

**Environmental and Social Considerations in Detailed Planning Survey
(Technical Cooperation for Development Planning)**

June 2019

1. Full title of the Project

The Project for Sustainable Planning and Improvement of Solid Waste Management in Yangon City (Yangon City Development Committee Area – YCDC)

2. Type of the Project

Master Plan

3. Categorization and Its Reason

The Study is classified as a “Category B” because of the following reasons:

The Project is a planning study and it does not include any facility localization and/or construction works that are common in projects of feasibility study and/or detailed design. Therefore, the Project is not likely to have significant adverse impact on the environment under the JICA Guidelines for Environmental and Social Considerations (April 2010) (hereinafter referred to as “JICA Guidelines”) in terms of its sectors, characteristics and areas.

The Project formulates Solid Waste Management Master Plan of Yangon City. In order to acquire knowledge and experience contribute to the Master Plan formulation, the Project also carries out pilot projects and activities for improving waste management. Since the pilot projects and activities will not include any construction work, they are out of scope of this screening. Thus, when pilot projects and/or activities and their pilot areas are specified at the project implementation stage, necessary Social and Environmental Considerations will be implemented. In addition, NO pilot projects and/or activities classified as “Category A” under the JICA Guidelines will be conducted by the Project.

4. Agency or Institution Responsible for the Implementation of the Project

Implementing Agency : Yangon City Development Committee (YCDC)

5. Outline of the Project

(1) Expected Goal which will be attained after implementing the proposed plan

Solid waste generated in Yangon City is properly and sustainably treated.

(2) Outputs

- 1) Master Plan on Solid Waste Management in Yangon City is formulated.
- 2) Knowledge and experience which contribute to Master Plan formulation and implementation are acquired through pilot projects.
- 3) Capacity of YCDC in solid waste management is strengthened through formulation of Master Plan and implementation of pilot projects.

(3) Activities

- 1) Formulating Solid Waste Management Master Plan for YCDC
- 2) Implementing Pilot Projects

Pilot projects will possibly be implemented in following areas;

- i. Improvement of collection of waste collection service fee
- ii. Improvement of waste collection service

6. Description of the Project Site

The project site is Yangon City in Myanmar, which consists of 33 townships.

(1) General Features & Natural Environment

1) Outline

Yangon City is the capital of the Yangon Region and commercial capital of Myanmar. Yangon served as the administrative capital of Myanmar until 2006, when the military government relocated the administrative functions to the purpose-built city of Naypyidaw in central Myanmar. With over 7 million people, Yangon is Myanmar's largest city and its most important commercial centre.

Yangon boasts the largest number of colonial-era buildings in Southeast Asia and has a unique colonial-era urban core that is remarkably intact. The colonial-era commercial core is centred around the Sule Pagoda, which is reputed to be over 2,000 years old. The city is also home to the gilded Shwedagon Pagoda – Myanmar's most sacred Buddhist pagoda. The mausoleum of the last Mughal Emperor is located in Yangon, where he had been exiled following the Indian Mutiny of 1857.

2) Physical Features

The Republic of the Union of Myanmar is the second largest state of Southeast Asia with a total land area of 676,552.697380 km² (261,228 square miles), divided into 7 states, 7 regions and 1 union territory. Myanmar spans 2,056 km from north to south and 933 km from east to west between latitudes 09° 32' N and 28°31' N and longitudes 92°10' E and 101°11' E. Myanmar is bordered on the north and northeast by the People's Republic of China, on the east and southeast by the Lao People's Democratic Republic and the Kingdom of Thailand, on the south by the Andaman Sea and the Bay of Bengal and on the west by the People's Republic of Bangladesh and the Republic of India. The full length of the border of Myanmar is 6,284.75 kilometers (km), sharing 271.92 km with Bangladesh, 1,452.93 km with India, 2,226.85 km with China, 234.91 km with Laos and 2,098.14 km with Thailand. The coastline extends over 2,228.47 km from the mouth of the Naff River in the west to Bayintnaung Point (called Victoria Point in the colonial period) in Kawthaung; Rakhine State has 712.79 km of the coastline, the Ayeyarwady Delta 437.65 km and Mon State with Tanintharyi Region 1,078.03 km.

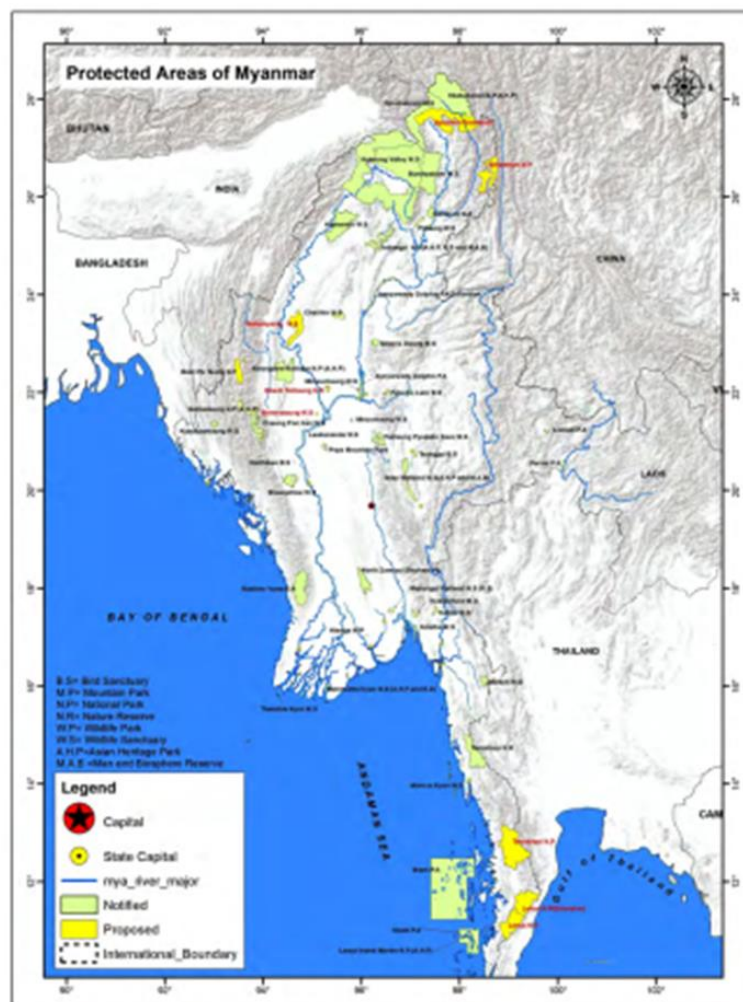
Yangon is located in Lower Burma (Myanmar) at the convergence of the Yangon and Bago Rivers about 30 km (19 mi) away from the Gulf of Martaban at 16° 48' North, 96° 09' East (16.8, 96.15). Its standard time zone is UTC/ GMT +6:30 hours. The Tertiary deposits are strongly folded into narrow end echelon anticlinal folds such as the Yangon ridge, the Thanlyin-Kyauktan ridge, and the Twantay-Kawhmu ridge. All these ridges are trending south towards the Gulf or Martaban. Rocks of the Tertiary period contain well consolidated marine sandstone and shale of the Pegu Group and semi-consolidated, continental deltaic and marginal marine deposits of the Irrawaddy Formation. The synclinal valley or trough west of the Yangon anticlinal ridge is filled with unconsolidated deposits from the Quaternary period. There forms a wedge-shaped alluvial accumulation, ranging in thickness from a few feet near the ridge up to 100 m in the synclinal valley. The wedge-shaped form of these sediments extends both in the east-west and north-south directions and shows thickening toward the south and west. These sediments include clay, silt, sand and very coarse-grained gravel.

3) Natural protected area in Myanmar

Myanmar has been widely regarded as one of the biodiversity richest countries in the Asia and Pacific Region. The country has 251 known species of mammals, and 272 known reptile species, more than 1,000 bird species, and more than 11,000 plant species (Myanmar NBSAP 2011).

There are 61 globally threatened plant species known to occur in Myanmar; of these, 16 are assessed on the IUCN Red List of Threatened Species as Critically Endangered {CR}, 24 as Endangered {EN} and 21 as Vulnerable {VU}. Moreover, there are 47 globally threatened mammal species in Myanmar, 5 Critically Endangered {CR}, 17 Endangered {EN} and 25 Vulnerable {VU} (Source: Myanmar NBSAP 2015).

The Department of Forest (DOF) under the Ministry of Natural Resources and Environmental Conservation (MONREC) manages natural protected area in Myanmar. As of October 2016, 39 numbers of Protected Areas (PAs) are existed in Myanmar. 43 numbers of designated PAs cover approximately 38,906.49 km² of land, representing 5.75 % of the total country area.



Source: Wildlife Conservation Society, Protected Areas, 2017

Figure 1. Location of Protected Areas of Myanmar

Table 1. Permanent Forest Estate by States and Regions for Year 2017-2018

State/Region	Year	Total Land Area	Permanent Forest Estate		
			Reserved Forest & Protected Public Forest Area	Protected Area System (PAS)	Total
Kachin State	2017-2018	34,379	7203.27	6169.83	13373.1
Kayah State	2017-2018	4,530	2441.86	-	2441.86
Kayin State	2017-2018	11,731	3490.76	115.5	3606.26
Chin State	2017-2018	13,907	2015.98	325.78	2341.76
Sagaing Region	2017-2018	36,534	11752.15	5799.89	17552.04
Taninthayi Region	2017-2018	16,736	5301.38	754.32	6055.7
Bago Region	2017-2018	15,214	6144.37	419.59	6563.96
Magway Region	2017-2018	17,305	4161.93	181.48	4343.41
Mandalay Region	2017-2018	14,295	3621.53	175.59	3797.12
Mon State	2017-2018	4,748	828.06	68.98	897.04
Rakhine State	2017-2018	14,200	3267.57	677.88	3945.45
Yangon Region	2017-2018	3,927	413.87	2.41	416.28
Shan State	2017-2018	60,155	13334.14	383.27	13717.41
Ayeyawady Region	2017-2018	13,567	2408.84	53.12	2461.96
Total	2017-2018	261,228	66,386	15,128	81,513

Source: Forest Department, Ministry of Natural Resources and Environmental Conservation, 2018

Table 2. List of Myanmar Protected Area

No.	Site name	National Designation	Status	Establishment Year	Area (km ²)
1	Alaungdaw Kathapa	National Park	Designated	1989	1597.62
2	Bawditataung	Nature Reserve	Proposed	2008	72.52
3	Bumhpabum	Wildlife Sanctuary	Designated	2004	1854.43
4	Chatthin	Wildlife Sanctuary	Designated	1941	269.36
5	Hlawga	Wildlife Park	Designated	1989	6.24
6	Hponkanrazi	Wildlife Sanctuary	Designated	2003	2703.95
7	Htamanthi	Wildlife Sanctuary	Designated	1974	2150.73
8	Hukaung Valley	Wildlife Sanctuary	Designated	2004	6371.37
9	Hukaung Valley (Extension)	Wildlife Sanctuary	Designated	2004	15431.16
10	Indawgyi Lake	Wildlife Sanctuary	Designated	2004	814.99
11	Inlay Lake	Wildlife Sanctuary	Designated	1985	641.90
12	Kahilu	Wildlife Sanctuary	Designated	1928	160.56
13	Kelatha	Wildlife Sanctuary	Designated	1942	23.93
14	Khakaborazi	National Park	Designated	1998	3812.46
15	Kyaikhtyoe	Wildlife Sanctuary	Designated	2001	156.23
16	Kyauk-Pan-Taung	Wildlife Sanctuary	Proposed	2001	132.61
17	Lampi Island	Marine National Park	Designated	1996	204.84
18	Lawkananda	Wildlife Sanctuary	Designated	1995	0.47
19	Lenya	National Park	Proposed	2002	1761.19
20	Lenya (Extension)	National Park	Proposed	2004	1398.59
21	Loimwe	Protected Area	Designated	1996	42.84
22	Maharmyaing	Wildlife Sanctuary	Proposed	2002	1180.39

No.	Site name	National Designation	Status	Establishment Year	Area (km ²)
23	Mainmahla Kyun	Wildlife Sanctuary	Designated	1993	136.69
24	Minsontaung	Wildlife Sanctuary	Designated	2001	22.60
25	Minwuntaung	Wildlife Sanctuary	Designated	1972	205.88
26	Moscov Island	Wildlife Sanctuary	Designated	1927	49.19
27	Moyingyi Wetland	Bird Sanctuary	Designated	1988	103.60
28	Mulayit	Wildlife Sanctuary	Designated	1936	138.54
29	Natma Taung	National Park	Proposed	1997	722.61
30	Panlaung-Pyadalin Cave	Wildlife Sanctuary	Designated	2002	333.80
31	Parasar (Par Sar)	Protected Area	Designated	1996	77.02
32	Pidaung	Wildlife Sanctuary	Designated	1918	122.08
33	Popa	Mountain Park	Designated	1989	128.54
34	Pyin-O-Lwin	Bird Sanctuary	Designated	1918	127.25
35	Rakhine Yoma Elephant Range	Wildlife Reserve	Designated	2002	1755.70
36	Shinpinkyetthauk	Wildlife Sanctuary	Proposed	2006	71.90
37	Shwesettaw	Wildlife Sanctuary	Designated	1940	552.70
38	Shwe-U-Daung	Wildlife Sanctuary	Designated	1918	325.95
39	Tanintharyi	National Park	Proposed	2002	2071.81
40	Tanintharyi	Nature Reserve	Designated	2005	1699.99
41	Taunggyi	Bird Sanctuary	Designated	1930	16.06
42	Thamihla Kyun	Wildlife Sanctuary	Designated	1970	0.88
43	Wenthtikan	Bird Sanctuary	Designated	1939	4.40

Source: Protected Areas in Myanmar 2011

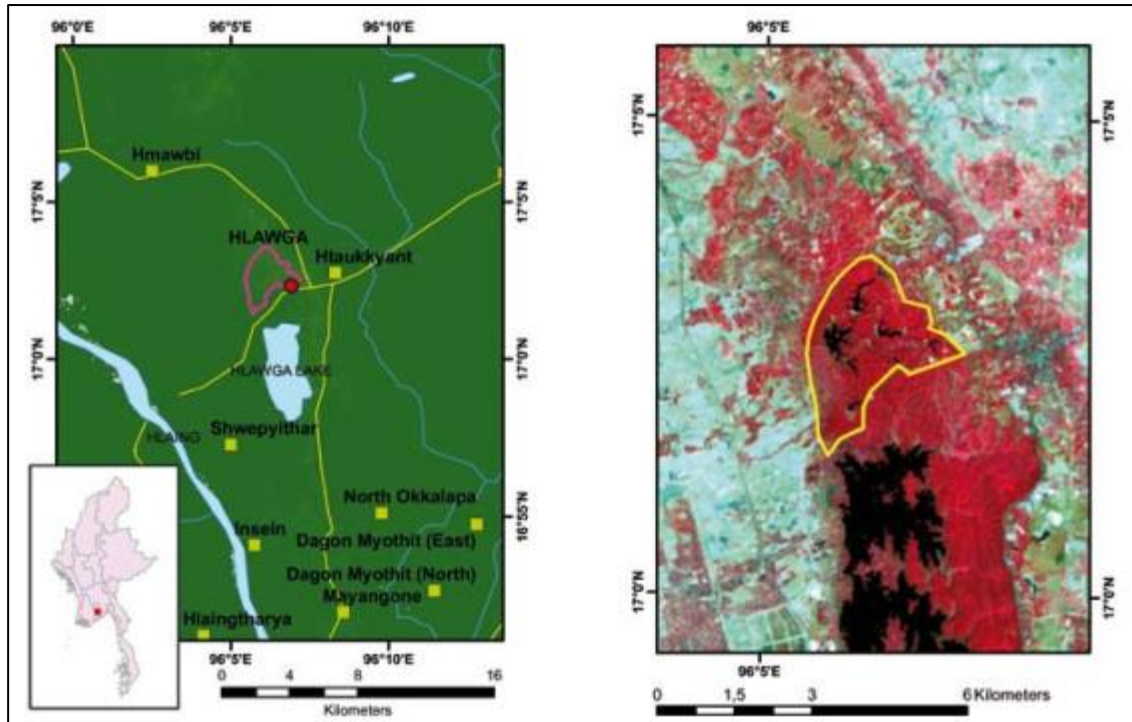
4) The protected area in Yangon

In Yangon, the protected area is Hlawga Wildlife Park. The Park is located 35 km north of Yangon and the area is 6.2 km² including a wildlife park (3.1 km²), a mini-zoo (0.3 km²) and a buffer zone (2.7 km²) (Figure 2 and Table). The Park was established in 1982 to establish an environmental education center near Yangon, to protect the forests and vegetative cover in the catchment of Hlawga Lake, to establish a representative collection of Myanmar indigenous wildlife species of mammals, reptiles and birds, and kept under as near as possible natural conditions in such a way that they can be readily viewed by visitor.

Hlawga Wildlife Park is an open zoo created in 1982 by the Forest Department in the proximity of Yangon with the objectives of providing environmental education facilities, protecting the forest and plant cover in the catchment of the Hlawga lake, and establishing a representative collection of Myanmar indigenous plants and wildlife species. In 2010 the site has passed to joint management of NWCD and private entities.

The site preserves three types of habitat: evergreen forests, mixed deciduous forests and swamp forests. 108 tree species have been identified. Common tree species are Dipterocarps. Deciduous species like teak (*Tectona grandis*) are also found. Barking deer, hog deer and wild boar are the most common of the 12-mammal species from the retrieved checklist. The overpopulation of non-native macaques (*Macaca* spp.) is negatively influencing the ecological balance of the site. Resident and migratory birds are abundant inside the park, with 191 identified species.

The site is visited every year by more than 100,000 local tourists and 400 foreigners, mainly coming from Yangon city. Tourists can use park facilities (tea shops, picnic sites, recreation sites, aviary, mini-zoo, biodiversity museum, environmental education center and chalets).



Source: Myanmar National Biodiversity Strategy and Action Plans, 2011

Figure 2. Location of Hlawga Wildlife Park

Table 3. Detail Description of Hlawga Wildlife Park

Item	Description
Locality	Yangon Region, Mingaladon Township
Coordinates	N17°02', E96°06'
Size (km ²)	6
Altitude (m. asl)	20 – 55
Myanmar category	Wildlife Park
UCN category	NA
Site Governance	Joint management by NWCD and private companies
Boundaries	Demarcated
Year gazetted	1989
Main purposes	Research/Education, Conservation
Protection level	Partial (Recreation/Tourism allowed)
Habitat	Evergreen Forest (Typical), Mixed Deciduous Forest (Lower), Swamp Forest
Key resources	Eld's Deer, Sambar Deer, Barking Deer, Hog Deer, Migratory birds

Source: Myanmar National Biodiversity Strategy and Action Plans, 2011.

(2) Social Environment

1) Politics and Administration

Yangon Region is administered by Yangon Regional Government. Yangon Region is divided into four districts: North, East, South and West. Yangon Region has 45 townships in total and among 45 Townships in Yangon Region, Yangon City Development Committee (YCDC) is responsible for municipal works such as roads in some area, water supply, sanitation, solid waste and market management in 33 Townships.

2) Population

Myanmar has a population about 51 million. Approximately one-third of Myanmar's population is living in urban areas, while the rest of the population in rural areas and largely dependent on subsistence farming. The official capital of the country is Nay Pyi Taw, located midway between Myanmar's two largest cities of Yangon, with a population of around 4.6 million, and Mandalay, with a population of around 1.0 million.

According to census carried out in 2014, the population in Myanmar was estimated at 51.5 million. Approximately 70% reside in rural areas and 30% in urban areas. The density of population is 76.1 people live per km². The population rate is 0.89 %. The population of male and female are 24.8 million and 26.7 million respectively. Sex ration is 93 males per 100 females. About 32.67 percent of the population is between 1 and 14 years old, and 5.42 percent is 65 years old and above. Half of the population is under age 27, but the proportion of children has started to fall. The average number of children per woman has declined to 2.3 from 4.7 in 1983. Life expectancy at birth, 66.8 years, has improved but is still one of the lowest in South-East Asia. Life expectancy is six years longer for females than males. Literacy rate (15 years and over) is 96.6 %: male (98 %) and female (95.5 %). 85 % of adult males and 50 % of females are in the workforce; unemployment is 4 % and nearly twice as high for those 15-29.

The densest area is in Yangon Division: 7.4 million and the density of population is about 390 people live per km², while the least dense is in Chin State, where the population density is only 10 per km². The population in each townships in Yangon Region is shown in Table 4.

Table 4. Population in Each Township in Yangon

No.	Township	Male	Female	Total	No.	Township	Male	Female	Total
1	Mingaladon	158,259	173,327	331,586	24	Pabedan	15,171	18,165	33,336
2	Shwepyitha	164,264	179,262	343,526	25	Kyaukdata	13,777	16,076	29,853
3	Hlaingthahaya	322,862	365,005	687,867	26	Seikkan	1,697	1,129	2,826
4	Mayangon	93,392	104,721	198,113	27	Seikkyi Kanaungto	17,068	16,935	34,003
5	Insein	146,158	159,125	305,283	28	Dala	84,671	88,186	172,857
6	Hlaing	75,029	85,278	160,307	29	Yankin	32,724	38,222	70,946
7	Kamayut	36,958	47,611	84,569	30	Tamwe	74,662	90,651	165,313
8	North Okkalapa	156,340	176,953	333,293	31	Mingala Taungnyur	62,530	69,964	132,494
9	East Dagon	80,861	84,767	165,628	32	Thaketa	107,290	113,266	220,556
10	North Dagon	96,388	107,560	203,948	33	Dawbon	36,745	38,580	75,325
11	South Okkalapa	75,547	85,579	161,126	34	Hlegu	134,087	136,654	270,741
12	South Dagon	181,140	190,506	371,646	35	Cocokyun	1,294	646	1,940
13	Dagon Seikkan	82,697	84,751	167,448	36	Hmawbi	120,931	123,676	244,607
14	Thingangyun	98,698	110,788	209,486	37	Htantabin	71,807	73,985	145,792
15	Pazundaung	22,131	26,324	48,455	38	Kawhmu	58,299	60,751	119,050
16	Botataung	19,416	21,579	40,995	39	Kayan	75,510	82,509	158,019
17	Bahan	45,518	51,214	96,732	40	Kungyangon	54,107	57,525	111,632
18	Kyimyindaing	52,627	58,887	111,514	41	Kyauktan	64,378	68,387	132,765
19	Sanchaung	43,993	55,626	99,619	42	Taikkyi	134,714	142,554	277,268
20	Dagon	11,846	13,236	25,082	43	Thongwa	75,492	82,384	157,876
21	Ahlone	25,551	29,931	55,482	44	Twantay	111,251	115,585	226,836
22	Lanmadaw	20,180	26,980	47,160	45	Thanlyin	130,537	137,526	268,063
23	Latha	10,728	14,329	25,057					
Total							3,499,325	3,826,695	7,326,020

Source: Census result in 2014

3) Ethnic Groups and Religions

In Myanmar, around 90% of the population is Buddhist, but it is also home to Christians, Muslims,

and Hindus.

The races residing in Yangon are shown in Table 1. Most of the people who live in the townships are Burma, followed by Kayin, Rakhine, and Indian people. A small number of foreigners live in most of the townships.

Table 1. Distribution of Major Ethnic People in Yangon Area in 2014

No.	Township	Kachin (%)	Kayah (%)	Kayin (%)	Chin (%)	Mon (%)	Burma (%)	Rakhine (%)	Shan (%)	Others (%)	Foreigner (%)
1.	Ahlone	0.990	0.170	5.520	0.720	0.960	79.540	1.300	0.830	9.800	0.170
2.	Bahan	0.290	0.020	1.940	0.460	0.870	90.830	2.920	1.010	-	1.650
3.	Botahaung	0.180	-	1.750	0.800	0.890	71.940	2.430	0.690	-	21.000
4.	Dagon	0.472	0.031	3.218	1.003	0.401	92.187	1.196	1.310	-	0.181
5.	Hlaing	0.160	0.040	2.050	0.700	0.780	83.980	2.120	0.780	1.240	9.450
6.	Kamaryut	0.190	0.040	4.070	0.280	2.360	91.490	0.480	0.890	-	0.241
7.	Kyauktada	0.280	0.010	1.710	1.580	0.950	91.280	1.290	1.070	-	1.780
8.	Kyeemyintaing	0.160	0.002	1.980	0.210	0.230	95.410	0.250	0.230	1.330	0.200
9.	Lanmadaw	0.234	0.003	2.631	0.553	0.275	94.060	0.871	0.815	0.195	0.358
10.	Latha	0.130	0.070	1.950	0.160	0.310	24.500	0.470	0.920	1.940	71.240
11.	Mayangon	0.060	0.050	3.120	0.160	0.230	94.180	1.220	0.330	0.190	0.470
12.	Mingalardon	0.200	0.080	1.480	0.910	0.630	93.000	1.210	0.190	-	1.440
13.	MingalarTaungNyunt	0.154	0.030	0.723	0.291	0.513	71.100	1.572	0.512	-	25.094
14.	North Okkapala	0.090	0.020	1.290	0.080	0.410	93.600	1.000	0.120	-	3.050
15.	Pabedan	0.060	0.060	1.060	0.410	0.400	32.280	2.010	0.620	2.910	63.230
16.	Pazuntaung	0.300	0.010	0.960	0.550	0.690	84.000	1.830	0.980	-	10.670
17.	Sanchaung	1.550	0.060	1.420	0.890	0.390	84.300	1.630	1.250	1.620	8.510
18.	Seikkan	-	-	0.390	-	0.130	95.670	3.230	0.580	-	-
19.	SeikkyiKaNaungTo	-	-	0.330	0.010	0.620	96.470	0.170	-	-	2.400
20.	ShwePyiThar	0.140	0.030	1.950	0.510	0.610	93.860	2.100	0.190	-	0.630
21.	South Okkapala	0.194	0.007	0.727	0.128	0.970	90.983	3.312	0.186	-	3.490
22.	Tarmwe	0.270	0.025	1.070	0.470	1.160	80.520	3.980	0.800	7.140	4.600
23.	Thaketa	0.280	0.240	0.930	0.360	0.970	80.020	2.960	0.390	-	13.840
24.	Thanlyin	0.010	-	0.240	0.010	0.010	95.210	0.210	0.010	-	4.310
25.	Thingangyun	0.150	0.030	0.770	0.110	0.730	96.320	1.420	0.350	-	0.080
26.	Thongwa	0.001	0.001	0.034	0.002	0.012	95.790	0.021	-	-	4.130
27.	YanKin	0.200	0.050	1.500	0.340	0.380	87.420	1.600	0.660	-	7.810
28.	Insein	0.120	0.020	8.450	0.750	0.410	88.360	1.320	0.280	-	0.290
29.	Dawbon	0.004	-	0.243	0.068	0.856	81.248	1.223	0.087	-	16.270
30.	Dala	0.002	-	1.181	0.020	0.068	95.860	0.272	0.003	-	2.587
31.	East Dagon	0.050	0.010	1.050	0.720	0.800	92.910	2.570	0.200	-	1.700
32.	North Dagon	0.187	0.038	2.299	1.612	0.457	92.188	1.501	0.401	-	1.312
33.	Dagon Seikkan	0.070	0.020	0.620	2.040	0.820	90.500	2.710	0.840	-	2.380
34.	Hlegu	0.13	-	4.71	0.3	0.11	93.14	0.13	0.05	0.12	1.4
35.	Cocokyun	-	-	0.53	0.35	0.44	98.02	0.62	-	-	-
36.	Hmawbi	0.2	1.1	9.17	0.84	0.17	85.18	0.51	1.15	0.01	1.61
37.	Htantabin	0.006	-	13.49	-	0.21	85.24	0.04	0.009	-	0.097
38.	Kawhmu	-	-	14.63	0.006	-	0.011	0.096	85.03	-	0.202
39.	Kayan	-	-	0.028	0.004	-	99	0.021	-	1.034	1.0476
40.	Kungyangon	0.003	-	11.12	-	-	88.85	0.025	0.0008	-	0.002
41.	Kyauktan	0.002	0.001	0.13	0.007	0.005	97.05	0.054	0.002	-	5.51
42.	Taikkyi	0.13	-	9.93	0.18	0.02	83.52	0.07	1.74	0.23	4.18
43.	Thongwa	0.00061	0.00061	0.034	0.0024	0.012	95.79	0.021	-	3.97	0.163
44.	Twantay	-	-	22.9	0.003	0.009	75.88	0.057	0.13	0.98	0.02
45.	Thanlyin	0.01	-	0.24	0.01	0.01	95.21	0.21	0.01	1.86	2.45

Source: Census result in 2014

The primary religions practiced in Yangon are Buddhism, Christianity, Hinduism, and Islam. Shwedagon Pagoda is a famous religious landmark in the city. Religion which people living in Yangon area is shown table 6. More than 90% of the people living in Yangon are Buddhists and Muslims are the second largest religion.

Table 2. Religion in Yangon Area in 2014 (%)

No.	Township	Buddhist	Christian	Hindu	Muslim	Other	No.	Township	Buddhist	Christian	Hindu	Muslim	Other
1	Mingaladon	95.49	1.64	1.26	1.59	0.02	24	Pabedan	45.24	2.04	4.96	47.76	
2	Shwepyitha	94.43	2.59	0.99	1.92	0.07	25	Kyaukdata	67.73	4.5	3.89	23.89	
3	Hlaingahaya	95.56	1.55	2	0.89		26	Seikkan	100.00				
4	Mayangon	84.95	12.65	0.88	1.52		27	Seikkyi Kanaungto	94.90	0.25	1.36	3.49	
5	Insein	89.48	8.37	0.53	1.62		28	Dala	89.78	1.8	4.07	4.35	
6	Hlaing	91.34	1.85	3.24	2.33	1.24	29	Yankin	91.14	1.95	5.3	1.47	0.14
7	Kamayut	95.38	4.53	0.08	0.01		30	Tamwe	76.03	3.48	3.32	17.12	0.04
8	North Okkalapa	95.29	1.58	0.9	2.07		31	Mingala Taungnyunt	60.44	2.81	6.32	29.84	0.6
9	East Dagon	97.03	1.45	0.78	0.74		32	Thaketa	84.80	2.06	2	11.14	
10	North Dagon	92.77	5.94	0.49	0.79		33	Dawbon	83.14	1.06	7.58	8.23	
11	South Okkalapa	96.14	0.77	0.78	2.32		34	Hlegu	95.06	3.76	0.30	0.67	0.21
12	South Dagon	92.66	0.05	2.07	5.21		35	Cocokyun	100				
13	Dagon Seikkan	94.46	2.7	0.9	1.37	0.58	36	Hmawbi	90.99	7.46	0.34	1.20	
14	Thingangyun	81.83	1.63	2.15	14.39		37	Htantabin	10.91	4.98	0.29	0.04	0.01
15	Pazundaung	86.58	1.21	2.94	8.85	0.42	38	Kawhmu	98.41	1.38	0.08	0.12	
16	Botataung	80.22	3.63	2.72	13.31	0.12	39	Kayan	97.69	0.08	1.38	0.85	
17	Bahan	96.75	1.68	0.75	0.3	0.52	40	Kungyangon	95.86	0.02	0.06	2.57	1.48
18	Kyimyindaing	97.63	1.85	0.28	0.23		41	Kyauktan	96.94	0.74	1.97	0.36	
19	Sanchaung	89.58	5.82	1.37	3.63	0.13	42	Taikkyi	91.66	4.34	0.59	2.91	0.50
20	Dagon	92.33	4.17	1.09	2.41		43	Thongwa	96.03	0.65	3.21	0.11	
21	Ahlon	92.58	5.02	0.34	2.06		44	Twantay	79.74	19.25	0.29	0.72	
22	Lanmadaw	95.73	3.48	0.24	0.55		45	Thanlyin	95.62	0.25	2.27	1.86	
23	Latha	96.94	2.45	0.28	0.32								

Source: Census result in 2014

(3) Economy and Employment Status

Yangon is the country's main center for trade, industry, real estate, media, entertainment and tourism. The city represents about one fifth of the national economy. According to official statistics for FY 2010–2011, the size of the economy of Yangon Region was 8.93 trillion kyats, or 23% of the national GDP. The city is Lower Burma's main trading hub for all kinds of merchandise – from basic food stuffs to used cars. Much of the country's legal imports and exports go through Thilawa Port. There is also a great deal of informal trade, especially in street markets that exist alongside street platforms of Downtown Yangon's townships managed by YCDC.

Manufacturing accounts for a sizable share of employment. At least 14 light industrial zones ring Yangon, directly employing over 150,000 workers in 4,300 factories in early 2010. The city is the centre of country's garment industry which exported US\$292 million in 2008/9 fiscal year. More than 80 percent of factory workers in Yangon work on a day-to-day basis. Most are young women between 15 and 27 years of age who come from the countryside in search of a better life. Table 3 shows employment status in Yangon region.

Table 3. Employment Status in Yangon Region

Labour Force Participation Rate (15-64)			Unemployment Rate			Aggregate measure of Labour Underutilization			Employment to Population Ratio (15-64)		
Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
58.99	77.26	43.6	1.4	1.1	1.8	5.4	4.6	6.6	58.2	76.4	42.8

Source: Myanmar Labour Force, Child Labour and School-to-Work Transition Survey, 2018

7. Solid Waste Management

(1) Responsible organization for SWM in Yangon

Municipal affairs in Yangon and Mandalay cities are organized differently than in the rest of the

country. The two cities are managed by the Yangon City Development Committee (YCDC) and the Mandalay City Development Committee (MCDC), which are responsible for municipal service delivery and public works (waste management, water supply, roads and bridges, parks and sports grounds, street lighting, funeral services and firefighting etc.), city planning, urban land administration, tax collection (including business licensing and registration), public health, and urban development (Table). Thus, YCDC is responsible for Solid Waste Management in Yangon.

Table 8. List of Social Service Duties and Functions

No.	Item
1	Town planning
2	Water supply
3	Sanitation (Including Waste Management)
4	Sewage disposal
5	Disaster preparedness
6	Street lighting
7	Roads and bridges
8	Vagrant persons on streets
9	Animal control
10	Parks, swimming pools, public baths &
11	Road rules, street naming & addresses
12	Cemeteries and crematoriums
13	Removal of cemeteries
14	Other development works in the public
15	Other duties as needed
16	Public buildings under the charge of
17	Demolition of squatter buildings
18	Construction permission for private building

Source: YCDC/MCDC, 2016

(2) National Strategy and Action Plan for Solid Waste Management (2018)

The Myanmar’s National Waste Management Strategy and Action Plan was developed by the financial support of the Ministry of Environment Japan (MOEJ) based on agreement of the Environmental Conservation Department (ECD) of MONREC and the Institute for Global Environmental Strategies’ Centre Collaborating with UNEP on Environmental Technologies (CCET) with the aim to make transformation from conventional waste management towards achieving a goal of a zero waste, resource-efficient and sustainable society by 2030. It is the Government’s first national initiative aimed at institutionalizing waste and strategic guide for addressing key issues, opportunities and challenges associated with achieving a resource efficient and zero waste society.

It has been prepared with the vision of “Sustainable, Green, Clean and Healthy Environment towards a Brighter Future for Myanmar” to provide the strategic vision, guiding principles, long-term goals and key activities for addressing waste management in Myanmar in a more holistic and integrated manner, and with the mission statement of “To develop and implement the holistic and integrated waste management strategy based on principles of inclusiveness, zero waste, zero emissions and circular economy to achieve a greener, cleaner and healthier environment in Myanmar” to be focused on promoting zero waste, zero emissions and an overall circular economy aimed at achieving a greener, cleaner and healthier environment in the country.

The National Waste Management Strategy and Action Plan makes efforts to link with other existing and proposed national environmental policies, laws/regulations, development plans and strategies. Based on the existing policy and regulation, institutional framework and current status of waste management, the six national goals, objectives and targets are set in the strategy with short-term targets (2017-2020), mid-term targets (2021-2025) and long-term targets (2025-2030) to be achieved as follows:

- ✓ Goal A: Extending sound waste collection service to all citizens and eliminate uncontrolled disposal and open burning as a first step towards environmentally sound waste management,
- ✓ Goal B: Extending sustainable and environmentally sound management of industrial and other hazardous wastes
- ✓ Goal C: Substantively reduce waste through 3Rs (reduce, reuse, recycling) and thereby establish a resource circular society
- ✓ Goal D: Ensure sustainable financing mechanisms
- ✓ Goal E: Awareness Raising, Advocacy and Capacity Building
- ✓ Goal F: Compliance, Monitoring, Enforcement and Recognition

To ensure effective implementation of Myanmar's NWMSAP, key priorities and mechanisms were identified as 1) Adoption and launch, 2) Mobilizing resources, 3) Legislation and regulation, 4) Monitoring and performance assessment, 5) Commitment and partnership building, 6) Choice of technology and 7) Awareness raising and public education.

(3) Laws and Ordinances

1) Prevention of Hazard from Chemical and Related Substances Law (2016)

The aim of the Law is among others to:

- ✓ Protect the environment, occupational safety and human health against being damaged by chemical and related substances,
- ✓ Control and supervise systematically the use of chemicals and related substances.

To achieve the aim of the Law, duties and powers are divided in three levels: the Central Leading Board, the Central Supervisory Board and the Board of Inspection. The Law states that a person who wants to operate chemical and related substances business shall apply to obtain a license in accordance with the stipulations. This means that the licenses need to be coordinated with the Environmental Compliance Certificate (ECCs) that are issued according to the EIA Procedure.

According to the definition in the Law, 'Chemical' includes smoke and gas, liquid, oil and grease and solid wastes which are obtained from chemical reaction of element, compound and mixture by technique;

2) Prevention of Hazard from Chemical and Related Substances Rules (2016)

The Rules have stipulations and requirements regarding inspections, storage, transport etc. The Rules states that license holders and organizations that operate the chemical and related substances business and the users of them shall comply with the following facts

in discharging the wastes to be free from the hazard:

- a) carrying out the discharging in accordance with these rules, rules relating to water distribution and sewage sanitation prescribed by the City Development Committee, and the Environmental Conservation Law and Rules;
- b) discharging only after making the suitable treatment to the wastes and waste water;
- c) carrying out in accordance with the techniques in order not to pollute to the natural environment and to protect from the depletion of ozone layer due to the wastes; reducing the amount of wastes released from using the chemicals, reusing and recycling them as energy".

Ministry of Industry (MOI) is currently working with a new notification regarding the process of licensing treatment facilities that dispose of chemical and chemical related waste. It may be adopted as an amendment of the Rules. A Waste code for chemical and related substances, also including hazardous substances, will be included in the notification, probably the European Waste List. The details in the notification is currently not known, but it is crucial that ECD and MOI cooperate to coordinate new regulations regarding Hazardous Waste (HW) management. The amendments do also need to be coordinated with the EIA Procedure.

8. Environmental Assessment

(1) Legal framework of Environmental Assessment

1) Environmental Conservation Law (2012)

To establish sound environment policies in the utilization of water, land, forests, mineral, marine resources, and other natural resources in order to conserve the environment and prevent its degradation, the National Environment Policy of Myanmar was proclaimed in December 1994 and Myanmar Agenda 21 was published in 1997.

Environmental Conservation Law (ECL) is the key framework law for national and cross-sectoral coordination and implementation of environmental policies in Myanmar. ECL provides the Ministry with a legislative mandate for a comprehensive national approach on environmental conservation issue. The objectives of the Law are as follows.

- ✓ to enable to implement the Myanmar National Environmental Policy;
- ✓ to enable to lay down the basic principles and give guidance for systematic integration of the matters of environmental conservation in the sustainable development process;
- ✓ to enable to emerge a healthy and clean environment and to enable to conserve natural and cultural heritage for the benefit of present and future generations;
- ✓ to reclaim ecosystems as may be possible which are starting to degenerate and disappear;
- ✓ to enable to manage and implement for decrease and loss of natural resources and for enabling the sustainable use beneficially;
- ✓ to enable to implement for promoting public awareness and cooperation in educational programmes for dissemination of environmental perception;
- ✓ to enable to promote international, regional and bilateral cooperation in the matters

of environmental conservation;

- ✓ to enable to cooperate with Government departments, Government organizations, international organizations, non-government organizations and individuals in matters of environmental conservation.

2) The Environmental Conservation Rules (2014)

In order to implement the Environmental Conservation Law, the Environmental Conservation Rules (ECR) including precise information of implementation process for environmental conservation policy was promulgated in June 2014.

The Environmental Conservation Rules further elaborates the powers and duties of MONREC. The Rules includes chapters on Waste Management which further elaborates the provisions in ECL. The Rules clearly signals that MONREC and ECD shall have a national role in management of HW.

ECR requires that necessary policies relating to environmental conservation for each relevant sector including waste management should be prepared in coordination with suitable organization or an individual from the Government department, Government organization and private sector concerned and submit them to the Government.

Environmental conservation policies approved by the Government shall be disclosed to the public with suitable means.

3) The Environmental Impact Assessment (EIA) Procedure (2015)

The EIA Procedure contains detailed provisions on procedural matters as well as the content of the EIA/IEE-reports. The Procedures also includes provisions on reporting, inspection and compliance monitoring and administrative punishment. MONREC is entrusted with the full powers to implement the Procedure.

The projects required to conduct an IEE or EIA are listed in Annex I of the Procedure. Among these projects are several waste management activities: Non-HW Disposal Facilities Landfills, Non-HW Recycling, Recovery or Reuse Facilities, HW Disposal Facilities (all sizes), HW Recycling and Recovery or Reuse Facilities. The projects proponent must also prepare an Environmental Management Plan (EMP). The EMP shall include a summary of impacts and mitigation measures and management and monitoring sub-plans.

Some business sectors will not be within the scope of the EIA Procedure, for example small industries, auto repair shops, transporters of HW etc. The EIA and IEE reports, and the EMPs, are to be approved by an Environmental Compliance Certificate (ECC) issued by MONREC, on the terms and conditions set by MONREC.

4) National Environmental Quality (Emission) Guideline (2015)

MONREC formulated the National Environmental Quality (Emission) Guidelines (NEQG) in coordination with ADB in December 2015. The objective is to provide the basis for regulation and control of noise, air emissions, and liquid discharges from various sources to prevent pollution and protect humans and ecosystem health. The Guidelines consist of one general part and one industry specific part.

Section 2.4 applies to projects dedicated to the management of municipal solid waste and industrial waste including waste receipt, unloading, processing, and storage; landfill disposal; physio-chemical and biological treatment; and incineration projects. Industry-specific waste management activities (e.g. medical waste) are covered in the relevant industry part of the Guidelines. Effluent levels for landfills and air emission levels from incinerators are set. The Guidelines state that incinerator bottom ash and other solid residue from industrial or medical

HW should be treated and disposed as hazardous waste unless it can be demonstrated to be not hazardous.

Technical issues like incineration temperature, cleansing equipment, and construction of landfills are not addressed, and the Guidelines do not address all parameters that would be relevant in landfills and incinerators for HW. An emission standard is under development as National Environmental Quality Standard and will replace the NEQG. The Standard will contain ambient water quality standard (aquatic life and human health), ambient air quality standard, soil quality standard, emission standard and ground water quality standard.

Table 9. Laws and Regulations Relevant to Environment Conservation

Laws and Regulations		Established Year
1. Constitutional and Environmental Policy		
	Constitution of the Republic of the Union of Myanmar	2008
	Myanmar Environmental Conservation Policy	1994
	National Sustainable Development Strategy	2009
2. Environmental Conservation		
	Environmental Conservation Law	2012
	Environmental Conservation Rules	2014
	Environmental Impact Assessment (EIA) Procedure	2015
	National Environmental Quality (Emission) Guidelines	2015
3. Biodiversity, Natural and Cultural Conservation		
	Wildlife Protection Act 1936	1936
	Forest Law	1992
	Animal Health and Development Law	1993
	Protection of Wildlife and Conservation of Natural Area Law	1994
	Conservation of Water Resources and River Law	2006
	National Biodiversity Strategy Action Plan in Myanmar	2012
	Conservation of Water Resources and River Rules	2013
	The Law Protecting the Antique Objects	2015
	The Law Protecting the Antique Buildings	2015
4. Urban Development and Management		
	The Yangon Water Works Act	1884
	Yangon Development Trust Act	1920
	The City of Yangon Municipal Act	1922
	The City of Yangon Municipal Act 1922	1922
	The Underground Water Act	1930
	The City of Yangon Municipal Amendment Act 1961	1961
	The City of Yangon Municipal Amendment Act 1991	1991
	Road and Bridge Utilization Law	1985
	City of Yangon Development Law	1990
	Law Amending the City of Yangon Development Law	1996
	Yangon City Development Committee	1999
	Road Law	2000
	Law Amending the Road and Bridge Utilization Law	2014
	The Second Amending Law of the Road and Bridge Utilization Law	2015
	The Second Amending Law of the Road	2015
	Highways Law	2015
	Law Amending the Highways Law	2015
	Condominium Law	2016

Laws and Regulations		Established Year
5. Land Acquisition and Resettlement		
	The Land Acquisition Act 1894	1894
	Lower Burma Town and Village Lands Act	1899
	The Law Amending the Lower Myanmar Town and Village Lands Act	2015
6. Heritage		
	The Protection of Preservation of Cultural Heritage	1994
	Protection and Preservation of Cultural Heritage Regions Law	1998
	Law Protecting Ancient Materials	2015
	Law on the Preservation and Protection of Ancient Buildings	2015
7. Public Health		
	Public Health Law	1972
	National Health Policy	1993
	Prevention and Control of Communicable Diseases law	1995
	The Body Organ Donation Law	2004
	The Law Relating to Private Health Care Services	2007
	Myanmar Medical Council Law	2015
	Nation-wide Health Insurance Policies	2015
8. Social Security		
	Leave and Holiday Act 1951	1951
	Labour Organization Law	2011
	Social Security Law	2012
	Social Security Rules	2012
	Myanmar National Social Protection Strategy Plan	2014
	Minimum Wages Law	2013
	Employment and Social Security Notification	2013
	Minimum Wages Rules	2013
	The Law Amending Leave and Holiday Act 1951	2013
	Employment and Skill Development Law	2013
	Settlement of Labour Dispute Law	2014
	Notification for Minimum Wages Law	2015
	Payment of Wages Law	2016

Source: JICA

(2) Projects requiring IEE/EIA

1) IEE type projects

IEE type projects mean that a project judged by MONREC that it has some adverse environmental and/or social impacts, but these impacts are less significant than those of EIA type projects due to its scope and size and these impacts can be mitigated by using technologies and practices.

The EIA Procedure determined that the IEE report shall contain the following subjects.

- i. Project Description
- ii. Identification of the Project Proponent
- iii. Identification of IEE experts
- iv. Description of the surrounding environmental condition
- v. Identification and Assessment of Potential Adverse Impacts

- vi. Results of public consultation/ participation
- vii. Environmental protection measures,
- viii. Conclusion
- ix. Environmental Management Plan (EMP) and
- x. The budget necessary for implementation of EMP

2) EIA type projects

All projects judged by MONREC as being likely to have potential for significant adverse environmental or social impacts are required to carry out EIA. It means generally those which involve multiple components and many of varied pollution sources and pollutant types, requiring integrated EMP to be tailored specifically to mitigate such pollution.

The EIA Procedure describes that the EIA report shall include following subjects.

- i. Executive Summary
- ii. Introduction
- iii. Policy, Legal and Institutional Framework
- iv. Project Description and Alternative Selection
- v. Identification of the Project Proponent
- vi. Identification of IEE experts
- vii. Description of the surrounding environment
- viii. Impact and Risk Assessment and Mitigation Measures
- ix. Cumulative Impact Assessment
- x. Environmental Management Plan (EMP)
- xi. The budget needed for implementation of EMP and
- xii. Result of Public Consultation and Disclosure

(3) The EIA process in Myanmar

The EIA process in Myanmar is as follows. As a first step, the proponent must submit a “Project Proposal (PP)” to ECD, which contains a description of the project and its likely impacts. Based on the PP, ECD undertakes “Screening” depending on the significance of the likely impacts caused by the proposed project.

For EIA type projects, the Proponent is required to submit Scoping Report and Terms of Reference (TOR) which include the proposed content and scope of the study. Public Consultation must be held at the timing.

The proponent then undertakes necessary study and prepares a draft of EIA report and Environment Management Plan (EMP) based on the TOR. The proponent must hold Public Consultation again. the draft of EIA report and EMP are updated based on the comments from the participants of the Public Consultation.

The “Report Review Body” –consisting of relevant ministries and experts- reviews and assesses the report. Based on the Committee’s recommendations, the Ministry makes a decision whether or not the project should be approved. If approved, ECD issues an

Environmental Compliance Certificate (ECC) with conditions to protect the environment.

For IEE type projects, Initial Environmental Examination (IEE) report and EMP are required to be submitted to ECD, which reviews and assesses the proponent's application. Public consultation is required as well.

Flow Diagram of the EIA procedure

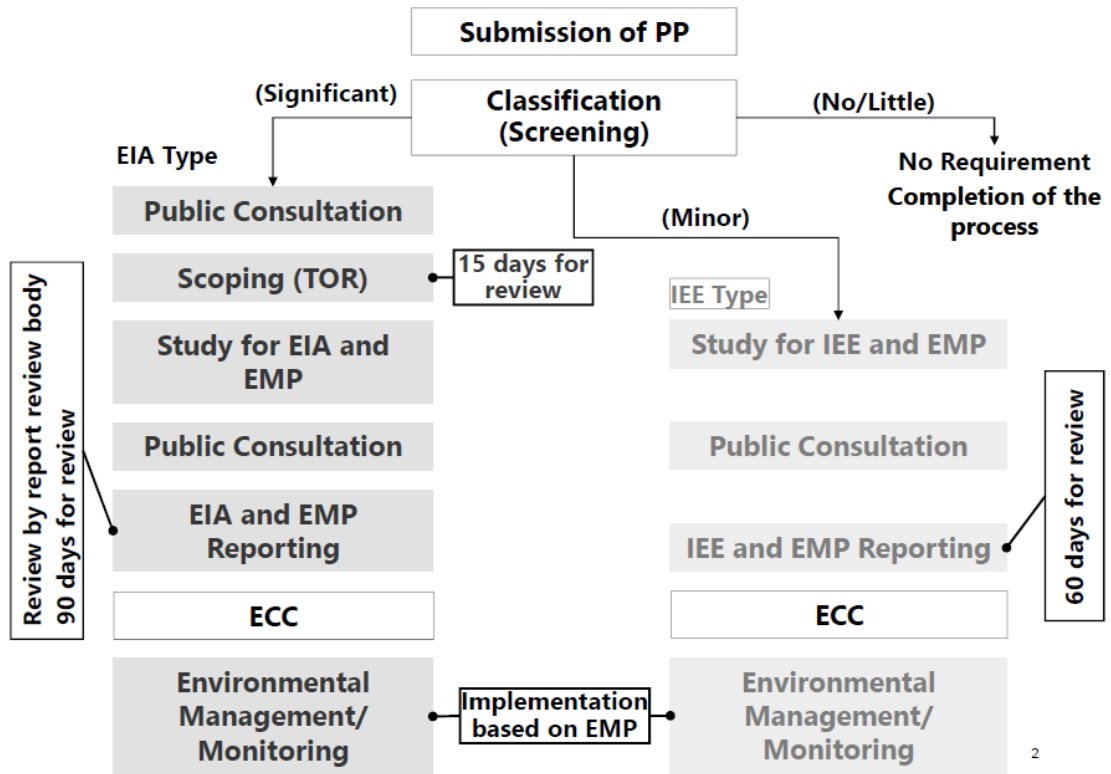


Figure 3. The EIA process in Myanmar

(4) The flow of EIA reports review

The flow of EIA reports review is as follows. Article 68 of the EIA Procedure (2015) requires that ECD provide comments within 90 working days. According to the EIA Procedure (2015), all EIA reports must be submitted to and approved by RT (EIA Review Team) after initial review by ECD.

1. Initial Review by ECD
2. Submission of report on initial review to RT which consists of 39 members from relevant ministries and academic institutions.
3. Hold a meeting between RT, Proponent and EIA consultancy firms
4. Site visit (if required)
5. ECD provides comments on EIA report to the Proponent
6. Proponent revise EIA reports based on the comments and submit them to ECD
7. Hold a meeting between RT, Proponent and EIA consultancy firms
8. If satisfied, submit to National Environment Conservation Committee and issue ECC (if not satisfied, repeats steps 5,6,7)

EIA Review Process

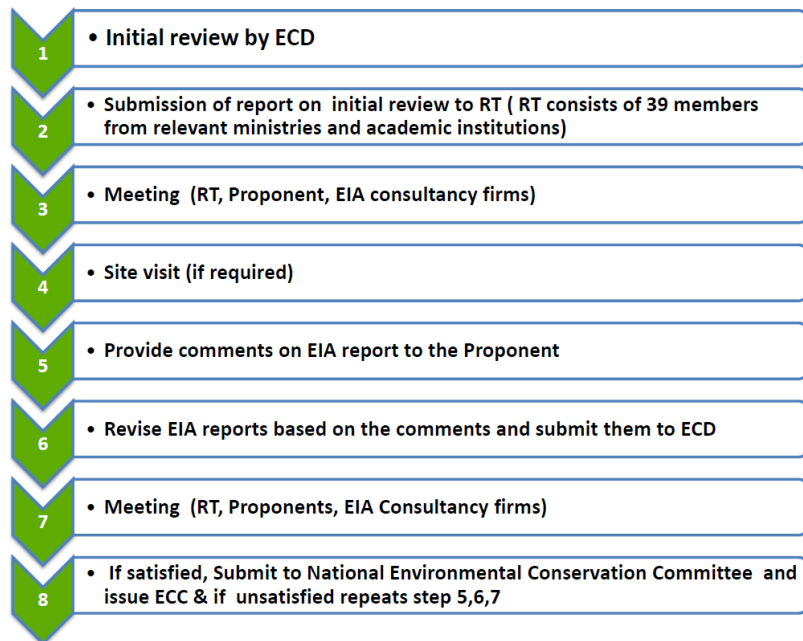


Figure 4. The review process by MONREC

9. Laws and Rules related to Land Use

The key laws and regulations related to land use are as follows.

- ✓ The Land Acquisition Act (1894)
- ✓ National Land Use Policy (2016)
- ✓ The Farmland Law (2012)
- ✓ The Farmland Rules (2012)
- ✓ The Vacant, Fallow and Virgin Lands Management Law (2012)
- ✓ The Vacant, Fallow and Virgin Lands Management Rules (2012), etc.
- ✓ Draft Summary of Land Acquisition, Resettlement and Rehabilitation Law (2018)

(1) The Land Acquisition Act (1894)

The Land Acquisition Act (1894) serves as the fundamental law for land acquisition in Myanmar that sets out the procedure of land acquisition and compensation. The act further outlines relevant procedures, including notice periods, procedures for objections to acquisition (Article 5), method of valuation of land, process for taking possession of land (Article 16 and 17), court processes and appeals (Article 18 and 24), procedures for the temporary occupation of land (Article 35), and the acquisition of land for companies (Article 38). The act requires that compensation 'at market value' is provided to those from whom the land is acquired (Article 23).

(2) Draft Summary of Land Acquisition, Resettlement and Rehabilitation Law (2018)

The overall objective of the Law is to protect the interest of those whose land is acquired for public purpose in accordance with the Law. The Law outlines the process to be followed when land is acquired for Public Purpose. The Law requires the following documents to be attached for the proposal for land acquisition.

- a) Proposal signed by the Project Proponent or their designated representative;
- b) Map and land record, draft land map if land survey has not been done, relating to required land;
- c) Explanation of the reasons for which land needs to be acquired for Public Purpose and proposal to use land;
- d) Information concerning the presence or otherwise of religious buildings, public burial grounds or tombs on the required land; and opinion on whether they should be exempted or not, and if they are to be removed and transferred, an undertaking to take all responsibility for the expenses incurred for the transfer and removal in accordance with the negotiated agreement with relevant responsible person;
- e) Environmental impact assessment report and socio-economic impact assessment report carried out in accordance with the environmental conservation law, byelaw and environmental impact assessment procedure for the projects for which the land is being acquired;
- f) Resettlement and restoration rehabilitation plan/s to be implemented for land owners of the land to be acquired;
- g) Proposal related to resettlement and rehabilitation;
- h) Written undertaking to take responsibility by the project proponent for the matter related to financial costs associated with processes of land acquisition;
- i) Explanation of the adequate reasons leading to the need for Urgent or Temporary Acquisition of land;
- j) Administrative approval of the department, organization proposed to acquire land.

According to Section 16, land acquisition shall be undertaken only with the approval of the Union Hluttaw through the Union Government where the following are present in land and building earmarked for acquisition:

- a) Land where the ancient object and heritages sites are located and protected under the existing law;
- b) Places where historical and cultural heritages are located;
- c) Distinctive areas and buildings and their precincts, and land marks which have established historical and public value;
- d) Places which are valued and protected by ethnic nationalities and land being used in accordance with their customary practice.

For providing Compensation and Damages, Section 36 mentions that if there is no building firmly constructed on the acquired land or if there is no business being operated in that particular building, instead, Compensation and Damages shall be provided to the land owner, and provide Damages to the person/s related to the acquired land. However, if there is a building firmly constructed on the acquired land or if there is a business being operated in that particular building, one of the following entitlements chosen by the land

owner including the relocation expenses shall be provided (Section 37):

- a) Entitlement to full Compensation money and Damages for the acquired land and building;
- b) Instead of enjoying the entitlement under subsection (a), or in addition to part of that entitlement:
 - (1) Entitlement to land or (for?) land and building allowed to be resettled;
 - (2) Entitlement to one of the livelihood restoration programmes;
 - (3) The right to take part in investing in the project to be implemented on the acquired land or receiving an appropriate share of the land.

If there are seasonal and perennials crops on the acquired land, an additional amount equivalent to three times of the market value of what is to be benefitted from the crops in a given year shall be given out to the affected person. In case of acquiring land in urgency, due to incurring more damage, the land owner shall be provided an additional 10% of the local market value of the land, and an additional 10% of the amount of Damages to the person related to the acquired land (Section 53 (c)).

10. Provisional Scoping

Provisional scoping was made for possible waste treatment facilities that might be proposed by the output of the Project. The results of the provisional scoping are summarized in the table below. Since this provisional scoping is for identifying important environmental impact items, detailed impacts, mitigation measures, and monitoring method will be elaborated on through the implementation of the Project.

Provisional Scoping Matrix for possible facilities proposed by the Master Plan

Example of possible facilities proposed by the Master Plan; Material Recovery Facility, Sanitary Landfill site, Waste to Energy Plant and/or Transfer Station

The items are selected based on the JICA Guidelines. Category of Impact Level:

A: Significant impact is expected (+: Positive impact, -: Negative impact)

B: Some impact is expected (+: Positive impact, -: Negative impact)

C: Extent of impact is unknown, further examination will be required (+: Positive impact, -: Negative impact)

D: No impact is expected

No.	Item	Scoping result			Description of Impacts/ Reasons for Rating
		P	C	O	Note for abbreviations: P: planning stage, C: construction stage, and O: operation stage. Rational of assessment is described below for respective stages.
Pollution Control					
1	Air Pollution	D	B-	B-	P: No impact is expected as no engineering work is carried work at this stage.

					<p>C: A certain amount of air pollutants is expected to be emitted from the use of heavy machines and vehicles during construction work of the facilities.</p> <p>O: A certain amount of air pollutants is expected to be emitted from the facilities.</p>
2	Water Pollution	D	B-	C-	<p>P: No impact is expected as no engineering work is carried work at this stage.</p> <p>C: It is possible that turbid water is produced from the construction.</p> <p>O: Contamination by leachate will be expected if there's river nearby after the completion of the facilities</p>
3	Waste/Hazardous Materials	D	B-	B-	<p>P: No impact is expected as no engineering work is carried work at this stage.</p> <p>C: Construction work of the facilities will generate surplus soil and construction debris.</p> <p>O: Waste treatment plant such as incineration plant will produce hazardous substances like fly ashes.</p>
4	Bottom Sediment Contamination	D	B-	C-	<p>P&O: Waste treatment project will not contaminate bottom sediment in the rivers and canals.</p> <p>C: Sedimentation might occur due to the construction works of the facilities.</p> <p>O: Contamination by leachate will be expected after the completion of the facilities construction.</p>
5	Noise/Vibration	D	B-	B-	<p>P: No impact is expected as no engineering work is carried work at this stage.</p> <p>C: Noise and vibration will be generated from the construction sites of the facilities</p> <p>O: Facilities operation will cause some noise and vibration.</p>
6	Land Subsidence	D	D	D	<p>P: No impact is expected as no engineering work is carried work at this stage</p> <p>C: As groundwater abstraction will not be done in construction work of the facilities, land subsidence will not take place.</p> <p>O: Land subsidence will not take place during operation stage.</p>
7	Offensive Odor	D	C-	B-	<p>P: No impact is expected as no engineering work is carried work at this stage.</p> <p>C: A certain emission of offensive odor is possible during construction work of facilities.</p> <p>O: Offensive odor might be emitted from the facilities.</p>
8	Soil Contamination	D	B-	B-	<p>P: No impact is expected as no engineering work is carried work at this stage.</p> <p>C: Soil contamination might take place in the construction works of the facilities if no preventive measures are elaborated.</p> <p>O: Soil contamination caused by leachate might take place after the completion of the facilities.</p>
Natural Environment					
9	Protected area/ Forest	D	C-	D	P: No impact is expected in this stage.

					C: Construction work may demolish some part of forest if the project is localized in such a place.
					O: No impact is expected in operation stage.
10	Ecosystem, Flora, Fauna and Biodiversity	D	C-	D	P: No impact is expected in this stage.
					C: It might be possible that some trees and bushes will be removed during the construction work of the facilities.
					O: No impact is expected during the operation stage.
11	Hydrology	D	D	D	P: No impact is expected as no engineering work is carried work at this stage.
					C: It is unlikely that construction works cause any minor or temporal impact on hydrology.
					O: Hydrology profile will be constant after the completion of the facilities construction.
12	Geology	D	D	D	P, C&O: No impact is expected as the project will not alter the geological conditions of the project area.
13	Topography	D	B-	D	P: No impact is expected as no engineering work is carried work at this stage.
					C: Changes in topographic condition might occur due to excavation and filling works.
					O: Topographic feature will be constant after the completion of the facilities construction.

Social Environment					
14	Involuntary Resettlement	C-	D	D	P: Involuntary resettlement may occur.
					C: Resettlement will be completed in the pre-construction stage.
					O: No resettlement will occur in operation stage.
15	Land Acquisition	B-	D	D	P: Land acquisition will be needed for the construction of facilities.
					C: Land acquisition will be completed in the pre-construction stage.
					O: No land acquisition will occur in operation stage.
16	Poor People	C-	B+	B-	P: Involuntary resettlement which might give negative impacts to poor may occur.
					C: They might be benefitted from employment opportunities during construction work.
					O: Waste collection and treatment system newly instrumented might give negative impacts to poor who survive by gaining income from waste picking at streets.
17	Ethnic Minorities /Indigenous People	C-	C-	C-	P, C&O: Project area is not selected. However, it is predicted that there is impact to ethnic minorities and/or indigenous people depending on selected location of the project area.
18	Local Economy and Livelihood	B-	B- B+	B+	P: If involuntary resettlement takes place, loss of income source and livelihood might be introduced and consequently it might negatively affect the local economy and livelihood.
					C: Temporal traffic restriction and traffic congestion accompanied with construction work may give negative impact to the local economy. On the other hand, construction works of the facilities will have positive impact on local economy by creating employment and business opportunity in the project area.
					O: Improvement of municipal services of waste management will bring about the living condition improvement and it will lead to the improvement of the livelihood.
19	Utilization of Local Resources	D	C-	D	P: No impact is expected as no engineering work is carried work at this stage.
					C: If massive use of local resources such as construction materials takes place in a short period, it may obstruct these utilization by the local people for other purposes.
					O: No impact is expected in operation stage.

20	Water Usage, Water Rights	D	D	D	P: No impact is expected.
					C: No impact is expected during construction stage.
					O: No impact is expected.
21	Social Infrastructure and Services	D	B-	B+	P: No impact is expected as no engineering work is carried work at this stage.
					C: Access to social infrastructure and services may be temporarily affected due to construction work of the facilities as well as traffic congestion due to the operation of construction vehicles.
					O: The project will improve municipal waste management services.
22	Water Usage, Water Rights	D	D	D	P: No impact is expected.
					C: No impact is expected during construction stage.
					O: No impact is expected.
23	Social Institutions	D	D	D	P, C&O: No impact is expected as there will be no change in social institutions.
24	Unequal Distribution of Benefit and Damage	B-	B-	D	P: If involuntary resettlement takes place, it will lead to unequal distribution of benefit and damage between groups who are directly affected by the project and who are not.
					C: If involuntary resettlement takes place, resettling households bear much of damage, meanwhile other may get benefits from job creation relating the construction works, resulting in unequal distribution of benefit and damage.
					O: No impact is expected in operation stage.
25	Local Conflict and Inequity	D	B-	B-	P: No impact is expected.
					C: If construction works introduce benefit for someone such as employment and someone not. It may create local conflict and inequity.
					O: If facilities operation introduces benefit for someone such as business opportunity and someone not. It may create local conflict and inequity.
26	Cultural and Historical Heritage	C-	C-	D	P&C: Project area is not selected. However, it is predicted that there is a cultural and historical heritage depending on selected location of the project area.
					O: No impact is expected as the project will not affect cultural and historical heritage.
					O: Waste collection and treatment system newly instrumented might give negative impacts to poor who survive by gaining income from waste picking at streets.
27	Gender	D	D	C-	P&C: No impact is expected.
					O: Details of impacts are not known as the project area is not selected.

28	Children's Rights	D	D	D	P: No impact is expected.
					C&O: Child labor is unlawful and only adult is eligible for employment opportunity created by the project.
29	Infectious Diseases such as HIV/AIDs	D	B-	D	P: No impact is expected
					C: It is possible that workers activities may cause risk of infectious diseases such as HIV / AIDs.
					O: No impact is expected.
30	Occupational Health and Safety (OHS)	D	B-	B-	P: No impact is expected.
					C: Occupational health and safety of construction work should be properly managed through adequate labor management.
					O: Occupational health and safety of operation and maintenance work of the facilities should be properly managed through adequate labor management.
Others					
31	Accidents	D	B-	B-	P: No impact is expected.
					C: Accidents associated with construction work should be properly managed through adequate safety management.
					O: Accidents associated with operation and maintenance work of the facilities should be properly managed through adequate safety management.
32	GHG Emission	D	B-	B- B+	P: No impact is expected.
					C: The use of construction machines and operation of vehicles will result in increase in GHG emissions.
					O: Waste treatment facilities such as waste incineration plant may increase in GHG emissions. On the other hand, proper waste treatment such as proper management of final disposal site may decrease in GHG emissions.

11. Alternatives to the Project Activities including “Without project” Option

Alternatives to the project activities including “without project option” will be studied in the Project.

12. Result of the Consultation with the Recipient Government on the Environmental and Social Considerations including Roles and Responsibilities

JICA explains that the Project shall comply with the national laws and guidelines and the JICA Guidelines. Both parties agree on the compliance to ensure that appropriate considerations shall be implemented for the environmental and social impacts expected by the Project implementation.

JICA also explains that a Strategic Environmental Assessment (SEA) shall be conducted in the Study as a master plan study, and it shall involve related stakeholders.

13. Terms of Reference for the Environmental and Social Considerations

The Project should include a Terms of Reference (TOR) for Environmental and Social Considerations including comparative analysis of alternative proposed plans based on the concept of Strategic Environmental Assessment (SEA) in line with the “JICA Guideline for Environmental and Social Considerations (April 2010)” as outlined below;

- (1) Analysis of the goals and objectives of the Mater Plan;
- (2) Analysis of possible alternative considering development constrains;
- (3) Analysis of the contents of the Master Plan;
- (4) Conducting scoping including choosing alternatives for analysis, a range of significant and potentially significant impacts, and study methods;
- (5) Conducting baseline surveys for Environmental and Social Considerations, including land use, natural environment, indigenous people and social and economic situation;
- (6) Review of existing institutional and organizational structure on environmental and social considerations in Myanmar, including;
 - 1) Laws, regulations, and standards related to environmental and social considerations (environmental impact assessment, resettlement, public participation, information disclosure, and others);
 - 2) Gaps between the JICA Guidelines and the legal framework of Myanmar on environmental and social considerations;
 - 3) Relevant organizations responsible for implementation of projects and their roles on environmental and social considerations including Environmental Impact Assessment (EIA) and SEA;
- (7) Prediction of likely impacts of the proposed projects under the Master Plan based on the scoping;
- (8) Evaluation of likely impacts of the plans and comparative analysis of alternative proposed plans, including the ‘without project’ option;
- (9) Examination of the mitigation measures (to be avoided, minimized, and compensated);
- (10) Examination of the monitoring methods (monitoring items, frequencies, and methods);
- (11) Support to hold stakeholder meetings;
- (12) Preform other duties deemed necessary.

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