

**Second Workshop on the Development of
National and City Waste Management Strategies for Myanmar**

Hosted by:

Ministry of Natural Resources and Environmental Conservation (MONREC)

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**United Nations Environmental Program, International Environmental Technology Centre
(UNEP-IETC)**

and

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Reported

By

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ACRONYMS/ABBREVIATIONS

3Rs	Reduce, Reuse, Recycle
ADB	Asia Development Bank
CCET	Center Collaborating with UNEP on Environmental Technologies
CDC	City Development Committee
CSOs	Civil Society Organizations
DISI	Department of Industrial Supervision and Inspection
ECD	Environmental Conservation Department
EIA	Environmental Impact Assessment
EPM	Environmental Planning and Management
EQM	Environmental Quality Management
GAD	General Administrative Department
IGES	Institute for Global Environmental Strategies
INGOs	International Non –Governmental Organizations
MCDC	Mandalay City Development Committee
MMK	Myanmar Kyat
MOE	Ministry of Education
MOEE	Ministry of Electricity and Energy
MOHS	Ministry of Health and Sports
MOI	Ministry of Industry
MOPF	Ministry of Planning and Finance
MONREC	Ministry of Natural Resources and Environmental Conservation
NDC	Nay Pyi Taw Development Committee
NGOs	Non –Governmental Organizations
NPT	Nay Pyi Taw
PPP	Public Private Partnership
SCP	Sustainable Consumption and Production
TDC-	Township Development Committee
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
UN-Habitat	United Nations Human Settlements Programme
WWF	World Wide Fund for Nature
YCDC	Yangon City Development Committee
YGN	Yangon

1. Workshop Report on the Development of National and City Waste Management Strategies for Myanmar

1.1 Background

Myanmar's *Second Workshop on the Development of the National and City Waste Management Strategies* was delivered in Yangon from 5-6 December 2016 in collaboration with the Ministry of Natural Resources and Environmental Conservation (MONREC) of the Government of Myanmar, the Yangon City Development Committee and Mandalay City Development Committee with support from the United Nations Environment Programme's International Environmental Technology Centre (UNEP-IETC), the Institute for Global Environmental Strategies (IGES) Centre Collaborating with UNEP on Environmental Technologies (IGES-CCET) and with the facilitation of local consultants from Environmental Quality Management (EQM). The workshop brought together the relevant governmental agencies at national, regional and township levels, as well as private sector actors, industries, academic and civil society groups to discuss, refine and validate the national and city waste management strategies that have been under development from early 2016.

As outlined in Myanmar's first series of workshops held in June 2016, the national and city waste management strategies aim to achieve a goal of zero waste and zero emissions in line with realizing a resource recovery society by 2030. To this end, the strategies set short-term targets (2017-2020), mid-term targets (2021-2025) and long-term targets (2025-2030) and include a comprehensive list of actions based on the findings of a quick study and consultations with a range of national and city-level stakeholders between January to September 2016.

The second workshop focused on reviewing comments made on the national and city waste management strategies compiled during first workshop and focus group discussions with national and local policy makers, public waste management providers and related stakeholders, aimed at finalizing the strategies and related action plans. In addition, the workshop sought to further ensure the stated goals and directives of public authorities were reflected in the strategies with a view towards efficient and effective implementation and future replication at the township level.

1.2 Planning meetings before the second workshop

In preparation for the workshop, consultation meetings were held with the Environmental Conservation Department (ECD), Mandalay City Development Committee (MCDC), relevant development partners and NGOs as well as CCET to discuss the organization and agenda for guiding national and city-level dialogue on waste management.

These included:

- (i) Meeting Environmental Conservation Department
- (ii) Meeting Mandalay City Development Committee
- (iii) Meeting intergovernmental/ non- governmental organizations including UNDP, ADB, UN-Habitat, WWF, Gret

- (iv) Meeting “Industries, Urban and Rural Waste Management Working Group Committee established by the Union Government. The committee is comprised of (13) members from respective ministries, City Development Committees (CDCs), Myanmar Forest Association and Myanmar Industries Association. It is being chaired by Permanent Secretary of Ministry of Construction and the secretary is Director General of Environmental Conservation.

1.2.1 Main outcomes:

Main outcomes of these meetings included an assessment of comments and inputs shared by CDCs and Environmental Conservation Departments (ECDs) from the seven states and seven regions of Myanmar housed under State and Regional Governments and MONREC respectively.

1.3 Selection of target audience / participants, venues

City development committees as well as MONREC’s Environmental Conservation Departments from Myanmar’s seven states (Kachin, Kayah, Kayin, Chin, Mon, Shan and Rakhine) and seven regions (Yangon, Mandalay, Magwe, Tanintharyi, Saging, Ayeyarwaddy and Bago) were invited to the Second Workshop, as these comprise the primary waste management providers in Myanmar outside of Yangon City, Mandalay City, and Nay Pyi Taw..

Other participants included high level government representatives, such as the Secretary of YCDC’s Chief Minister's Office, the Director General of MONREC's Environmental Conservation Department (ECD) and accompanying officials, the Union Attorney General's Office, as well as other relevant ministries such Ministry of Planning & Finance, Ministry of Construction, Ministry of Home Affairs, YCDC, MDCD, and NCDC, and international development partners (UNDP, JICA, ADB). The workshop hosted a total of seventy-three (73) local participants and three (3) international participants. (Refer to Annex I).

1.4 Workshop methodology

1.4.1 Policy maker’s presentations

(i) Daw Hlaing Maw Oo, Secretary of YCDC’s speech

During the opening ceremony, YCDC Secretary Daw Hlaing Maw Oo delivered a speech emphasizing that because environmental impacts often coincide with economic development, it is necessary to enhance public awareness about the importance of the environmental rules and regulations as well as the promotion of 3R (reduce, reuse, recycle) activities. The main points of the Secretary’s speech included as follows:

- The Secretary expressed her gratitude to all departments who cooperated in ensuring the workshop could be organized and implemented in a timely manner.
- YCDC recognizes that the Myanmar’s First National and City-level workshops were successfully delivered in Nay Pyi Taw and Mandalay respectively

- At present, Myanmar faces a range of environmental challenges and impacts resulting from climate change and related natural disasters which are likely to have an influence on the country's continued development, particularly at the city level.
- For this reason, all the citizens must follow the laws and rules enacted by the Government aimed at protecting the environment, including ensuring sustainable waste management and the 3Rs.
- YCDC is currently working with other relevant government departments and the greater public to share knowledge, exchange information and experiences as well as promote partnership with international organizations with a view to address Myanmar's wider environmental challenges.
- The Secretary concluded by requesting the active participation of those in attendance to workshop proceedings and discussions, including by contributing inputs, comments and suggestions to ensure its success.

(ii) U Hla Mg Thein, Director General, MONREC ECD

The Director General expressed his thanks to UNEP, IGES, EQM, NGOs, INGOs and other relevant government departments and stakeholders for their continued support, effort and participation with regard to developing the national/city-level waste management strategies.

- ECD has been actively collaborating with UNEP and IGES for the development of national and city waste management strategies.
- The main purpose of this workshop is to further revise the draft strategies initially developed during the first workshops.
- All developing countries face a number of environmental challenges resulting from industrialization and the globalization of trade. MONREC works to ensure that there is harmony between economic development and environmental sustainability.
- Myanmar's President circulated official guidance to approach waste as a valuable resource. In this regard, Myanmar is also discussing with international experts how best to promote environmental management and conservation, including how to adapt and mitigate climate change.
- Furthermore, being one of the vulnerable countries to natural disasters, regarding the reduction plan for climate change, National Climate Change Strategies and Action Plan are being created together with international experts.
- Together with the promotion of urban economic development, Myanmar needs to develop strategies and guidance for managing wastes in a sustainable way.

- However, the country faces several constraints including lack of technology, as well as limited human and financial resources.
- Policy and strategic framework for Green Economy infrastructure had been finalized according to the workshop held in Nay Pyi Taw on Nov 29 and 30.
- In 2012, Myanmar's Environmental Conservation Law was issued followed in 2014 by the dissemination of the country's Environmental Conservation Rules
- MONREC-ECD has also developed Environmental Impact Assessment (EIA) procedures and Environmental Quality (Emissions) Guidelines.
- At the same time there is an ongoing need to collect current data and information so that existing rules and regulations may be revised and updated accordingly.
- Similarly, all stakeholders involved in waste management should work to identify existing gaps and weaknesses in order to further improve the respective national and city-level strategies.
- This National Waste Management Strategies and Action Plans can be adopted as the guiding principles for waste management practise.
- In closing, the Director General encouraged participants engage in productive discussions, sharing information and experience from their associated fields as well as difficulties that may have been encountered.

(iii) Mr. Kazunobu ONOGAWA, Director, IGES Centre Collaborating with UNEP on Environmental Technologies (CCET)

- Municipal waste management is an issue of critical importance crucially linked with development in all countries.
- IGES focuses on strategic research activities aimed at identifying how environmental conservation can be pursued in a way that is complementary to economic development.
- Environmental pollution can largely be attributed to improper waste management; addressing waste effectively requires is learning lessons both from successes as well as from failures.

- Successful waste management action plans not only concern designing but also operating waste management systems. Waste management thus involves addressing day-to-day issues as well as working closely with the wider public.
- Technical engineering aspects of waste management comprise an essential component but it is also crucial to consider social inclusion and participation for the effective implementation of waste system.
- Given that the scope of the national and city-level strategies under development concerns holistic waste management, this entails addressing solid, liquid and gaseous waste in an integrated and complementary manner.
- At the same time, it is important to recognize that waste management presents a range of opportunities to promote the 3Rs, corresponding with a resource efficient approach and a wider understanding of Sustainable Consumption and Production (SCP).

1.4.2 Participants' Presentations

Presentations by YCDC, MONREC and IGES highlighted the main issues and challenges related to waste management in Myanmar together with ongoing progress with regard to the development of waste management strategies at the national and city-level, respectively. In addition, ECD representatives from Myanmar's respective states and regions shared information on their existing waste management situation, including limitations, gaps and support for actions by financial institutions such as ADB. (Individual presentations are detailed in Annex IV)

1.4.3 Group Discussions

Group discussions were organized as follows: participants were assembled into four groups, with two participants representing City Development Committees (CDCs) Environmental Conservation Departments (ECDs) from Myanmar's 7 states and 7 regions present within each group. The CDCs and ECDs were matched together based on their relative size and geographical proximity.

Subsequently, other participants including YCDC, MCDC, NDC, representatives from relevant ministries and NGOs were selected to sit in different groups where they were expected to engage in discussions as well as share their current experiences and challenges with regard to waste management.

Group discussions thus served as a participatory exercise aimed at reexamining the goals, actions, responsibility, time frame and budget decided upon in the first national and city waste management workshops towards the finalization of respective strategies and action plans.

1.4.4 Workshop materials /resources

- Presentations (please refer to Annex VI)
- Moderators, facilitators and interpreter assisted in guiding group discussion

- IGES personnel led the workshop as moderators
- 4-5 facilitators experienced with waste management assisted the participants
- One interpreter communicated the workshop proceedings in Myanmar language

1.5 Main challenges identified and lessons learned

As participants from Myanmar's 14 different states and regions were in attendance, a number of logistical issues arose, including how to efficiently accommodate additional numbers of participants resulting from a strong expression of interest from local governments and NGOs. Apart from these issues, no significant challenges were identified that impeded the delivery of the workshop.

1.6 Discussion proceedings

On the first day of workshop, the main goals and objectives outlined in the previously-drafted national and city-level strategies were reviewed; participants were offered an opportunity to provide additional comments towards refining and improving the strategies. On the second day of the workshop, proposed actions, responsibilities, time frame and budget for the strategies were revised accordingly. Plenary discussions will be used as additional inputs towards finalizing the national and city waste management strategies and action plans.

2. Day (1) Discussion

2.1 Group 1 discussion

U Mg Mg Lwin (MOPF), U Soe Win (Yangon Regional CDC), Daw Aye Win (Attorney General Office), Daw Khin Thida Tin (ECD, YGN,) Daw Ni Ni Thin (ECD, NPT), Daw Myat Su Yi (ECD, NPT), Daw Htet Htet Htun (YCDC), Daw Kaythari Mg (YCDC), Daw Kyu Kyu Win (YCDC) as well as Daw Yun Tayzar Kyaw (YCDC) actively participated in discussion.

2.1.1 Day 1 Discussion topics

Goal A – Maximize municipal solid waste collection and recycling in the city

Goal E – Capacity Development, Awareness

(I) Goal A

U Mg Mg Lwin (MOPF) proposed that an additional objective should be included in Goal A: the promotion of recycling businesses through the issuing of proper incentives.

Objective A.1: *Provide effective and efficient municipal waste collection services*

Proposed revision to action A.1.2

- Daw Aye Win (Attorney General Office) suggested including provision of dust bins and waste receptacles along various roads and city wards, and to emphasize the need for a regular waste collection system (set times, door-to-door)
- CDC is responsible for defining the scope of the law, as well as overall supervision and operation duties.

Proposed revision to action A.1.3

- U Soe Win (Yangon Regional CDC) discussed the need to make use of tri-cycles for waste collection from narrow streets.
- CDC is responsible for buying and operating these vehicles
- Daw Htet Htet Htun (YCDC) indicated that it is important to promote clarity on good waste management practices including by making efforts to ensure responsible agencies illustrate these to the public.
- CDC is responsible for disseminating facts and figures and raising public awareness about waste management.
- U Soe Win and Daw Htet Htet Htun discussed to the need to upgrade existing waste waste collection vehicles and dust filters.

Proposed revision to action A.1.5

- Daw Aye Win and U Mg Mg Lwin discussed to eradicate illegal dumpsites and enforce according to the CDC law
- CDC is responsible for operation and taking action

Objective A.3: *Integrate private and informal sectors as partners in the delivery of sustainable waste management*

Include as proposed activities for A.3.6

- Daw Aye Win (Attorney General Office), U Mg Mg Lwin (MOPF), U Soe Win (Yangon Regional CDC) and Daw Htet Htet Htun (YCDC) highlighted the importance of including

3R principles as an additional criteria for business licensing among factories as well as to strengthen enforcement such as by closing factories should they not comply with such rules.

General Discussion

Encouraging recycling businesses through the issuing of incentives

- CDC is responsible for managing waste.
- MOEE is responsible for producing and distributing energy from waste. MOI is responsible for supervising the licensing of concerned industries.
- MOHS is responsible for supervising the licensing of private clinics.
- ECD is responsible for defining emission guidelines.
- MOPF is responsible for distributing loans at low interest for waste management activities.
- MOE is responsible for promoting awareness-raising activities on waste management in the schools.
- CDC is responsible for supporting schools in conducting these activities.

Objective A. 4: Improve infrastructure for waste collection, storage, transfer and transport

Include as proposed activities for 4.6

- Daw Htet Htet Htun (YCDC) discussed the need to adequately providing occupational safety brochures/pamphlets and personal protective equipment including gloves and masks to ensure waste collection is carried out effectively.

(II) Goal E

Include in target

- Daw Aye Win (Attorney General Office) and U Mg Mg Lwin (MOPF) communicated that awareness-raising programs should be extended to industrial zones and public clinics, with respective targets set at 30%, (short term), 50% (middle term) and 70% (long term) of all industrial zones and public clinics.
- CDC is responsible for ensuring waste collection and disposal is implemented in these zones and clinics.

Objective E.1: Mainstream environmental education and waste management in school curricula and programs

Revise action E.1.1

- Daw Aye Win (Attorney General Office) proposed the introduction of a curriculum on waste management in existing primary school courses.

Include proposed activities for E1.8

- Daw Htet Htet Htun (YCDC) emphasized the significance of carrying out waste clean-up activities, essay competitions, arts programs and other related activities on waste management in schools.

2.2 Group 2 Discussion

U That Tun (CDC, Rakhine), U Sain Maung Htwe (ECD, Magwe), U Min Thein (ECD, Mandalay), U Aung Aung Kywe (ECD, Rakhine), U Than Htut (MCDC), Daw June Khing Wint Tun (AIT), U Khin Maung Thein (Myanmar, KOEI), Dr. Ni Ni Aung (ECD, Bago), U Aung Myint (CDC, Bago), U Ko Ko Aung (YCDC).

2.2.1 Day 1 Discussion topic

Goal C- Maximize proper collection and disposal of industrial and hazardous (Medical) waste

Participants from Group 2 mainly focused on the following:

- Central detail procedures by the responsible governmental body for all industrial zones
- Technical assistance and support
- Budget
- Land use
- Capacity building of relevant agencies
- Introducing strong rules and regulations
- Clustering industries in the same location

Objective C.1: Reduce industrial and hazardous waste generation and promote landfill diversion

Include central detail procedure for industrial zone as proposed activities for C1.3

- Establish network of industrial committees, institutions and relevant ministries to promote effective waste management

Objective C.2: Implement source segregation and waste collection system

Include enhancing rules and regulations as proposed activities for C2.4

- Compliance with current rules and regulations related to industrial waste management

Objective C.3: Promote effective recycling, treatment and final disposal

Include technology support as proposed activities for C3.4

- Support the introduction of appropriate technology for different types of hazardous wastes (industrial wastes) factoring in regional differences with regard to wastes and generation amounts.

Include budget management as proposed activities for C3.5 and C3.6

- Government should encourage grants/loans, tax incentives to industries aimed at encouraging waste treatment for large scale production
- Introduce polluter pay principle for industrial waste

Include land development as proposed activities for C3.7

Union Government should streamline land procurement processes intended for waste disposal, as CDCs often face difficulties in acquiring suitable land for this purpose

Include capacity building of relevant stakeholders (investors, workers, government staff) under objective C.4

- Implementation of awareness programs for waste generators and collectors
- Capacity building of government staff
- Supporting effective lab analysis for setting effluent waste parameters.

Include industrial clustering under objective C.5

- New industrial zones managed by regional governments
- Existing industrial zones relocated to new locations with government support
- Government provides support for electricity supply, land, water supply, transportation, drainage system, telecommunications, central waste treatment system at affordable cost

General recommendations for Goal-C

Group B recommended that DISI serve as the focal department for the authorization of industrial zones, tasked with evaluating specific rules and regulations related to environmental management as an initial step for registering industries in these zones.

Ministry of Health and Sports should serve as the focal ministry for hospital waste management

2.3 Group 3 Discussion

U Myint Aung, (Saging CDC), Daw Ohnmar Myint (Saging ECD), U Sai Htun Htun, (Shan CDC), Dr. Myat Thaw Htet, (NDC), Daw Lwin Lwin Lat (NDC), U Htun Htun Win, (Shan ECD), U Hta Laer Ye, (Chin ECD), U Win Bo, (Kachin ECD), U Kyaw Soe , (Kachin ECD), Daw Saint , (NPT ECD), Daw Thet Wai Hnin , (Yangon ECD), Daw Maing Chin Sone, (Chin ECD), Dr. Twae Mu Mu Myint, (EQM)

2.3.1 Day (1) discussion topic

Goal B Improve final treatment and disposal system in the city

Goal D – Maximize proper disposal and treatment of wastewater

Group 3) suggested to add an additional objective as B.5: To reduce waste volume at final disposal site

(i) Goal B: Ensure the effective and efficient delivery of waste services

- B.5.1 Supporting the implementation of waste segregation at the household level
- B.5.2 Promoting segregation of organic wastes at market areas, including composting of produce, and paper waste recycling
- B.5.3 Banning the use of plastics bags usage
- B.5.4 Providing different color bins for guiding waste segregation
- B.5.5 Raising awareness of law enforcement to prevent illegal dumping

- B.5.6 Conducting regular monitoring
- B.5.7 Evaluating the option of relocating landfill sites as needed

Furthermore, Group 3 discussed and revised Goal B as follows:

Objectives:

Objective 1: Promote waste reduction from upstream through introduction of sustainable production and consumption (in the design, fabrication and manufacturing of products, traditional repair and remanufacturing)

Objective 2: Promote reuse, recycling and recovery of waste materials before final disposal

B.1: Promoting waste reduction

B.1.1: Introduce design principles that incorporate the re-use of goods or their dismantling into components for re-use.

- Group 3 assessed the need for approaches and required for waste reduction and segregation at source within households, markets and industries, as well as the role of awareness raising programs and media for encouraging community participation.
- U Sai Htun Htun (Shan CDC), U Win Bo (Kachin ECD) and U U Hta Laer Ye, (Chin ECD) agreed that urban planning is important for future development of waste management programs.

B.1.2: Mandate Extended Producer Responsibility (EPR) with a view to enforce industries to take responsibility for the lifecycle of products that they produce, including establishing methods and funding mechanisms to manage the products once they become waste, and setting targets for re-use, recycling or recovery.

- Daw Ohnmar Myint (Sagaing ECD) highlighted the need to raise awareness and educate decision makers about how EPR enforcement might target new industries focused on waste reduction, control and management.

B.1.3: Implement a Cleaner Production Strategy that aims to minimize the quantity and toxicity of waste produced during the manufacturing processes

- Daw Ohnmar Myint (Sagaing ECD) underlined that treatment plants should be established for each industry and awareness should be raised among decision makers of companies and industries to prevent waste hazards and streamline the EIA process.
- Daw Ohnmar Myint (Sagaing ECD) suggested that similar industries should be sited in proximity to each other to ensure water treatment can be conducted more easily and effectively.

B.1.4: Allocate investment for research and development of technology innovations in design to minimize waste generation

- Group 3 did not specifically discuss about research and development.

B.1.5: Introduce national policies, programs and awareness campaigns to promote green businesses, sustainable consumption and production, and eco-labeling, etc.

- Group 3 agreed that effective enforcement of laws and penalties remains lacking in Myanmar and should be made stricter to advance environmental goals.

B.2: Promote waste reuse, recycling and recovery of waste materials before final disposal

- Dr. Myat Taw Htet (NDC) and U Sai Htun Htun (Shan CDC) proposed that waste awareness raising campaigns should be expanded to more fully engage the public.
- Community participation in waste management was discussed as a critical component of waste management to compensate for the lack of responsible staff in CDCs.
- Dr. Myat Taw Htet (NDC) suggested composting organic solid wastes produced from the markets and in surrounding areas with a view to reduce waste volumes at final disposal sites.

B.2.1: Mandate CDCs and TDCs to develop waste management plans with measurable targets for waste separation and recycling

- Dr. Myat Taw Htet (NDC) emphasized that sufficient budget is required for technology and training personnel.
- U Win Bo (Kachin ECD) suggested first implementing a pilot project from which monitoring and evaluation can assist in the promotion and implementation of new waste management projects.

B.2.2: Direct industries in industrial zones to develop waste management plans with targets for waste reduction and for re-use, recycling and proper recovery.

- U Myint Aung (Sagaing CDC) and Daw Ohnmar Myint (Sagaing ECD) shared experiences about monitoring industries that have received public complaints as well as the planning required for promoting regular monitoring of industries in the future.

B.2.3: Develop national standards for cities with a view to promote waste minimization, reuse, recycle, and recovery of waste materials.

- U Hta Lar Yel (Chin ECD) suggested promoting consistency among waste laws across all of Myanmar to encourage stronger participation and coordination.
- Daw Ohnmar Myint (Sagaing ECD), Daw Lwin Lwin Latt (NDC) and Dr. Myat Taw Htet (NCDC) suggested having better sewage systems around houses and industries.

B.2.4: Develop strategies and guidelines on waste separation, collection and sorting of general recyclable waste materials, supported by appropriate recycling infrastructure.

- All participants of Group 3 agreed that additional resources and technologies are required to implement, manage and monitor waste issues effectively and efficiently.
- U Sai Htun Htun (Shan CDC) emphasized that awareness raising conducted by the media and community leaders would be prove more effective than conventional approaches followed in Myanmar.
- Group 3 reached consensus that law enforcement should be made more strict with a view to more fully reach all citizens.
- Dr. Myat Taw Htet (NCDC) communicated that waste segregation conducted in areas near markets would help to reduce load and transportation costs.
- Group 3 confirmed that waste segregation should first be initiated at the household level starting with designated bags for 2 waste streams which then could be monitored accordingly.

B.2.5: Develop standards and incentives for the establishment of material recovery facilities (MRFs) and buy-back centers in different CDCs and TDCs, with space provided for sorting re-useable and recyclable waste.

- Group 3 did not specifically discuss this topic.

B.2.6: Combine recyclable waste collection systems with existing waste collection services and transform disposal sites into integrated waste management sites

- Group 3 did not specifically discuss this topic.

B.2.7: Promote nationally-coordinated awareness campaigns which support separation at source of recyclables from the domestic waste stream among all households, businesses and organizations.

- Group 3 agreed that organizing different competitive events, including arts campaigns, can help to mobilize households and communities in the promotion of effective waste management.

B.2.8: Build on existing small-scale entrepreneurial recycling by integrating the informal recycling within the mainstream waste management sector.

Group 3 did not specifically discuss this topic

B.2.9: Develop strategies, standards and incentives for diversion of specific waste streams such as food waste, green waste, hazardous waste (industrial and medical waste) from landfills.

- Daw Ohnmar Myint (Sagaing ECD) pointed out that industries are duly inspected should they warrant complaints and are allocated sufficient time to address the matter in question before being penalized; future inspections will be conducted regularly to ensure thorough monitoring and guidance for treatment of hazardous waste.

B.2.10: Study and develop strategies/ standards for various waste treatment/recovery options that cannot be re-used or recycled, including biogas projects and methane gas from landfills, as well as thermal treatment; by introducing financial incentives such as tipping fees and renewable energy feed-in tariff and sound empirical standards for air emissions/water effluents aimed at mitigating the impact on human health and the environment

- Group 3 did not specifically discuss this topic

B.2.11: Establish a proper mechanism for data gathering, monitoring, enforcement and incentives for waste management strategies at city-level and in industrial zones.

- Group 3 did not specifically discuss this topic

B.2.12: Include sustainable lifestyle practices into the formal and non-formal education

- Daw Ohnmar Myint (Sagaing ECD) and Daw Sai Htun Htun (Shan CDC) proposed developing multi-tiered awareness programs aimed at educating different target audiences about waste according to their education level.
- Daw Sai Htun Htun (Shan CDC) emphasized that pupils can be expected to learn and be more productive in clean environments, such that education on waste management should be well planned for future generations of students.

(ii) Goal D – Maximize proper disposal and treatment of wastewater

Group 3 indicated that the following objective together with the proposed activities for the Goal D should be revised as follows:

D.3 To establish systematic and expensive waste treatment plant

- D.3.1 Establishing material recovery facilities before directing wastes to final disposal sites
- D.3.2 Installing wastewater treatment plants to address wastewater issues
- D.3.3 Considering long-term waste issues through to 2050
- D.3.4 Engaging law enforcement to ensure waste is effectively treated by all industries
- D.3.5 Providing sewage systems in areas near industries and restaurants
- D.3.6 Conducting regular monitoring of industrial wastewater in line with existing Environmental Quality Guidelines

General discussion: how to improve strategies for Goal B and D

Participants identified the key areas that can be addressed and improved upon at the national level and carried out at the sub national level.

Group 3 noted that ECD should improve existing management plans to include the role of waste management technologies and infrastructure, supported by research. The following proposed improvements should be conducted across all of Myanmar:

- Engaging local and international experts for training, planning, implementation and awareness raising.

- Collaborating with experts to develop effective poster designs, publications and media.
- Setting the time frame for this process should be at least five years with budget sourced from international funding mechanisms.
- Developing training and capacity building workshops aimed at enhancing human resources, coordinated by MONREC-ECD.

Furthermore participants suggested that in order to achieve the optimal outcome within the short period, human resources, machineries and technologies should be upgraded together with the ensuring sufficient budget.

In terms of responsibilities for the above listed actions, participants in Group 3 emphasized that citizens are also important stakeholders in promoting waste management. For instance:

- Using media to promote behaviour changes among the public.
- Ensuring laws and regulations are consistent and mete out appropriate penalties aimed at promoting clarity and transparency among the public
- Strengthening public awareness about the reasons illegal dumping is prohibited.

Group 3 proposed the following activities for increasing public awareness on the importance of waste management:

- Promoting incentives for encouraging compliance
- Strategic planning for awareness-raising campaigns
- Health education firstly to committee members elected by local people and then secondly to local people
- Ensuring sufficient budget for adequate numbers of waste receptacles
- Designing training targeting different educational levels

Participants also proposed the following actions:

- Mandating self-collection of food waste in restaurants aimed at reducing the volume of such waste directed to landfill.
- Engaging villagers in waste reduction campaigns as rural populations comprise 70% of total Myanmar's total population.
- Collaborating with local leaders at the township level to guide waste management improvements.
- Ensuring a system of incentives and penalties for waste management are in place.
- Promoting the separation of dry and wet waste at the household level supported by effective awareness-raising campaigns on good recycling practices.

The waste management strategies and action plans particularly Goal (B) and (D) should be considered to be adopted at the border areas waste management where the incineration plants are being used.

Group 3 identified the following as critical factors in ensuring waste management practices are improved and effectively carried out:

- Infrastructure (transportation, treatment facilities, etc.)

- Finance
- Sufficient knowledge of health and safety among relevant staff working in waste management
- Household participation
- Appropriate waste technology (i.e., machinery and vehicles)
- Appropriate salary for staff involved in waste management
-
- Public engagement, such as targeting unemployed/underemployed citizens to support the delivery of waste management services (i.e., cleaning, collection, etc.)

2.4 Group 4 discussion

U Zaw Oo (ECD, Ayeyarwady), U Tin Maung Htay (CDC, Ayeyarwady), U Soe Naing (ECD, Mon), Daw San San New (ECD, Mon), U Aung Myat Win (ECD, Kayin), U Tin Ko Ko (CDC, Mon), U Zaw Linn Htun (CDC, Kayin), Daw Khin Htet Tay Zar Maung (ECD, yangon), U Htun Naing (CDC Tanintharyi.), U Maw Maw Ko (ECD, Kayah), Daw Zin Mar Win (ECD, Tanintharyi,) as well as U Banyar Aung (ECD, Yangon) actively participated in discussion.

2.4.1 Discussion topic

Goal F: Ensure sustainable services through review, monitoring, innovation and improvement

Objective F.3

Group 4 suggests that objective F.3 should be deleted.

(i) General discussion

In terms of data collection and Information sharing, U Tin Ko Ko (CDC, Mon) and U Maw Maw Ko (ECD, Kayah) pointed out that the previous strategy draft only referred to the need for establishing a data collection system, and thus suggested assigning roles and responsibilities to organizations which will task with managing this system.

Daw Khin Htet Tay Zar Maung (ECD) discussed how data management systems might be best optimized at the CDC level, emphasizing that CDCs and TDCs should work to collect and maintain data on respective waste streams.

U Tin Ko Ko (CDC) remarked that each respective city should make efforts to manage waste related data at the local level, noting that different waste sources may have different data requirements. For instance, waste between households is largely homogeneous, however in market areas, waste generation widely varies day-to-day.

Daw Khin Htet Tay Zar Maung (ECD) provided further explanation on the data management systems currently utilized in the Thilawar Special Economic Zones. All new investors in these zones are required to submit an ECPP/Environmental Management Plan outlining the scope of different wastes produced by the factory including but not limited to hazardous waste, plastic waste, domestic waste, industrial waste etc. Furthermore, these investors must indicate the

estimated amount of waste generated per day as part of a mandated waste management plan that includes monitoring procedures for sustainable waste management.

Regarding Monitoring, Daw Khin Htet Tay Zar Maung (ECD) highlighted ECD's legislative and operational role, both with regard to developing relevant policy frameworks on waste as well as its principal responsibility for conducting regular inspections. In addition, U Maw Maw Ko (CDC), Daw Zin Mar Win (ECD) and U Zaw Oo (ECD) emphasized that ECD is also responsible for reviewing monitoring reports on waste management to ensure compliance with the law as well.

Group 4 also commented and pointed out the roles and responsibilities as follows:

(ii) Responsible stakeholders

Group discussion referenced seven departments under various ministries that are required to cooperate in order to ensure waste management is implemented in a sustainable manner.

These include as follows:

1. ECD
2. General Administration Department
3. TDCs
4. DISI
5. Industrial Zone Committees
6. Small and Medium Enterprises
7. Department of Health

(a) Responsibility of ECD

- Developing relevant policy frameworks on waste
- Conducting regular inspection of factories
- Reviewing monitoring reports on waste management
- Ensuring legal compliance

(b) Responsibility of General Administration Department

- Promoting cooperation and coordination with the local community and related government departments

(d) Responsibility of TDCs

- Collecting municipal taxes
- Coordinating waste Collection and disposal
- Supervising waste management practices of private sector

(e) Responsibility of DISI

- Overseeing industrial registration processes
- Conducting regular inspection of industries

(f) Responsibility of Industrial Zone Committees

- Cooperating with regular inspection of industries

(g) Responsibility of Small and Medium Enterprises

- Ensuring proper registration

(i) Responsibility of Department of Health

- Managing issues related to environmental and occupational health

(iii) Proposal to include the following activity under Objective F.4:

F. 4 Allocate sufficient budget to local government

- F.4. 1 Establish a regular budget process and engage with stakeholders on issues of data collection, information sharing and monitoring.

(iv) Proposal to include the following activities under Objective F.5:

F. 5 Enact effective legal action/penalties for those who do not comply with the laws and regulations

- F.5.1 Issue notice letter
- F.5.2 Request legal counsel
- F.5.3 Pursue legal actions as necessary

3. Day (2) Discussion

3.1 Group 1 discussion

3.1.1 Discussion topic: Responsible stakeholders and corresponding actions

Group 1 focused on Goal (A), (B), (C) and (D) as follows:

(i) Goal A – Promote waste minimization, reuse, recycle and recovery to establish a resource circular society

- During the year 2017/18-2019-20, Group 1 discussed the need to segregate dry and wet fractions of household waste, sharps and infectious fractions of medical waste, hazardous and non-hazardous fractions of industrial wastes.
- During the year 2020/21-2029-2030, Group 1 communicated the need to segregate recyclable materials from household waste such as tin, cans, bottles, plastics, and electronics, radioactive and electronic components from medical wastes, and electronic wastes, and waste water from industrial wastes, together with a promotion of the 3Rs.
- Responsible agencies for these activities include ECD's Policy Division, CDCs, State and Region Development Committees, MOHS, and relevant implementing agencies of MOI. Funding will be sourced from Union Budget, State/Region Budget, CDC Budget, as well as through grants and loans from development partners and investors.

(ii) Goal B: Ensure the effective and efficient delivery of waste services

- Group 1 discussed two aspects with regard to Goal B: raising public awareness and promoting proper waste management and treatment systems.

Raising public awareness:

- Government departments (CDC and Administrative departments) are main responsible to raise public awareness.
- Firstly, these departments will need to collect the baseline data of waste generation of their respective areas.
- Secondly, the facts and the information using their local regional own language should be prepared so as to understand for the local community.
- Later, these messages should be distributed into the public by Government departments (CDC and Administrative department) together with participation of voluntary associations such as NGOs, Social Organizations

Ensuring proper waste collection and treatment systems:

- Township Development Committees (TDCs) should make efforts to announce when and how they will collect and manage waste using signboards and other media.
- TDCs should clearly define waste management categories and provide separate bins (wet and dry for short term with further types of wastes to be separated in the long term) in the common areas.
- TDCs should designate a common temporary storage area/secondary collection site for waste segregation purposes before transporting the waste to a final disposal site.

- TDCs should establish recycling centres and recycling markets for the reusable wastes after these have been segregated.
- Specific wastes should be addressed differently, such as the incineration of medical waste prior to final disposal and land filling of organic wastes.
- Hazardous wastes should be addressed through an appropriate hazardous waste management strategy and technology should be made available on how to best manage these types of waste.
- Waste water should be treated via a centralized waste water treatment plant.

(iii) Goal C – Ensure sound budgeting for securing sustainable sources of revenue for waste sector

- During the year 2017/18-2029-2030, Group 1 considered the establishment of a specific fund for waste management (separation, collection, disposal, treatment, emergency issues, awareness raising activities, etc.)
- Responsible agencies for these activities include ECD's Policy Division/CDCs, State and Region Development Committees Implementing Agencies, and MOPF. Funding will be sourced from Union Budget, State/Region Budget, CDC Budget, as well as through grants and loans from development partners and investors.

(iv) Goal D – Compliance, monitoring, enforcement and recognition

- During the year 2017/18-2029-2030, Group 1 evaluated the potential of establishing an ad hoc working group made up of regulators, communities, CSOs, NGOs, etc., for purposes of continuous monitoring.
- Responsible agencies for these activities will include regulators (CDC, ECD, DISI, MOHS, as well as law enforcement agencies, with reference to necessary directives), communities, and CSOs, who would serve in an advisory capacity.
- Funding will be sourced from related departments, communities, such as through taxes and levies, CSOs, NGOs, etc.

3.2 Group 2 discussion

3.2.1 Discussion topic: Responsible stakeholders and corresponding actions

Group 2 mainly focused on Goal (A), (B), (C), (D) and (E) accordingly as follows:

(i) Goal A: Promote waste minimization, reuse, recycling and recovery to establish a resource circular society

- MONREC ECD should introduce national solid waste guidelines such as the national emission guidelines that have been established for liquid and gas. Based on waste classifications for commercial and industrial wastes, CDCs should impose and collect

service fees from responsible parties. (i.e., service fees for industrial waste) and increase fees for non-bio degradable waste.

Promote sustainable materials management including the introduction of packaging guidelines (i.e. encouraging paper instead of plastic packaging).

- Introduce environmental planning and management EPM policy which requires due diligence of owners with regard to product manufacturing.
- Promote 3R-related businesses. For instance, in Mandalay, most recycling wastes are exported to China.
- Expand markets for resource recovery and waste technologies to generate more revenue.

Implementation

Government should invest in the following technologies to support the development of resource recovery businesses.

- Recycling technology to process recycled waste
- Sorting machines for separating recyclable waste
- Cleaning plants to promote reuse bottle
- Glass recycling technology
- Metal recycling technology

Monitoring

Responsible agencies will be CDCs and ECD.

(ii) Goal B: Ensure the effective and efficient delivery of waste services

To achieve Goal (B), the following factors are critical:

- Capacity
- Budget
- Development of PPP (Public Private Partnership)

Implementation

The relevant authorities should work to address the following issues:

- Increasing labor for waste management
- Increasing salary of relevant workers involved in waste management
- Increasing budget for waste management

Monitoring

Responsible agencies will be CDCs and ECD.

(iii) Goal C: Ensure sustainable budgeting and sound financial management of the waste sector

- Implementation of waste management requires strong political will at the national level

Implementation

- Redesign service fee collection processes per city or per person or at the regional and/or sectoral level (e.g. waste volume collection fees for restaurants and collection fees based on the number of rooms for the hotel)
- Develop related waste management activities based on collection fees coordinated by appropriate teams

Monitoring

Responsible agencies will be CDCs and ECD.

(iv) Goal D: Compliance, monitoring, enforcement and recognition

- Develop waste audits aimed at establishing relevant databases related to waste management

Implementation

- Engage media and photographers responsible for covering infractions of the law
- Introducing incentives and punishment to encourage compliance

Monitoring Responsible agencies will be CDCs and ECD.

(v) Goal E: Capacity development, awareness raising and advocacy

- Promoting training and public awareness campaigns
- Involving media
- Inviting NGOs to participate
- Focusing interventions on schools and workplaces

Implementation

- Development of environmental education programs

3.3 Group 3 discussion

3.3.1 Discussion topic: Responsible stakeholders and corresponding actions

Group 3 mainly focused on Goal (A), (B), (C), (D) and (E) accordingly as follows:

Responsible agencies will be CDCs, ECD and Ministry of Education.

Action Plan for Implementation and Monitoring

- Goal A: Promote waste minimisation, reuse, recycling and recovery to establish a resource circular society
- Goal B: Ensure the effective and efficient delivery of waste services
- Goal C: Ensure sustainable budgeting and sound financial management of the waste sector
- Goal D: Compliance, monitoring, enforcement and recognition

(i) Goal A: Promote waste minimisation, reuse, recycling and recovery to establish a resource circular society

Implementation

The relevant authorities should work to address the following issues:

- Supporting the development of specific waste management plans supported by research and available infrastructure
- Engaging local and international experts

Monitoring

- Responsible agencies will be CDCs and ECD.

(ii) Goal B: Ensure the effective and efficient delivery of waste services

Implementation

The relevant authorities should work to address the following issues:

- Establishing suitable infrastructure
- Appropriate waste technology (i.e., machinery and vehicles)
- Promoting training and workshops
- Proposing training led by the international experts
- Designing health and safety trainings for the waste sector

Monitoring

- Responsible agencies will be ECD, CDCs and private sectors.

(iii) Goal C: Ensure sustainable budgeting and sound financial management of the waste sector

Implementation

The relevant authorities should work to address the following issues:

- Loan
- International Funding.
- Salary for Staff

Monitoring

- Responsible agencies will be MONREC-ECD, CDCs, INGOs.

(iv) Goal D: Compliance, monitoring, enforcement and recognition

Implementation

The relevant authorities should work to address the following issues:

- Encourage mindset, attitude, knowledge and behaviours through repeated attractive awareness programs

- Support self reflection
- Regular and Surprise Check
- Flexible and specific members for monitoring team
- Set policy and disciplines
- Law enforcement
- Make sure for illegal dumping issue
- Sector Laws Enforcement

Monitoring

Responsible agencies will be MONREC-ECD, Attorney General Office, Regional governments and CDCs.

Furthermore Group 3 identified the following stakeholders responsible for monitoring waste management within their respective sectors and areas.

- Administration Department particularly in landfill areas
- Township leaders, land owners, associated property management committees
- Authorization from Central Government is required for designated areas larger than 5 acres.

(v) Goal E: Capacity development, awareness raising and advocacy

Implementation

The relevant authorities should work to address the following issues:

In terms of Awareness raising,

- Household Participation
- Distributing knowledge activities using media
- Education according to different educational levels
- Clean and nice environment can produce more creativity

Monitoring

- CDC is responsible for distributing information materials and organizing activities, including printing awareness-raising posters, carrying out radio and media broadcasts, promoting education and training, and supporting competitions and events to draw attention to waste management issues. It was noted that CDC budget is limited for this purpose.
- Committee members elected by citizens are responsible for developing awareness-raising programs and defining incentives and penalties.
- General administrative departments are specifically responsible for organizing such activities.
- Media agencies are responsible for disseminating updates and news on waste management issues, including on matters of rewards and punishments for compliance and non-compliance

Responsible agencies will be

- MONREC- ECD
- Ministry of Education
- CDCs
- Private sector actors

They will be responsible for the following issues:

- Budget allocation
- Planning strategies

3.4 Group 4 discussion

3.4.1 Discussion topic: Responsible stakeholders and corresponding actions

(i) Goal A – Promote waste minimization, reuse, recycle and recovery to establish a resource circular society

Group 4 proposed 6 actions for Goal A.:

- Mandating source segregation of wet and dry waste as an initial step for improving solid waste management
- Identifying and establishing proper waste disposal sites
- Evaluating systematic methodologies for waste disposal
- Implementing a sustainable waste collection system in line with 3R principles
- Conducting awareness raising

Responsible Stakeholders:

- **Waste segregation:** ECD should serve as a focal point for this activity, collaborating with CDCs, Ministry of Health and Sport, DISI as well as the greater public as necessary.
- **Establishing waste disposal sites:** the primary responsible institutions include the Union Government, Regional Governments, CDCs, as well as the Settlement and Land Record Department housed under the Ministry of Agriculture and Irrigation.
- **Evaluating waste disposal issues:** the main focal institutions for this activity are Regional Governments and CDCs.
- **Promoting Waste collection:** main focal institutions include Regional Government and CDCs.
- **Raising awareness:** the main focal institutions include ECD, the General Administration Department (GAD), Ministry of Education (responsible for developing waste management course curricula), and Ministry of Information (responsible for conducting knowledge sharing through use of media).

Time Frame

- **Implementing waste segregation:** Group 4 agreed that the time frame for this activity should be 2017-2018.

- **Establishing waste disposal sites:** as this must be agreed upon by various government departments, the exact time frame presently cannot be determined.
- **Evaluating waste disposal issues:** as this must be agreed upon by various government departments, the exact time frame presently cannot be determined.
- **Promoting waste collection and 3Rs:** as this must be agreed upon by various government departments, the exact time frame presently cannot be determined.
- **Raising awareness:** participants agreed that related awareness-raising activities should be completed within 2017-2020.

Estimated Budget:

- **Waste Segregation:** participants agreed that the designed focal organization should organize a national-level workshop at least two times as well as educate the greater public about the proper steps for implementation, with an estimated 150 million (MMK) for conducting these activities.
- **Establishing waste disposal sites:** As the land in question is stated owned, no budget estimations were made.
- **Evaluating waste disposal issues:** Given that government authorities are responsible for this activity, no budget estimations were made.
- **Promoting Waste Collection:** Given that government authorities are responsible for this activity, no budget estimations were made.
- **Raising awareness:** Participants agreed that a total estimated budget of 140million (MMK) would be sufficient for this activity.

Implementation

- To achieve Goal A, the following actions are necessary: Conducting data collection
- Disseminating information on rules and regulations to the private sector Promoting 3Rs activities at the community level

Monitoring

Monitoring	
State/regional /city level	National Level
<ul style="list-style-type: none"> • Regional Government, • Private sector, third parties 	<ul style="list-style-type: none"> • Ministry of Natural Resources and Environmental

<ul style="list-style-type: none"> • CSOs, • NGOs 	Conservation (MONREC)
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(ii) For Goal B: Ensure the effective and efficient delivery of waste services

Group 4 identified CDCs and private sector actors were discussed as the main stakeholders involved in implementing Goal B, in line with the following actions::

- Establishing laws on waste segregation
- Issuing robust rules and regulations
- Securing sufficient levels of human, technical and financial resources
- Allocating appropriate budget
- Developing Public Private Partnerships

Monitoring

The General Administrative Department (GADMONREC-ECD are the primary focal points responsible for communicating with other ministries as well as the greater public.

Monitoring	
State and regional /City Level	National Level
<ul style="list-style-type: none"> • GAD, • CDCs, • ECD • CSOs • NGOs 	<ul style="list-style-type: none"> • ECD, MONREC • Ministry of Education • Ministry of Health and Sports • Ministry of Information

Goal C: Ensure sustainable budgeting and sound financial management of the waste sector

Group 4 agreed that that budget and financial support is the most critical factor required for achieving Goal C. Securing a sufficient budget involves the following:

- Setting commercial and municipal tax rates
- Ensuring municipal taxes are based on waste generation rates
- Allocating budget in line with the revenues generated from the above tax
- Defining municipal taxes according to different types of waste

Monitoring

with other ministries as well as the greater public.

Monitoring	
State and regional /City Level	National Level

<ul style="list-style-type: none"> • GAD, • CDCs, • ECD • CSOs • NGOs 	<ul style="list-style-type: none"> • ECD, MONREC • Ministry of Education • Ministry of Health and Sports • Ministry of Information
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(iv) Goal D: Compliance, monitoring, enforcement and recognition

Group 4 agreed that ECD should provide sectoral guidance, follow up and monitor to ensure the wider public private sectors are aware of proper waste management practices and comply with relevant rules and laws. Two approaches to implementation were proposed:

- Defining laws and regulations
- Providing guidance on the scope of rules and regulations

Monitoring	
State and regional /City Level	National Level
<ul style="list-style-type: none"> • GAD • CDCs, • ECD • CSOs • NGO 	<ul style="list-style-type: none"> • MONREC-ECD • Ministry of Education • Ministry of Health and Sports • Ministry of Information

(v) Goal E: Capacity development, awareness raising and advocacy

Group 4 identified ECD, Ministry of Education, Ministry of Health and Sports, Ministry of Information, CDCs and GAD as the primary stakeholders involved in achieving Goal E.

Accordingly, these stakeholders should collaborate on implementing the following actions:

- Promoting awareness raising
- Guiding on 3R-related activities
- Integrating environmental education into the academic curricula
- Enforcing laws on waste management

Monitoring	
State and regional /City Level	National Level
<ul style="list-style-type: none"> • GAD • CDCs, • ECD • CSOs • NGOs 	<ul style="list-style-type: none"> • MONREC-ECD • Relevant ministries (Ministry of Education, Ministry of Health and Sports, Ministry of Information)

Annex (I)

Participants Group 1

Discussion topic:

Goal A: Maximise municipal solid waste collection and recycling in the city

Goal E: Capacity Development, Awareness Raising and Advocacy

Sr	Name	Position	Department
1	U Mg Mg Mg Lwin	Deputy Director	Ministry of Planning and Finance
2	U Soe Win	Deputy Director	Yangon Regional Development Committee
3	U Zaw Min Thant	Director	General Administration Department , Yangon
4	Daw Aye Win	Director	Attorney General office, NPT
5	Daw Khin Thida Tin	Director	YGN, ECD
6	Daw Ni Ni Thin	Assistant Director	NPT, ECD
7	Daw Myat Su Yi	Deputy Staff Officer	NPT, ECD
8	Daw Htet Htet Htun	Sub Assistant Engineer	(YCDC)
9	Daw Kaythari Mg	Sub Assistant Computer Supervisor	(YCDC)
10	Daw Kyu Kyu Win	Work Charge (Engineer)	(YCDC)
11	Daw Yun Tayzar Kyaw	Daily Wages (Engineer)	(YCDC)
12	Ko Khin ZawWin	Associate Environmental Consultant	Environmental Quality Management Co., Ltd

Group 2

Discussion topic:

Goal C: Maximise proper waste collection and treatment of industrial and hazardous (medical) waste

No	Name		Department
1.	U That Tun	Director	Rakhine Development Committee
2.	U Sain Maung Htwe	Deputy Staff Officer	Magwe, ECD
3.	U Min Thein	Deputy Director	Mandalay, ECD
4.	U Aung Kwae	Staff Officer	Rakhine ,ECD

5.	U Than Htut	Assistant Director	MCDC
6.	Daw June Khing Wint Tun	Student (Observer)	AIT
7.	U Khin Maung Thein	Env. Engineer	Myanmar Koei
8.	Dr. Ni Ni Aung	Director	Bago, ECD
9.	U Aung Myint		Bago Development Committee
11.	U Ko Ko Aung		YCDC
12	Ms. Khing Thwe Oo	Associate Environmental Consultant	Environmental Quality Management Co., Ltd

Group 3

Discussion topic:

Goal B: Improve final treatment and disposal

Goal D: Maximise proper disposal and treatment of liquid waste

Sr	Name	Position	Department
1	U Myint Aung	Deputy Superintendent Engineer of	Sagaing region Development Development Affairs
2	Daw Ohnmar Myint	Assistant Director	Sagaing ECD
3	U Sai Htun Htun	Director	Department of Shan State Development Affairs, Secretary of Shan State Development Committee)
4	Dr. Myat Taw Htet	Deputy Director	Pollution Control and Cleansing Department (Nay Pyi Taw Development Committee)
5	Daw Lwin Lwin Lt	Assistant Director	Pollution Control and Cleansing Department (Nay Pyi Taw Development Committee)
5	U Htun Htun Win	Deputy Director	Shan State ECD
6	U Hta Laer Ye	Director	Chin State Development Committee
7	U Win Bo	Deputy Chief Engineer	(Kachin State Development Committee
8	U Kyaw Soe	Staff officer	Kachin, ECD
9	Daw Saint	Deputy Staff officer	NPT, ECD
10	Daw Thet Wai Hnin	Deputy Staff officer	Yangon , ECD
11	Daw Maing Chin Sone	Deputy Staff officer	Chin, ECD
12	Taw Mu Mu Myint	Associate	Environmental Quality Management Co.,

		Environmental Consultant	Ltd
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Group 4

Discussion topic:

Goal F - Ensure sustainable services through regular review, monitoring, innovation and improvement

Sr	Name	Position	Department
1	U Tin Maung Htay	Deputy Director	Ayeyarwady Development Committee
2	U Min Maw	Director	NPT, ECD
3	U Soe Naing	Deputy Director	Mon State, Environmental Conservation Department (ECD)
4	Daw San San Nwe	Staff Officer	Mon State, (ECD)
5	U Aung Myat Win	Assistant Director	Kayin (ECD)
6	U Tin Ko Ko (CDC)	Deputy Staff Officer	Mon State, Development Committee
7	U Zaw Linn Htun	Assistant Director	Kayin Development Committee
8	Daw Khin Htet Tay Zar Maung	Assistant Director	Yangon ECD
9	U Htun Naing	Deputy Chief Engineer	Tanintharyi Development Committee
10	U Maw Maw Ko	Assistant Director	Kayah ECD
11	U Zaw Oo	Assistant Director	(Ayeyarwady, ECD)
12	Daw Zin Mar Win (ECD)	Deputy Staff Officer	Tanintharyi, ECD
13	U Ba Nyar Aung	Deputy Staff Officer	Yangon ECD
14	Phyo Thet Khaing	Associate Environmental Consultant	Environmental Quality Management Co., Ltd

Annex (II)

Final program

Second Workshop on the Development of National and City Waste Management Strategies for Myanmar

Yangon City Development Committee (YCDC)

Ministries of Natural Resources and Environmental Conservations/ Environmental Conservation Department

UNEP

IGES Team

Participants from City Development Committees (CDCs) and Environmental Conservation Departments (ECDs) from (14) States and Regions, different ministries / Yangon, Nay Pyi Taw and Mandalay City Development Committees/Institutes and NGOs Environmental Quality Management Co. Ltd Team members

Target: Finalization of the National and City Waste Management Strategies along with the inputs from the representatives of CDCs and ECDs from the states and regions, the relevant ministries as well as YCDC, NCD and MCDC

1. Programme for the national workshop in Yangon, 5-6, December 2016

Date and Time	Topics	Presenter
Day 1: 5 (Mon) December 2016		
09:00-09:30	Registration	
Session 1: Open Ceremony		
09:30 – 09:45	Opening Speech	Daw Hlaing Maw Oo, Secretary, (YCDC)
09:45 – 10:00	Welcome Message by MONREC	Director General ECD Representative from MONREC
10:00 – 10:30	Introduction to the workshop by CCET (A need of National/City Waste Management Strategies and Action Plans to achieve more resource efficient and sustainable society)	Mr. Kazunobu Onogawa, Director, IGES-Center Collaborating with UNEP on Environmental Technologies (CCET)
10:30- 11:10	Brief Discussion on “Environmental Mainstream into Development to Sustainable Economic Development in Myanmar”	U Hla Mg Thein (Director General, ECD)
11:10 – 11:15	Group Photo	
11:15– 11:30	Tea Break	
11:30– 12:30	City Overview of Waste Management by townships, Mawlamyine (Mon State), Myawaddy, Hpa-An (Kayine State) and Monywa (Sayaing Region) (solid waste, liquid waste, etc.) (09	Representatives of respective Townships
12:30 – 13:30	Lunch Break	

13:30 – 14:00	Presentation of development of the draft City Waste Management Strategy for Mandalay	Dr.D.G.J.Premakumara, Senior Researcher/Mr. Matthew Hengesbugh, Policy Researcher, IGES
14:00 – 15:00	Discussion 1: Group discussion on the contents (Goals, Targets, Objectives, and Actions) of the	2 Groups (Urban and Rural)
15:00 – 15:30	Group presentations and finalisation	Facilitate by IGES/EQM
15:30 – 15:45	Tea Break	
15:45 – 17:00	Discussion 2: Group discussion for preparation of action plan (Activities, time frame,	2 Groups (Urban and Rural)
17:00 – 17:30	Group presentations and finalization	Facilitate by IGES/EQM
Day 2: 6 (Tue) December 2016		
09:00 – 09:30	Registration	
09:30 – 10:15	Presentation of development of the draft national waste management strategy	Dr. D.G.J.Premakumara, Senior Researcher/ Mr. Matthew Hengesbugh, Policy Researcher, IGES
10:15– 10:30	Tea Break	
10:30– 11:30	Discussion 3: Group discussion on the contents (Goals, Targets, Objectives, and Actions) of the strategy and its	3 Groups (Townships, Business and National)
11:30–12:15	Group Presentation and finalization of the national strategy	Facilitate by IGES/EQM
12:15– 13:00	Lunch Break	
13:00 – 14:00	Discussion 4: Group discussion	3 Groups (Townships, Business and National)

Annex (III)

Group Photos



Figure 1. Opening Speech by YCDC's Secretary



Figure 2. Greeting by Director General U Hla Maung Thien (ECD, MONREC)



Figure 3. Introduction speech by Mr. Kazunobu Onogawa, Director, IGES, UNEP)



Figure 4. National Overview of Waste Management by MONREC (U Hla Maung Thien, DG, ECD)



Figure 5. Group Photos



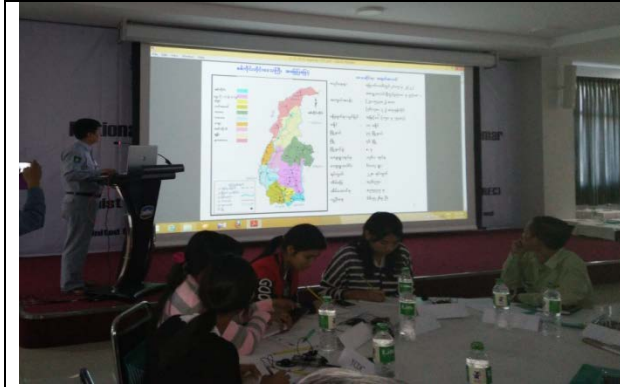


Figure 6. Presentation from Monywa (Sagaing Region)



Figure 7. Presentation from Mawlamyine (Mon State)



Figure 8. Presentation of Development of the draft City Waste Management Strategies by Mr.Mathew Hengesbugh



Figure 9. Presentation of Development of the draft City Waste Management Strategies by Dr.D.G.J.Premakumara



Figure 10. Group 1 Discussion





Figure 11 Group 2 Discussion



Figure 12 Group 3 Discussion



Figure 13. Group 4 Discussion

Annex (IV)
Presentation Materials (attached)

2nd Workshop on National and City Waste Management Strategy and Action Plan



Brief on Environmental Mainstreaming into Development to Sustainable Economic Development in Myanmar

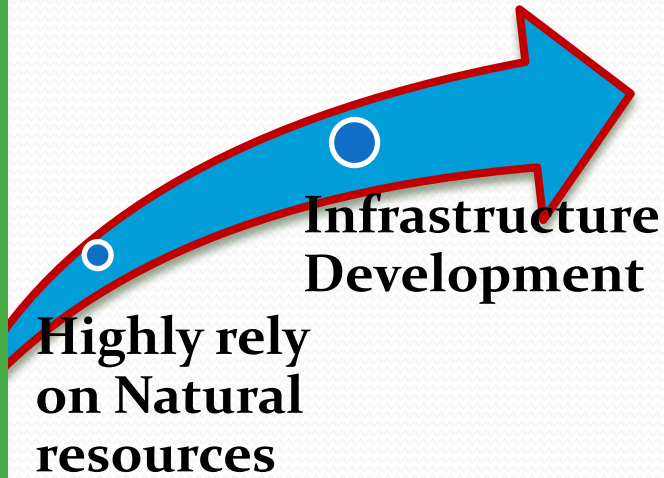
**U Hla Maung Thein
Director General
Environmental Conservation Department
MONREC**

05-12-2016

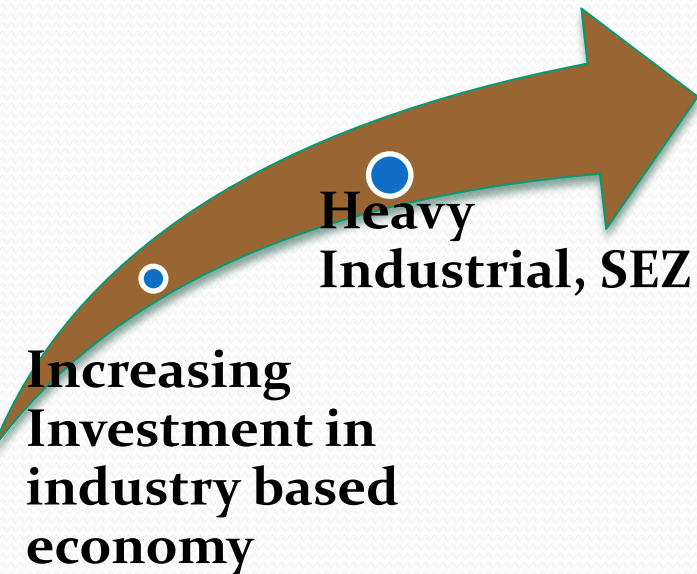
Outlines

- **Environmental Challenges**
- **Enabling conditions**
- **Gaps**
- **Integrated approach**
- **Way Forward**

Economic Reform: Environmental Challenges



- Agriculture,
- Fishery,
- Water,
- Forest,
- Extractive
- Industries,
- Renewable En



- Non-RE,
- Manufacture,
- Transport,
- Waste,
- Human settlement

Environmental Challenges

Sustainable economic development ?

Climate Change

Political Guidance



- By **NLD's Chairperson Daw Aung San Suu Kyi 2015** Election Manifesto, stating “...*Where there is natural resource extraction and usage, we will lay down appropriate methods so as **to avoid environmental and ecological damage***”
- “...*We will enact legislation to assess and evaluate the **risks of environmental harm** resulting from domestic and international investment.*”

- By **Former President U Thein Sein's** inaugural address to Pyidaungsu Hluttaw (Union Parliament, 30 March 2012), stating “...*we will lay down a new policy in which we will work for economic development in parallel with environmental conservation*” .

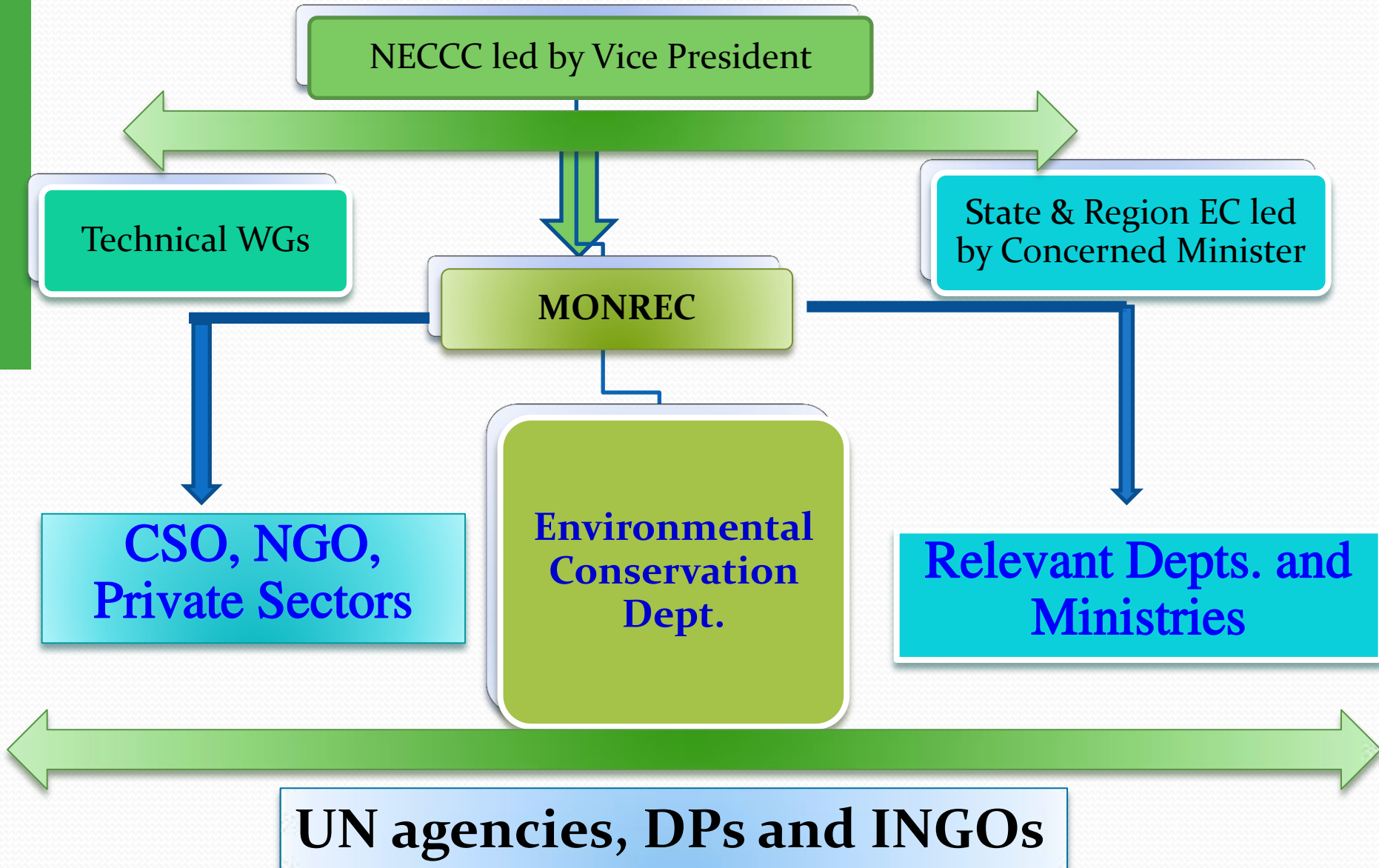
Policy Guidance by President in 5th



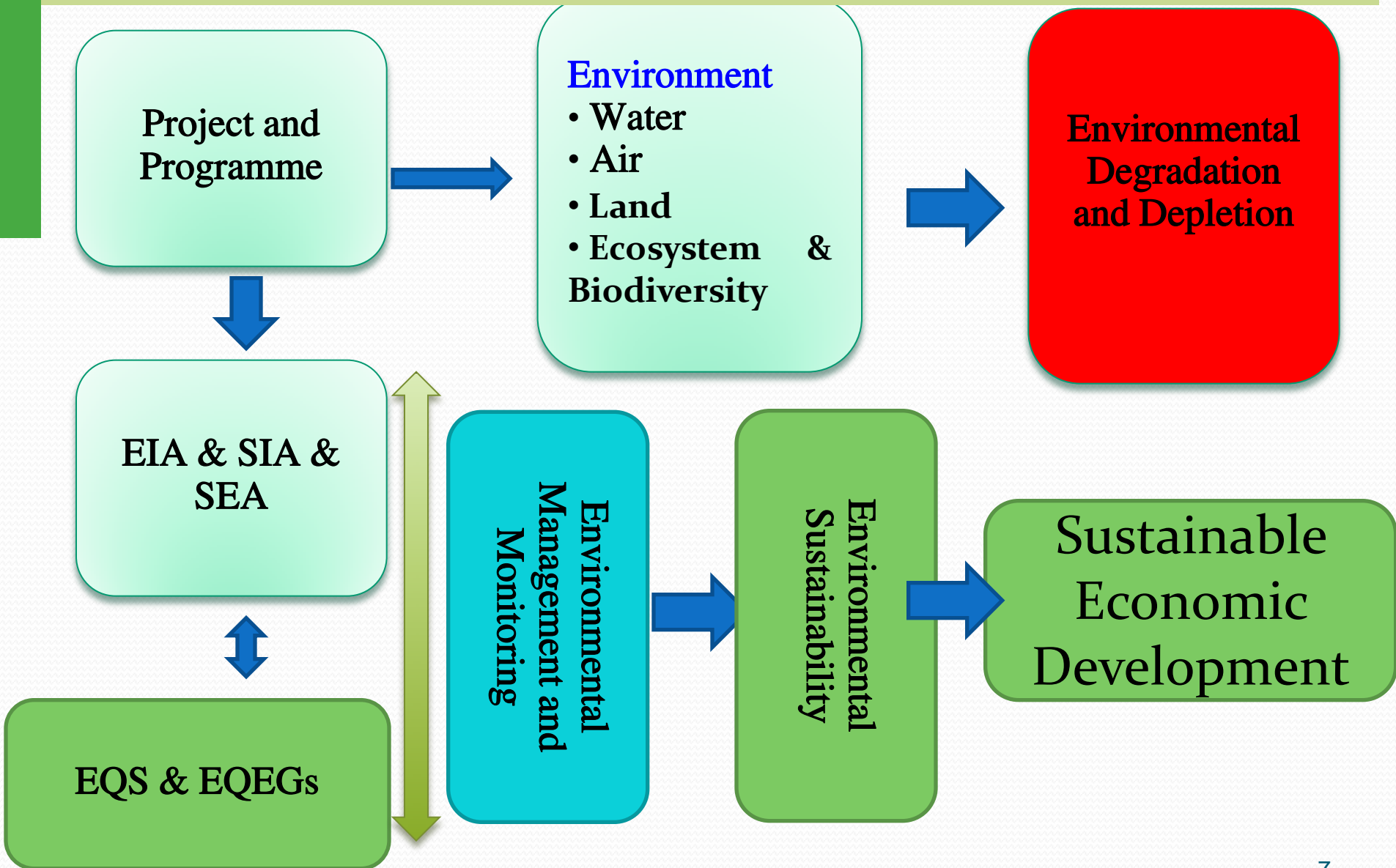
GEGG forum

- Encouraging and enabling **renewable energy** and setting targets for renewable energy use with time frames.
- Increasing **efficient use and conserving** of energy, water, soil, biodiversity;
- Changing behavior and practices in **consumption, production patterns**;
- Fundamental conceptual change in **considering wastes as a resource**;
- Innovative **economic incentives and financial mechanisms** to support and encourage applications and innovations;
- **Human resource** development and education for emerging opportunities

Multi-stakeholders partnerships for Environmental Safeguards



Environmental Mainstreaming into Development through EIA process



Enabling conditions



Environmental Mainstreaming:



- Political support
- Public awareness
- Institutions
- EC Law/ Rules
- NCDP
- MIC guidelines
- FDI Law/Rules/Notification
- Tools : EIA & SIA & EQGs & SEA



Gaps



Sustainable Development Policy and Strategies Framework

Specific Rules, Regulation and Guidelines

Green Technology

Research & Development Innovation

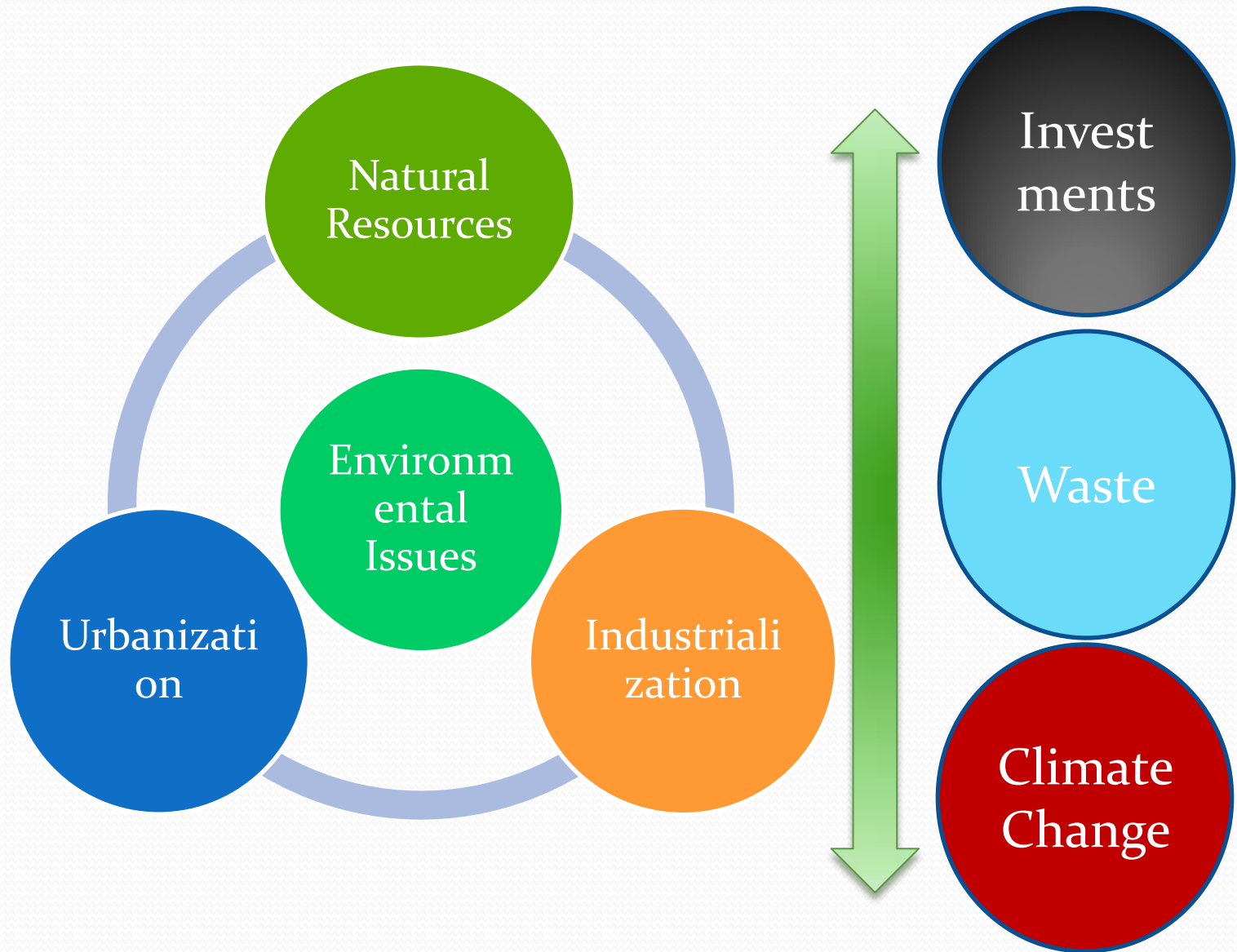
Public Private Partnership

Coordination Mechanism and Institution

International Cooperation

Financial Mechanism

Key priority issues:



Sustainable Development

Sustainable Development Framework

Green Economy

Low carbon, resource efficient and socially inclusive as an integral part of sustainable growth which promotes economic growth. (UNEP)

Human Society

Low carbon,
Energy Security
Jobs

Environment

Environmental
Sustainability, Resource
efficient and healthy
Ecosystem and
Environment

Economic

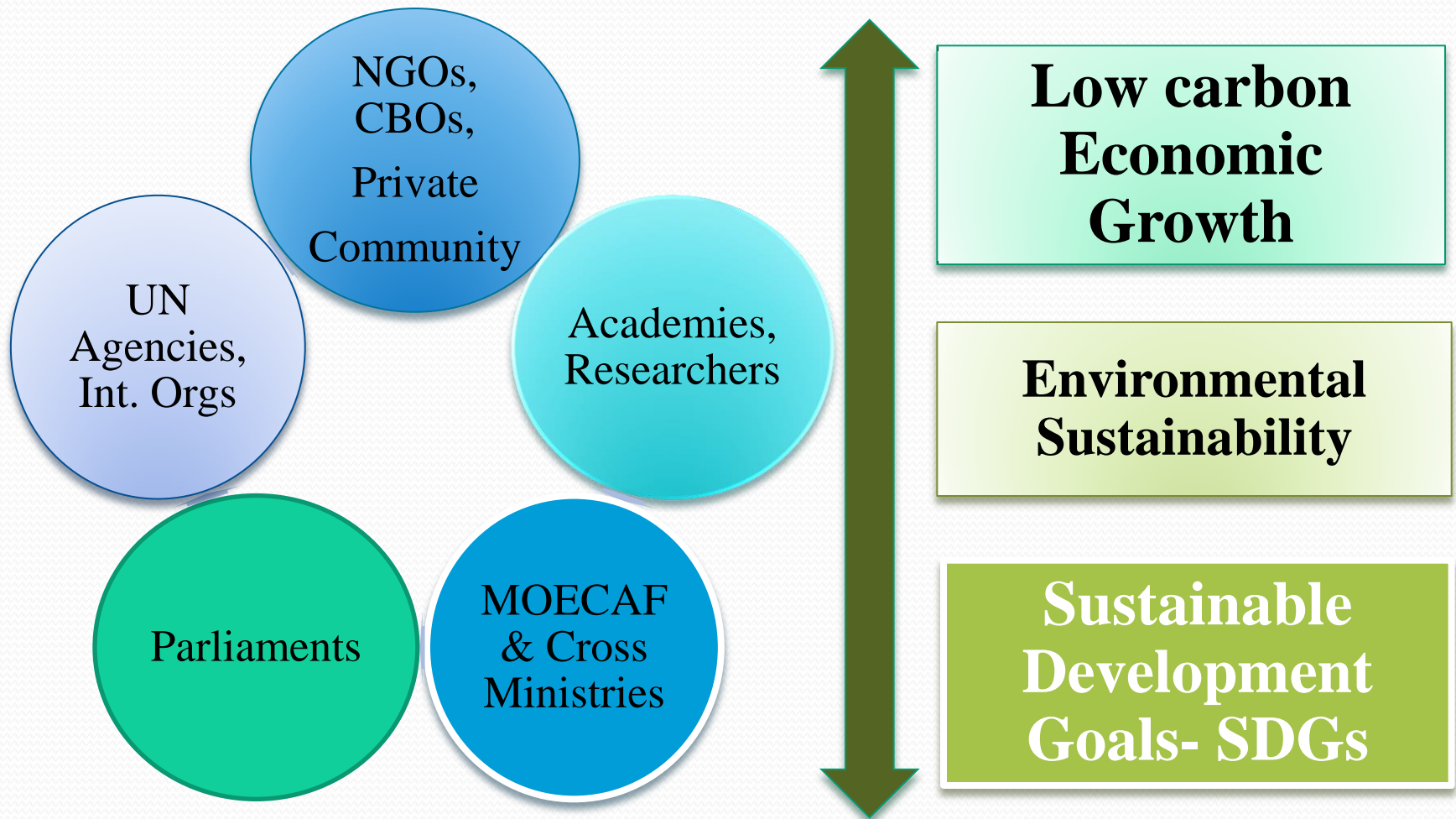
Sustainable
Consumption and
Production

Sustainable Society

- Basic Needs
- Education
- Livelihoods
- Food
- Clean Water
- Health

- Environment Sustainability
- Biodiversity and ecosystem
- Climate Change Mitigation and Adaptation

Integrated Approach: Multi-stakeholders Engagement





Integrated Approach towards a sustainable economic development through Environmental mainstreaming

National Environmental Policy and Strategic framework & Master Plan

National Climate Change Policy & Strategy

National GE Policy Strategic Framework

National Waste Management Strategic Policy Framework

Action Plan

Institution:
National Environmental Conservation and Climate change committee
Region and State regions ECCCC supervison committee

Environmental Management Fund

Forest	Biodiversity	water	EnviroQuality	Land	Marine	Agric	Indu,&Trans	Health	Tourism	Culture	Extra ctive Industries	Urban/Infrast ructure	En erg y
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National Environmental policy and strategy



Vision: Economic development, social inclusion and environmental conservation come together in a new paradigm for sustainable development

National Environmental Policy

National Environmental Policy Principles

Clean environment and healthy, functioning ecosystems

Sustainable development

Mainstreaming environmental protection and management

Sustainable Development Goals



National Environmental Policy – Strategic Framework

Guidance for Strategic Policy Themes

Integrating Strategic Policy Themes in Key Sectors

Guidance for Environmental Governance

National Environmental Policy Master Plan/s

Sub-national Environmental Policy Master Plans

Strategic Policy Theme Master Plan/s

Sector-based Environmental Master Plan/s



Overview: Green Economy Policy Framework- GEPF (Draft)

- Guiding principles: ***sustainable, inclusive and efficient***

- **Objectives :**

Stimulate green investments from the private sector

Manage impacts from brown investments

Ensuring sustainable financing for the public sector

Fostering human capital – within government and creating jobs

Natural resource-based sectors

- Agriculture and livestock
- Fisheries
- Water
- Forests
- Extractive industry
- Renewable energy

Efficiency-based sectors

- Non-renewable energy
- Manufacturing
- Buildings
- Transport
- Waste
- Urban and human settlements

National Climate Change Strategy and Action Plan- NCCSAP



GOAL

By 2030, Myanmar is achieving climate resilience and is engaged in low-carbon, resource efficient & inclusive development as a contribution to sustainable development

STRATEGIC OBJECTIVES

Increase adaptive capacity and resilience of communities and sectors

Maximise opportunities for low carbon development in potential sectors

FOCUS AREAS (KEY ENTRY POINTS)

Agriculture and Food Security

Environment, and Natural Resources

Energy, Transport, and Industry

Urban, Building and Human Settlements

Education, Awareness, Science and Technology

DRR, Health and Early Warning Systems

STRATEGIC PRIORITIES (FOR EACH FOCUS AREAS)

Integrating Climate Change

Policy, Legislation, Planning, Budgeting

Institutional Arrangements

Coordination Mechanisms, Human Skills, Implementation, Monitoring and evaluation

Financial Mechanisms

Fund management, Financial instruments

Access to technology

Access to environmentally sound technology for adaptation and mitigation

Awareness, and Capacity

Capacity, Education and awareness, Research data & innovation

Multi-stakeholder Partnerships

Public, (including CSOs) private partnership; Joint implementation; International cooperation

National & City Waste Management Strategy and Action Plan-NWMSAP(Draft)



Vision : “Sustainable, Green, Clean and Healthy Environment towards a Brighter Future for Myanmar”

Mission: To develop and implement the holistic/ integrated waste management strategy based **on principles of inclusiveness, zero waste and circular economy** to achieve a **greener, cleaner and healthier environment**.

Objectives

Goal A:
Extending sound waste management practices for all types of waste to eliminate uncontrolled treatment, disposal and open burning

Goal B:
Promote waste minimization, reuse, recycling and recovery to establish a resource circular society

Goal C:
Ensure sound for securing sustainable sources of revenue for the waste sector

Goal D:
Awareness raising , advocacy and Capacity building

Goal E:
Compliance, monitoring, enforcement and recognition

Future steps for Implementation

Sustained Political Support

**Sustainable and environmental sound
Development Policy and Strategies**

Specific Rules, Regulation and Guidelines

**Human resources development &
Environmental education**

Green Technology

Research Innovation & Development

Public Private Partnership

Coordination Mechanism and Institution

International Cooperation

Sustainable Financial Mechanism

Thank you



19.06.2010



MAWLAMYINE 2022-CLEAN AND GREEN



SOLID WASTE MANAGEMENT

Contant

- Existing situation
- Vision and SWOT Analysis
- GAP Analysis
- Objective
- Strategies
- Proposals (Project Cost)

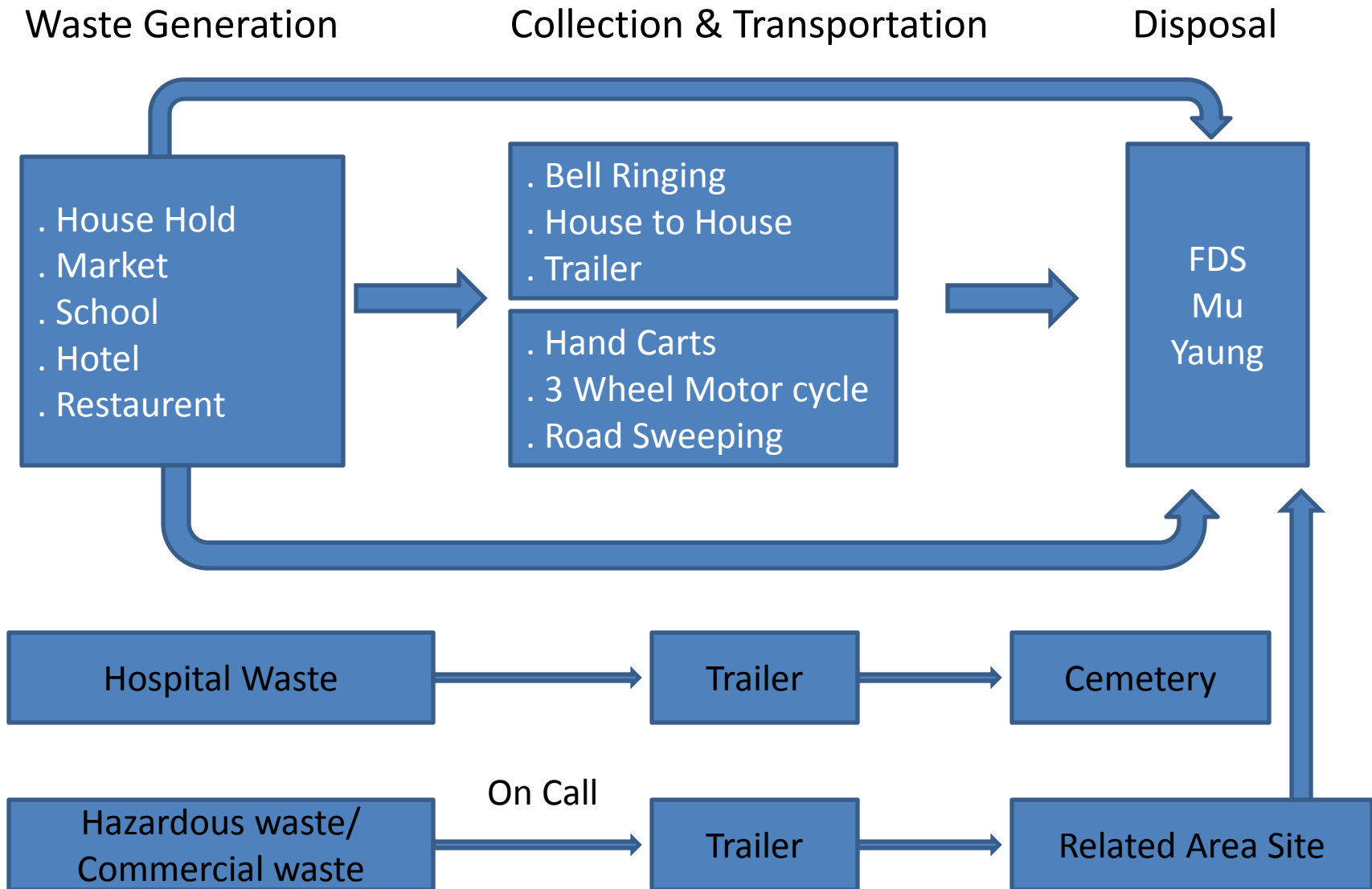
Existing Situation

CITY BACKGROUND AND URBAN PLANNING INFORMATION



• Area	-	218.9 km ²
• Population	-	258860 (2015)
• Ward	-	29 wards
• Generation rate	-	0.55 kg/capita/day
• Household Waste Generated	-	143.76 ton/day
• Market Waste	-	28.5 ton/day
• Total Waste	-	170.8 ton/day
• Served waste	-	60.89 ton/day
• Served ward	-	23 wards
• Coverage	-	35.6 %

Current Solid Waste Management System



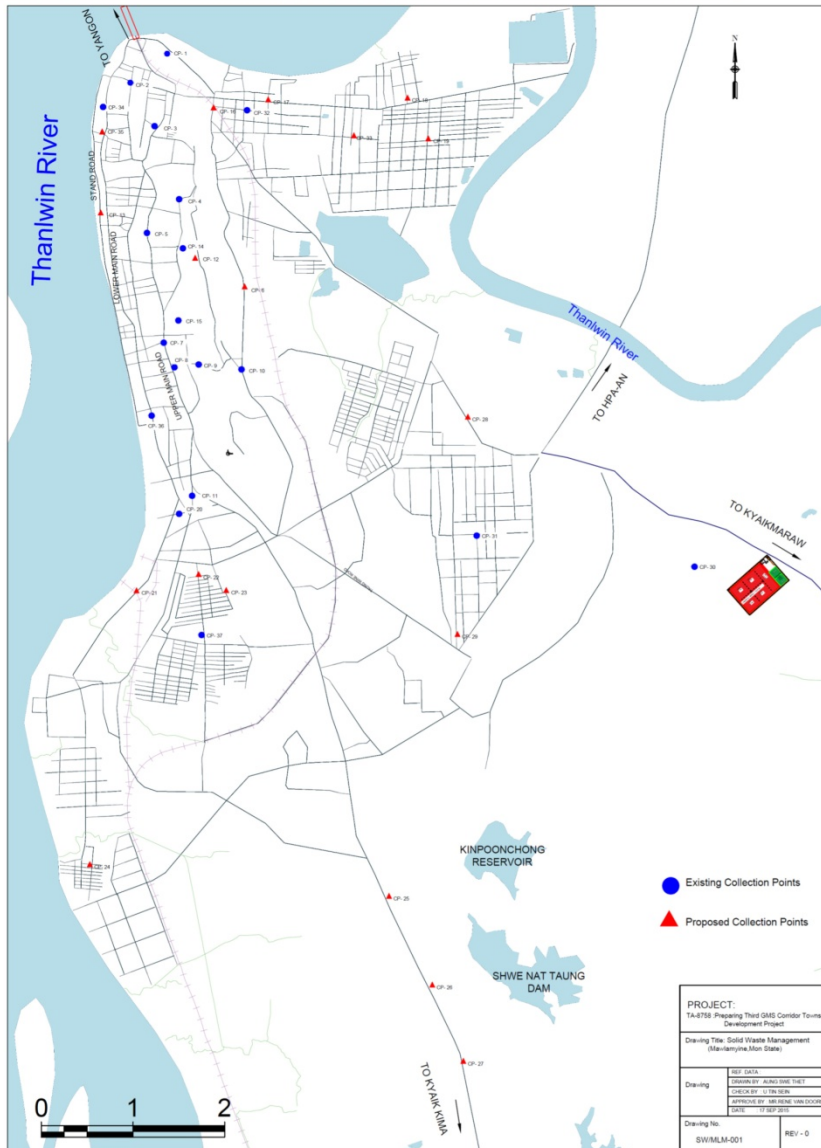
COLLECTION EFFICIENCY

Year	Waste Collection Ton/day	Workers/Employee	Collection Vehicles	3 wheel Motorcycle/ Trailer
2012	35.0	90	9	2
2013	35.46	95	10	2/15
2014	39.12	95	11	2/15
2015	41.28	100	11	2/10
2016	60.89	127	18	2/5

SOLID WASTE ESTIMATION

Year	population	Waste Generation Kg/c/d	Waste Generation (Ton/day)	Market Waste (Ton/day)	Total Waste (Ton/day)	Waste Collected (Ton/day)
2015	258860	0.55	142	28.5	170.8	46.9
2016	264089	0.56	149	29.8	178.7	60.89
2020	286084	0.62	177	35.5	212.8	191.6
2025	316172	0.69	218	43.6	261.8	240.8
2030	349424	0.76	266	53.1	318.7	299.6
2040	426788	0.9	384	76.8	460.9	451.7

FINAL DISPOSAL SITE



Damp site area = 81.46 acres



Truck





SOLID WASTE MANAGEMENT BUDGET

Income (2016-2017)				
(1)	Income from waste collection (Tax+Fees)		24,962,677	MMK/year
(2)	Commercial Waste Tax		13,700,000	MMK/year
	Total		38,662,677	MMK/year
(3)	Average Daily Income		109,525	MMK/year
(4)	Average Household fees		1198.65	MMK/year
Regular Expenditure				
(1)	Salary		102,500,000	MMK/year
(2)	Fuel		70,200,000	MMK/year
(3)	Equipment		2,200,000	MMK/year
(4)	Maintenance		9,650,000	MMK/year
	Total		184,550,000	MMK/year

VISION

- **Mawlamyine 2022- Clean and Green**



SWOT ANALYSIS

• Strength

- Financial Strength of the TDC (Surplus budget in 2016-17)
- Small and large scale informal sector collectors of recyclable materials
- Availability of City development plan
- Current levy of tariff on solid waste management (1200mmk/year)
- Assistance of the international funding institutions (i.e. assistance for water supply)

• Weakness

- Absence of organized waste separation and resource recovery practices and current practise only limited to open dump
- Water born diseases is recorded to be a major health problem
- Absence of community awareness of the sustainable solid waste management practices
- Inadequate staff , vehicles and equipment of the cleaning department
- Current practises of the waste management – land fill only

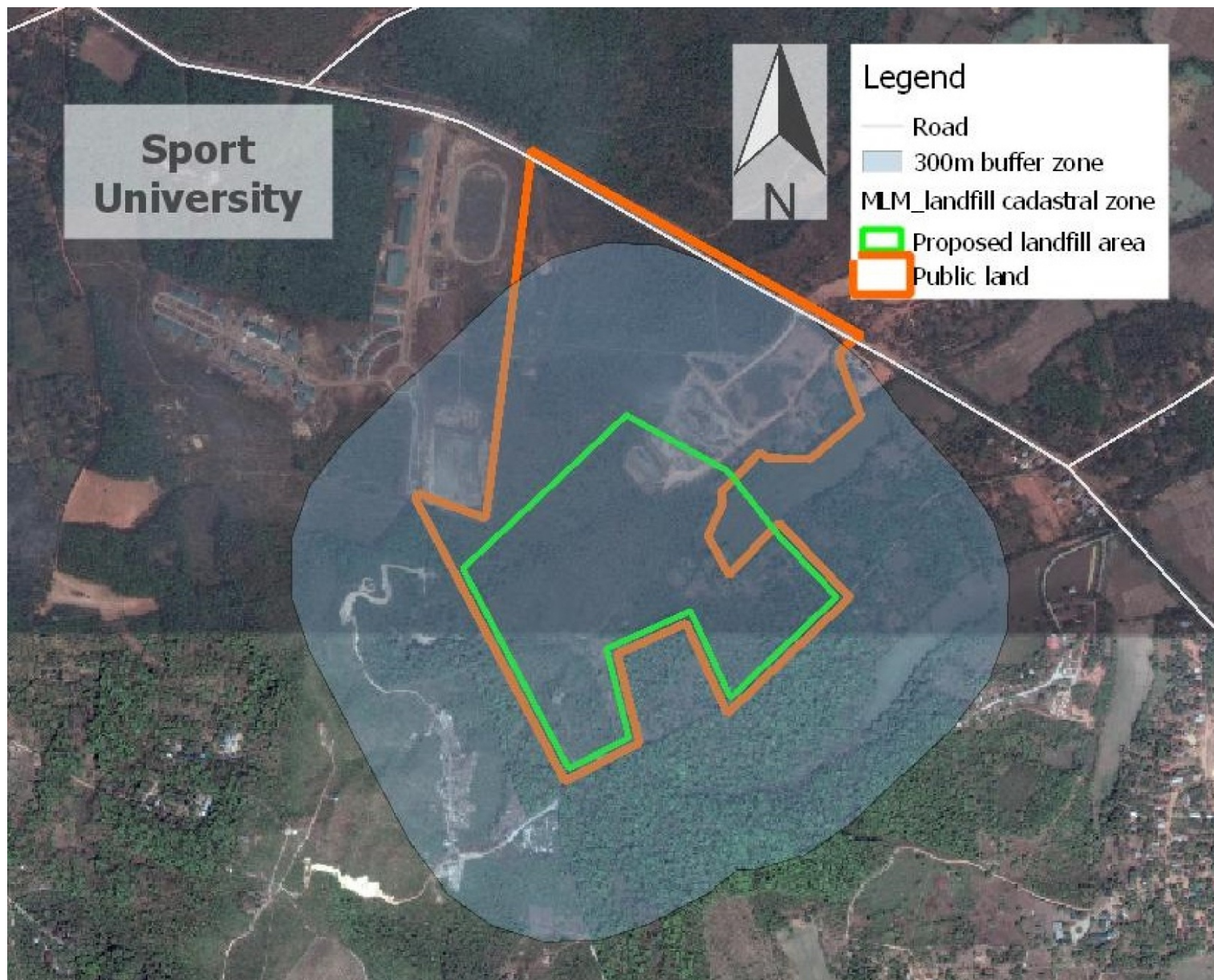
• opportunities

- Priority placed by international donors on environmental infrastructure
- Demand for recycled materials in the local and international market
- Growing demand for organic food in the global and local market

• Threats

- Location of dump site near the Residential house and sports institute

Location of Damp Site



Objectives

- Recovery of the resources up to 70% By 2022 and 100% by 2025
- Separation of the waste at the source up to 75% by 2022 and 100% by 2025
- Cleaning Department to become financially self sufficient by 2022
- Enhancing the living condition of the informal waste collectors

Gap Analysis

Indicator	Current Situation	Future Expectation (2022)	Gap
1. Resource recovery level	0	70 %	70 %
2. Waste Separation at the source	0	70 %	70 %

Strategies

- Restructuring & Strengthening the technical, financial and management capabilities of the cleaning Department of the TDC.
- Implementation of continuous community awareness programmes together with strict law enforcement.
- Restructuring the waste collection system to match and strengthen the value chain of the resource recovery.
- Establishment of **Private -Public -Partnerships** with the local investors for composting biodegradable waste, getting the local university involved in research.

PROJECT COST

- Improving primary collection system in the town and secondary transport system to the landfill and composting site;
- More efficient separation and collecting of recyclables e.g like ferrous, plastic bottles, glass, aluminium cans and paper, both through the informal sector and formal sector;
- Implementation of a small Hospital Waste Incinerator;
- Introducing source separating organics (SSO) system for diverting large amounts of organic waste to the new planned Compositing Plants
- Upgrading of the existing dumpsite to a controlled Landfill with bottom liner and leachate collection and treatment.

Above measures are included in the investment plans of the town and proposed for ADB Financing .

Total CAPEX is estimated **at 14 million USD** for the first phase of project implementation

BENEFITS

• Social

- Health-related benefits due to clean environment
- Employment generation for low-income people and increased job standards
- Upgrading living conditions of the low-income people involved in waste separation/collection
- Enhancement of community perception - the pride of having a clean city

• Economic

- Building the city brand names as a Clean City – a key aspect of the city competitiveness attracting investors.
- Strengthening financial stability of the TDC, so that it can provide other services better.
- Reduction of the cost of agriculture produce, due to the use of compost fertilizer and increase of the farmers' income . It will provide a further encouragement to step into the organic food market, further increasing the farmers' income.
- Save value urban land – otherwise necessary for landfill
- Savings from storm water management.

• Environment

- Control of Groundwater and soil pollution
- Control of air pollution
- Elimination of unpleasant visual quality of the city due to improper waste disposal.
- Elimination of infections from direct contact with contaminated materials, dog and rodent bites, consuming meat from the waste-fed animal



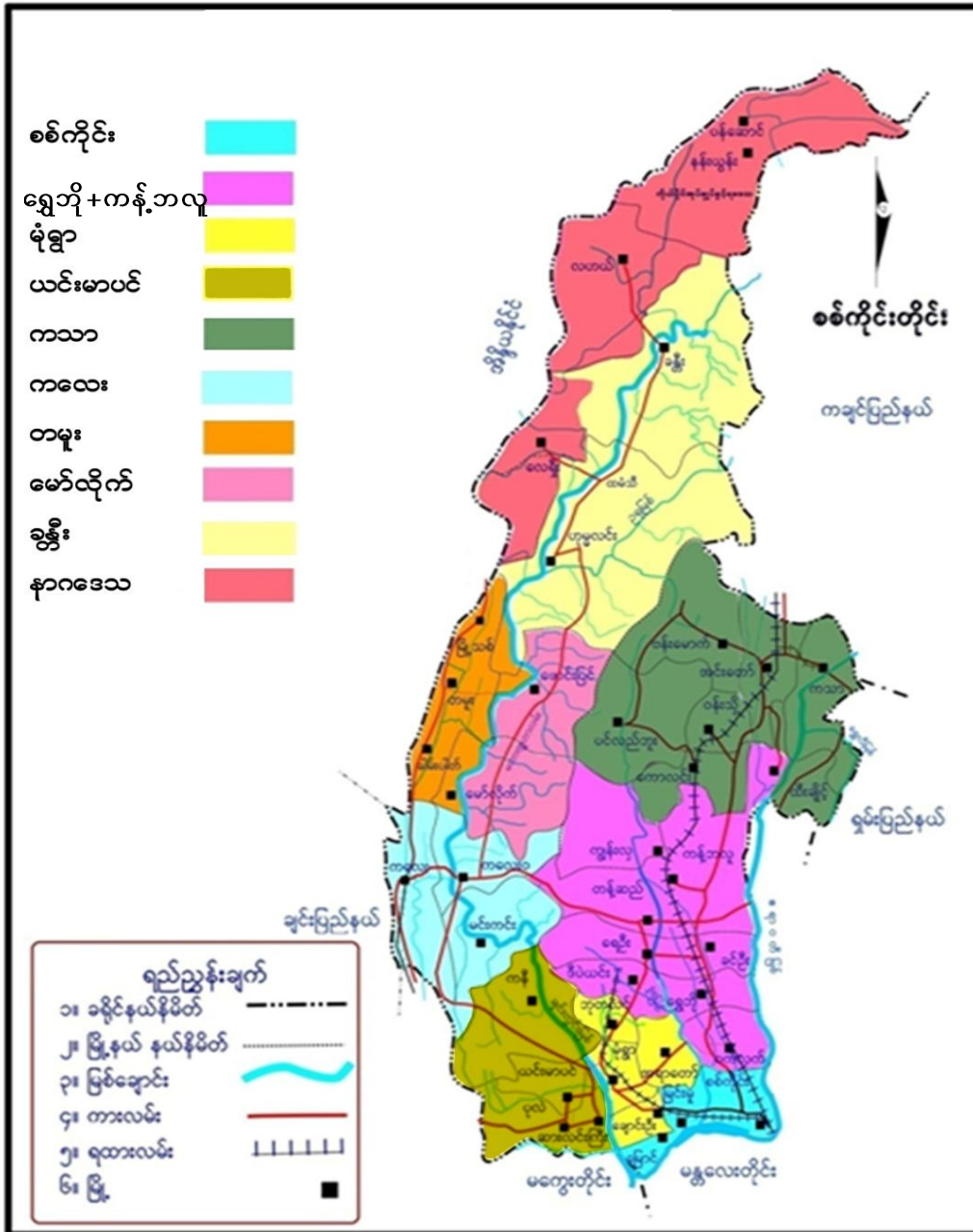
Thank you for your attention

စစ်ကိုင်းတိုင်းဒေသကြီး

သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေး

စွန့်ပစ်ပစ္စည်းစီမံခန့်ခွဲမှု တင်ပြချက်

စစ်ကိုင်းတိုင်းဒေသကြီး အခြေပြမြေပုံ



ဒေသဆိုင်ရာ အချက်အလက်

- တည်နေရာ - မြောက်လတီတွင် ၂၁၀၅' မှ ၂၇၂၂' အရှေ့လောင်ဂျီတွင် ၉၄၀၀' မှ ၉၇၀၈' ၊
- အကျယ်အဝန်း - (၂၃၁၅၄၃၈၂) ဧက၊ (၃၆၁၇၈. ၇၂) စတုရန်းမိုင်
- မြေမျက်နှာသွင်ပြင် - အမြင့်ပေ (၁၅၀ မှ ၅၄၈၃) ခရိုင်
- ခရိုင် - ၁၀ ခရိုင်
- မြို့နယ် - ၃၇ မြို့နယ်
- မြို့ - ၄၆ မြို့
- မြို့နယ်ခွဲ - ၈ ခု
- ကျေးရွာအုပ်စု - ၁၇၆၁ အုပ်စု
- ကျေးရွာပေါင်း - ၆၀၀၄ ရွာ
- ရပ်ကွက် - ၂၂၈ ရပ်ကွက်
- အိမ်ခြေ - ၈၃၆၇၅၀
- အိမ်ထောင်စု - ၈၇၅၄၇၇ စု
- လူဦးရေ - ၆၆၅၄၂၆၉ ဦး

ခစ်ကိုင်းတိုင်းဒေသကြီးအတွင်းရ

အမှိုက်သိမ်းယာဉ်နှင့် ခွန်ပစ်ပစ္စည်း နေ့စဉ် ထွက်ရှိမှု ခန့်မှန်းခြေစာရင်း

၁။	ပြည်သူ့စွန့်ပစ်အမှိုက်	-	(၂၉၆) တန်
၂။	ဆေးရစ္စန့်ပစ်ပစ္စည်း(အရည်)	-	(၉၃၀၀၀) ဂါလံ
၃။	ဆေးရစ္စန့်ပစ်ပစ္စည်း(အစိုင်အခဲ)	-	(၄.၇၅) တန်
၄။	စက်မှုလက်မှုလုပ်ငန်းနှင့် စားသောက်ဆိုင်များမှစွန့်ပစ်(အရည်)	-	(၂၅၀၀၀၀) ဂါလံ
၅။	စက်မှုလက်မှုလုပ်ငန်းနှင့် စားသောက်ဆိုင်များမှစွန့်ပစ်(အစိုင်အခဲ)	-	(၂၅၅) တန်
၆။	စက်ရုံ၊ အလုပ်ရုံများ စစ်ဆေးကြီးကြပ်ခြင်း	-	(၆၅) ကြိမ်

ခစ်ကိုင်းတိုင်းဒေသကြီးအစိုးရအဖွဲ့ ၊ ရန်ပုံငွေဖြင့် မြို့နယ်စည်ပင်သာယာရေးကော်မတီများသို့ အမှိုက်သိမ်းယာဉ် (၃၄)စီး ထောက်ပံ့ပေးအပ်မှု မှတ်တမ်းဓာတ်ပုံ



၂၀၁၇-၂၀၁၈ခု ဘဏ္ဍာရေးနှစ်အတွင်း ယာဉ်စက်ယန္တရားများ ဝယ်ယူဖြည့်တင်းမည့်အခြေအနေ



Pull Arm Type Garbage Truck

Fecal Suction Truck



**မြို့နယ်စည်ပင်သာယာရေးကော်မတီများမှ စက်ရုံ၊ အလုပ်ရုံများနှင့် အများပြည်သူ
စွန့်ပစ်အမှိုက်နှင့် အညစ်အကြေးများစာရင်း**

မြို့နယ်	အများပြည်သူမှ စွန့်ပစ်အမှိုက်များ သိမ်းဆည်းခြင်း				ဆေးရုံများမှစွန့်ပစ် ပစ္စည်းထုတ်လွှတ်မှု		စက်မှုလက်မှုလုပ်ငန်းများ (စက်ရုံ၊ အလုပ်ရုံများ၊စားသောက်ဆိုင်များ		
	တည်နေရာ အကျယ်အ ဝန်း (ဧက)	စွန့်ပစ်စနစ်	အစိုင်အခဲ (တန်)	အမှိုက် သိမ်းယာဉ်၊ ယာဉ်/စက် (စင်း)	အရည် (ဂါလံ)	အစိုင်အခဲ (တန်)	အရည် (ဂါလံ)	အစိုင်အခဲ (တန်)	အခိုး၊ အငွေ (ကျ/ပေ)
မုံရွာ	၂၀	Open Dump	၉၀.၅	၂၆	၃၀၀၀၀	၁.၅	၉၅၀၀၀	၃၀	
စစ်ကိုင်း	၅.၁၆	Open Dump	၁၈	၇	၁၅၀၀၀	၀.၅	၅၀၀၀၀	၄၀	
ရွှေဘို	၉.၉၉	Open Dump	၃၀	၁၄	၁၈၀၀၀	၀.၇၅	၃၅၀၀၀	၁၃၀	
ကလေး	၅.၅၅	Open Dump	၃၀	၉	၂၀၀၀၀	၀.၈	၃၀၀၀၀	၁၅	
စုစုပေါင်း	၃၅.၁၅		၁၃၈.၅	၅၆	၆၃၀၀၀	၂.၇၅	၂၁၀၀၀၀	၂၁၅	

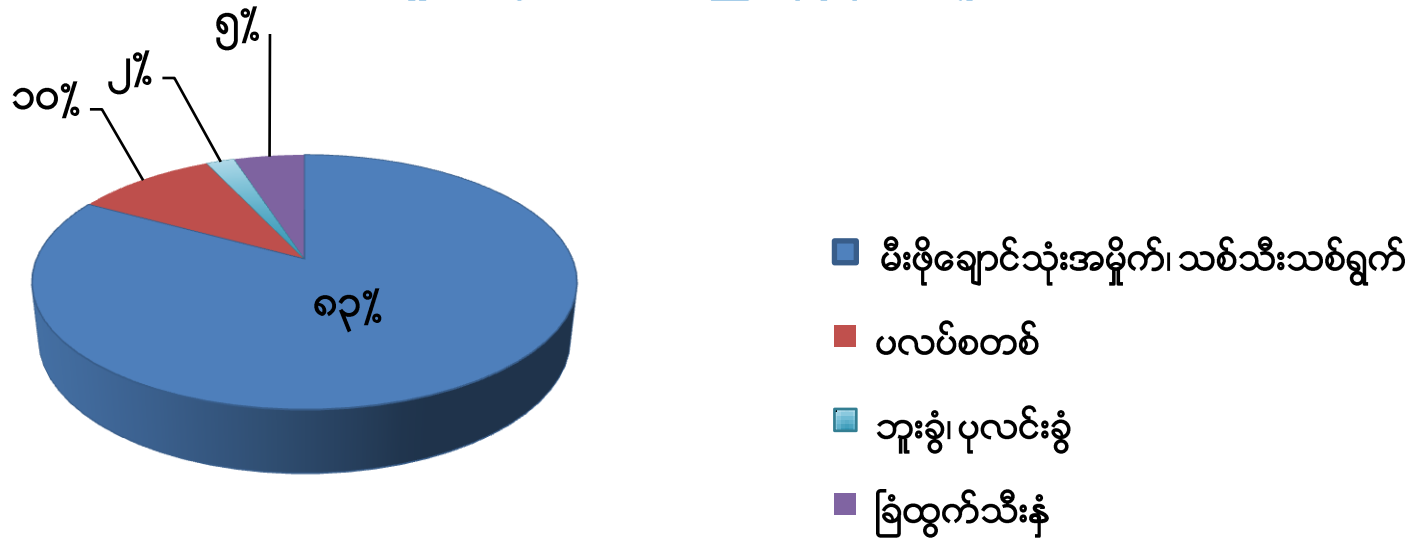
**ခစ်ကိုင်းတိုင်းဒေသကြီးအတွင်းရ
အမှိုက်သိမ်းယာဉ်/စက်/ယန္တရားများ လက်ရှိသုံးစွဲမှု အချုပ်စာရင်း**

၁။	အမှိုက်သိမ်းယာဉ်	-	၇၅	စီး
၂။	စက်ယန္တရားများ (Loader, JCB, Dozer)	-	၁၆	စီး
၃။	ထွန်စက်နောက်တွဲ	-	၅	စီး
၄။	Compactor Garbage Truck	-	၂	စီး
စုစုပေါင်း		-	၉၈	စီး

မုံရွာမြို့ ခွန်ပစ်အမှိုက်နှင့် သက်ဆိုင်သည့်အချက်များ

မြို့အကျယ်ဧရိယာ	-	၁၇၀၂၄၀ - ဧက (၂၆၆ စတုရန်းမိုင်)
အိမ်ခြေ	-	၃၃၆၃၀ - အိမ်
အိမ်ထောင်စု	-	၃၅၆၁၀ - စု
လူဦးရေ	-	၁၇၁၀၃၆ - ယောက်
စည်ပင်မှသိမ်းဆည်းနိုင်သည့် အမှိုက်တန်	-	၁၁၇ - တန်

အမှိုက်တွင်ပါဝင်သည့်ခန့်မှန်းအမျိုးအစား



မုံရွာမြို့နယ်စည်ပင်သာယာရေးကော်မတီ၏
အမှိုက်သိမ်းယာဉ်/စက်/ယန္တရားများ လက်ရှိသုံးစွဲမှု အချုပ်စာရင်း

၁။	အမှိုက်သိမ်းယာဉ်	-	၂၆	စီး
၂။	စက်ယန္တရားများ (Loader, JCB, Dozer)	-	၅	စီး
၃။	ထွန်စက်နောက်တွဲ	-	၁	စီး
၄။	Compactor Garbage Truck	-	၁	စီး
စုစုပေါင်း			၃၃	စီး

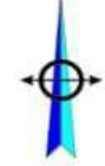
မုံရွာမြို့နယ်စည်ပင်သာယာရေးကော်မတီ၏
လက်ရှိအမှိုက်သိမ်းဆည်းမှု လုပ်သားအချုပ်စာရင်း

၁။	ယာဉ်မောင်း	-	၂၆	ယောက်
၂။	အမှိုက်သိမ်းလုပ်သား	-	၈၇	ယောက်
၃။	အခြားလုပ်သား	-	၂၉	ယောက်
		<hr/>		
	စုစုပေါင်း	-	၁၄၂	ယောက်

မုံရွာမြို့နယ် ခည်ပင်သာယာရေးကော်မတီပိုင် အမှိုက်သိမ်းယာဉ်များ



စစ်ကိုင်းမြို့ အခြေပြမြေပုံ



စစ်ကိုင်းမြို့

စကေး ၁ လက်မ = ၄၅၀ မေ



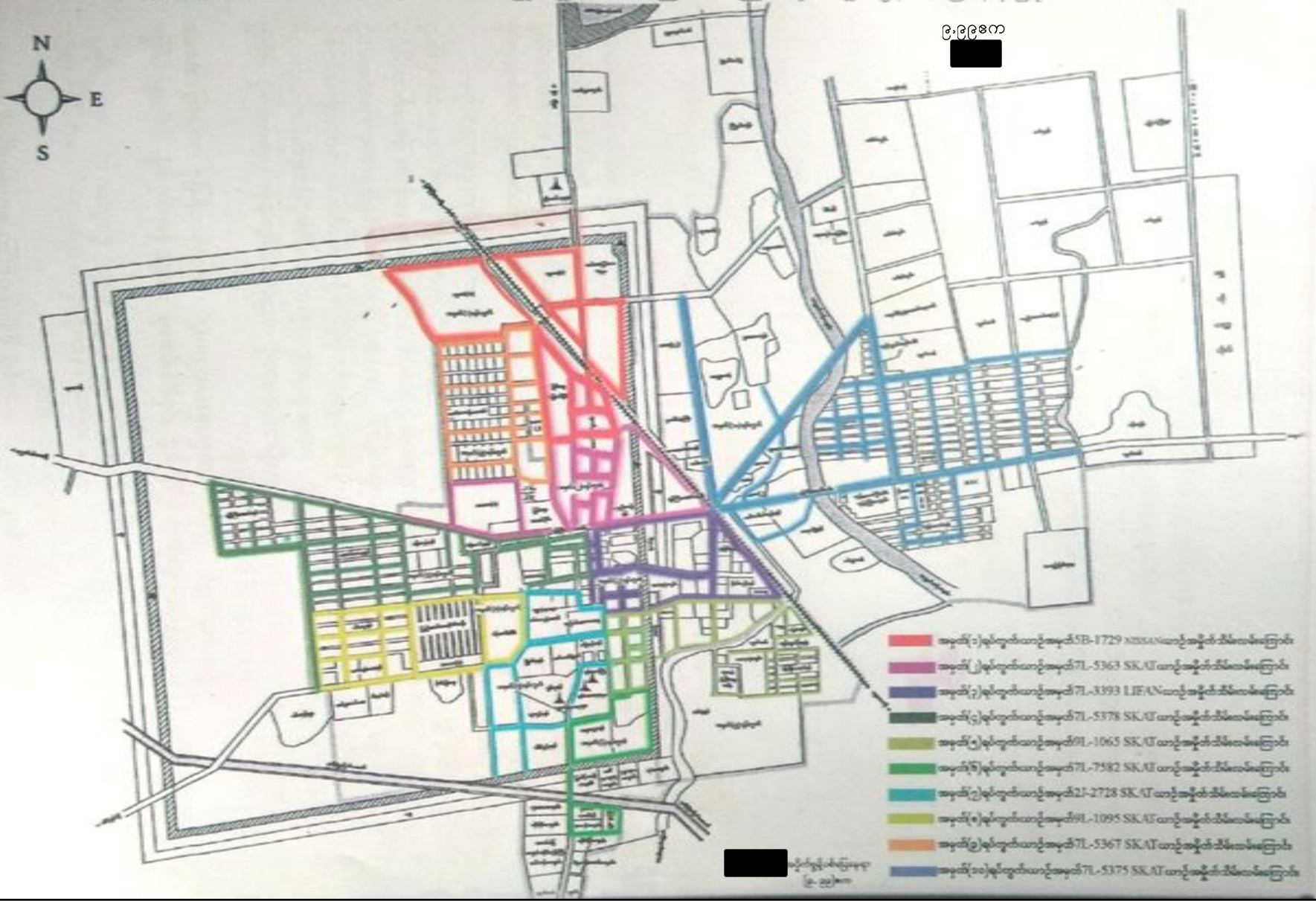
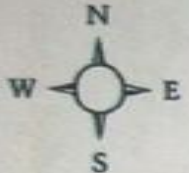
ရည်ညွှန်းချက်

■ အမှိုက်ကျင်းတည်နေရာ
(၃.၅-ဧက)

ရွှေဘိုမြို့နယ်စည်ပင်သာယာရေးကော်မတီ၏မြို့အမှိုက်သိမ်းဆည်းလမ်းကြောင်းနှင့်အမှိုက်စွန့်ပစ်မြေနေရာပြပုံ

ဧက(၁)

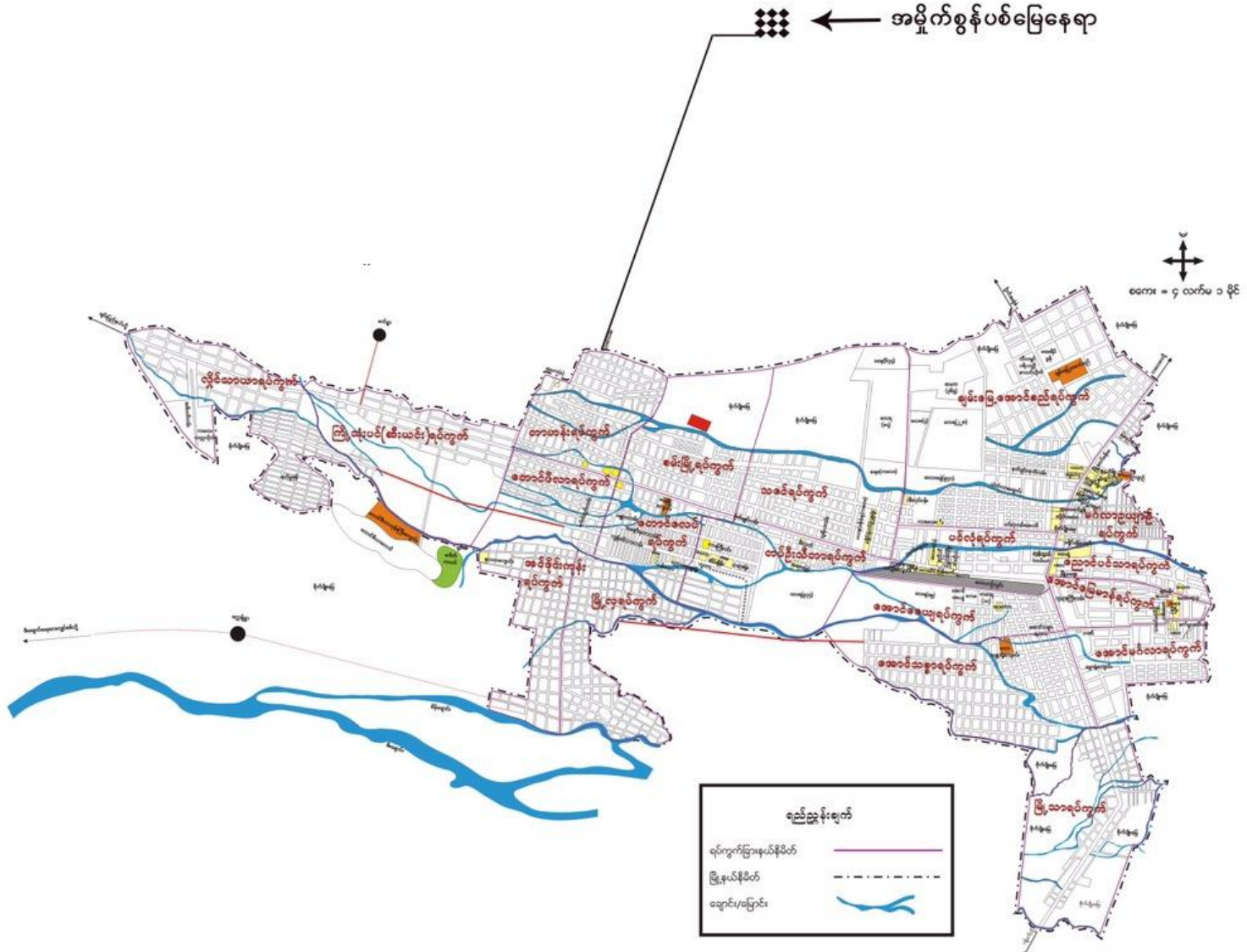
၉,၉၉၈



- အမှိုက်(၁)ရုပ်ကွက်ယာဉ်အမှတ်5B-1729 MISSANယာဉ်အမှိုက်သိမ်းဆည်းကြောင်း
- အမှိုက်(၂)ရုပ်ကွက်ယာဉ်အမှတ်7L-5363 SK,AT ယာဉ်အမှိုက်သိမ်းဆည်းကြောင်း
- အမှိုက်(၃)ရုပ်ကွက်ယာဉ်အမှတ်7L-3393 LIFEANယာဉ်အမှိုက်သိမ်းဆည်းကြောင်း
- အမှိုက်(၄)ရုပ်ကွက်ယာဉ်အမှတ်7L-5378 SK,AT ယာဉ်အမှိုက်သိမ်းဆည်းကြောင်း
- အမှိုက်(၅)ရုပ်ကွက်ယာဉ်အမှတ်9L-1065 SK,AT ယာဉ်အမှိုက်သိမ်းဆည်းကြောင်း
- အမှိုက်(၆)ရုပ်ကွက်ယာဉ်အမှတ်7L-7582 SK,AT ယာဉ်အမှိုက်သိမ်းဆည်းကြောင်း
- အမှိုက်(၇)ရုပ်ကွက်ယာဉ်အမှတ်2J-2728 SK,AT ယာဉ်အမှိုက်သိမ်းဆည်းကြောင်း
- အမှိုက်(၈)ရုပ်ကွက်ယာဉ်အမှတ်9L-1095 SK,AT ယာဉ်အမှိုက်သိမ်းဆည်းကြောင်း
- အမှိုက်(၉)ရုပ်ကွက်ယာဉ်အမှတ်7L-5367 SK,AT ယာဉ်အမှိုက်သိမ်းဆည်းကြောင်း
- အမှိုက်(၁၀)ရုပ်ကွက်ယာဉ်အမှတ်7L-5375 SK,AT ယာဉ်အမှိုက်သိမ်းဆည်းကြောင်း

မြို့အမှိုက်သိမ်းဆည်းရေး
(၉.၉၉၈)ဧက

ကလေးမြို့နယ်စည်ပင်သာယာရေးကော်မတီ အမှိုက်စွန့်ပစ်မှုနေရာပြမြေပုံ



ယာဉ်/ခက်ယန္တရားဖြင့် အမှိုက်ရှင်းလင်းရေး ဆောင်ရွက်ထားရမှု မှတ်တမ်းဓာတ်ပုံများ



မုံရွာမြို့နယ်စည်ပင်သာယာရေးကော်မတီမှ ပြည်သူ့များစွန့်ပစ်သည့် အမှိုက်များအား သိမ်းဆည်းရင်းလင်းနေမှု မှတ်တမ်းဓာတ်ပုံ



မုံရွာမြို့နယ်ခည်ပင်သာယာရေးကော်မတီမှ ပြည်သူ့များစွာနစ်သည့် အမှိုက်များအား သိမ်းဆည်းရင်းလင်းနေမှု မှတ်တမ်းဓာတ်ပုံ



အမှိုက်များအား အမှိုက်ကွင်းများအတွင်း ခွန်ပစ်မှုအခြေအနေ



မုံရွာမြို့



ခမ်ကိုင်းမြို့



ရွှေဘိုမြို့

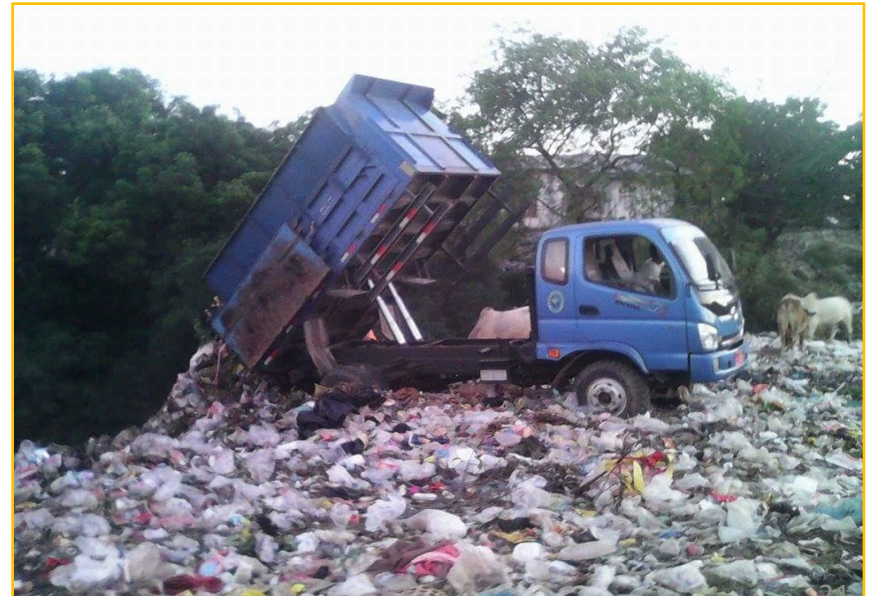


ကလေးမြို့

ရွှေဘိုမြို့၊ ပြည်သူများမှ ခွန်ပစ်သည့် အမှိုက်များအား သိမ်းဆည်းရင်းလင်းနေမှု မှတ်တမ်းဓာတ်ပုံ



ခစ်ကိုင်းမြို့၊ ပြည်သူ့များမှစွန့်ပစ်သည့် အမှိုက်များအား သိမ်းဆည်းရင်းလင်းနေမှု မှတ်တမ်းဓာတ်ပုံ



မုံရွာမြို့နယ်စည်ပင်သာယာရေးကော်မတီမှ မြို့နယ်ချင်းဆက်လမ်းများသို့ အမှိုက်လို့က်လံသိမ်းဆည်းနေမှု မှတ်တမ်းဓာတ်ပုံ

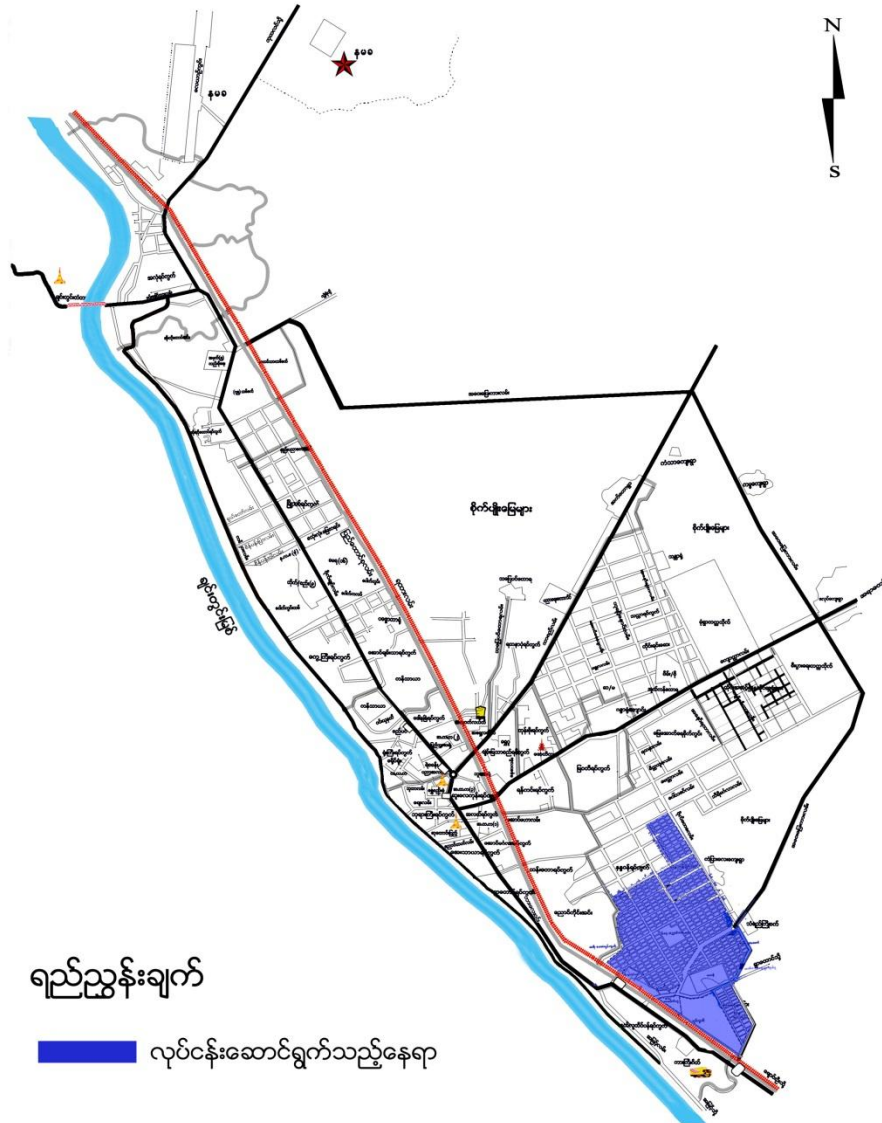


မုံရွာမြို့ ဆေးရုံဆေးခန်းများမှအမှိုက်များ သိမ်းဆည်းခွန်ပစ်မှု



ဆေးရုံဆေးခန်းများမှအမှိုက်များ သိမ်းဆည်းခွန်ပစ်သည့်ကျင်း

မုံရွာမြို့အတွင်းရှိ မွေးမြူရေးနှင့် စက်မှုဇုန် အခြေပြမြေပုံ



ရည်ညွှန်းချက်

■ လုပ်ငန်းဆောင်ရွက်သည့်နေရာ

ခမ်ကိုင်တိုင်းဒေသကြီးအတွင်း မှတ်ပုံတင်ပုဂ္ဂလိကခက်မှုလုပ်ငန်းများအခြေအနေ

မုံရွာခက်မှုရန်

စဉ်	လုပ်ငန်းအုပ်စု	လုပ်ငန်းအရေအတွက်				ရင်းနှီးမြှုပ်နှံမှုများ		ထုတ်လုပ်မှုတန်ဖိုး		အားအသုံးပြုမှု				လုပ်သားဦးရေ
		ကြီး	လတ်	ငယ်	ပေါင်း	(ကျပ်သန်း)	US \$	(ကျပ်သန်း)	US \$	HP	KW	KVA	အင်ဂင်	
၁။	စားသောက်ရေး	၈	၂	၁	၁၁	၁၁၅၆.၉၄၀	-	၅၃၀.၆၃၆	-	၁၁၀၂	၅၀.၁၅	၇၅	၈၃	၁၉
၂။	ဝတ်ဆင်ရေး	၃	၁	၁	၅	၁၄၉.၅၉၀	၀.၁၁၄	၁၉၆၀.၁၇၁	-	၁၀၇၄	-	၅၀၀	၃၁	၁၈
၃။	နေထိုင်ရေး	၁၃	၁	-	၁၄	၅၂၁၆.၉၉၅	၆.၈၄၅	၁၁၀၇၀.၅	၈.၄၅	၂၃၈၆.၅၈	၇၁၆.၆၆	၂၁၃၀	၉၅၅	၁၂၅
၄။	လူသုံးကုန်ပစ္စည်း	၅	၂	-	၇	၂၅၂.၉၇၀	-	၅၁၀.၄၅၁	-	၄၆၈.၅	၁၂၅.၅	၁၅၀	၄၄၀	၁၄
၅။	အိမ်သုံးကုန်ပစ္စည်း	၅	-	-	၅	၈၈၁၃၆၅	-	၁၁၁၈	-	၉၃၉	-	၁၃၄၀.၆	၄၅၀	၁၅
၆။	စာပေးနှင့်အနုပညာ	-	-	-	-	-	-	-	-	-	-	-	-	-
၇။	ကုန်ကြမ်းပစ္စည်း	-	၁	-	၁	၅	-	၇.၅	-	၃၅	-	-	-	-
၈။	ခါတ်သတ္တုပစ္စည်း	၇	၂	-	၉	၃၉၉.၀၃	-	၄၉၆.၃	-	၁၂၄၂	-	၃၇၅၀	၈၀	၁၅
၉။	စိုက်ပျိုးရေးကိရိယာ	-	-	-	-	-	-	-	-	-	-	-	-	-
၁၀။	စက်နှင့်စက်ကိရိယာ	-	-	-	-	-	-	-	-	-	-	-	-	-
၁၁။	သယ်ယူပို့ဆောင်ရေး	၁	-	-	၁	၃၈.၁	-	၁၃၃၀	-	-	-	-	၅၀	-
၁၂။	လျှပ်စစ်ပစ္စည်း	၃	-	-	၃	၇၉.၇၉	၀.၁၆၁	၁၈၇၄၂.၃၄၄	-	၁၆၁၁	-	၁၆၂၃	၂၂၅၂	၃
၁၃။	အထွေထွေစက်မှု	-	၁	၂	၃	၆.၆၅	-	၁၃.၆	-	-	-	၁၀	၄၂	-
	စုစုပေါင်း	၄၅	၁၀	၄	၅၉	၈၁၈၆.၄၃၀	၇.၁၂	၃၅၇၇၉.၅၀၂	၈.၄၅	၈၈၅၈.၀၈	၈၉၂.၃၁	၉၅၇၈.၆	၄၃၉၃	၂၅

ခမ်ကိုင်တိုင်းဒေသကြီးအတွင်း မှတ်ပုံတင်ပုဂ္ဂလိကခက်မှုလုပ်ငန်းများအခြေအနေ

ခမ်ကိုင်ခက်မှုစွန့်

စဉ်	လုပ်ငန်းအုပ်စု	လုပ်ငန်းအရေအတွက်				ရင်းနှီးမြှုပ်နှံမှုများ		ထုတ်လုပ်မှုတန်ဖိုး		အားအသုံးပြုမှု				လုပ်သား ဦးရေ
		ကြီး	လတ်	ငယ်	ပေါင်း	(ကျပ်သန်း)	US \$	(ကျပ်သန်း)	US \$	HP	KW	KVA	အင် ဂါ	
၁။	စားသောက်ရေး	၈	၂	၁	၁၁	၁၁၅၆.၉၄	-	၅၃၀.၆၃၆	-	၁၁၀၂	၅၀.၁၅	၇၅	၈၃	၁၉၃
၂။	ဝတ်ဆင်ရေး	၃	၁	၁	၅	၁၄၉.၅၉၀	၀.၁၁၄	၁၉၆၀.၁၇၁	-	၁၀၇၄	-	၅၀၀	၃၁	၁၈၃
၃။	နေထိုင်ရေး	၁၃	၁	-	၁၄	၅၂၁၆.၉၉၅	၆.၈၄၅	၁၁၀၇၀.၅၀၀	၈.၄၅	၂၃၈၆.၅၈	၇၁၆.၆	၂၁၃၀	၉၉၅	၁၂၅၉
၄။	လူသုံးကုန်ပစ္စည်း	၅	၂	-	၇	၂၅၂.၉၇၀	-	၅၁၀.၄၅၁	-	၄၆၈.၅	၁၂၅.၅	၁၅၀	၄၄၀	၁၄၁
၅။	အိမ်သုံးကုန်ပစ္စည်း	၅	-	-	၅	၈၈၂.၃၆၅	-	၁၁၁၈.၀၀၀	-	၉၃၉	-	၁၃၄၀	၄၅၀	၁၅၉
၆။	စာပေးနှင့်အနုပညာ	-	-	-	-	-	-	-	-	-	-	-	-	-
၇။	ကုန်ကြမ်းပစ္စည်း	-	၁	-	၁	၅.၀၀	-	၇.၅၀၀	-	၃၅	-	-	-	-
၈။	ခါတ်သတ္တုပစ္စည်း	၇	၂	-	၉	၃၉၉.၀၃၀	-	၄၉၆.၃၀၀	-	၁၂၄၂	-	၃၇၅၀	၈၀	၁၂၀
၉။	စိုက်ပျိုးရေးကိရိယာ	-	-	-	-	-	-	-	-	-	-	-	-	-
၁၀။	စက်နှင့်စက်ကိရိယာ	-	-	-	-	-	-	-	-	-	-	-	-	-
၁၁။	သယ်ယူပို့ဆောင်ရေး	၁	-	-	၁	၃၈.၁၀၀	-	၁၃၃၀.၀၀	-	-	-	-	၅၀	၅၀
၁၂။	လျှပ်စစ်ပစ္စည်း	၃	-	-	၃	၇၉.၇၉	၀.၁၆၁	၁၈၇၄၂.၃၄၄	-	၁၆၁၁	-	၁၆၂၃	၂၂၅၂	၁၇၀
၁၃။	အထွေထွေစက်မှု	-	၁	၂	၃	၆.၆၅၀	-	၁၃.၆၀၀	-	-	-	၁၀	၄၂	၁၉
	စုစုပေါင်း	၄၅	၁၀	၄	၅၉	၈၁၈၆.၄၃၀	၇.၁၂၀	၃၅၇၇၉.၅၀၂	၈.၄၅	၈၈၅၈.၀၈	၈၉၂.၃	၉၅၇၈	၄၃၈၃	၂၂၅၀

ခမ်ကိုင်းတိုင်းဒေသကြီးအတွင်း မှတ်ပုံတင်ပုဂ္ဂလိကခက်မှုလုပ်ငန်းများအခြေအနေ

ရွှေဘိုခက်မှုဇုန်

စဉ်	လုပ်ငန်းအုပ်စု	လုပ်ငန်းအရေအတွက်				ရင်းနှီးမြှုပ်နှံမှုများ		ထုတ်လုပ်မှုတန်ဖိုး		အားအသုံးပြုမှု				လုပ်သားဦးရေ
		ကြီး	လတ်	ငယ်	ပေါင်း	(ကျပ်သန်း)	US \$	(ကျပ်သန်း)	US \$	HP	KW	KVA	အင်ဂင်	
၁။	စားသောက်ရေး	၂၅	၂၈	၁၂	၆၅	၁၂၉၄.၆၂၄	-	၅၅၅၈.၇၀၃	-	၁၉၀၃.၅	၄၈၁.၀၅	၂၀၀	၁၂၉၀	၄၁၅
၂။	ဝတ်ဆင်ရေး	-	-	၁	၁	၁	၂.၄	၁၀	-	-	-	-	-	၄
၃။	နေထိုင်ရေး	-	၅	၂	၇	၂၃.၈၇	-	၄၂.၈၄	-	၄၆	-	-	၁၅၁	၆၀
၄။	လူသုံးကုန်ပစ္စည်း	၂	-	-	၂	၃၂.၉၇	-	၁၁၆.၄၆	-	၉၉.၅	-	-	၉၀.၄၅	၆၂
၅။	အိမ်သုံးကုန်ပစ္စည်း	-	-	-	-	-	-	-	-	-	-	-	-	-
၆။	စာပေးနှင့်အနုပညာ	-	-	-	-	-	-	-	-	-	-	-	-	-
၇။	ကုန်ကြမ်းပစ္စည်း	-	-	-	-	-	-	-	-	-	-	-	-	-
၈။	ခါတ်သတ္တုပစ္စည်း	၁	-	၄	၅	၃.၅၃၄	-	၉.၆၁	-	၁၁	-	-	၈၈	၂၂
၉။	စိုက်ပျိုးရေးကိရိယာ	-	၁	-	၁	၄.၉	-	၁၀	-	၆.၅	-	-	-	၄
၁၀။	စက်နှင့်စက်ကိရိယာ	-	-	-	-	-	-	-	-	-	-	-	-	-
၁၁။	သယ်ယူပို့ဆောင်ရေး	-	-	-	-	-	-	-	-	-	-	-	-	-
၁၂။	လျှပ်စစ်ပစ္စည်း	-	-	-	-	-	-	-	-	-	-	-	-	-
၁၃။	အထွေထွေစက်မှု	၁	၄	၂၈	၃၃	၄၂.၉၉၄	-	၁၃၇.၉၅၃	-	၈၈	-	-	၆၀၇	၁၅၂
	စုစုပေါင်း	၂၉	၃၈	၄၇	၁၁၄	၁၄၀၃.၈၉၂	-	၅၈၇၇.၉၆၆	-	၂၁၆၄.၅	၄၈၁.၀၅	-	၂၂၂၆.၄၅	၇၂၉

ခမ်ကိုင်တိုင်းဒေသကြီးအတွင်း မှတ်ပုံတင်ပုဂ္ဂလိကခက်မှုလုပ်ငန်းများအခြေအနေ

ကလေးခက်မှုစနစ်

စဉ်	လုပ်ငန်းအုပ်စု	လုပ်ငန်းအရေအတွက်				ရင်းနှီးမြှုပ်နှံမှုများ		ထုတ်လုပ်မှုတန်ဖိုး		အားအသုံးပြုမှု				လုပ်သားဦးရေ
		ကြီး	လတ်	ငယ်	ပေါင်း	(ကျပ်သန်း)	US \$	(ကျပ်သန်း)	US \$	HP	KW	KVA	အင်ဂင်	
၁။	စားသောက်ရေး	၂	၂	၂	၆	၄၆.၂၂	-	၂၄.၅၆	-	-	-	-	၁၈၃	၄၇
၂။	ဝတ်ဆင်ရေး	-	-	-	-	-	-	-	-	-	-	-	-	-
၃။	နေထိုင်ရေး	၁	၁	-	၂	၃၆.၉၄	-	၂၈၉.၈၀	-	-	-	-	၆၈	၃၂
၄။	လူသုံးကုန်ပစ္စည်း	-	-	-	-	-	-	-	-	-	-	-	-	-
၅။	အိမ်သုံးကုန်ပစ္စည်း	-	-	-	-	-	-	-	-	-	-	-	-	-
၆။	စာပေးနှင့်အနုပညာ	-	-	-	-	-	-	-	-	-	-	-	-	-
၇။	ကုန်ကြမ်းပစ္စည်း	-	-	-	-	-	-	-	-	-	-	-	-	-
၈။	ခါတ်သတ္တုပစ္စည်း	-	၁	၅	၆	၆.၈၈	-	၁၀.၉၉	-	-	-	-	၁၅၃	၃၆
၉။	စိုက်ပျိုးရေးကိရိယာ	-	-	၁	၁	၀.၆၂	-	၁.၉၇၆	-	-	-	-	၁၃	၃
၁၀။	စက်နှင့်စက်ကိရိယာ	-	-	-	-	-	-	-	-	-	-	-	-	-
၁၁။	သယ်ယူပို့ဆောင်ရေး	-	-	-	-	-	-	-	-	-	-	-	-	-
၁၂။	လျှပ်စစ်ပစ္စည်း	-	-	-	-	-	-	-	-	-	-	-	-	-
၁၃။	အထွေထွေစက်မှု	-	၁၅	၆၄	၇၉	၆၉.၇၉၃	-	၁၄၈.၄၉၅	-	၄၄	-	-	၁၄၃.၅	၂၇၈
	စုစုပေါင်း	၃	၁၉	၇၂	၉၄	၁၆၀.၄၅၃	-	၄၇၅.၈၂၁	-	၄၄	-	-	၁၈၆၀.၅	၃၉၆

ရွှေဘိုမြို့ရှိ ရွှေဘူရင်မအရက်ချက်ခက်ရုံမှ ရေဆိုးခွန်ပစ်မှုကြီးကြပ်ခြင်း

ရွှေဘူရင်မခက်ရုံတွင် ခွန်ပစ်ရေများနှင့် ပတ်သက်၍ Treatment Plant တည်ဆောက်ကာ ရေဆိုးများအား သန့်စင်ပြီးမှ ခွန်ထုတ်လျက်ရှိပြီး အခါအားလျော်စွာ အောက်ပါအတိုင်း စစ်ဆေးလျက်ရှိပါသည်-

- ❖ ခက်ရုံဆူညံသံ (Internal/External Noise) အား Noise Level Detector ဖြင့်တိုင်းတာခြင်း
ခွန်ပစ်ရေအပူချိန်အား သာမိုမီတာဖြင့်တိုင်းတာခြင်း
- ❖ PH meter ခက်ဖြင့် PH Level တိုင်းတာခြင်း
- ❖ ခက်ရုံမှထွက်သော အနံ့အသက်များအား Gas Detector ဖြင့်တိုင်းတာခြင်း
- ❖ အနည်ထိုင်ကန်၊ Aeration ကန်များအား စစ်ဆေးခြင်း



ရွှေဘိုမြို့ရှိ ရွှေဘူရင်မအရက်ချက်စက်ရုံမှ ရေဆိုးသန့်စင်မှုစနစ်



ရွှေဘိုမြို့နယ် ဆိပ်ခွန်ခံပြုကျေးရွာ ယက္ကန်းခက်ရုံများမှ ရေဆိုးခွန်ပစ်မှုအခြေအနေ

- ❖ ယက္ကန်းခက်ရုံများမှ နေ့စဉ်အသုံးပြုနေသော ချည်ဆိုးဆေးရေများအား ရာအတွင် မြောင်းသွယ်များသို့ တို့က်ရိုက်ခွန်ပစ်
 - ❖ မြောင်းသွယ်များမှတစ်ဆင့် မြို့နယ်တွင်းရ ကျေးရာများသို့ စီးဆင်းသွားသော မူးတိမ်ချောင်းအတွင်းသို့ ခွန်ပစ်
 - ❖ မူးတိမ်ချောင်းရေ ညစ်နွမ်းနေပြီး သဘာဝဂေဟစနစ်အား ထိခိုက်စေပါသည်။
 - ❖ မူးတိမ်ချောင်းရေသည် ငါးများရင်သန်နှိုင်းမှု မရှိတော့ကြောင်း တွေ့ရှိရ
- မှတ်ချက်။ အခိုင်အခဲခွန်ပစ်ပစ္စည်းများ ၊ အရည်ခွန်ပစ်ပစ္စည်းများ၊ မီးခိုးငွေ့များကိုလည်း လေထုထဲသို့ ခွန်ပစ်ရာတွင် သန့်စင်၍ ခွန်ပစ်သည့်စနစ်မရှိသေးခြင်းကြောင့် ရေရည်၌ခက်မှုန့်ဝန်းကျင်တွင် လေထုညစ်ညမ်းမှုများ ဖြစ်ပေါ်လာနိုင်သည့် အန္တရာယ်ရှိကြောင်း တွေ့ရှိရပါသည်။

ရွှေဘိုမြို့၏ အဓိကစက်မှုလုပ်ငန်းများနှင့်စွန့်ပစ်ပစ္စည်းများထွက်ရှိမှုအခြေအနေ

- ❖ ရွှေဘိုမြို့သည် ဆန်စပါးအဓိကထွက်ရှိရာမြို့ဖြစ်
- ❖ မြို့ပေါ်တွင် ဆန်စက် (၂၀)ကျော်နှင့် ကျေးရာများတွင် ဆန်စက် (၁၀)ခုကျော်ရှိ
- ❖ ဆန်စက်များမှ အဓိကစွန့်ပစ်ပစ္စည်းမှာ စပါးခွံ တစ်ရက် ပျမ်းမျှ (၁၀၈)တန်ခန့် ထွက်ရှိ
- ❖ စွန့်ပစ်ရန်အခက်အခဲရှိပြီး မီးဘေးအန္တရာယ်စိုးရိမ်ရပါသည်။
- ❖ လေထူထဲသို့ စပါးခွံများလွင့်ပါမှုကြောင့် ပတ်ဝန်းကျင်လေထူညစ်ညမ်းမှုများ တွေ့ကြုံရ

မှတ်ချက်။ စပါးခွံများ (Solid wastage) အား သိမ်းဆည်း၍ လောင်စာအဖြစ် ပြန်လည်အသုံးပြုပြီး လျှပ်စစ်ဓါတ်အား ထုတ်ခြင်းနှင့် ထင်းအစားထိုး လောင်စာ ထုတ်လုပ်ခြင်းများ ဆောင်ရွက်နိုင်သော်လည်း နည်းပညာနှင့်ရန်ပုံငွေများလို့အပ်ပါသည်။

မုံရွာမြို့၊ ခက်မှုန့်ရို ခက်ရုံများအား ကွင်းဆင်းကြီးကြပ်စစ်ဆေးနေသည့် မှတ်တမ်းများ



ကြာခဲခက်ရုံများ



မုံရွာမြို့၊ ခက်မှုန့်ရို ခက်ရုံများအား ကွင်းဆင်းကြီးကြပ်စစ်ဆေးနေသည့် မှတ်တမ်းများ



ပဲကြော်ခက်ရုံများ



အထည်ခက်ရုံများ

ခစ်ကိုင်းမြို့၊ ခက်မှုရှင်ရှိခက်ရုံများမှ ရေဆိုးစွန့်ပစ်မှုအခြေအနေအား
ကွင်းဆင်းကြီးကြပ်ခစ်ဆေးနေသည့် မှတ်တမ်းများ



ခစ်ကိုင်းမြို့၊ ခက်မူဇွန်ရှိ ခက်ရုံများအား ကွင်းဆင်းကြီးကြပ်ခစ်ဆေးနေသည့် မှတ်တမ်းများ



ဆေးဝါးခက်ရုံများ



အရက်ချက်ခက်ရုံများ

ခစ်ကိုင်းတိုင်းဒေသကြီး၊ အင်းတော်မြို့ရှိ ခက်ရုံများအား ကွင်းဆင်းကြီးကြပ်ခစ်ဆေးနေသည့် မှတ်တမ်းများ



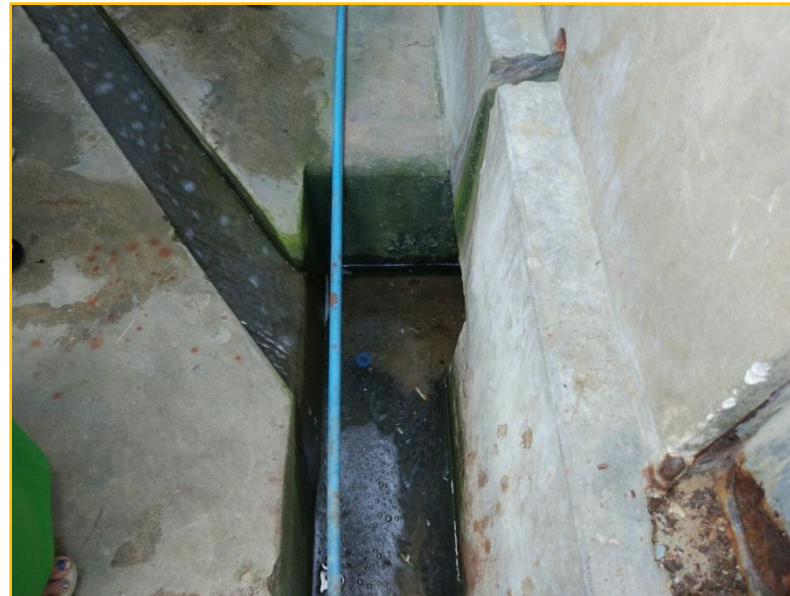
ပဲကြော်ခက်ရုံများ



ရွှေဘိုမြို့ရှိ ဆန်စက်များမှ Solid Waste ထွက်ရှိမှုအား ကွင်းဆင်းကြီးကြပ်စစ်ဆေးနေသည့် မှတ်တမ်းများ



ရွှေဘိုမြို့ရှိ ရေသန့်စက်ရုံများအား ကွင်းဆင်းကြီးကြပ်စစ်ဆေးနေသည့် မှတ်တမ်းများ



ခစ်ကိုင်းတိုင်းဒေသကြီး၊ အင်းတော်မြို့ရှိ ပဲကြော်ခက်ရုံများမှ ရေဆိုးများစွန့်ပစ်နေမှု



မုံရွာမြို့၊ ခက်မှုန့်ရှိခက်ရုံများမှ ရေဆိုးများခွန်ပစ်မှု အခြေအနေ



သားရေနယ်ခက်ရုံမှ ရေဆိုးများ ထွက်ရှိနေမှု



ကြာဇံခက်ရုံမှ ရေဆိုးများ ထွက်ရှိနေမှု

မုံရွာမြို့၊ ခက်မှုန့်ရိုခက်ရုံများမှ ရေဆိုးများ ထွက်ရှိနေမှု အခြေအနေ



ရေနံချက်ခက်ရုံမှ ရေဆိုးများစွန့်နေမှု



စားသောက်ဆိုင်များမှ ရေဆိုးများစွန့်နေမှု

ခစ်ကိုင်မြို့ ရေးဆွဲခွန်ထုတ်မှုအား ကွင်းဆင်းခစ်ဆေးမှု မှတ်တမ်းဓါတ်ပုံ



မဏ္ဍိုင်ခတ္တုဇက်ရုံ

ရွှေဘိုမြို့နယ်၊ ဆိပ်ခွန်ကျေးရာရှိ ယက်ကန်းစက်ရုံများမှ ရေးဆိုးခွန်ထုတ်မှုအား ကွင်းဆင်းစစ်ဆေးမှုမှတ်တမ်းဓာတ်ပုံ



ခစ်ကိုင်းတိုင်းဒေသကြီးအတွင်းရ စက်ရုံများမှ လေထု ညစ်ညမ်းမှုများ



မုံရွာမြို့၊ စက်မှုဇုန်မှ မိုးခိုးဗျားထွက်ရှိမှု

ခစ်ကိုင်းမြို့၊ သံရည်ကြိုစက်ရုံမှ မိုးခိုးဗျားထွက်ရှိမှု



ခစ်ကိုင်းတိုင်းဒေသကြီးအတွင်းရ စက်ရုံများမှ လေထု ညစ်ညမ်းမှု

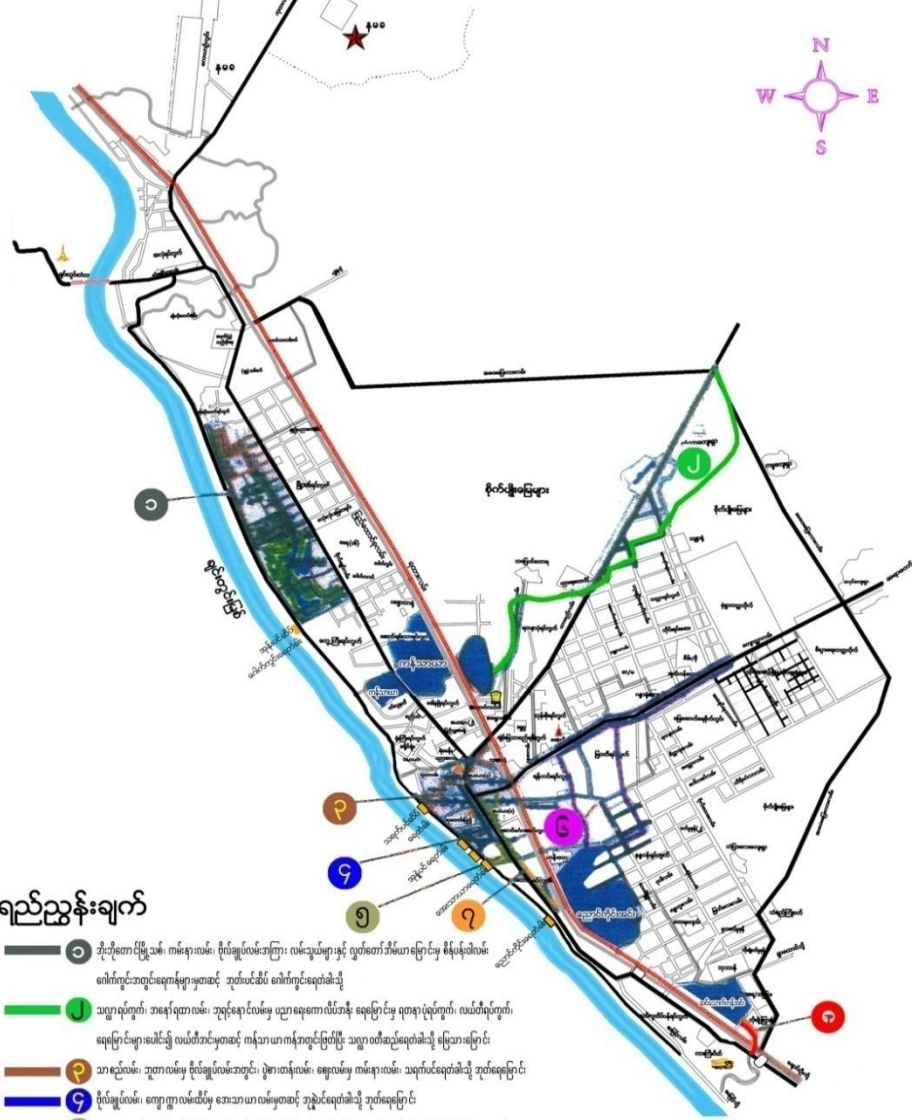


ခစ်ကိုင်းမြို့ သံရည်ကြိုစက်ရုံမှ မီးခိုးထွက်ရှိမှု

အင်းတော်မြို့ရှိ စက်ရုံမှ မီးခိုးထွက်ရှိမှု



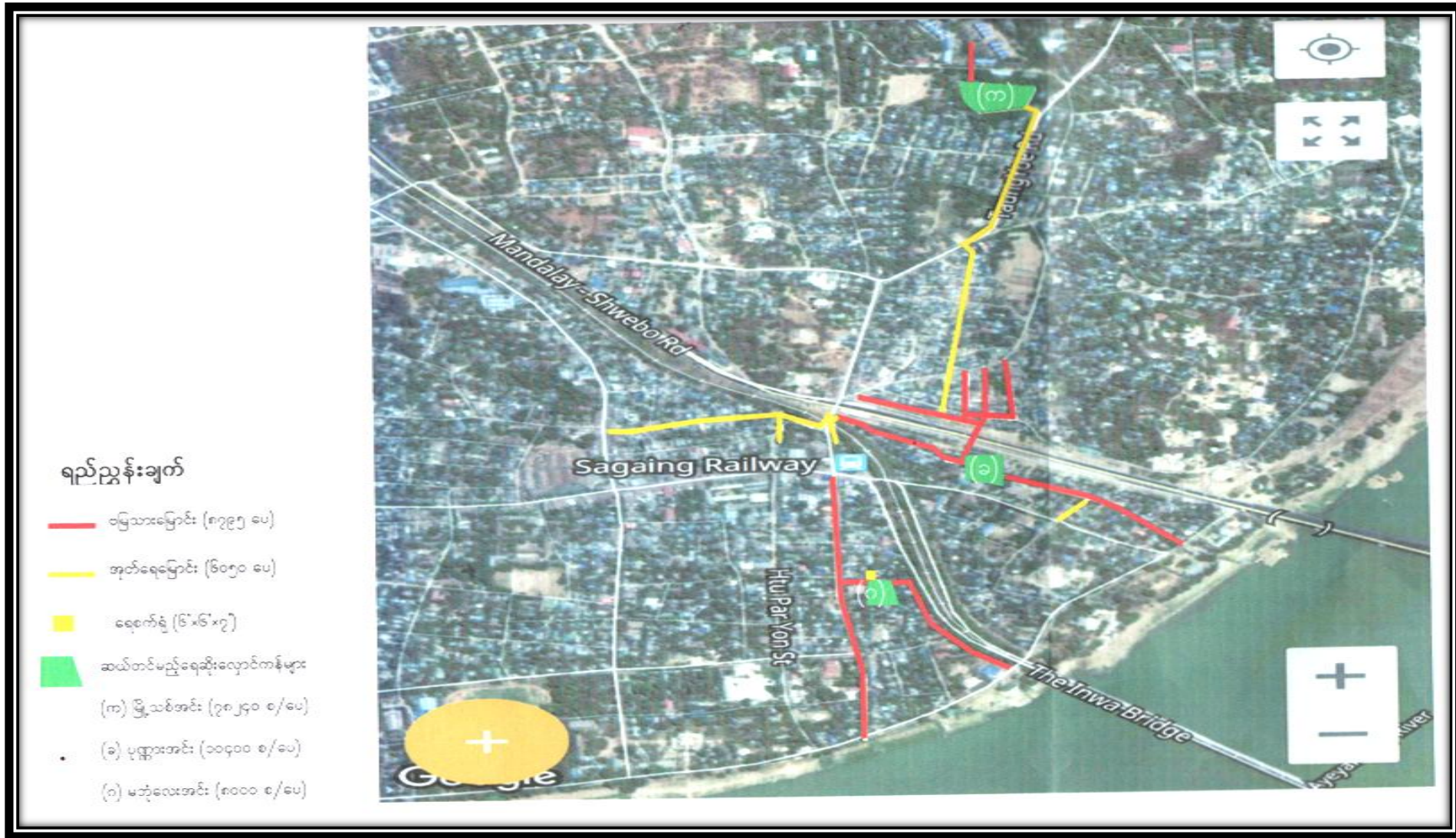
မုံရွာမြို့၊ လက်ရှိစီးဆင်းနေသော ရေမြောင်းများ အခြေပြမြေပုံ



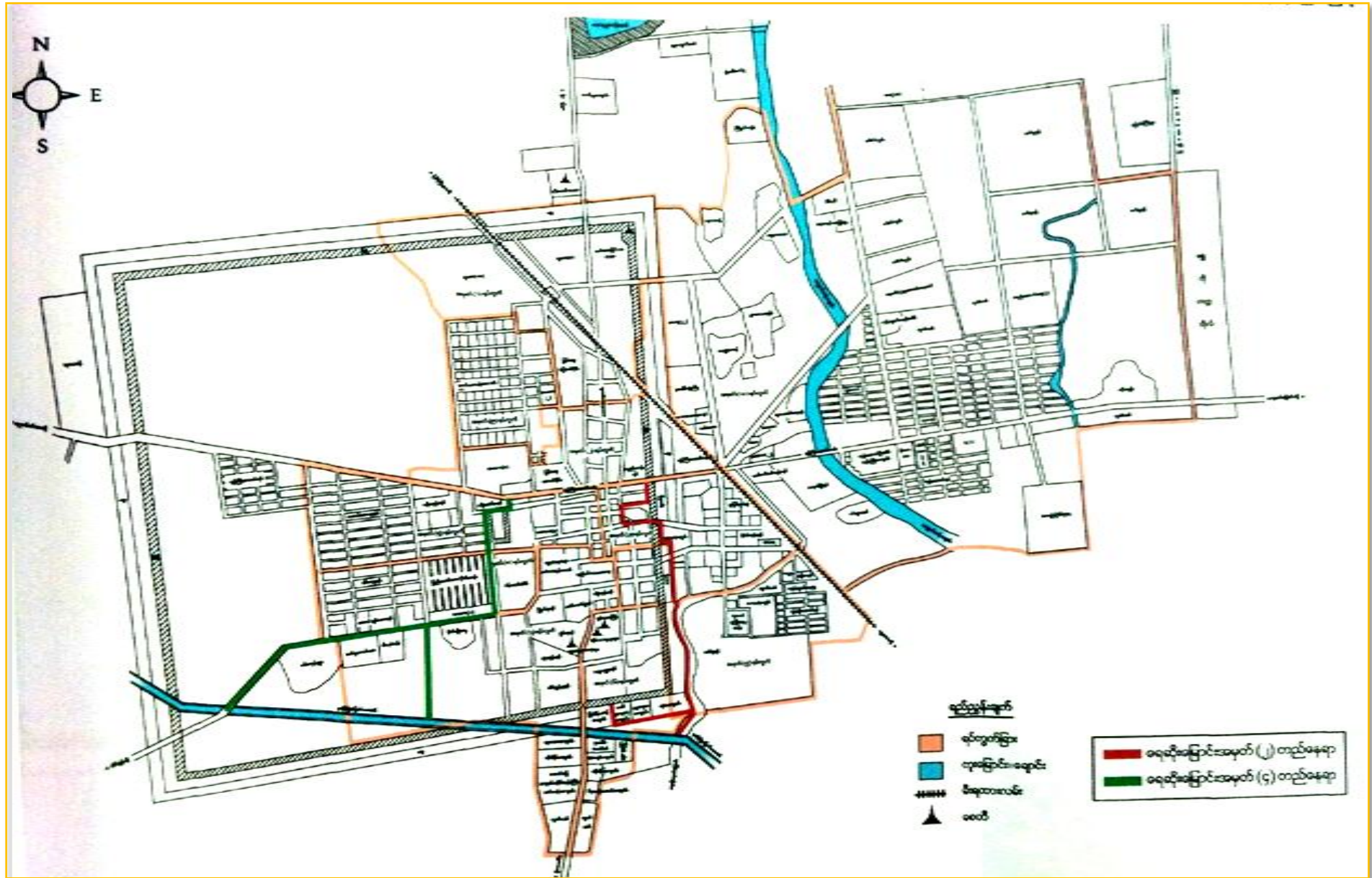
ရည်ညွှန်းချက်

- ၁။ ဘိုးဘိုတောပြင်၊ သစ်တော၊ ကမ်းနားလမ်း၊ စိုက်ပျိုးရေးဥယျာဉ်၊ လမ်းသစ်များနှင့် လွတ်တော်ဘိမ်းယာမြောင်းမှ စီမံခန့်ခွဲပေးမည့် ဝေဖက်ကွင်းအတွင်းကန်များဖွဲ့စည်းဆောင်ရွက်ခြင်း၊ ဘုတ်ပင်စိမ် ဝေဖက်ကွင်းရေတံခါးခံ
- ၂။ သဏ္ဍာန်ကွဲပြားစွာ ဘေးဒဏ်ဒဏ်ခံနိုင်စွမ်းရှိသည့် ရေမြောင်းမှ ရေတံခါးခံကွင်း၊ လမ်းပိုင်းကွဲများ၊ ရေမြောင်းများအပေါ်ရှိ လမ်းပိုင်းကွဲများနှင့် ကန်သမားကန်အတွင်းရှိ သဏ္ဍာန်ကွဲများအပေါ်ရှိ မြေသားမြောင်း
- ၃။ သာဓကလမ်း၊ ဘုတ်လမ်း၊ စိုက်ပျိုးရေးဥယျာဉ်၊ ဝါးစာလမ်း၊ ရွှေလမ်း၊ ကမ်းနားလမ်း၊ သုတေသနရေတံခါးခံ ဘုတ်မြောင်း
- ၄။ စိုက်ပျိုးရေး၊ ကျေးရွာလမ်းပိုင်း၊ ဘေးဒဏ်ဒဏ်ခံ ဘုတ်မြောင်း
- ၅။ ကျေးရွာလမ်းပိုင်း၊ ပြည်ထောင်စုလမ်း၊ စိုက်ပျိုးရေးဥယျာဉ်နှင့် မြေသားမြောင်း၊ ဘေးဒဏ်ဒဏ်ခံ စိုက်ပျိုးရေးဥယျာဉ်၊ စိုက်ပျိုးရေးဥယျာဉ်၊ ပြည်ထောင်စုလမ်း၊ ဘေးဒဏ်ဒဏ်ခံ ဘုတ်မြောင်း
- ၆။ ကျေးရွာလမ်း၊ မိုင်းကောင်းဘုတ်လမ်းမှ ရွှေလမ်း၊ မိုင်းကောင်းလမ်း၊ မေတ္တာလမ်း၊ ဘေးဒဏ်ဒဏ်ခံ ဘုတ်မြောင်း
- ၇။ စိုက်ပျိုးရေး၊ မြို့ပတ်လမ်းမှ ကာလေးကွင်းကောင်းဘုတ်၊ ပြည်ထောင်စုလမ်းမှ မြေသားမြောင်းကောင်းဘုတ်
- ၈။ တော်လှန်ရေး၊ မြို့ပတ်လမ်းကောင်းဘုတ်၊ မုံရွာ-အလောင်းလမ်းမြို့နယ်ဘုတ်၊ တောင်ရောင်ရေတံခါးခံ မြေသားမြောင်း

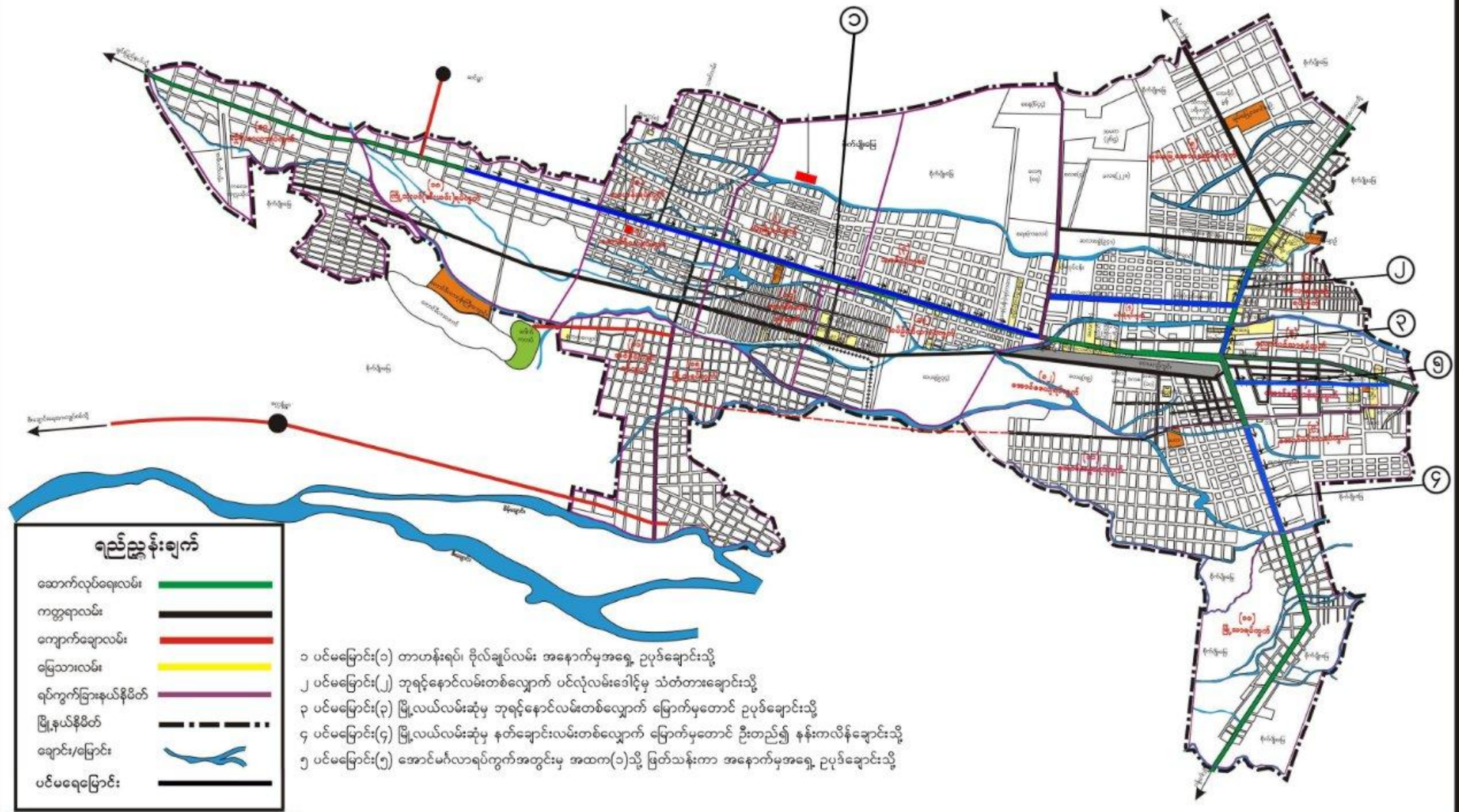
ခစ်ကိုင်းမြို့ ရေစီးရေလာကောင်းမွန်ရေး ဆောင်ရွက်မည့် တည်နေရာပြမြေပုံ



ရွှေဘိုမြို့ ရေစီးရေလာအခြေပြမြေပုံ



ကလေးမြို့ ရေစီးရေလာအခြေပြမြေပုံ



မုံရွာမြို့ ၊ ရေစီးရေလာကောင်းမွန်ရေး(Main Drain Plan)တိုးချဲ့ဆောင်ရွက်ရန် ခန့်မှန်းကုန်ကျငွေစာရင်း

စဉ်	လုပ်ငန်းအမည်	အတိုင်းအတာ (ပေ)	ခန့်မှန်းကုန်ကျငွေ (ကျပ်သိန်း)	မှတ်ချက်
၁	အုတ်ရေမြောင်းတည်ဆောက်ခြင်း	၈၃၇၂	၁၈၅၉.၂	
၃	အုတ်ရေမြောင်းချဲ့ခြင်း	၁၁၃၀	၂၂၆.၉၇	
၅	လမ်းဖြတ်မြောင်းကူးတံတား တည်ဆောက်ခြင်း	၂၈ ခု	၅၉၆.၇၂	
	စုစုပေါင်း	၉၅၃၀	၂၆၈၂.၉	

ရေစီးရေလာကောင်းမွန်ရေးအတွက် ဆောင်ရွက်ထားရမှု မှတ်တမ်းဓာတ်ပုံ



(Waste Management) နှင့်ပတ်သက်၍ ခစ်ကိုင်းတိုင်းဒေသကြီးမှ ဌာနဆိုင်ရာဝန်ထမ်းများ၏ လေ့လာရေး ခရီးစဉ်များ

- ❖ ရန်ကုန်မြို့တော်စည်ပင်
- ❖ ခင်ကာပူနိုင်ငံ
- ❖ တရုတ်နိုင်ငံ၊ ကူမင်းမြို့
- ❖ ထိုင်းနိုင်ငံ၊ ဘန်ကောက်မြို့



ရန်ကုန်မြို့တော်စည်ပင်ရေဆိုးသန့်စင်မှုစနစ်
သွားရောက်လေ့လာမှု မှတ်တမ်း

Waste Management နှင့်ပတ်သက်သည့် လေ့လာရေးခရီးစဉ် မှတ်တမ်းဓာတ်ပုံများ



Solid Waste နှင့် Waste to energy လုပ်ငန်းလေ့လာခြင်း



အမှိုက်သိမ်းဆည်းစနစ်အား လေ့လာခြင်း

မြည်တွင်းမြည်ပကုမ္ပဏီများနှင့် ညှိနှိုင်းဆောင်ရွက်ဆဲလုပ်ငန်း

Zeta + Rose Wood Co.Ltd; မြင့်ဆွေးနွေးဆဲ



MSW Plant Layout and Process

Operating principle of COGEN biomass Electrical Power Generation Plant

STEP 1&2

- Biomass is conveyed into the boiler to be burnt at very high temperature

STEP 2

-Conversion of water into superheated steam

STEP 3

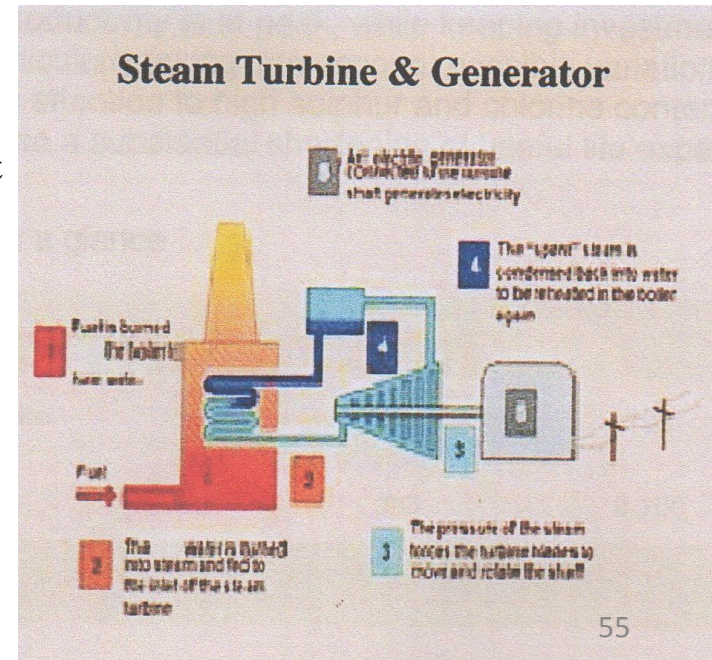
-Steam drives turbine

STEP 4

-Condensation of steam back to water in a condenser and return to boiler for the next heating circle.

STEP 5

-Steam turbine drives electric generator feeding power into grid



(NGO) အသင်းအဖွဲ့များနှင့် ပူးပေါင်းဆောင်ရွက်မည့် အစီအစဉ်

- ❖ သဘာဝမြေဩဇာ ဖြစ်နိုင်သည့် စွန့်ပစ်အမှိုက်နှင့် ချေဖျက်ရန် မလွယ်ကူသော စွန့်ပစ်အမှိုက်ခွဲခြားရန်
- ❖ ပထမဦးစားပေး စာသင်ကျောင်းများတွင် အမှိုက်ပုံး(၂)မျိုးထားရရန်
- ❖ NGO(ဇေယျာစိမ်းလန်းမြေအသင်း၊---စသည်)တို့မှ အမှိုက်ပုံးလှူဒါန်းမည်ဖြစ်ပါသည်။
- ❖ စည်ပင်သာယာရေးကော်မတီမှ သိမ်းဆည်းနိုင်ရန် ညှိနှိုင်းဆောင်ရွက်လျက်ရှိ

သဘာဝပတ်ဝန်းကျင် ထိန်းသိမ်းရေးနှင့်ပတ်သက်၍ အသိပညာပေးမှုမှတ်တမ်း

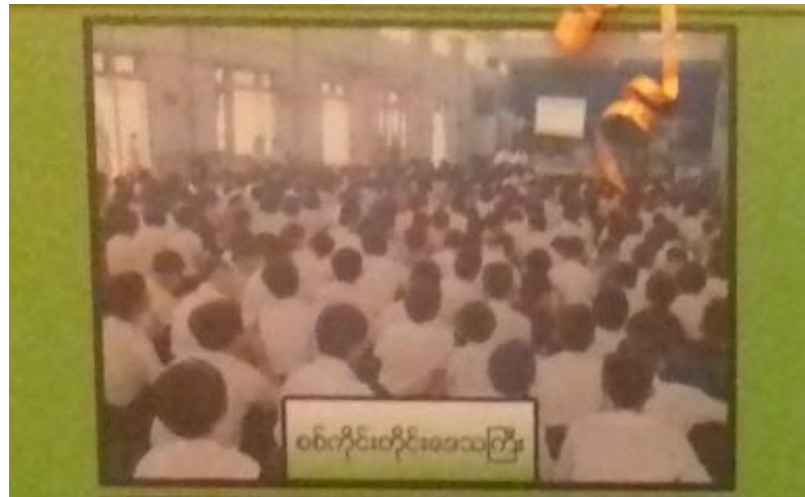
ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်
စစ်ကိုင်းတိုင်းဒေသကြီးအစိုးရအဖွဲ့
(စည်ပင်သာယာရေးဝန်ကြီးဌာန)



စည်ပင်သာယာရေးအဖွဲ့များ၏ လှုပ်ငန်းတာဝန်များ ၊
ကောက်ခံသည့် အခွန် ၊ အခ | အကောက်များနှင့်
ထုတ်ပြန်ခဲ့သည့် ဥပဒေ ၊ နည်းဥပဒေ သိကောင်းစရာ
လမ်းကမ်းစာစောင်

လက်ကမ်းစာစောင်အုပ်ဖြန့်ဝေပေးခြင်း

အသိပညာပေးဟောပြောခြင်း



စစ်ကိုင်းတိုင်းဒေသကြီး Waste Management နှင့်ပါတ်သက်သည့် ဆောင်ရွက်မည့် အစီအစဉ်နှင့် အကြံပြုတင်ပြချက်များ

- အမှိုက်သိမ်းဆည်းမှု ၊ အမှိုက်စွန့်ပစ်မှုများအား စနစ်တကျရှိစေရန် တစ်မြို့လုံးရှိ အမှိုက်များကို အမှိုက်သိမ်းယာဉ်ဖြင့် နေ့စဉ်စနစ်တကျ သိမ်းဆည်း၍ အမှိုက် ကွင်းသို့ သွားရောက်စွန့်ပစ်ခြင်း
- မြို့ပေါ်ရှိပြည်သူ့ဆေးရုံ ၊ ပုဂ္ဂလိကဆေးရုံ ၊ ဆေးခန်းများမှ ထွက်ရှိသော အညစ်အကြေးများအား သီးသန့်အမှိုက်သိမ်းယာဉ်ထားရှိ၍ ဝန်ထမ်းများအား ကာကွယ်ရေးပစ္စည်းများ ဝတ်ဆင်စေကာ သီးသန့်လိုက်လံသိမ်းဆည်းခြင်း ၊ မီးရှို့ဖျက်ဆီးခြင်းနှင့် အမှိုက်ကျင်းတွင် သီးသန့်နေရာပိုင်းခြား၍ မြေမြုပ်စွန့်ပစ်ခြင်း၊
- မြို့အနီး အမှိုက်ကျင်းဟောင်းများအား ပိတ်သိမ်း၍ မြို့ပြင်တွင် အမှိုက်များအား ကျင်းဖြင့်စနစ်တကျစွန့်ပစ်ရန် ဆောင်ရွက်ခြင်း

- စည်ပင်+ပြည်သူပူးပေါင်း၍ ရေဆိုးထုတ်မြောင်းများအတွင်းရှိ အမှိုက်သရိုက်နှင့် နွံများအား ဆယ်ထုတ်၍ ရှင်းလင်းခြင်း
- မြို့ချင်းဆက်မလမ်းများ၊ မြို့နယ်များ ၊ ရပ်ကွက်များတွင် စည်ပင်+ပြည်သူပူးပေါင်း၍ အမှိုက်ရှင်းလင်းခြင်း ၊ အမှိုက် စနစ်တကျစွန့်ပစ်ရေးပညာပေးခြင်း
- စက်မှုဇုံများနှင့် စီးပွားရေးလုပ်ငန်းများမှ စွန့်ပစ်အမှိုက်များ၊ ရေဆိုးများ၊ မီးခိုးများ ၊ အနံ့အသက်ဆိုး စနစ်တကျစွန့်ပစ်စေခြင်း ၊ သန့်စင်စွန့်ပစ်စေခြင်း
- စက်ရုံလုပ်သားများ အသက်ရှူလမ်းကြောင်း မထိခိုက်စေရန် Mask များတပ်ဆင်စေခြင်း
- စက်မှုဇုံရှိ စက်ရုံတစ်ရုံချင်း သို့မဟုတ် စက်ရုံများမှ ထွက်ရှိသည့် ရေဆိုးများစုစည်း၍ သန့်စင်မှု စနစ်ဖြင့် ဆောင်ရွက်ပြီးမှ ရေမြောင်းအတွင်းစွန့်ပစ်ရန် ညှိနှိုင်းဆွေးနွေးခြင်း၊ အသိပညာပေး ပြောကြားခြင်းများ ဆောင်ရွက်ခြင်း

- စက်မှုဇုန်များ၊ ကြာဇုန်၊ သရေဇုန်၊ မွေးမြူရေးဇုန်မှ ရေဆိုးများအား စနစ်တကျ သန့်စင်ထုတ်လွှတ်ရန် ကွင်းဆင်းစိစစ်ခြင်း ၊ ရေနမူနာစမ်းသပ်ခြင်းများ ၊ သဘာဝပတ်ဝန်းကျင် ၊ ကျန်းမာရေး ၊ စက်မှုကြီးကြပ် ဌာနများဖြင့် ပူးပေါင်းဆောင်ရွက်ခြင်း၊
- စက်မှုစီမံကိန်းမှ စွန့်ပစ်ပစ္စည်းများ စနစ်တကျစွန့်ပစ်ရေးနှင့် EIA/SIA လုပ်ငန်းများ ဆောင်ရွက်မှုအား ကြီးကြပ်ဆောင်ရွက်ခြင်း
- ဌာနဆိုင်ရာများ ၊ သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးလုပ်ငန်းကော်မတီများနှင့် ပူးပေါင်း၍ စစ်ဆေးခြင်း ၊ ကြီးကြပ်ခြင်း ၊ အသိပညာပေးခြင်း ၊ ကြော်ငြာဆိုင်းဘုတ်များ ၊ လက်ကမ်းစာစောင်များဖြန့်ဝေခြင်း
- သက်ဆိုင်ရာဌာနများနှင့်ပူးပေါင်း၍ ကွင်းဆင်းစစ်ဆေးပြီး သတ်မှတ်ထားသည့် စက်ရုံ၊ အလုပ်ရုံဆိုင်ရာဥပဒေ ၊ ညွှန်ကြားချက်များနှင့် ညီ/မညီ ကွင်းဆင်းစစ်ဆေးခြင်း

ကျေးဇူးတင်ပါသည်-

City Waste Management Strategy and Action Plan for Mandalay

Draft for Discussion

05 December 2016



Structure of the Strategy



Waste Management Strategy and Action
Plan for Mandalay

(Revised Draft)

October 2016



Presentation of the Strategy

- Vision Statement

- *Mandalay will be a Clean, Green, and Healthy City in Myanmar, where culture and environment are preserved for future generations.*



- Mission Statement

- *To reduce solid waste generation and manage residual waste materials in a way which maximises opportunities for resource recovery, while protecting public health and the environment to achieve a zero waste society.*



- Guiding Principles

- **Waste Hierarchy** (This consists 3Rs including Reduce - reduce waste that must be generated and which goes to the landfill (this includes composting), Reuse - repair goods that can be repaired, or find alternative uses for wastes, Recycle - return wastes with recoverable value for re-processing).
- **Resource conservation** (Promoting the most efficient use of resources, including resource recovery and waste avoidance).
- **Polluter-pays Principle** (A principle that holds that those responsible for causing pollution or generating solid waste should pay the cost for dealing with the pollution, or managing the solid waste (collection and disposal) in order to maintain ecological health and diversity).
- **Precautionary Principle** (Principle that dictates that a lack of scientific data/information certainty should not be used as a reason for not acting to prevent serious or irreversible environmental damage or degradation).
- **Proximity Principle** (A principle that maintains that waste should be dealt with as close to the source of generation as possible. This reduces transportation costs, and also reduces risks of contamination of the environment during transport).
- **Consultation Principle** (A principle that conveys the importance of all levels of Government consulting and working with people and organizations throughout the development and implementation of waste management strategies and action plans).
- **Shared responsibility** (In this context, zero waste is a shared responsibility and requires partnerships and collaborations between all sectors of government, industry, research institutions, NGO's, and the general community)

Setting Goals, Targets, Objectives and Actions

This City Waste Management Strategy has identified the following major goals:

- Goal A – Maximise municipal solid waste collection and the 3Rs (Reduce, Reuse and Recycling) in the city
- Goal B – Improve final treatment and disposal system in the city
- Goal C – Maximise proper collection and disposal of industrial and hazardous (medical) waste
- Goal D – Maximise proper disposal and treatment of wastewater
- Goal E: Capacity development, awareness raising and advocacy
- Goal F - Ensure sustainable services through review, monitoring, innovation and improvement

Goal A – Maximise municipal solid waste collection and the 3Rs (Reduce, Reuse and Recycling) in the city



Objectives:

- A.1: Provide effective and efficient municipal waste collection services
- A.2: Introduce waste separation at source
- A.3: Integrate private and informal sectors as partners in the delivery of sustainable waste management
- A.4: Improve infrastructure for waste collection, storage, transfer and transport

Short-term (2017 – 2020)	Middle-term (2021 – 2025)	Long-term (2026 – 2030)
<ul style="list-style-type: none">• Increased municipal waste collection coverage (80% of the whole city)	<ul style="list-style-type: none">• Increased municipal waste collection coverage (90% of the whole city)	<ul style="list-style-type: none">• Increased municipal waste collection coverage (100% of the whole city)
<ul style="list-style-type: none">• Established waste separation at source (1 or 2 model township)	<ul style="list-style-type: none">• Increased waste separation at source (3 townships or 50% of the total townships)	<ul style="list-style-type: none">• Increased waste separation at source (all townships in the city)
<ul style="list-style-type: none">• Increased material recovery and recycling (25% of recyclable materials)	<ul style="list-style-type: none">• Increased material recovery and recycling (50%, including 25% recyclable materials, 15% of food waste and 10% industrial and other waste)	<ul style="list-style-type: none">• Increased material recovery and recycling (80%, including 25% recyclable materials, 35% of food waste and 20% industrial and other waste)

Goal B – Improve final treatment and disposal system in the city



Objectives

- B.1: Reduce organic waste (food waste) sent to landfill
- B.2: Increase recovery of additional material at landfill for RDF
- B.3: Examine potential of waste to energy (W2E) technologies such as incinerator and landfill gas capture
- B.4: Establish a new sanitary landfill meeting engineering standards for final disposal
- B.5: Establish mechanisms to discontinue the operation of illegal dumping sites in the city

Short-term (2017 – 2020)	Middle-term (2021 – 2025)	Long-term (2026 – 2030)
<ul style="list-style-type: none"> • Reduction of illegal dumpsites in the city (50%) 	<ul style="list-style-type: none"> • Reduction of illegal dumpsites in the city (75%) 	<ul style="list-style-type: none"> • Reduction of illegal dumpsites in the city (100%)
<ul style="list-style-type: none"> • Immediate improvements to the operation of existing landfills 	<ul style="list-style-type: none"> • Establishment of sanitary landfill site with minimum requirements in place to protect the environment 	<ul style="list-style-type: none"> • Full operation of the sanitary landfill
	<ul style="list-style-type: none"> • Reduction of food waste (market waste) sent to landfill (15%) 	<ul style="list-style-type: none"> • Imposed ban on food waste (market waste) sent to landfill (100%)
		<ul style="list-style-type: none"> • Introduction of viable technologies such as bio digesters, refuse derived fuel (RDF) and waste-to-energy (W2E) technologies aimed

Goal C – Maximise proper collection and disposal of industrial and hazardous (medical) waste



Objectives

- C.1: Reduce industrial and hazardous waste generation and landfill
- C.2: Implement source segregation and collection systems
- C.3: Promote effective recycling, treatment and final disposal and the introduction of selected technologies

Short-term (2017 – 2020)	Middle-term (2021 – 2025)	Long-term (2026 – 2030)
<ul style="list-style-type: none">• Reduction of industrial waste sent to landfill (25%)	<ul style="list-style-type: none">• Reduction of industrial waste sent to landfill (50%)	<ul style="list-style-type: none">• Ban on industrial and hazardous (medical) waste sent to the landfill (100%)
<ul style="list-style-type: none">• Reduction of hazardous and medical waste sent to landfill (25%)	<ul style="list-style-type: none">• Reduction of hazardous (medical) waste sent to landfill (50%)	<ul style="list-style-type: none">• Established proper waste treatment methods and technologies for industrial and hazardous (medical) waste (100%).

Goal D – Maximise proper disposal and treatment of wastewater



Objectives

- D.1: Improve the collection and treatment of liquid waste in domestic areas
- D.2: Improve the collection and treatment of liquid waste in industrial areas
- D.3: Improve the collection and treatment of liquid waste in public areas (public market and central bus/train terminals)

Short-term (2017 – 2020)	Middle-term (2021 – 2025)	Long-term (2026 – 2030)
<ul style="list-style-type: none">• Increased coverage of liquid waste collection and treatment in domestic sector (25%)	<ul style="list-style-type: none">• Increased coverage of liquid waste collection and treatment in domestic sector (50%)	<ul style="list-style-type: none">• Increased coverage of liquid waste collection and treatment in domestic sector (100%)
<ul style="list-style-type: none">• Increased coverage of liquid waste collection and treatment in industrial sector (25%)	<ul style="list-style-type: none">• Increased coverage of liquid waste collection and treatment in industrial sector (50%)	<ul style="list-style-type: none">• Increased coverage of liquid waste collection and treatment in industrial sector (100%)
<ul style="list-style-type: none">• Increased coverage of liquid waste collection and treatment in public places	<ul style="list-style-type: none">• Increased coverage of liquid waste collection and treatment in public places	<ul style="list-style-type: none">• Increased coverage of liquid waste collection and treatment in public places

Goal E: Capacity development, awareness raising and advocacy



• Objectives

- E.1: Mainstream environmental education and waste management in school curricula and programmes
- E.2: Mobilise support of local stakeholders by increasing awareness and participation in environmental education and waste management

Short-term (2017 – 2020)	Middle-term (2021 – 2025)	Long-term (2026 – 2030)
<ul style="list-style-type: none">• Increased number of townships have implemented standard awareness-raising programmes for their residents (25%)	<ul style="list-style-type: none">• Increased number of townships have implemented standard awareness-raising programmes for their residents (50%)	<ul style="list-style-type: none">• Increased number of townships have implemented standard awareness-raising programmes for their residents (100%)
<ul style="list-style-type: none">• Increased number of schools have established environmental education programmes for their students (25%)	<ul style="list-style-type: none">• Increased number of schools have established environmental education programmes for their students (50%)	<ul style="list-style-type: none">• Increased number of schools have established environmental education programmes for their students (100%)

Goal F - Ensure sustainable services through review, monitoring, innovation and improvement



• Objectives

- F.1: Establish a data collection mechanism
- F.2: Establish a reporting mechanism
- F.3: Establish a communication mechanism to ensure regular consultation among key stakeholders

Short-term (2017-2020)	Mid-term (2021-2025)	Long-term (2026-2030)
<ul style="list-style-type: none">• Establish and monitoring of benchmark performance indicators (50%)	<ul style="list-style-type: none">• Establish and monitoring of benchmark performance indicators (75%)	<ul style="list-style-type: none">• Establish and monitoring of benchmark performance indicators (100%)
<ul style="list-style-type: none">• Increase in the number of successful enforcement actions filed against non-compliant entities (50%)	<ul style="list-style-type: none">• Increase in the number of successful enforcement actions filed against non-compliant entities (75%)	<ul style="list-style-type: none">• Increase in the number of successful enforcement actions filed against non-compliant entities (100%)

The background features abstract, overlapping green geometric shapes in various shades, including light lime green, medium green, and dark forest green, creating a modern and dynamic feel.

Waste Management Strategy Development in Myanmar: Consultation and Formulation Process

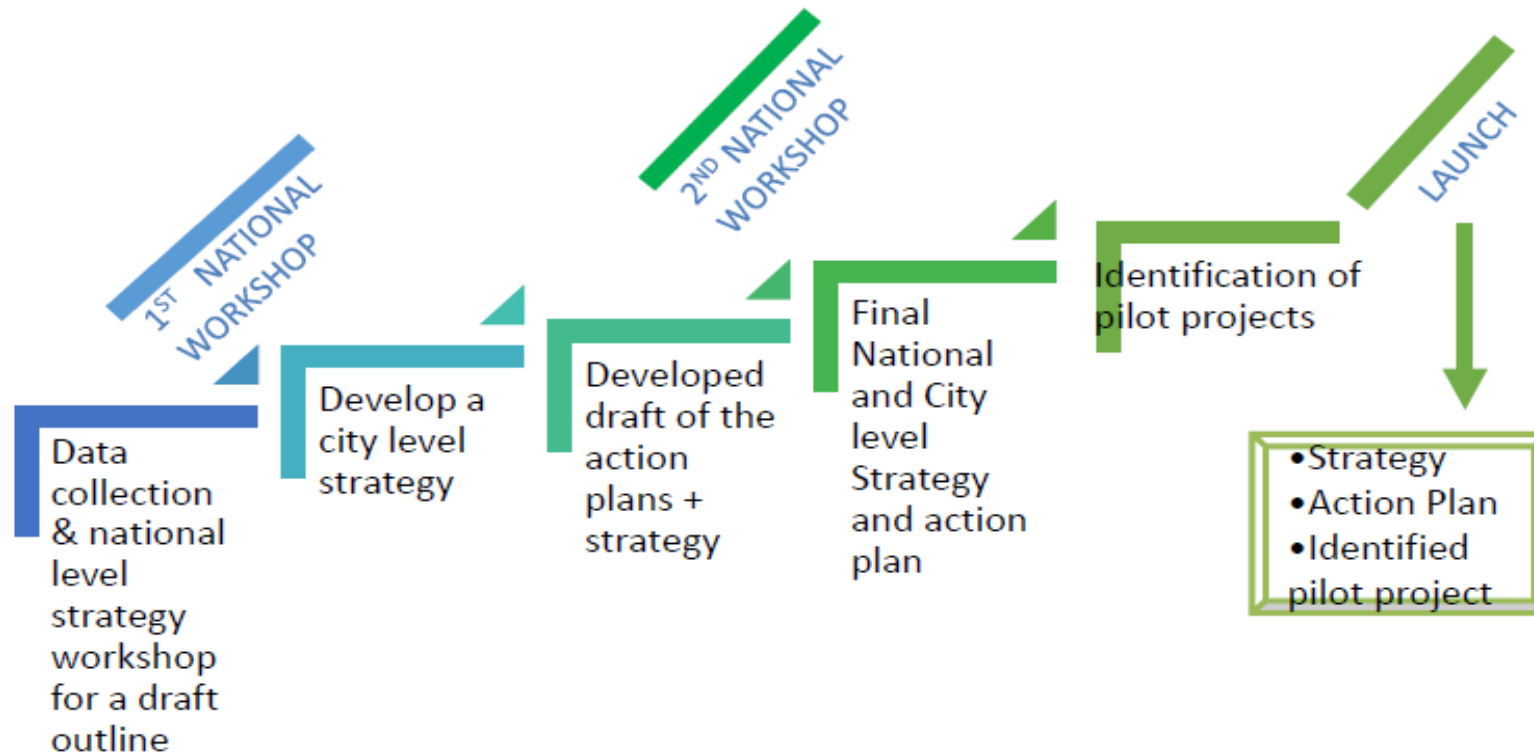
Matthew Hengesbaugh

Policy Researcher

Institute for Global Environmental Strategies (IGES)

5 December 2016

Waste Management Strategy Development in Myanmar: Roadmap



Waste Management Strategy Development in Myanmar

Initial Dialogue → March 2016

First round of consultations with MONREC, YCDC, MCDC, NCDC

- Agreement on scope of national/city-strategies
- Mandalay selected as target city for strategy development
- Confirmation of schedule for first National and City-Level Workshops

Rapid Assessment → March-May 2016

Quick Study preparation

- Evaluation of existing WM system (policy, technology and finance)
- Identification of major gaps and good practices at national and city level

Waste Management Strategy Development in Myanmar (2)

Participatory Work Planning → 13-17 June 2016

1st National/City-Level Workshop held in Nay Pyi Taw & Mandalay

- Validation of waste management gaps and challenges
- Mobilization of stakeholders for strategy formulation
- Establishment of monitoring and feedback mechanisms for strategy

Main Outcomes

- Consensus reached with national/local counterparts on content of strategies
- Emphasis on coherence with existing policy development processes
 - 5-Year Development Plan (MONREC)
 - Mandalay Regional Development Plan
- Examination of potential financing for future activities (JICA, ADB)
- Agreement on follow-up review process at regional level





Waste Management Strategy Development in Myanmar (3)

Evaluation and Review → September 2016

Organization of National/City-Level Roundtable Discussions

- Consultation on initial drafts of waste management strategies held with MONREC/NCDC/MCDC/YCDC
 - Guidance on improving policy and regulatory alignment with existing MONREC & MCDC rules/regulations and standards, planning and budget cycles, coordination mechanisms, institutional roles and responsibilities
 - Suggested consideration of National Environmental Policy (UNDP), National Climate Change Strategy (UN-Habitat), Green Economy Policy Framework (WWF)
 - Feedback on time interval/target setting, monitoring and evaluation
 - Plan and consensus on officialising strategies

Finalization and Identification of Pilot Project → December 2016

Group (B)

**Gold C- Maximise proper collection
and disposal of industrial and
hazardous (Medical)waste**

Members of group (B)

No	Name	Department
1.	U That Tun	CDC
2.	U Sain Maung Htwe	ECD
3.	U Min Thein	ECD
4.	U Aung Kwe	ECD
5.	U Than Htut	MCDC
6.	Daw June Khing Wint Tun	AIT
7.	U Khin Maung Thein	Myanmar Koei
8.	Dr, Ni Ni Aung	ECD
9.	U Aung Myint	CDC
10.	Ms. Khing Thwe Oo	ECD
11.	U Ko Ko Aung	YCDC

Outline of Presentation

- Land used
- Budget
- Central Detail Procedure for industrial Zone
(Need Networking between Ministries)
- Technology Support
- Capacity Building to related person
(Investor, worker, government staff)
- Strong Rule and Regulation
- Cluster the same type of industries in same location

Land used

- Central government should support land for waste disposal
- To get sufficient land for waste disposal

Budget

- Government(INGOs) 's grand/loan
- Tax reduce for treatment plant owned industries
- Developed Polluter Pay Principal for industrial waste

Central Detail procedure for industrial

- Institution

Technology Support

- Suitable Technology for different kinds and amount of hazardous waste

(each region cannot be same type of waste and generation amount)

Capacity Building

- Awareness program for both waste generator and collector
- Capacity building for government staff
- Qualified lab analysis

Strong Rule and Regulation

- Based on Regional level/National
- Should obey current rules and regulation(all industries worker and investor)

Cluster same types of industries

- Management by regional government for new industrial zones
- Relocated existing industrial zone by government support

(Electrical Power Supply, Land, water supply, transportation, land, drainage system, Telecommunication, central waste treatment system)

Recommendation for Goal-C

- Should be have one focal department
(DISI should be focal department for industrial area)
That department should evaluate Specific Rule and Regulation for environmental conservation in first step of industrial registration

Workshop Presentation of Chin State, Sagaing Region , Kachin State and Shan State

Goal B and D

5.12.2016

YCDC Conference Hall

To reduce waster volume

- To separate dry waste and wet waste
- To reduce waste volume
- Others cannot easily destroy goes to other method (such as inceneration ..)
- Systemic landfill is needed
- Systemetic and expensive treatment can also replace with own method like covering ...

Solutions

First , Liquid waste treatment and final product goes to ..

Less amount of waste can go to inceneration

Wastes become fertilizer near market ?
Technology ..?

To reduce market waste

Papers to recycle

fruits and vegetables to fertilizer

Plastic bags less → lesser waste

To ban plastic bag industry ← Minimize first

To reduce waste volume

What if Segregation starts from home ...?

Monitoring for Implementation is important in enforcing laws .

Segregation is also possible at first site

Separate with different garbage bins <- Firstly , wet and dry can be implement with 2 colors separation in Myanmar

In city We can also separate

1. Wastes which can become fertilizer
- 2 . Wastes which cannot become fertilizer

Law enforcement after awareness period for stopping illegal dumping

Monitoring after that period such as surprise check by going around with vehicles

..

Human resource for that???

To meet Long term Plan

- Short term and Mid term plan Urban planning is important if the dumping site shifting happens often ... other departments and local government have to negotiate for agreement .
- Landfill site ... Environmental conservation with planting should be included in long term plan)
- Wide area for landfill area is needed for long term ...
- One or two areas but wide space is important in long term plan
- So we all have to negotiate with different sectors for future urban planning ...

Thinking about 2050 for long term plan

-

D . Waste Water Treatment

- Technology ...waste water management
- Budget
- Enforcement

- Checking industry , Warning period first and then punishment starts if they don't follow the rules ...
- Same types of industries altogether at nearby place so treatment can be more easily .(same chemical and hazardous waste with same technology for treatment)
- At the first stage of Proposal to build an industry .., we have to make them aware at first stage about treatment for specific waste water and it is best to have at least one technician for waste water .

- Every industry should have treatment plant .
- We don't still have waste water collecting system .
- We only has a small plant in Nay Pyi Daw just for a quarter.

Waste Water Management

- EIA ...?
- Sewage system near industry and near restaurants
- Industry waste water checking when they have complaints .
- First give them time to correct before go checking again .

- Plan to do regular checking for industries even they don't have complaints.
- In Taunggyi , they give instructions to every restaurant , hotel and inn for what to do and to have Detection Pond .
- Common plant is hard as scattered industries and different chemical waste and individual financial separation would be not easy to divide .
- Some people replace with Lime for expensive Substance for Treatment plant .Lime doesn't reduce smell so that complaints happens.

**Thank you very much
for your attention ...**

**Ensure Sustainable Services
Through review, monitoring,
innovation and improvement**

Gold F

Point Need to Revised

- F.3 Deleted
- Need to change the topic (Burmese language)

Points need to add

- F. 4 Allocate Sufficient Budget by Local Government
- F.4. 1 To establish the system of regular budget sharing system by discussing with stakeholders in In the issue of data collection, information sharing and monitoring

F. 5 Do the effective legal action for penalties if it is not follow in accordance with the rules

- F.5.1 Send the notice letter
- F.5.2 To request for legal counsel
- F.5.3 Do effective legal actions

City Waste Management Strategy and Action Plan for Mandalay

Draft for Discussion
05 December 2016



Structure of the Strategy



Waste Management Strategy and Action Plan for Mandalay

(Revised Draft)

October 2016



Presentation of the Strategy

- Vision Statement

- *Mandalay will be a Clean, Green, and Healthy City in Myanmar, where culture and environment are preserved for future generations.*



- Mission Statement

- *To reduce solid waste generation and manage residual waste materials in a way which maximises opportunities for resource recovery, while protecting public health and the environment to achieve a zero waste society.*



- Guiding Principles

- **Waste Hierarchy** (This consists 3Rs including Reduce - reduce waste that must be generated and which goes to the landfill (this includes composting), Reuse - repair goods that can be repaired, or find alternative uses for wastes, Recycle - return wastes with recoverable value for re-processing).
- **Resource conservation** (Promoting the most efficient use of resources, including resource recovery and waste avoidance).
- **Polluter-pays Principle** (A principle that holds that those responsible for causing pollution or generating solid waste should pay the cost for dealing with the pollution, or managing the solid waste (collection and disposal) in order to maintain ecological health and diversity).
- **Precautionary Principle** (Principle that dictates that a lack of scientific data/information certainty should not be used as a reason for not acting to prevent serious or irreversible environmental damage or degradation).
- **Proximity Principle** (A principle that maintains that waste should be dealt with as close to the source of generation as possible. This reduces transportation costs, and also reduces risks of contamination of the environment during transport).
- **Consultation Principle** (A principle that conveys the importance of all levels of Government consulting and working with people and organizations throughout the development and implementation of waste management strategies and action plans).
- **Shared responsibility** (In this context, zero waste is a shared responsibility and requires partnerships and collaborations between all sectors of government, industry, research institutions, NGO's, and the general community)

Setting Goals, Targets, Objectives and Actions

This City Waste Management Strategy has identified the following major goals:

- Goal A – Maximise municipal solid waste collection and the 3Rs (Reduce, Reuse and Recycling) in the city
- Goal B – Improve final treatment and disposal system in the city
- Goal C – Maximise proper collection and disposal of industrial and hazardous (medical) waste
- Goal D – Maximise proper disposal and treatment of wastewater
- Goal E: Capacity development, awareness raising and advocacy
- Goal F - Ensure sustainable services through review, monitoring, innovation and improvement

Goal A – Maximise municipal solid waste collection and the 3Rs (Reduce, Reuse and Recycling) in the city



Objectives:

- A.1: Provide effective and efficient municipal waste collection services
- A.2: Introduce waste separation at source
- A.3: Integrate private and informal sectors as partners in the delivery of sustainable waste management
- A.4: Improve infrastructure for waste collection, storage, transfer and transport

Short-term (2017 – 2020)	Middle-term (2021 – 2025)	Long-term (2026 – 2030)
<ul style="list-style-type: none">• Increased municipal waste collection coverage (80% of the whole city)	<ul style="list-style-type: none">• Increased municipal waste collection coverage (90% of the whole city)	<ul style="list-style-type: none">• Increased municipal waste collection coverage (100% of the whole city)
<ul style="list-style-type: none">• Established waste separation at source (1 or 2 model township)	<ul style="list-style-type: none">• Increased waste separation at source (3 townships or 50% of the total townships)	<ul style="list-style-type: none">• Increased waste separation at source (all townships in the city)
<ul style="list-style-type: none">• Increased material recovery and recycling (25% of recyclable materials)	<ul style="list-style-type: none">• Increased material recovery and recycling (50%, including 25% recyclable materials, 15% of food waste and 10% industrial and other waste)	<ul style="list-style-type: none">• Increased material recovery and recycling (80%, including 25% recyclable materials, 35% of food waste and 20% industrial and other waste)

Goal B – Improve final treatment and disposal system in the city



Objectives

- B.1: Reduce organic waste (food waste) sent to landfill
- B.2: Increase recovery of additional material at landfill for RDF
- B.3: Examine potential of waste to energy (W2E) technologies such as incinerator and landfill gas capture
- B.4: Establish a new sanitary landfill meeting engineering standards for final disposal
- B.5: Establish mechanisms to discontinue the operation of illegal dumping sites in the city

Short-term (2017 – 2020)	Middle-term (2021 – 2025)	Long-term (2026 – 2030)
<ul style="list-style-type: none"> • Reduction of illegal dumpsites in the city (50%) 	<ul style="list-style-type: none"> • Reduction of illegal dumpsites in the city (75%) 	<ul style="list-style-type: none"> • Reduction of illegal dumpsites in the city (100%)
<ul style="list-style-type: none"> • Immediate improvements to the operation of existing landfills 	<ul style="list-style-type: none"> • Establishment of sanitary landfill site with minimum requirements in place to protect the environment 	<ul style="list-style-type: none"> • Full operation of the sanitary landfill
	<ul style="list-style-type: none"> • Reduction of food waste (market waste) sent to landfill (15%) 	<ul style="list-style-type: none"> • Imposed ban on food waste (market waste) sent to landfill (100%)
		<ul style="list-style-type: none"> • Introduction of viable technologies such as bio digesters, refuse derived fuel (RDF) and waste-to-energy (W2E) technologies aimed

Goal C – Maximise proper collection and disposal of industrial and hazardous (medical) waste



Objectives

- C.1: Reduce industrial and hazardous waste generation and landfill
- C.2: Implement source segregation and collection systems
- C.3: Promote effective recycling, treatment and final disposal and the introduction of selected technologies

Short-term (2017 – 2020)	Middle-term (2021 – 2025)	Long-term (2026 – 2030)
<ul style="list-style-type: none">• Reduction of industrial waste sent to landfill (25%)	<ul style="list-style-type: none">• Reduction of industrial waste sent to landfill (50%)	<ul style="list-style-type: none">• Ban on industrial and hazardous (medical) waste sent to the landfill (100%)
<ul style="list-style-type: none">• Reduction of hazardous and medical waste sent to landfill (25%)	<ul style="list-style-type: none">• Reduction of hazardous (medical) waste sent to landfill (50%)	<ul style="list-style-type: none">• Established proper waste treatment methods and technologies for industrial and hazardous (medical) waste (100%).

Goal D – Maximise proper disposal and treatment of wastewater



Objectives

- D.1: Improve the collection and treatment of liquid waste in domestic areas
- D.2: Improve the collection and treatment of liquid waste in industrial areas
- D.3: Improve the collection and treatment of liquid waste in public areas (public market and central bus/train terminals)

Short-term (2017 – 2020)	Middle-term (2021 – 2025)	Long-term (2026 – 2030)
<ul style="list-style-type: none">• Increased coverage of liquid waste collection and treatment in domestic sector (25%)	<ul style="list-style-type: none">• Increased coverage of liquid waste collection and treatment in domestic sector (50%)	<ul style="list-style-type: none">• Increased coverage of liquid waste collection and treatment in domestic sector (100%)
<ul style="list-style-type: none">• Increased coverage of liquid waste collection and treatment in industrial sector (25%)	<ul style="list-style-type: none">• Increased coverage of liquid waste collection and treatment in industrial sector (50%)	<ul style="list-style-type: none">• Increased coverage of liquid waste collection and treatment in industrial sector (100%)
<ul style="list-style-type: none">• Increased coverage of liquid waste collection and treatment in public places	<ul style="list-style-type: none">• Increased coverage of liquid waste collection and treatment in public places	<ul style="list-style-type: none">• Increased coverage of liquid waste collection and treatment in public places

Goal E: Capacity development, awareness raising and advocacy



• Objectives

- E.1: Mainstream environmental education and waste management in school curricula and programmes
- E.2: Mobilise support of local stakeholders by increasing awareness and participation in environmental education and waste management

Short-term (2017 – 2020)	Middle-term (2021 – 2025)	Long-term (2026 – 2030)
<ul style="list-style-type: none">• Increased number of townships have implemented standard awareness-raising programmes for their residents (25%)	<ul style="list-style-type: none">• Increased number of townships have implemented standard awareness-raising programmes for their residents (50%)	<ul style="list-style-type: none">• Increased number of townships have implemented standard awareness-raising programmes for their residents (100%)
<ul style="list-style-type: none">• Increased number of schools have established environmental education programmes for their students (25%)	<ul style="list-style-type: none">• Increased number of schools have established environmental education programmes for their students (50%)	<ul style="list-style-type: none">• Increased number of schools have established environmental education programmes for their students (100%)

Goal F - Ensure sustainable services through review, monitoring, innovation and improvement



Objectives

- F.1: Establish a data collection mechanism
- F.2: Establish a reporting mechanism
- F.3: Establish a communication mechanism to ensure regular consultation among key stakeholders

Short-term (2017-2020)	Mid-term (2021-2025)	Long-term (2026-2030)
<ul style="list-style-type: none">• Establish and monitoring of benchmark performance indicators (50%)	<ul style="list-style-type: none">• Establish and monitoring of benchmark performance indicators (75%)	<ul style="list-style-type: none">• Establish and monitoring of benchmark performance indicators (100%)
<ul style="list-style-type: none">• Increase in the number of successful enforcement actions filed against non-compliant entities (50%)	<ul style="list-style-type: none">• Increase in the number of successful enforcement actions filed against non-compliant entities (75%)	<ul style="list-style-type: none">• Increase in the number of successful enforcement actions filed against non-compliant entities (100%)



Waste Management Strategy Development in Myanmar: Consultation and Formulation Process

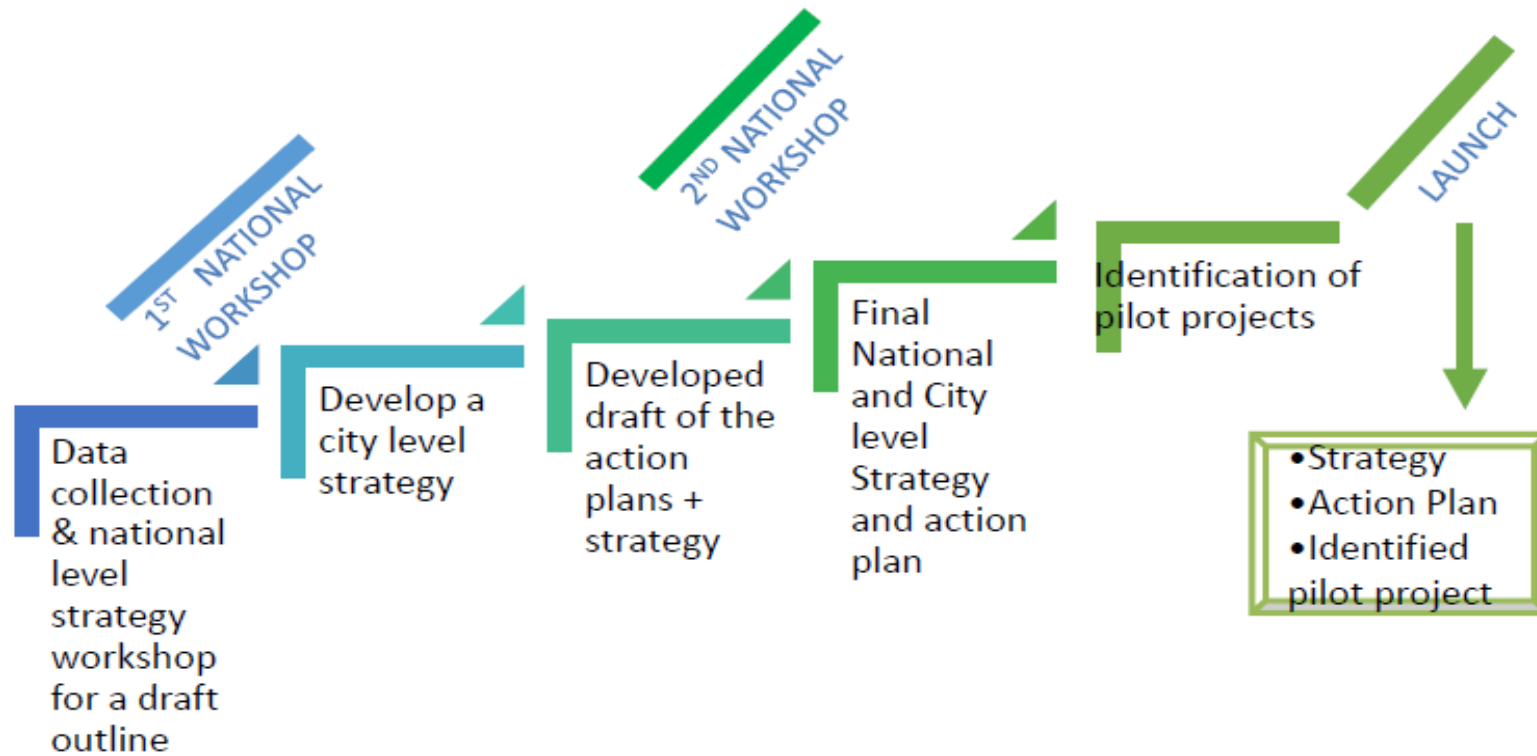
Matthew Hengesbaugh

Policy Researcher

Institute for Global Environmental Strategies (IGES)

5 December 2016

Waste Management Strategy Development in Myanmar: Roadmap



Waste Management Strategy Development in Myanmar

Initial Dialogue → March 2016

First round of consultations with MONREC, YCDC, MCDC, NCDC

- Agreement on scope of national/city-strategies
- Mandalay selected as target city for strategy development
- Confirmation of schedule for first National and City-Level Workshops

Rapid Assessment → March-May 2016

Quick Study preparation

- Evaluation of existing WM system (policy, technology and finance)
- Identification of major gaps and good practices at national and city level

Waste Management Strategy Development in Myanmar (2)

Participatory Work Planning → 13-17 June 2016

1st National/City-Level Workshop held in Nay Pyi Taw & Mandalay

- Validation of waste management gaps and challenges
- Mobilization of stakeholders for strategy formulation
- Establishment of monitoring and feedback mechanisms for strategy

Main Outcomes

- Consensus reached with national/local counterparts on content of strategies
- Emphasis on coherence with existing policy development processes
 - 5-Year Development Plan (MONREC)
 - Mandalay Regional Development Plan
- Examination of potential financing for future activities (JICA, ADB)
- Agreement on follow-up review process at regional level





Waste Management Strategy Development in Myanmar (3)

Evaluation and Review → September 2016

Organization of National/City-Level Roundtable Discussions

- Consultation on initial drafts of waste management strategies held with MONREC/NCDC/MCDC/YCDC
 - Guidance on improving policy and regulatory alignment with existing MONREC & MCDC rules/regulations and standards, planning and budget cycles, coordination mechanisms, institutional roles and responsibilities
 - Suggested consideration of National Environmental Policy (UNDP), National Climate Change Strategy (UN-Habitat), Green Economy Policy Framework (WWF)
 - Feedback on time interval/target setting, monitoring and evaluation
 - Plan and consensus on officialising strategies

Finalization and Identification of Pilot Project → December 2016

GROUP DISCUSSION ON

Goal A – Maximize municipal solid waste collection and recycling in the city

**Goal E – Capacity Development, Awareness
Raising and Advocacy**

Group 3

5.12.2016

Goal A – Maximize municipal solid waste collection and recycling in the city

To add -- Objective – To encourage recycle business

Action -- To attract recycle businessmen through giving incentives

To repair

Objective 1

Action 1.2 - To settle dust bin and waste tank in the roads and wards, and to have the regular waste collecting system (regular time, door to door)

Action 1.3 - To use tri-cycle in narrow streets

- To have the transparency through explaining and displaying the existing situations by the responsible agencies
- To upgrade existing waste collector trucks and dust filters

Goal A – Maximize municipal solid waste collection and recycling in the city

To repair

Action 1.5 - Eradicate illegal dumpsites and punish according to the CDC law

To add

Objective 3

Action 3.6 - To include the principle of following 3Rs system in the

approval of license to the factories and industries

and to

make the punishment (shutting down the factories)

if they

are absent to follow

Objective 4

Action 4.6 - To have occupational safety pump flats and material

Goal E – Capacity Development, Awareness Raising and Advocacy

To add

- Target**
- Awareness in industrial zones, 30%, 50%, 70%
 - Awareness in public clinics, 30%, 50%, 70%

To repair

Objective 1

- Action 1.1 - To have the curriculum in the primary school course
- Action 1.8 - To celebrate waste pickup activities, essay competition, painting arts and other activities in the schools

Goal A – Maximize municipal solid waste collection and recycling in the city

Remark	Objective no.	Action no.	Type of action	Responsible agencies	Type of its action
To add	Objective		To attract recycle businessmen through giving incentives	City Development Committee	To manage waste
				Ministry of Electricity and Energy	To produce and distribute energy from waste
				Ministry of Industry	Supervision with the conditions in the license for industries
				Ministry of Health and Sports	Supervision with the conditions in the license for private clinics
				Environmental Conservation Department	To define the emission guidelines
				Ministry of Planning	To distribute loan with

Goal A – Maximize municipal solid waste collection and recycling in the city

Remark	Objective no.	Action no.	Type of action	Responsible agencies	Type of its action
To repair	Objective 1	Action 1.2	To settle dust bin and waste tank in the roads and wards, and to have the regular waste collecting system (regular time, door to door)	City Development Committee	To define, supervise and operate
		Action 1.3	To use tri-cycle in narrow streets	City Development Committee	To buy and operate
			To have the transparency through explaining and displaying the existing situations by the responsible agencies	City Development Committee	To display facts and figures to the public

Goal A – Maximize municipal solid waste collection and recycling in the city

Remark	Objective no.	Action no.	Type of action	Responsible agencies	Type of its action
To add	Objective 1	Action 1.5	Eradicate illegal dumpsites and punish according to the CDC law	City Development Committee	To operate and take action
To add	Objective 3	Action 3.6	To include the principle of following 3Rs system in the approval of license to the factories and clinics and to make the punishment (shutting down the factories and clinics) if they are absent to follow	Ministry of Industry	To define the conditions in the license
				City Development Committee	To collect and dispose through joining with them
				Ministry of Health and Sports	To define the conditions in the license
To add	Objective	Action	To have occupational	City	To support and

Goal E – Capacity Development, Awareness Raising and Advocacy

Remark	Target	Objective no.	Action no.	Type of action	Responsible agencies	Type of its action
To add	Awareness in industrial zones, 30%, 50%, 70%				Ministry of Industry	To define the conditions in the license
					City Development Committee	To collect and dispose through joining with them
To add	Awareness in public clinics, 30%, 50%, 70%				Ministry of Health and Sports	To define the conditions in the license
					City Development Committee	To collect and dispose through joining with them

Goal E – Capacity Development, Awareness Raising and Advocacy

Remark	Objective no.	Action no.	Type of action	Responsible agencies	Type of its action
To repair	Objective 1	Action 1.1	To have the curriculum in the primary school course	Ministry of Education	To add in the curriculum
To repair	Objective 1	Action 1.8	To celebrate waste pickup activities, essay competition, painting arts and other activities in the schools	Ministry of Education	To celebrate activities in the schools
				City Development Committee	To support to the schools in holding these activities

Responsible Persons for proper Landfill

For Land

- Administration Department
- >5 acres Have to ask for Central Government
- Township leaders , Owners of land , related committee for land and property

Transportation

- CDC
- Budget is needed to do that ..
- Citizens also have responsibility for discipline
- Road quality for better transportation .
- Security of landfill ... fence ?

Awareness

- CDC , Administrative departments and Media ...
- Committee members chosen by citizens .
- Repeated awareness programs ...
- **CDC** – Pamphlets , activities , posters , Radio Broadcast , Education at school , Arts Competition for waste management (but budget is limited to do so ...)

Administrative Departments

- Organizing people to make events.
- Prize giving for idol house for each quarter.

Media

- News and publishing ...
- Make Awareness widely
- ? Punishment in media – People are afraid and follow discipline more but is that really nice for people ...?

Government

- Budget
- Planning
- Land

Responsible Persons for Waste Water

- **Residential waste water** ... CDC is responsible.
- **Industrial waste water** ...Department for Industrial Supervision and Inspection is responsible.
- **Waste at public areas** Committee grouped by States and Regions , CDC .
 1. Chairmen
 2. Secretary

GOLD F

Responsible Person for Monitoring

ECD

General Administration Department

Township Development Committee

Department of Industrial Supervision and Inspection

Industrial Zone Committees

Small and Medium Enterprises

No	Department	Role
1	ECD	Policy framework, To conduct regular inspection To review monitoring reports for waste management system To check compliance and law enforcement
2	General Administration Department	Corporation and Coordination with local people and related departments
3	Township Development Committee	Municipal Tax Waste Collection and Disposal Supervision on Private sector on Waste management
4	Department of Industrial Supervision and Inspections	Industrial Registration Regular Inspection for Industries
5	Industrial zones committees	To cooperate in regular inspection
6	Small Enterprises	Registration
7	Department of Health	Environmental Health Issue

GROUP DISCUSSION ON

Actions, Responsibility,
time frame and budget

National Strategy

Group 1

6.12.2016

Goal A – Extending sound waste management practices for all types of waste to eliminate uncontrolled treatment, disposal and open burning

Action	Responsibility	Time-frame	Budget Source (amount)
Waste segregation system - Household waste (dry and wet) - Medical waste (sharpening and infectious) - Industrial waste (hazardous and non-hazardous)	Environmental Conservation Department, City Development Committees, State and Region Development Committee, Ministry of Health and Sports, Ministry of Industry	2017/18 – 2019/20	Union Budget, State/Region Budget, CDC Budget, Grant and loan by development partner

Goal A – Extending sound waste management practices for all types of waste to eliminate uncontrolled treatment, disposal and open burning

Action	Responsibility	Time-frame	Budget Source (amount)
<p>Waste segregation system</p> <ul style="list-style-type: none"> - Household waste (Recyclable materials separation such as tin, can, bottle, plastic, electronic waste) - Medical waste (radioactive waste and electronic wastes) - Industrial waste (electronic wastes, 3Rs and waste water) 	<p>Environmental Conservation Department, City Development Committees, State and Region Development Committee, Ministry of Health and Sports, Ministry of Industry</p>	<p>2020/21 – 2029/30</p>	<p>Union Budget, State/Region Budget, CDC Budget, Grant and loan by development partner</p>

Goal B – Promote waste minimization, reuse, recycle and recovery to establish a resource circular society

Action	Responsibility	Time-frame	Budget Source (amount)
- Development of 3Rs	<ul style="list-style-type: none"> - Environmental Conservation Department (<i>Policy</i>) - City Development Committees, State and Region Development Committee, Ministry of Health and Sports, Ministry of Industry (<i>Implementing agencies</i>) 	2020/21 – 2029/30	Union Budget, State/Region Budget, CDC Budget, Grant and loan by development partner, Investors

Goal C – Ensure sound budgeting for securing sustainable sources of revenue for waste sector

Action	Responsibility	Time-frame	Budget Source (amount)
<p>- Establish specific fund for waste management (separation, collection, disposal, treatment, emergency issues, awareness activities, etc.,)</p>	<ul style="list-style-type: none"> - Environmental Conservation Department (<i>Policy</i>) - City Development Committees, State and Region Development Committee (<i>Implementing agencies</i>) - Ministry of Planning and Finance 	<p>2017/18 – 2029/30</p>	<p>State/Region Budget, CDC Budget, Development partners</p>

Goal D – Compliance, monitoring, enforcement and recognition

Action	Responsibility	Time-frame	Budget Source (amount)
<ul style="list-style-type: none"> - Establish adhoc group depending on the case by the regulators - Continuous monitoring by Community, CSOs, NGOs, etc., 	<ul style="list-style-type: none"> - Community, CSOs (<i>Advice</i>) - CDC, ECD, DISI, MOHS (<i>law enforcement, necessary directives</i>) 	2017/18 – 2029/30	Related department, Community, CSOs, NGOs, etc.,



Thank you

Group B					
Goal	Action	Detail	Responsibilities	Time	Budget
Goal A	Solid Waste Guideline	<ul style="list-style-type: none"> • Including waste classification (e.g. domestic waste, industrial waste, Hazardous waste, Garden waste, etc.) • Reduction: increased collection fees for non-bio degradable waste or bio degradable waste • Reuse and Recycle: Reinforcements • Development of resource recovery market and technology • Packaging guideline 	ECD	1 year	Union
Goal B	Capacity Building Budget PPP (public private partner) development		CDCs		
Goal C	Attraction Political will		Union level		
Goal D	Need to setup Development of Waste statistic	Data based for waste generation	ECD and CDCs		
Goal E	Training Awareness camping Public awareness program for waste	Inclusive development on capacity building Entertainment, Media and Radio	ECD and CDCs		

National Level

Group C

Technology Improvement

ECD

- **Better Management Plan** – Research , Infrastructures
- **Experts**
- Local and International Experts
- **Awareness** – Experts for Poster design , publications and Media
- Substitution of Human Resource to **Machines and Technologies Development**

Human Resources

- **Capacity building** – Training and workshops
- Staffs from Townships or cities
- Coordination - **ECD**
- **Training Proposal** - Budget (International Experts)

Responsibilities , Discipline , Politics

- Citizens
- Media – soft way to attract
- Laws enforcement – afraid to be punishment
- Discipline _ To feel shy for illegal dumping and throw away of waste (Media , Awareness ... attractive videos)
- National Laws (188 ..) (**Same Laws** to every regions and departments ...)

Awareness

- Incentives
- **Attractive** Planning for awareness
- Health education -> Committee members chosen by local people .. (**National Level**) –CDC members first and then to local people
- **Budget** for plenty of **Garbage Bins**
- **Education** according to **different educational levels**
- **Mindset , Attitude , Knowledge and Behaviors**

Younger Generation

- Clean and nice environment can produce more creativity
- *Environmental pollution* can make shorter lifespan , **Quality of Life and Productivity** .
- **Self collection system** after eating and **lesser food waste**
- **Awareness also to Villagers** as those include larger population in Myanmar. **(70% of total population in Myanmar)**

Township leaders

- To Chose **Wisely**
- Based on their **Educational Level**
- Prize and Punishment System
- Incineration Plant at borderline areas

Household

- Dry and Wet
- Awareness on Recycling Practice
- Selling waste for recycle
- Awareness and participation

Management

- Infrastructures
- Loan
- Health and Safety of staffs
- Household Participation
- Instruments , Machines and Vehicles
- Salary for Staffs
- Transportation and Maintenance
- **Jobless citizens** -> Mindset to be involved in waste management services (e.g., cleaning , collection , etc...)

Action Plans Related
Ministries

Group D

Action Plan

Actions	Responsibilities	Time- Frame	Budgets
Wet and Dry Waste Segregations	Focal –ECD CDC, Health and Sport, DISI,	2017-2018	1,500 Lakh, MMK
Set the place for waste disposal site	National Government, Regional Government, CDCs, Department of Agricultural Land Management and Statistics	-	No need
Investigate systematic method of waste disposal issue	National Government , CDCs	-	No need
Promote waste Collection System and 3Rs	National Government and CDCs		
Awareness Raising	ECD, GAD, Department of Education, Ministry of Information	2017-2020	1,400 Lakh/MMK

What should be priority for strategy and how to be monitor

Group 1

6.12.2016



Assuming that this strategy has been confirmed

Implementing Stage

For Public awareness

- Collecting the base line data of waste generation
- Collecting the facts and information which they want to give to the public and prepare according to the state and region, such as in their own language
- Distributing these messages to the public by Government departments (CDC and Administrative department) through getting participation of voluntary associations such as NGOs, Social Organizations
- Announcement by TDC when and how they will collect and manage waste with boards
- Defining and setting dust bins (wet and dry for short term and more types in the long term) at the common areas
- To have the common temporary storage area for waste segregation before disposing to the final disposal site
- To create recycle center and recycle market for the waste which are usable from segregation
- For the wastes from final disposal, to establish an incinerator for some waste such as medical wastes and landfilling for organic wastes
- For hazardous waste, to have link with hazardous waste management strategy and distribute technology how to manage
- For waste water, to develop a central waste water treatment plant

Monitoring Stage

- For data collection, to monitor at defined interval by CDC
- To pay attention to the public voice and various associations
- To monitor the capacity and impact of incinerator from various points of views

Goal A: Promote waste minimization, reuse, recycling and recovery to establish a resource circular society	
Implementation	Monitoring
Development of Recycling Machine in related region by Union Level Establish Resources Recovery Business Network by regional	SME Development Committee Recycle business development Committee
Goal B: Ensure the effective and efficient delivery of waste services	
Implementation	Monitoring
Need Union level organization to connect international loan and technology support	ECD and CDCs by waste statics return
Goal C: Ensure sustainable budgeting and sound financial management of the waste sector	
Implementation	Monitoring
Development of activities based budgeting Redesign service fees collection by regional level	ECD and CDCs by waste statics return
Goal D: Compliance, monitoring, enforcement and recognition	
Implementation	Monitoring
Intensive and punishment City level	ECD and CDCs by waste statics return
Goal E: Capacity development, awareness raising and advocacy	
Implementation	Monitoring
Development of environmental education	ECD and CDCs

Successful Implementation and Monitoring

Group C

How to Implement ?

Pilot Project

- Target one area and train and monitor with information ,suggestion and Supervision
 - at least **one** year
 - _ Meetings and Feedback
 - (Pros and Cons , Challenges)
 - _ Reasonable prices for community participation in Long term Plans
 - _ Modern Techniques
 - _ Regular Warnings for waste segregation (eg., loudspeakers ...)
 - _ Budget and Profits

Central Committee

- **Vice President** as Chairman.
- Authorized Persons should be included in Committee .
- **Environmental Committee** –(Region , District and Township)
- **Enough** human resources needed for implementation and Monitoring . (ECD)
- **Collaboration** with Different Sectors
- Guidelines
- Policy for Waste Management and Reduction
- **Unity**
- **SWOT** (Strength , Weakness , Opportunities and Threats)

Union Level

- President , Vice president
- MORNEC
- Administration of Home Affairs

Regional Level

- Institutions
- ECD
- CDC
- Ministries

Implementation

- Education and awareness about waste management and reduction at younger age .
- Participation of Industrial and Manufacturing Investors and Clients .
- Challenges include huge investors (Eg., Mining Sectors ...)

How to monitor Implementation

- Responsible **Leaders** for Monitoring ?
- Responsible **Groups** for Monitoring .
- Monitoring areas altogether with responsible persons for different sectors .
- Sector Laws Enforcement
- Self Reflection
- Regular and Surprise Check
- Repeated Attractive Awareness Programs and Encouragement
- Flexible and specific members for monitoring team

Action Plan for Implementation and Monitoring

Group D

Setting Goals, Targets, Objectives and Actions

- The National Waste Management Strategy has identified the following major goals and each of these goals is then briefly discussed with some key targets and objectives.
 - **Goal A** – Promote waste minimisation, reuse, recycling and recovery to establish a resource circular society
 - **Goal B:** Ensure the effective and efficient delivery of waste services
 - **Goal C:** Ensure sustainable budgeting and sound financial management of the waste sector
 - **Goal D:** Compliance, monitoring, enforcement and recognition
 - **Goal E:** Capacity development, awareness raising and advocacy

Goal (A): Promote waste minimizations , reuse, recycling and recovery to establish a resource circular society

Goal	Stakeholder/ Ministries	Implementation	Monitoring	
			State	Union
A	CDCs, Private Sector, ECD,	<ul style="list-style-type: none"> • Data collection, • Discipline rules an regulations, (Private and Business), • Need to select to establish for the industries, • Promote 3Rs activities in the community level. 	<ul style="list-style-type: none"> • Regional Government, • CDCs, • Private Sectors, • ECD, • CSOs, • NGOs 	<ul style="list-style-type: none"> • National Government • Ministry of Natural Resources and Environmental Conservation (MONREC), • NGO

Goal (B): Ensure the effective and efficient delivery of waste services

Goal	Stakeholders/ Ministries	Implementation	Monitoring	
			State	Unions
B	CDC, Private	<ul style="list-style-type: none"> • Law for waste segregation • Systematic ways of waste management issue, and implement better waste management strategies • Need to set Laws and Rules as firmly • Need sufficient amount of human resources and others resources such as truck and mechanisms • Budget Allocation • Public Private Partnership issue 	<ul style="list-style-type: none"> • GAD, • CDCs, • ECD • CSOs • NGO 	<ul style="list-style-type: none"> • National Government, • Business Entrepreneur • State Government

Goal C: Ensure sustainable budgeting and sound financial management of the waste sector

Goal	Stakeholders/ Ministries	Implementation	Monitoring	
			State	Union
C	CDCs Private	<ul style="list-style-type: none"> • Set both commercial tax and municipal based on current situation • Set municipal tax based on the amount of waste generation rate • Plan budget allocation with the above tax • Set the municipal tax by type of waste 	<ul style="list-style-type: none"> • GAD, • CDCs, • ECD • CSOs • NGO 	<ul style="list-style-type: none"> • National Government, • Business Entrepreneur • State Government

Goal D: Compliance, monitoring, enforcement and recognition

Goal	Stakeholders/ Ministries	Implementations	Monitoring	
			State	Union
D	CDCs, Private	<ul style="list-style-type: none"> • Advice the sectoral Laws • Set the systematic Law and follow accordingly Follow the laws which is set by ECD 	<ul style="list-style-type: none"> • GAD, • CDCs, • ECD • CSOs • NGO 	<ul style="list-style-type: none"> • National Government, • Business Entrepreneur • State Government

Goal E: Capacity Development awareness raising and advocacy

Goal	Stakeholders/ Ministries	Implementation	Monitoring	
			State	Union
E	<ul style="list-style-type: none"> • ECD • Department of Education • Department of Health • Ministry of Information • CDCs • GAD 	<ul style="list-style-type: none"> • Promote on awareness raising • Promote and practice 3Rs activities • Put/Investigate in the School Curriculum • Law enforcement in waste management 	<ul style="list-style-type: none"> • GAD, • CDCs, • ECD • CSOs • NGO 	<ul style="list-style-type: none"> • National Government, • Business Entrepreneur • State Government

National Waste Management Strategy and Action Plan for Myanmar

Draft for Discussion
11-16 September 2016



Outline of the Presentation

- Strategy Development Process
- Introduction to the National Waste Management Strategy (NWMS)
- Presentation of the Strategy
- Setting Goals, Targets, Objectives and Actions



National Waste Management Strategy
and Action Plan for Myanmar

(Draft)

August 2016



Strategy Development Process

(1) Preliminary meeting and consultation with key stakeholders



29 Feb 2016 (Meeting with MONREC),



29 Feb 2016 (Meeting with Nay Pyi Taw City Development Committee)

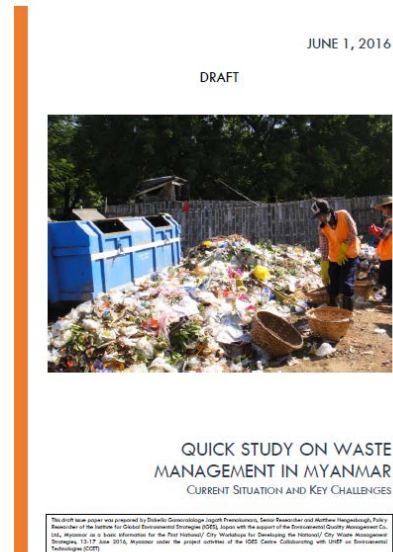


2 Mar 2016 (Site visit in Mandalay City Development Committee)



4 Mar 2016 (Meeting with Yangon City Development Committee)

(2) Carried out the quick study and identify the key gaps (Mar – May 2016)



(3) 1st National Workshop (13 – 15 June 2016) for drafting a national waste management strategy and action plan



A total 65 participants including both government, business, civil society, academic and non-governmental organizations were participated.

Introduction to the National Waste Management Strategy (NWMS)

- **Scope and period covered by the strategy**

- The NSWMS seeks to achieve a goal of zero waste by 2030; sets a short-term target to be achieved during the period of 2017-2022 (five year) and long-term targets by 2023-2030 (seven years); includes a comprehensive list of actions; reflects the stated goals and directives of public authorities with a view towards at efficient and effective implementation.
- It covers municipal solid waste from residential, commercial, institutional, and industrial, hazardous and liquid (waste water) wastes. However, it is not intended to propose any specific technologies in this stage.

- **Strategic context for Waste Management**

- This Strategic Plan is in line with the other national development plans and strategies, such as the National Comprehensive Development Plan (NCDP) 2015 of Myanmar identifies the importance of managing the environment and natural resources in a sustainable manner.
- Further, the National Climate Change Policy and Strategy and National Green Growth and Green Economy Policy and Strategic Framework (currently being drafted) will also need to be considered in finalizing the NWMS and its Strategic Plan for Myanmar.

Structure of the Strategy



Presentation of the Strategy

- **Vision Statement**

- In light of vision statements outlined both in the National Sustainable Development Strategy (NSDS, 2009) and the National Environmental Policy and Strategy Framework (Draft, 2015), the following vision was identified:

“Sustainable, Green, Clean and Healthy Environment towards a Brighter Future for Myanmar”

- **Mission Statement**

- ***To develop and implement the holistic/ integrated waste management strategy based on principles of inclusiveness, zero waste and circular economy to achieve a greener, cleaner and healthier environment in Myanmar.***

- **Guiding Principles**

- ***Waste Hierarchy*** (This consists 3Rs including Reduce - reduce waste that must be generated and which goes to the landfill (this includes composting), Reuse - repair goods that can be repaired, or find alternative uses for wastes, Recycle - return wastes with recoverable value for re-processing).
- ***Resource conservation*** (Promoting the most efficient use of resources, including resource recovery and waste avoidance).
- ***Polluter-pays Principle*** (A principle that holds that those responsible for causing pollution or generating solid waste should pay the cost for dealing with the pollution, or managing the solid waste (collection and disposal) in order to maintain ecological health and diversity).
- ***Precautionary Principle*** (Principle that dictates that a lack of scientific data/information certainty should not be used as a reason for not acting to prevent serious or irreversible environmental damage or degradation).
- ***Proximity Principle*** (A principle that maintains that waste should be dealt with as close to the source of generation as possible. This reduces transportation costs, and also reduces risks of contamination of the environment during transport).
- ***Consultation Principle*** (A principle that conveys the importance of all levels of Government consulting and working with people and organizations throughout the development and implementation of waste management strategies and action plans).
- ***Shared responsibility*** (In this context, zero waste is a shared responsibility and requires partnerships and collaborations between all sectors of government, industry, research institutions, NGO's, and the general community)

Setting Goals, Targets, Objectives and Actions

- The National Waste Management Strategy has identified the following major goals and each of these goals is then briefly discussed with some key targets and objectives.
 - **Goal A** – Promote waste minimisation, reuse, recycling and recovery to establish a resource circular society
 - **Goal B:** Ensure the effective and efficient delivery of waste services
 - **Goal C:** Ensure sustainable budgeting and sound financial management of the waste sector
 - **Goal D:** Compliance, monitoring, enforcement and recognition
 - **Goal E:** Capacity development, awareness raising and advocacy

Goal A: Promote waste minimisation, reuse, recycling and recovery to establish a resource circular society

• Targets

- Potential recyclables from landfill sites are diverted for re-use, recycling or recovery – 25% (2022) and 50% (2030).
- All three major City Development Committees (Yangon, Mandalay and Nay Pyi Taw) have institutionalised waste separation at source programmes by 2022 and all other Township Development Committees have initiated separation at source programmes by 2030.
- Waste reduction and recycling targets set in Industrial Waste Management Plans (IWMP) are achieved in major industrial zones by 2022 and over the rest of the country by 2030.

Objectives:

- A.1: Promote waste minimisation from upstream (in the design, fabrication and manufacturing of products)
- A.2: Promote waste reuse, recycling and recovery of waste materials before final disposal

Goal A: Promote waste minimisation, reuse, recycling and recovery to establish a resource circular society

- **Objectives:**

- A.1: Promote waste minimisation from upstream (in the design, fabrication and manufacturing of products)

- **Activities**

- A.1.1: Introduce design principles that incorporate the re-use of goods or their dismantling into components for re-use.
- A.1.2: Mandate Extended Producer Responsibility (EPR) with a view to enforce industries to take responsibility for the lifecycle of products that they produce, including establishing methods and funding mechanisms to manage the products once they become waste, and setting targets for re-use, recycling or recovery.
- A.1.3: Implement a Cleaner Production Strategy that aims to minimise the quantity and toxicity of waste produced during the manufacturing processes
- A.1.4: Allocate investment for research and development of technology innovations in design to minimise waste generation
- A.1.5: Introduce national policies, programmes and awareness campaigns to promote green businesses, sustainable consumption and production, and eco-labelling etc

Goal A: Promote waste minimisation, reuse, recycling and recovery to establish a resource circular society

- **Objectives**

- A.2: Promote waste reuse, recycling and recovery of waste materials before final disposal

- **Activities**

- A.2.1: Mandate Township Development Committees to develop waste management plans with measurable targets for waste reduction
- A.2.2: Direct industries in industrial zones to develop waste management plans with targets for waste reduction and for re-use, recycling and proper recovery.
- A.2.3: Develop national standards for cities with a view to promote waste minimisation, reuse, recycle, and recovery of waste materials in urban areas.
- A.2.4: Develop strategies and guidelines on waste separation, collection and sorting of general recyclable waste materials, supported by appropriate recycling infrastructure.
- A.2.5: Develop standards and incentives for the establishment of material recovery facilities (MRFs) and buy-back centres in different municipalities, with space provided for sorting re-useable and recyclable waste.
- A.2.6: Combine recyclable waste collection systems with existing waste collection services and transform disposal sites into integrated waste management sites
- A.2.7: Promote nationally coordinated awareness campaigns which support separation at source of recyclables from the domestic waste stream among all households, businesses and organisations.
- A.2.8: Develop strategies, standards and incentives for diversion of specific waste streams such as green waste, hazardous waste (industrial and medical waste) from landfills.
- A.2.9: Study and develop strategies/ standards for various waste treatment/recovery options that cannot be re-used or recycled, including biogas projects and methane gas from landfills, as well as thermal treatment; by introducing financial incentives such as tipping fees and renewable energy feed-in tariff and sound empirical standards for air emissions/water effluents aimed at mitigating the impact on human health and the environment.
- A.2.10: Establish a proper mechanism for data gathering, monitoring, enforcement and incentives for waste management strategies at city-level and in industrial zones.

Goal B: Ensure the effective and efficient delivery of waste services

• Targets

- Ensure access to adequate levels of waste collection services for 95% of urban households and 75% of rural households by 2022, respectively, and 100% coverage by 2030.
- Establishment of well-functioning sanitary landfills for three major City Development Committees (Yangon, Mandalay and Nay Pyi Taw) with 80% of waste disposal sites in the country possessing permits by 2022 and all waste disposal sites in the country have permits ensuring its sanitary operation.
- Separate waste collection system and treatment methods in place for industrial waste generated in major industrial zones by 2022 and throughout the entire country by 2030
- Provision of effective waste collection and treatment systems for medical waste in three major City Development Committees (Yangon, Mandalay and Nay Pyi Taw) by 2022 throughout the entire country by 2030.
- Provision of effective waste collection and treatment systems for liquid waste management in three major City Development Committees (Yangon, Mandalay and Nay Pyi Taw) by 2022 and throughout the entire country by 2030

Objectives

- Objective 1: Progressively expand access to waste management in order to ensure a minimum level of services
- Objective 2: Safe disposal of waste in permitted landfill sites

Goal B: Ensure the effective and efficient delivery of waste services

- **Objective**

- B.1: Progressively expand access to waste services to at least a basic level of service
- B.1.1: Develop, implement and monitor National Waste Management Standards to ensure that municipalities meet minimum-level standards for waste services in urban, peri-urban and rural contexts, using such standards to determine service provision levels, selection of options for waste collection, separation at source, supply of receptacles, collection vehicles, and health and safety, with a view to redress prior disparities in waste collection services.

- **Activities**

- B.1.2: Develop municipal and provincial Integrated Waste Management Plans (IWMPs) that will set out the strategy to achieve appropriate waste collection and treatment standards for domestic, industrial, hazardous and liquid wastes, with municipalities setting targets and formulating action plans including allocation of budget, monitoring and evaluation mechanisms, and measurement of progress.
- B.1.3: Set service standards in municipal by-laws based on national standards and guidelines for separating, transferring, and storing solid waste, managing and directing solid waste disposal, and controlling litter.
- B.1.4: Establish proper fiscal mechanisms to assist in the funding of expanded waste services, such as appropriate tariff setting and full-cost accounting for waste services.
- B.1.5: Coordinate action among different government units to address fiscal and capacity gaps faced with waste service provision, including the establishment of an inter-ministerial committee comprised of MONREC and other relevant national agencies to address waste service delivery issues and support municipalities with expanding waste service provision.
- B.1.6: Formulate a policy that provides impoverished households access to essential waste removal services, specifying appropriate service levels based on settlement densities, composition and volume of waste generated, and appropriate subsidy mechanisms for targeting services especially among households that cannot afford to pay for services. This policy

Goal B: Ensure the effective and efficient delivery of waste services

- **Objective**

- B.2: Safe disposal of waste in licenced landfill sites

- **Activities**

- B.2.1: Introduce a waste disposal standard at landfills, including regulations on standard engineering design, and receipt/disposal requirements for different classes of landfills, restrictions on certain types of waste, and guidelines for thermal waste treatment.
- B.2.2: Develop standards and compliance mechanisms for managing hazardous wastes, as determined by established waste classification and management system to achieve safe disposal of such waste.
- B.2.3: Conduct a nation-wide assessment of the necessary actions required to standardise management and licensing of existing disposal sites, providing the basis for the design and implementation of a national landfill licencing programme.
- B.2.4: Conduct a feasibility study on the costs and benefits of establishing regional disposal facilities in partnership with private companies.
- B.2.5: Guide municipalities on registration processes for waste transporters in accordance with the rules and regulations of relevant Waste Management Offices (WMOs) at the national, provincial or local level, mandating that registered transporters prevent any spillage of waste/littering from waste transport vehicles and that the disposal of waste is conducted in officially designated areas
- B.2.6: Perform a feasibility study on options for introducing waste-to-energy technologies
- B.2.7: Review current practices and promote awareness raising among municipalities on good practices with regard to sewage sludge treatment

Goal C: Ensure sound budgeting and sustainable financial management for waste sector

• Targets

- 70% of municipalities that provide waste services have conducted full-cost accounting for waste services by 2022 and 100% by 2030
- 70% of municipalities that provide waste services have implemented cost reflective tariffs by 2022 and 100% by 2030

Objectives

- Objective 1: Enhanced financing options for waste management
- Objective 2: Sustainably financed waste management at the local level

Goal C: Ensure sound budgeting and sustainable financial management for waste sector

- **Objective**

- C.1: Enhanced financing options for waste management

- **Activity**

- C.1.1: Identify existing and potential funding availability from government institutions, including reviewing, documenting and updating information on concessional windows available for local governments to finance waste management projects, conduct consultative discussions with other concerned institutions with a view to gather inputs on options for streamlining accounting processes and requirements to avail such funds, and establishing a database for local governments to monitor funding availability.
- C.1.2: Support Public -Private Partnership schemes for waste management, including compiling a directory of private enterprises involved in the market of SWM equipment and services; reviewing and proposing enabling policies or systems for the promotion of public-private partnerships; clarifying legal and institutional support mechanisms for undertaking such partnerships,, e.g., BOT, DBO; compiling a compendium of all possible PPP modalities, including advantages, trade-offs and examples of good practices for assisting local governments in implementing SWM projects and programs; disseminating relevant fact sheets to local governments via various channels; collaborating with international donor/development agencies and relevant government institutions in capacitating local governments on entering public-private partnerships, such as conducting feasibility studies and tender processes.; and facilitating business matching of the LGUs' investment portfolio with private enterprises involved in marketing SWM products and services.
- C.1.3: Establish a national waste management fund (NWMF) for supporting cities, based on discussions with the Ministry of Finance and Policy Planning on opportunities to develop such a funding mechanism as well as consultations with relevant agencies on possible funding sources, including but not limited to environmental taxes, tobacco excise taxes, special shares and earmarks from the proceeds from national taxes, fines and penalties, as well as private sector/domestic and foreign sources

Goal C: Ensure sound budgeting and sustainable financial management for waste sector

- **Objective**

- C.2: Sustainably financed waste management at the local level

- **Activity**

- C.2.1: Enhance cost recovery mechanisms at the city level, including by reviewing existing local SWM ordinances and related national policies on cost-recovery features and strategies, such as sticker systems, integrated utilities billing system, pay-as-you-throw systems, business licensing, income generation, charges for special waste management, etc.; compiling local SWM statutes with cost-recovery mechanism and develop pro forma ordinance as a guide for local governments; capacitating all LGUs in replicating or customizing their own ordinances, reviewing and recommending waste fees and tariffs, as well as fines and penalties; full-cost accounting of SWM services; conducting public perception, demand analysis, capacity- and willingness-to-pay surveys following a generic format; establishing a separate SWM account under general funds to ensure the optimal management of collected waste fees; formulating protocols on how to access funds for local government projects and SWM Board activities; developing ordinances with localized cost-recovery mechanism, and ensuring that such ordinances are adopted and strictly implemented by local governments.
- C.2.2: Establish a database monitoring system to evaluate performance levels among local governments in implementing cost recovery mechanisms with a view towards the identification of good practices, including but not limited to the integration of financial data as parameter(s) in the SWM compliance/performance criteria, documenting the financial/full-cost accounting data), analysing relevant policies, guidelines or recommendations, as needed, and documenting and disseminating case studies as needed.
- C.2.3: Support economies of scale in the design of waste management facilities and programmes, including reviewing and documenting examples of successful local government alliances and clustered SWM facilities, assessing the advantages and trade-offs vis-a-vis technical and financial requirements for materials recovery facilities, composting and sanitary landfills; developing guidelines and/or pro forma memoranda of understanding/ agreement (MOU/MOA) formats for inter-municipal, provincial government-led and private sector-led clustering approaches, including incentive options for host governments; strengthening the capacity of local governments for replicating or customizing clustered approaches; and monitoring the performance of local government clusters with a view to document best practices.

Goal D: Compliance, Monitoring, Enforcement and Recognition

• Targets

- 50% of local governments have established a suitable mechanism for monitoring and enforcement by 2022 with 100% achieved by 2030.
- Quantifiable increase in the number of successful enforcement actions filed against non-compliant facilities
- Quantifiable increase the number of staff appointed at the national and local levels for conducting monitoring and enforcement of the waste sector

Objectives

- D.1: Institutionalise mechanisms for monitoring, enforcement and recognition

Goal D: Compliance, Monitoring, Enforcement and Recognition

- **Objective**

- D.1: Institutionalise mechanisms for monitoring, enforcement and recognition

- **Activity**

- D.1.1: Establish and regularly update an interactive database for monitoring the compliance of local governments and other stakeholders with relevant waste laws and regulations, including establishing standard process flow in data gathering and agreeing on the parameters for local level compliance; inputting existing local government information with a view towards monitoring, developing and pilot-testing the national online database;; strengthening the capacity of local governments by assisting in data gathering, completing official compliance monitoring forms, and establishing up internal monitoring systems to manage the online database; circulating a memorandum to all regional offices aimed at consolidating, validating and updating the database on or before the end of every quarter; and evaluating local government compliance monitoring data using results-based monitoring schemes whilst ensuring the availability if such information to the general public.
- D.1.2: Strengthen the capacities local authorities including by deputizing SWM enforcers at all levels by developing guidelines on the deputation of national and local SWM enforcers following competitive examination or evaluation with corresponding provisions for qualifications; setting terms on honoraria/allowances, developing training modules and standardized operations manuals for SWM enforcement officers/task forces at the national and local levels; pool trainers for would-be enforcers; conduct legal training and practicum on SWM enforcement at all levels, including directives with regard to apprehension of violators, setting terms of engagement and issuance of citation tickets, with parameters for enforcing violations, among others
- D.1.3: Document best practices of recognized local governments and other stakeholders with regard to SWM, including by forging partnerships with institutions and networks that support the promotion of awards and recognitions; review, and revise if necessary, existing criteria and assessment forms for recognizing SWM best practices and develop standardized evaluation schemes applicable for each sector or category, i.e., provinces, cities/municipalities, private sector, schools, etc.; and continually enhance and institutionalize existing rewards and incentive systems, including a monitoring period for sustainability of SWM programs.

Goal E: Capacity Development, Awareness Raising and Advocacy

• Targets

- 70% of municipalities conducting local awareness campaigns by 2022, achieving 100% by 2030
- 70% of schools implementing waste awareness programmes by 2022, achieving 100% by 2030

Objectives

- E.1: Mainstream environmental SWM in school curricula and programmes at all levels
- E.2: Mobilise support of all SWM stakeholders by increasing awareness and participation in environmental SWM

Goal E: Capacity Development, Awareness Raising and Advocacy

- **Objective**

- E.1: Mainstreamed ESWM in school curricula and programmes at all levels

- **Activity**

- E.1.1: Support curriculum development by reviewing existing policies and programs for including SWM in school curricula and university course offerings; collaborating with the agencies involved in preparing the National Education Plans to strengthen SWM in to strengthen SWM in organizational policies and to enhance collaboration between schools and local stakeholders; collaborating with the relevant agencies to standardized SWM modules or course offerings, teachers' instructional guide and competency-based learning materials, in coordination with inter-agency bodies, and formalized through memorandum circulars, administrative orders or any appropriate legal instruments; assisting educational institutions in integrating SWM into pre-, elementary, secondary, tertiary, and technical, vocational, education and training (TVET) school curricula, the Community Service Program (CSP) for high schools and National Service Training Program (NSTP) for colleges and universities; and continuously monitoring, evaluating, improving and replicating in relevant educational institutions
- E.1.2: Select and disseminate best practices for integrating environmental SWM in the school curricula, including by reviewing and upgrading criteria for evaluating best practices associated with SWM for curriculum integration; , establish incentives/award system aimed at incentivising best practices in SWM curriculum integration through national, regional and local awards (e.g., Annual Search for Sustainable and Eco-Friendly Schools) or private sector initiatives); review criteria for selecting examples of good practices and case studies; record best practices/lessons learned using a common documentation format; identify channels of communication for dissemination of case studies; assess and document successful practices and case studies)
- E.1.3: Collaborate with concerned agencies towards encouraging schools and universities to implement environmental SWM programs, including by reviewing and consolidating existing policies and programs, e.g., school MRF, composting facilities, segregation systems, demo-gardens, etc.; identifying, reviewing and promoting model SWM plans and projects in schools and universities; reviewing, adopting and proposing guidebooks and guidelines for establishing, financing, evaluating and monitoring school-based environmental SWM programs, identifying institutional and financial support mechanisms for promoting environmental SWM in schools; implementing capacity building or mentoring programs for educational institutions.

Goal E: Capacity Development, Awareness Raising and Advocacy

- **Objective**

- E.2: Mobilise the support of local stakeholders by increasing awareness and participation in environmental SWM

- **Activity**

- E.2.1: Conduct training needs assessments based on identified core competencies in SWM at the national, regional and local levels and develop appropriate tools and instruments (e.g., survey forms, gap analysis, etc.) with a view to establish a formal training and development needs assessment system, used to analyse data and inform training development
- E.2.2: Develop standardized training modules for SWM capacity development following a training of trainers approach (, including by developing an inventory of knowledge products associated with all aspects and functional elements of SWM; designing, consolidating, or piloting communication and technical skills/SWM training-of-trainers training modules and relevant workshop courses; making use of visual aids and instructional manuals; finalising the training materials/workshops by pilot-testing them at national and regional levels; evaluating the standardized training modules, packaging and delivering them for different audiences; and continuously updating and improving SWM training materials and courses.
- E.2.3: Deliver regular SWM trainings on values formation, communication, technical skills and financial management for trainers, organizations, SWM focal persons and advocates, including by identifying potential information channels, venues and funding sources for SWM capacity building, values formation, communication facilitation and technical skills trainings for selected targets, including education professionals, local government stakeholders, etc.; customising the training modules for different audiences, conducting trainers' trainings and accrediting trainers;; conduct annual regional SWM Summits, capacity development activities and other awareness-building campaigns together with partners for selected target groups; and monitor/adjust social marketing and advocacy campaigns strategies as necessary.



Waste Management Strategies: Turning Problem into Resources



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Sustainable Cities, IGES Centre Collaborating with UNEP on
Environmental Technologies (CCET)**

The National Waste Management Seminar, 19 July 2016, Male, Maldives



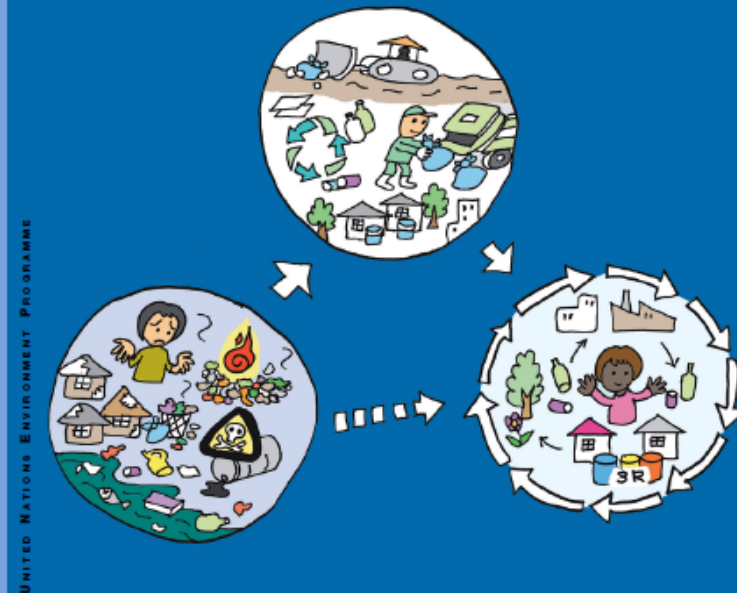


Overview

- Why waste management is a matter in developing countries?
- Need of a Holistic Approach for Waste Management
- UNEP support for National and City Waste Management Strategies



Global Waste Management Outlook



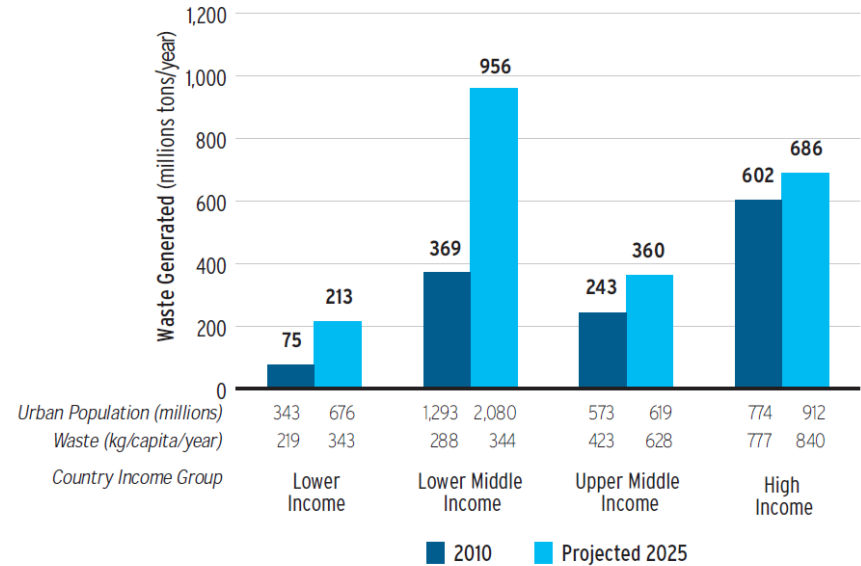


Increasing Waste Generation

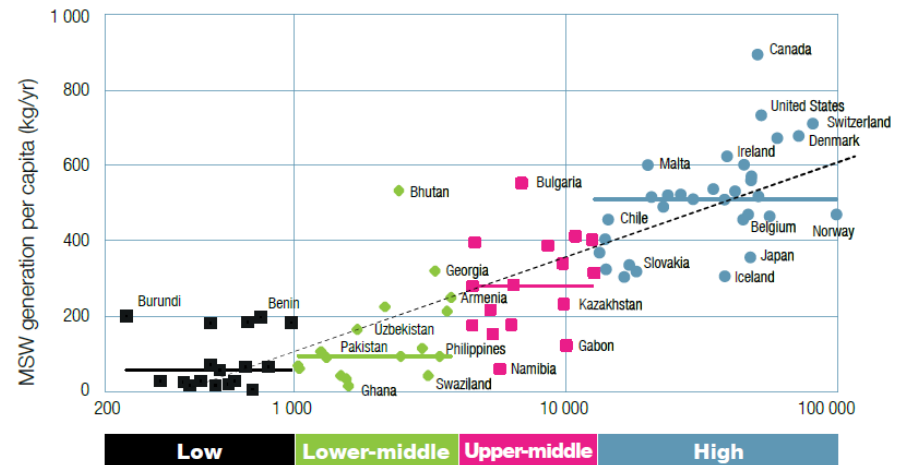
Currently, world cities generate about 1.3 billion tonnes of solid waste per year. This volume is expected to increase to 2.2 billion tonnes by 2025. *“Lower income cities in Africa and Asia will double their municipal solid waste generation within next 15-20 years”*



MSW generation rates vary widely within and between countries. The generation rates depend on income levels, socio-cultural patterns and climatic factors. *“the richer we get, more we discharged”*



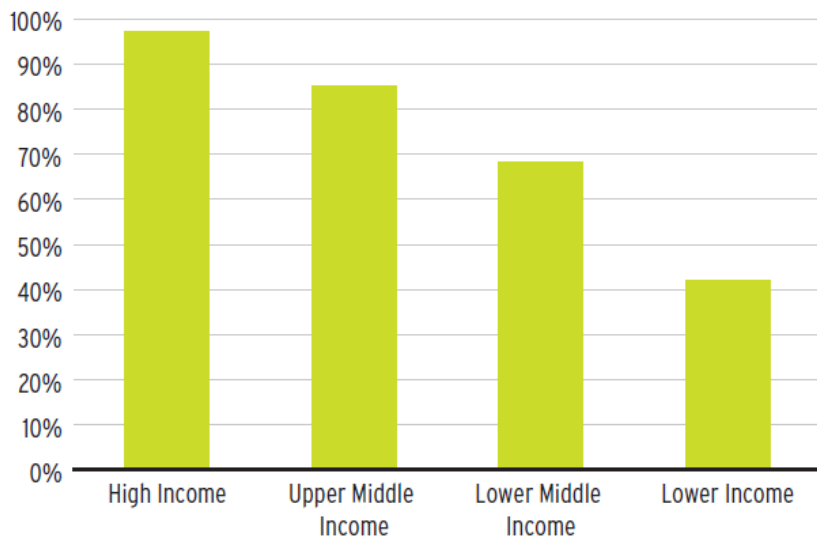
Urban waste generation by income level and year, World Bank (2012)



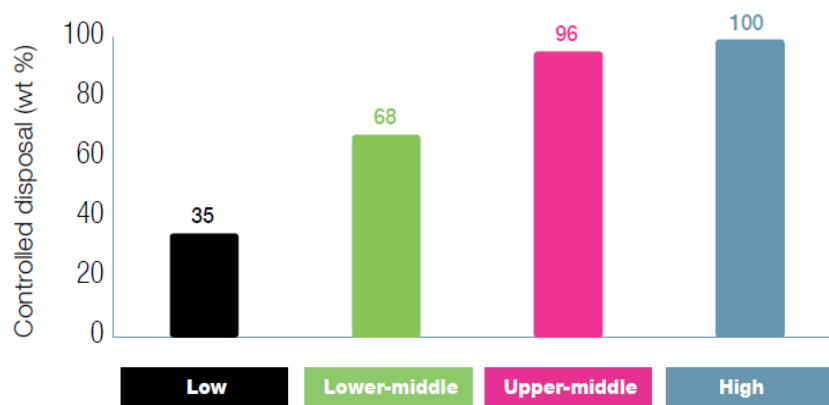
Waste generation versus income level by country, UNEP/ISWA (2015)



Solid Waste Management is Essential Service



Waste Collection Rates by Income, World Bank (2012)



Income group

Controlled disposal for selected cities by income level, UNEP/ISWA (2015)





Multiple Benefits

Waste management has strong linkages to a range of other global challenges: health, climate change, poverty reduction, food and resource security, sustainable production and consumption. The political case for action can be significantly strengthened when waste management is viewed as an entry point to address a range of sustainable development issues, many of which are difficult to tackle.



Climate change

Potential impact of improved waste management on reducing GHG emissions across the economy: 15-20%



Diversion from disposal of biodegradable wastes prevents emissions of methane, a powerful greenhouse gas (GHG)

Reduction, reuse and recycling all displace virgin materials and products, and the GHG emissions in their manufacture



A clean city

- Where the solid waste management service works well
- A holistic approach is taken to managing all residuals



A successful city

- A healthy, pleasant and safe place to live
- A good place to do business and visit as a tourist
- Fosters a sense of community and belonging



Good governance

- The cleanliness of the city can be used as a proxy indicator of good governance



Enterprise and creating sustainable livelihoods

'Waste to wealth' projects in Africa have demonstrated that new waste services can be used as a catalyst for sustainable livelihoods and economic development in poor neighbourhoods of some of the world's poorest cities

2000-2010 in Europe employment in waste and resource management doubled: > 2 million

15-20 million people working in the small-scale entrepreneurial 'informal' waste sector worldwide

Estimate of worldwide potential for new jobs in the circular economy: 9 to 25 million



Waste management: An ‘entry point’ to sustainable development

A GLOBAL CALL FOR ACTION

Addressing waste management as a priority will facilitate early progress towards more than half of the Sustainable Development Goals (SDGs) within the Post-2015 Development Agenda

Global waste management goals

Global waste management goals		Related SDGs	
Ensure by 2020	W.1 Access for all to adequate, safe and affordable solid waste collection services	3 – Health for all	11 – Safe cities
	W.2 Stop uncontrolled dumping, open burning	3 – Health for all 11 – Safe cities 12 – Sustainable consumption and production (SCP)	6 – Clean water and sanitation 14 – Marine resources 15 – Terrestrial ecosystems
Ensure by 2030	W.3 Achieve sustainable and environmentally sound management of all waste, particularly hazardous waste	12.4 – Managing all waste 13 – Climate change	7 – Access to energy
	W.4 Substantially reduce waste generation through prevention and the 3Rs (reduce, reuse, recycle) and thereby create green jobs	12.5 – The 3Rs 8 – Growth & employment	1 – End poverty 9 – Sustainable industry
	W.5 Halve per capita global food waste at the retail and consumer levels and reduce food losses in the supply chain	12.3 – Food waste	2 – End hunger; food security

Global Waste Management Outlook, UNEP/ISWA (2015)



Paradigm shift from Waste Management to Resource Management



20th CENTURY

WASTE
MANAGEMENT

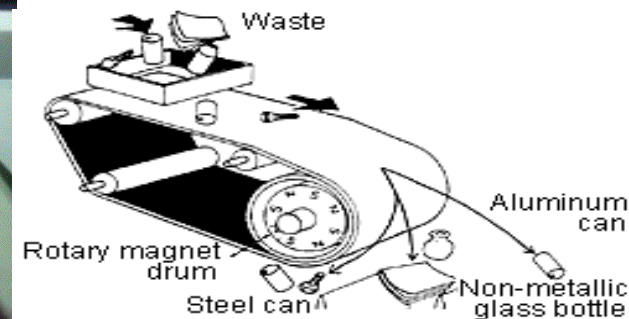
“How do we get rid of our waste efficiently with minimum damage to public health and the environment?”



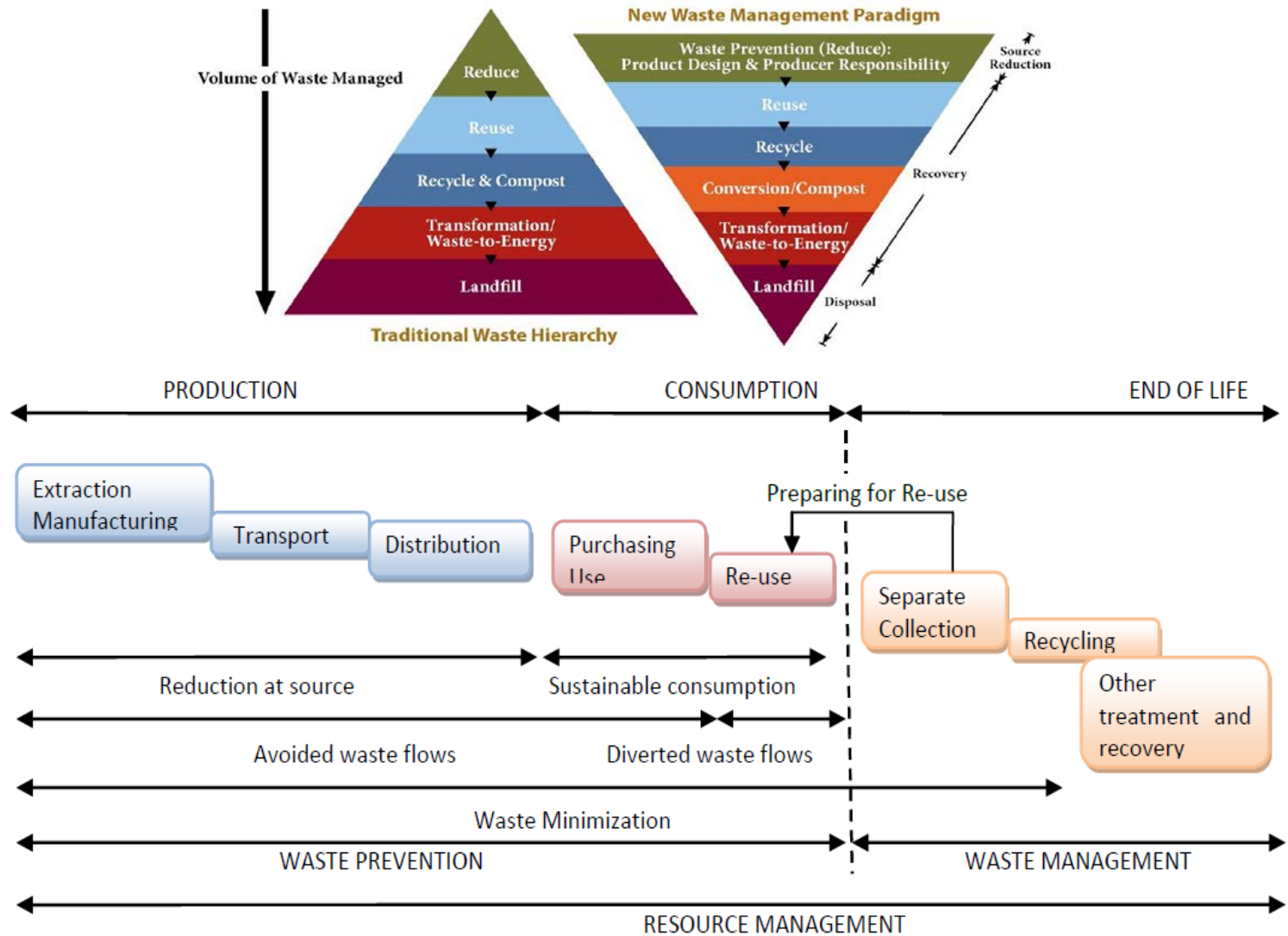
21st CENTURY

RESOURCE
MANAGEMENT

“How do we handle our discarded resources in ways which do not deprive future generations of some, if not all, of their value?”

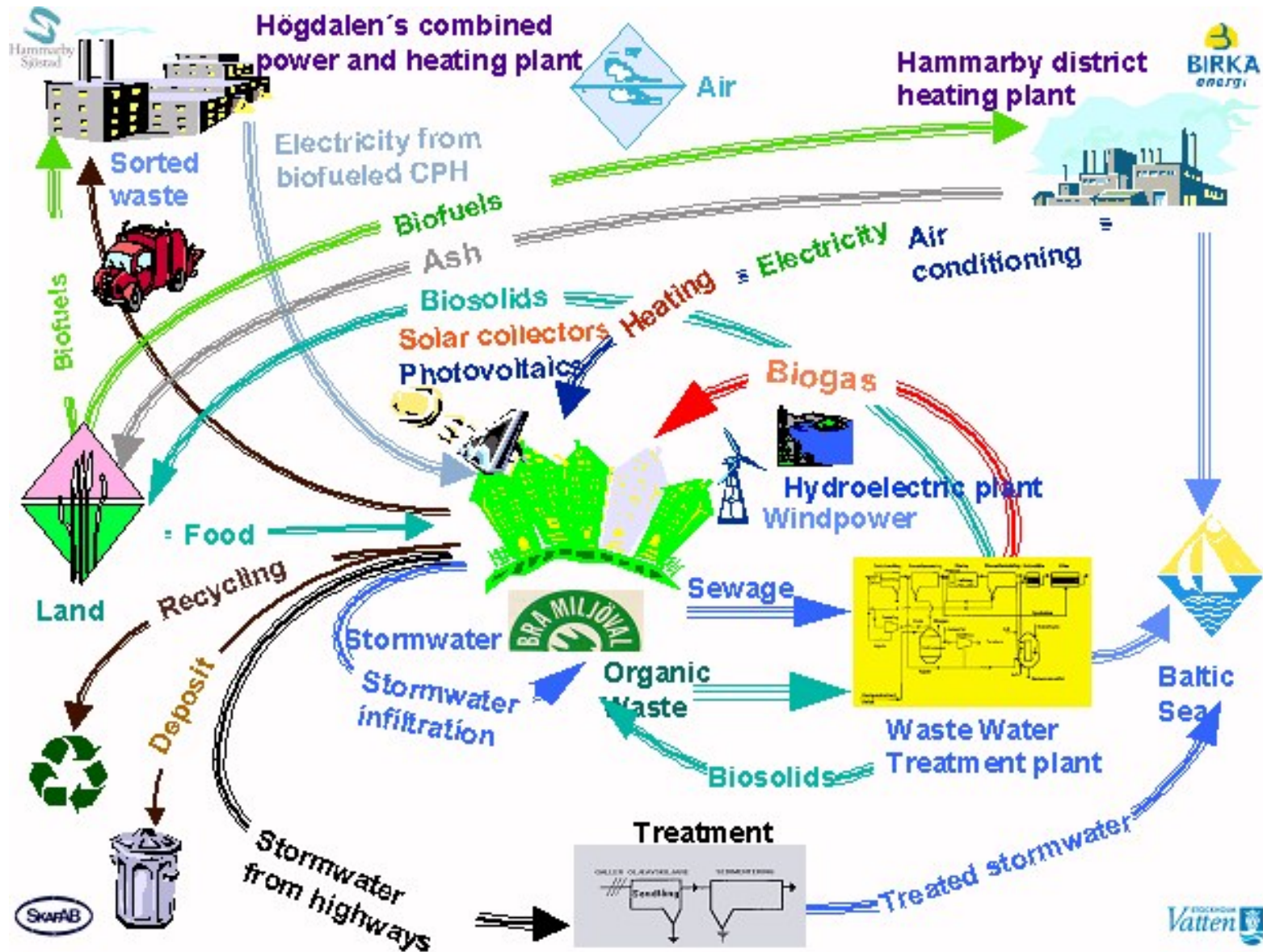


Resource Management





Circular Economy/ 3R – Closing the Loop



What needs to be done at the local and national levels



Bring wastes under control

Ensure access for all to basic waste services (A)

Stop uncontrolled dumping and burning

- Extend affordable collection services to all in society, irrespective of income level
- Ensure the controlled disposal of all waste as a necessary first step towards environmental protection

Deal with the hazardous substances in wastes (B)

Bring hazardous wastes under control

- Separate hazardous waste, and in particular hazardous healthcare waste, from other waste at source
- Manage them separately in environmentally sound facilities
- Need a holistic approach to managing all residuals, as pollution controls concentrate contaminants from air emissions and wastewater into (often hazardous) waste

Focus on waste prevention

- Reducing waste improves resource security, improves well-being and saves everyone money
- Design out waste and hazardous waste
- Maximize repair, reuse and remanufacture
- Keep materials separate/seggregate waste at source to minimize contamination and facilitate reuse and recycling

Focus on the 'feedback loops'

- Maximize recycling
- In low-income countries, integrate existing small-scale entrepreneurial recycling within mainstream waste management
- Develop environmentally sound energy recovery facilities and landfills for residual waste that cannot be sustainably recycled

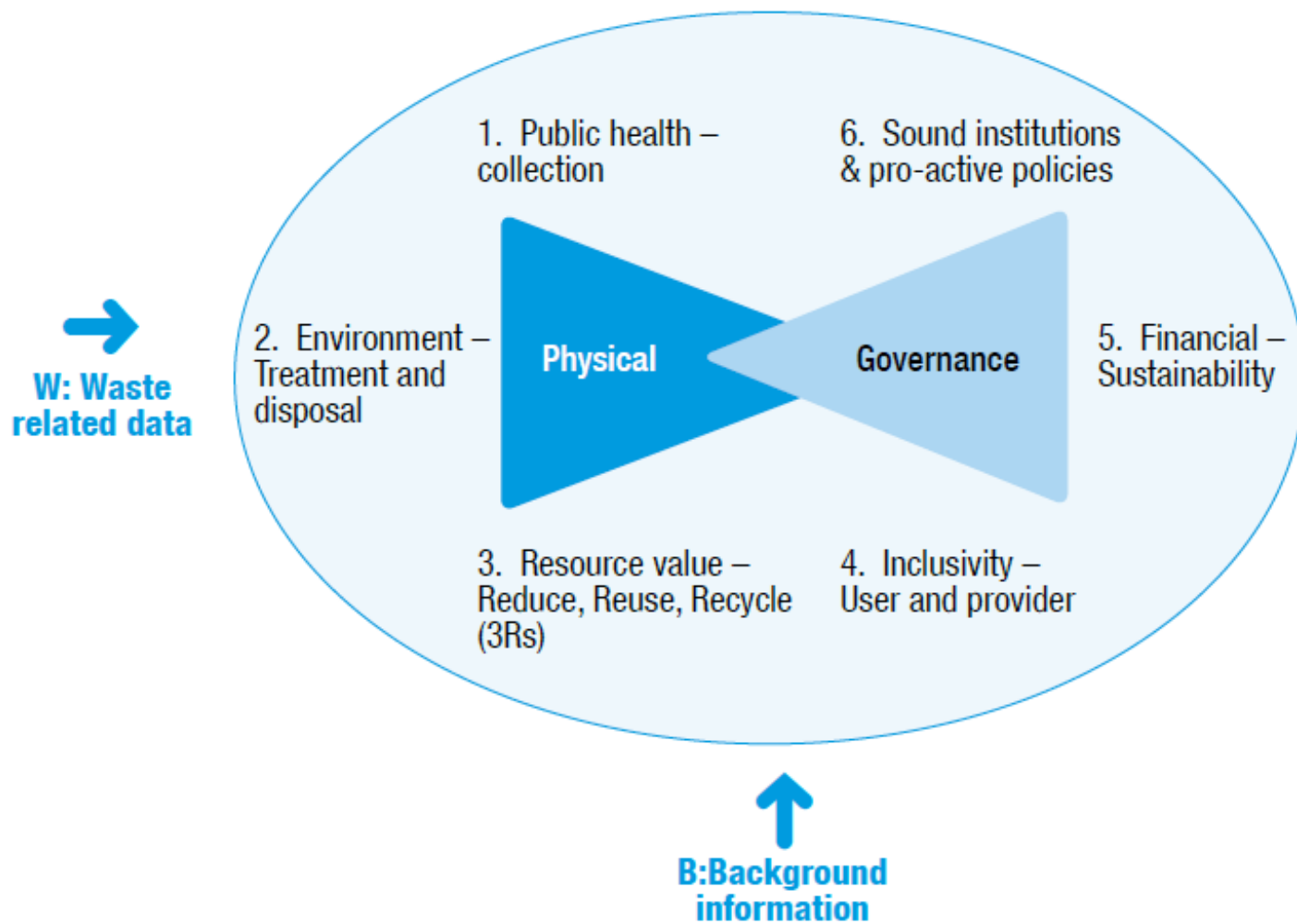
Tackle the problem at the source (C)

Close a clean material cycle (D)

Move from a linear to a circular economy

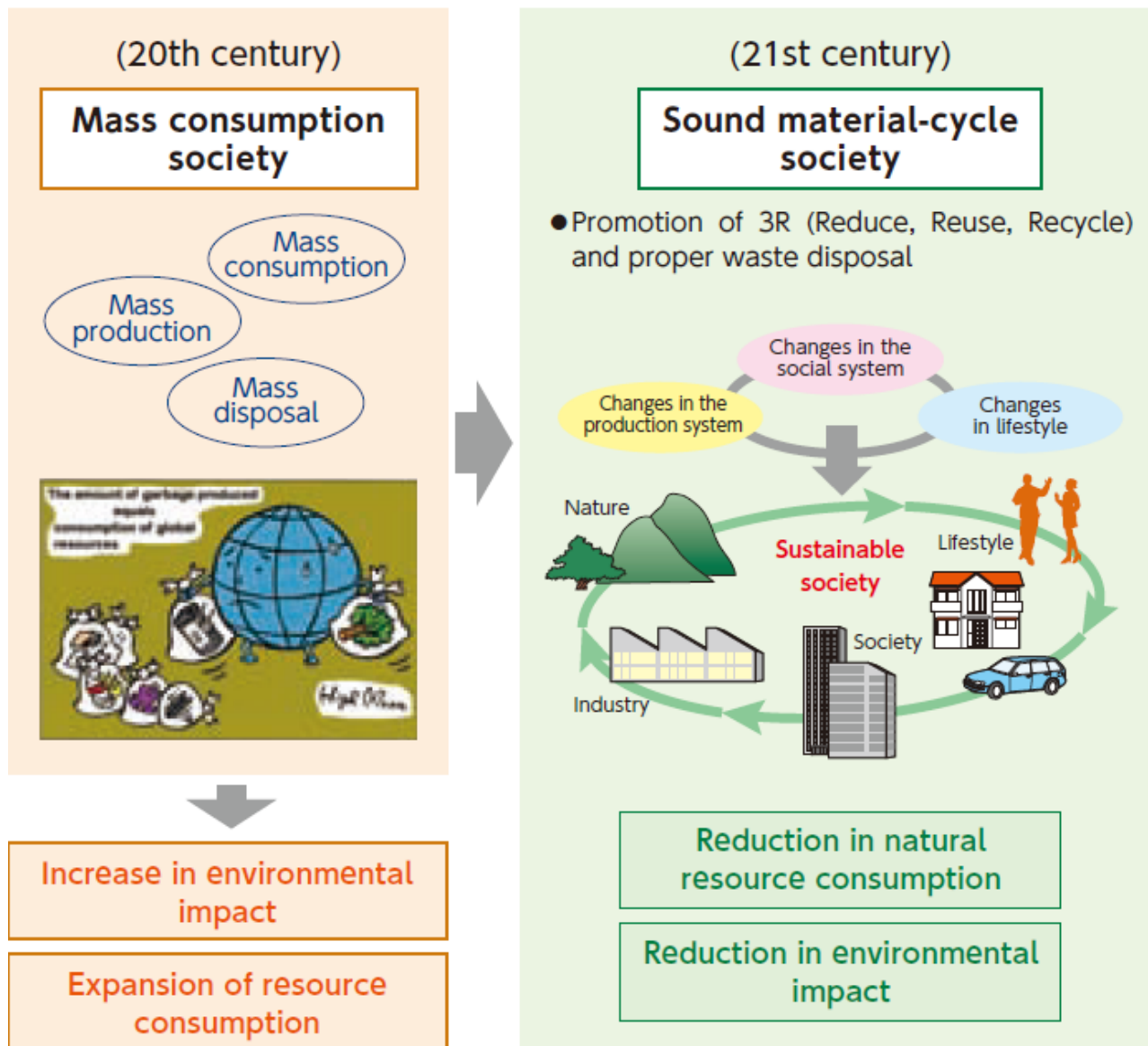
Action Imperatives, UNEP/ISWA (2015)

Sustainable Factors or Motivating Factors to Change

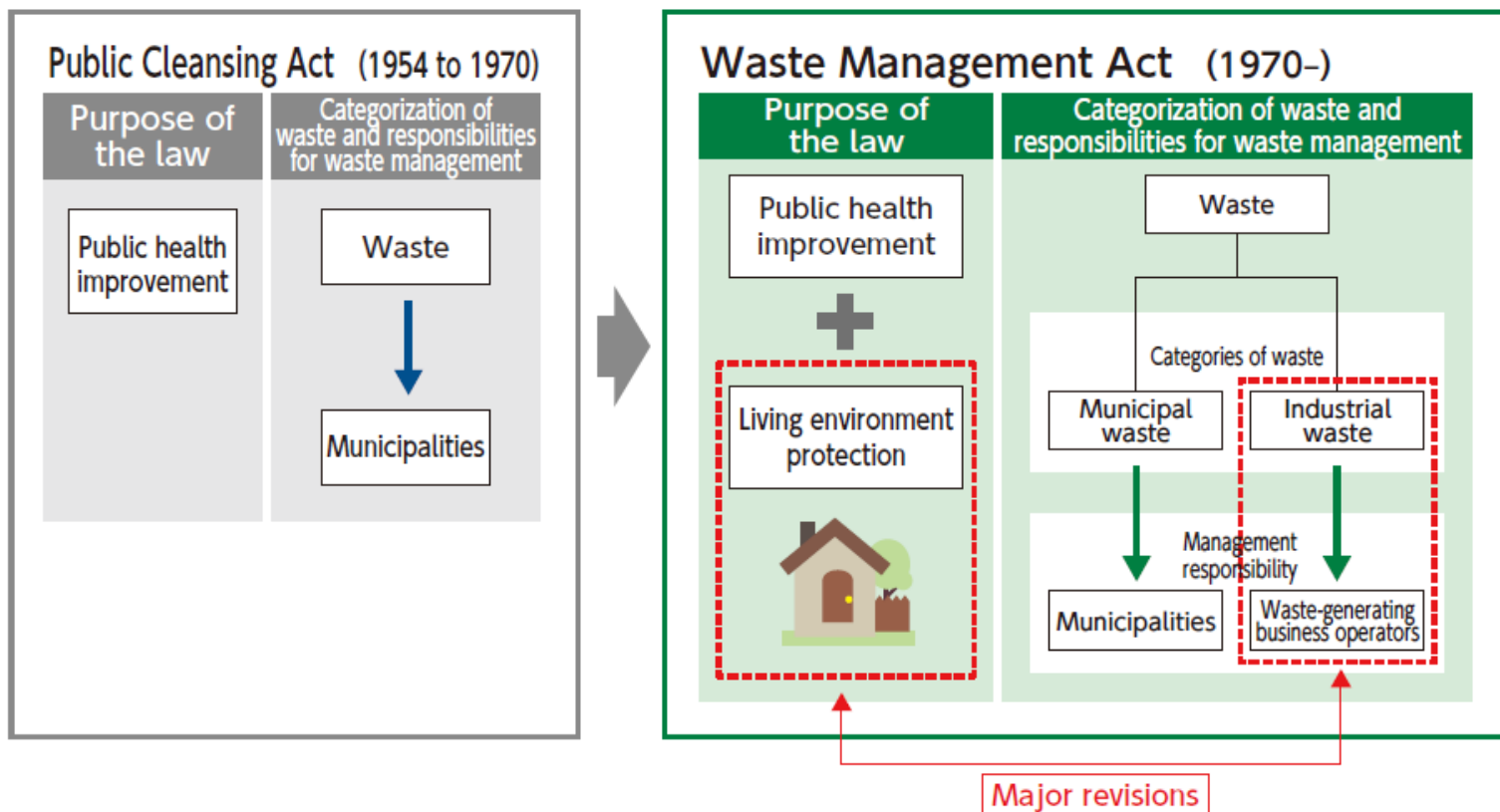




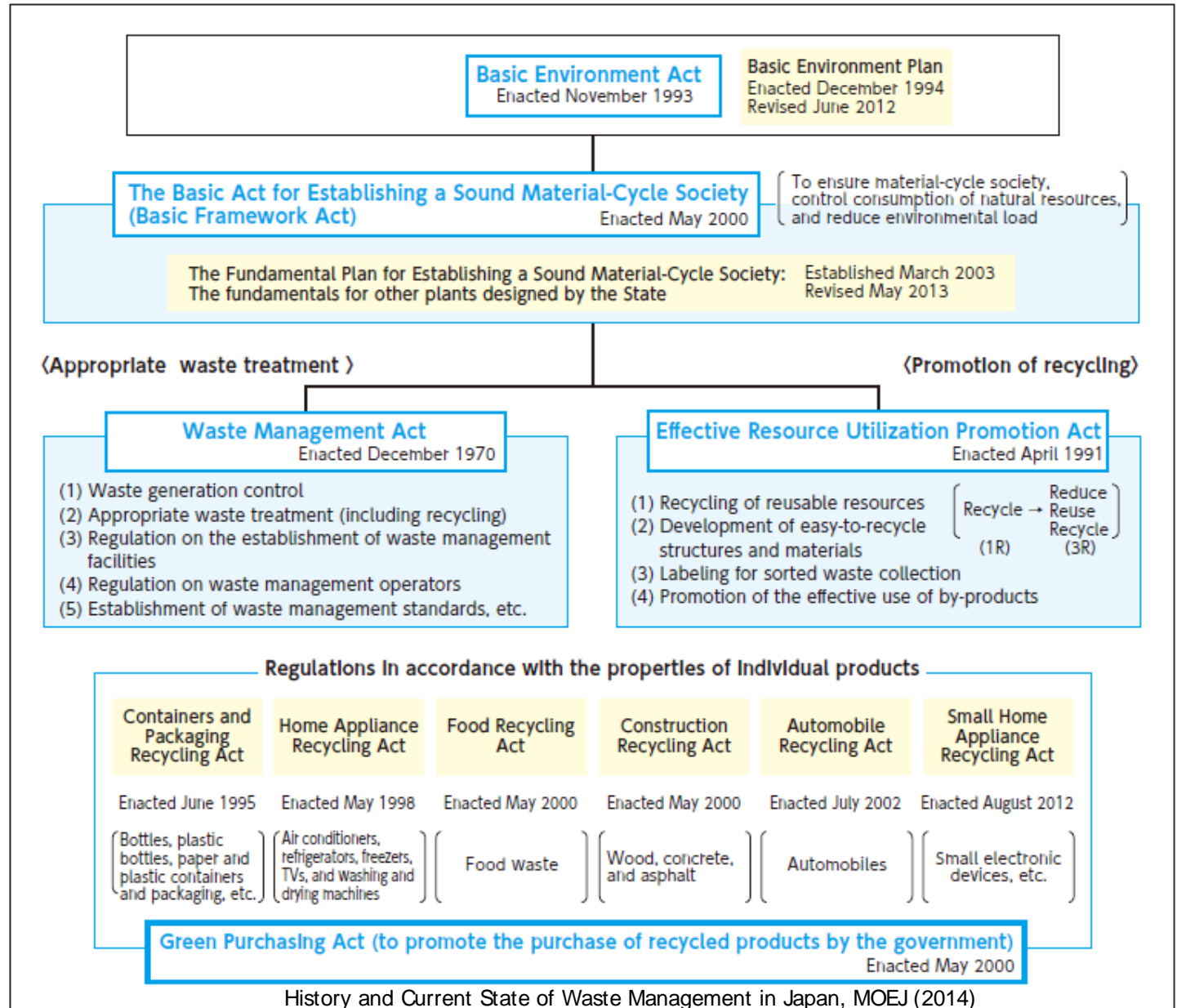
Moving from Waste Management to Resource Management in Japan



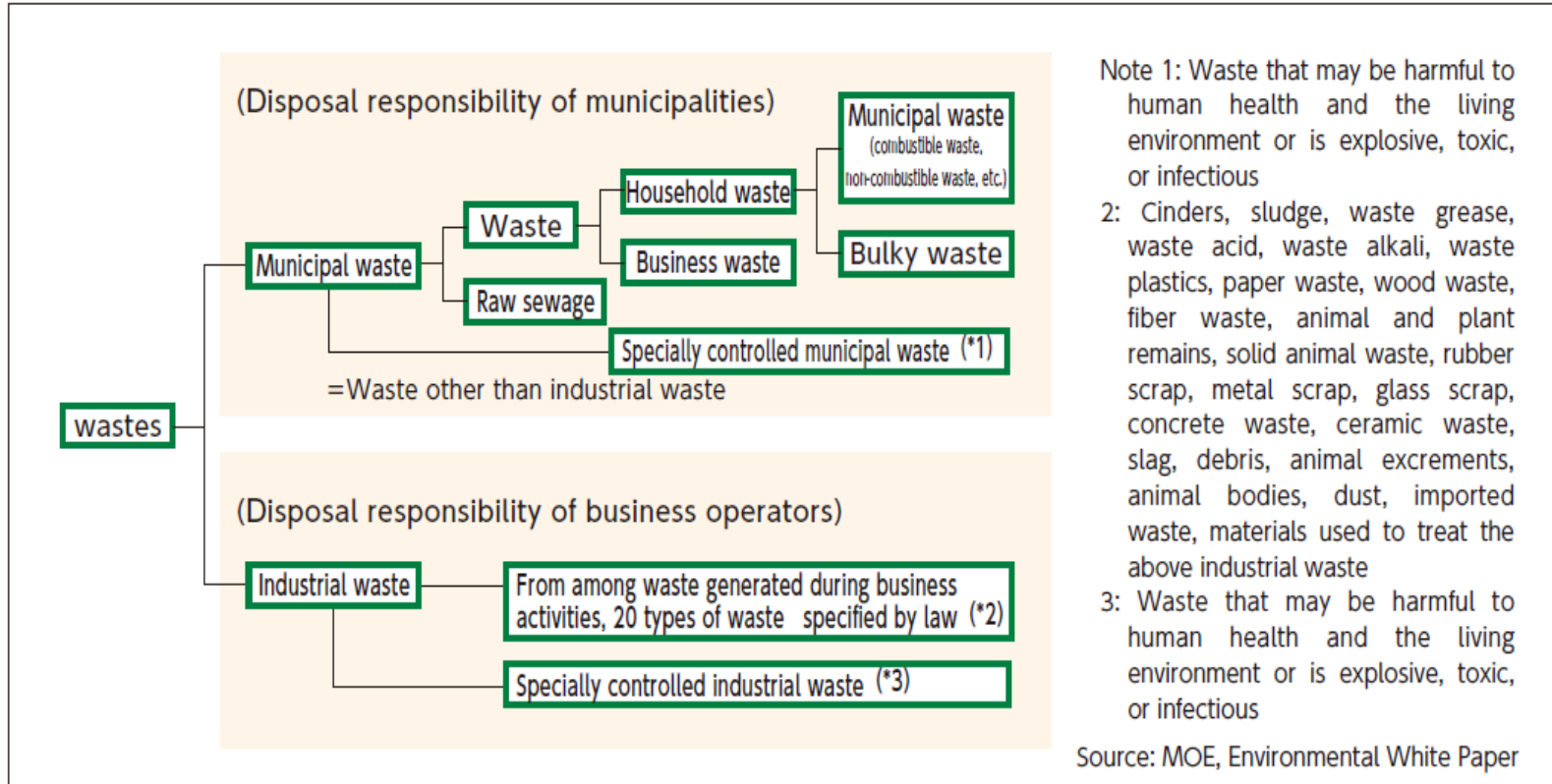
Development of Basic Legal System to Support Waste Management in Japan



Comprehensive Legal System to Support Waste Management in Japan



Categories of Waste for Management



Note 1: Waste that may be harmful to human health and the living environment or is explosive, toxic, or infectious

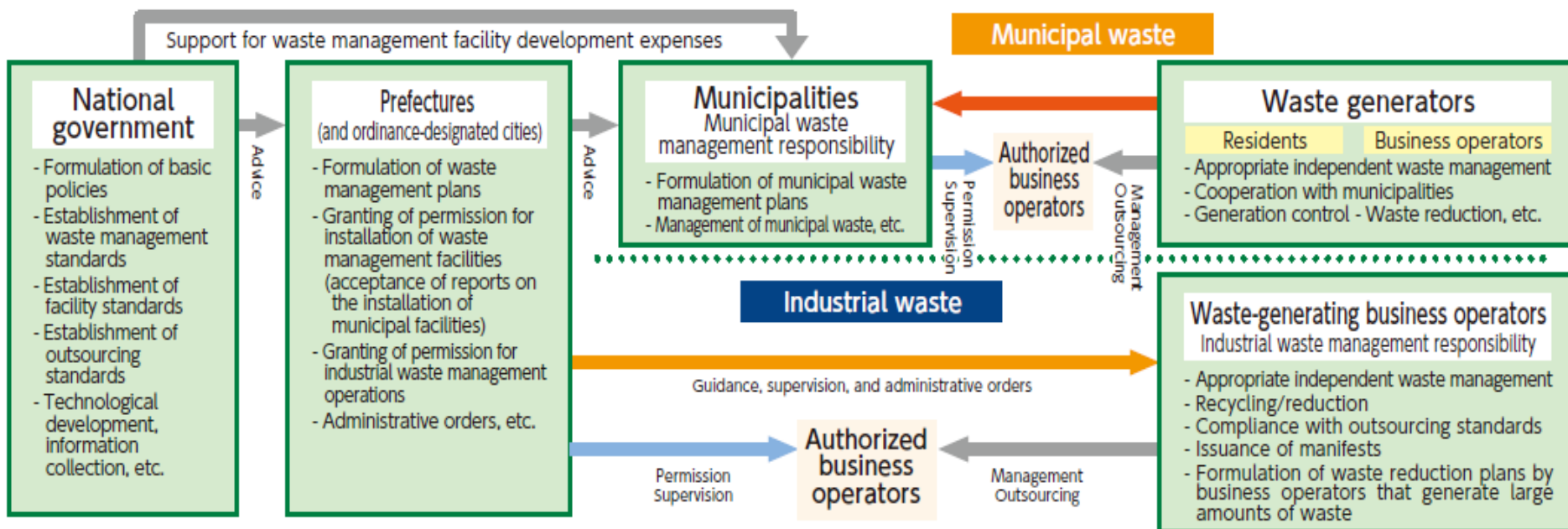
2: Cinders, sludge, waste grease, waste acid, waste alkali, waste plastics, paper waste, wood waste, fiber waste, animal and plant remains, solid animal waste, rubber scrap, metal scrap, glass scrap, concrete waste, ceramic waste, slag, debris, animal excrements, animal bodies, dust, imported waste, materials used to treat the above industrial waste

3: Waste that may be harmful to human health and the living environment or is explosive, toxic, or infectious

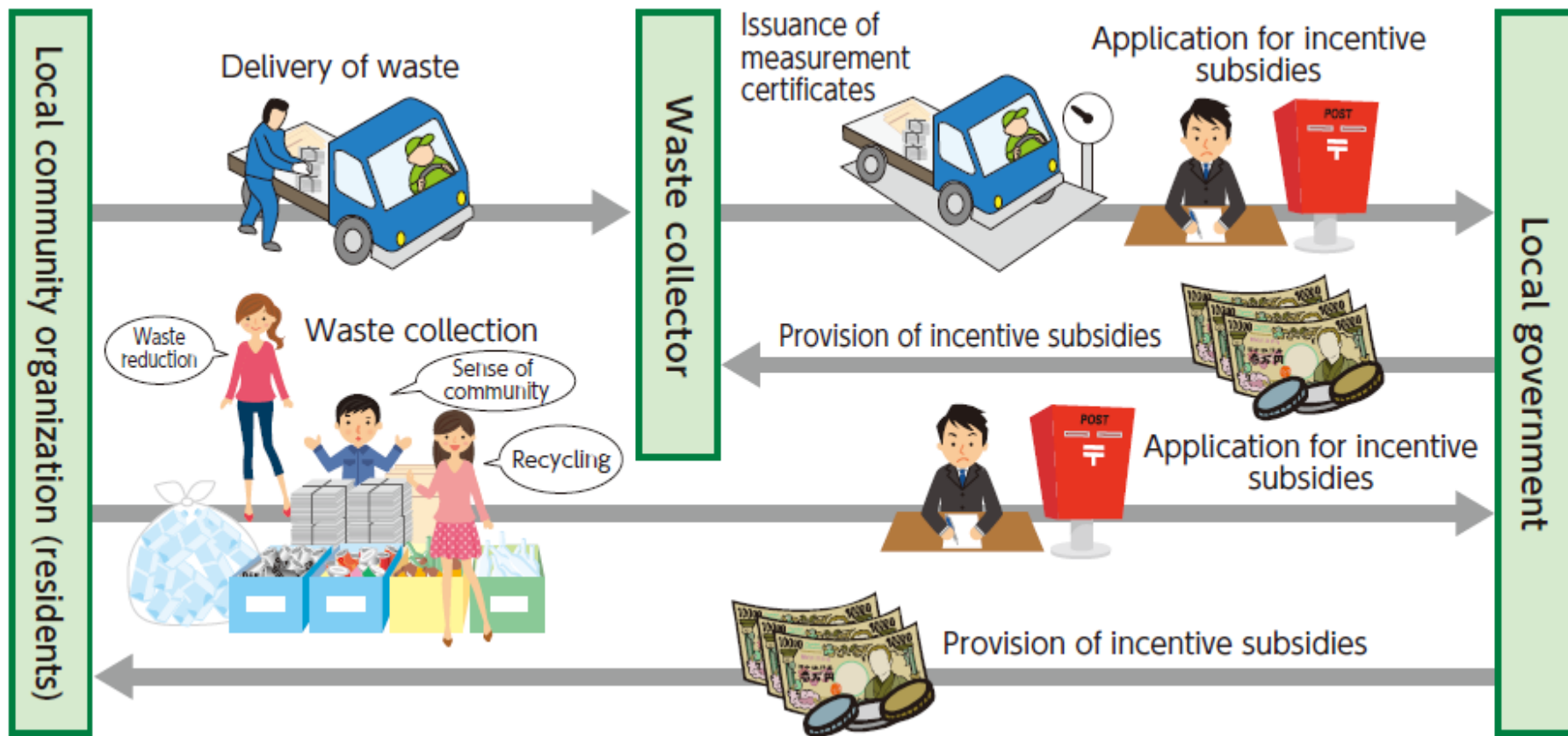
Source: MOE, Environmental White Paper

Roles and Responsibilities Among Key Stakeholders

Relationships between national and local governments and waste-generating business operators in the Waste Management Act



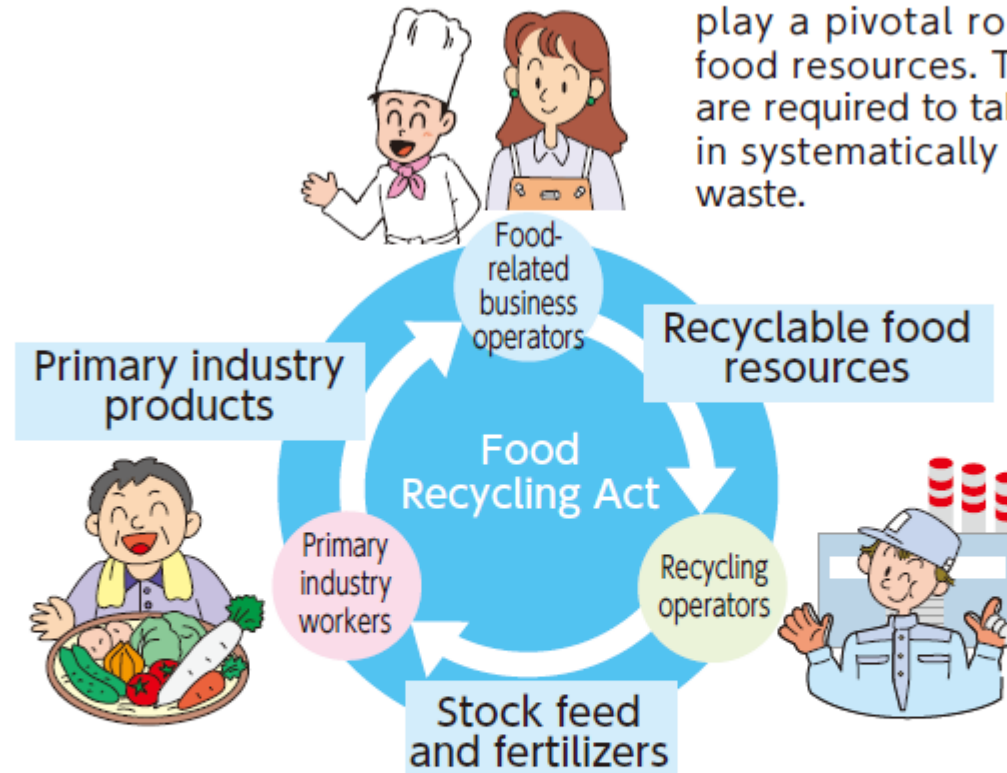
Creating Incentive System



Creating Sustainable Recycling Loops



As food waste generators, food-related business operators play a pivotal role in recycling food resources. Therefore, they are required to take the initiative in systematically recycling food waste.

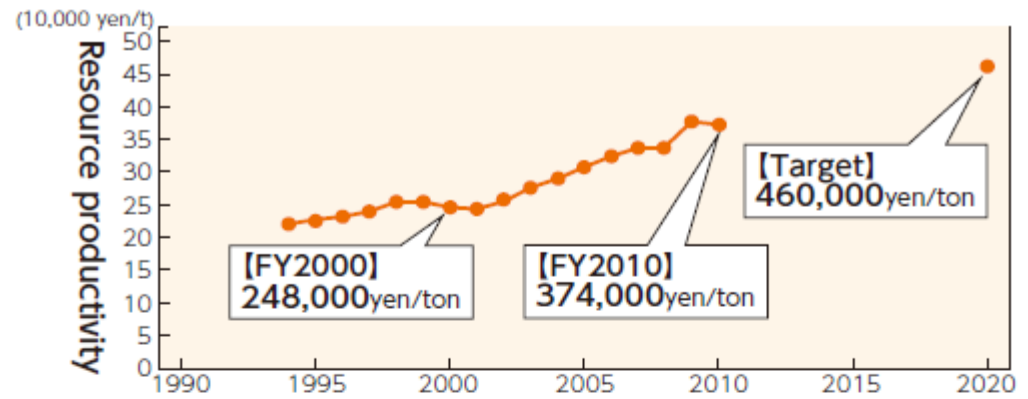


Primary industry workers are required to use recycled fertilizers and stock feed as much as possible to produce their products and provide such products to food-related business operators to ensure resource circulation between food production and consumption.

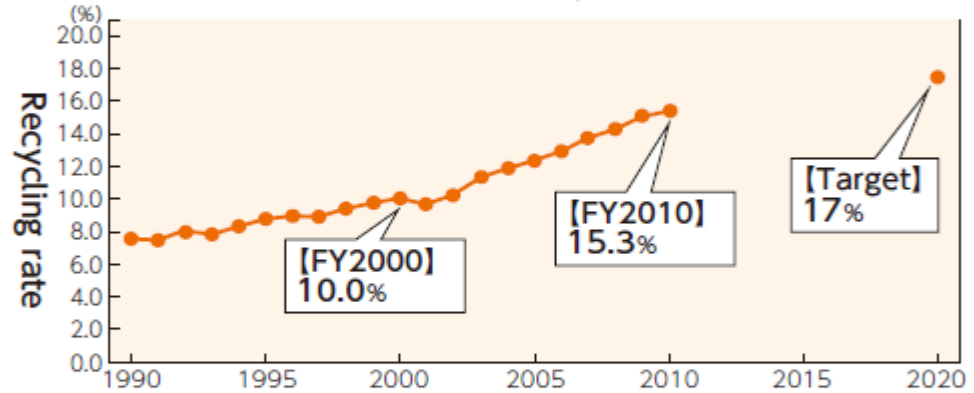
Recycling operators recycle recyclable food resources and play the role of connecting food-related business operators and users of fertilizers and stock feed. Recycling operators are required to provide information to other parties involved as well as to develop programs that are friendly to the environment in which we live.



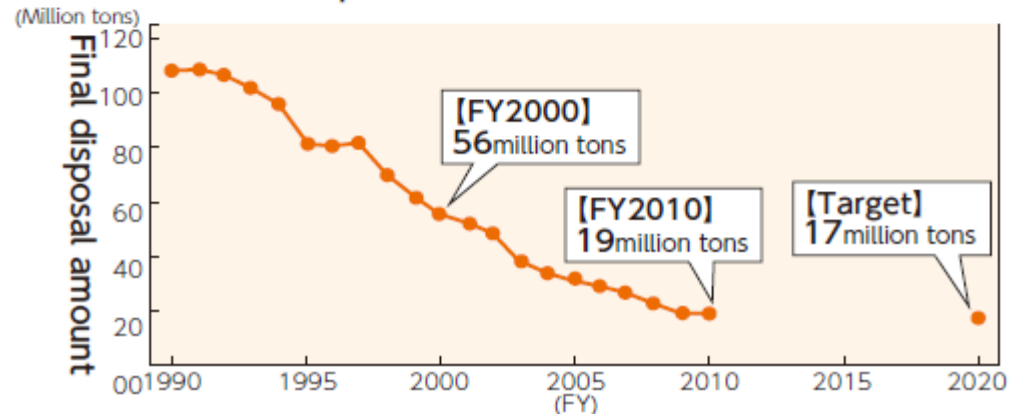
Target Setting, Data Management and Monitoring



■ Cycle: Recycling rate
Recycling amount / (recycling amount + input of natural resources, etc.)



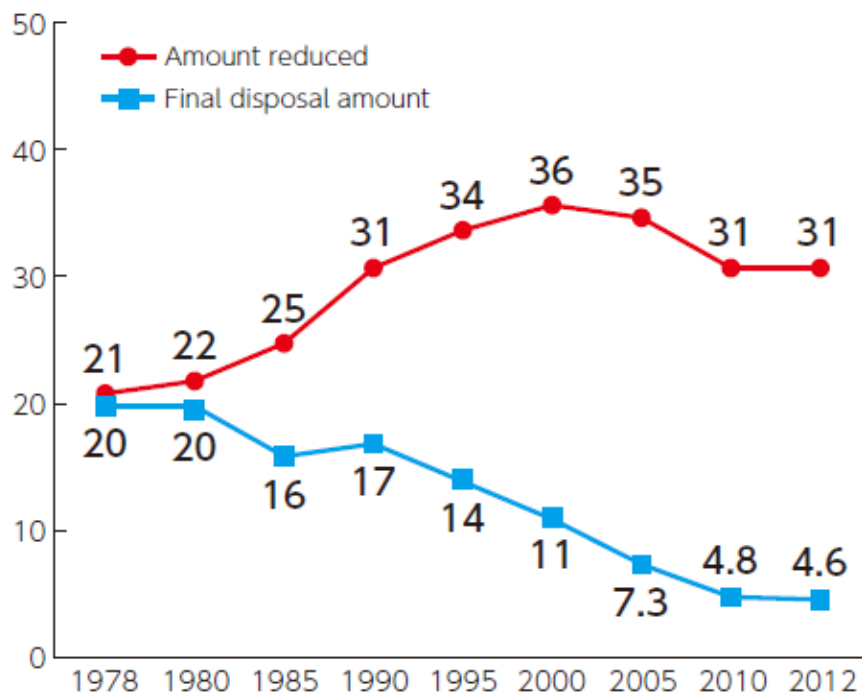
■ Outlet: Final disposal amount



Results of Waste Reduction

Municipal waste

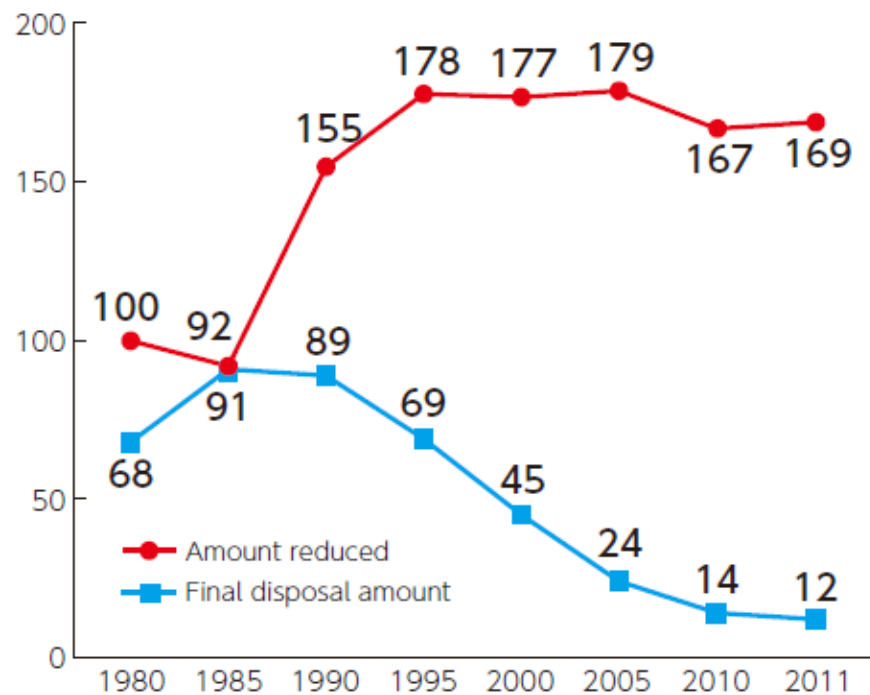
(Units: million tons)



Source: Compiled from MOE, Waste Management in Japan (annual editions)

Industrial waste

(Units: million tons)

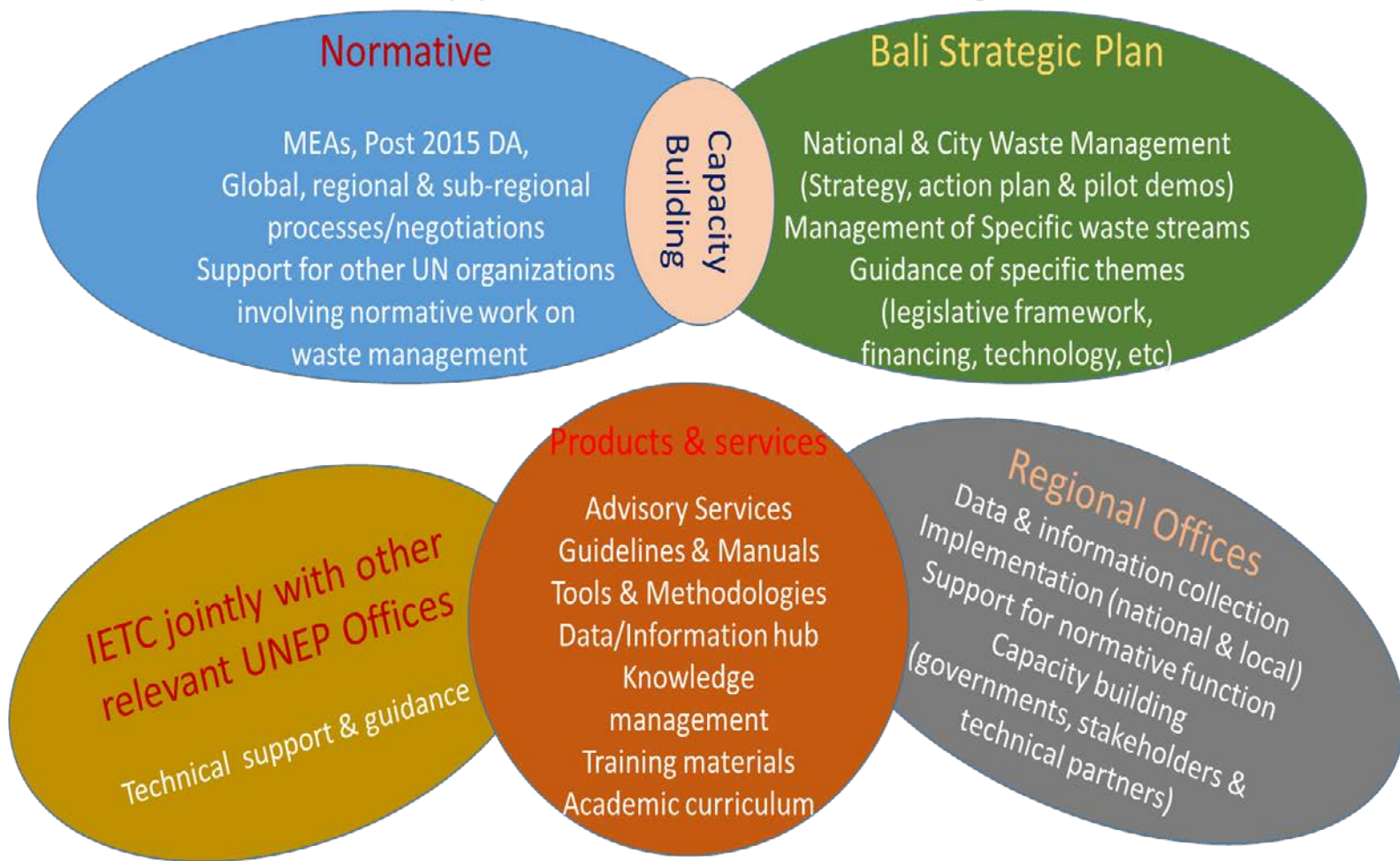


Source: Compiled from MOE, Survey on the Discharge and Disposal of Industrial Waste (annual editions)



UNEP Support for Waste Management

UNEP Support on “Waste Management”





UNEP-IETC Support for Holistic Waste Management

- Holistic approach to waste
- Waste to Resource (From linear to closed-loop material cycle)
- Promote Prevention Policies: Anchor

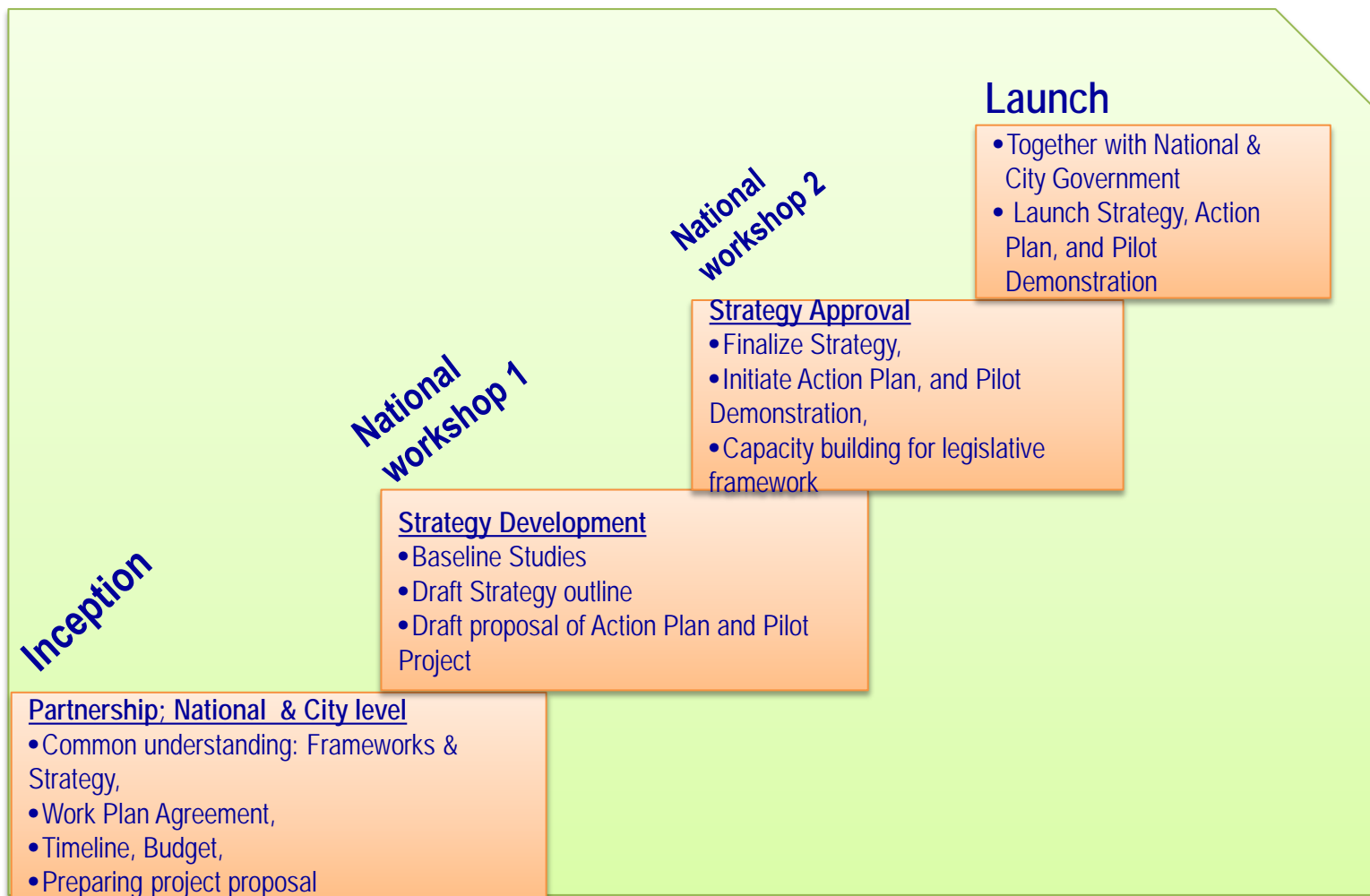


Knowledge, Expertise, Technology, Policies

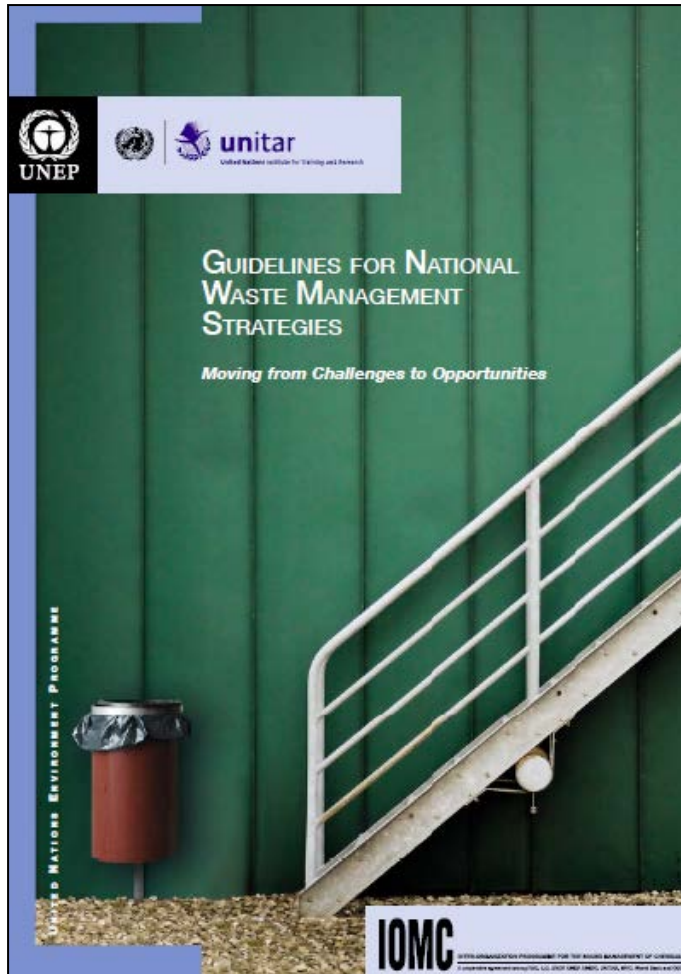




UNEP-IETC Support for Development of National and City Waste Management Strategies



Guidelines for National/City Waste Management Strategies



<http://www.unep.org/ietc/InformationResources/Event/s/GuidelinesfortheDevelopmentofNationalWasteM/tabid/1104470/Default.aspx>

- Provide a conceptual and methodological framework for national planning that countries may adapt to their particular circumstances.
- Establish a clear rationale for making waste management a national priority.
- The guidelines, while focused on strategy development, also encompasses implementation, review and updating of the strategy.

Development of National and City Waste Management Strategies

- Wuxi New District, China – 2008
- Pune City, India – 2008
- Maseru City, Lesotho – 2009
- Matale City, Sri Lanka – 2009
- Novo Hamburgo, Brazil – 2009
- Nairobi – 2010
- Bahir Dar, Ethiopia – 2010
- Pathum Thani, Thailand – 2011
- Addis Ababa – 2011
- Danang, Vietnam – 2012
- Kampot, Cambodia – 2012
- Bangkok – 2012
- Honduras - 2013



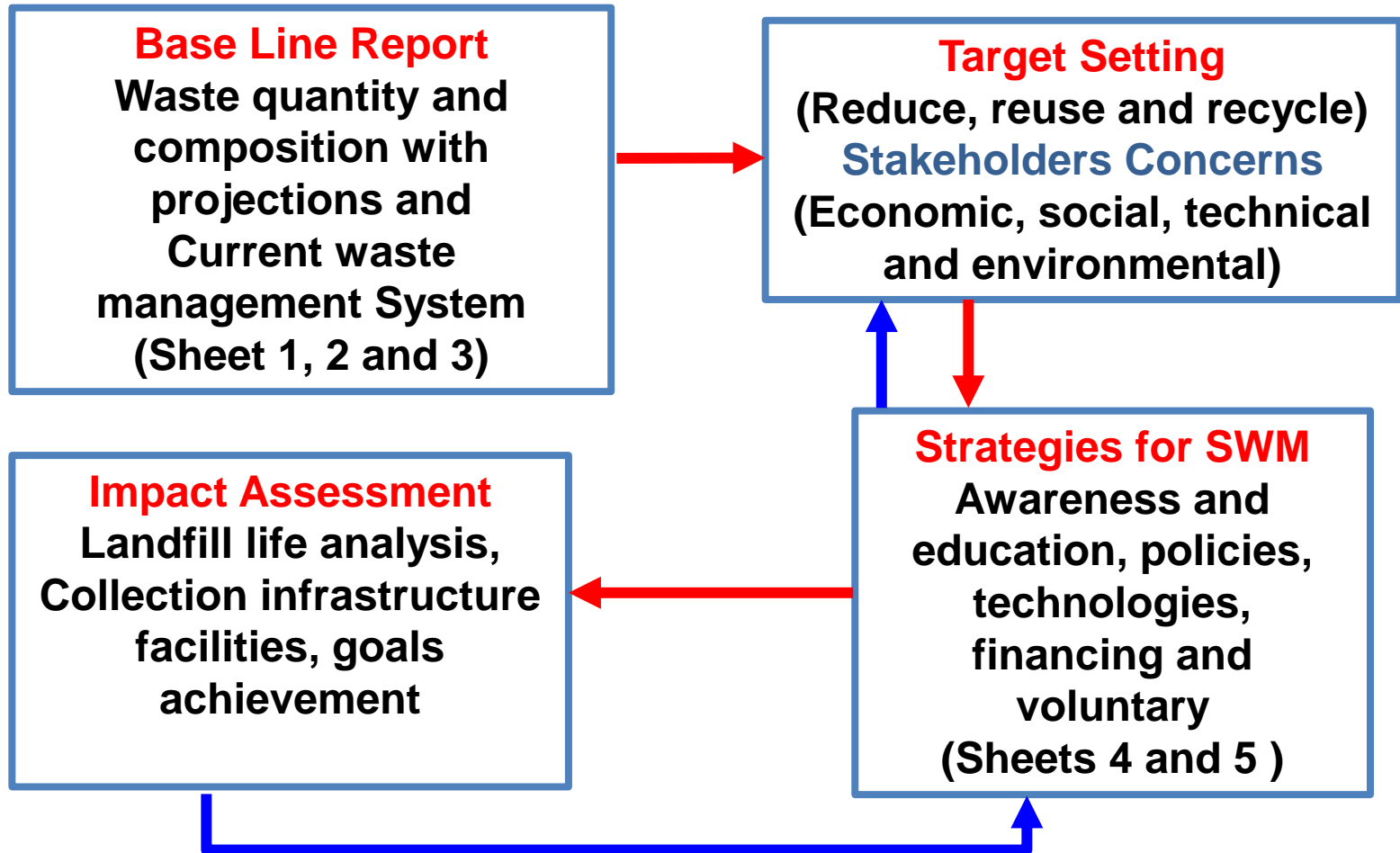


Strategic Planning Process for Development of National/City Waste Management Strategies



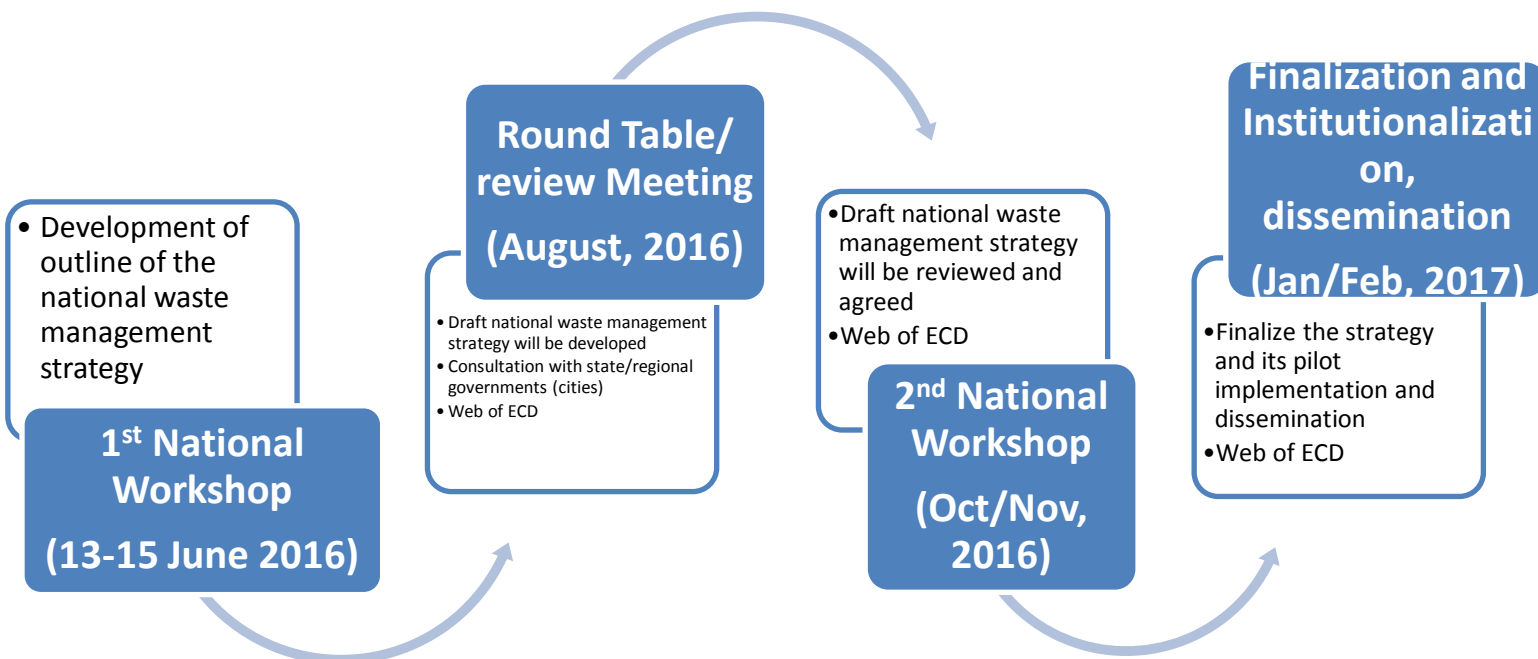
Strategic Planning Process	Adopted Methodology
Phase 1: Where are we now?	1. Review of current waste management system and identify gaps (Day 1 - Session 2)
Phase 2: Where are we going?	1. Identify vision, mission and guiding principles (Day 2 - Session 3)
Phase 3: How did we get there?	1. Identify goals and strategies (Day 2 - Session 3) 2. Develop an action plan (Day 3 - Session 4)
Phase 4: Are we on track?	1. Identify monitoring mechanism (Day 3 - Session 4)

Key Steps/Actions





Development of National/City Waste Management Strategy in Myanmar





IGES Center Collaborating with UNEP on Environmental Technologies (CCET) for supporting national/city waste management strategies



- Signed in Lima in December 2014
- The Centre, named “IGES Centre Collaborating with UNEP on Environmental Technologies” (CCET), will be established as a unit within IGES, located at IGES Headquarters in Hayama, Japan.
- The Centre will be headed by a Director and assisted by two dedicated Programme Coordinators working primarily in the Sustainable Consumption and Production Area.



IGES is an Implementer of CCAC-MSWI Projects in Asia



CLIMATE AND CLEAN AIR COALITION TO REDUCE SHORT LIVED CLIMATE POLLUTANTS MUNICIPAL SOLID WASTE MANAGEMENT INITIATIVE

What is the Coalition?

The Climate and Clean Air Coalition is the only global effort that unites governments, civil society and private sector, committed to improving air quality and protecting the climate in next few decades by reducing short-lived climate pollutants across sectors.

Complementary to mitigating CO2 emissions, the Coalition acts as a catalyst to create, implement and share immediate solutions addressing near-term climate change to improve people's lives rapidly, and to ensure sustainable development for future generations.

Starting in February 2011 with 6 Countries and 1 International Organisation, the coalition has rapidly expanded to 49 Countries, 44 NGOs, 16 International Organisations (as of September 2015).

The Municipal Solid Waste Management Initiative is one of 11 initiatives currently being undertaken by the coalition.

Short Lived Climate Pollutants from the Solid Waste Management Sector

Methane (gas)

- Landfill gas comprises ~50% methane and ~50% CO2
- Global warming potential of 25 (100 year time horizon), relative to CO2
- Anthropogenic - formed as a result of management of waste from humans

Black Carbon (fine particles in aerosol form)

- Most strongly light-absorbing component of particulate matter
- Formed by the incomplete combustion of fossil fuels, biofuels, and biomass
- Emissions patterns and trends vary significantly across regions, countries and sources
- An aerosol (not a greenhouse gas)

How Cities Participate in the MSW Initiative

- Undertake City Waste Assessments
- Quantify SLCP emissions and identify suitable sustainable alternatives for waste management - Emissions Quantification Tool
- Develop Work Plans
- Attend training and capacity building workshops targeting specific waste related themes
- Participate in city-to-city collaboration
- Obtain technical and financial analysis support in developing sustainable waste management projects
- Get access to resources and information on best practices on the CCAC MSW Initiative Knowledge Platform
- Get access to a world-wide network of experts

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SCP Mainstreaming in Maldives and Sub-Regional Forum on Sustainable Tourism





Mainstreaming of SCP into national policy making in the Maldives and South-Asia Sustainable Tourism Forum – Early September 2016

Activities:

1. Organization of National Roundtable on Sustainable Consumption and Production (SCP) and the 10YFP in the Republic of Maldives
2. Organization of South Asia SCP dialogue with emphasis on sustainable tourism – potential interfaces with waste management issues will be explored

Activity 1 – Expected results:

- Establish a foundation for dialogue to integrate SCP and resource efficiency requirements in relevant national policies and legislation, and raise awareness on the importance to adopt SCP practices
- Proposals for the integration of SCP in national development plans and strategies (*i.e. National Strategy on Sustainable Development, National Framework for Development, National Environmental Action Plan*)

Activity 2 – Expected results:

- To engage government representatives and policy makers in dialogue and collaboration with emphasis on the promotion of sub-regional sustainable tourism strategies
- Assess progress towards Sustainable Tourism in South Asia and propose policy priorities feeding into annual South Asia SCP Forum dialogues
- Support meaningful, evidence based dialogue and decision making on SCP issues, and monitoring of progress in achieving regional SCP objectives (*i.e. 10YFP Regional Roadmap on SCP*)



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