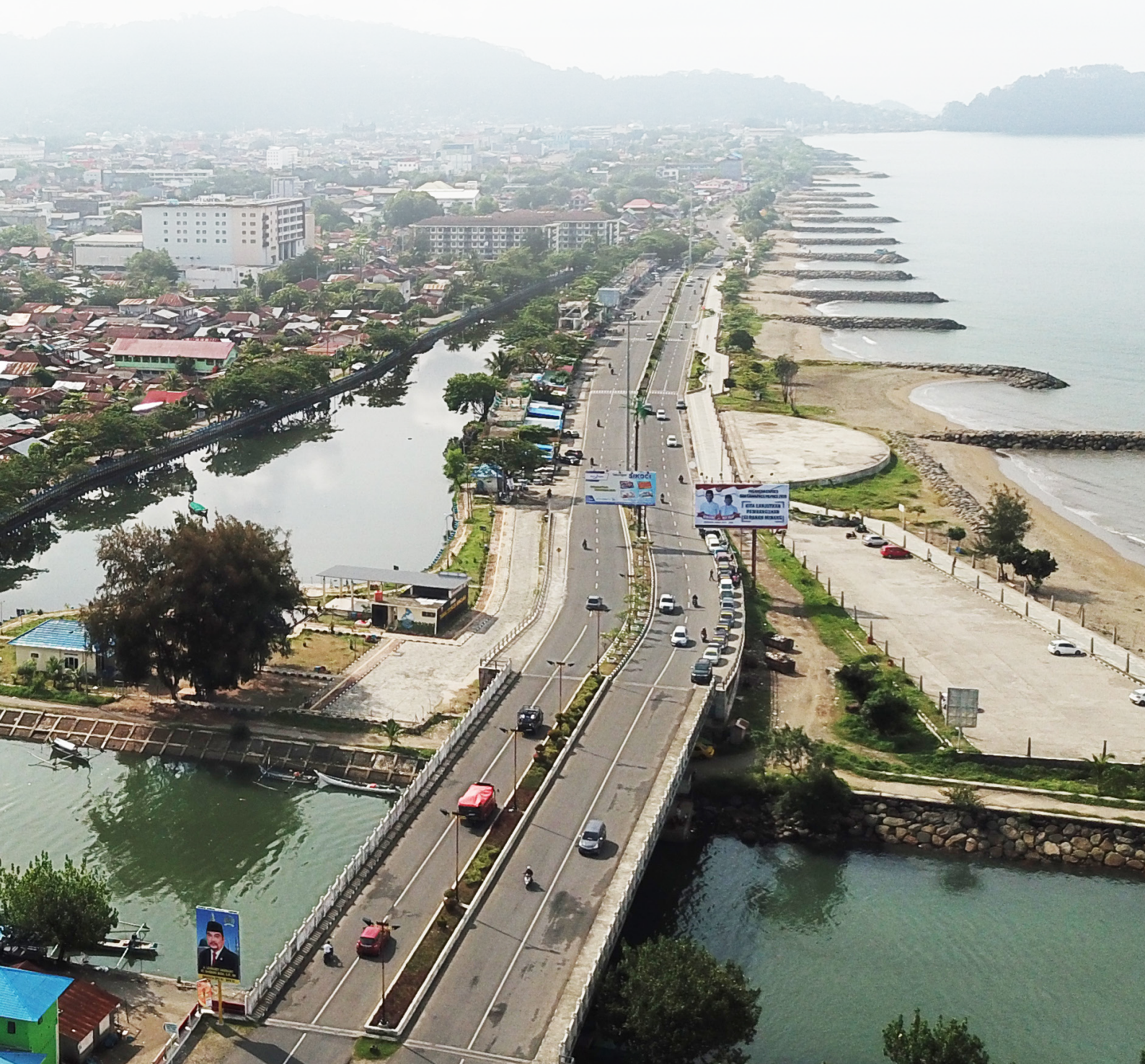
Action Plan on Integrated Solid Waste Management in Padang City (2023-2030)



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Editorial Team

IGES Centre Collaborating with UNEP on Environmental Technologies (CCET): Miho Hayashi, Dr. Rajeev Kumar Singh, Dr. Eng. Sudarmanto Budi Nugroho, and Dr. Premakumara Jagath Dickella Gamaralalage

Universitas Andalas: Dr. Eng. Slamet Raharjo

Wahana Lingkungan Hidup Indonesia Sumbar (WALHI: Indonesian Forum for the Environment) : Uslaini, SP and Nur Indah Kartikasani, SP

Reviewers

United Nations Environment Programme- The International Environmental Technology Centre (UNEP-IETC): Dr. Shunichi Honda

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Padang City

Jl. Bagindo Azis Chan No. 1, Aie Pacah - Kota Padang, Sumatera Barat
Tel. : 0751 4640800 URL: https://www.padang.go.id/

United Nations Environment Programme
- International Environmental Technology Centre (UNEP-IETC)

2-110 Ryokuchi koen, Tsurumi-ku, Osaka 538-0036 Japan
Tel: +81-6-6915-4581 URL: https://www.unep.org/ietc/

Indonesia-Malaysia-Thailand Growth Triangle (IMT-GT)

Centre for IMT-GT Subregional Cooperation (CIMT)
Office 3A, Level 3, Menara PjH, No. 2, Jalan Tun Abdul Razak, Precint 2, 62100 Putrajaya, MALAYSIA
Tel: +603-8893 0925 URL: https://imtgt.org/

IGES Centre Collaborating with UNEP on Environmental Technologies (CCET)

2108-11 Kamiyamaguchi, Hayama, Kanagawa, 240-0115 Japan
Tel. : +81-46-855-3840 URL: https://www.ccet.jp/ URL: https://www.iges.or.jp/

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The Action Plan has been developed by the City of Padang in collaboration with Universitas Andalas and Wahana Lingkungan Hidup Indonesia Sumbar (WALHI: Indonesian Forum for the Environment), and with financial and technical support from the Ministry of the Environment, Japan, the United Nations Environment Programme - International Environmental Technology Centre (UNEP-IETC), IGES Centre Collaborating with UNEP on Environmental Technologies (CCET) and Indonesia-Malaysia-Thailand Growth Triangle (IMT-GT).

STATEMENT FROM THE CITY MAYOR

Waste management in Indonesia has seen much improvement in the past few years in line with regulations issued by the central and local governments. While Padang City has improved its waste collection, the city still contends with an increasing amount of waste, currently at 660.5 tonnes/day, of which 72% (478 tonnes/day) goes to a final disposal site (TPA) and only 7% (49 tonnes/day) is recycled or composted. The burgeoning amounts of mixed waste has shortened the life of the TPA and has led to the loss of valuable material.

Due to this situation, Padang has issued strategic policies (JAKSTRADAs 2017-2025) aiming to achieve a 30% reduction in waste and ensuring that 70% of its waste is adequately handled by 2025, bringing the city in line with the National Policy and Strategy for Developing Solid Waste Management Systems 2017-2025 (JAKSTRANAs). Padang City also promotes a Circular Economy Program, focusing on the 5Rs: reducing or optimising the use of raw materials from nature (Reduce), reusing materials and products (Reuse), transforming used materials and products into new products (Recycle), recovering used material and products in the form of material and energy (Recovery), and repairing the products for more extended use (Repair). To support the programme and to reduce plastic debris and marine plastic pollution, a regulation to restrict the use of single-use plastic bags was issued in 2018.

To achieve the targets set out in the JAKSTRADAs, **an action plan on integrated solid waste management in Padang City (2023-2030)** has been developed in collaboration with Universitas Andalas and Wahana Lingkungan Hidup Indonesia Sumbar (WALHI) and with financial and technical support from the Ministry of the Environment, Japan, the United Nations Environment Programme - International Environmental Technology Centre (UNEP-IETC), IGES Centre Collaborating with UNEP on Environmental Technologies (CCET) and Indonesia-Malaysia-Thailand Growth Triangle (IMT-GT).

It will be crucial to have the cooperation and collaboration of a wide range of stakeholders to ensure the successful implementation of the plan, so that the city can be clean and waste-free. Padang will continue to make efforts to mobilise the participation of all organisations and communities to implement the action plan, which is expected to contribute to a sound environmental society in Sumatra Island and Indonesia as a whole.

Hendri Septa
Mayor, Padang City

THE NEED FOR AN ACTION PLAN

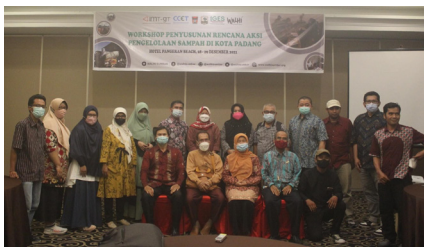
Padang City, the capital of West Sumatra Province, has a population of 982,884 people as of 2021. A field study was carried out and showed that waste generation in the city reached 660.50 tonnes/day while the volume of waste disposed of at the Tempat Pemrosesan Akhir (TPA: final disposal site in Bahasa Indonesia) Aia Dingin in 2021 was 478 tonnes/day, or 72.4% of total waste generated. Only 7.0% was recycled, 0.4% was composted, and the remaining 20.2% was either burned, dumped, or leaked into the environment. With the increasing mixed waste generation due to little or no practise of waste separation at the source, TPA Aia Dingin is predicted to be at full capacity by 2026 even though it was designed to be able to operate until 2030 initially. The life of the TPA has been shortened and resources with economic value have been wasted. In addition, the increasing amount of waste puts a heavy burden on the municipal budget.

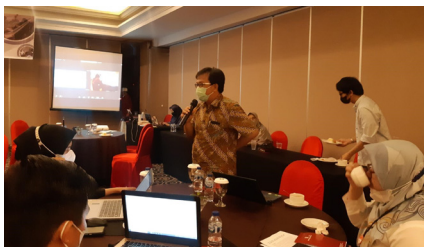
Efforts to establish and increase community-based waste banks and Tempat Penampungan Sementara 3Rs (TPS3Rs) for each kelurahan ("subdistrict" in Bahasa Indonesia) were expected to reduce waste going to the TPA. However, based on preliminary studies and interviews, no TPS3R is currently active and most waste banks do not collect enough recyclables to make a profit due to the lack of community participation and insufficient finance for operations. Some community residents still dump or burn their waste in open areas, resulting in air and water pollution.

Under such circumstances, two waste management targets have been determined in JAKSTRADAs in Padang City, namely, a 30% reduction in waste and ensuring that 70% waste is handled properly. This action plan has been developed to achieve the targets under the principle of a circular economy (optimisation of material with less consumption of energy and resources before disposal) instead of a linear economy (from collection to transportation and disposal).

DEVELOPMENT PROCESS

- Focus group discussion was conducted with four different groups: 1) government, 2) university/academics, 3) NGOs and community leaders, and 4) private sector and waste management operators.

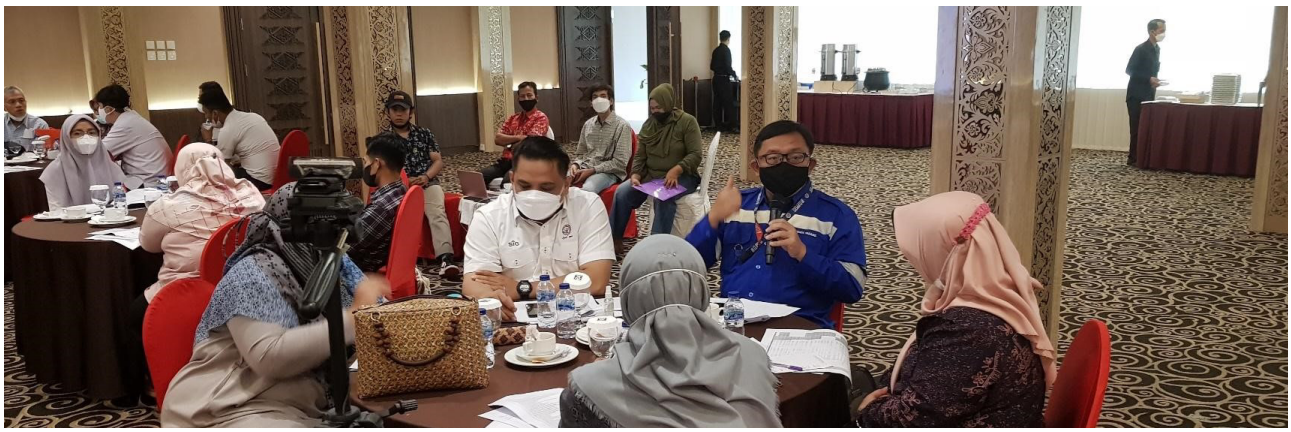





- A study tour in Bandung City was carried out in January 2022 to learn best practices for community-based waste management that can be replicated in Padang City. The participants included representatives from DLH, Walhi Sumbar, Universitas Andalas, waste banks, and also Kelurahan. They visited the Waste Recycling Center Cicabe, TPS3R Babakan Sari, Organic Waste Recycling Center Ciwastra, Composting Facility Batu Nunggal, RW 07 Kelurahan Cihaurgeulis, RW 09 Kelurahan Sukaluyu, and RW 02 Banjarsari Kelurahan Sukamiskin.
  For details please visit https://www.ccet.jp/news/exchange-study-tour-bandung;



- A final workshop to review the draft action plan was organised in December 2021. Representatives from government, universities, NGOs, communities, the private sector and waste banks participated and discussed possible solutions to waste issues.



IDENTIFIED ISSUES and CITY TARGETS

Identified Issues	Primary Objectives (targets in JAKSTRADA)
Shorter life for TPA, resources with economic value wasted, and municipal budget inefficiently used because of disposal of increasing mixed waste without application of 3Rs	30% of total waste should be reduced through 5R activities
Environmental pollution caused by improper waste handling such as open burning, open dumping, and lack of waste collection	70% of total waste should be properly handled
Waste management structure among different stakeholders and governance are weak	

FIVE SPECIFIC OBJECTIVES by 2030

Objective 1.
Enhance waste separation to achieve a 30% waste reduction at the source

Objective 2.
Increase organic waste reduction to 10% (Baseline in 2021: 0.4%)

Objective 3.
Increase inorganic waste recycling and recovery to 20% (Baseline in 2021: 7.1%)

Objective 4.
Reduce unmanaged waste that leaks to the environment to 10% (Baseline in 2021: 20.20%)

Objective 5.
Enhance institutional capacity for better SWM with the focus on monitoring and evaluation (M&E) and collaboration with other partners

APPROACHES to ACHIEVE THE OBJECTIVES

Approach 1	Establish and Strengthen **management structure** for sustainable operation
Approach 2	Develop and implement comprehensive **environmental education through awareness-raising activities**
Approach 3	Select and apply **locally adaptable and affordable technology, techniques, and tools** based on scientific research
Approach 4	**Regulate and enforce the law and policies** in waste management

Objective 1. Enhance waste separation to achieve a 30% waste reduction at source

Approach 1. Management structure for sustainable operation

1-1 Establish and provide training for PKK cadres, the youth, and informal waste collectors at RWs to be community facilitators (environmental cadres)

Approach 2. Education and Awareness-raising

2-1 Trained cadres will disseminate information about 5Rs and waste separation through community meetings and gatherings

2-2 Conduct campaigns and events on the waste separation at source and 5Rs at different levels (community, commercial and public sectors) by adopting the 5R slogan "Kang Pisman" as in Bandung City.

Approach 3. Research and Technology

3-1 Develop environmental education modules that focus on 5Rs and apply them in line with the national Adiwiyata programme for primary and secondary schools

3-2 Develop IEC materials (leaflets, brochures, videos) to facilitate waste separation and 5Rs both at the community and school levels

3-3 Develop a digital platform (apps or website based) to facilitate waste separation and 5Rs for students and communities

3-4 Provide buckets for each household for organic waste collection (with conditions)

3-5 Rent or provide rickshaws with two compartments to transport the sorted waste (with conditions)

Approach 4. Regulatory and Enforcement

4-1 Provide Kelurahan/RT/RW with different coloured flags (red and green) referring to the level of performance of waste separation and/or waste management

Objective 2. Increase organic waste reduction to 10% (Baseline in 2021: 0.4%)

Approach 1. Management structure for sustainable operation

1-1 Identify the operational modality and potential operators of each decentralised and centralised organic waste treatment facility

1-2 Help potential operators develop a business plan at decentralised and centralised facilities

1-3 Provide both technical and operational training for the operators

Approach 2. Education and Awareness-raising

2-1 Conduct “No Food Waste” campaigns

2-2 Provide technical, financial and environmental information and training about decentralised organic waste treatment methods (biopori, pipe composting, maggot, eco enzyme, etc.)

Approach 3. Research and Technology

3-1 Conduct a study and hold meetings to select suitable technology and location for the organic waste treatment at each decentralised and centralised facility

3-2 Conduct market research about fresh organic waste and its treated products such as compost and maggots, or bi-product such as methane gas, and negotiate with potential buyers and retailers including DLH and farmers

3-3 Design and install organic waste treatment facilities under a financial and operational agreement with the stakeholders involved

Approach 4. Regulatory and Enforcement

4-1 [RW/Kelurahan level: decentralised treatment] Determine the method, frequency, and points of organic waste collection from the source of generation to collection points

4-2 [City level: centralised treatment] Determine the method, frequency, route, and points of organic waste collection and transportation from collection points to the TPA

Objective 3. **Increase inorganic waste recycling and recovery to 20%** (Baseline in 2021: 7.1%)

Approach 1. Management structure for sustainable operation

- 1-1 Create at least one waste bank per kelurahan through the main work programme (POKIA) of health and environment (informal collector to be involved)
- 1-2 [RW/Kelurahan level] Provide training and tools to strengthen the operation of waste banks and RDF/RPF plant (and TPS3Rs)
- 1-3 [RW/Kelurahan level] Provide training and equipment to strengthen the upcycling skill of waste banks (and TPS3Rs)

Approach 2. Education and Awareness-raising

- 2-1 Trained waste bank staff and informal waste collectors will disseminate the information about the 5Rs and waste separation through community meetings and gatherings
- 2-2 Establish or improve marketing facilities such as bazaars, exhibitions, and Dekranasda to promote products made out of recycled material

Approach 3. Research and Technology

- 3-1 Develop a digital matching tool and set up regulations to create a network between buyers and suppliers of recyclables
- 3-2 Conduct a study on GHG-SLCP emissions in relation to the RDF/RPF development plan
- 3-3 Conduct a feasibility study on the RDF/RPF development with the identification of operational modality
- 3-4 Design and install a RDF/RPF plant under a financial and operational agreement with the stakeholders involved

Approach 4. Regulatory and Enforcement

- 4-1 [RW/Kelurahan level] Determine the method, frequency, and points of collection of recyclables from the source of generation to collection points
- 4-2 [City level] Determine the method, frequency, route, and points of collection of recyclables and hazardous waste collection and transportation from collection points to the TPA
- 4-3 Add a fee to tourist entrance tickets in collaboration with Tourism Office to facilitate 5Rs and sales of recycled products

Objective 4. **Reduce unmanaged waste to 10%** (Baseline in 2021: 20.20%)

Approach 1. Management structure for sustainable operation

- 1-1 Develop and implement a plan to expand the collection coverage
- 1-2 [City level] Collaborate with Dinas Perkim as an OPD in housing and settlement waste facilities to take care of the waste generated from slum areas

Approach 2. Education and Awareness-raising

- 2-1 Undertake clean-up activities with a slogan to stop open dumping and burning especially along rivers
- 2-2 Undertake 'Single-Use Plastic Diet' campaigns across the city

Approach 3. Research and Technology

- 3-1 Develop and install a technology or tool to monitor the waste collection at each municipal collection point and major illegal waste dumping and waste burning points

Approach 4. Regulatory and Enforcement

- 4-1 Develop and enforce regulations on waste littering, open burning, and the restrictions on the use of single-use plastic bags at shopping centres, restaurants, and offices

Objective 5. Enhance institutional capacity for better SWM with the focus on monitoring and evaluation (M&E) and collaboration with other partners

Approach.

5-1 Establish M&E and reporting mechanisms for waste management (waste separation, recycling, composting, disposal, open dumping and burning) among the key stakeholders

5-2 Each stakeholder receives training and a tool on data collection and M&E to be able to assume the determined mandate

5-3 Review past and current financial status of municipal waste management and propose a new fee setting, find funding sources for sustainable operation of activities (M&E, awareness-raising, research, technology development, app maintenance, law enforcement, waste management operations, etc.)

FUNDING SOURCES FOR IMPLEMENTATION

There are various funding sources for the implementation of the action plan. Local, provincial and central government budgets will make up the main motor for implementation, while it is also important to get financial support from international institutions to install and operate large-scale infrastructure such as RDF / RPF[1] plants and a centralised organic waste treatment plant. It is suggested that Padang City maintains a good relationship with higher government as well as IMT-GT to get funding opportunities.

It is also essential to clearly state the responsibility of the private sector and citizens as waste generators. corporate social responsibility (CSR) funds from private companies with community-based voluntary activities will contribute to the improvement of waste management. The funds can be used to raise awareness through educational campaigns, events and clean-up activities. At the same time, it is crucial to strengthen the institutional and individual capacity of those who are in charge of planning and operations of waste management, and the capacity of SMEs that convert waste to valuable material. The rules and regulations including incentives related to green products made out of recycled materials should be widely disseminated based on a circular economy, through which recycling and upcycling business will be enhanced.

[1] RDF: Refuse Derived Fuel, RPF: Refuse Paper & Plastic Fuel.

Both RDF and RPF are fuel produced from various types of waste such as municipal and industrial solid wastes. RPF is made from waste paper and plastics only without organic waste which has high moisture. RPF has less contamination by foreign matter, lower level of chlorine concentration, higher calorie content, and lower rate of ash generation than RDF.

KEY STAKEHOLDERS

Environmental Agency (DLH) – responsible for monitoring of soil and air pollution, waste management as well as for the control of the final disposal site by Service Technical Implementation Unit (UPTD). DLH is also in charge of the collection and transportation of waste from TPSs to TPA. Waste management consists of two sections, namely, waste reduction and waste handling.

Local Governments – the mayor, Regional Secretariat (Sekda) and Regional Council (DPRD) make and issue policies and regulations; the Civil Service Police Unit (Satpol PP) supports law enforcement; Regional Financial and Asset Management Agency (BPKAD), Local Development Planning Agency (Bappeda), Public Works and Public Housing Agency (PUPR) finance and procure infrastructure and technology; Cooperatives & SMEs Agency (Dinas Koperasi dan UMKM), Tourism Agency (Dinas Pariwisata), Agricultural Agency (Dinas Pertanian), Industry & Trading Agency (Dinas Industri dan Perdagangan) support marketing of products made out of recycled materials.

Women's Associations – including Family Welfare Development (PKK), and PKBS, can be main actors in action plan implementation for waste management at the community level. They usually organise meetings to disseminate information about health, education, childcare and environment to educate and empower citizens, especially women. Some members become environmental cadres and facilitators who raise awareness in the community and coordinate with government staff ranging from RT, RW, subdistricts and districts to the city.

Community Institutions – districts, sub-districts, RT, and RW are administratively responsible for waste management on the ground. These institutions can reach community groups such as women's associations and youth unions to enhance community involvement. However, the authority level differs in each place.

Environmental Cadres and Facilitators – responsible for community mobilisation and collective awareness-raising on waste issues, especially waste separation and the 5Rs. They make efforts together with government agencies including RT, RW, subdistricts, districts and the city.

NGOs, Academia/Universities and Experts – NGOs are involved in action plan development and support for implementation of the plan. They harness community aspirations based on a bottom-up approach. NGOs actively support and conduct campaigns and events on waste separation and restriction of single-use plastics at source.

Universities/Academia and experts provide support for the development of modules and curricula for schools, research about different technologies, and studies on GHG emissions. They usually work together with local governments in line with established policy and strategies. The results, findings and lessons learnt from these activities are disseminated through seminars and workshops.

Waste Management Facilities and Operators – waste banks and Lembaga Pengelolaan Sampah (LPS) are responsible for further waste sorting for recycling and storage. Like environmental cadres and community facilitators, they conduct door-to-door awareness-raising and education activities on waste separation at source and the 5Rs.

Aggregators and Recycling Enterprises – they buy recyclables in bulk from waste pickers, waste banks, and LPSs. The accumulated recyclables are cleaned, sorted and compacted, and then transported to recycling factories in bigger cities such as Medan.

Private Companies (plastic manufacturers, producers using plastic packaging, retailers, importers, etc.) – these companies can contribute funding through various programmes such as Corporate Social Responsibility (CSR), Extended Producer Responsibility (EPR), and other programmes that give mutual benefit to both private companies and the funding target. However, the EPR programme has not yet been well established in Indonesia.

Waste Recovery Operators – A cement factory is one of the potential private companies that can contribute to waste reduction and waste recovery. Together with the Padang City government, PT Semen Padang has been currently planning to install an RDF / RPF plant where the waste will be used as the source of fuel which is an alternative to coal. It also contributes to climate change through the reduction of GHG emissions.

Objective 1. Enhance waste separation to achieve a 30% waste reduction at source

Approach 1. Management structure for Sustainable operation

1-1 Establish and provide training for PKK cadres, the youth, and informal waste collectors at RWs to be community facilitators (environmental cadres)

Target group	informal waste collector/ transporter, RT/RW/Kelurahan, PKK cadres, Karang Taruna
Responsible Agencies	DLH, NGO

2023	2024	2025	2026	2027	2028	2029	2030

Approach 2. Education and Awareness-raising

2-1 Trained cadres will disseminate the information about 5Rs and waste separation through community meetings and gatherings

Target group	households, commercial facilities
Responsible Agencies	NGO, Environmental Cadres

2023	2024	2025	2026	2027	2028	2029	2030

2-2 Conduct campaigns and events on the waste separation at source and 5Rs at different levels (community, commercial and public sectors) by adopting the 5Rs slogan "Kang Pisman" as in Bandung City.

Target group	households, commercial facilities
Responsible Agencies	DLH, NGO, Industry and Trade Office, Regional administrators (RT, RW, Kelurahan, Kecamatan, City), environmental cadres

2023	2024	2025	2026	2027	2028	2029	2030

Approach 3. Research and Technology

3-1 Develop environmental education modules that focus on 5Rs and apply them in line with the national Adiwiyata programme for primary and secondary schools

Target group	communities, commercial and industrial facilities, regional administrators (RT, RW, Kelurahan, Kecamatan), Schools
Responsible Agencies	DLH, NGO, Academia

2023	2024	2025	2026	2027	2028	2029	2030

3-2 Develop IEC materials (leaflets, brochures, videos) to facilitate waste separation and 5Rs both at community and school levels

Target group	communities, commercial and industrial facilities, regional administrators (RT, RW, Kelurahan, Kecamatan), Schools
Responsible Agencies	DLH, NGO, Academia

2023	2024	2025	2026	2027	2028	2029	2030

3-3 Develop a digital platform (apps or website based) to facilitate waste separation and 5Rs for students and communities

Target group	communities, commercial and industrial facilities, regional administrators (RT, RW, Kelurahan, Kecamatan), Schools
Responsible Agencies	DLH, department of Communication and Informatics, Academia

2023	2024	2025	2026	2027	2028	2029	2030

3-4 Provide buckets for each household for organic waste collection (with conditions)

Target group	households
Responsible Agencies	DLH/Kecamatan/Kelurahan/RW/RT, NGO

2023	2024	2025	2026	2027	2028	2029	2030

3-5 Rent or provide rickshaws with two compartments to transport the sorted waste (with conditions)

Target group	informal waste collector, waste bank
Responsible Agencies	DLH/Kelurahan

2023	2024	2025	2026	2027	2028	2029	2030

Approach 4. Regulation and Enforcement

4-1 Provide Kelurahan/RT/RW with different coloured flags (red and green) referring to the level of performance of waste separation and/or waste management.

Target group	DLH/Kecamatan/Kelurahan/RW/RT, environmental cadres
Responsible Agencies	DLH

2023	2024	2025	2026	2027	2028	2029	2030

Objective 2. **Increase organic waste reduction to 10%** (Baseline in 2021: 0.4%)

Approach 1. Management structure for Sustainable operation

1-1 Identify the operational modality and potential operators of each decentralized and centralized organic waste treatment facility

Target group	Kecamatan/Kelurahan/RW/RT, waste bank, Dinas Pertanian
Responsible Agencies	DLH, academia, experts

2023	2024	2025	2026	2027	2028	2029	2030

1-2 Help potential operators develop a business plan at decentralized and centralized facilities

Target group	facility operators
Responsible Agencies	DLH, experts

2023	2024	2025	2026	2027	2028	2029	2030

1-3 Provide both technical and operational training for the operators

Target group	facility operators
Responsible Agencies	DLH, experts

2023	2024	2025	2026	2027	2028	2029	2030

Approach 2. Education and Awareness-raising

2-1 Conduct "No Food Waste" campaigns

Target group	communities, commercial and industrial facilities, regional administrators (RT, RW, Kelurahan, Kecamatan), Schools
Responsible Agencies	DLH, NGO, Environmental Cadres

2023	2024	2025	2026	2027	2028	2029	2030

2-2 Provide technical, financial and environmental information and training about decentralised organic waste treatment methods (biopori, pipe composting, maggot, eco enzyme, etc.)

Target group	communities, commercial and industrial facilities, regional administrators (RT, RW, Kelurahan, Kecamatan), Schools
Responsible Agencies	DLH, NGO, Academia, environmental cadres

2023	2024	2025	2026	2027	2028	2029	2030

Approach 3. Research and Technology

3-1 Conduct a study and meetings to select a suitable technology and a location for the organic waste treatment at each decentralized and centralized facility

Target group	communities, commercial and industrial facilities, regional administrators (RT, RW, Kelurahan, Kecamatan), waste banks, Schools, TPA managers
Responsible Agencies	DLH, Min. of Agriculture, NGO, Academia

2023	2024	2025	2026	2027	2028	2029	2030

3-2 Conduct market research about the fresh organic waste and its treated products such as compost and maggot or bi-product such as methane gas and negotiate with potential buyers and retailors including DLH and farmers

Target group	facility operators, farmers
Responsible Agencies	DLH, Dinas Pertanian, NGO, Academia

2023	2024	2025	2026	2027	2028	2029	2030

3-3 Design and install organic waste treatment facilities under a financial and operational agreement with the stakeholders involved

Target group	Min of Agriculture, facility operator
Responsible Agencies	DLH, experts

2023	2024	2025	2026	2027	2028	2029	2030

Approach 4. Regulation and Enforcement

4-1 [RW/Kelurahan level: decentralized treatment] Determine the method, frequency, and points of organic waste collection from source of generation to collection points

Target group	informal waste collector/ transporter, waste bank, facility operator
Responsible Agencies	DLH/Kecamatan/Kelurahan/RW/RT

2023	2024	2025	2026	2027	2028	2029	2030

4-2 [City level: centralized treatment] Determine the method, frequency, route, and points of organic waste collection and transportation from collection points to the TPA

Target group	Kecamatan/Kelurahan/RW/RT, facility operator
Responsible Agencies	DLH, TPA manager

2023	2024	2025	2026	2027	2028	2029	2030

Objective 3. **Increase inorganic waste recycling and recovery to 20%** (Baseline in 2021: 7.1%)

Approach 1. Management structure for Sustainable operation

1-1 Create at least one waste bank per kelurahan through working main program (POKIA) of health and environment (informal collector to be involved)

Target group	Kecamatan/Kelurahan/RW/RT, environmental cadres
Responsible Agencies	DLH, waste bank, NGO

2023	2024	2025	2026	2027	2028	2029	2030

1-2 [RW/Kelurahan level] Provide training and tools to strengthen the operation of waste banks and the RDF/RPF plant (and TPS3Rs)

Target group	waste bank, environmental cadres, operators of RDF/RPF plant
Responsible Agencies	DLH, NGO

2023	2024	2025	2026	2027	2028	2029	2030

1-3 [RW/Kelurahan level] Provide training and equipment to strengthen the upcycling skill of waste banks (and TPS3Rs)

Target group	waste bank, environmental cadres
Responsible Agencies	DLH, Dekranasda, NGO, experts

2023	2024	2025	2026	2027	2028	2029	2030

Approach 2. Education and Awareness-raising

2-1 Trained waste bank staff and informal waste collectors will disseminate the information about the 5Rs and waste separation through community meetings and gatherings

Target group	communities, commercial and industrial facilities, regional administrators (RT, RW, Kelurahan, Kecamatan), Schools
Responsible Agencies	DLH, NGO, Academia, environmental cadres

2023	2024	2025	2026	2027	2028	2029	2030

2-2 Establish or improve marketing facilities such as bazaars, exhibitions, and Dekranasda to promote products made out of recycled material

Target group	waste bank, recyclers, cooperatives, SMEs
Responsible Agencies	DLH, Dekranasda, Tourism office, industry office

2023	2024	2025	2026	2027	2028	2029	2030

Approach 3. Research and Technology

3-1 Develop a digital matching tool and set up regulations to create network between buyers and suppliers of recyclables

Target group	waste bank, recyclers, informal waste collectors/transporters
Responsible Agencies	DLH, experts, academia

2023	2024	2025	2026	2027	2028	2029	2030

3-2 Conduct a study on GHG-SLCP emissions in relation to the RDF/RPF development plan

Target group	household, commercial sector, city, PT. Semen Padang
Responsible Agencies	academia / experts

2023	2024	2025	2026	2027	2028	2029	2030

3-3 Conduct a feasibility study on the RDF/RPF development with the identification of operational modality

Target group	Bapeda, DLH, PUPR, PT semen Padang
Responsible Agencies	academia / experts

2023	2024	2025	2026	2027	2028	2029	2030

3-4 Design and install a RDF/RPF plant under financial and operational agreement with the stakeholders involved

Target group	DLH, ST semen Padang
Responsible Agencies	DLH, experts, ST semen Padang, Ministries of Environment, Finance, and Foreign Affairs

2023	2024	2025	2026	2027	2028	2029	2030

Approach 4. Regulation and Enforcement

4-1 [RW/Kelurahan level] Determine the method, frequency, and points of collection of recyclables from source of generation to collection points

Target group	waste bank, recyclers, informal waste collectors/transporters
Responsible Agencies	DLH/Kecamatan/Kelurahan/RW/RT

2023	2024	2025	2026	2027	2028	2029	2030

4-2 [City level] Determine the method, frequency, route, and points of collection of recyclables and hazardous waste collection and transportation from collection points till the TPA

Target group	Kecamatan/Kelurahan/RW/RT
Responsible Agencies	DLH, TPA manager

2023	2024	2025	2026	2027	2028	2029	2030

4-3 Add fee to the tourist entrance tickets in collaboration with Tourism Office to facilitate the 5Rs and sales of recycled products

Target group	Kecamatan/Kelurahan/RW/RT, commercial facilities
Responsible Agencies	tourism office, DLH

2023	2024	2025	2026	2027	2028	2029	2030

Objective 4. **Reduce unmanaged waste to 10%** (Baseline in 2021: 20.20%)

Approach 1. Management structure for Sustainable operation

1-1 Develop and implement a plan to expand the collection coverage

Target group	Kecamatan/Kelurahan/RW/RT, commercial and industrial facilities
Responsible Agencies	DLH

2023	2024	2025	2026	2027	2028	2029	2030

1-2 [City level] Collaborate with Dinas Perkim as an OPD in housing and settlement waste facilities to take care of the waste generated from slum areas

Target group	Kecamatan/Kelurahan/RW/RT, informal waste collectors, waste bank, environmental cadres
Responsible Agencies	DLH, Dinas Perkim

2023	2024	2025	2026	2027	2028	2029	2030

Approach 2. Education and Awareness-raising

2-1 Undertake clean-up activities with a slogan on stop open dumping and burning especially along rivers

Target group	Kecamatan/Kelurahan/RW/RT, commercial and industrial facilities
Responsible Agencies	DLH, NGO

2023	2024	2025	2026	2027	2028	2029	2030

2-2 Undertake 'Single-Use Plastic Diet' campaign across the city

Target group	household, commercial and public facilities
Responsible Agencies	DLH, NGO, Environmental Cadres, Industry and Trade Office

2023	2024	2025	2026	2027	2028	2029	2030

Approach 3. Research and Technology

3-1 Develop and install a technology or tool to monitor the waste collection at each municipal collection point and major illegal waste dumping and waste burning points

Target group	Kecamatan/Kelurahan/RW/RT, commercial and industrial facilities
Responsible Agencies	DLH, academia, experts

2023	2024	2025	2026	2027	2028	2029	2030

Approach 4. Regulation and Enforcement

4-1 Develop and enforce regulations on waste littering, open burning, and the restrictions on the use of single-use plastic bags at shopping centres, restaurants, and at offices

Target group	communities, environmental cadres, Kecamatan/Kelurahan/RW/RT, commercial and industrial facilities
Responsible Agencies	DLH, DPRD, regional secretariat, mayor

2023	2024	2025	2026	2027	2028	2029	2030

Objective 5. Enhance institutional capacity for better SWM with the focus on monitoring and evaluation (M&E) and collaboration with other partners

Approach.

5-1 Establish the M&E and reporting mechanism of waste management (waste separation, recycling, composting, disposal, open dumping and burning) among the key stakeholders

Target group	communities, environmental cadres, Kecamatan/Kelurahan/RW/RT, waste bank, commercial and industrial facilities, facility operators
Responsible Agencies	DLH, academia, experts

2023	2024	2025	2026	2027	2028	2029	2030

5-2 Each stakeholder receives training and a tool on data collection and M&E to be able to assume the determined mandate

Target group	communities, environmental cadres, Kecamatan/Kelurahan/RW/RT, waste bank, commercial and industrial facilities, facility operators
Responsible Agencies	DLH, academia, experts

2023	2024	2025	2026	2027	2028	2029	2030

5-3 Review past and current financial status of municipal waste management and propose a new fee setting, find funding source for sustainable operation of activities (M&E, awareness-raising, research, technology development, app maintenance, law enforcement, waste management operations, etc.)

Target group	communities, environmental cadres, Kecamatan/Kelurahan/RW/RT, waste bank, commercial and industrial facilities, facility operators
Responsible Agencies	DLH, academia, experts

2023	2024	2025	2026	2027	2028	2029	2030

Action Plan on Integrated Solid Waste Management in Padang City (2023-2030)

Padang City

Jl. Bagindo Azis Chan No. 1, Aie Pacah - Kota Padang, Sumatera Barat
Tel. : 0751 4640800 URL: https://www.padang.go.id/

United Nations Environment Programme
- International Environmental Technology Centre (UNEP-IETC)

2-110 Ryokuchi koen, Tsurumi-ku, Osaka 538-0036 Japan
Tel: +81-6-6915-4581 URL: https://www.unep.org/ietc/

Indonesia-Malaysia-Thailand Growth Triangle (IMT-GT)

Centre for IMT-GT Subregional Cooperation (CIMT)
Office 3A, Level 3, Menara PjH, No. 2, Jalan Tun Abdul Razak, Precint 2, 62100 Putrajaya, MALAYSIA
Tel: +603-8893 0925 URL: https://imtgt.org/

IGES Centre Collaborating with UNEP on Environmental Technologies (CCET)

2108-11 Kamiyamaguchi, Hayama, Kanagawa, 240-0115 Japan
Tel. : +81-46-855-3840 URL: https://www.ccet.jp/ URL: https://www.iges.or.jp/