JICA Global Agenda for

No. 18 Environmental Management

~ JICA Clean City Initiative ~

Japan International Cooperation Agency (JICA) works toward the achievement of the Sustainable Development Goals (SDGs).

1. Objectives

JICA contributes to achieving sound environmental quality for the development of a sustainable society in order to protect people's health and living environment in partner countries. It will be realized by cooperation centering on improving the competence of administrative organizations responsible for environmental management and promoting environmental measures such as waste management and prevention of water and air pollution.

JICA will also promote this Global Agenda in urban areas of partner countries, thereby contributing to the creation of clean cities.

2. Current Situation, Analysis of Issues and Reasons for Setting objectives

(1) Importance of environmental management

An environment that includes water, air, and other necessities is essential for ensuring healthy and safe lives for people and achieving human security. It is a public property accessible to all. Economic growth generally contributes to making better people's quality of life by improving livelihoods and creating jobs. However, as possible external diseconomies, industrialization, and urbanization can take place in conditions where appropriate environmental measures are not taken, which leads to environmental contamination or quality degradation of air and water due to harmful chemical substances and waste. This can further cause the deterioration of the health and living environment of residents in the surrounding areas, damage to agriculture, forestry and fisheries, health damage due to contaminated food, and hindrances due to foul odors and landscape deterioration.

Furthermore, it takes a great deal of money and years (the long term) to address the aftermath once pollution has spread beyond the threshold. Post-pollution measures cannot bring about a complete recovery (irreversibility). In addition, degradation of environmental quality will not only undermine the resources needed for future generations and deprive them of their right to live healthily and safely but will also compromise intergenerational equity.

Pollution and “garbage wars” became major social problems in Japan, especially during the period of high economic growth. The administrative organizations played a central role in gradually overcoming these problems through consensus building with various stakeholders, leading to changes in the economic and social systems. With Japan’s experience to inform partner countries, it is essential for the realization of human security to predict and prevent the deterioration of living environments caused by waste and pollution that may come with economic and social growth in developing countries, to control pollution at an early stage through appropriate pollution measures and waste management, and to ensure people’s right to a healthy life in a healthy environment. Through these efforts, it is important to contribute to the realization of a sustainable society by appropriately managing the interaction between human socioeconomic activities and the environment, and by maintaining a balance between the conservation and use of environmental resources.

Furthermore, these environmental problems have widespread and diffuse adverse effects beyond national borders (wide-area nature and diffusivity), leading to global-scale issues such as marine plastic problems, loss of biodiversity, and climate change. There is an urgent need to realize proper environmental management for not just individual countries or regions but the entire world to achieve sustainable development.

In addition, improved waste management, interruption of infection routes for waterborne diseases by ensuring water sanitation, and reduction of factors that cause serious illness by improving air pollution may contribute to preventing the spread of various infectious diseases, including COVID-19, and preventing infected people from becoming seriously ill.

(2) Current status

In developing countries, along with economic development, industrialization, rapid urbanization, and concentration of the population, socially vulnerable groups, including the poor, face the most serious damage: environmental pollution and deterioration of the quality of the environment. Nevertheless, the human resources and organizational structures of public institutions that should address these issues, are generally weak in such countries. The capacity[1] of society, including citizens, businesses, and research institutions, to take the necessary environmental measures is low, and thus these kinds of measures have fallen by the wayside.

[1] Here, “capacity” is defined as the problem-solving abilities required to tackle and solve a certain issue and is perceived as an aggregate of a variety of competences that takes into account all the factors at the individual, organizational, institutional and societal levels related to the problem in question (Institute for International Cooperation, JICA, 2006). The same applies hereinafter.

As a result, as shown below, the issues continue to grow with increasing severity, and it is imperative that we strengthen our response as soon as possible.

1) Waste

In many cities in developing countries, waste management systems (collection, transportation, and treatment) have not yet been established, which leads to major environmental and public health problem. In densely populated urban areas, waste overflowing into living spaces is left uncollected on streets, vacant lots, waterways, etc., which not only destroys the aesthetics of the city and worsens public safety, but also attracts pests and vermin, causing the spread of infectious diseases.

In Sub-Saharan Africa, for example, more than 70% of waste is thrown away in open dumpsites,[2] which causes a foul odor and air, soil, and surface and groundwater pollution, resulting in serious health hazards along with social and economic problems. Waste pickers at final disposal sites suffer from health problems such as lead poisoning and gastrointestinal, respiratory, and skin diseases due to poor working circumstances and exposure to harmful substances. Open burning of waste causes not only smoke and bad odors but also air pollution due to the scattering of ash and dust. Poorly managed waste incineration produces harmful substances such as dioxins, which adversely affect the health of local residents. Additionally, garbage disposal sites are also a source of methane gas[3] generated by the decomposition of organic matter and black carbon particles produced from incomplete combustion, among other short-lived climate pollutants.[4]

Furthermore, in recent years, marine plastic waste discharged into the ocean owing to inappropriate waste management on land has caused various problems, including the deterioration of ecosystems and the marine environment at large, the degradation of coastal functions, adverse effects on landscapes, obstacles to ship navigation, and impacts on fisheries and tourism. The estimated amount of marine plastic discharged into the ocean every year worldwide is eight million tons. If this trend continues, the weight of marine plastic waste is expected to exceed the weight of fish by 2050.

The amount of waste generated is on the rise all over the world with the progress of economic development and urbanization. Particularly in low-income countries in South Asia and Sub-Saharan Africa, where industrialization and the introduction of

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[2] The terms “open dumping” or open “dumpsite” refers to a type of disposal in which waste is simply dumped on the ground or at a final disposal site. (Same as above, page 82)

[3] It is the third largest source of anthropogenic methane gas.

[4] Short-Lived Climate Pollutants: SLCPs。 The main target substances are methane, tropospheric ozone, and black carbon particles (black carbon), which are the major components of soot.

consumer goods are expected to continue, the amount of waste generated is forecasted to reach two to three times that in 2018 by 2050.[5]

Therefore, it is essential to strengthen proper management by improving the capacity of operating entity of waste management and putting in place systems and regulations, in addition to promoting the effective use and reuse of recyclable resources and encouraging the reduction and control of waste generation itself.

2) Water and Soil Pollution

The discharge of untreated or improperly treated domestic wastewater and industrial wastewater is causing the deterioration of water quality in rivers, lakes, marshes, groundwater, coastal waters (especially closed waters), and entire watersheds, resulting in problems such as the perishing of aquatic organisms, contamination of fish and shellfish by harmful substances, and damage to fisheries by red tides. Inappropriate treatment of industrial wastewater and hazardous chemicals also leads to the contamination of soil and groundwater, of which the latter is also a source of drinking water.

The consumption of contaminated drinking water and food is also causing serious health problems for humans. At present, 4.2 billion people around the world do not have access to public health services such as wastewater treatment, and 500,000 people mainly in developing countries, mostly infants, die annually from waterborne diseases such as diarrhea, dysentery, and cholera. In addition, the inappropriate discharge of hazardous substances such as heavy metals, including mercury generated from industrial sources, into public waters can lead to the onset of serious and long-lasting health hazards such as those seen in Minamata disease and itai-itai disease in Japan.

Therefore, it is necessary to take regulatory measures such as permits and approvals upon the establishment of factories, and for industrial wastewater and such, after assessing the current situation based on scientific evidence. It is important to establish an appropriate wastewater treatment system (including sewage treatment) with a focus on densely populated urban areas and secure a system that includes the financial base necessary for its sustainable operation and maintenance.

3) Air Pollution

Air pollution caused by industrial activities and automotive traffic accounts for the fourth leading cause of death worldwide, with an estimated 6.67 million deaths attributed to air pollution in 2019. Health hazards caused by particulate matter such as PM 2.5 have also been reported in recent years, and as of 2016, more than 90%

[5] World Bank (2018) What a Waste 2.0

of the world's population was living in an air environment that did not meet the WHO standard for PM2.5, and more than half of the population was living in an air environment that was 2.5 times higher than the standard. [6,7]

In addition to such damage to human life and health, air pollution is causing serious problems for the global environment and future generations, such as the destruction of forest and lake ecosystems due to acid rain and the impact of climate change deriving from increased greenhouse gas (GHG) emissions.

Therefore, it is necessary to take measures to regulate the emission of air pollutants with an understanding of the current situation based on scientific evidence. To ensure the effectiveness of such measures, it is important to strengthen the technical aspects of measurement and analysis, raise public awareness, and improve monitoring by disclosing information to make the pollution situation more visible.

(3) Relationship with ODA Policy Priorities

1) Human Security

Promoting environmental management through cooperation with this Global Agenda will help actions addressing the threats of environmental pollution affecting people in developing countries, including local residents, and ensure their healthy and safe lives while contributing to the creation of resilient social systems that can prevent and respond to various threats.

2) Development Cooperation Charter

Regarding Development Cooperation Charter of Japan's ODA, in Chapter II. Priority Policies (1) Priority Issues, under A. Quality Growth and Poverty Eradication through Such Growth, it is stated that "Japan will provide assistance necessary to promote people-centered development that supports basic human life," including safe water and sanitation. Additionally, under C. Building a Sustainable and Resilient International Community through Efforts to Address Global Challenges, "environmental management and other environmental-related initiatives" is clearly stated, which is in line with the issues defined in this Global Agenda.

3) SDGs

The key SDG targets to which this Global Agenda contributes are listed below. All of them are targets that JICA focuses on in its SDGs Position Paper.

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[6] Health Effects Institute (2020) State of Global Air 2020. Special Report.

[7] WHO (2020) *World health statistics 2020: monitoring health for the SDGs, sustainable development goals*, p16. PM 2.5 is a suspended particulate matter with a particle size of 2.5 μm or less that originates from facilities that generate soot and dust and is a causative agent of respiratory and circulatory diseases.

- ✓ 6.2: By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations
- ✓ 6.3: By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally
- ✓ 11.6: By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management
- ✓ 12.4: By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment
- ✓ 12.5: By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse
- ✓ 14.1: By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution

* Although it is difficult to quantitatively identify the relationship with the results of cooperation, this will contribute to Target 3.9 (“substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water, and soil pollution and contamination”), etc.

4) Infrastructure Exports

The Government of Japan advanced that “Strategy for Overseas Expansion of Infrastructure Systems 2025 (resolved at the Economic Cooperation Infrastructure Strategy Meeting in December 2020)” and the “Ministry of the Environment’s Basic Strategy of the Promotion of Environmental Infrastructure (2017)" set forth the promotion of waste power generation, recycling, and the diffusion and deployment of water pollution prevention and wastewater treatment technologies to meet the needs of developing countries. Based on these policies and frameworks, JICA will work in cooperation with relevant ministries and agencies.

5) International Framework on Hazardous Chemicals

Japan has been participating in international frameworks to promote the prevention and risk reduction of health hazards and environmental destruction caused by hazardous chemicals. In particular, Japan has taken the initiative in effectuating the Minamata Convention on Mercury in 2017. Based on the Convention, the Government of Japan has established a policy to support the research and assessment of mercury use, emissions, and actual conditions in developing countries, and capacity development for the management of hazardous substances.

6) International Targets for Marine Plastic Waste

Japan proposed the Osaka Blue Ocean Vision at the 2019 G20 Osaka Summit, and the leaders shared the long-term international goal of reducing additional pollution by marine plastic waste to zero by 2050. In order to achieve this goal, the Government of Japan announced the launch of the MARINE Initiative at the meeting and has committed to providing support to partner countries through ODA for capacity development and institutional development for waste legislation, waste management (including sorting and collection systems), 3R promotion, the introduction of high-quality environmental infrastructure such as waste treatment facilities, including recycling facilities and waste power generation facilities, and the education and training of waste management personnel. Many of these initiatives are expected to be implemented by JICA and will be covered by this Global Agenda.

3. Significance of Japan and JICA's Engagement

(1) Significance of Japan's and JICA's Initiatives

1) In Japan, economic activities and development were prioritized until the period of high economic growth, and as a result of ignoring the impact on the environment and failing to take measures, environmental destruction and pollution progressed, causing severe air pollution and pollution of public waters. In response to worsening environmental problems, in the 1970s, the government fundamentally improved the legal system, established an organizational structure, improved technology, developed human resources, and carried out comprehensive capacity development in cooperation with the relevant sectors of society. As a result, Japan is moving toward the realization of an economically-efficient and environmentally-friendly society where economic growth is achieved while pollution is controlled, along with the formation of a sustainable, Sound Material-Cycle Society. The sharing of Japan's experience will improve the predictability

of environmental risks and the effectiveness of measures in developing countries, thereby contributing to the promotion of their sustainable development.

2) Cooperation in environmental management in partner countries also has great significance as it directly concerns Japan's environment and public health through the response to global environmental problems and infectious diseases. By promoting the export of environmental infrastructure,[8] Japanese private companies can also contribute to the development of partner countries through their excellent technologies. Overseas activities and human resource development by local governments are also expected to contribute to regional revitalization.

4. Scenarios Contributing to Objectives of the Global Agenda, and Clusters

(1) Basic concept of cooperation

1) Prevention of environmental pollution as well as information disclosure and scientific understanding of the situation when pollution occurs

JICA will promote the establishment of an environmental management system by the central government, local governments, and other public entities in order to prevent environmental pollution, degradation of public health resulting from environmental pollution, and social problems such as pollution-related public hazards, For existing environmental problems, it is urgent to prevent further deterioration or expansion of the contamination phenomenon, taking into account the expanse of the affected area, diffusivity, long-lastingness, and irreversibility. For this purpose, JICA support partner countries to scientifically understand the contamination, analyze the situation, and then share the knowledge and technologies required to consider necessary measures and policies based on Japan's experience. It is also important that information based on scientific knowledge be shared with experts both inside and outside the administration and be widely available to the general public.

[8] In "Infrastructure System Export Strategy", it is considered that Japanese technologies have advantages in the areas of waste management and wastewater treatment, specifically collection and transportation vehicles, heavy machinery for disposal sites, power generation from waste incineration, small incinerators for medical waste, and the "Fukuoka method" final disposal site in the area of waste management; and in the area of wastewater treatment, the pre-treated trickling filter (PTF) system, closed face pipe jacking method for laying sewerage pipes, trenchless rehabilitation of pipes, and septic tanks.

2) Strengthening the capacity of environmental administration according to the stage of development

JICA supports improving the capacity of organizations responsible for environmental administration based on the economic and social conditions of each country and region. Administrative functions for environmental assessment, permission/certification, general environmental monitoring and evaluation, and environmental regulation and surveillance as well as public health service functions for waste management and wastewater treatment are often the responsibilities of different organizations. JICA will promote effective and efficient cooperation by supporting capacity development in organizations on both sides.

As the quantity and quality of pollutant emissions change according to the level of economic and social development, it is important to steadily promote measures in stages under a common understanding based on a medium- to long-term roadmap for environmental management that takes into account future projections and the organizational structure and financial resources necessary to manage them.

As environmental administration organizations need to gain further understanding and cooperation from the public and companies, coordinate with fiscal authorities, and cooperate with ministries and agencies in other fields, such as the economy, industry, agriculture, and construction, JICA will consider strengthening coordination with such a diverse range of parties involved.

3) Securing the financial base for public health services

Generally citizens' willingness pay for public health services, including waste treatment and wastewater/sewage treatment is relatively low compared to essential infrastructure, such as electricity, public transport, and water supply, which often leads to an insufficient collection of fees and financial base that enable the provision of sustainable services. A tendency to readily rely on outsourcing to the private sector has also been observed.

In order to realize sound and sustainable financial management of public health services, it is essential to make measures against environmental pollution a public responsibility underpinned by the polluter-pays principle and the extended producer responsibility, as well as introduce policies to internalize external diseconomies in stages. It is effective to incorporate, from the upstream phase of the plan, a system to secure revenue as specific financial resources by collecting integrated water and sewerage charges and collecting waste treatment charges together with electricity charges and other public service charges, as well as an administration-led system to internalize the external economy through tax incentives and such like to cultivate

efforts in private enterprises. JICA will emphasize the formulation of a master plan and the enhancement of administrative operational capacity to construct such systems.

4) Improving the environmental management capacity of society as a whole

Both sustainable financial resources and voluntary efforts by many and unspecified pollutant disposers are essential for the implementation of effective measures. In light of this, JICA will support partner countries to accumulate objective data and publish information with universities and other research institutes, thereby fostering environmental awareness in the public and companies to enhance their understanding of how and why to use public financial resources to this end. JICA will also support to promote collaboration with and among diverse stakeholders for making changes in people's behavior, the development of environmentally friendly industries, and the creation of innovation by utilizing combinations of regulations and incentive measures.

Furthermore, through these consensus building processes, JICA aims for a comprehensive capacity development that improves environmental governance across the entirety of the social system.

(2) Composition of JICA Clusters

To ensure the sustainable health and safety of people in developing countries, based on the above-mentioned cooperation needs and the strengths and significance of Japan's support, the following JICA clusters are established:

1) Improvement of waste management and promotion of a Sound Material-Cycle Society, and

2) Promotion of healthy environment through appropriate environmental regulations and pollution control.

(3) Objective of Each JICA Cluster

1) "Improvement of waste management and promotion of a Sound Material-Cycle Society"

Objective: To strengthen the capacity of regional administrations and public institutions, including those in urban areas, and of institutions responsible for waste management administration throughout the country, as entities that can sustainably and proactively improve waste management systems and promote initiatives by residents, companies, and other disposers based on the principle of disposer's responsibility. JICA will also

support the realization of a Sound Material-Cycle Society where consumption of resources is reduced and the burden on the environment is minimized.

2) "Promotion of healthy environment through appropriate environmental regulations and pollution control"

Objective: To strengthen the capacity of government agencies as the regulatory body responsible for the management of environmental quality (water, air, and soil quality), including the prevention of environmental pollution and other pollution problems. When pollution does occur, such government agencies should be able to understand the status and source of pollution and formulate and implement measures based on scientific evidence.

Support for facilities and capacity development will also be provided to operating entities responsible for water pollution control, including public wastewater treatment projects.

3) "Promotion of healthy environment through appropriate environmental regulations and pollution control"

- Fifty (50) beneficiary countries and 500 million beneficiaries (individuals) by 2030
- Fifty (50) thousand people to be developed as human resources for environmental management by 2030
- Implementation of initiatives involving external organizations (at least five projects by the end of the next mid-term target period)

(4) Approaches

1) "Improvement of waste management and promotion of a Sound Material-Cycle Society"

Since waste management requires policies and systems to be developed at the national level and implemented at the local level, it is essential to build on the capacity of both the central and local governments.

As for local governments, JICA promotes the establishment of more efficient and appropriate waste management systems by considering the introduction of inter-regional management by multiple local governments as a complementary measure to alleviate financial and personnel constraints, in addition to disseminating the results and lessons learned from the efforts of individual local governments and cities to other cities and reflecting them in the improvement of the national system.

As for central governments (ministries in charge of the environment), JICA aims to cooperate in the development and improvement of systems at the national level and in providing guidance and assistance to local governments. JICA also aims to support their capacity development in the following aspects: analysis and organization of findings and issues based on the actual state of waste management in each city, information sharing between the central government and local governments, and continuous coordination among relevant ministries and agencies. These efforts will be aimed at building an effective and efficient waste management system for the country as a whole.

Furthermore, JICA considers encouraging the strengthening of responsibility and initiatives at the source, as well as in the production stages, in terms of waste reduction and effective use and reuse of resources, support capacity development at administrative bodies that develop and promote policies and measures to create a Sound Material-Cycler Society and a circular economy, and promote cooperation with the private sector.

With the above in mind, support should be considered and implemented based on the circumstances of each country and city, using the examples of initiatives in Stages 1 through 3 below as reference.[9]

(i) Stage 1

- In cities where the deterioration of sanitation is apparent, the first step of cooperation must be to improve capacity of the local governments in planning and implementation of the flow of waste management from collection and transportation to final disposal. This has to improve the living environment in cases where waste is scattered all over the city and areas have become unsanitary.
- A monitoring system should be established to quantify waste at each stage of generation, collection, and disposal. As a prerequisite, could be defined and classified. Efforts will be put into the survey method education and strengthening data management capabilities.
- Based on identified waste management flow, the issues along with the needs for support to resolve them can be identified. The capacity of the target entities must be adequately assessed before selecting cooperative approaches respectively suitable for individuals, organizations, and society. Specifically, these approaches include capacity development of waste management operators through technical

[9] Although this section classifies projects into stages of development for the purpose of convenience, it should be noted that developing countries often need to address these issues simultaneously and in parallel, and it is not always possible to place each project in only one of these stages.

cooperation, optimization of operation and management plans along with the systems to implement them and their financial management, formulation of rules for waste discharge and disposal, and awareness-raising for citizens and private businesses.

- To establish a sustainable waste management system, it is necessary to implement measures based on a consistent long-term policy while anticipating changes in the quality and quantity of waste in relation to economic activities and urban development. However, the policies and systems that serve as the legal basis for such measures are often undeveloped. Even when such systems do exist, they lack effectiveness, have low profitability, or are highly dependent on public resources. Therefore, JICA provides support for the formulation of the master plan in the initial stage of the cooperation through technical cooperation for development research in order to shape the medium- to long-term policy. The roles of each stakeholder and the core elements of regulations and management can also be clarified in this effort.[10] The master plan will define and specify the measures and facilities to be introduced in stages and the importance of these in terms of policies along with the rationale for financial measures, thereby contributing to the awareness of decision makers and the improvement in prioritizing such policies.
- In accordance with the master plan, a combination of the following can be implemented on a grant or a loan to facilitate early achievement of results: improvement of collection/transportation vehicles and equipment for disposal sites, and capacity development for the entities operating the waste management project. Communication to decision makers and citizens will also be stepped up.
- Cooperation plans should be formulated with consideration given to socially vulnerable groups (e.g., slum dwellers, waste pickers, low-caste groups) engaged in informal waste management, so that benefits will reach these people.

(ii) Stage 2

- As economic development progresses, the amount and composition of waste generated will change along with the expansion of production and consumption, which in turn may change the problems and goals that need to be addressed. The difficulty of securing land for final disposal sites should also increase. Consequently, there must be an increased awareness of the need for efficient

[10] In identifying needs, the following seven aspects will be considered: (1) improvement of the legal system, (2) improvement of the organization, (3) improvement of finances, (4) promotion of appropriate cooperation with the private sector, (5) promotion of initiatives by disposal business operators, (6) promotion of citizen participation, and (7) consideration of culture and society.

use of resources and a growing concern among citizens for the entire community's living environment.

- In line with this situation, JICA aims to promote waste reduction by introducing management methods with low environmental impact (e.g., the Fukuoka Method for final disposal) and measures that reduce the amount of waste generated and the amount of final disposal (e.g., sorted disposal, intermediate treatment, and recycling). JICA considers grant aid for the improvement of unprofitable final disposal sites. For the introduction of waste reduction methods, JICA is willing to promote the 3Rs, foster industries that turn solid industrial waste into reusable resources, facilitate participation of the private sector, and seek cooperation with citizen groups.
- Building on the results of the cooperation to date, when there is a need for expansion to other cities, JICA considers support to scale up the project by means of JICA's loan aid (assuming the possibility of project-type loans, development policy loans (DPLs), and program loans) and collaboration with other organizations.
- For waste that requires special consideration, such as infectious or hazardous waste, JICA also work with relevant ministries and agencies in the health and economic sectors to support the formulation of policies and laws and the improvement of treatment capacity.
- In addition to establishing tax and fee collection systems along with regulatory measures to prevent environmental pollution, it is also necessary to incorporate measures such as the introduction of economic incentives to encourage voluntary efforts by businesses, citizens, and others into policies and systems. Public awareness-raising and private-sector partnerships must be promoted to gradually build a consensus regarding the burden of beneficiaries. Revising the responsibility and cost sharing between the government and disposers and extending producer responsibility through such efforts should internalize external diseconomies and lead to transforming the entire social system.

(iii) Stage 3

- The shortage of final disposal sites in each city, along with the increased environmental awareness of citizens and businesses and a growing understanding of the beneficiary-payment principle through building a consensus regarding treatment costs, may drive the shift from a market-oriented society based on mass production, mass consumption, and mass disposal to a society where resource consumption is controlled to reduce the burden on the environment. JICA supports the introduction of laws and policies to curb waste generation, introduce extended producer responsibility, and promote the

recycling and effective use of resources.

- As the responses become more sophisticated and refined (including efforts such as fostering the industries that turn solid industrial waste into reusable resources and handling hazardous waste and other difficult-to-dispose materials such as e-waste), the private sector may have a greater role to play regarding financing and technology development. JICA takes note that the role of administration shifts to a position of introducing both regulations and incentive measures and developing systems and environments that enable economic actors to take the initiative and lead innovation.
- In cities where a basic waste management system has been established, the goal is to realize a Sound Material-Cycle Society through the establishment of comprehensive waste management that takes into consideration resource recycling and environmental impact. This is to be promoted by sharing and introducing technologies for waste reduction, recycling, energy conversion, and combating climate change in the light of the economic and technological levels of partner countries. In doing so, Japan's experience must be shared in a multi-layered manner, covering the development of legislation like the Basic Act for Establishing a Sound Material-Cycle Society (Japan) by the government as well as specific efforts by each actor.

Task	Approach	Specific inputs ■: Technical support, □: Financial aid
Stage 1 Establish waste management flow and maintain to improve public health	- Collect and understand waste data - Review short-term improvement measures and formulate medium- to long-term policies - Develop a waste management flow and management structure	■ Organize the definition and classification of waste ■ Understand the waste flow by introducing inspection methods and improving data management capabilities ■ Formulate the basic policy and master plan for waste management improvement ■ Improve capacity of the planning and implementation at each stage of the waste management flow (Develop rules and guidelines for collection, transportation, and final disposal; improve the competence of personnel in charge of waste management operations) □ Improve equipment and facilities (including collection and transport equipment, heavy

		machinery for disposal sites, transfer stations, and disposal sites)
Stage 2 Reduce the environmental impact through proper waste management and reduction	- Develop plan and introduce technologies and equipment for waste reduction and intermediate treatment; - Strengthen legal and institutional base	■ Support the formulation and implementation of waste reduction plans ■ Optimize organizational and financial systems by streamlining operations and improving fee collection ■ Support the development of legal system, planning, and implementation for the promotion of the 3Rs and development of recycling businesses ■ Promote resident education and private-sector cooperation (social norms, environmental laws, and public relations strategies) ■□ Introduce intermediate treatment facilities and environmentally friendly disposal methods (sorting, composting, sanitary landfills, etc.) ■ Support the formulation of policies and legal systems concerning waste that require special considerations such as infectious or hazardous waste, and development of the capacity to enforce such policies and systems
Stage 3 Promote a Sound Material-Cycle Society through a wide range of actors	- Introduce measures that facilitate waste reduction and resource reuse - Strengthen financial base	■ Support the introduction of regulations, incentive measures, and an Extended Producer Responsibility system that will lead to increased producer responsibility ■ Pursue technological innovations and scale up such innovations by expanding partnerships (build and operate collaborative platforms) ■□ Support the mobilization of private funds and the introduction of Japanese technologies □ Improve intermediate treatment (Incineration power generation: yen loans; recycling and

		small-scale incineration: private-sector collaborative projects)

Priority countries:

African countries (promote mutual learning through the African Clean Cities Platform), Asia (Indonesia, Philippines, Myanmar, Bangladesh, Sri Lanka, and Malaysia), Oceania (J-PRISM), Central and South America (promote interregional cooperation centering on the Dominican Republic), and the Middle East (Palestine)

Countries in need:

Asia (Thailand, Vietnam, Cambodia, and Laos), Central and South America (share the results from efforts in Oceania countries with island countries, Peru, and Brazil), and Middle East (Egypt, Iran, and Turkey)

2) Promotion of healthy environment through appropriate environmental regulations and pollution control

Environmental regulations

JICA contributes to the prevention of pollution and environmental contamination by progressively strengthening the capacity of environmental management entities (both the central government, which is responsible for the development of policies and systems at the national level, and local governments, which are responsible for implementation at the city level) to monitor and analyze pollutants in order to understand the status of pollution, and to set and enforce environmental standards and emission regulations.

To address water pollution, JICA also supports entities operating public wastewater treatment to strengthen their capacity, develop treatment facilities, and promote the introduction of technologies, all of which are aimed at keeping the discharge of harmful substances into the environment below the environmental regulation limits. In doing so, it should be noted that the most appropriate technologies and facilities need to be selected according to the actual state of environmental pollution and the capacity of the administrative body in the target municipality regardless of stage as described below.

(i) Stage 1

Capacity building on systems for monitoring and generating inventory of pollutants, strengthening analytical capacity, and supporting the introduction of effective environmental regulations must be prioritized.

- Materials and equipment for identifying and analyzing pollutants have to be necessary for improving the capabilities to undertake research and analysis of environmental impacts and actual health hazards. In this regard, JICA

considers integrated support, including the provision of equipment through a grant aid.

- The results of environmental monitoring and impact assessment must be used to raise awareness among citizens and companies through information disclosure and to promote understanding of the actual state of pollution, its impact on the living environment, and the need for action.

(ii) Stage 2

- To ensure the effectiveness of environmental regulations, JICA supports strengthening the capacity to plan and implement measures such as identifying pollution sources and controlling the generation of pollutants through regulatory approaches.

- To make appropriate enforcement of laws and regulations, , collaboration with the central government should also be given to secure and strengthen the involvement of various stakeholders, including the business sector while the cooperation focusing on local governments.

- In addition to stepping up monitoring throughout society by means of information disclosure and measures to raise environmental awareness among residents, JICA will prevent the formation of inappropriate economic interests and encourage appropriate cost sharing.

- Once a wide-closed water area gets polluted, it takes a long time and a large amount of money to restore healthy water quality. Therefore, water quality management of wide-closed water areas with a high concentration of population and industry requires comprehensive and systematic water quality improvement measures. In addition to the application of effluent standards and regulations for each discharge source, JICA will consider measures to reduce the pollution load in stages by introducing total volume control.

- When formulating the master plan and other plans for urban environmental improvements, including water quality improvement, JICA aims to promote comprehensive urban environmental improvement efforts to create clean cities in cooperation with other organizations by means of not only technology transfers through technical cooperation projects, but also sector loans, DPLs, etc.

(iii) Stage 3

- To achieve target environmental standards, JICA considers further strengthening the effectiveness of pollution control measures in line with the progress in improving the capacity of government agencies. From the perspective of preventing risks such as transboundary migration and

infiltration into soil and water sources, as a framework for regional and cross-sectoral coordination, JICA suggests partner countries to establish a regular information sharing mechanism among relevant ministries, agencies, and local governments, and a platform to promote cooperation with businesses and access points for dialogue with citizens.

- To address air pollution, measures against dioxin, PM 2.5, and other pollutants that require the introduction of advanced measurement technologies are also needed.
- It is also necessary to support the ability to develop policies and systems that can comprehensively introduce not only direct regulatory methods, but also economic methods, procedural methods such as environmental impact assessment systems, and informational methods such as the adoption of eco-labels. In addition, these measures will help set up a system and environment that facilitate companies, citizens, and others to invest in necessary environmental measures, thereby improving the capacity of society as a whole to cope with environmental issues.

Task	Approach	Specific inputs ■: Technical support, etc. □: Financial aid
Stage 1 Understand the current situation and analyze the problem structure	- Improve scientific knowledge and analytical skills	■ Establish an environmental management organization or identify issues in capacity development ■ Improve pollutant monitoring and analysis capabilities ■ Conduct pollution source inspections, prepare and update pollutant inventories, and disclose pollutant information ■ Introduce and practice methods for environmental impact and risk assessment ■ Study waterborne infectious diseases and health hazards attributable to air pollution □ Provide equipment for environmental monitoring

Stage 2 Establish a framework for and strengthen the implementation of measures	- Formulate and implement measures based on scientific evidence	■ Improve the capacity to review and formulate measures for reducing pollution load according to pollution sources (provide support for the establishment of environmental standards and regulations, master plan, etc.) ■ Support the development of policies, legal systems, and standards based on scientific scenarios ■ Improve the capacity to disclose information and raise public awareness
Stage 3 Improve the effectiveness of pollution control measures (toward the achievement of environmental standards, etc.)	- Strengthen control and monitoring of discharge of pollutant - Implement wide-area/transboundary coordination mechanisms	■ Introduce watershed-based integrated water quality management and support the development of necessary laws and institutions ■□ Develop cross-sectoral planning and monitoring systems ■ Reflect changes in national policies and legal systems □ Prepare air pollution control equipment, etc. ■□ Support the development and introduction of alternative technologies to control the generation of pollutants ■ Support the introduction of investment in environmental measures

Development and operation of wastewater treatment facilities

In planning the construction of facilities, the size and demographics of the target municipality, local water environment, pollution situation, water quality standards to be achieved, capacity of the operating entity, and economic efficiency and other factors should be comprehensively considered. Wastewater treatment facilities of the type that best meets local needs[11] (collective or decentralized type) should be developed.

[11] Generally, the treatment systems that can be developed depend on the stage of economic development as follows. Phase 1: decentralized wastewater treatment facilities mainly for sewage treatment (septic tanks, etc.). Phase 2: combination of decentralized and centralized wastewater treatment (sewerage). Phase 3: expansion of centralized wastewater treatment (sewerage). Citywide Inclusive Sanitation (CWIS) will be realized by optimizing the process flow from the generation of sewage and sludge to treatment (Sanitation Service Chain) through the introduction of appropriate technologies upon determining the stage of development.

At the same time, JICA supports the operating entities in promoting the introduction of technologies and improving their operational capacity.

The formulation of a master plan for improvement of water quality and urban environment is effective from a medium- to long-term perspective. JICA aims to promote comprehensive efforts to improve the urban environment and create clean cities by not only applying the results achieved through technical cooperation, but also using sector loans, DPLs, etc., working together with other organizations.

When developing sewerage systems, securing a sustainable operation system and financial base is a prerequisite in addition to long-term and large-scale investments. For this reason, JICA considers support for not only strengthening the capacity of the entities responsible for the operation and maintenance of facilities, but also for developing a system to collect fees from wastewater dischargers and other necessary systems, through technical cooperation and other means. In doing so, JICA tries to utilize Japan's experience and technologies in improving the water environment.
In cities with a weak public financial base and where action is urgently in need, JICA may consider options for comprehensive support, including grant aid from the perspective of early control of environmental pollution risks. On the other hand, for cities where a fee collection system has been established and a certain amount of revenue can be expected, and for projects that require large-scale facilities or are expected to be developed across multiple cities, JICA will consider the introduction of loans through medium- to long-term action scenarios, including Phase 3.

Approach	Specific inputs ■: Technical support, etc. □: Financial aid
- Improve the capacity to develop and operate treatment facilities - Secure and strengthen the financial base - Diversify finance	■ Research the status of access to and services related to wastewater treatment and sanitation facilities ■ Improve the ability to study treatment methods and treatment areas, and formulate facility development plans through the formulation of a wastewater treatment master plan, etc. ■ Strengthen the management system necessary to implement measures (manage facility operations, clarify income and expenditure plans, strengthen the financial base by securing public funds, etc.) ■ Strengthen the operation and maintenance capabilities of wastewater treatment plants ■ Consolidate the financial base through the collection of fees and promotion of investment

	□ Improve sewerage and wastewater/sludge treatment facilities □ Improve wastewater treatment facilities (including advanced treatment) and sewerage systems

Priority countries

Water pollution: Asian countries (Indonesia, Philippines, Vietnam, Myanmar, Cambodia, India, and Nepal)

Air pollution: Thailand, Myanmar, Mongolia, Iran, and Kosovo

Countries in need

Water pollution: Pakistan, Sri Lanka, Mongolia, African countries, and Central and South America (promotion of third-country training and regional cooperation)

Air pollution: Countries and cities where measures against pollution from large-scale stationary sources (thermal power plants, etc.) and mobile sources (automobiles, etc.) are highly necessary (examples include Bangladesh and India)

(5) Input and outcome results

- The average annual input in the field of environmental management from Japanese fiscal year 2017 to 2019 was approximately 6 billion yen[12] in technical cooperation, 3.9 billion yen in grant aid, and 78.5 billion yen in yen loans. Through these programs, approximately 6,200 engineers and government officials are trained every year.

- Owing to the nature of this field, which requires time to achieve quantifiable results, there are many cases of step-by-step improvements, capacity development, and area expansion by continued involvement through cooperation over a relatively medium- to long-term period. The main models for scaling up the results of cooperation are: (1) expansion of service areas and upgrading of treatment capacity in relevant cities, (2) spreading the area of coverage within the country, and (3)

[12] This includes the actual results from grass-roots projects, SATREPS projects, private sector collaboration projects, and other projects and programs that are not under the control of the Global Environment Department (fiscal 2018 and 2019).

expansion through reflection in the policies of the central government.

- Major examples of cooperation:
  - ✓ Dhaka in Bangladesh (Waste: Improve the capacity to deal with issues in phases through master plans, grant aid, technical cooperation projects, and volunteer teams)
  - ✓ Pacific Islands/J-PRISM (Waste: Improve regional capacity through regional cooperation)
  - ✓ Ulaanbaatar in Mongolia (Air pollution: Perform monitoring, regulatory development, and implementation of measures)
  - ✓ Vietnam (Water pollution: Improve the capacity to formulate policies for watershed water quality management and reflect them in national legislation)

  Thailand (Environmental regulations: Gradually develop laws and regulations for issues at each stage of development and sophisticate environmental regulations)

(6) Scale of inputs

- Technical cooperation (Development research, technical projects, and preparatory surveys for cooperation): About 15 cases per year
- Grant aid (under the control of the Global Environment Department): About five cases per year
- Loans: About five projects per year (mainly on wastewater treatment) plus sector loans, DPLs, etc.

(7) Relationship with other Global Agendas

In each of the following Global Agendas which is closely related to achieving the goals of this Global Agenda incorporate the perspective of environmental management in the planning of these agendas, and mainstreaming efforts to consider and conserve environmental quality across sectors.

1) Urban and regional development

Environmental management issues are closely related to human socio-economic activities, and it is important to include environmental considerations from the basic conceptualization and early stages of city planning to achieve sustainable urban development.

2) Improving safe water and sanitation

Since the need for wastewater treatment generally increases after the expansion of the water-supplied population along with the development of water supply facilities, JICA may consider rolling out cooperative efforts in the field of wastewater treatment in collaboration with the target countries of Global Agenda “Supporting the growth of water utilities – Urban water supply –” based on their current conditions and achievements.

3) Public health and medicine

Maintenance and improvement of urban sanitation can contribute to the prevention of the spread of both waterborne diseases and infectious diseases and to the control of health risks such as respiratory diseases caused by harmful substances. Accordingly, JICA aims to mutually improve the health and environmental awareness of citizens through educational activities in cooperation with public health and medical institutions.

4) Conservation of the natural environment

Conservation of the natural environment is the foundation of sustainable development. Through this Global Agenda, JICA will promote the prevention of pollution risks and the effective use of natural resources through environmental management measures and contribute to the comprehensive conservation of natural environmental resources in close cooperation with efforts for the protection and restoration of ecosystems along with building their resilience to change.

5) Climate change

Promoting the realization of a Sound Material-Cycle Society by ensuring healthy environment and waste management will lead to the reduction of greenhouse gas emissions and form the basis for building a decarbonized society.

5. Strategic Approaches for the Global Agenda and Clusters

(1) Strategic promotion through the JICA Clean City Initiative and other initiatives

- Cooperation in environmental management is not only important for human security and high-quality growth in the partner country, but also contributes to combating environmental problems and infectious diseases on a global scale and is an area where Japan can demonstrate its strengths and leadership. On the other hand, developing countries tend to give priority to economic development, and governments do not necessarily give high priority to policies and infrastructure development in this field, regardless of the needs of the people. Therefore, it is necessary to actively facilitate project development by encouraging the understanding of the partner country's government regarding the significance of this area in cooperation with the Government of Japan.

- For this reason, Japan’s cooperation based on this Global Agenda, JICA Clean City Initiative, with the aim of delivering clean cities in partner countries. JICA aims to promote the cross-sectoral and comprehensive promotion of this Initiative with a focus on urban areas.

- Based on the concept of the JICA Clean City Initiative, JICA aims to engage in expansive support for comprehensive waste and wastewater management in both urban and selected non-urban areas according to the actual situations. For example, efforts in the Oceania region will be conducted under the JICA Oceania Clean Initiative.

- JICA will communicate the significance and goals of these initiatives both internally and externally. These initiatives aim to strategically promote crosscutting and comprehensive contributions to the application of Japanese experience and technologies, cooperation with local governments and companies, human resource development and enlightenment education at various levels, utilization of innovations, and measures against COVID-19 and other infectious diseases.

- JICA also aims to create best practices that will lead efforts in partner countries and encourage the expansion of impacts to other cities or the adoption of such practices throughout the country. JICA is willing to scaling up the benefits by encouraging efforts by the central government through DPLs and sector loans, nationwide expansion, and collaboration with development partners.

(2) Application of Japanese experience and technologies and collaboration with local governments, companies, and research institutes

For technical and financial cooperation, the know-how of Japanese local governments regarding environmental administration and the products and technologies of Japanese companies will be actively utilized. JICA may promote participation through public-private partnership projects, overseas loans and investments, civil participation projects, and grant aid, etc., with local governments. Through these activities, JICA may also consider to promote overseas activities by Japanese companies using their products and technologies, inter-city cooperation and human resource development of local governments, and expansion of overseas operations of local companies.

(3) Diverse human resource development and environmental education, including the JICA Development Studies Program

- To develop leaders in the environmental field, long-term trainees will be accepted under the JICA Development Studies Program for candidates for senior positions in central government environmental administrative organizations and major cities. The Program draws on Japanese experience in training and form a network for trainees with relevant Japanese parties.

- Training on Environmental management should be provided in Japan or third countries. The training programs will be an opportunity for the participants to objectively recognize their own issues by comparing them with those of other countries and cities. Participants can also learn about case studies and initiatives in Japan and other host countries, which is also aimed at contributing to the development of projects for technical cooperation, etc., and producing and increasing successful results continuously.

- In order to promote awareness-raising among local residents and environmental education in the field, JICA is able to apply the experience of local governments in Japan to each project and promote collaboration through the JICA grassroots partnership program and activities by the overseas cooperation volunteers.

(4) Applying innovation

- While many developing countries are still working to establish basic legal and administrative systems, they have the potential to introduce new concepts (e.g., Sound Material-Cycle Society and discharger regulations) and advanced technologies at an early stage of development. This does not mean that they should

be guided to follow in the footsteps of Japan; rather, JICA aims to bring about an efficient paradigm shift by avoiding foreseeable risks, adopting approaches that allow leapfrogging, and collaborating with partners who share our vision.

- In particular, individual cooperative projects can explore the applicability of innovative DX-based technologies to the improvement of waste management, such waste generation monitoring and waste collection improvement using GPS and GIS, optimization of disposal site management by means of aerial photography using camera drones, and the introduction of automated monitoring for water pollution and wastewater treatment plant management.

- In addition to technical aspects, JICA actively considers new concepts that will bring about social change, including “zero-waste” and the “sharing economy,” as well as measures to reduce the environmental impact of production and consumption, with the aim of contributing to the sustainability of the entire supply chain.

(5) Promotion of environmental management as preventive measures against COVID-19 and other infectious diseases

The improvement of public health through environmental management efforts contributes to the prevention of the spread of various infectious diseases, including COVID-19, and the prevention of serious illness in infected people. During the emergency period in the early stages of the spread of infection, it will be necessary to prevent infection and ensure the safety of workers while keeping up social services such as waste collection and disposal and wastewater management and dealing with the explosive increase in infectious wastes. In the medium- to long-term, measures also need to be taken with consideration given to the risks of economic and logistical stagnation and financial deterioration.

1) Securing the infrastructure for the continuity of urban services in an emergency phase (short term)

- Continuity of waste collection and disposal through provision of equipment and materials for COVID-19 response

- Reducing the risk of spread of infection by supporting the development and dissemination of guidance and guidelines for service workers and residents

2) Promoting the rationalization and strengthening of urban service provision infrastructure (medium term)

- Strengthening service operation infrastructure through rationalization of waste collection and transportation, development of business continuity

plans, and awareness-raising among residents

- Promoting sanitation improvement by expanding wastewater treatment services (including promoting centralized systems that connect all houses in the community) and strengthening water quality monitoring, both through supporting the raising of awareness of sanitation among residents

3) Promoting comprehensive infection risk reduction through the development of a sanitary urban environment (medium to long term)

- Controlling the risk of infection and improving urban sanitation through proper management of waste, including infectious waste
- Continuous improvement of urban sanitation through the promotion of developing wastewater treatment facilities
- Reducing the long-term risk of serious illness by means of air pollution monitoring and support for action planning

(6) Scaling up by means of DPLs and collaboration with development partners

- For DPLs, a policy matrix consisting of multi-year policy actions to be taken by the partner country will be developed, and this will be used to engage in dialogue with the partner country's relevant officials (Ministry of Finance, competent ministries and agencies, Ministry of Planning, etc.) and other donors in order to facilitate improvements through financial support. The policy matrix will be developed in collaboration with other Global Agendas as necessary. When formulating projects, JICA may seek collaboration with other projects (including related technical cooperation projects) and co-financing with other donors.
- JICA leads the African Clean Cities Platform (ACCP) and the Japanese Technical Cooperation Project for Promotion of Regional Initiative on Solid Waste Management (J-PRISM) in the Oceania region. While promoting the sharing and dissemination of knowledge among administrative agencies in partner countries as well as collaboration among various stakeholders, including international organizations, JICA aims to promote positive outcomes through cooperative efforts across other JICA efforts and targets and scale them up with external funding and resources over a wider area.
- Furthermore, JICA will promote efficiently scale up and expand the deployment of benefits from development projects through active utilization of JICA's external

partnerships, initiatives,[13] and other collaborative infrastructure, in addition to the resources of other organizations.

- For each project, JICA can make collaboration and co-financing with the Government of Japan (specifically, the Ministry of the Environment), international organizations (notably those funded by the Government of Japan), multilateral development banks (MDBs), and other donors.

END of Document

[13] At the global level, JICA will work with the government-led Japan Platform for Redesign: Sustainable Infrastructure, Waste Wise Cities Campaign, Alliance to End Plastic Waste, and C40. At the regional level, JICA envisions cooperation with ACCP in Africa, J-PRISM in the Oceania region, and the 3R Promotion Forum and the Water Environment Partnership in Asia (WEPA) for the Asian region, to give some examples.

What is the JICA Global Agenda?

JICA's cooperation strategies for global issues. JICA, with its partners, aims to show global impacts realizing the goals set under JICA Global Agenda. JICA Global Agenda and its goals will be shared among partner countries and various actors, enhancing dialogue and collaboration, therefore, maximizing the development impacts. Through these efforts, JICA will comprehensively contribute to the achievement of the SDGs by 2030 as well as realize Japan's Development Cooperation Charter which focus on "human security," "quality growth," and "addressing global challenges".

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Japan International Cooperation Agency (JICA) is an international cooperation organization that is centrally responsible for the implementation of bilateral assistance among Japan's Official Development Assistance. JICA cooperates with about 150 countries and regions around the world.

https://www.jica.go.jp/english/our_work/thematic_issues/index.html