Pin Lae Bu TS SHS (S:24HH / M:0HH / L:0HH) Mini-G:0
DRD-5055	Sagaing	Kai Shae	Pin Lae Bu TS SHS (S:17HH / M:0HH / L:0HH) Mini-G:0
DRD-5056	Sagaing	Taung Boe Hla	Pin Lae Bu TS SHS (S:51HH / M:0HH / L:0HH) Mini-G:0
DRD-5057	Sagaing	Naung Kat Pal	Pin Lae Bu TS SHS (S:27HH / M:0HH / L:0HH) Mini-G:0
DRD-5058	Sagaing	Kaut Taung	Pin Lae Bu TS SHS (S:40HH / M:0HH / L:0HH) Mini-G:0
DRD-5060	Sagaing	Kan Kone	Pin Lae Bu TS SHS (S:26HH / M:0HH / L:0HH) Mini-G:0
DRD-5061	Sagaing	Taung Sein	Pin Lae Bu TS SHS (S:30HH / M:0HH / L:0HH) Mini-G:0
DRD-5062	Sagaing	Htet Yinn Thar	Pin Lae Bu TS SHS (S:55HH / M:0HH / L:0HH) Mini-G:0
DRD-5063	Sagaing	Aout Yinn Thar	Pin Lae Bu TS SHS (S:56HH / M:0HH / L:0HH) Mini-G:0
DRD-5064	Sagaing	Thar Yar Kone	Pin Lae Bu TS SHS (S:45HH / M:0HH / L:0HH) Mini-G:0
DRD-5065	Sagaing	Tha Yet Kan	Pin Lae Bu TS SHS (S:97HH / M:0HH / L:0HH) Mini-G:0
DRD-5066	Sagaing	Lel U	Pin Lae Bu TS SHS (S:88HH / M:0HH / L:0HH) Mini-G:0
DRD-5067	Sagaing	Man Sein	Pin Lae Bu TS SHS (S:34HH / M:0HH / L:0HH) Mini-G:0
DRD-5068	Sagaing	Thar Yar Kone	Pin Lae Bu TS SHS (S:94HH / M:0HH / L:0HH) Mini-G:0
DRD-5069	Sagaing	Ohn Pyin	Pin Lae Bu TS SHS (S:154HH / M:0HH / L:0HH) Mini-G:0
DRD-5070	Sagaing	Tin Paung Kyin	Pin Lae Bu TS SHS (S:97HH / M:0HH / L:0HH) Mini-G:0
DRD-5071	Sagaing	Kyin Kyi	Won Thio TS SHS (S:25HH / M:0HH / L:0HH) Mini-G:0
DRD-5072	Sagaing	Pint Sin Tae	Ba Mauk TS SHS (S:101HH / M:0HH / L:0HH) Mini-G:0
DRD-5073	Sagaing	Pain Nae Pin	Ba Mauk TS SHS (S:36HH / M:0HH / L:0HH) Mini-G:0
DRD-5075	Sagaing	Mhan Kinn	Homemalin TS SHS (S:110HH / M:0HH / L:0HH) Mini-G:0
DRD-5076	Sagaing	Naung Mhaw	Homemalin TS SHS (S:89HH / M:0HH / L:0HH) Mini-G:0
DRD-5078	Sagaing	Nhaung San Kyin	Homemalin TS SHS (S:252HH / M:0HH / L:0HH) Mini-G:0
DRD-5079	Sagaing	Zee Pin Thar	Homemalin TS SHS (S:202HH / M:0HH / L:0HH) Mini-G:0
DRD-5080	Sagaing	Mae Za Li	Homemalin TS SHS (S:150HH / M:0HH / L:0HH) Mini-G:0
DRD-5081	Sagaing	Min Thar Yar	Homemalin TS SHS (S:83HH / M:0HH / L:0HH) Mini-G:0
DRD-5082	Sagaing	Naung Lon	Homemalin TS SHS (S:77HH / M:0HH / L:0HH) Mini-G:0
DRD-5083	Sagaing	Nar Naut	Homemalin TS SHS (S:56HH / M:0HH / L:0HH) Mini-G:0
DRD-5084	Sagaing	Htwat Wa	Homemalin TS SHS (S:135HH / M:0HH / L:0HH) Mini-G:0
DRD-5085	Sagaing	Sar Mi	Homemalin TS SHS (S:59HH / M:0HH / L:0HH) Mini-G:0
DRD-5086	Sagaing	Nyung Kone	Homemalin TS SHS (S:26HH / M:0HH / L:0HH) Mini-G:0
DRD-5087	Sagaing	Nan Tha Let	Homemalin TS SHS (S:63HH / M:0HH / L:0HH) Mini-G:0
DRD-5088	Sagaing	Nan Taung Kyin	Homemalin TS SHS (S:20HH / M:0HH / L:0HH) Mini-G:0

Project Code	State/Region	Name of Subproject (Village Name)	Item
DRD-5089	Sagaing	Ward (1) (2)	Homemalin TS SHS (S:138HH / M:0HH / L:0HH) Mini-G:0
DRD-5090	Sagaing	Mhan Thae	Homemalin TS SHS (S:48HH / M:0HH / L:0HH) Mini-G:0
DRD-5091	Sagaing	Hway Nar	Homemalin TS SHS (S:21HH / M:0HH / L:0HH) Mini-G:0
DRD-5092	Sagaing	Ma Kyee Taw	Homemalin TS SHS (S:42HH / M:0HH / L:0HH) Mini-G:0
DRD-5093	Sagaing	Chin Pone	Homemalin TS SHS (S:272HH / M:0HH / L:0HH) Mini-G:0
DRD-5094	Sagaing	Sai Hlar	Homemalin TS SHS (S:226HH / M:0HH / L:0HH) Mini-G:0
DRD-5095	Sagaing	Paut Tite	Homemalin TS SHS (S:360HH / M:0HH / L:0HH) Mini-G:0
DRD-5097	Sagaing	Jut	Pale TS SHS (S:119HH / M:0HH / L:0HH) Mini-G:0
DRD-5098	Sagaing	In Tine Thar	Pale TS SHS (S:123HH / M:0HH / L:0HH) Mini-G:0
DRD-5099	Sagaing	Lel Dhamma	Pale TS SHS (S:223HH / M:0HH / L:0HH) Mini-G:0
DRD-5100	Sagaing	Htan Khin Kyi	Pale TS SHS (S:235HH / M:0HH / L:0HH) Mini-G:0
DRD-5101	Sagaing	Yay Kyaw	Pale TS SHS (S:178HH / M:0HH / L:0HH) Mini-G:0
DRD-5102	Sagaing	Yinn Thwin	Ka Ni TS SHS (S:212HH / M:0HH / L:0HH) Mini-G:0
DRD-5108	Sagaing	Mhying	Ka Ni TS SHS (S:170HH / M:0HH / L:0HH) Mini-G:0
DRD-5110	Sagaing	Yinn	Ka Ni TS SHS (S:50HH / M:0HH / L:0HH) Mini-G:0
DRD-5111	Sagaing	Kone Thar	Ka Ni TS SHS (S:50HH / M:0HH / L:0HH) Mini-G:0
DRD-5112	Sagaing	Kyaut Hlay Khar	Ka Ni TS SHS (S:50HH / M:0HH / L:0HH) Mini-G:0
DRD-5113	Sagaing	Nyung Saut	Wet Let TS SHS (S:91HH / M:0HH / L:0HH) Mini-G:0
DRD-5114	Sagaing	Sinn Tut	Wet Let TS SHS (S:590HH / M:0HH / L:0HH) Mini-G:0
DRD-5115	Sagaing	Ku Kaung	Wet Let TS SHS (S:450HH / M:0HH / L:0HH) Mini-G:0
DRD-5117	Sagaing	Lay Poe Seit	Wet Let TS SHS (S:50HH / M:0HH / L:0HH) Mini-G:0
DRD-5118	Sagaing	Ywar Thit	Wet Let TS SHS (S:90HH / M:0HH / L:0HH) Mini-G:0
DRD-5119	Sagaing	Su Tet	Khin U TS SHS (S:200HH / M:0HH / L:0HH) Mini-G:0
DRD-5120	Sagaing	War Yone Kone	Khin U TS SHS (S:162HH / M:0HH / L:0HH) Mini-G:0
DRD-5121	Sagaing	Ywar Thit	Khin U TS SHS (S:164HH / M:0HH / L:0HH) Mini-G:0
DRD-5122	Sagaing	Shar Lwin	Khin U TS SHS (S:309HH / M:0HH / L:0HH) Mini-G:0
DRD-5123	Sagaing	Ywar Thit (Noui)	Khin U TS SHS (S:155HH / M:0HH / L:0HH) Mini-G:0
DRD-5124	Sagaing	Htan Taw	Kan Ba Lu TS SHS (S:226HH / M:0HH / L:0HH) Mini-G:0
DRD-5125	Sagaing	Maw Za Taw	Kan Ba Lu TS SHS (S:180HH / M:0HH / L:0HH) Mini-G:0
DRD-5126	Sagaing	Chaung Shae	Kan Ba Lu TS SHS (S:320HH / M:0HH / L:0HH) Mini-G:0
DRD-5127	Sagaing	Ma Yar Thar	Kyun Hla TS SHS (S:164HH / M:0HH / L:0HH) Mini-G:0
DRD-5128	Sagaing	Hae Kin	Kyun Hla TS SHS (S:124HH / M:0HH / L:0HH) Mini-G:0
DRD-5129	Sagaing	Khaw Taw	Kyun Hla TS SHS (S:147HH / M:0HH / L:0HH) Mini-G:0
DRD-5130	Sagaing	Ma Kyee Kone	Kyun Hla TS SHS (S:221HH / M:0HH / L:0HH) Mini-G:0
DRD-5131	Sagaing	Ywar Bin	Kyun Hla TS SHS (S:98HH / M:0HH / L:0HH) Mini-G:0
DRD-5132	Sagaing	Mal Kal (Ya)	Kyun Hla TS SHS (S:110HH / M:0HH / L:0HH) Mini-G:0
DRD-5133	Sagaing	Mal Kal (Na)	Kyun Hla TS SHS (S:132HH / M:0HH / L:0HH) Mini-G:0
DRD-5134	Sagaing	In Tine Kyi	D Pae Yin TS SHS (S:41HH / M:0HH / L:0HH) Mini-G:0
DRD-5135	Sagaing	Sel Lel	D Pae Yin TS SHS (S:138HH / M:0HH / L:0HH) Mini-G:0
DRD-5136	Sagaing	Late Thae	D Pae Yin TS SHS (S:151HH / M:0HH / L:0HH) Mini-G:0
DRD-5137	Sagaing	Min Gan	D Pae Yin TS SHS (S:58HH / M:0HH / L:0HH) Mini-G:0
DRD-6001	Mon	Taung Ka Lay	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:958HH) Mini-G:0
DRD-6002	Mon	Maw Ka Yo	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:317HH) Mini-G:0
DRD-6003	Mon	Fat Tae Kone	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:80HH) Mini-G:0
DRD-6004	Mon	U Lay	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:355HH) Mini-G:0
DRD-6005	Mon	Ma Yin Kone	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:275HH) Mini-G:0
DRD-6006	Mon	Nyung Kone	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:71HH) Mini-G:0
DRD-6007	Mon	War Phan Kone	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:230HH) Mini-G:0
DRD-6008	Mon	Aung Ba La Kone	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:42HH) Mini-G:0
DRD-6009	Mon	Kyaik Htaw	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:110HH) Mini-G:0
DRD-6010	Mon	Oat Aw Kone	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:21HH) Mini-G:0
DRD-6011	Mon	Kya Khat kone	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:264HH) Mini-G:0
DRD-6012	Mon	Ka Tone Si	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:404HH) Mini-G:0
DRD-6013	Mon	Thayet Kone	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:217HH) Mini-G:0
DRD-6014	Mon	Ka Naing Lo	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:320HH) Mini-G:0
DRD-6015	Mon	Kyan Taw	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:431HH) Mini-G:0
DRD-6016	Mon	Kawt Ka Lain Taung	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:89HH) Mini-G:0
DRD-6017	Mon	Nwat Li	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:154HH) Mini-G:0
DRD-6018	Mon	Mal Ka Yo	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:289HH) Mini-G:0
DRD-6019	Mon	Kwan Ngan	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:414HH) Mini-G:0
DRD-6020	Mon	Paut Taw	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:36HH) Mini-G:0
DRD-6021	Mon	Kaut Kha Lain	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:275HH) Mini-G:0
DRD-6022	Mon	Kaut Kyeik	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:91HH) Mini-G:0
DRD-6023	Mon	Kyar Inn Chaung	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:299HH) Mini-G:0

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DRD-6024	Mon	Ma Yann Kone	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:239HH) Mini-G:0
DRD-6025	Mon	Hpa Yar Kone	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:131HH) Mini-G:0
DRD-6026	Mon	Chaung Hna Khwa	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:378HH) Mini-G:0
DRD-6027	Mon	Taung Ka Lay	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:165HH) Mini-G:0
DRD-6028	Mon	Taung Thu Kone	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:100HH) Mini-G:0
DRD-6029	Mon	Kan Nar Su	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:61HH) Mini-G:0
DRD-6030	Mon	Ywar Thit Kone	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:90HH) Mini-G:0
DRD-6031	Mon	Hlwa Sin Kone	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:80HH) Mini-G:0
DRD-6032	Mon	Mon Su	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:40HH) Mini-G:0
DRD-6033	Mon	Ywar Tan Shae	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:60HH) Mini-G:0
DRD-6034	Mon	Yae Mon	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:69HH) Mini-G:0
DRD-6035	Mon	Nga Pyay Ma	Kyaik Ma Yaw TS SHS (S:0HH / M:0HH / L:200HH) Mini-G:0
DRD-6036	Mon	Shan Su	Tha Ton TS SHS (S:86HH / M:0HH / L:153HH) Mini-G:0
DRD-6037	Mon	Ah Nan Pin	Tha Ton TS SHS (S:122HH / M:0HH / L:158HH) Mini-G:0
DRD-6038	Mon	Htone Bo Lay	Tha Ton TS SHS (S:115HH / M:0HH / L:20HH) Mini-G:0
DRD-6039	Mon	Htone Bo Kyi	Tha Ton TS SHS (S:0HH / M:0HH / L:95HH) Mini-G:0
DRD-6040	Mon	Ka Lar Kone	Tha Ton TS SHS (S:0HH / M:0HH / L:55HH) Mini-G:0
DRD-6041	Mon	Ma Yann	Tha Ton TS SHS (S:0HH / M:0HH / L:40HH) Mini-G:0
DRD-6042	Mon	Thae Kone	Tha Ton TS SHS (S:0HH / M:0HH / L:61HH) Mini-G:0
DRD-6043	Mon	Win Kan	Kyaik Hto TS SHS (S:0HH / M:0HH / L:246HH) Mini-G:0
DRD-6044	Mon	Kha Ywae	Kyaik Hto TS SHS (S:0HH / M:0HH / L:399HH) Mini-G:0
DRD-6045	Mon	Chaung Wa	Kyaik Hto TS SHS (S:0HH / M:0HH / L:141HH) Mini-G:0
DRD-6046	Mon	Pain Nae Kone	Kyaik Hto TS SHS (S:0HH / M:0HH / L:45HH) Mini-G:0
DRD-6047	Mon	Moe Baw	Kyaik Hto TS SHS (S:0HH / M:0HH / L:80HH) Mini-G:0
DRD-6048	Mon	Kyaut Phyar	Kyaik Hto TS SHS (S:0HH / M:0HH / L:190HH) Mini-G:0
DRD-6049	Mon	Thone Kwa	Kyaik Hto TS SHS (S:0HH / M:0HH / L:173HH) Mini-G:0
DRD-6050	Mon	Yay Kyaw	Kyaik Hto TS SHS (S:0HH / M:0HH / L:50HH) Mini-G:0
DRD-6051	Mon	Mote Ka Maut	Kyaik Hto TS SHS (S:0HH / M:0HH / L:168HH) Mini-G:0
DRD-6052	Mon	Sit Kwin	Kyaik Hto TS SHS (S:0HH / M:0HH / L:182HH) Mini-G:0
DRD-6053	Mon	Zee Pyaung (2)	Kyaik Hto TS SHS (S:0HH / M:0HH / L:35HH) Mini-G:0
DRD-6054	Mon	Zee Pyaung (3)	Kyaik Hto TS SHS (S:0HH / M:0HH / L:69HH) Mini-G:0
DRD-6055	Mon	Zee Pyaung (4)	Kyaik Hto TS SHS (S:0HH / M:0HH / L:24HH) Mini-G:0
DRD-6056	Mon	Zee Pyaung (5)	Kyaik Hto TS SHS (S:0HH / M:0HH / L:84HH) Mini-G:0
DRD-6057	Mon	Zee Pyaung (6)	Kyaik Hto TS SHS (S:0HH / M:0HH / L:37HH) Mini-G:0
DRD-6058	Mon	Ka Daing Dot	Kyaik Hto TS SHS (S:43HH / M:0HH / L:60HH) Mini-G:0
DRD-6059	Mon	Mae Yone Kyi	Kyaik Hto TS SHS (S:114HH / M:0HH / L:80HH) Mini-G:0
DRD-6060	Mon	Saung Naing Kyi	Kyaik Hto TS SHS (S:61HH / M:0HH / L:80HH) Mini-G:0
DRD-6062	Mon	Inn Wine Kone	Bee Lin TS SHS (S:0HH / M:0HH / L:39HH) Mini-G:0
DRD-6063	Mon	Kwin Ka Lay	Bee Lin TS SHS (S:82HH / M:0HH / L:50HH) Mini-G:0
DRD-6064	Mon	Pho Kyi Seit	Bee Lin TS SHS (S:0HH / M:0HH / L:96HH) Mini-G:0
DRD-6065	Mon	Kyaut Saung	Bee Lin TS SHS (S:24HH / M:0HH / L:5HH) Mini-G:0
DRD-6066	Mon	Win Thaung	Bee Lin TS SHS (S:0HH / M:0HH / L:44HH) Mini-G:0
DRD-6067	Mon	Kyaut Pone	Bee Lin TS SHS (S:0HH / M:0HH / L:49HH) Mini-G:0
DRD-6068	Mon	Ka Ya Way Seit Ah Htet	Bee Lin TS SHS (S:0HH / M:0HH / L:47HH) Mini-G:0
DRD-6069	Mon	Ka Ya Way Seit Ah Lel	Bee Lin TS SHS (S:0HH / M:0HH / L:79HH) Mini-G:0
DRD-6070	Mon	Ka Ya Way Seit OUt	Bee Lin TS SHS (S:0HH / M:0HH / L:49HH) Mini-G:0
DRD-6072	Mon	Nyung Htaut	Bee Lin TS SHS (S:82HH / M:120HH / L:0HH) Mini-G:0
DRD-6073	Mon	Shan Su	Bee Lin TS SHS (S:30HH / M:30HH / L:0HH) Mini-G:0
DRD-6074	Mon	Win Tar Pan	Bee Lin TS SHS (S:0HH / M:0HH / L:57HH) Mini-G:0
DRD-6075	Mon	Win Tar Pan Ah Htet	Bee Lin TS SHS (S:54HH / M:0HH / L:5HH) Mini-G:0
DRD-6076	Mon	Win Tar Pan Out	Bee Lin TS SHS (S:205HH / M:0HH / L:10HH) Mini-G:0
DRD-6077	Mon	Myit Kyoe	Bee Lin TS SHS (S:0HH / M:150HH / L:155HH) Mini-G:0
DRD-6078	Mon	P Ti	Bee Lin TS SHS (S:87HH / M:0HH / L:0HH) Mini-G:0
DRD-6079	Mon	Phoe Kaw Htaw	Bee Lin TS SHS (S:50HH / M:0HH / L:0HH) Mini-G:0
DRD-6080	Mon	Thet Kat Kyin	Bee Lin TS SHS (S:63HH / M:0HH / L:27HH) Mini-G:0
DRD-6082	Mon	Mae Lan Gaung	Bee Lin TS SHS (S:4HH / M:0HH / L:100HH) Mini-G:0
DRD-6083	Mon	Lel Saul Lot	Bee Lin TS SHS (S:5HH / M:0HH / L:100HH) Mini-G:0
DRD-6084	Mon	Than Pya Chaung	Bee Lin TS SHS (S:5HH / M:0HH / L:15HH) Mini-G:0
DRD-6085	Mon	Kya Khat Chaung	Bee Lin TS SHS (S:22HH / M:0HH / L:50HH) Mini-G:0
DRD-6086	Mon	Shan Ka Lay	Bee Lin TS SHS (S:7HH / M:0HH / L:10HH) Mini-G:0
DRD-6087	Mon	Naung Ka Tote	Bee Lin TS SHS (S:61HH / M:0HH / L:85HH) Mini-G:0
DRD-6088	Mon	Yay Twin Phyu	Bee Lin TS SHS (S:16HH / M:15HH / L:0HH) Mini-G:0
DRD-6089	Mon	Ohn Taw	Bee Lin TS SHS (S:25HH / M:15HH / L:0HH) Mini-G:0
DRD-6090	Mon	Myaut Ywar	Bee Lin TS SHS (S:29HH / M:0HH / L:18HH) Mini-G:0

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DRD-6091	Mon	Phar Khee	Bee Lin TS SHS (S:9HH / M:10HH / L:0HH) Mini-G:0
DRD-6092	Mon	Shan Su	Bee Lin TS SHS (S:38HH / M:30HH / L:0HH) Mini-G:0
DRD-6093	Mon	Kwat Thit	Bee Lin TS SHS (S:90HH / M:30HH / L:0HH) Mini-G:0
DRD-6094	Mon	Shwe Laung Inn	Bee Lin TS SHS (S:69HH / M:50HH / L:0HH) Mini-G:0
DRD-6095	Mon	Ka Yin Su	Bee Lin TS SHS (S:46HH / M:30HH / L:0HH) Mini-G:0
DRD-6096	Mon	Pyin Thar	Bee Lin TS SHS (S:71HH / M:7HH / L:0HH) Mini-G:0
DRD-6097	Mon	Ah Sue Chaung	Bee Lin TS SHS (S:31HH / M:0HH / L:25HH) Mini-G:0
DRD-6098	Mon	Kwin Ka Lay	Bee Lin TS SHS (S:6HH / M:0HH / L:15HH) Mini-G:0
DRD-6099	Mon	Tar Oat Khee	Bee Lin TS SHS (S:157HH / M:0HH / L:47HH) Mini-G:0
DRD-6100	Mon	Kya Thaung Taw	Bee Lin TS SHS (S:11HH / M:4HH / L:9HH) Mini-G:0
DRD-6101	Mon	Nwe Taw	Bee Lin TS SHS (S:3HH / M:6HH / L:0HH) Mini-G:0
DRD-6102	Mon	Maw Khee	Bee Lin TS SHS (S:65HH / M:0HH / L:4HH) Mini-G:0
DRD-6103	Mon	Kyoe Wine	Bee Lin TS SHS (S:2HH / M:0HH / L:65HH) Mini-G:0
DRD-6104	Mon	Baw Naw Khee	Bee Lin TS SHS (S:25HH / M:0HH / L:62HH) Mini-G:0
DRD-6105	Mon	Noe Kha Nae	Bee Lin TS SHS (S:0HH / M:0HH / L:150HH) Mini-G:0
DRD-6106	Mon	Shan Chaung	Bee Lin TS SHS (S:252HH / M:0HH / L:0HH) Mini-G:0
DRD-7001	Nay Pyi Taw	Yit Htway	Pyin Ma Nar TS SHS (S:0HH / M:0HH / L:10HH) Mini-G:0
DRD-7002	Nay Pyi Taw	Myaing Thar Yar (Myay Myo)	Pyin Ma Nar TS SHS (S:0HH / M:0HH / L:64HH) Mini-G:0
DRD-7003	Nay Pyi Taw	San Thit Lwin	Pyin Ma Nar TS SHS (S:0HH / M:0HH / L:80HH) Mini-G:0
DRD-7004	Nay Pyi Taw	Htain Pyaung	Pyin Ma Nar TS SHS (S:0HH / M:0HH / L:56HH) Mini-G:0
DRD-7005	Nay Pyi Taw	Lay Eain	Pyin Ma Nar TS SHS (S:0HH / M:0HH / L:71HH) Mini-G:0
DRD-7006	Nay Pyi Taw	Ngar Tae Su	Pyin Ma Nar TS SHS (S:0HH / M:0HH / L:66HH) Mini-G:0
DRD-7007	Nay Pyi Taw	Sa Lu	Pyin Ma Nar TS SHS (S:0HH / M:0HH / L:39HH) Mini-G:0
DRD-7008	Nay Pyi Taw	Than Ma Yae	Pyin Ma Nar TS SHS (S:0HH / M:0HH / L:55HH) Mini-G:0
DRD-7009	Nay Pyi Taw	Thone Khwa Taw	Pyin Ma Nar TS SHS (S:0HH / M:0HH / L:10HH) Mini-G:0
DRD-7010	Nay Pyi Taw	Aung Beik Thate	Pyin Ma Nar TS SHS (S:0HH / M:0HH / L:73HH) Mini-G:0
DRD-7011	Nay Pyi Taw	Boe Ma Ah Htet	Pyin Ma Nar TS SHS (S:0HH / M:0HH / L:79HH) Mini-G:0
DRD-7012	Nay Pyi Taw	Kant Pha Lar	Pyin Ma Nar TS SHS (S:0HH / M:0HH / L:32HH) Mini-G:0
DRD-7013	Nay Pyi Taw	Phone Soe	Pyin Ma Nar TS SHS (S:0HH / M:0HH / L:27HH) Mini-G:0
DRD-7014	Nay Pyi Taw	Chaut Eain Su	Pyin Ma Nar TS SHS (S:0HH / M:0HH / L:37HH) Mini-G:0
DRD-7015	Nay Pyi Taw	Lay Eain Su	Pyin Ma Nar TS SHS (S:0HH / M:0HH / L:17HH) Mini-G:0
DRD-7016	Nay Pyi Taw	Tae Su	Pyin Ma Nar TS SHS (S:0HH / M:0HH / L:43HH) Mini-G:0
DRD-7017	Nay Pyi Taw	Taung Myint Yay Pu	Pyin Ma Nar TS SHS (S:0HH / M:0HH / L:39HH) Mini-G:0
DRD-7018	Nay Pyi Taw	Taung Myint Ywar Ma	Pyin Ma Nar TS SHS (S:0HH / M:0HH / L:57HH) Mini-G:0
DRD-7019	Nay Pyi Taw	Baw Ga Hta Ah Lel	Pyin Ma Nar TS SHS (S:0HH / M:0HH / L:29HH) Mini-G:0
DRD-7020	Nay Pyi Taw	Baw Ga Ta Pya Htan	Pyin Ma Nar TS SHS (S:0HH / M:0HH / L:35HH) Mini-G:0
DRD-7021	Nay Pyi Taw	Ah Lel Chaung Ywar Ma	Pyin Ma Nar TS SHS (S:0HH / M:0HH / L:45HH) Mini-G:0
DRD-7022	Nay Pyi Taw	Ah Lel Chaung Htet	Pyin Ma Nar TS SHS (S:0HH / M:0HH / L:27HH) Mini-G:0
DRD-7023	Nay Pyi Taw	Ah Lel Chaung Kin Lite	Pyin Ma Nar TS SHS (S:0HH / M:0HH / L:47HH) Mini-G:0
DRD-7024	Nay Pyi Taw	Saung Taung Gyi	Pyin Ma Nar TS SHS (S:0HH / M:0HH / L:31HH) Mini-G:0
DRD-7025	Nay Pyi Taw	Pain Nae Tite	Pyin Ma Nar TS SHS (S:0HH / M:0HH / L:16HH) Mini-G:0
DRD-7026	Nay Pyi Taw	Lan Kaw	Pyin Ma Nar TS SHS (S:0HH / M:0HH / L:43HH) Mini-G:0
DRD-7027	Nay Pyi Taw	Wai Thar Li	Pyin Ma Nar TS SHS (S:0HH / M:0HH / L:70HH) Mini-G:0
DRD-7028	Nay Pyi Taw	Koe Ywar	Pyin Ma Nar TS SHS (S:0HH / M:0HH / L:120HH) Mini-G:0
DRD-7029	Nay Pyi Taw	Mine Kone	Pyin Ma Nar TS SHS (S:0HH / M:0HH / L:45HH) Mini-G:0
DRD-7031	Nay Pyi Taw	Oat Shit Hline	Lel Way TS SHS (S:0HH / M:0HH / L:465HH) Mini-G:0
DRD-7032	Nay Pyi Taw	Htain Taw	Lel Way TS SHS (S:0HH / M:0HH / L:260HH) Mini-G:0
DRD-7033	Nay Pyi Taw	Pay Pin	Lel Way TS SHS (S:0HH / M:0HH / L:234HH) Mini-G:0
DRD-7034	Nay Pyi Taw	Chin Pyit	Lel Way TS SHS (S:0HH / M:0HH / L:165HH) Mini-G:0
DRD-7037	Nay Pyi Taw	Wat Pole	Lel Way TS SHS (S:0HH / M:0HH / L:316HH) Mini-G:0
DRD-7038	Nay Pyi Taw	Chaung Ma Nge	Lel Way TS SHS (S:0HH / M:0HH / L:217HH) Mini-G:0
DRD-7050	Nay Pyi Taw	Bu Tar Su	Lel Way TS SHS (S:0HH / M:0HH / L:390HH) Mini-G:0
DRD-7051	Nay Pyi Taw	Chin Su	Lel Way TS SHS (S:0HH / M:0HH / L:260HH) Mini-G:0
DRD-7052	Nay Pyi Taw	Ywar Ma	Lel Way TS SHS (S:0HH / M:0HH / L:267HH) Mini-G:0
DRD-7054	Nay Pyi Taw	Sein Pan Pin	Tet Kone TS SHS (S:0HH / M:0HH / L:155HH) Mini-G:0
DRD-7055	Nay Pyi Taw	Twin Ne	Tet Kone TS SHS (S:0HH / M:0HH / L:206HH) Mini-G:0
DRD-7056	Nay Pyi Taw	Tote Twin	Tet Kone TS SHS (S:0HH / M:0HH / L:259HH) Mini-G:0
DRD-7057	Nay Pyi Taw	Dee Dote Kone	Tet Kone TS SHS (S:0HH / M:0HH / L:86HH) Mini-G:0
DRD-7058	Nay Pyi Taw	Ka Yin Chaung	Tet Kone TS SHS (S:0HH / M:0HH / L:215HH) Mini-G:0
DRD-7059	Nay Pyi Taw	Inn Khone	Tet Kone TS SHS (S:0HH / M:0HH / L:175HH) Mini-G:0
DRD-7060	Nay Pyi Taw	Pann Nyo	Tet Kone TS SHS (S:0HH / M:0HH / L:83HH) Mini-G:0
DRD-7061	Nay Pyi Taw	Oat Shit Kone	Tet Kone TS SHS (S:0HH / M:0HH / L:387HH) Mini-G:0
DRD-7062	Nay Pyi Taw	Kant Ni	Tet Kone TS SHS (S:0HH / M:0HH / L:101HH) Mini-G:0
DRD-7063	Nay Pyi Taw	Zaung Hlar Kone	Tet Kone TS SHS (S:0HH / M:0HH / L:17HH) Mini-G:0

DRD-7064	Nay Pyi Taw	Sein Pan Khaing	Tet Kone TS SHS (S:0HH / M:0HH / L:147HH) Mini-G:0
DRD-7065	Nay Pyi Taw	Thar Yar Aye	Tet Kone TS SHS (S:0HH / M:0HH / L:356HH) Mini-G:0
DRD-7066	Nay Pyi Taw	Ywar Thit	Tet Kone TS SHS (S:0HH / M:0HH / L:289HH) Mini-G:0
DRD-7067	Nay Pyi Taw	Lel Pyin Ma	Tet Kone TS SHS (S:0HH / M:0HH / L:340HH) Mini-G:0
DRD-7068	Nay Pyi Taw	Lel Za Pin	Tet Kone TS SHS (S:0HH / M:0HH / L:205HH) Mini-G:0
DRD-7069	Nay Pyi Taw	Phat Than Taung	Tet Kone TS SHS (S:0HH / M:0HH / L:605HH) Mini-G:0
DRD-7070	Nay Pyi Taw	Hlwa Bone	Tet Kone TS SHS (S:0HH / M:0HH / L:675HH) Mini-G:0
DRD-7071	Nay Pyi Taw	Nyung Pin Thar Lay	Tet Kone TS SHS (S:0HH / M:0HH / L:143HH) Mini-G:0
DRD-7072	Nay Pyi Taw	Kyee Inn	Tet Kone TS SHS (S:0HH / M:0HH / L:550HH) Mini-G:0
DRD-7073	Nay Pyi Taw	Mel Za Li Kyinn	Tet Kone TS SHS (S:0HH / M:0HH / L:150HH) Mini-G:0
DRD-7074	Nay Pyi Taw	Let Pan Aint	Tet Kone TS SHS (S:0HH / M:0HH / L:200HH) Mini-G:0
DRD-7075	Nay Pyi Taw	Thae Chaung	Tet Kone TS SHS (S:0HH / M:0HH / L:140HH) Mini-G:0
DRD-7076	Nay Pyi Taw	Nyung Pin Kwin	Tet Kone TS SHS (S:0HH / M:0HH / L:73HH) Mini-G:0
DRD-7077	Nay Pyi Taw	Chaung Sone	Tet Kone TS SHS (S:0HH / M:0HH / L:94HH) Mini-G:0
DRD-7078	Nay Pyi Taw	Mone Hnit	Oat Ta Ra Thi Ri TS SHS (S:0HH / M:0HH / L:212HH) Mini-G:0
DRD-7079	Nay Pyi Taw	Aung Tha Pyay	Oat Ta Ra Thi Ri TS SHS (S:0HH / M:0HH / L:125HH) Mini-G:0
DRD-8001	Chin	Ngal Bual	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8002	Chin	Bwe Le	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8003	Chin	Phai Za	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8004	Chin	Dam Pi	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8005	Chin	Twe San Zan	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8006	Chin	Zing Pi	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8007	Chin	Ta hual Khuai Nui, Dim Lo	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8008	Chin	Khing Zan	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8009	Chin	Zan Zawl	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8010	Chin	Taung Sial	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8011	Chin	Van Tek	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8012	Chin	Twe Htan	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8013	Chin	Twe Kyint Lwe	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8014	Chin	Tat Lam	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8015	Chin	Ping Pih	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8016	Chin	Hauh Pi	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8017	Chin	Lai Bung	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8018	Chin	Khaw Sak	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8019	Chin	He Le	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8020	Chin	Than New	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8021	Chin	Twe Bial	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8022	Chin	Lei Dawh	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8023	Chin	Ling Khai (Bung)	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8024	Chin	Tung Zan	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8025	Chin	Mual Pi	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8026	Chin	Mual Zan	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8027	Chin	Suang San	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8028	Chin	Ling Khai (Zo)	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8029	Chin	Mual Lum	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8030	Chin	Dim Pi	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8031	Chin	Phu Nuam	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8032	Chin	Zung	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8033	Chin	Lo Phei	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8034	Chin	Khai Kam	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8035	Chin	Kim Lai	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8036	Chin	Thal Mual (old)	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8037	Chin	Val Bum	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8038	Chin	Kam Ngai	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8039	Chin	Kel Zan	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8040	Chin	Zan Twe	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8041	Chin	Twe Tauh	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8042	Chin	Gaw Sein	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8043	Chin	Pat Zan	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8044	Chin	Lan Zan	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:
DRD-8045	Chin	Ka Ngin	Tedim TS SHS (S:HH / M:0HH / L:0HH) Mini-G:

ANNEX4 Ranking of Sub-Project Evaluation

A	B	C		D	E	F (D+E)/2	G	H	I	J	K (I+J)/2	L	M F×20	N G×20	O H×40	P I×20	Q M+N+O+P	R Q×L	U	V
Reference Number	Project Code	State/Region	Name of Subproject	Evaluation(Norm)								Coefficient Infrastructure undeveloped rate	Evaluation (Weighting :Poverty Population=40%)						Rank	Shortlist final
				① Purposiveness			② Cost Benefit	③ Needs / Urgency	④ Feasibility				① Purposiveness	② Cost Benefit	③ Needs / Urgency	④ Feasibility	Small Total	Total		
				National Policy	C/P Needs		EIRR	Poverty Population	Implementation	Management										
112	ESE-1201	Ayeyarwady	Pathein	1.00	1.00	1.00	0.62	1.00	1.00	0.56	0.78	61.460	20.0	12.4	40.0	15.6	88.0	5,407	1	Shortlist
117	ESE-1206	Ayeyarwady	Einme	1.00	0.00	0.50	0.58	1.00	1.00	0.53	0.76	61.460	10.0	11.5	40.0	15.3	76.8	4,719	2	Shortlist
168	TDC-28	Ayeyarwady	Pathein	0.5	1.00	0.75	0.16	1.00	0.90	0.18	0.54	59.132	15.0	3.1	40.0	10.8	68.9	4,075	4	Shortlist
165	TDC-25	Ayeyarwady	Wakema	0.5	0.94	0.72	0.15	1.00	0.90	0.15	0.52	59.132	14.4	3.0	40.0	10.5	67.9	4,014	5	Shortlist
169	TDC-29	Ayeyarwady	Myaungmya	0.5	0.89	0.69	0.17	1.00	0.90	0.15	0.53	59.132	13.9	3.4	40.0	10.5	67.8	4,010	6	Shortlist
160	TDC-20	Ayeyarwady	Bogale	0.5	0.83	0.67	0.17	1.00	0.90	0.14	0.52	59.132	13.3	3.5	40.0	10.4	67.2	3,975	7	
161	TDC-21	Ayeyarwady	Kyaiklat	0.5	0.72	0.61	0.16	1.00	0.90	0.20	0.55	59.132	12.2	3.3	40.0	11.0	66.5	3,931	8	
18	MoC-18	Ayeyarwady	NgaThine Chaung - Gwa Road	1.00	1.00	1.00	0.10	1.00	1.00	1.00	1.00	47.199	20.0	2.0	40.0	20.0	82.0	3,872	9	Shortlist
114	ESE-1203	Ayeyarwady	Myaungmya (Pyin Village)	0.00	1.00	0.50	0.08	1.00	1.00	0.06	0.53	61.460	10.0	1.7	40.0	10.6	62.3	3,829	10	
163	TDC-23	Ayeyarwady	Nyaungdon	0.5	0.56	0.53	0.12	1.00	0.90	0.16	0.53	59.132	10.6	2.4	40.0	10.6	63.6	3,759	11	
162	TDC-22	Ayeyarwady	Dedaye	0.5	0.50	0.50	0.11	1.00	0.90	0.14	0.52	59.132	10.0	2.2	40.0	10.4	62.6	3,701	12	
17	MoC-17	Shan	Tangoo - LeikTho - YaDo - Hopone Road	1.00	1.00	1.00	0.11	0.72	0.50	1.00	0.75	54.594	20.0	2.1	28.6	15.0	65.8	3,591	14	Shortlist
135	ESE-1317	Mandalay	PyinOoLwin T/S (Ahne Sakhan-Myoma, Myoma S/S)	1.00	1.00	1.00	0.47	0.84	1.00	0.42	0.71	43.951	20.0	9.3	33.5	14.2	77.0	3,383	15	Shortlist
14	MoC-14	Rakhine	NgaThine Chaung - Gwa Road	1.00	1.00	1.00	0.10	0.54	1.00	1.00	1.00	53.181	20.0	1.9	21.6	20.0	63.5	3,379	16	
116	ESE-1205	Ayeyarwady	Kyaiklat-Bogale	0.00	0.00	0.00	0.15	1.00	1.00	0.14	0.57	61.460	0.0	3.0	40.0	11.4	54.4	3,346	17	
140	ESE-1322	Mandalay	TharSi T/S (Myoma S/S)	1.00	1.00	1.00	0.37	0.84	1.00	0.34	0.67	43.951	20.0	7.4	33.5	13.4	74.3	3,265	18	Shortlist
5	MoC-05	Sagaing	[illegible]	1.00	1.00	1.00	0.15	0.36	1.00	1.00	1.00	55.772	20.0	2.9	14.5	20.0	57.4	3,201	19	Shortlist
109	ESE-1101	Magway	Chauk (GwePin Village)	1.00	1.00	1.00	0.19	0.56	1.00	0.18	0.59	54.622	20.0	3.8	22.6	11.8	58.2	3,177	20	Shortlist
184	TDC-44	Shan	Lashio	0.5	0.95	0.73	0.29	0.72	0.90	0.20	0.55	52.044	14.5	5.8	28.6	11.0	60.0	3,124	21	Shortlist
189	TDC-49	Shan	Keng Tung	0.5	0.91	0.70	0.32	0.72	0.90	0.18	0.54	52.044	14.1	6.5	28.6	10.8	60.0	3,122	22	
49	ESE-0703	Shan	Kalaw (Heho)	1.00	1.00	1.00	0.22	0.72	1.00	0.21	0.60	47.785	20.0	4.5	28.6	12.1	65.2	3,115	23	Shortlist
139	ESE-1321	Mandalay	Kyauk Pa Taung T/S	1.00	1.00	1.00	0.25	0.84	1.00	0.23	0.62	43.951	20.0	5.0	33.5	12.3	70.8	3,112	24	Shortlist
136	ESE-1318	Mandalay	Meikhtilar T/S (near Nyaung Myint Village)	1.00	1.00	1.00	0.23	0.84	1.00	0.21	0.61	43.951	20.0	4.6	33.5	12.1	70.2	3,087	25	Shortlist
177	TDC-37	Shan	Taunggyi	0.5	0.86	0.68	0.28	0.72	0.90	0.15	0.52	52.044	13.6	5.6	28.6	10.5	58.4	3,037	26	Shortlist
178	TDC-38	Shan	Aungpan	0.5	1.00	0.75	0.20	0.72	0.90	0.15	0.52	52.044	15.0	4.0	28.6	10.5	58.1	3,024	27	Shortlist
22	MoC-22	Shan	Hen Myintmo-Myo Gyi-Ywar Ngan-Aung Pan Road	1.00	0.00	0.50	0.09	0.72	0.50	1.00	0.75	54.594	10.0	1.7	28.6	15.0	55.4	3,023	28	Shortlist
50	ESE-0704	Shan	Kengtaung	1.00	1.00	1.00	0.15	0.72	1.00	0.14	0.57	47.785	20.0	3.1	28.6	11.4	63.2	3,018	29	
197	TDC-57	Mandalay	Meiltila	0.5	1.00	0.75	0.30	0.84	0.90	0.16	0.53	45.780	15.0	6.0	33.5	10.6	65.1	2,980	30	Shortlist
183	TDC-43	Shan	Ping Long	0.5	0.73	0.61	0.28	0.72	0.90	0.15	0.53	52.044	12.3	5.6	28.6	10.5	57.0	2,967	31	
137	ESE-1319	Mandalay	TharSi T/S (TharSi-Nyaung Yan, Nyaung Yan S/S)	1.00	1.00	1.00	0.13	0.84	1.00	0.12	0.56	43.951	20.0	2.6	33.5	11.2	67.3	2,959	32	Shortlist
100	ESE-1006	Bago	Tharyarwad	1.00	1.00	1.00	0.37	0.41	1.00	0.34	0.67	51.427	20.0	7.5	16.5	13.4	57.4	2,950	33	Shortlist
46	ESE-0601	Rakhine	Ann(kazukain)	0.00	1.00	0.50	0.19	0.54	1.00	0.18	0.59	60.948	10.0	3.9	21.6	11.8	47.3	2,882	34	Shortlist
181	TDC-41	Shan	Nansang	0.5	0.82	0.66	0.18	0.72	0.90	0.08	0.49	52.044	13.2	3.6	28.6	9.8	55.1	2,870	35	
182	TDC-42	Shan	Loilen	0.5	0.77	0.64	0.16	0.72	0.90	0.12	0.51	52.044	12.7	3.1	28.6	10.2	54.7	2,846	36	
65	ESE-0805	Sagaing	Wallat(Sinnaingkwe)	1.00	1.00	1.00	0.28	0.36	1.00	0.25	0.63	53.664	20.0	5.5	14.5	12.5	52.5	2,820	37	Shortlist
47	ESE-0602	Rakhine	Thandwe (Kyaunkgyi)	0.00	1.00	0.50	0.14	0.54	1.00	0.13	0.57	60.948	10.0	2.9	21.6	11.3	45.8	2,793	38	Shortlist
192	TDC-52	Shan	Mongping	0.5	0.68	0.59	0.14	0.72	0.90	0.14	0.52	52.044	11.8	2.8	28.6	10.4	53.6	2,791	39	
62	ESE-0802	Sagaing	Ohmtaw-Myinmu	1.00	1.00	1.00	0.25	0.36	1.00	0.22	0.61	53.664	20.0	5.0	14.5	12.2	51.7	2,773	40	Shortlist
153	TDC-13	Mandalay	Myingyan	0.5	0.50	0.50	0.28	0.84	0.90	0.17	0.53	45.780	10.0	5.6	33.5	10.7	59.7	2,734	41	Shortlist
94	ESE-0901	Tanintharyi	Launglon(Zalot village)	1.00	1.00	1.00	0.16	0.20	1.00	0.15	0.57	64.016	20.0	3.2	7.8	11.5	42.5	2,719	42	Shortlist
72	ESE-0812	Sagaing	Kani	1.00	1.00	1.00	0.21	0.36	1.00	0.20	0.60	53.664	20.0	4.2	14.5	12.0	50.7	2,719	43	Shortlist
110	ESE-1102	Magway	Taungdwingyi (Satthwa Village)	1.00	0.00	0.50	0.23	0.56	1.00	0.21	0.61	54.622	10.0	4.6	22.6	12.1	49.4	2,696	44	Shortlist
68	ESE-0808	Sagaing	Khin Oo (Chay Myint Kyin)	1.00	1.00	1.00	0.19	0.36	1.00	0.18	0.59	53.664	20.0	3.8	14.5	11.8	50.1	2,686	45	Shortlist
73	ESE-0813	Sagaing	Batalin (MaungTaung)	1.00	1.00	1.00	0.18	0.36	1.00	0.17	0.59	53.664	20.0	3.7	14.5	11.7	49.9	2,677	46	Shortlist
69	ESE-0809	Sagaing	Depayin (Myae)	1.00	1.00	1.00	0.18	0.36	1.00	0.16	0.58	53.664	20.0	3.5	14.5	11.6	49.6	2,663	47	Shortlist
63	ESE-0803	Sagaing	Shwebo(Myo Hla)	1.00	1.00	1.00	0.17	0.36	1.00	0.16	0.58	53.664	20.0	3.5	14.5	11.6	49.6	2,660	48	
66	ESE-0806	Sagaing	Kanbalu (Malae)	1.00	1.00	1.00	0.17	0.36	1.00	0.15	0.58	53.664	20.0	3.3	14.5	11.5	49.3	2,648	49	
75	ESE-0815	Sagaing	Chaung Oo (Amyint)	1.00	1.00	1.00	0.16	0.36	1.00	0.15	0.58	53.664	20.0	3.3	14.5	11.5	49.3	2,644	50	
61	ESE-0801	Sagaing	Sagaing (Ywathitgyi)	1.00	1.00	1.00	0.16	0.36	1.00	0.15	0.57	53.664	20.0	3.1	14.5	11.5	49.1	2,634	51	
78	ESE-0819	Sagaing	Pinlabu(Gapwepalwe)	1.00	1.00	1.00	0.16	0.36	1.00	0.15	0.57	53.664	20.0	3.1	14.5	11.5	49.1	2,633	52	
123	ESE-1305	Mandalay	Taungthar T/S (Myingyan -Taungthar, Taungthar S/S)	0.00	1.00	0.50	0.22	0.84	1.00	0.20	0.60	43.951	10.0	4.4	33.5	12.0	59.9	2,632	53	Shortlist
77	ESE-0818	Sagaing	Kawlin	1.00	1.00	1.00	0.14	0.36	1.00	0.13	0.56	53.664	20.0	2.7	14.5	11.3	48.5	2,602	54	
172	TDC-32	Bago	Gyobingauk	0.5	1.00	0.75	0.16	0.41	0.90	0.14	0.52	57.649	15.0	3.2	16.5	10.4	45.0	2,596	55	Shortlist
127	ESE-1309	Mandalay	Nyungoo T/S (wetgyinn)	0.00	1.00	0.50	0.17	0.84	1.00	0.16	0.59	43.951	10.0	3.5	33.5	11.6	58.5	2,573	56	Shortlist
141	TDC-01	Rakhine	Sittwe	0.5	1.00	0.75	0.22	0.54	0.90	0.14	0.52	49.736	15.0	4.4	21.6	10.4	51.5	2,561	57	Shortlist
145	TDC-05	Magway	Taungdwingyi	0.5	0.89	0.69	0.40	0.56	0.90	0.36	0.63	44.956	13.9	7.9	22.6	12.6	56.9	2,560	58	Shortlist
151	TDC-11	Magway	Pakokku	0.5	1.00	0.75	0.38	0.56	0.90	0.16	0.53	44.956	15.0	7.6	22.6	10.6	55.8	2,507	59	Shortlist

A	B	C		D	E	F (D+E)/2	G	H	I	J	K (I+J)/2	L	M F×20	N G×20	O H×40	P I×20	Q M+N+O+P	R Q×L		U	V
Reference Number	Project Code	State/Region	Name of Subproject	Evaluation(Norm)								Coefficient Infrastructure undeveloped rate	Evaluation (Weighting :Poverty Population×40%)							Rank	Shortlist final
				① Purposiveness			② Cost Benefit	③ Needs / Urgency	④ Feasibility				① Purposive ness	② Cost Benefit	③ Needs / Urgency	④ Feasibility	Small Total	Total			
				National Policy	C/P Needs		EIRR	Poverty Populatio	Implemen tation	Managem ent											
53	ESE-0707	Shan	Talay	0.00	1.00	0.50	0.13	0.72	1.00	0.12	0.56	47.785	10.0	2.5	28.6	11.2	52.3	2,500		60	
48	ESE-0701	Shan	Hopong(Pinpat)	0.00	1.00	0.50	0.12	0.72	1.00	0.11	0.55	47.785	10.0	2.4	28.6	11.1	52.1	2,490		61	
56	ESE-0710	Shan	NamSan(Hiphat)	1.00	0.00	0.50	0.11	0.72	1.00	0.10	0.55	47.785	10.0	2.1	28.6	11.0	51.7	2,473		62	
64	ESE-0804	Sagaing	Kyaukmyaung	1.00	1.00	1.00	0.07	0.36	1.00	0.00	0.50	53.664	20.0	1.4	14.5	10.0	45.9	2,462		63	
6	MoC-06	Bago	Taungoo - Leik Tho - Yar Oo - Loikaw - Ho Pone Road	1.00	1.00	1.00	0.08	0.41	1.00	1.00	1.00	42.064	20.0	1.6	16.5	20.0	58.0	2,441		64	Shortlist
102	ESE-1008	Bago	Bago(N0-4(Oakthar)	1.00	0.00	0.50	0.36	0.41	1.00	0.36	0.68	51.427	10.0	7.3	16.5	13.6	47.3	2,432		65	Shortlist
3	MoC-03	Kayin	Taungoo - Leik Tho - Yar Oo - Loikaw - Ho Pone Road	1.00	1.00	1.00	0.13	0.11	0.50	1.00	0.75	56.573	20.0	2.6	4.2	15.0	41.9	2,369		67	Shortlist
170	TDC-30	Bago	Bago	0.5	0.50	0.50	0.18	0.41	0.90	0.19	0.55	57.649	10.0	3.5	16.5	10.9	40.9	2,359		68	Shortlist
143	TDC-03	Magway	Yenangyaung	0.5	0.94	0.72	0.22	0.56	0.90	0.15	0.52	44.956	14.4	4.4	22.6	10.5	51.9	2,334		69	
171	TDC-31	Bago	Padaung	0.5	0.75	0.63	0.05	0.41	0.90	0.14	0.52	57.649	12.5	1.0	16.5	10.4	40.4	2,330		70	
88	ESE-0830	Sagaing	Kani (Moekaung)	1.00	0.00	0.50	0.27	0.36	1.00	0.25	0.62	53.664	10.0	5.4	14.5	12.5	42.3	2,272		73	
148	TDC-08	Magway	Thayet	0.5	0.78	0.64	0.19	0.56	0.90	0.19	0.55	44.956	12.8	3.8	22.6	10.9	50.1	2,255		74	Shortlist
39	ESE-0501	Mon	Saung Naing Gyi (Kyaikhto)	1.00	1.00	1.00	0.39	0.18	1.00	0.35	0.68	48.315	20.0	7.8	7.1	13.5	48.5	2,244		75	Shortlist
85	ESE-0826	Sagaing	Myinmu	1.00	0.00	0.50	0.23	0.36	1.00	0.21	0.61	53.664	10.0	4.7	14.5	12.1	41.3	2,215		76	
105	ESE-1013	Bago	Yedashe(Myohla)	1.00	0.00	0.50	0.22	0.41	1.00	0.20	0.60	51.427	10.0	4.5	16.5	12.0	43.0	2,211		77	Shortlist
67	ESE-0807	Sagaing	Khin Oo	0.00	1.00	0.50	0.22	0.36	1.00	0.20	0.60	53.664	10.0	4.3	14.5	12.0	40.8	2,191		78	
81	ESE-0822	Sagaing	Kalaywa	0.00	1.00	0.50	0.22	0.36	1.00	0.20	0.60	53.664	10.0	4.3	14.5	12.0	40.8	2,191		79	
149	TDC-09	Magway	Kamma	0.5	0.72	0.61	0.15	0.56	0.90	0.14	0.52	44.956	12.2	3.0	22.6	10.4	48.2	2,169		80	
2	MoC-02	Kayah	Taungoo - Leik Tho - Yar Oo - Loikaw - Ho Pone Road	1.00	1.00	1.00	0.04	0.00	1.00	1.00	1.00	52.898	20.0	0.9	0.0	20.0	40.9	2,162		81	
144	TDC-04	Magway	Chauk	0.5	0.83	0.67	0.09	0.56	0.90	0.14	0.52	44.956	13.3	1.7	22.6	10.4	48.1	2,162		82	Shortlist
146	TDC-06	Magway	Minbu	0.5	0.50	0.50	0.25	0.56	0.90	0.15	0.52	44.956	10.0	5.0	22.6	10.5	48.1	2,161		83	Shortlist
84	ESE-0825	Sagaing	Pale(Phalangin)	1.00	0.00	0.50	0.18	0.36	1.00	0.17	0.59	53.664	10.0	3.7	14.5	11.7	39.9	2,139		84	
87	ESE-0828	Sagaing	Khin Oo (Myindong)	1.00	0.00	0.50	0.17	0.36	1.00	0.16	0.58	53.664	10.0	3.5	14.5	11.6	39.6	2,123		85	
74	ESE-0814	Sagaing	Ahyartaw(Naunggyei)	0.00	1.00	0.50	0.16	0.36	1.00	0.14	0.57	53.664	10.0	3.1	14.5	11.4	39.0	2,094		86	
7	MoC-07	Magway	Gan Gaw - AiKa Road	0.50	0.00	0.25	0.10	0.56	1.00	1.00	1.00	42.206	5.0	1.9	22.6	20.0	49.5	2,090		87	Shortlist
95	ESE-0902	Tanintharyi	Thayetchaung(Mindut)	1.00	0.00	0.50	0.16	0.20	1.00	0.15	0.57	64.016	10.0	3.2	7.8	11.5	32.5	2,079		88	Shortlist
90	ESE-0833	Sagaing	Wonetho(Mwekan)	1.00	0.00	0.50	0.12	0.36	1.00	0.11	0.56	53.664	10.0	2.4	14.5	11.1	38.0	2,041		89	
76	ESE-0817	Sagaing	Kathar(Innlaya)	0.00	1.00	0.50	0.12	0.36	1.00	0.11	0.56	53.664	10.0	2.4	14.5	11.1	38.0	2,039		90	
79	ESE-0820	Sagaing	Mawlight	0.00	1.00	0.50	0.12	0.36	1.00	0.10	0.55	53.664	10.0	2.3	14.5	11.0	37.8	2,031		91	
91	ESE-0834	Sagaing	Inntaw	1.00	0.00	0.50	0.11	0.36	1.00	0.10	0.55	53.664	10.0	2.2	14.5	11.0	37.7	2,024		92	
147	TDC-07	Magway	Sidokdaya	0.5	0.61	0.56	0.08	0.56	0.90	0.00	0.45	44.956	11.1	1.6	22.6	9.0	44.3	1,991		93	
198	TDC-58	Mon	Mawlamyine	0.5	1.00	0.75	0.23	0.18	0.90	0.21	0.56	52.044	15.0	4.5	7.1	11.1	37.8	1,966		94	Shortlist
86	ESE-0827	Sagaing	Ohntaw-Sartaung	0.00	0.00	0.00	0.37	0.36	1.00	0.34	0.67	53.664	0.0	7.4	14.5	13.4	35.3	1,895		95	
176	TDC-36	Tanintharyi	Bokpyin	0.5	1.00	0.75	0.13	0.20	0.90	0.16	0.53	50.725	15.0	2.6	7.8	10.6	36.0	1,824		96	Shortlist
196	TDC-56	Mon	Ka Mar Wel (Mudon)	0.5	0.83	0.67	0.13	0.18	0.90	0.13	0.52	54.132	13.3	2.6	7.1	10.3	33.4	1,807		97	
38	ESE-0401	Chin	Teetain	0.00	1.00	0.50	0.14	0.14	1.00	0.13	0.57	59.287	10.0	2.9	5.8	11.3	30.0	1,776		98	Shortlist
156	TDC-16	Kayin	Than Daung Gyi	0.5	1.00	0.75	0.06	0.11	0.90	0.15	0.52	56.275	15.0	1.3	4.2	10.5	31.0	1,743		99	Shortlist
194	TDC-54	Mon	Thanlyuzayat	0.5	0.67	0.58	0.10	0.18	0.90	0.14	0.52	54.132	11.7	1.9	7.1	10.4	31.1	1,681		100	Shortlist
106	ESE-1014	Bago	Sinmeeswe	0.00	0.00	0.00	0.21	0.41	1.00	0.19	0.60	51.427	0.0	4.2	16.5	11.9	32.7	1,679		101	Shortlist
108	ESE-1016	Bago	Othegon	0.00	0.00	0.00	0.21	0.41	1.00	0.19	0.60	51.427	0.0	4.2	16.5	11.9	32.6	1,678		102	Shortlist
158	TDC-18	Kayin	Kyainseikgyi	0.5	0.80	0.65	0.11	0.11	0.90	0.14	0.52	56.275	13.0	2.1	4.2	10.4	29.8	1,677		103	Shortlist
23	ESE-0101	Kachin	Waing maw	1.00	0.00	0.50	0.24	0.16	1.00	0.22	0.61	49.766	10.0	4.9	6.3	12.2	33.4	1,661		104	Shortlist
104	ESE-1011	Bago	Htantabin (Zayatgyi)	0.00	0.00	0.00	0.19	0.41	1.00	0.17	0.59	51.427	0.0	3.8	16.5	11.7	32.0	1,648		105	Shortlist
159	TDC-19	Kayin	Kamarmaung	0.5	0.70	0.60	0.10	0.11	0.90	0.17	0.53	56.275	12.0	1.9	4.2	10.7	28.9	1,624		106	
175	TDC-35	Tanintharyi	Yebyu	0.5	0.75	0.63	0.12	0.20	0.90	0.00	0.45	50.725	12.5	2.5	7.8	9.0	31.8	1,613		107	
154	TDC-14	Kayin	Phaan	0.5	0.60	0.55	0.13	0.11	0.90	0.15	0.52	56.275	11.0	2.5	4.2	10.5	28.3	1,590		108	
33	ESE-0303	Kayin	Pinekyon	1.00	0.00	0.50	0.21	0.11	1.00	0.20	0.60	51.938	10.0	4.3	4.2	12.0	30.5	1,584		109	Shortlist
174	TDC-34	Tanintharyi	Launglon	0.5	0.50	0.50	0.10	0.20	0.90	0.17	0.54	50.725	10.0	2.1	7.8	10.7	30.6	1,554		110	Shortlist
4	MoC-04	Chin	Gan Gaw - AiKa Road	0.50	0.00	0.25	0.13	0.14	0.50	0.50	0.50	66.135	5.0	2.6	5.8	10.0	23.4	1,547		111	
32	ESE-0302	Kayin	Hpa-an(Shwetaw)	1.00	0.00	0.50	0.16	0.11	1.00	0.15	0.57	51.938	10.0	3.2	4.2	11.5	28.9	1,503		114	
155	TDC-55	Mon	Ye	0.5	0.50	0.50	0.07	0.18	0.90	0.00	0.45	54.132	10.0	1.3	7.1	9.0	27.4	1,485		115	
27	ESE-0201	Kayah	Loikaw (Ywarlanshae)	1.00	1.00	1.00	0.30	0.00	1.00	0.28	0.64	38.072	20.0	6.1	0.0	12.8	38.8	1,478		116	
34	ESE-0304	Kayin	Shanywarthit	1.00	0.00	0.50	0.14	0.11	1.00	0.13	0.57	51.938	10.0	2.9	4.2	11.3	28.5	1,478		117	
20	MoC-20	Kayah	Taungoo - Mawtike - Loikaw (BawaKhe-Phar Saung Bochon)	0.50	0.00	0.25	0.11	0.00	1.00	1.00	1.00	52.898	5.0	2.2	0.0	20.0	27.2	1,439		118	
12	MoC-12	Mon	Khaw Zar- MaKyi Road	0.50	0.00	0.25	0.16	0.18	1.00	1.00	1.00	40.039	5.0	3.2	7.1	20.0	35.3	1,413		119	
43	ESE-0506	Mon	Mawlamyine(Khayu)	1.00	0.00	0.50	0.10	0.18	1.00	0.09	0.54	46.315	10.0	2.0	7.1	10.9	30.0	1,389		120	
11	MoC-11	Mon	Yae - KaLawt - KhawZar Road	0.50	0.00	0.25	0.11	0.18	1.00	1.00	1.00	40.039	5.0	2.2	7.1	20.0	34.3	1,375		121	
28	ESE-0202	Kayah	Demawso(Lobarkho)	0.00	1.00	0.50	0.16	0.00	1.00	0.14	0.57	38.072	10.0	3.1	0.0	11.4	24.5	934		122	

A	B	C		D	E	F (D+E)/2	G	H	I	J	K (I+J)/2	L	M F×20	N G×20	O H×40	P I×20	Q M+N+O+P	R Q×L	U	V
Reference Number	Project Code	State/Region	Name of Subproject	Evaluation(Norm)								Coefficient Infrastructure undeveloped rate	Evaluation (Weighting :Poverty Population×40%)						Rank	Shortlist final
				① Purposiveness			② Cost Benefit	③ Needs / Urgency	④ Feasibility				① Purposiveness	② Cost Benefit	③ Needs / Urgency	④ Feasibility	Small Total	Total		
				National Policy	C/P Needs		EIRR	Poverty Populatio	Implementation	Management										
24	ESE-0102	Kachin	Mohnyin	1.00	1.00	1.00	0.00	0.16	#DIV/0!	-0.30	#DIV/0!								#N/A	Canceled
25	ESE-0103	Kachin	Mogaung	1.00	1.00	1.00	0.00	0.16	#DIV/0!	-0.30	#DIV/0!								#N/A	Canceled
29	ESE-0203	Kayah	Pruhso	0.00	0.00	0.00	0.00	0.00	#DIV/0!	-0.30	#DIV/0!								#N/A	Canceled
30	ESE-0204	Kayah	Hoyar	0.00	0.00	0.00	0.00	0.00	#DIV/0!	-0.30	#DIV/0!								#N/A	Canceled
31	ESE-0301	Kayin	Hpa-an(Metayaung)	1.00	1.00	1.00	0.00	0.11	#DIV/0!	-0.30	#DIV/0!								#N/A	Canceled
38	ESE-0403	Chin	Kanpatlat	1.00	1.00	1.00	0.00	0.14	#DIV/0!	-0.30	#DIV/0!								#N/A	Canceled
40	ESE-0502	Mon	Mattama	1.00	1.00	1.00	0.00	0.18	#DIV/0!	-0.30	#DIV/0!								#N/A	Canceled
41	ESE-0503	Mon	Mawlamyine(Theinsaik)	1.00	0.00	0.50	0.00	0.18	#DIV/0!	-0.30	#DIV/0!								#N/A	Canceled
42	ESE-0505	Mon	Mawlamyine(Kyauk tan Industrial Zone)	1.00	0.00	0.50	0.00	0.18	#DIV/0!	-0.30	#DIV/0!								#N/A	Canceled
44	ESE-0507	Mon	Thain Za Yat (Mokepalin)	1.00	0.00	0.50	0.17	0.18	#DIV/0!	0.07	#DIV/0!								#N/A	Canceled
45	ESE-0508	Mon	Bilin	1.00	0.00	0.50	0.00	0.18	#DIV/0!	-0.30	#DIV/0!								#N/A	Canceled
54	ESE-0708	Shan	Mineyu	1.00	1.00	1.00	0.00	0.72	#DIV/0!	-0.30	#DIV/0!								#N/A	Canceled
55	ESE-0709	Shan	Loimwe	0.00	1.00	0.50	0.22	0.72	#DIV/0!	0.17	#DIV/0!								#N/A	Canceled
59	ESE-0714	Shan	Tonta	0.00	0.00	0.00	0.00	0.72	#DIV/0!	-0.30	#DIV/0!								#N/A	Canceled
60	ESE-0715	Shan	Mineyaung	0.00	0.00	0.00	0.00	0.72	#DIV/0!	-0.30	#DIV/0!								#N/A	Canceled
70	ESE-0810	Sagaing	Nandawon Substation	1.00	1.00	1.00	0.00	0.36	#DIV/0!	-0.30	#DIV/0!								#N/A	Canceled
71	ESE-0811	Sagaing	Monywa (Industrial Zone(Tharzi))	1.00	1.00	1.00	0.00	0.36	#DIV/0!	-0.30	#DIV/0!								#N/A	Canceled
80	ESE-0821	Sagaing	Kalay	0.00	1.00	0.50	0.00	0.36	#DIV/0!	-0.30	#DIV/0!								#N/A	Canceled
83	ESE-0824	Sagaing	Pale (Mintainbin)	1.00	1.00	1.00	0.00	0.36	#DIV/0!	-0.30	#DIV/0!								#N/A	Canceled
89	ESE-0831	Sagaing	Ahyartaw(Naunggyiei)	0.00	0.00	0.00	0.34	0.36	#DIV/0!	0.42	#DIV/0!								#N/A	Canceled
92	ESE-0835	Sagaing	Mawlu	0.00	0.00	0.00	0.22	0.36	#DIV/0!	0.16	#DIV/0!								#N/A	Canceled
96	ESE-1001	Bago	Kyaukdaga (Phado)	1.00	1.00	1.00	0.00	0.41	#DIV/0!	-0.30	#DIV/0!								#N/A	Canceled
97	ESE-1003	Bago	Daik U	1.00	1.00	1.00	0.00	0.41	#DIV/0!	-0.30	#DIV/0!								#N/A	Canceled
98	ESE-1004	Bago	Pamtaung	1.00	1.00	1.00	0.00	0.41	#DIV/0!	-0.30	#DIV/0!								#N/A	Canceled
99	ESE-1005	Bago	Hmattaing	1.00	1.00	1.00	0.33	0.41	1.00	0.30	0.65								#N/A	Canceled
101	ESE-1007	Bago	Oakshitbyin	1.00	1.00	1.00	0.00	0.41	#DIV/0!	-0.30	#DIV/0!								#N/A	Canceled
103	ESE-1010	Bago	Kaylumati	0.00	0.00	0.00	0.34	0.41	1.00	0.31	0.66								#N/A	Canceled
107	ESE-1015	Bago	Wathlikan	1.00	0.00	0.50	0.23	0.41	1.00	0.21	0.61								#N/A	Canceled
115	ESE-1204	Ayeyarwady	Kanaung	1.00	1.00	1.00	0.00	1.00	#DIV/0!	-0.30	#DIV/0!								#N/A	Canceled
118	ESE-1207	Ayeyarwady	Inpin	0.00	0.00	0.00	2.10	1.00	#DIV/0!	4.17	#DIV/0!								#N/A	Canceled
119	ESE-1301	Mandalay	Chanayethazan T/S (MESC Head Office)	0.00	1.00	0.50	0.32	0.84	1.00	0.30	0.65								#N/A	Canceled
120	ESE-1302	Mandalay	[illegible] T/S (76-Shwekyingyi, Haemarzala-76, AungPinLae-76)	1.00	1.00	1.00	0.82	0.84	1.00	0.75	0.88								#N/A	Canceled
121	ESE-1303	Mandalay	Mahaaungmyay T/S (Haemarzala-76)	0.00															#N/A	Canceled
122	ESE-1304	Mandalay	Mahaaungmyay T/S (AungPinLae-76)	0.00															#N/A	Canceled
124	ESE-1306	Mandalay	Taungthar T/S (Myingyan -Taungthar)	0.00															#N/A	Canceled
125	ESE-1307	Mandalay	Taungthar T/S	0.00															#N/A	Canceled
126	ESE-1308	Mandalay	Ngazon T/S (Ngazon-Ngamyar, Ngazon S/S)	#REF!	1.00	#REF!	0.00	0.84	#DIV/0!	-0.30	#DIV/0!								#N/A	Canceled
128	ESE-1310	Mandalay	Chanayethazan T/S (Haemarzala-daewon west Shwekyingyi)	1.00	0.00	0.50	0.90	0.84	1.00	1.60	1.30								#N/A	Canceled
129	ESE-1311	Mandalay	Chanayethazan T/S (Shwekyingyi-daewon west)	0.00															#N/A	Canceled
130	ESE-1312	Mandalay	Chanmyathazi T/S (Chipa)	1.00	0.00	0.50	0.27	0.84	1.00	0.25	0.62								#N/A	Canceled
131	ESE-1313	Mandalay	Chanmyathazi T/S (76-Sinphyukan)	0.00															#N/A	Canceled
132	ESE-1314	Mandalay	Chanmyathazi T/S (AungPinLae-Minkalar Mandalay)	1.00	0.00	0.50	0.89	0.84	1.00	0.82	0.91								#N/A	Canceled
133	ESE-1315	Mandalay	Myingyan T/S (kokoke)	0.00															#N/A	Canceled
134	ESE-1316	Mandalay	Ngazon T/S	0.00	0.00	0.00	0.00	0.84	#DIV/0!	-0.30	#DIV/0!								#N/A	Canceled
138	ESE-1320	Mandalay	MyinChan T/S (near KokeKae village)	1.00	1.00	1.00	0.13	0.84	1.00	0.13	0.57								#N/A	Canceled
142	TDC-02	Rakhine	Ann	0.5	0.50	0.50	0.07	0.54	#DIV/0!	-0.30	#DIV/0!								#N/A	Canceled
152	TDC-12	Magway	Kyaukhtu	0.5	0.56	0.53	0.50	0.56	#DIV/0!	-0.30	#DIV/0!								#N/A	Canceled
173	TDC-33	Tanintharyi	Palaw	0.5	0.00	0.25	0.00	0.20	#DIV/0!	-0.30	#DIV/0!								#N/A	Canceled
179	TDC-39	Shan	Hsihseng	0.5	0.00	0.25	0.00	0.72	#DIV/0!	-0.30	#DIV/0!								#N/A	Canceled
180	TDC-40	Shan	Laihka	0.5	0.00	0.25	0.00	0.72	#DIV/0!	-0.30	#DIV/0!								#N/A	Canceled
185	TDC-45	Shan	Muse	0.5	0.50	0.50	0.25	0.72	0.90	0.22	0.56								#N/A	Canceled
187	TDC-47	Shan	Namtu	0.5	0.00	0.25	0.00	0.72	#DIV/0!	-0.30	#DIV/0!								#N/A	Canceled
188	TDC-48	Shan	Kunlong	0.5	0.00	0.25	0.00	0.72	#DIV/0!	-0.30	#DIV/0!								#N/A	Canceled
190	TDC-50	Shan	Mongton	0.5	0.00	0.25	0.00	0.72	#DIV/0!	-0.30	#DIV/0!								#N/A	Canceled
199	TDC-59	Shan	Mongshoo																	Canceled
1	MoC-01	Kachin	Mandalay - [illegible] Road [illegible]	1.00	1.00	1.00	0.17	0.16	1.00	1.00	1.00								#N/A	Eliminated by screening
8	MoC-08	Mandalay	BaLin - [illegible] - Pyin Oo Lwin ([illegible]) Road (BaLin side / [illegible])	0.50	1.00	0.75	0.12	0.84	1.00	0.50	0.75								#N/A	Eliminated by screening
9	MoC-09	Mandalay	BaLin - YeYwen - Pyin Oo Lwin (AhkSokan) Road (MayMyo side)	0.50	0.00	0.25	0.11	0.84	1.00	0.50	0.75								#N/A	Eliminated by screening
10	MoC-10	Mandalay	BaLin - [illegible] - Pyin Oo Lwin ([illegible]) Road (BaLin side / [illegible])	0.50	0.00	0.25	0.14	0.84	1.00	0.50	0.75								#N/A	Eliminated by screening
13	MoC-13	Rakhine	Yangon - Kyauk Phyu Road	1.00	1.00	1.00	0.17	0.54	1.00	0.50	0.75								#N/A	Eliminated by screening
15	MoC-15	Yangon	Dala - ThaKut - Latkoak Kone Road	0.50	0.00	0.25	0.19	0.42	0.50	0.50	0.50								#N/A	Eliminated by screening
16	MoC-16	Yangon	KunChan Gone - Taw Kayan - West BohDin Road	0.50	0.00	0.25	0.18	0.42	0.50	0.50	0.50								#N/A	Eliminated by screening
21	MoC-21	Rakhine	Yangon - Kyauk Phyu Road	1.00	0.00	0.50	0.13	0.54	1.00	0.50	0.75								#N/A	Eliminated by screening
26	ESE-0104	Kachin	Shweku	1.00	1.00	1.00	0.19	0.16	#DIV/0!	0.10	#DIV/0!								#N/A	Eliminated by screening
52	ESE-0706	Shan	Kutkhaing(Namphatkar)	1.00	1.00	1.00	0.06	0.72	#DIV/0!	-0.30	#DIV/0!								#N/A	Eliminated by screening
57	ESE-0711	Shan	Namato(Narsai)	0.00	0.00	0.00	0.00	0.72	#DIV/0!	-0.30	#DIV/0!								#N/A	Eliminated by screening

A	B	C		D	E	F (D+E)/2	G	H	I	J	K (I+J)/2	L	M F×20	N G×20	O H×40	P I×20	Q M+N+O+P	R Q×L		U	V
Reference Number	Project Code	State/Region	Name of Subproject	Evaluation(Norm)								Coefficient Infrastructure undeveloped rate	Evaluation (Weighting ;Poverty Population×40%)							Rank	Shortlist final
				① Purposiveness			② Cost Benefit	③ Needs / Urgency	④ Feasibility				① Purposiveness	② Cost Benefit	③ Needs / Urgency	④ Feasibility	Small Total	Total			
				National Policy	C/P Needs		EIRR	Poverty Populatio	Implemen tation	Managem ent											
58	ESE-0712	Shan	Mabain (NgaO)	0.00	0.00	0.00	0.07	0.72	#DIV/0!	-0.30	#DIV/0!									#N/A	Eliminated by screening
93	ESE-0836	Sagaing	Homemalin	0.00	0.00	0.00	0.14	0.36	#DIV/0!	-0.00	#DIV/0!									#N/A	Eliminated by screening
150	TDC-10	Magway	Mindon	0.5	0.67	0.58	0.27	0.56	0.90	0.16	0.53									#N/A	Eliminated by screening
155	TDC-15	Kayin	Myawaddy	0.5	0.50	0.50	0.00	0.11	0.90	0.00	0.45									#N/A	Eliminated by screening
157	TDC-17	Kayin	Kyondoe	0.5	0.90	0.70	0.20	0.11	#DIV/0!	-0.30	#DIV/0!									#N/A	Eliminated by screening
166	TDC-26	Ayeyarwady	Hinthada	0.5	0.17	0.33	0.16	1.00	#DIV/0!	-0.30	#DIV/0!									#N/A	Eliminated by screening
167	TDC-27	Ayeyarwady	Maubin	0.5	0.11	0.31	0.19	1.00	#DIV/0!	-0.30	#DIV/0!									#N/A	Eliminated by screening
186	TDC-46	Shan	Kyaukme	0.5	0.64	0.57	0.52	0.72	0.90	0.19	0.55									#N/A	Eliminated by screening
191	TDC-51	Shan	Mong Hsat	0.5	0.00	0.25	0.00	0.72	0.90	0.00	0.45									#N/A	Eliminated by screening
193	TDC-53	Shan	Monghpyak	0.5	0.55	0.52	0.00	0.72	0.90	0.00	0.45									#N/A	Eliminated by screening
113	ESE-1202	Ayeyarwady	Pyapone	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.50	61.460	20.0	0.0	40.0	10.0	70.0	4,302		3	No economic effectiveness
164	TDC-24	Ayeyarwady	Mawlamyinegyun	0.5	0.78	0.64	0.00	1.00	0.90	0.00	0.45	59.132	12.8	0.0	40.0	9.0	61.8	3,653		13	No economic effectiveness
82	ESE-0823	Sagaing	Pale	1.00	1.00	1.00	0.00	0.36	1.00	0.00	0.50	53.664	20.0	0.0	14.5	10.0	44.5	2,387		66	No economic effectiveness
111	ESE-1103	Magway	Taungdwingyi (Bawethano)	1.00	0.00	0.50	0.00	0.56	1.00	0.00	0.50	54.622	10.0	0.0	22.6	10.0	42.6	2,327		71	No economic effectiveness
51	ESE-0705	Shan	Minpan	0.00	1.00	0.50	0.00	0.72	1.00	0.00	0.50	47.785	10.0	0.0	28.6	10.0	48.6	2,324		72	No economic effectiveness
37	ESE-0402	Chin	Htonzon	0.00	1.00	0.50	0.00	0.14	1.00	0.00	0.50	59.287	10.0	0.0	5.8	10.0	25.8	1,528		112	No economic effectiveness
19	MoC-19	Nay Pyi Taw	TatKone - Highway Connect Road	0.50	0.00	0.25	0.00	0.11	1.00	1.00	1.00	51.862	5.0	0.0	4.4	20.0	29.4	1,526		113	No economic effectiveness
35	ESE-0305	Kayin	Ta Kaung Poe	0.00	0.00	0.00	0.00	0.11	1.00	0.00	0.50	51.938	0.0	0.0	4.2	10.0	14.2	739		123	No economic effectiveness

ANNEX5 Ka De Small Hydropower Development Project

5.1 Outline of Tanintharyi Region

Tanintharyi Region, which has an area of 43,328km2 in southern Myanmar, is a long and narrow area of 580km long of north-south extension. The population is approximately 1,700,000 (2009 yearly bases), which is the 11th .largest among all 14 States and Regions in Myanmar and accounting for about 3% of the country's total population. The Region is divided into three Districts - Dawei District, Myeik District, Kawthaungy District - and consists of 10 township or 265 villages. It is also a home to Ethnic minorities such as Bamar, Kayin and Mon.

Although Tanintharyi Region is not connected with national electric power system (National Grid), electric power is supplied by local diesel power generation by the private sector. This diesel-generated power had been supplied by ESE in the past, but it became impossible for ESE to continue it due to influence of a fossil fuel price escalation. At present, the electric power supply by the diesel generator through distribution lines, which was once owned by ESE, has been continuing at each city/town unit by joint management of an electrification association and/or ESE and private enterprises.

The Operation and Maintenance (O&M) of power facilities are done by ESE, the private enterprises, and their joint management organization, while the fee for O&M and facility administration, which is paid by the electrification association etc., is collected by ESE.

Figure 5.1-1 Tanintharyi Region

As shown in the schedule of National Grid expansion in the future (Fig-3), the power line extension to Tanintharyi Region is planned in 2017 onwards, but even if the National Grid is extended to Dawei, capital city of the Region, within the specified timeframe, it is undecided when it can reach Ka De village in Palaw township, which is the site of Ka De Small Hydropower Development Project.

5.2 Ka De Small Hydropower Development Project

Ka De small hydropower development project (hereinafter referred to as "Ka De project") plans to establish a new run-off-river type hydropower station, which has an electric energy output of 3,200kw (3.2MW) in Ka De village (about 10 km east from Palaw township in Tanintharyi Region) to be supplied to the whole Ka De village and Palaw township. If the diesel-generated power Ka De village is currently purchasing from private company was replaced by this hydropower-generated one, the lives of villagers would be improved with easier access to and daily supply of electric power as well as with less financial burden by lighting and heating expense.

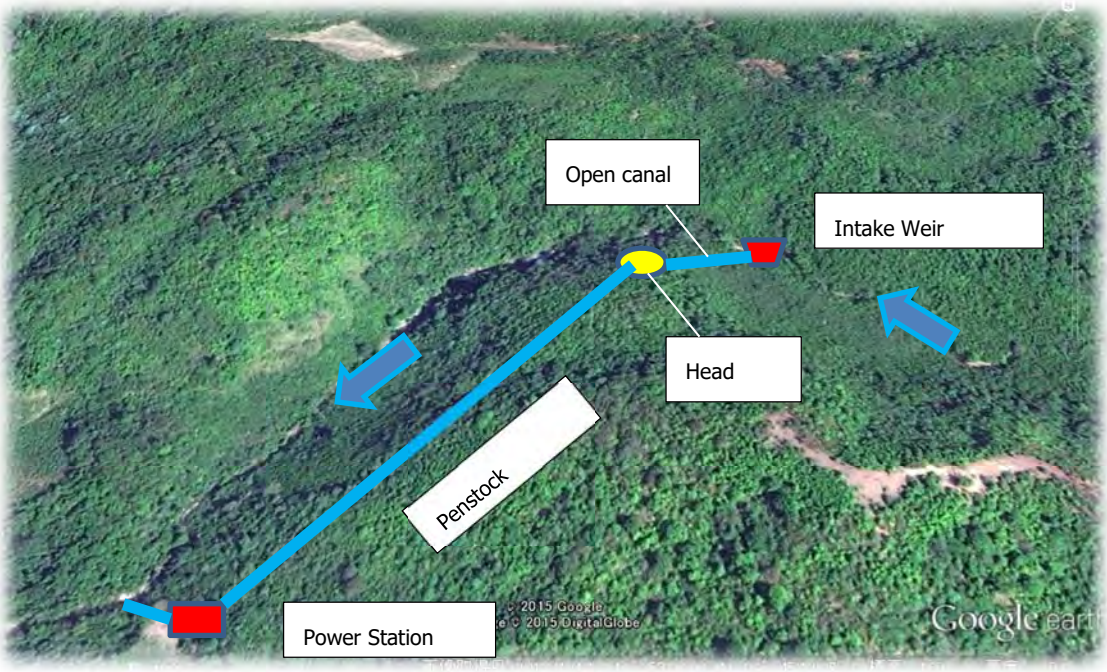
This project generates power by use of the altitude difference of river slope of Ka De river, which is a

Table 5.1-1 Project Features of Ka De Small Hydropower Station

Project name	Ka De SHPS
Catchment areas	10.8km^2
Annual rainfall	5,080mm
Power output	800kw/unit@4units=3.2MW
Power Discharge	0.37m^3/sec@4units=1.2m^3/sec
Rated net head	80m
Annual Power Output	12~15Gwh
Dam	Buttress type(L×H=75m×14m)
H.W.L	EL.
L.W.L	EL.
Spillway	Free flow type
Stilling basin	
Waterway	Open channel
Penstock	D×L=1.1m×442m 2lines
Type of generation	Run-of-river type
Powerhouse	Open, L×W×H=30m×8m×7m
Tailrace	
Turbine	Horizontal axis Francis turbine@4units
Generator	Horizontal axis synchronous generator@4units
Switchyard	4/6.6/KV, Conventional type@4units
Transmission line	11KVA, L=11.2km

natural river. The main structure is a diversion weir installed in the river to take the water into the power-station, and a sand basin created at a flat area near the diversion weir to remove floating soil and sand. The clean water obtained through the main structure is led to a head-tank (water tank) through a concrete open channel. Then, it drops from the head-tank through a penstock pipe (about 442m) and rotates a generator directly connected with water turbines (Francis water turbine) in the power-station to generate electric power. After the generation, the energy-evacuated water is discharged to the original river through a tailrace structures. It is planned that the generated power is transmitted to neighboring sub-station at Palaw city through an 11kV transmission lines and then distributed from the sub-station to Ka De village and Palaw city through 6.6kV distribution line of ESE property.

The annual electric power production of Ka De project is estimated to be about 13.5Gwh. Since this is larger than the annual consumption, the rest will be sent to Palaw city. For DRD/ESE, there is an expected increase of revenues by the selling of power and an accompanying revenue increase by transmission charge (wheeling charge).



Source: Google map,

Figure 5.2-1 project Bird's eye view of Ka De

The present power tariff in Ka De village is 375 Ks/kwh (it was 450 Ks/kwh last year), which has been adjusted according to the drop of heavy oil price (close to Ka De, there is also an area where it is as high as 700Ks/kwh.) The power is supplied for about 2～3 hours/day on average and but not at the specified time every day. The hearing investigation from the village chief and the villagers, who accompanied the second field survey by the Preparatory Survey Team, revealed that they would be willing to pay 200Ks/kwh as power tariff if the hydropower station started to supply electric power every day. This price, 200Ks/kwh, is about a half of the currently paid and is already declared by Regional government.

Although hydropower development projects in Myanmar, most of which are large-scale, have been implemented with the support of donors, they tend to face difficulties such as technical barriers and financial deficit in this country. An ODA-based hydropower project like this is more likely to reduce poverty, contributing to the mitigation of living gaps between city and village, and promotion of small- and medium-scale hydropower developments for local energy.

In addition, the promotion of this project will create employment opportunity for construction works, O&M, and the facilities management after the construction is finished. With the ODA-based development model,

technologies that advanced countries have - ranging from planning, design and construction to O&M and management of hydropower development – can be transferred to Myanmar.

Another advantage of the project would be its contribution to the prevention of air pollution, or the reduction of CO2 emission. As being one of the renewable energy, hydropower generation is expected to be an effective alternative to fossil fuel combustion from thermal power station operation such as diesel/gas/coal generation. Moreover, the use of hydropower as renewable energy itself works as a way to diversify energy, thus contributing to the reservation of energy security.

From the macro-economic point of view, the use of inexpensive hydropower energy with low price fluctuations reduces the fossil fuel consumption and the import of fuel volume, thus contributing to the saving of foreign currencies of Myanmar.

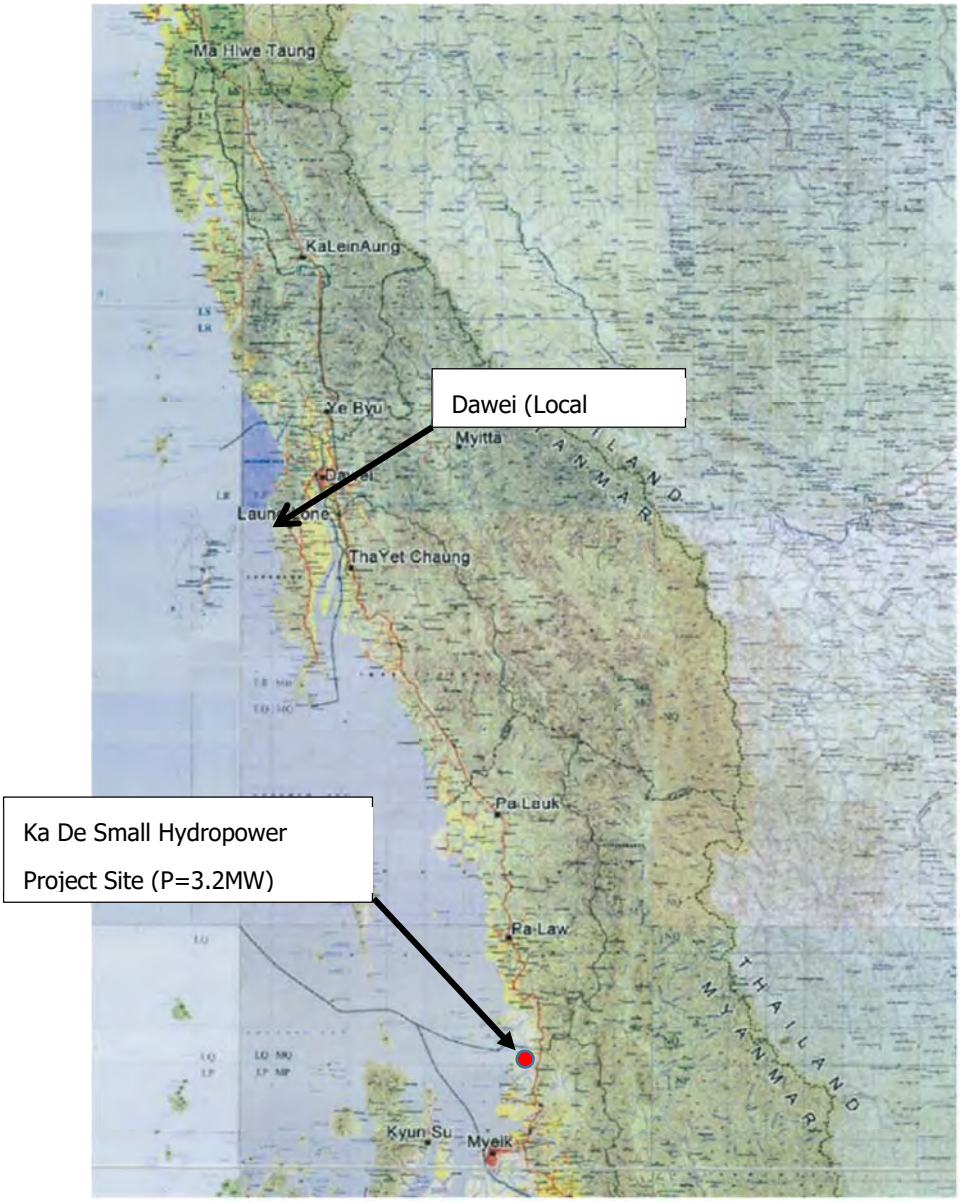


Figure 5.2-2 Project location

5.2.1 Technology/measure

(1)Intake dam (diversion weir)

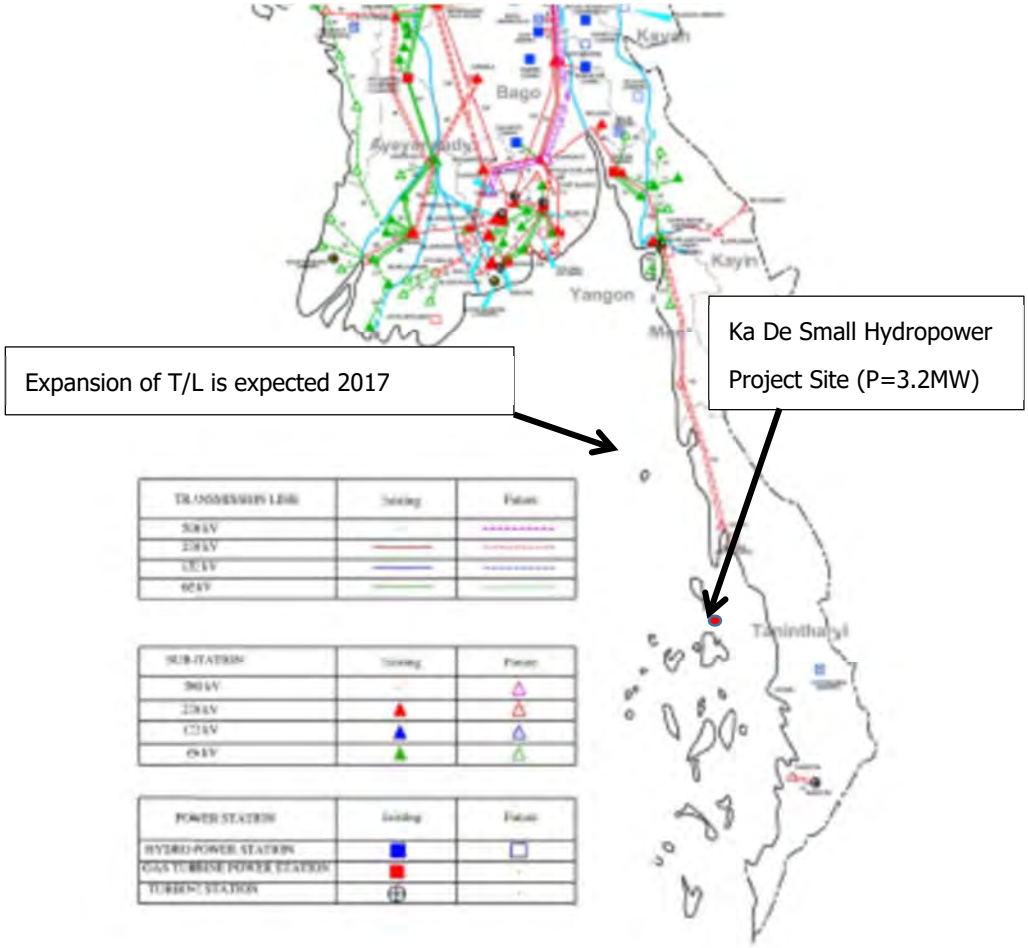
A concrete gravity dam with a height of 14m is provided for intake of the river water. With spillway, the free overflow system is employed for flood control. In order to make sure that the required water volume are inleted while preventing inflow of soil and sand into a waterway, a soil-and-sand flushing gate is provided near the intake. The deposited gravel, sand and soil in front of the intake are flushed. In addition, a fish-pass (waterway) is provided to allow the movement of underwater creatures such as fish so that the dam does not obstruct its natural behavior, i.e. spawning.

(2) Intake

The intake is installed on the left-bank in order to inlet the necessary water volume for power generation from the river into the waterway. It is composed of the following four things; (1) a trash boom installed upstream the intake to trap driftwood, garbage, etc. flowing into the waterway; (2) a screen and the accompanying trash-eliminating equipment; (3) an intake gate for extracting water for a prolonged period of time for inspection/repair of the waterway and its related structures (the gate is also for controlling the inflow volume in relation to the intake level and load fluctuation) and ;(4) a settling basin for precipitating and removing in-flowed soil and sand.

(3)Waterway (water channel)

A waterway for inletting the water for power generation is running to the head-tank. The channel is composed of a non-pressure channel and a canal-crossing bridge with the length of about 30m is employed at a transverse section over the stream.



Source: MOEP

Figure 5.2-3 Expansion Plan of National Grid Project

(4) Head-tank

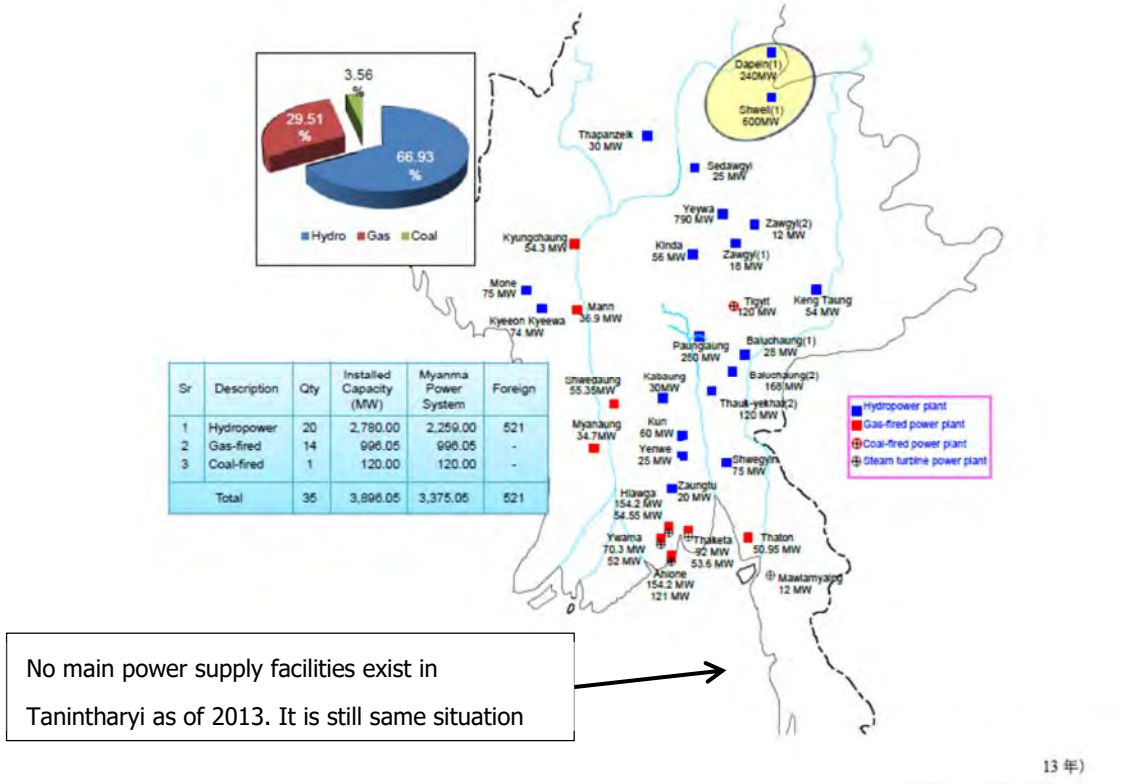
The head-tank is located at a connecting point of the water channel and the penstock pipe. This is to prevent adverse effect to the headrace, penstock pipe, water turbine, tailrace structures, etc. which can be caused by water hammer pressure due to load fluctuation or by water volume variation. The head-tank is composed of a gate, a sand flushing gate, a screen, trash eliminating equipment, an air vent and incidental equipment such as a water-level gauge and alarm device, etc.

(5) Head-tank spillway

It is facility for discharging overflow water from the head-tank to the river. The head-tank spillway is composed of overflow weir and concrete chute with a pranging pool.

(6)Penstock

An exposed steel pipe waterway with the length of 442m, usually called as penstock, is installed on a mountain slope in order to lead the water from the head-tank to the water turbine. A bent portion of the penstock is fixed by concrete anchor blocks, and a straight portion between the anchor blocks is supported by a concrete saddle.



Sr	Description	Qty	Installed Capacity (MW)	Myanma Power System	Foreign
1	Hydropower	20	2,780.00	2,259.00	521
2	Gas-fired	14	996.05	996.05	-
3	Coal-fired	1	120.00	120.00	-
Total		35	3,896.05	3,375.05	521

No main power supply facilities exist in Tanintharyi as of 2013. It is still same situation

Source: MOEP

Figure 5.2-4 Power Supply Facilities in Myanmar

(7) Power-station

The power-station is of open-air ground type. It is composed of a main machine room for the water turbine and generator, a switchboard room, an auxiliary equipment room for storing attached devices etc., a control room and an outdoor switchyard. A horizontal-axis Francis water turbine and a synchronous generator are installed in the main machine room.

(8)Tailrace structures

Tailrace is a waterway for leading the water released from the water turbine to the river. The tailrace structures are composed of an after-bay, a tailrace channel (open canal) and a tailrace outlet.

5.2.2 Alternative Study

(1) Development of Thermal Power Station

Since Myanmar does not produce fossil fuel, a thermal power station (having an output of about 2.4MW) equivalent to the project (a run-off-river power-station having an output of 3.2MW) can be explored as the alternative. However, the supposed amount of thermal power produced will be the same as the one currently supplied to the Palaw/Ka De power grid. This means that the condition of power supply of people in Palaw city and Ka De village will remain unchanged and high power tariff still come upon electricity consumers.

(2) Construction of Power Station of Non-Hydropower Renewable Energy

As an alternative to hydropower, other types of renewable energy (wind power, PV, biomass, etc.) might be the possibility in Myanmar. Although some of them could be locally produced, the geographical condition of Palaw city/Ka De village is said to be generally unfavourable for these. Specifically, its mountainous location provides

insufficient sunlight and very little place suitable for installation of PV unit, and fuel for biomass power generation cannot be sufficiently obtained. Furthermore, at present, it is well known that the construction cost of a PV or biomass power station is higher than that of a thermal or hydro power station.

(3) Continuation of Present Condition

This means that the same amount of electric energy supplied from the project will be supplied from national power grid if the project is not implemented. Unfortunately, the expansion schedule of national power grid to Palaw city/Ka De village is expected on 2020 afterward. Therefore, people in Palaw city/Ka De village will continue to bear high power tariff and they will be very difficult to improve their living-hood by then.

Since power demand in this area has been increasing every year, it is obvious that new power -stations such as diesel generation, which will make cover the deficit of power supply, will be constructed one after another. Accordingly, it can be said that the continuation of present condition is very difficult as an alternative plan for this project.

5.2.3 Investment analysis

(1) Inspection of optimal analysis method

There are three different analysis methods as follows;

① Cost comparison method,

② Comparison with alternative investment plan, and

③ Index-based confirmation.

(2) Selection of optimal analysis method

The most suitable method is selected from the above-mentioned three analysis methods.

The cost comparison method ① is to national grid power by revenues from selling electric power is not suitable. Because national grid power has been received subsidy from government, Ka De project cannot receive the subsidy when national grid would be expanded to this area.

Comparison with alternative investment project ② is not preferable because the alternative project such as diesel generation is not appropriate due to high power tariff. Therefore, the index-based confirmation ③ is the most suitable. The purpose of Ka De project development is to ensure an opportunity to supply the power to the people in Palaw city/Ka De village with reasonable price. When making decision on investment to the project, project developers are requested to take the power market, legal regulations and investment effect to infrastructure projects other than the projects into consideration.

The most comprehensible index for investment decision making is the tariff of the electric power compared to current it which the consumers are born at present.

The present power tariff at Palaw city/Ka De village is 375Ks/kwh as of 2015 (this price had been lowered from 450Ks/kwh due to the drop of fuel market last year). The local government of Tanintaryia state has declared to reduce the power tariff from ongoing power tariff to 200Ks/kwh when Ka De project will start commercial operation. For instance, the power tariff (as of 2015) with an application of tariff escalation with an annual rate of 2% accounts for $375\text{Ks/kwh} \times (1+0.02)^4 = 406\text{Ks/kwh}$ which serves as the power reference tariff (as of 2020) as the commissioning year of Ka De project. Therefore, when Ka De project starts its generation, the applied power tariff would be half price of ongoing it.

(3) Index calculation and comparative inspection

The levellized generating cost over the life period is calculated through financial calculation.

① Project developers' funds (capital)

② Borrowed money of the project (borrowing period and borrowing interest rate)

③ Discount rate applied to the project

④ Operation, maintenance and management costs (percentage with respect to project cost is applied)

⑤ Power sales cost

⑥ Taxes

Financial calculations obtain the internal ratio of return, present value, return on equity, weighted average cost of capital etc. applying the data as shown below.

5.2.4 Calculations of internal ratio of return, present value, return on equity and generating tariff etc.

(1) Weighted average cost of capital (WACC) expected

Expected WACC

= After-tax return on equity×Capital ratio + (1－Capital ratio)×Debt interest rate= 7.52%

Table 5.2-1 Financial calculation data

Description	Unit	Numeric value
Total project cost	Million Ks	9,480.40
Interest rate during construction period	%	0.01
Debt amount	Million Ks	8,058.49
Tax rate	%	20
Debt interest rate	%	0
Repayment period of debt[2]	year	40
After-tax return of equity(ROE)	%	47.8
Operation period	year	40
Operation and maintenance coefficient	%	1.5
Wheeling charge	Ks/kwh	Included in tariff
Escalation rate of O&M	%/year	8
Initial tariff as of 2020	Ks/kwh	200

(2) Levellized generating cost

The levellized generating cost for life period of 40 years is 105.8 Ks/kwh which is lower than the current generating cost of diesel generation which would be estimated about 406×1/3=135Ks/kwh as of 2020. Therefore, no investment barriers are seen for the project implementation.

[2] Grace period of 10 years is included.

In case of discount rate were weighted average cost of capital (WACC), the levellized generating cost would be 85.58Ks/kwh which means as the minimum levellized generating cost. This means that the invested capital could be recovered.

Table 5.2-2 Sensitivity analysis for FIRR

Item / Case	Generating cost	FIRR
	Ks/kwh	%
a)Basic case	105.8	7.70
b)Project cost (10% increase)	115.1	6.30
c)Annual output(10% decrease)	118.1	6.00
d) b) + c) happened at the same time	128.5	4.70

(3) Sensitivity analysis

Sensitivity analysis has done for the following cases:

The generating cost does not exceed the electric power reference tariff generated by diesel generation as 200Ks/kwh in all cases and Ka De project comes into attractive (resulting no investment barriers in).

(4) Calculation sheet of FIRR

Table 5.2-3 Financial Terms

Source	Interest rate	Front-end fee	Commitment fee	Repayment period (years)	Share	Loan	Equity	Retension Maney	Contribution	Total
Own Capital	0%	0%	0%		15.00%		1,421.92			1,421.92
JICA Loan	0.01%	0%	0.1%	30	85.00%	8,058.49			0.00	8,058.49
Bank Loan	13.00%				0.00%	0.00				0.00
Total					100.00%	8,058.49	1,421.92	0.00	0.00	9,480.40

＊1) Repayment period of 30 years in Table-3, the borrower will make repayment with principal and interest. It does not include grace period of 10 years in which the borrower will pay interest only.

Table 5.2-4 Disbuesement of Project Cost

(Unit: M Ks)

Commencement of Full Operation

(1) Construction Cost

Item	*2017*	*2018*	*2019*	*2020*	*Total*
1 **PIS including EIA etc**	0	**0.00**	**0.00**	**0.00**	**0.00**
2 **Preparatory Works**	82.95	497.7	165.9	82.95	829.5
3 **Construction Cost**		**2,827.44**	**4,112.06**	**771.06**	**7,710.56**
3.1 Civil Works		2,413.18	3,016.48	603.30	6,032.96
3.2 Electro-Mechanical Works		352.11	704.23	117.37	1,173.71
3.3 Transmission Line		62.15	124.29	20.72	207.15
3.4 Auxiliary Building			267.06	29.67	296.73
4 **Environmental & Social Cost**			0.00	0.00	0.00
4.1 Environmental Mitigation		0.00	0.00	0.00	0.00
5 **Project Management Cost**	**243.99**	**97.60**	**97.60**	**48.80**	**487.98**
Total Construction Cost	326.94	3,422.74	4,375.55	902.80	9,028.04
	3.6%	37.9%	48.5%	10.0%	100.0%
Total Construction Cost including VAT VAT= 5%	**343.29**	**3,593.88**	**4,594.33**	**947.94**	**9,479.44**

(2) Project Cost

item	**Unit**	*2017*	*2018*	*2019*	*2020*	*Total*
Equity	MKs.	343.29	1,078.63	0.00		1,421.92
Loan	MKs.					
Disburse	MKs.	0.00	2,515.25	4,594.33	947.94	8,057.52
Interest	MKs.		0.00	0.25	0.71	0.96
Total	MKs.	0.00	2,515.25	4,594.58	948.65	8,058.49
Equity(excl. fees) + Loan	MKs.	343.29	3,593.88	4,594.58	948.65	9,480.40
Commitment Charge	MKs.					
JICA	MKs.	8.06	5.54	0.95	0.00	14.55
Total of Fees	MKs.	8.06	5.54	0.95	0.00	14.55
Construction Insurance	MKs.	0.00	0.00	0.00	0.00	0.00
Initial Working Capital (IWC)	MKs.				64.05	64.05
Equity + Loan + Fees + IWC	MKs.	351.35	3,599.42	4,595.53	1,012.71	9,559.00

＊1) Construction cost includes 5% of VAT(value added tax).

＊2) Disbursement on 2020 means the release of retention money.

Table 5.2-5 Asseumtion on Financial Analysis (Operation Period : 40years)

No.	Item	Amount			Remark
1	**Capital Cost (Base Cost)**	Foreign (MKs)	Local (MKs)	Total (MKs)	
	2017			343.29	D/D & Tendering
	2018			3,593.88	Ground Break
	2019			4,594.33	Commisioning
	2020			947.94	
	Total			9,479.44	Current price
2	**Fund Source**	Foreign (MKs)	Local (MKs)	Total (MKs)	Repayment period (yr)
	Contribution			0.00	
	Equity			1,421.92	
	Loan			8,058.49	30
	Total			9,480.40	
3	**Loan Interest Rate**				
	JICA	0.010%			
4	**Construction Period**	3	years		
5	**Generation Capacity**	3.2	MW		
6	**Operation period**	40	years from start of operation		
7	**Energy Production (GWh)**	Primary	Secondary		
	2020	16.88	0		
	2021 onward	13.50	0		
	2019 Commencement	3.38			
8	**T/L Loss, P/P Consumption, etc.**	20.0%			
9	**Energy Sales (GWh)**	Primary	Secondary		
	2020	16.20	0		
	2021 onward	10.80	0		
	2019 Commencement	2.70			
10	**Tariff**	Primary	Secondary		
	Initial tariff (Ks/kWh)	200			
	2nd period(Ks/kWh)	230			
	3rd period(Ks/kWh)	250			
	4th period(Ks/kWh)	280			
11	**Annual O & M Costs**				
	Unit fixed cost	1.50%	of project base cost		
	Unit variable cost	0.26	Ks./MWh		
	Annual fixed cost	128.10	MKs.		
	Annual variable cost	0.0035	MKs.		
	Total O & M cost	128.10	MKs.		
	Escalation rate	8.00%			
13	**Depreciation / Amortization**	Financial charge	Capital assets		
	Period (years)	0	40		
	Salvage value	0%	10%		
	Method	Straight-line	Straight-line		
14	Debt service reserve	50%		50% of annual debt service	
15	Initial working capital	50%	of annual fixed OM cost in 2020		
20	Corporate tax rate	20%	No tax holiday		
21	VAT	5%			
22	Dividend rate	80%	of net profit		
23	Withholding tax rate	0%	of divident		
24	CPI inflation rate	2.00%			
25	Insurance Premium Rate	0.00%		For assets	
26	Insurance Premium Rate	0.00%		Construction period	3

Table 5.2-6 Project Cashflow Statement

(Base case)

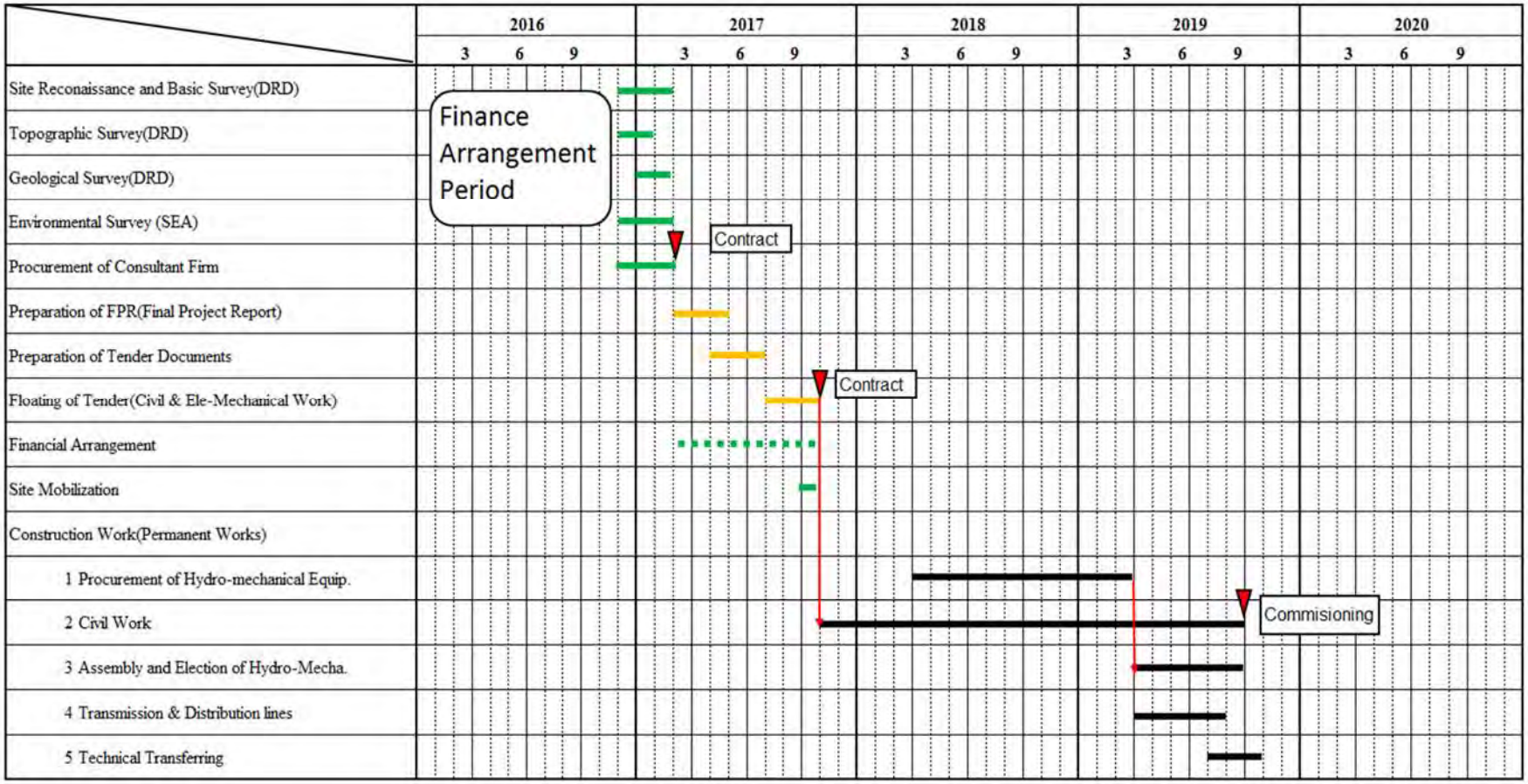
Item			Year	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059
Income Statement	Operating Revenue			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
		Energy Sales	GWh	16.200	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800
		Primary	GWh	16.200	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800	10.800
		Power Tariff(Primary)	Ks/kWh	200	200	200	200	200	200	200	200	200	200	230	230	230	230	230	230	230	230	230	230	260	260	260	260	260	260	260	260	260	260	280	280	280	280	280	280	280	280	280	280
		Operating Revenue	M Ks.	3,240	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,484	2,484	2,484	2,484	2,484	2,484	2,484	2,484	2,484	2,484	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	3,024	3,024	3,024	3,024	3,024	3,024	3,024	3,024	3,024	3,024
		Primary	M Ks.	3,240	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,484	2,484	2,484	2,484	2,484	2,484	2,484	2,484	2,484	2,484	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	3,024	3,024	3,024	3,024	3,024	3,024	3,024	3,024	3,024	3,024
	Operating Expenses	O & M Cost	M Ks.	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	585	585	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128
		Fined Cost	M Ks.	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128
		Replacement	M Ks.																				457.15	457.15																					
		Variable Cost	M Ks.	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.05	0.05	0.06	0.06	0.07	0.07
		Retention Money	M Ks.	947.94																																							
		Depreciation (Capital Assets)	M Ks.	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213
		Total Cost	M Ks.	1,289	341	341	341	341	341	341	341	341	341	341	341	341	341	341	341	341	341	341	799	799	341	341	341	341	341	341	341	341	341	341	341	341	341	341	341	341	341	341	341
	Operating Income		M Ks.	1,951	1,819	1,819	1,819	1,819	1,819	1,819	1,819	1,819	1,819	2,143	2,143	2,143	2,143	2,143	2,143	2,143	2,143	2,143	1,685	1,901	2,359	2,359	2,359	2,359	2,359	2,359	2,359	2,359	2,359	2,683	2,683	2,683	2,683	2,683	2,683	2,683	2,683	2,683	2,683
	Non-operating Statement	Interest Payment in Total	M Ks.	0.806	0.806	0.806	0.806	0.806	0.806	0.806	0.806	0.806	0.806	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779
		Short-term Interest Payment	M Ks.																																								
		Non-operating Income	M Ks.																																								
		Total	M Ks.	0.806	0.806	0.806	0.806	0.806	0.806	0.806	0.806	0.806	0.806	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779
	Profit before Tax		M Ks.	1,950	1,818	1,818	1,818	1,818	1,818	1,818	1,818	1,818	1,818	2,142	2,142	2,142	2,142	2,142	2,142	2,142	2,142	2,142	1,685	1,901	2,358	2,358	2,358	2,358	2,358	2,358	2,358	2,358	2,358	2,682	2,682	2,682	2,682	2,682	2,682	2,682	2,682	2,682	2,682
	Corporate Tax(20%)		M Ks.	390	364	364	364	364	364	364	364	364	364	428	428	428	428	428	428	428	428	428	337	380	472	472	472	472	472	472	472	472	472	536	536	536	536	536	536	536	536	536	536
	Net Profit		M Ks.	1,560	1,454	1,454	1,454	1,454	1,454	1,454	1,454	1,454	1,454	1,713	1,713	1,713	1,713	1,713	1,713	1,713	1,713	1,713	1,348	1,521	1,886	1,886	1,886	1,886	1,886	1,886	1,886	1,886	1,886	2,145	2,145	2,145	2,145	2,145	2,145	2,145	2,145	2,145	2,145
	Cummulative Net Profit		M Ks.	1,560	3,014	4,468	5,923	7,377	8,831	10,285	11,739	13,194	14,648	16,361	18,075	19,788	21,502	23,215	24,929	26,642	28,355	30,069	31,417	32,937	34,823	36,710	38,596	40,482	42,368	44,254	46,141	48,027	49,913	52,059	54,204	56,349	58,495	60,640	62,786	64,931	67,076	69,222	71,367
Fund Statement	Source	Operating Income	M Ks.	1,951	1,819	1,819	1,819	1,819	1,819	1,819	1,819	1,819	1,819	2,143	2,143	2,143	2,143	2,143	2,143	2,143	2,143	2,143	1,685	1,901	2,359	2,359	2,359	2,359	2,359	2,359	2,359	2,359	2,359	2,683	2,683	2,683	2,683	2,683	2,683	2,683	2,683	2,683	2,683
		Amortization (Financial Fees)	M Ks.																																								
		Depreciation (Capital Assets)	M Ks.	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213
		Non-operating Income	M Ks.																																								
		Loan Capital	M Ks.																																								
		Equity Capital (excl. Ins. Prem.)	M Ks.	9,346	9,132	8,919	8,706	8,492	8,279	8,066	7,853	7,639	7,426	7,213	6,999	6,786	6,573	6,359	6,146	5,933	5,719	5,506	5,293	5,080	4,866	4,653	4,440	4,226	4,013	3,800	3,586	3,373	3,160	2,946	2,733	2,520	2,306	2,093	1,880	1,667	1,453	1,240	1,027
		Income in Total	M Ks.	2,164	2,032	2,032	2,032	2,032	2,032	2,032	2,032	2,032	2,032	2,356	2,356	2,356	2,356	2,356	2,356	2,356	2,356	2,356	1,899	2,115	2,572	2,572	2,572	2,572	2,572	2,572	2,572	2,572	2,572	2,896	2,896	2,896	2,896	2,896	2,896	2,896	2,896	2,896	2,896
	Use	**Interest Payment in Total**	M Ks.	0.806	0.806	0.806	0.806	0.806	0.806	0.806	0.806	0.806	0.806	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779	0.779
		Bank Balance	M Ks.	8,058	8,058	8,058	8,058	8,058	8,058	8,058	8,058	8,058	8,058	7,790	7,521	7,253	6,984	6,715	6,447	6,178	5,910	5,641	5,372	5,104	4,835	4,566	4,298	4,029	3,761	3,492	3,223	2,955	2,686	2,418	2,149	1,880	1,612	1,343	1,074	806	537	269	0
		Loan Payment in Total	M Ks.	0	0	0	0	0	0	0	0	0	0	269	269	269	269	269	269	269	269	269	269	269	269	269	269	269	269	269	269	269	269	269	269	269	269	269	269	269	269	269	269
		Insurance Premium	M Ks.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Short-term Debt Service	M Ks.																																								
		Corporate Tax	M Ks.	390	364	364	364	364	364	364	364	364	364	428	428	428	428	428	428	428	428	428	337	380	472	472	472	472	472	472	472	472	472	536	536	536	536	536	536	536	536	536	536
		Payment in Total	M Ks.	391	364	364	364	364	364	364	364	364	364	698	698	698	698	698	698	698	698	698	606	650	741	741	741	741	741	741	741	741	741	806	806	806	806	806	806	806	806	806	806
	Cash Surplus		M Ks.	1,773	1,668	1,668	1,668	1,668	1,668	1,668	1,668	1,668	1,668	1,658	1,658	1,658	1,658	1,658	1,658	1,658	1,658	1,658	1,292	1,465	1,831	1,831	1,831	1,831	1,831	1,831	1,831	1,831	1,831	2,090	2,090	2,090	2,090	2,090	2,090	2,090	2,090	2,090	2,090
	Cummulative Cash Surplus		M Ks.	1,773	3,441	5,108	6,776	8,443	10,111	11,778	13,446	15,113	16,781	18,439	20,097	21,755	23,414	25,072	26,730	28,388	30,046	31,704	32,997	34,462	36,293	38,124	39,955	41,785	43,616	45,447	47,278	49,109	50,940	53,030	55,120	57,210	59,301	61,391	63,481	65,571	67,661	69,751	71,841
Debt Service Reserve Account			M Ks.	0	0	0	0	0	0	0	0	0	0	135	135	135	135	135	135	135	135	135	135	135	135	135	135	135	135	135	135	135	135	135	135	135	135	135	135	135	135	135	135
Dividend Payment			M Ks.	1,248	1,163	1,163	1,163	1,163	1,163	1,163	1,163	1,163	1,163	1,371	1,371	1,371	1,371	1,371	1,371	1,371	1,371	1,371	1,078	1,216	1,509	1,509	1,509	1,509	1,509	1,509	1,509	1,509	1,509	1,716	1,716	1,716	1,716	1,716	1,716	1,716	1,716	1,716	1,716
Withholding Tax			M Ks.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cummulative Dividend Payment after Withholding Tax			M Ks.	1,248	2,411	3,575	4,738	5,901	7,065	8,228	9,392	10,555	11,718	13,089	14,460	15,831	17,201	18,572	19,943	21,314	22,684	24,055	25,133	26,350	27,859	29,368	30,877	32,386	33,895	35,404	36,913	38,422	39,931	41,647	43,363	45,080	46,796	48,512	50,229	51,945	53,661	55,377	57,094
Cash Surplus after Dividend Payment & Withholding Tax			M Ks.	525	504	504	504	504	504	504	504	504	504	287	287	287	287	287	287	287	287	287	214	249	322	322	322	322	322	322	322	322	322	374	374	374	374	374	374	374	374	374	374
Debt Service Cover Ratio (DSCR)				651.84	625.62	625.62	625.62	625.62	625.62	625.62	625.62	625.62	625.62	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	0.80	0.92	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39

Table 5.2-7 KaDe Mini-hydropower Project Cost (Operation Period : 40 years)

(As of 2015)

No	Description	Amount(MKs)	Foreign Currency(K$)	Local Currency(MKs)
1	Site Reconnaissance Cost	0.000		
2	Preparatory Work Cost	790.000	0.000	790.000
	2.1 Site Mobilization	790.000	0.000	790.000
	2.11 Earth Work Preparation	200.400		200.400
	2.12 Road & bridge	500.000		500.000
	2.13 Temporary Buildings	79.600		79.600
	2.14 Cleaning of Project Area	10.000		10.000
3	**Construction Cost**	7,343.388	3.471	2,900.025
	3.1 Civil Works	5,745.678	2.512	2,530.607
	3.11 Dam/Weir	3,322.000	1.038	1,993.200
	Intake	0.000		
	Stilling Basin	0.000		
	Waterway	0.000		
	Headtank	0.000		
	Penstock	1,896.960	1.186	379.392
	Powerhouse	526.718	0.288	158.015
	Tailrace	0.000		
	3.2 Hydro-mechanical Equipment	1,117.820	0.830	55.891
	3.21 Gates, Turbine, Generator etc.	1,117.820	0.830	55.891
	3.31 Transmission/Distribution Lines	197.290	0.108	59.187
	3.41 Auxiliary Building	282.600	0.022	254.340
	3.3 Physical Contingency(1)	406.650	0.159	203.325
4	**Environmental & Social Cost**	0.000		
	4.1 Environmental Mitigation Work			
5	**Administration Cost**	487.980	0.267	146.394
	Total Amount	**9,028.018**	**3.897**	**4,039.744**

Table 5.2-8 Impremention Schedule for Ka De Mini-hydropower Project



＊1)The best timing of commissioning date is at the end of dry season, namely the beginning of rainy season on June. Therefore, this construction schedule should be squeezed for the total of 3 months from the viewpoint of revenues. The writer thinks that the squeeze of construction period shall be possible.

5.2.5 Barrier analysis

There are various hurdles in addition to the above-mentioned investment barriers and these hurdles hinder development funds procurement.

In general, investigation and construction of hydro power station require a large amount of labour, time and cost in comparison with the construction of a substitutable thermal power station of the same scale, and the payback period is longer than other projects. For these reasons, hydropower developments are not attractive for investment. DRD does not have experiences of hydropower development yet and therefore approval acquisition, coordination between interested parties and environmental assessment etc. require a large amount of labour, time and cost.

Each individual risk related to investment hurdles will be explained below.

(1) Country risk

In Myanmar which is blessed with favourable topographical and geographical conditions (precipitous terrains and plentiful hydropower resources), large- and middle-scale hydropower developments have been implemented by Ministry of Electric Power (hereinafter referred to be “MOEP”) with the support of donors since the '50s.

Ka De project is not subjected to development by MOEP that could obtain development funding from international financial institutions. Furthermore, investment hurdles exist also for private investors, making the project difficult to implement. In spite of a small scale and small revenues, this project requires a large initial investment cost and a long payback period, which are reasons why the project has not attracted investors' interest.

Uncontrollable risks for these project developers include the country risk, exchange risk, electric power sales and the like. However, when the project was approved as an ODA-based project, an ODA schemes are ensured thus alleviating following investment hurdles.

Electrical equipment such as the water turbine and generator with the high degree of technology is procured from advanced nations (equipment procured from developing countries are inferior to the reliability). ODA money (hard currencies such as Yen) can be applied as repayment funds, alleviating the exchange risk for debt repayment and simultaneously making it easier to make an equipment supply contract.

Creation of social and economic benefits also promotes the participation of private participants (private investors) who can make full use of new technologies from advanced nations.

(2) Access to the project site

This project site is located 10km east from Palaw city. The access road to the project site with the length of about 11km will be planned and constructed by local government shortly. Therefore, this cannot be a risk for project implementation, though thermal power generation is comparatively easy to access.

(3) Drought risk

This project is a hydropower generation project, and a drought risk may be uncontrollable. On the other hand, development of thermal power station has a fuel procurement risk (price increase, securing of material handling way, production stop, etc.). Therefore, it is said that the drought risk specific to a hydropower generation project can be a fuel supply risk.

(4) Rights-and-duties prosecution risk

Since hydraulic equipment of the project is produced by order and therefore has low versatility and furthermore is laid with concrete, carrying out and reselling is difficult (in other words, the hydraulic equipment has no potential for diversion). In the contrary, it is said that the turbine and generator of thermal power station are easier to withdraw and move than the hydraulic equipment. Therefore, the rights-and-duties prosecution risk in the event of default on an obligation of the project is larger than thermal power station.

(5) Risk that the project is not approved as an ODA project

If Ka De project is not approved as an ODA project, the project is least likely to be implemented and new thermal power station is likely to be implemented or continuation of present condition is staying on.

Therefore, if the project is approved and implemented as an ODA project, it becomes possible to alleviate "Country risk".

5.2.6 Technical hurdles

As mentioned in investment barrier, MOEP will be assigned to hydropower developments with an output of more than 5MW or over. DRD has no background in planning, design and construction of hydropower development. In particular, DRD has no experience in power generation planning, structure design, construction, quality control, and operation and maintenance related to hydropower, which serve as technical hurdles for development potential[3].

Each individual risk related to technical hurdles will be explained below.

(1) Civil engineering technical risk

This project generates the electric power by use of the altitude difference by the river slope of a natural river. A diversion weir is installed in the river to take the water, and a settling basin is installed at a plain land near the diversion weir to remove floating soil and sand. The clean water is led to a head-tank (water tank) through waterway made concrete open channel. The water drops from the head-tank through a penstock pipe (about 442m) and rotates a generator directly connected with a water turbine (Francis water turbine) in the power station to generate electric power. The water that evacuated energy after power generation is discharged to the original river through a tailrace structures. Furthermore, in the case of a run-of-river power generation, the water volume used for the water turbine (turbine output) is automatically controlled in relation to the fluctuation of the river flow. Therefore, if the turbine suddenly stops from any cause, the water is safely discharged into the river through a head-tank spillway provided with head-tank.

Civil engineering technologies applied to the project largely differ from those applied to thermal power station, and therefore it is difficult to simply compare technical risks. Since the above-mentioned hydropower technologies applied to the project has a history of 100 years or longer and accordingly high degree of technology, it can be said that there are few indefinite technical factors unlike thermal power generation. Therefore, generally there are few technical risks.

(2) Delay of work risk

It is said that construction of a hydropower station requires about twice as many work periods as a thermal power station of the same scale. An increase in construction costs by price escalation occurring in the difference between processes and change of electric power tariff by change of social and economic situation are uncontrollable risks for the project.

In Myanmar, large- and medium-scale hydropower development technologies have been transferred and accumulated for several years. Technical hurdles of the project can be alleviated by applying these technologies. DRD as main development body does not have an experience in maintenance, management and operation of small-scale hydropower generation. Although DRD receives technology transfer related to the maintenance, management and operation under acquisition during large- and medium-scale hydropower development, DRD can perform maintenance, management and operation of the project. Therefore, it can be said that technical hurdles that hinder the implementation of the project can be alleviated.

[3] MOEP provides state-of-the-art technology of hydropower for large- and medium-scale hydropower. Therefore, this is the systematic problem of energy sector in Myanmar. It will be possible to be solved by transferring of hydropower technology from MOEP to DRD. If it were hard, DRD should hire foreign consultants to master hydropower technologies in introduction stage.

5.2.7 Institutional hurdles

Myanmar government has been promoting the use of renewable energy from the viewpoint of electrification promotion in local districts; concrete measures for promoting development support related to the use of renewable energy depend on donor support. Therefore, if donor support cannot be obtained, renewable energy is not used in reality.

If the project is approved and implemented as an ODA project, this has not served as institutional hurdles that hinder the use of renewable energy.

Although the above-mentioned investment barriers, technical and institutional hurdles hinder the implementation of the project in reality, some hurdles (for example, country risk) can be alleviated if the project is approved and implemented as an ODA project. It is known that various barriers and hurdles exist in the implementation of the hydropower project, and it is difficult to remove all of the above-mentioned barriers and hurdles through an ODA project. Specifically, it can be said that the above-mentioned barriers, hurdles and risks are to be borne by every project in project implementation.

Barriers that hinder activity and attainment of proposed project arise in the case of project implementation. Specifically, if the project is not implemented, it is thought that one of the following three project alternatives is likely to be implemented.

Thermal power station construction is likely to be performed and rarely subjected to the above-mentioned barriers and the attainment is not hindered.

Construction of power stations using non-hydropower renewable energy is subjected to the above-mentioned barriers and the attainment is likely to be hindered.

Continuation of present condition without project implementation means that the present condition will continue and is not subjected to the above-mentioned barriers.

Among these project alternatives, ③Continuation of present condition without project implementation is most likely to serve as alternative.

Above three alternative projects means that power tariff would still high and would not introduce poverty reduction and rural development. This is the reason why Ka De project is expected to approve and implement as an ODA project.

5.3 Organization chart

Fig-6 shows preferable organization chart for the period of project implementation and operation/maintenance.

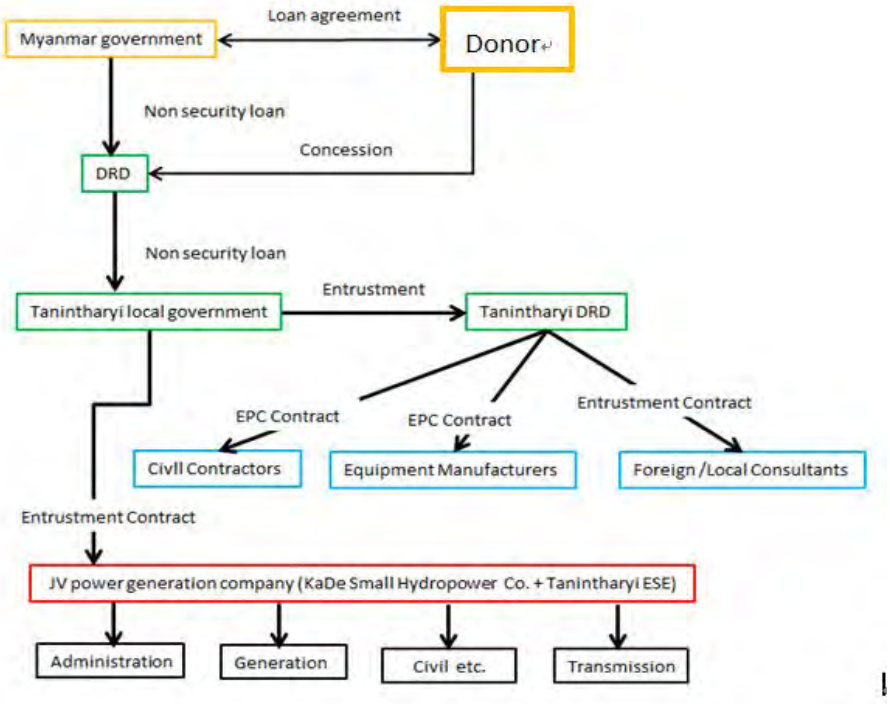


Figure 5.3-1 Organization chart of Ka De project

5.4 Conclusion

In this field survey, the villager (village people who accompanied with village chief) of Ka De village were sounded about the power tariffs of 200Ks/kwh. Since in the old days the electric power supply was performed (distribution line is coming) in Ka De village, they feel a lot of pains such as to use telephone and to watch TV etc., due to no power supply at present.

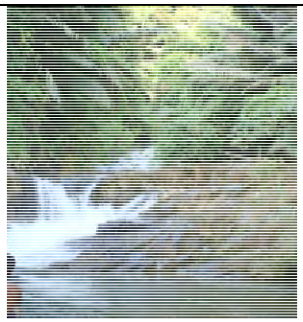
		
Crossing the river on the way	Dam site	Survey menbers

Image 5.4-1 Reconnaissance survey of Ka De project on 13th Oct. 2015

They say that power supply is sometimes carried out with about power tariff of 400kyats/kwh. If power would be supplied by small scale hydropower, they are willing to pay power charge because of the tariff with 1/2 of the present charge. Moreover, they will fully cooperate for the construction of small scale hydropower station.

In this area, there are dotted sites for promising of hydropower development which is domestic renewable energy. Moreover, this area is close to large power market, easy to access to project site and short distance to new transmission line. We think that the development of Ka De small scale hydropower using like this great natures will introduce expansion of power supply area (rural electrification), improvement of life standard and regional improvement as poverty reduction.

In Myanmar, large scale developments of hydropower have been done, and many farmers had lost and been kicked out by the construction of large scale development. Then, generated electric power has been sent to big cities, and no benefit had been brought to farmers (Electric power development which was carried out by Japan's post war compensation in the 1950s has been also one of them).

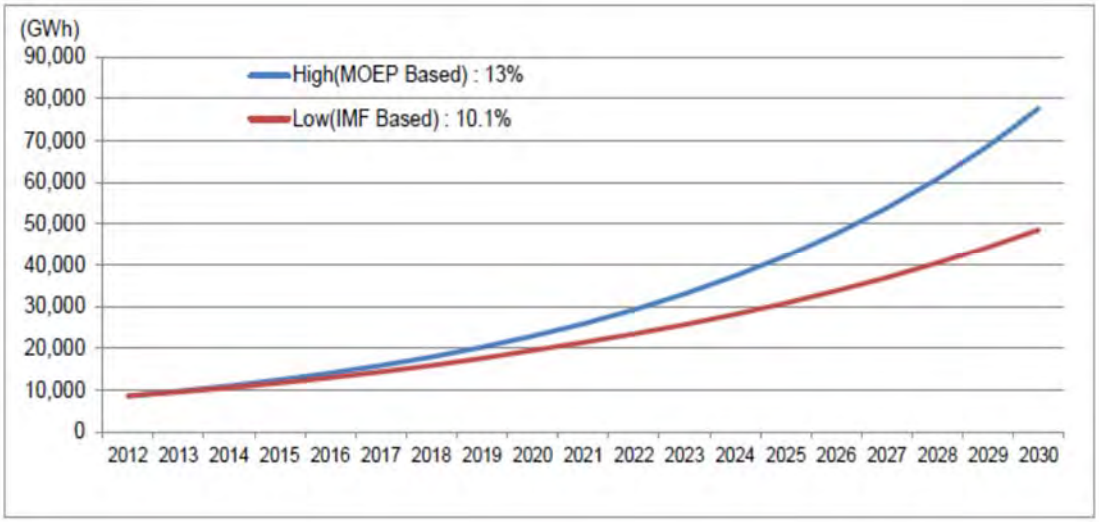
There are mountains and rivers in the Ka De village in which this project is located.

Small scale hydropower will inherit mountains and rivers in the Ka De village in the next generation, and is local-supply-and-local-consumption type of energy which shall protect the area.

Since the output of Ka De hydropower is small, making exiting economic progress with introductory of this small scale hydropower will be unreasonable, but Ka De villagers are expecting the support which does not expand gaps of living standard. The Ka De project shows feasible financial features for the project implementation such as FIRR(7.70%) and levellized generating cost (105.8 Ks/kwh) for base case, and various sensitivity analyses also indicate preferable indices in its life period of 40 years from the viewpoints of economic analyses. As Ka De project is small scale hydropower project, it has little risk of being influenced by inflation from finance aspects when project started operation. Namely, it is judged as the non-recourse loan project which can be repaid with the revenues from the project, and is a bankable investment project.

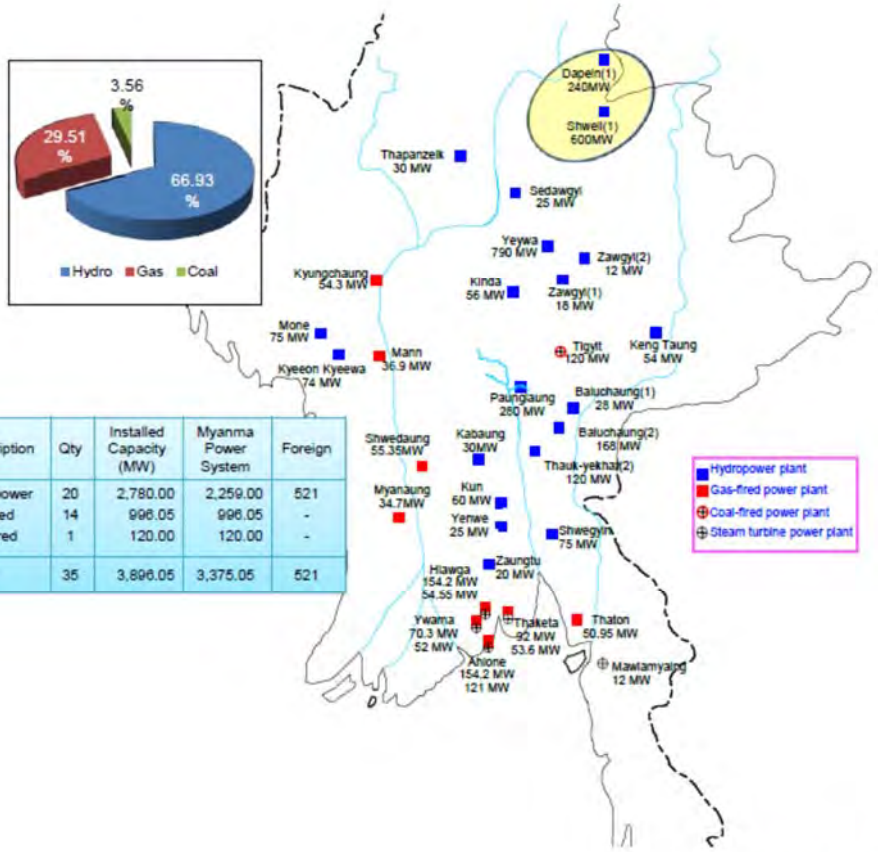
5.5 Reference materials from MOEP

1) Demand forecast until 2030



Region/State	High Case(MW)		Low Case(MW)	
	FY2012	FY2030	FY2012	FY2030
Kachin	21	185	21	140
Kayah	8	162	8	130
Kayin	13	165	13	135
Chin	3	90	3	60
Mon	45	418	45	338
Rakhine	10	243	10	180
Shan	103	355	103	288
Sagaing	98	349	98	282
Tanibtharyi	52	290	52	235
Bago	131	646	131	523
Magway	106	293	106	238
Mandalay	457	2,731	457	2,203
Ayeyarwady	85	406	85	329
Yangon	742	8,209	742	4,019
Total	1,874	14,542	1,874	9,100

2) Existing power facilities including IPP



Sr	Description	Qty	Installed Capacity (MW)	Myanma Power System	Foreign
1	Hydropower	20	2,780.00	2,259.00	521
2	Gas-fired	14	996.05	996.05	-
3	Coal-fired	1	120.00	120.00	-
	Total	35	3,896.05	3,375.05	521

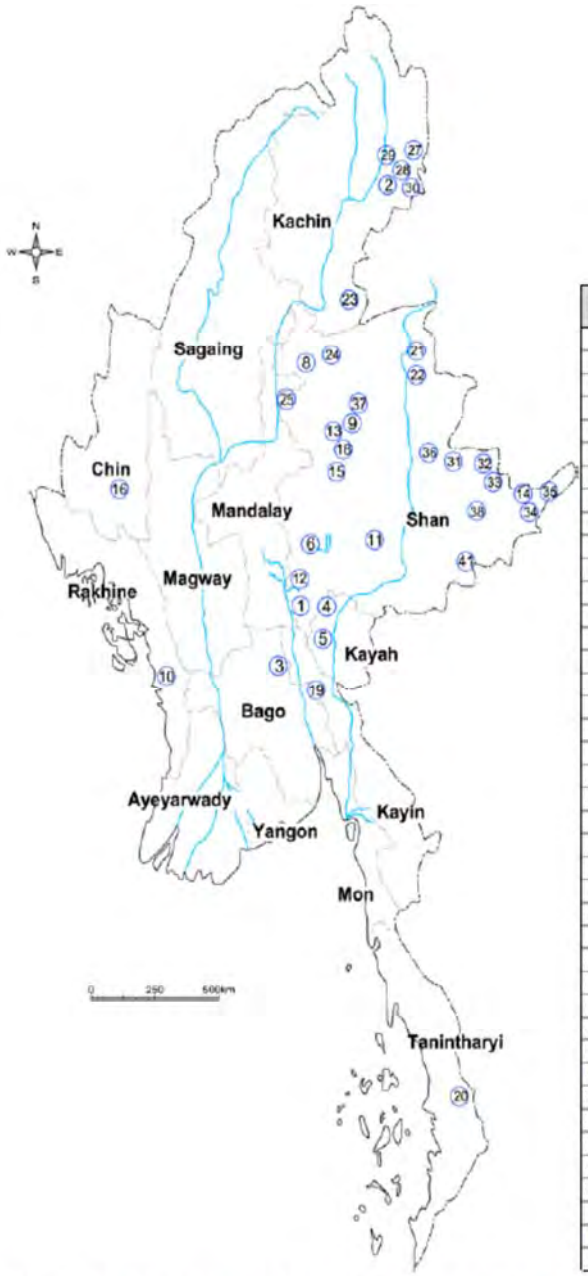
	Hydropower	Output (MW)
1	Baluchaung-1	28
2	Baluchaung-2	168
3	Yeywa	790
4	Kinda	56
5	Sedawgyi	25
6	Zawgyi -1	18
7	Zawgyi -2	12
8	Thapanzeik	30
9	Mone	75
10	Paunglaung	280
11	Kabaung	30
12	Yenwe	25
13	Zaungtu	20
14	Shweli-	600 (300)
15	Keng Tawng	54
16	Shwegyin	75
17	Kun	60
18	Kyee On Kyee Wa	74
19	Dapein-1	240(221)
20	Thauk Ye Khat-2	120
	Subtotal	2,780 (521)

	Gas-fired	Output (MW)
1	Kyungchaung	54.3
2	Mann	36.9
3	Shwedaung	55.35
4	Mawlamyaing	12
5	Myanaung	34.7
6	Hlawga	154.2+54.55*=208.75
7	Ywama	70.3+52*=122.3
8	Ahlone	154.2+121*=275.2
9	Thaketa	92+53.6*=145.6
10	Thaton	50.95
	Subtotal	996.05

	Coal-fired	Output (MW)
1	Tigyit	120

Existing Power System Total = 3,896.05 (521) MW

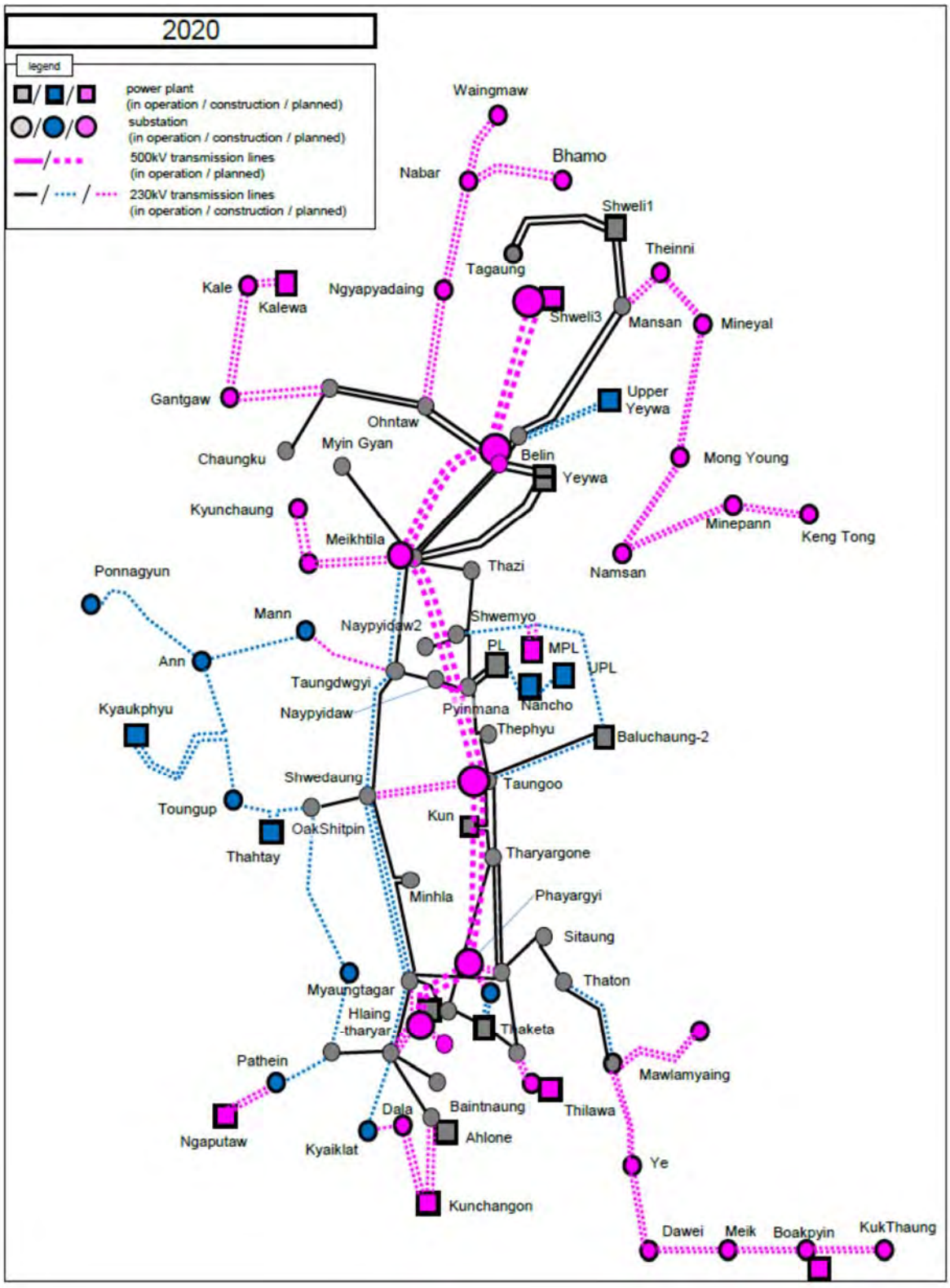
(-----) shows power capacity operated by IPPs



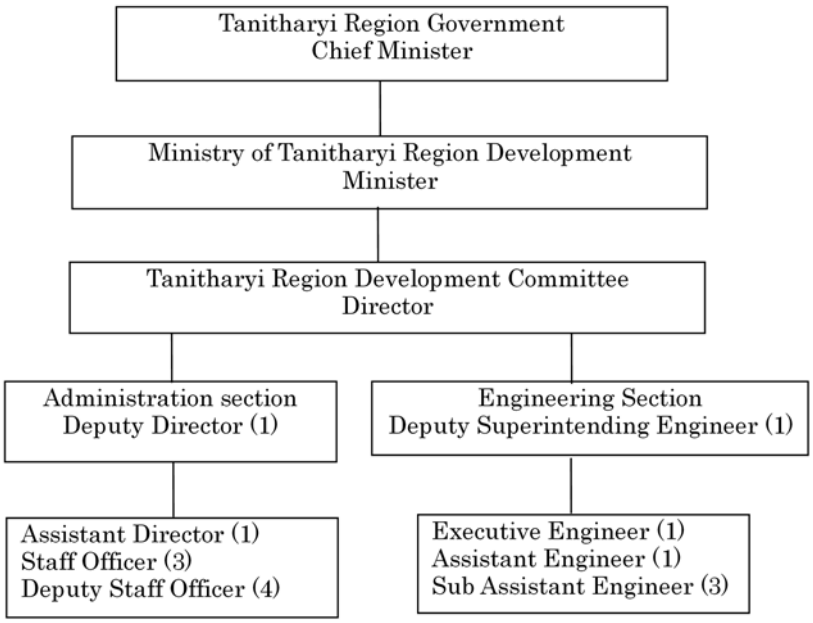
No.	Project	Installed Capacity for Myanmar(MW)	Operation Year
1	Nancho (MOEP)	40	2013-14
2	Chipwi Nge (JV)	99	2013-19
3	Phyu (MOEP)	40	2014-15
4	Upper Paunglaung (MOEP)	140	2014-15
5	Baluchaung-3 (BOT)	52	2013-14
6	Upper Baluchaung (BOT)	30.4	2017-18
7	Projects (MOAI)	79	2014-15
8	Shweli-3 (MOEP)	1050	2019-20
9	Upper Yeywa (MOEP)	280	2018-19
10	Thahtay (MOEP)	111	2018-19
11	Upper Keng Tawng	51	2017-18
12	Middle Paunglaung	100	2018-19
13	Dee Doke	66	2018-19
14	Mong Wa (BOT)	50	2016-17
15	Ngotchaung (BOT)	16.6	2017-18
16	Upper Bu (MOAI)	150	2020-21
17	Keng Kham (MOAI)	6	2020-21
18	Middle Yeywa	320	2023-24
19	Bawgata	160	2023-24
20	Tanintharyi	600	2030-31
21	Upper Thanlwin (Kunlong) (JV)	700	2021-22
22	Naopha, Mantong (JV)	712	2022-23
23	Dapein-2 (JV)	84	2021-22
24	Shweli-2 (JV)	260	2022-23
25	Upper Sedawgyi (MOAI)	64	2030-31
26	Nam Tamhpak (JV)	100	2030-31
27	Gaw Lan (JV)	50	2026-27
28	Hkan Kawn (JV)	80	2026-27
29	Lawngdin (JV)	300	2028-29
30	Tongxingqiao (JV)	170	2028-29
31	Keng Tong (JV)	64	2026-27
32	Wan Ta Pin (JV)	17	2026-27
33	So Lue (JV)	80	2026-27
34	Keng Yang (JV)	20	2026-27
35	He Kou (JV)	50	2026-27
36	Nam Kha (JV)	100	2030-31
37	Namtu (Hsipaw)	50	2030-31
38	Mong Young	22	2030-31
39	Dun Ban	65	2030-31
40	Nam Li	82	2030-31
41	Nam Khot	25	2030-31

Note: This figure consists of the candidate projects of MOEP.
As this plan is based on the provisional simulation, it may change in the future.

4) Future expansion plan of transmission line as of 2020



5.6 List of interviewees as of 12th and 13th October, 2015



Mr. Myat Ko Thanintharyi Region Cheif Minister
Mr. Win Swe Thanintharyi Region Minister
Mr. Thet Paing Tanintharyi DRD Director
Mr. Khin Lay Tanintharyi ESE Chief Engineer 098762323
Mr. Hla Tun Yangon Local Consultant Engineer 09972634448
Mr. Tin Thein Tanintharyi Ka De village Chairman of Ka De Village

5.7 ENVIRONMENTAL AND SOCIAL CONSIDERATION

5.7.1 Scoping Results

The result of scoping for Ka De Mini Hydropower Station is shown in the below Table .

Scoping Results of Ka De Mini Hydropower Station (Tanintharyi Region)

	No	Impacted Item on JICA Guidelines	Rating		Reasons of the Rating
			Pre/ During Construction	Operation Phase	
Pollution	1	Air pollution	B−	C	**Construction phase:** Some negative impact is expected due to the increase in traffic number in access roads. And temporary negative impacts are expected on air quality due to the use of construction machines and equipment. **Operation phase:** Extent of impact is unknown at this stage. Some negative impact is expected due to the increase in traffic number in access road. However, expected impact is limited because the site is located in mountain areas.
	2	Water pollution	B−	C	**Construction phase:** Turbid water may be generated by earth works. Additionally, organic polluted water may be discharged from base camp. **Operation phase:** Extent of impact is unknown at this stage
	3	Waste	B−	D	**Construction phase:** Construction waste such as waste soil and cut trees are expected. Additionally, domestic waste and night soil may be generated from construction base camp. **Operation phase:** No impacts are expected
	4	Soil contamination	D	D	**Construction and Operation phase:** No impacts are expected.
	5	Noise and vibration	B−	C	**Construction phase:** Noise generation is expected due to works of construction machines and equipment. **Operation phase:** Extent of impact is unknown at this stage. Noise generation is expected because of the increase in traffic number and travelling speed. However, the expected impact is limited because the site is located in mountainous or rural areas.
	6	Ground subsidence	D	D	**Construction and operation phase:** No impacts are expected since activities which cause ground subsidence are not planned.
	7	Odor	C	C	**Construction and operation phase:** Extent of impact is unknown at this stage. Offensive odor may be generated by using generator.
	8	Bottom Sediment	C	C	**Construction and Operation phase:** Extent of impact is unknown at this stage.
Natural environment	9	Protected area	A-/B-	C	**Construction and operation phase:** There is Tanintharyi National Park around 20km at east side of the site where endangered species inhabit. As cutting of many trees is expected, some negative impact is expected.
	10	Ecosystem	A-/B-	C	**Construction and Operation phase:** There is Tanintharyi National Park around 20km at east side of the site where endangered species inhabit. As cutting of many trees is expected, some negative impact is expected.
	11	Hydrology	B−	C	**Construction and Operation phase:** Extent of impact is unknown at this stage. During construction, some negative impacts are expected at the target river (Kade river).
	12	Topography and geology	C	C	**Construction and operation phase:** The extent of impact is unknown at this stage. Cutting land is expected in constructig access road. However, notable topography and geological sites are not located in the project area and the impact is limited.
S	13	Involuntary	B−	D	**Pre-Construction phase:** No resettlement is expected but land

	№	Impacted Item on JICA Guidelines	Rating		Reasons of the Rating
			Pre/ During Construction	Operation Phase	
		resettlement			acquisition is expected. **Operation phase:** No impact is expected
	14	The poor	D	B＋	**Construction phase:** Extent of impact is unknown at this stage **Operation phase:** Few impacts are expected by using water.
	15	Indigenous and ethnic people	D	B＋	**Construction phase:** Extent of impact is unknown at this stage **Operation phase:** Few impacts are expected by using water.
	16	Local economy such as employment and livelihood	D	B＋	**Pre-construction phase:** Extent of impact is unknown at this stage **Operation phase:** Few impacts are expected.by using water.
	17	Land use and utilization of local resources	C	D	**Pre-construction phase:** Extent of impact is unknown at this stage **Operation phase:** No impacts are expected.
	18	Water usage	D	B＋	**Construction phase:** No impacts are expected. **Operation phase:** Few impacts are expected by using water.
	19	Existing social infrastructures and services	B－	B＋	**Pre-Construction and Construction phase:** Traffic restriction might give impact on the access to emergency services and social infrastructure (e.g. school, hospital etc.). **Operation phase:** Few positive impacts are expected (e.g. improvement of access to social services etc.).
	20	Social institutions such as local decision making institutions	D	D	**Construction and operation phase:** No impacts on social institutions such as local-decision making institutions are expected.
	21	Misdistribution of benefit and damage	D	D	**Construction and operation phase:** No misdistribution of benefit and damage by this project is expected.
	22	Local conflict of interests	D	D	**Construction and operation phase:** No local conflict on interests is expected.
	23	Cultural heritage	D	D	**Pre-Construction, construction and operation phase:** Religious and cultural facilities are not observed at the project site.
	24	Landscape	B－	C	**Construction and operation phase:** Some impacts (i.e. landscape change) are expected by the construction of power plant and installation of water pipe line.
	25	Gender	D	D	**Construction and operation phase:** No negative impacts specifically on women are expected.
	26	Right of children	D	D	**Construction and operation phase:** No negative impacts specifically on children are expected.
	27	Infectious diseases such as HIV/AIDS	D	D	**Construction and operation phase:** No impacts are expected
	28	Labor environment	D	D	**Construction and operation phase:** No impacts are expected.
Others	29	Accidents	B－	C	**Construction phase:** Construction vehicles may use existing local road near residential areas, thus the number of traffic accident may increase. **Operation phase:** Extent of impact is unknown at this stage
	30	Cross boundary impacts and climate change	D	D	**Construction and operation phase:** No impacts are expected.

Note) Rating:

A+/-: Significant positive/negative impact is expected. B+/-: Some positive/negative impact is expected.
C: Extent of impact is unknown at this stage D: No impacts are expected.
Source: the Preparatory Survey Team

5.7.2 Ka De Mini Hydropower Station Project

As shown in the previous table about environmental scoping, there are some concerns raised over the environmental impact of the Ka De mini hydr power station (DRD-8001) project.

The primary concern is that the project site is located around 8 km (at the closest point) north of the Tanintharyi National Park, a demarcated national park whose main purpose is habitat conservation. International NGOs, such as Fauna and Flora International, have been quite active conducting surveys on ecosystem or biodiversity conservation activities in the Park (see Table 9-3-5). Given the environmental significance of the Park and its proximity to the project site, the project is considered to be located in the following Sensitive Areas or/and Natural Environment of Appendix -3 of the JICA guidelines (2010).

≪Sensitive Areas≫

- *National Parks, nationally designated protected areas*
- *Primary forests or natural forests in tropical areas*

≪Natural Environment≫

- *Habitats with important ecological value (mangrove wetlands etc.)*
- *Habitats of rare species that require protection under domestic legislation, international treaties etc.*

In addition to this, the MoNREC does not seem to have management plans of this Park even though the Park is nationally-owned. From the viewpoint of project feasibility, some of the necessary data to determine the project's environmental and social impacts, such as a layout plan of surrounding facilities, are either unclear or insufficient. Given all this, the project falls into the "Category A" and thus it is eliminated from the shortlisting process (see the Section 3.2 for the Evaluation Method).

Table 9-3-5 Mammal in Tanintharyi National Park Recorded in Camera Trapping

No	Common Name	Sciencetific Name	IUCN Status ※
1	Dusky Langur	*Trachypithecus obscurus*	Near Threatened
2	Long-Tailed Macaque	*Macaca Fascicularis*	Least Concern
3	Southern pig-tailed Macaque	*Macaca Leonina*	Vulnerable
4	Sun Bear	*Helarctors malayanus*	Vulnerable
5	Yellow Throated Marten	*Martes flavigula*	Data Deficient
6	Small Toothed Palm Civet	*Arctogalidia trivirgata*	Data Deficient
7	Small Asian Mongoose	*Herpestes javanicus*	
8	Leopard	*Panthera pardus*	Near Threatened
9	Tiger	*Panthera tigris*	Endangered
10	Clouded Leopard	*Neofelis nebulosa*	Vulnerable
11	Jungle Cat	*Felis chaus*	Least Concern
12	Asian Elephant	*Elephas Maximus*	Endangered
13	Asian Tapir	*Tapirus indicus*	Endangered
14	Eurasian Wild Pig	*Susscrofa*	Data Deficient
15	Lesser Mousedeer	*Tragulus kanchil*	Least Concern
16	Red Muntjac	*Muntiacus muntjak*	Least Concern
17	Sambar	*Rusa unicolor*	Vulnerable
18	Gaur	*Bos frontails*	Vulnerable
19	Southern Serow	*Capricornis samatraensis*	Vulnerable
20	Rodent spp.		
21	Malayan Porcupine	*Hystrix brachyura*	Data Deficient
22	Brush-tailed Porcupine	*Atherurus macrourus*	Data Deficient
23	Chestnut-headed Partridge	*A.cambodiana*	Least Concern
24	Red Jungle Fowl	*Gallus gallus*	Data Deficient
25	Bat spp.		
26	Heron Spp.		
27	Dove spp.		

28	Unknown bird spp.		
29	Lizard spp.		

Source: The Environmental Conservation Department

Note : IUCN stands for International Union for Conservation of Nature