



International Environmental
Technology Centre

Annual Report

2018

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United Nations
Environment Programme



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Technology Centre

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2018



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Message from the Director



Keith Alverson
Director,
International Environmental
Technology Centre
United Nations
Environment Programme

The year 2018 was a great one for IETC. As outlined in this, our first ever, annual report, we have delivered substantial results aligned with the waste management goals in the United Nations Environment Programme's programme of work, and in particular with resolution 7 of the second session of the United Nations Environment Assembly. These have included regional waste management outlooks and global thematic reports as well as substantial work assisting countries and municipalities to improve waste management on the ground. In this introduction, I highlight just two of our reports – the *Africa Waste Management Outlook* and *Single Use Plastics: A Roadmap to Sustainability*. But don't stop reading here - for a more thorough look at all of our work in 2018, I invite you to delve into the rest of this inaugural annual report.

According to our *Africa Waste Management Outlook*, 125 million tonnes of municipal solid waste was generated in Africa in 2012, a figure that is on track to double by 2025. On average only about half of this waste is collected, and of that which is collected, 90% is disposed of at uncontrolled dumpsites or landfills. Dealing with this massive problem in a hypothetically steady state environment would be an enormous challenge. Reality is even more challenging. Africa is urbanizing and developing rapidly while also attempting to build resilience to dramatic climatic change. Average population growth on the order of 2.5% is more than double that of any other continent. In many African countries, a rising middle class is consuming at least an order of magnitude more goods and services than their parents did, or indeed than their current national average consumption levels. The ongoing social and economic transformation is certainly providing benefits and opportunities, but it is also bringing new challenges, including the need to deal with waste.

As the son of an anthropologist, I spent two years in the 1970s as a child in rural Botswana herding goats. Our family of four lived in a mud and dung walled, thatch roofed hut without running water or electricity. Even with this effort to integrate, ours was the only family in the area that appeared to produce any waste at all. We dug a pit for things like used teabags and empty bottles and tin cans – essentially our own little uncontrolled dumpsite. To our surprise, no matter what we threw in the pit, it was usually gone within a day. After two years, the pit was still empty. Everything organic had been eaten by local pigs, goats and chickens, and as far as everything else was concerned, well, it seems that we had been mistaken in thinking these things were trash when they were in fact valuable resources that our neighbors had been very happy to remove and repurpose.

Since the 1970s, Botswana has developed rapidly and continues to do so. For almost everyone in the country, life bears little resemblance to that of the rural village of my youth. Indeed, a recent paper called attention to the problem of plastic waste in Botswana and the failure of a decade-old plastic bag levy, instituted in 2007 to encourage the use of biodegradable alternatives and protect the environment, due to “institutional vacuums and failures.” Botswana is not alone in grappling with single-use plastic waste, and this brings me to another IETC report produced this year: *Single Use Plastics: A Roadmap to Sustainability*, which provides a global overview of extant national-level plastic bag bans and levies and their impacts to date.

As shown in this report, specific product bans can sometimes have some positive effects, but most of the time they either don't have a demonstrable effect or there is insufficient data to assess their effectiveness. In any case, product bans do nothing about the underlying root cause of plastic pollution, which is not so much the fact that we use plastic – which is an extremely versatile and useful material – as our overuse, failure to reuse and recycle, and failure to put in place integrated solid waste management. About three-quarters of municipal solid waste generated in Africa is recyclable, yet only 4% is recycled. It is time to learn some lessons from the *batho ba botlhale* (wise old folks) from my childhood in Botswana who could still remember the value in the waste that my family misguidedly threw into a pit in the 1970s.

Building on the results shown in this annual report for 2018, we look forward to guidance on new directions from our Member States at the fourth session of the United Nations Environment Assembly to be held in Nairobi, in March 2019, and subsequent discussions amongst our International Advisory Board on how to implement this guidance, when they convene in May 2019 in Osaka, Japan.



Keith Alverson
Director,
International Environmental Technology Centre
United Nations Environment Programme

IETC's Vision

The International Environmental Technology Centre (IETC) works with developing countries to implement sustainable solutions to environmental challenges, with focus on holistic waste management.

To realize this vision, we provide technical and advisory support to national and local governments to enhance their use of environmentally sound strategies and approaches. We also implement in-country demonstration projects using innovative waste prevention and management methods and technologies to improve human well-being, reduce the impact of climate change, increase resilience and create jobs. We work with governments as well as academia, civil society and the private sector. We provide learning opportunities around the world and organize public outreach activities, expert groups and policy dialogues. Working with a wide range of partners and in line with relevant multilateral environmental agreements, our mission is to serve as a global centre of excellence on environmentally sound technologies with focus on holistic waste management.

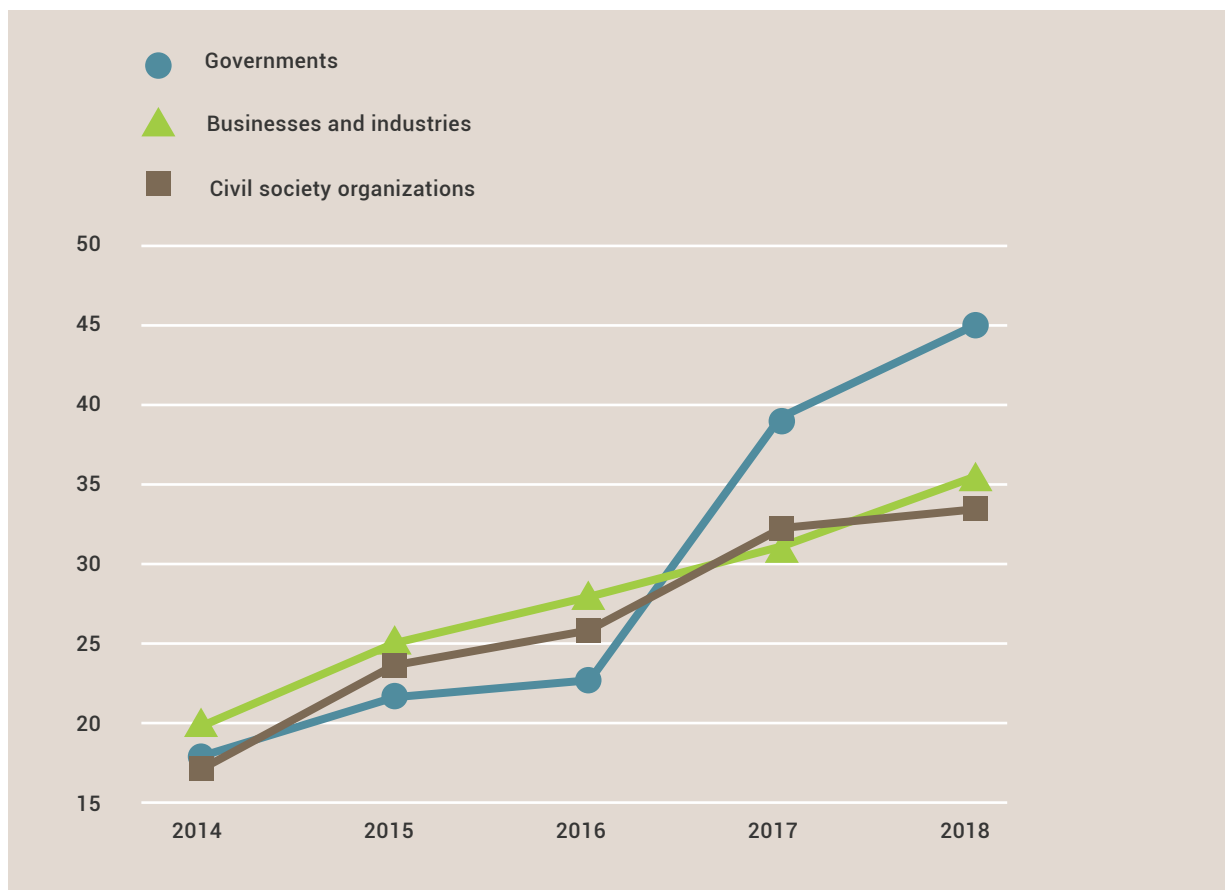
The United Nations Environment Programme promotes environmentally sound practices globally and in its own activities. This publication is available as an electronic document. Our distribution policy aims to reduce the carbon footprint of the United Nations Environment Programme.

Results Achieved in 2018

IETC is playing a key role in achieving one of the three expected accomplishments of the United Nations Environment Programme's programme of work on chemicals, waste and air quality, particularly on promoting the scientific and technical knowledge and tools needed to implement sound waste management in countries, including among major groups and stakeholders. The number of governments, private-sector entities, and civil society organizations using risk assessment and management tools for sound waste management with the support of the IETC has been increasing steadily over the years (2014-2018). This includes governments that have developed and implemented national and city level waste management strategies, businesses that

have developed and implemented best practices to prevent and manage waste soundly, and civil society organizations that have embraced holistic waste management approaches, such as universities and non-governmental organizations.

Countries, including Major Groups and stakeholders, increasingly use the scientific and technical knowledge and tools needed to implement sound waste management and the related multi-lateral environmental agreements



- Governments
- ▲ Businesses and industries
- Civil society organizations

In 2018 alone, **four** national governments, **two** local governments, **one** private-sector entity, and **three** civil society organizations began using sound waste management tools and technical knowledge with the support of IETC.

For example

● IETC worked with the Mandalay City Development Committee in Myanmar in cooperation with the Institute for Global Environmental Strategies Centre Collaborating with United Nations Environment Programme on Environmental Technologies (IGES-CCET) to develop a waste management strategy and action plan for Mandalay. The plan is an inclusive one, involving a range of stakeholders, including the informal sector, in its envisioned future waste management practices. Though focused at the city level, it links to Myanmar's National Comprehensive Development Plan and sets out a series of clear objectives with achievable targets over three periods, from short to long term. The Mandalay Regional Government and Mandalay Regional Parliament allocated additional financial resources for the implementation of the action plan in its 2018 budget. This plan succeeded in providing a systematic approach and mobilizing resources for waste management in the city, and thereby helped contribute to a healthier future for the growing population and the environment in Mandalay.

■ IETC worked with a consortium of Latin America and Caribbean universities in developing a graduate curriculum on sustainable waste management, a first for the region. Since then, Universidad de Ciencias Aplicadas y Ambientales in Colombia, the coordinator for the consortium, has received approval to offer a master's programme on holistic waste management. Based on these curricula, pilot training courses were convened in Venezuela (national) and Chile (regional). The curriculum will now be disseminated through the ARIUSA network to over 400 universities in Latin America and the Caribbean.

▲ In 2018 IETC also continued to promote its guidelines and tools on environmentally sound waste management to the private sector. Sunpower Corp., a Yokohama-based private sector entity involved in auto tire recycling, started to use IETC's compendium of technologies to recover materials and energy from waste tires in its recycling business. As Sunpower has many branches in Japan and other countries, the use of the compendium is expected to increase the amount of waste tires undergoing environmentally sound recycling, particularly in developing countries.

Waste Management Outlooks

Background and Overview

The Global Waste Management Outlook was published in 2015 in welcoming recognition of the Rio+20 outcome document “The future we want” and in response to the decision (GC 27/12) taken by the United Nations Environment Governing Council (now the United Nations Environment Assembly). It provides a pioneering scientific global assessment on the state of waste management and a call to action to the international community. It establishes the rationale and the tools for taking a holistic approach towards waste management and recognizing waste and resource management as a significant contributor to sustainable development and climate change mitigation.

In response to the positive reactions towards the Global Outlook and increasing demands from countries, United Nations Environment Assembly resolution 2/7 requested the United Nations Environment Programme to produce a series of regional waste management outlooks. Since 2017, outlooks for mountain regions, Asia, Central Asia, Africa and Latin America and the Caribbean have been released. Outlooks for West Asia and small island developing states (SIDS) will be released in 2019.



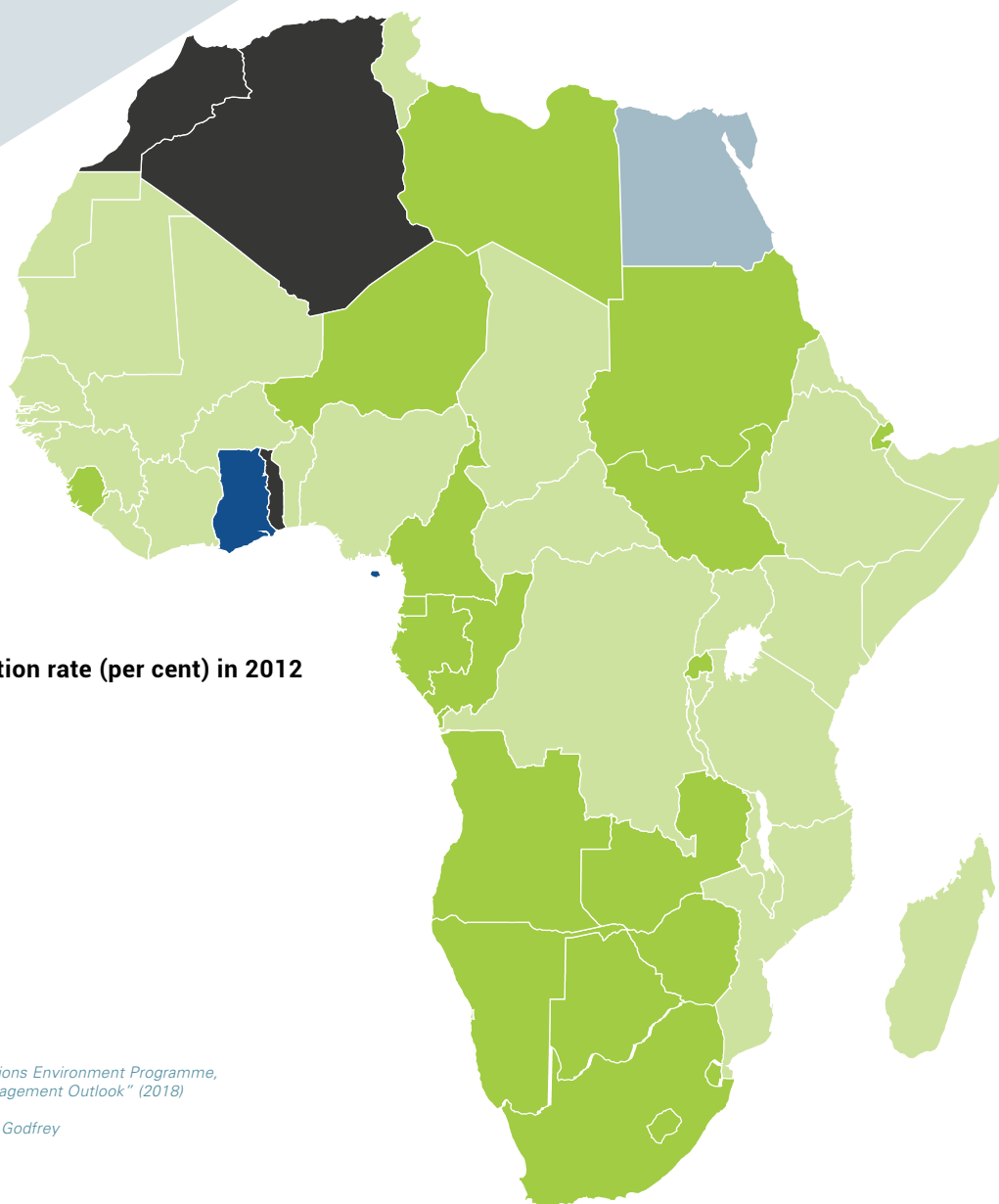
From the Africa Waste Management Outlook launch event, Pretoria, South Africa

Africa Waste Management Outlook (2018)

On 5 June 2018, the Africa Waste Management Outlook was released in Pretoria, South Africa in celebration of World Environment Day during South Africa's Sustainability Week. The launch of this report fostered synergy among the measures and the legislation that 24 African nations have so far implemented to ban or limit the use of single-use plastics.

Municipal solid waste generation is expected to reach **250 million tonnes** in Africa by **2025**. More than **90%** of waste generated in Africa is disposed of at **uncontrolled dumpsites** and **landfills**, which are often associated with **open burning**. An estimated **70-80%** of the municipal solid waste generated in Africa is **recyclable**, yet only **4%** is **currently recycled**.

The Africa Waste Management Outlook built on the process and outcomes of the Global Waste Management Outlook as well as other relevant key products and outcomes, taking into account the specific regional context and priorities. It provides an overview of regional waste management trends and challenges and assesses current policy and regulatory frameworks. It highlights the enabling governance environment to support sustainable waste management systems, underlining the impact of poor waste management practices such as marine litter on climate change and ecosystems. It also features a paradigm shift from “waste” to “secondary resources” within the vision of circular economy and suggests means for financing waste management, based on an understanding of its costs and benefits. It concludes with a set of recommendations to address the waste management challenges facing Africa and suggests solutions that are expected to be helpful for non-African countries as well.



Waste Management Outlook for Latin America and the Caribbean

The Waste Management Outlook for Latin America and the Caribbean was launched under the framework of the Forum of Ministers of Environment for Latin America and the Caribbean at a press conference in Buenos Aires, Argentina, on 9 October 2018. The presentation of the report took place on 11 October in the ISALUD University auditorium, with more than 150 people in attendance.

The outlook highlights waste as one of the main sustainability challenges in the region, as waste generation in the region steadily increases. The report calls for a regular and reliable waste collection service for the entire population, especially to reduce open dumping practices. Although the largest volume of waste broken down by type is organic waste, proper waste management is still required. Another challenge is the unsound management of special waste streams. Coherent and effective governance models are required to ensure integrated waste management and accelerate the transition towards a circular economy. It recommends informal recycling to be formalized and recognized, and that effective communication and participation by society to be encouraged. The outlook also underscores the needs for investment promotion, economic stability and data generation and collection.

A regular and reliable waste collection service for the entire population is required

- **Quantitative and qualitative improvement** in recent years
- Minor or lack of coverage in **marginalized and rural areas**
- **35,000 t/d** remain uncollected
- More than **40 million people** (7%) lack basic collection coverage

Source: United Nations Environment Programme, "Waste Management Outlook for Latin America and the Caribbean" (2018) wedocs.unep.org.
Lead Author: Attilio Savino

In Latin America and the Caribbean, **145 thousand tonnes of waste** are still disposed **daily in open dumpsites**, with **plastic waste** accounting for more than **10%** of it. Waste generation in the region is steadily increasing and it is expected to reach **670 thousand tonnes by 2050**. **40 million** people lack access to waste collection.

The launch event of the Waste Management Outlook for Latin America and the Caribbean, ISALUD University



Plastic bottle waste on the beach in Honduras

Minamata Convention on Mercury

Since 2015, IETC has been working on a global mercury waste project funded by the Government of Japan. The project focuses on assisting parties to the Minamata Convention and other countries to develop and implement environmentally sound management of mercury waste based on their national practices.

All mercury contained in products and used in industries will eventually become mercury waste.

Dealing with the vast amounts of mercury from the decommissioning of chlor-alkali facilities is an immediate challenge. A further challenge is how to manage waste containing and contaminated with trace amounts of mercury and mercury compounds.

Implementation of the Minamata Convention takes a life cycle approach to mercury waste management – minimizing or phasing out the use of mercury in products and industries while providing for the environmentally sound management of mercury waste.

Global Mercury Waste Assessment (2017)

At the first meeting of the Conference of the Parties to the Minamata Convention, IETC launched the **Global Mercury Waste Assessment** as the first-ever global report on mercury waste. The report identified waste management itself as still being a fundamental challenge for many countries. Mercury waste is often managed as part of municipal or industrial waste and disposed of as mixed waste in landfills or at open dumping sites or by open burning. Some countries have no mechanism for the separate collection of wastes, except for recyclables, and some have no formal waste collection system, no formal disposal sites, and little or no awareness of waste management. Other countries identify mercury waste in their regulatory frameworks, but do not have the capacity to implement the mercury provisions.

Field research in open dumping sites in 2018

At the second meeting of the Conference of the Parties to the Minamata Convention in 2018, IETC presented preliminary mission reports on field investigations of mercury emissions from open dumping sites. The preliminary findings identified that trace amounts of mercury are continuously emitted from open dumping sites into the atmosphere. These field investigations will be continued into 2019 and a final report will be released at the third meeting of the Conference of the Parties to the Minamata Convention.

Video of field research to measure mercury in the air at one of East Africa's largest open dumpsites.

<https://youtu.be/ZQHBkfUkVj8>





Crushing fluorescent lamps collected at the open dumping site to collect aluminium and copper as secondary resources

Open burning of waste at the open dumping site

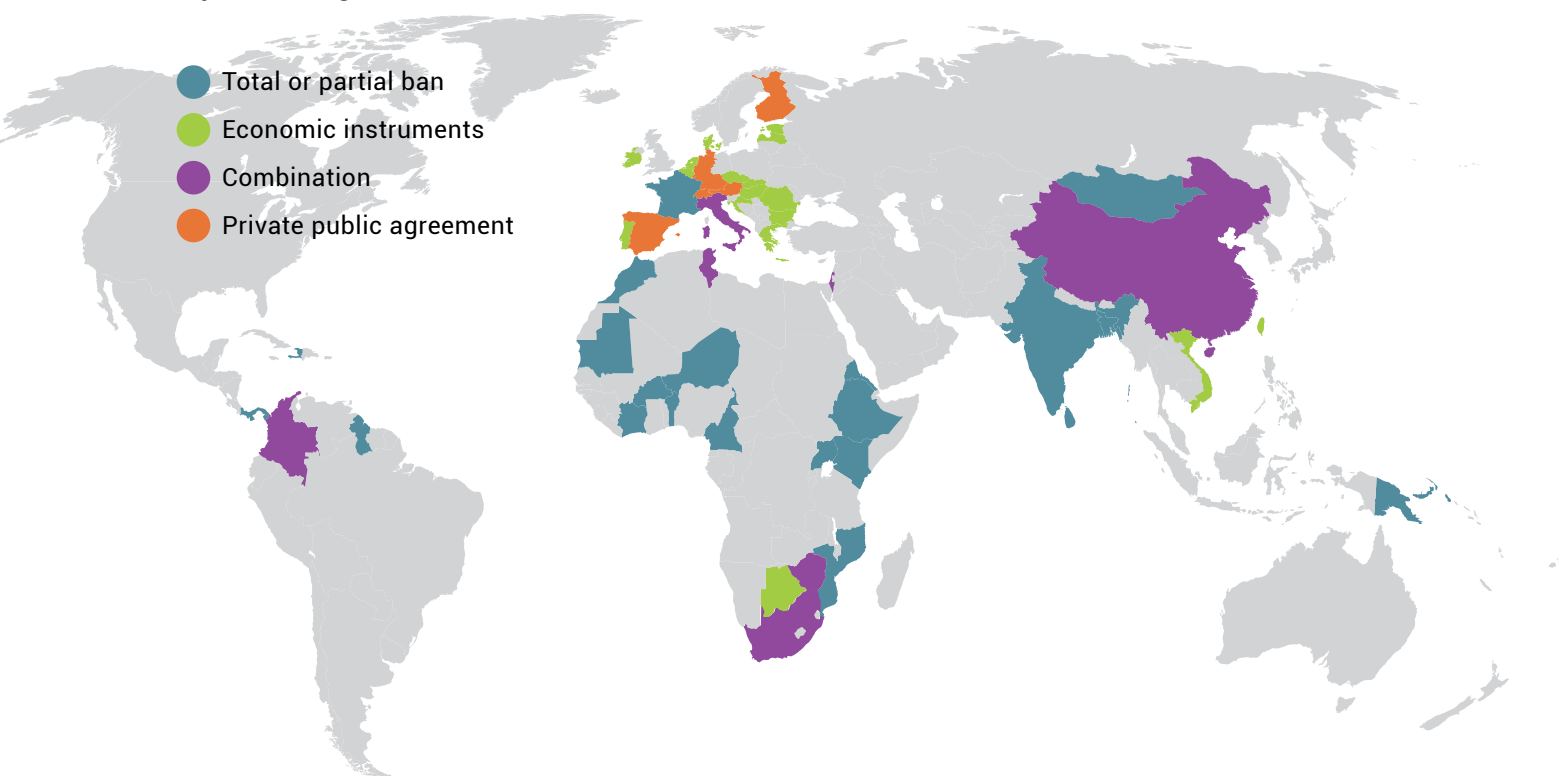


Single-use Plastics - A Roadmap for Sustainability

On the occasion of World Environment Day, the report *Single-use Plastics: A Roadmap for Sustainability* was launched in New Delhi. The theme **"Beat Plastic Pollution"** of World Environment Day 2018 reinforced the call to action to individuals, governments and public and private sector entities to work jointly towards reducing the world's dependency on plastic and decreasing the burden that plastic pollution imposes on human health, natural spaces and wildlife. Numerous ambitious commitments were made, with India leading the way with a pledge to ban single-use plastics nation-wide by 2022.

This paper sets out the latest thinking on how we can **"Beat Plastic Pollution"**. It looks at what governments, businesses and individuals have achieved at the national and sub-national levels to curb the consumption of single-use plastics. It also offers lessons that may be useful for policymakers who are considering regulating the production and use of single-use plastics. The report recommends improving waste management, promoting eco-friendly alternatives, educating consumers, enabling voluntary reduction strategies and successfully implementing bans or levies on the use and sale of single-use plastics. The report also cites the ongoing fundamental need for broader cooperation from businesses and private sector stakeholders, offering a roadmap for upstream solutions, including extended producer responsibility and incentives for adoption of a more circular economy approach to plastic production and consumption.

National level plastic bans and Styrofoam regulations



World plastic production

in 2015: **400 million**

tonnes, 36%

of which is **plastic packaging**

The report recognizes that single-use plastic waste generation and waste management practices differ across regions. While no single measure against pollution will be equally effective everywhere, the authors outline ten universal steps for policymakers wanting to tackle the issue in their communities.

The Single-use Plastics report (covered by international media including BBC and Xinhua) was 2018's most accessed report on the United Nations Environment Programme's website with 10,000 downloads.



Impact of national bans and levies on plastic bags (based on more than 60 countries' experiences)

20%

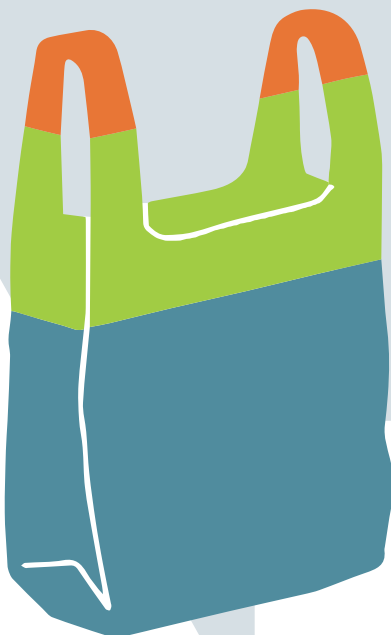
Little to no impact

30%

Reduced consumption or less pollution

50%

No data on impact



Main issues of little to no impact seems to be:

- i) Lack of enforcement
- ii) Lack of affordable alternatives

Source: United Nations Environment Programme, "Single-Use Plastics: A Roadmap For Sustainability" (2018) wedocs.unep.org.
Lead Author: Claudia Giacobelli

In-country Support

Active in-country support projects in 2018





Implementing partners include: Ministry of Environment, Cambodia; Phnom Penh Capital Administration; Cambodia Climate Change Alliance; Nexus for Development

Cambodia:

National and City Level Strategies



Photo © IGES-CCET

In collaboration with IGES-CCET, IETC:

- Conducted baseline studies on current waste data and waste management practices and published a **policy report**.
- Developed a holistic waste management strategy at both the national and the city level (Phnom Penh) in consultation with relevant stakeholders.
- Initiated a pilot project on promoting holistic waste management and the 3Rs (reduce, reuse, recycle) through environmental education in primary schools in Phnom Penh.

Project outcomes and impacts:

The city strategy was approved by the Phnom Penh City Hall in August 2018. Both the national and city strategies provide new implementation framework to decentralize waste management.

Primary students with snacks and beverage cups. Plastic waste from school vendors (such as snack bags, Styrofoam, beverage cups and straws) is a common waste management problem in primary schools in Phnom Penh.

*BACKGROUND IMAGE
Waste pickers collecting PET plastic bottles at the final disposal site*



Photo © IGES-CCET



Implementing partners

include: Varanasi Nagar Nigam; International Council for Local Environmental Initiatives South Asia; United Nations Environment Programme India Office



India:

Municipal Waste Management in Varanasi

In Varanasi, India, IETC:

- Conducted baseline studies for waste characteristics by mobilizing community support.
- Supported technical assessment and auditing of waste processing facilities, including two biomethanation plants, three decentralized recycling centres and one centralized composting plant.
- Implemented waste management practices as a pilot project in one ward in the city, including training for waste collectors.
- Developed a holistic waste management strategy in consultation with relevant stakeholders.

Project outcomes and impacts:

- More than 60% of households started to segregate waste in the ward where the pilot project was implemented
- More than 0.5 tonnes of segregated wet waste were processed daily in the biomethanation facility
- The waste collected from streets was reduced from 2.5 tonnes to 1 tonne daily.
- 430 kg of recyclables was collected and sold during the project period, generating additional revenue for sanitary workers.
- The project improved public health and created a more hygienic, cleaner environment.



Photo © Iyngararasan Mylvakanan

Waste separation for recycling in Varanasi

BACKGROUND IMAGE
Segregated waste to be collected and sent to a biomethanation plant



Implementing partners include: National Environment and Planning Agency of Jamaica; United Nations Environment Programme Latin America and the Caribbean Office; United Nations Environment Programme Caribbean Sub-regional Office

Jamaica:

Marine Plastic Litter Reduction

In Jamaica, IETC:

- Launched a Plastic Waste Minimization Project with the objective of enhancing the legislative framework in Jamaica to support the development and implementation of a national improved waste management system in order to reduce plastic marine litter generated from land-based activities
- Signed a two-year agreement in August 2018 with the National Environment and Planning Agency of Jamaica for the execution of the project.
- Organized the first steering committee meeting with relevant stakeholders.



Photo © Claudia Giacobelli

Recycling bins on the street

*BACKGROUND IMAGE
Waste in a stream in Gayle
flowing into the ocean*



Photo © Claudia Giacobelli



Implementing partners

include: Independent Ecological Expertise; State Committee on Environment Protection and Forestry; UN Environment Sub-regional Office for Central Asia; UN Environment Regional Office for Europe



Visit to a dumping site

Kyrgyzstan:

National Waste Management Strategy

In Kyrgyzstan, IETC:

- Conducted a comprehensive analysis of the existing waste management situation in Kyrgyzstan. An inventory of all existing landfills was compiled and studied for compliance with legislative requirements.
- Developed draft amendments to legislation, including the development of economic instruments for promoting the 3Rs (reduce, reuse, recycle), based on analyses and consultations with key stakeholders.
- Developed a national waste management strategy for Kyrgyzstan, including the decree of the Government of the Kyrgyz Republic "On Approval of the State Program on Sustainable Management of Wastes and Secondary Resources for 2019-2023," which was formulated using baseline studies and draft legislation. The strategy considers an integrated approach for all waste segments – municipal solid waste, hazardous, radioactive, electronic, medical, and mining sector wastes.

Project outcomes and impacts:

The legislative and regulatory framework was strengthened by analysing conflicts and gaps within the existing regulatory framework. A set of measures was developed for modernizing the waste management in line with the life cycle approach.

The State Agency on Environment Protection and Forestry of the Kyrgyz Republic expresses its gratitude to the International Environmental Technology Centre and the United Nations Environment Programme for your support on the "Delivering integrated waste solutions at the national and local level" project, implemented jointly with the "Independent Ecological Expertise" NGO. Due to the implementation of this project, an inventory of existing dumps and landfills was carried out in all regions of the republic. A draft law "On Amendments to Certain Legislative Acts of the Kyrgyz Republic on Waste Management" and a draft law "On Production and Consumption Wastes" were also developed.

The State Agency on Environment Protection and Forestry of the Kyrgyz Republic



The meeting to develop a waste management strategy



Implementing partners include: Ministry of Environment and Energy, Government of Maldives; Island Councils in zones 6 and 7.

Maldives:

Regional Waste Management Strategy and Action Plan

A regionalized waste management system divides the islands in the Maldives into seven zones. IETC in collaboration with IGES-CCET is supporting the development of a regional waste management strategy and action plan for zones 6 and 7. IETC:

- Conducted a baseline study to review the existing waste management practices at the island council level and identified key gaps in order to develop a regional waste management strategy and action plan.
- Completed a first review of the regional waste management strategy and action plan with the Ministry of Environment and Energy.
- Designed a pilot project on selected islands for integrated island-based waste management and 3R (reduce, reuse, recycle) activities.

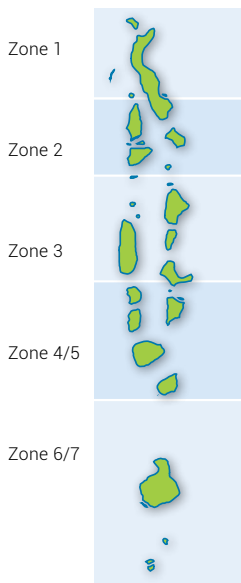
Project outcomes and impacts:

The project strengthened the capacity of 18 individual islands in zones 6 and 7 to develop their own waste management plans and actions. The introduction of the 3Rs and sustainable lifestyles is expected to increase resource efficiency and achieve environmental, social and economic co-benefits.

The regional strategy helped the Ministry of Environment and Energy to establish an institutional framework and operational mechanism for running a regional waste management centre, which is scheduled for development in 2019.



Community consultation and review of the island waste management plans



BACKGROUND IMAGE Promotion of plastic waste separation and collection, aimed at protecting the marine environment



Implementing partners

include: Ministry of Natural Resources and Environmental Conservation, Government of Myanmar; Mandalay City Development Committee; and Environmental Quality Management Co., Ltd



Waste separation and environmental education materials displayed within local communities

Myanmar:

National and City Level Waste Management Strategies and Action Plan

In Myanmar, IETC in collaboration with IGES-CCET:

- Published a policy report identifying gaps and key recommendations to consider in developing national and city waste management strategies.
- Prepared a city waste management strategy and action plan for Mandalay in consultation with different stakeholders, which was officially approved in 2018.
- Completed an inter-ministerial review of the national waste management strategy and master plan in both English and Burmese.
- Initiated a pilot project on promoting waste separation and the 3Rs (reduce, reuse, recycle) in six model communities, which included training and capacity building for residents, schools, waste collectors and recyclers.

Project outcomes and impacts:

The president of Myanmar acknowledged the importance of having a city waste management strategy and announced that all cities were to formulate city waste management strategy and action plans. Institutional capacity was strengthened towards addressing waste management in an integrated manner at both the national and local levels.

The Mandalay City Development Committee enforced the halting of the illegal dumping of waste and banned open burning. The Committee introduced a new city policy for waste separation at source, based on the city strategy. As a trial, Mandalay started educating citizens regarding a separated waste collection system in six model areas. An evaluation conducted after three months of operation indicated that 60% of residents separated their waste in accordance with the system.

The Committee established a new waste governance system at the township level to encourage the participation of civil society and the private sector, including informal waste recyclers. Businesses introduced incentives to reduce plastic bags, civil society took actions to separate waste, and schools incorporated waste separation, 3R activities and other topics related to environmental education into the curriculum.

The strategy was one of the key outputs that were discussed between Mr. Erik Solheim, Executive Director of the United Nations Environment Programme and Ms. Aung San Suu Kyi during their last meeting in Myanmar, 2018



Implementing partners include: Jua Kali Ltd., Saint Lucia Solid Waste Management Authority, United Nations Environment Programme Latin America and the Caribbean Office

Saint Lucia:

School Resource Recovery Pilot Project

In cooperation with United Nations Environment Programme Latin America and the Caribbean Office, IETC:

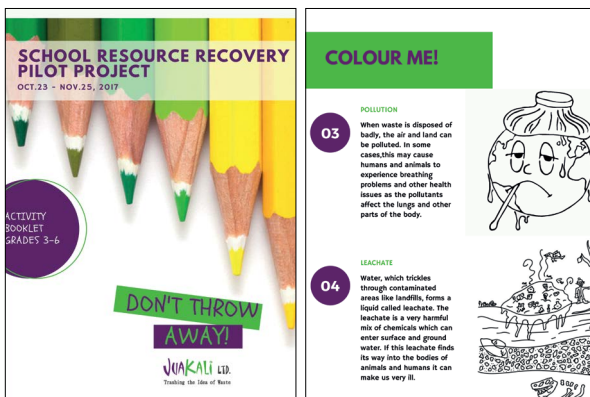
- Initiated a Schools Resource Recovery Pilot Project for six weeks in three schools: Bexon Primary School, John Odlum Memorial Secondary School, and Sir Arthur Lewis Community College.
- Provided a platform to test best practices in waste management education.
- Introduced new concepts such as resource recovery and the circular economy.
- Assessed the responsiveness of students to a different waste management curriculum.

Project outcomes and impacts:

The project stimulated and educated youth about the waste they generate. Students were engaged through participatory classroom sessions, a waste characterization exercise, a field trip to the Deglos Sanitary Landfill and a Resource Recovery Campaign Challenge. The project was considered a success with the demonstration of best practices in waste management education. Positive feedback from the school administrators, teachers, students and the Saint Lucia Solid Waste Management Authority reaffirmed this assessment.

Documents related to the outcomes of the Saint Lucia project can be found at the following links:

- [Video of the Schools Resource Recovery Pilot Project in St. Lucia](#)
- [Educational material 1: Bexon Primary School - Activity Booklet](#)
- [Educational material 2: Stanley Jon Odlum Memorial Secondary School - Activity Booklet](#)



BACKGROUND IMAGE
Students, who participated in the project, received the reusable bag.



Implementing partners

include: University of Dar es Salaam, Government of Tanzania; UN Environment Africa Office

Tanzania:

National and City Level Waste Management Strategies

Together with the University of Dar es Salaam, IETC:

- Finalized the national and city level waste management strategies for Tanzania and Dar es Salaam respectively, which were formulated on a multi-stakeholder consultative basis.

Project outcomes and impacts:

Tanzania's national solid waste management strategy seeks to establish a common platform for action among stakeholders to systematically improve waste management in Tanzania.

The Government of Tanzania has committed to the success of these strategies to achieve the four national goals of employment creation, resources conservation, regional integration and sustainable economic diversification.



Dumpsite operation situation



Implementing partners include:
Bhutan: National Environment Commission of Bhutan; World Wildlife Fund, Inc. Bhutan Program
Mongolia: Ministry of Environment of Mongolia; Green Development and Tourism; The Asia Foundation
Nepal: Ministry of Federal Affairs and General Administration of Nepal; Leadership for Environment and Development Nepal
Global Resource Information Database Arendal

Bhutan, Mongolia, Nepal:

Waste and Climate Change

Since 2016, IETC has been working on a waste and climate change project to reduce the impacts of the waste sector on climate change, through capacity strengthening and policy support at the national and local levels in Bhutan, Mongolia and Nepal. IETC:

- Completed preliminary baseline studies on waste data in Bhutan.
- Completed a waste technology assessment in Mongolia.
- Compiled the National Waste Management Strategy in Nepal.
- Conducted field research on gender and waste assessment for each country.
- Assisted in reporting to national entities in all three countries regarding the contribution of this project to the Intended Nationally Determined Contributions.

Project outcomes and impacts:

Bhutan

- We strengthened our partnership with the National Environmental Commission Secretariat through preliminary baseline studies.
- As a consequence, waste management became a national priority. It was echoed in most of the royal addresses of the King of Bhutan, and a dedicated division on Waste Management was instituted within the National Environment Commission Secretariat in February 2018.

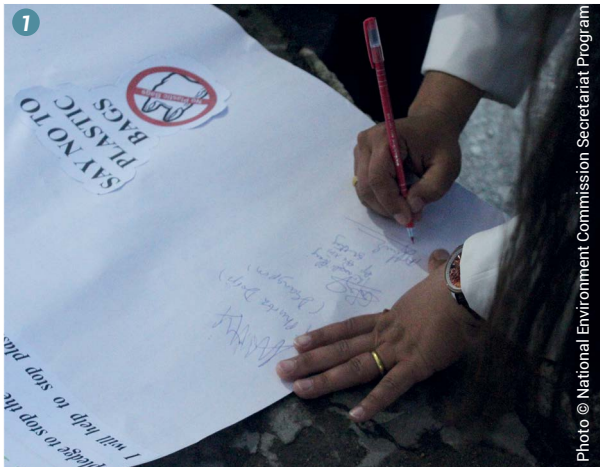
Mongolia

- Our national partner The Asia Foundation contributed to two Nationally Determined Contributions Partnership Forums ('Partnership Plan' in February and 'Partnership Plan Implementation through Coordinated Actions' in September). The team contributed to developing the framework of the partnership plan, its mechanism and its implementation.

Nepal

- Our national partner Leadership for Environment and Development Nepal signed a memorandum of understanding with the Ministry of Federal Affairs and General Administration on the implementation of this project.
- The baseline survey was instrumental in drafting the baseline assessment report on waste management of Nepal and national integrated waste management strategy. Both the report and strategy served as key references in developing Nepal's waste management plan.

1. In Bhutan, to mark 2018 World Environment Day, participants made voluntary pledges to stop using plastic bags for shopping and to replace them with jute bags. This initiative, launched by Bhutan's Waste Management Division of the National Environment Commission Secretariat, created awareness on reducing, reusing and recycling plastic bags.



2. Another photo illustrates an example of composting at schools. Some schools agreed to make their wet waste into manure for the school gardens while dry waste was sorted and reused in the school beautification program.



3. In Mongolia, a one-week awareness raising campaign took place for Global Recycling Day in March. At schools, an interactive information sharing session called "Learn the 3Rs by Playing" was organized at six schools in Ulaanbaatar.

5. On Global Recycling Day in March, university and monastic students participated in an education tour at the scrap dealer in Kathmandu and got hands-on practice with recycling. Participants learned the concept of the 3Rs (reduce, reuse and recycle) through these activities.

4. Training to manage agricultural waste in Nepal.





Implementing partners include:
 United Nations Institute for Training and Research

Cambodia, Pakistan and the Philippines:

Minamata Initial Assessment

Since 2015 under a project to develop a Minamata Initial Assessment, IETC has assisted in building capacity in Cambodia, Pakistan and the Philippines to reduce the exposure of humans and the environment to mercury by identifying the main sources and promoting integrated management. IETC:

- Established a coordination mechanism and organized the process.
- Assessed the national infrastructure and capacity for the management of mercury, including national legislation.
- Developed a mercury inventory using the United Nations Environment Programme mercury tool kit and strategies to identify and assess mercury-contaminated sites.
- Identified challenges, needs and opportunities for implementing the Minamata Convention on Mercury.
- Prepared and validated National Minamata Initial Assessment reports and assisted in implementing awareness raising activities and disseminating results.

Project outcomes and impacts:

The project strengthened institutions and improved national capacities to legislate mercury with a life cycle approach, while taking into consideration national proprieties identified for this issue. Through the use of scientific and technical knowledge and

tools, IETC also assisted the three countries in ratifying and implementing the Minamata Convention on Mercury.

In May 2018 in the city of Minamata in Kumamoto, Japan, IETC organized the Lessons Learned Workshop of the Minamata Initial Assessment Project in Asia. The workshop disseminated project results among the participating countries and discussed ways to effectively implement and fully comply with the convention.

IETC also assisted the UN Institute for Training and Research with its projects on the Minamata Convention. These projects support parties to the convention in implementing the convention and support these and other countries in achieving the objectives of protecting human health and the environment from mercury emissions.

ne to Minamata Environmental Academia
 s Learned Workshop of the Minamata Initial Assessment Project in Asia



The Lessons Learned Workshop of the Minamata Initial Assessment Project in Asia



Promotion and Dissemination of Environmentally Sound Practices and Methods

Active waste management education projects in 2018



Waste Management Education

IETC and the **Latin America and the Caribbean University Consortium** finalized a graduate curriculum on holistic waste management comprising of four modules, namely: Module I: Integrated waste management and material flows (Universidad de Ciencias Aplicadas y Ambientales, Colombia); Module II: Handling of waste (Universidad Autónoma del Estado de México); Module III: Solid waste treatment technologies towards holistic approaches (University of Technology, Jamaica); Module IV: Policy on solid waste management, governance and financing (University of Los Andes, Venezuela).

Each lead university was supported by several members of the academic consortium during the development of these modules. As an immediate follow-up, Universidad de Ciencias Aplicadas y Ambientales is the first university to receive formal approval from the Ministry of Education, Colombia to offer a new master's degree programme on integrated waste management. Furthermore, this graduate curriculum on holistic waste management was disseminated through the network of the Alliance of Iberoamerican University Network for Sustainability and the Environment (ARIUSA) to over 200 universities in the Latin American and Caribbean region.

In coordination with a consortium of **African universities**, a graduate curriculum on holistic waste management has been replicated for Africa with support from IETC and the United Nations Environment Programme Africa Office. In operationalizing this curriculum towards a full-fledged master's programme on holistic waste management, Suez Canal University in Egypt organized a pilot training course on holistic waste management for anglophone countries. Conducted over two months, October and November 2018, the course trained 35 participants from diverse sectors. In Burkina Faso, IETC organized a training course for francophone countries to pilot the holistic waste management curriculum that was developed by

IETC in partnership with a consortium of universities around Africa. This training course took place from October to December, and a group of eight master's students participated in the course.



The meeting to finalize a graduate curriculum for the Latin America and the Caribbean region

Project team members visiting dumping sites

Gender

International Women's Day

On 8 March 2018, IETC celebrated International Women's Day with a display of materials from the United Nations Environment Programme on the relationship between gender and various environmental issues, including pollution and sustainable consumption and production. IETC's own introductory material developed by the Gender Focal Point on the nexus between gender and waste management was also displayed.



International Women's Day

A New Study on Gender and Waste Management

Although waste management is often considered gender neutral, women and men are affected by and are involved in the management of waste differently due to existing gender inequalities, responsibilities and roles. To further study the linkage between gender, waste and climate change, a theme that is rarely investigated, IETC launched a nine-month gender study with Global Resource Information Database Arendal in April. In this project, a gender assessment with primary data collection was carried out in the three target countries of the German government-funded Waste and Climate Change Project (i.e., Bhutan, Mongolia and Nepal).

In Mongolia, women applicants are very often deemed ineligible to be waste truck drivers, a lucrative job, because, according to men, **'It's a dirty job, so how could they cook for their family in the evening?'** Also, many women who used to work as street sweepers and waste pickers in Ulaanbaatar were found to have been left out when the jobs became formalized with increased payment, taken over by men.

The field report on Mongolia by Global Resource Information Database Arendal can be found online.



Photo © Leadership for Environment and Development Nepal

Women working as informal waste pickers in Kathmandu

Photos taken during field research in Ulaanbaatar, Mongolia

In an effort to map out the gendered landscape of the waste sector, interviews were undertaken with various stakeholders in each country, including street sweepers, waste managers, city government officials, waste pickers, NGOs, recyclers and private waste companies. The field survey interviews and observations revealed that gender stereotypes and roles play a significant role in the setup of the waste sector and the different roles played by men and women in it.

The assessment has highlighted that the effectiveness and sustainability of waste management can be improved through incorporating a thorough **understanding of gender dynamics and gendered division of labour at each level of policy, programme and project development and implementation.**

The findings were presented in October 2018 at the International Solid Waste Association World Congress. The full report on gender and waste assessment will be released in 2019.



Photo © Levi Westerveld



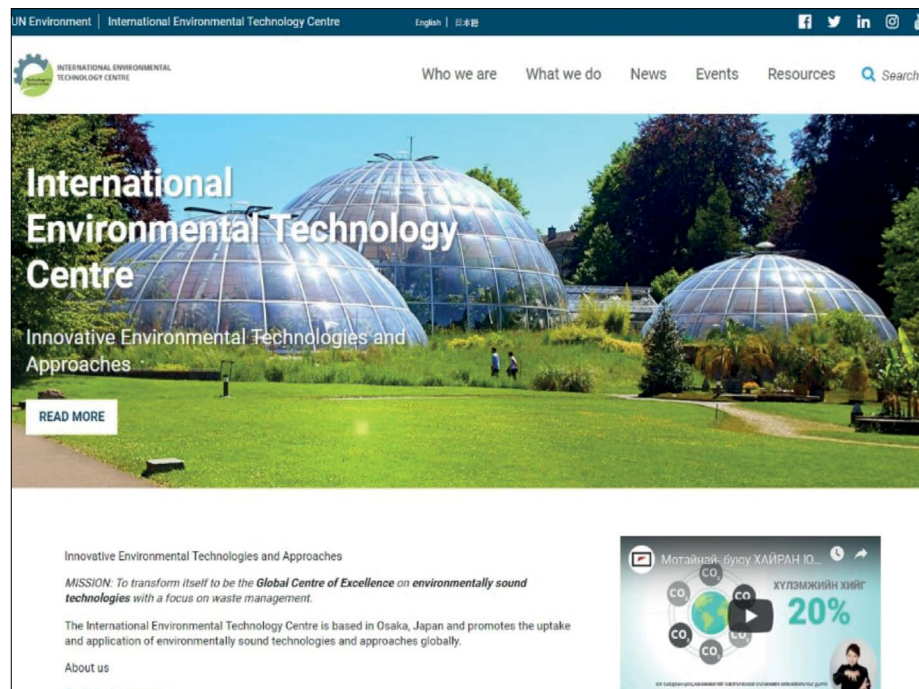
Global Resource Information Database Arendal

Outreach in 2018

Social Media

Website

In 2018 IETC revamped its website to enhance visitors' experience and improve ease of access to information.



Twitter

IETC has been active on Twitter:



TWEETS	FOLLOWING	FOLLOWERS	LIKES
621	51	314	280

Conferences and Events-Highlights

February 2018

Seminar on Environment Technologies for Integrated Waste Solutions



IETC and the Global Environment Centre Foundation jointly organized the Seminar on Environment Technologies for Integrated Waste Solutions in Thailand in February 2018, with the support of the City of Osaka. The seminar aimed at exploring environmentally sound technology options for integrated solid waste management by developing "business to business partnerships."

June 2018

SORA FEST Event with the Theme "Beat Plastic Pollution"



In Tokyo on 2-3 June 2018, Nippon Television Network Corporation organized the SORA FEST to

celebrate World Environment Day with IETC under the theme of "Beat Plastic Pollution." Over 17,000 people came to the event. Sorajiro, Nippon TV's mascot for weather forecasts, helped to raise awareness among young audience members about air pollution, food waste, marine litter and plastic waste. A plastic art exhibition was also arranged. The exhibition included one hundred fish-motif art pieces that were made from plastics floating in rivers and marine litter.

July 2018

2018 Asian Ministerial Conference on Disaster Risk Reduction (AMCDRR)



The 2018 Asian Ministerial Conference on Disaster Risk Reduction, held in Ulaanbaatar, Mongolia, brought together over 3,000 participants from over 50 countries and 1,500 organizations and was attended by the prime minister of Mongolia. IETC, in collaboration with the Mongolian Ministry of Environment and Tourism and The Asia Foundation, organized a special parallel session on **Enhancing Resilience through Disaster Waste Management and Building Back Better**. In view of the increasing number of disasters worldwide, the interactive discussions highlighted three urgent conclusions: disaster waste is more than just debris, disaster waste can be an asset in building back better, and there exists an urgent need to institutionalize disaster waste management.

October 2018
**Disaster Waste Management Training
 for the Caribbean**



Photo © Mahesh Pradhan

October 2018
**The International Solid Waste Association
 World Congress 2018**



Photo © The International Solid Waste



IETC, in cooperation with United Nations Environment Programme Latin America and Caribbean Office and the Caribbean Sub-regional Office, the Ministry of Infrastructure and Water, the Netherlands, the Caribbean Water and Wastewater Association and the Swedish Civil Contingencies Agency, organized a joint training programme in Montego Bay, Jamaica. This was held in conjunction with the second High-Level Forum of Caribbean Ministers Responsible for Waste Management. Over 25 representatives from 11 countries participated in the two-day training programme. Participants highlighted the urgency of preparing effective disaster waste management plans at the national and regional levels, taking into account the increasing number of disasters and extreme weather events in the Caribbean.

On 23 October, IETC, in cooperation with United Nations Environment Programme Asia and Pacific Office, organized at the International Solid Waste Association World Congress 2018 in Kuala Lumpur the side event "Mapping the status of women in the global waste management sector" as part of a special Women of Waste session. The event was jointly organized with Global Resource Information Database Arendal, Foundation of Norway and Women of Waste. Entrepreneurship, decision making, policy reform, budgets and education were highlighted in this joint gender and waste session.

Community Outreach - Highlights



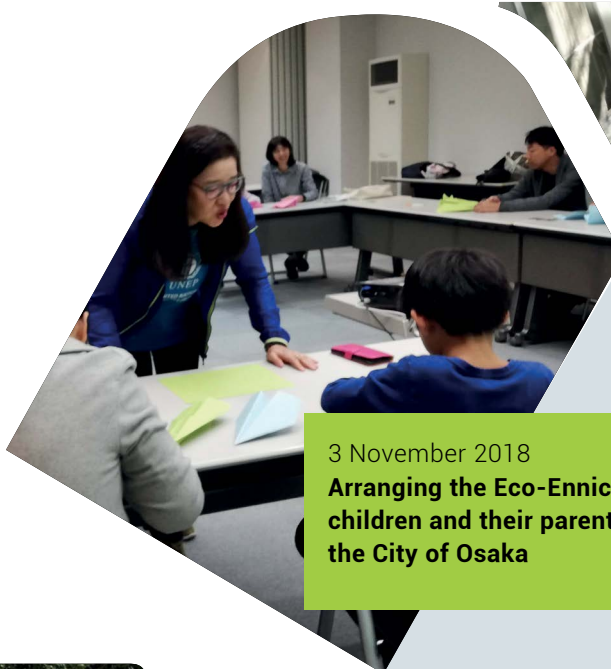
2 May 2018
**Participating in the Live & Clean project
organized by Tsurumi ward, Osaka, Japan**



26 January 2018
**Making a presentation at Imazu Primary
School, Osaka, Japan**



24 May 2018
**Cleaning up a local creek, together with the City
of Osaka and the Global Environment Centre
Foundation, prior to World Environment Day**



3 November 2018
Arranging the Eco-Ennichi IETC tour for local children and their parents, in cooperation with the City of Osaka



Community Outreach



24 October 2018
Explaining the IETC office and its activities to students from Yakeno Elementary School, Osaka, Japan



5 June 2018
Making personal pledges to fight plastic pollution on World Environment Day



6-8 December 2018
Participating in the EcoPro 2018 exhibition in Tokyo, in cooperation with the Japan Association for the United Nations Environment Programme



- Highlights



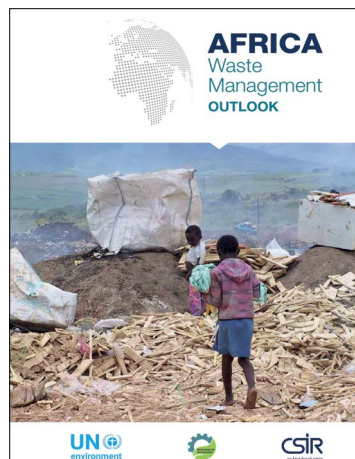
17-21 December 2018
Group photo of the Visiting Kitakyushu Eco-town, 1990 UNEP Global 500 Awardee, as part of an IETC retreat, to see the amazing transformation from the city's "Rainbow Smoke" and "Sea of Death"



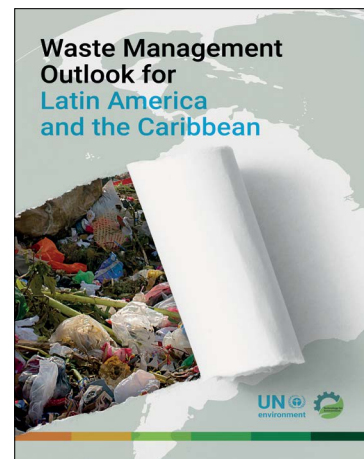
Publications



Single-use Plastics: A Roadmap for Sustainability (2018)
Full Report
Fact-sheet for Policymakers
Spanish version in progress



Africa Waste Management Outlook (2018)
Full Report
Summary for Policymakers
French version in progress

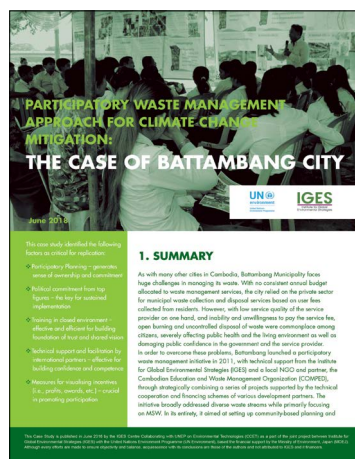


Waste Management Outlook for Latin America and the Caribbean (2018)
Full Report *English, Spanish*
Summary for Policymakers
English, Spanish

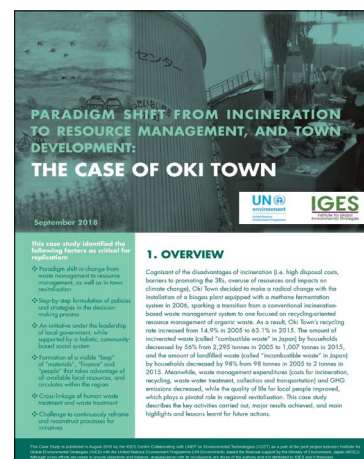
Joint Publication with IGES-CCET



State of Waste Management in Phnom Penh, Cambodia (June 2018)



Participatory Waste Management Approach for Climate Change Mitigation: The Case of Battambang City (June 2018)



Paradigm Shift from Incineration to Resource Management and Town Development: The Case of Oki Town (September 2018)

Greening the Blue at IETC

IETC is making great strides in reducing its environmental footprint by greening its activities in terms of energy consumption and waste generation.

In 2017, IETC used **42% less electricity** than in 2016.

In 2017, IETC saved over 26,000 kWh of electricity, representing a 42% drop in consumption compared to the previous year. The electricity saved is equivalent to a 13.5 tonne decrease of CO₂ emissions into the atmosphere.

Greater electricity usage is expected in 2018.

During the first half of fiscal year 2018, IETC had already used 60% of the previous year's electricity consumption. This can be attributed to the increased use of air conditioning during the record-breaking **summer heat wave** in Japan.

Japan's unprecedented heat wave in the summer of 2018 killed over 100 people and hospitalized more than 22,000. The strong heat wave experienced in Japan and globally is widely regarded as indicative of climate change. In the future, extreme weather events could become the new normal. Urgent actions must be taken to reduce greenhouse gas emissions.

How did we save energy?

IETC introduced **individual air conditioning** in 2017 to replace its central air conditioning system, thereby minimizing energy usage when staff are out of the office. This represents an important step in reducing IETC's greenhouse gas emissions.

Air travel emissions

In 2017, IETC had lower air travel emissions per person on staff than the overall average of the United Nations Environment Programme.

The air travel emissions of participants in meetings organized by IETC are included in this reporting. The figures for 2016 were dramatically higher in part because of greater air travel emissions by conference participants.

	IETC		United Nations Environment Programme
	FY 2016	FY 2017	FY 2017
Electricity (kWh)	62,740	36,330	/
Waste (kg)	792	346	465,729
Waste per person on staff (kg)	88	29	363
Air travel emissions per person on staff (tonnes of CO ₂)	9.5	3.6	5.8

GREENING THE BLUE.



Waste sorting station at IETC

IETC reduced waste by more than 50% in 2017.

IETC is proud to have lowered waste generation per person on staff from 88 kg to 29 kg. IETC is taking the lead in waste management among United Nations Environment Programme offices, where the average annual waste generated per staff member was 363 kg in 2017 (see table). The reduced use of office printing paper accounts for much of IETC's significant waste reduction in 2017.

In 2017, IETC used 378 kg less paper than in 2016.

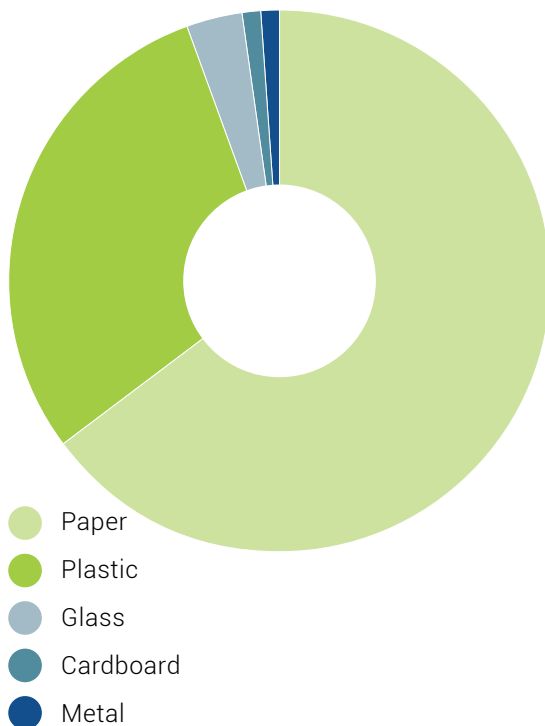
IETC owns a systematic waste sorting station to maximize the collection of recyclable waste, including paper, plastic, and aluminium cans. Recently, electronic waste and battery collection boxes were also introduced. Staff are encouraged to bring their e-waste and batteries to the office for recycling.

About every two months, a box of about 40 alkaline and button batteries is collected. The batteries and e-waste are then taken to specific recycling centres. Effective waste sorting and active staff participation brought significant changes to our waste generation patterns.

Of all the waste collected in 2017, 37% was recycled and the remaining 63% was collected as general waste and incinerated.

Staff members recycling e-waste and batteries at the IETC's waste sorting station

Recycled waste collected at IETC in 2017



IETC's waste reduction achievements would not be possible without our highly motivated staff members. In the future, IETC will continue to work on reducing our environmental impact and providing a sustainable and green working environment for our staff.



Thank you to our interns!

“ I am extremely grateful for having had the opportunity to work with United Nations Environment Programme IETC!

IETC continues to support and encourage young professionals beginning their careers in environmental management and development, especially in the field of waste management. In 2018, we expanded our internship/fellowship opportunities under the United Nations Environment Programme through increased advertising. IETC accepted seven interns/fellows in 2018, compared to two interns in 2017. IETC would like to thank its interns and fellows for their contributions to the Centre and wishes them all the best in their future endeavours.



Ms. Anudari ACHITSAIKHAN
Intern from October 2017 to April 2018



Mr. Quanyin TAN
Visiting Fellow from April 2018 to June 2018

2018 Interns and Fellows

Ms. Anudari ACHITSAIKHAN,
United States

Ms. Man Mei CHIM,
Hong Kong, China

Ms. Yue LIN,
China

Mr. Quanyin TAN,
China

Ms. Qing XU,
China

Ms. Andrea WEHRLI,
Switzerland

Ms. Yufei YUAN,
China

My time at the Centre has equipped me with the professional experience I need to further my career in the development field, particularly in relation to project management. I have learned an immense amount on waste management and sustainability issues within the six months and it has provided me with several options for career advancement in multiple countries. I am certain the same can be said for all our other interns.

It was a great experience working at IETC, which has strengthened the professional experience I need to further my career in the sustainable management of waste. The experience has also helped to open up channels for potential future cooperation between the IETC and BCRC China (Tsinghua University), where I am working. Collaborative projects were designed and submitted by cooperating with the efficient team of IETC. I am certain IETC is one of the best places for those who want to achieve self-improvement in the field of waste management.

Finances

Financial Report as of 31 December 2018

USD, thousands

Balance from 2017 5,207

Income

Government of Japan	
Ministry of Foreign Affairs	307
Ministry of the Environment	950
International Climate Initiative – Government of Germany	545
United Nations Environment Programme	420
Swedish International Development Cooperation Agency	189
Government of Norway	130
UN Secretariat	23
Global Environment Centre Foundation	20
Total income in 2018	2,584

Expenditures

Projects and activities	4,219
Personnel	1,749
Operating cost	61
Total expenditures in 2018	6,029

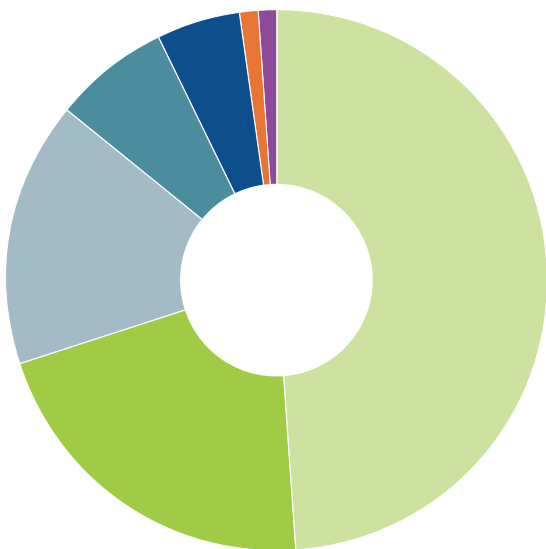
Balance 1,762



IETC benefits from numerous in-kind contributions, including our office space in the City of Osaka, seconded personnel from China and operational support cost from United Nations Environment Programme.

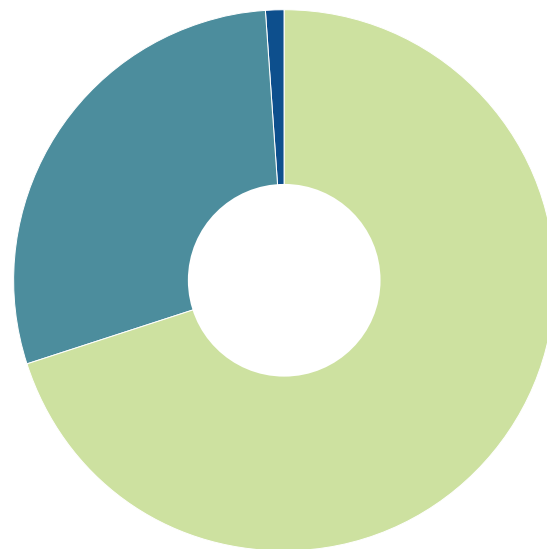
The IETC office in the city of Osaka, Japan

2018 Income (%)



- Japan 49%
- Germany 21%
- United Nations Environment Programme 16%
- Sweden 7%
- Norway 5%
- UN Secretariat 1%
- Global Environment Centre Foundation 1%

2018 Expenditures (%)



- Project and activities 70%
- Personnel 29%
- Operating cost 1%

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