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EIGHTH REGIONAL 3R FORUM IN ASIA AND THE PACIFIC 9-12 APRIL 2018

The Regional 3R (reduce, reuse, recycle) Forum in Asia and the Pacific held its eighth meeting in Indore, India, from 9-12 April 2018 under the theme "Achieving Clean Water, Clean Land and Clean Air through 3R and Resource Efficiency – A 21st Century Vision for Asia – Pacific Communities." The meeting was organized by the UN Centre for Regional Development (UNCRD), the Ministry of the Environment (MOEJ), Japan, and the Ministry of Housing and Urban Affairs (MoHUA), India.

The Eighth 3R Forum examined:

- the role of a circular economy in reducing air, land and water pollution, and in enhancing national productivity;
- how to promote zero waste societies in Asia-Pacific countries;
- how 3R policies can contribute to protection of coastal and marine ecosystems;
- the role of 3R technologies in promoting resource security; and
- options for financing implementation of 3R policies and programs, including infrastructure development.

The eighth meeting launched "The State of the 3Rs in Asia and the Pacific," a regular assessment report prepared by experts regarding progress in implementation of the Ha Noi 3R Declaration (2013-2023) adopted at the fourth meeting held in 2013 in Ha Noi, Viet Nam.

Around 700 participants attended the eighth meeting of the Forum from 40 countries, including government representatives from the following 28 Forum participating countries: Australia, Afghanistan, Bangladesh, Bhutan, Cambodia, the Federated States of Micronesia (FSM), India, Indonesia, Japan, Kiribati, Lao People's Democratic Republic (PDR), Malaysia, Maldives, Mongolia, Myanmar, Nepal, Pakistan, Palau, the Philippines, the Republic of Korea (ROK), Russian Federation, Singapore, Sri Lanka, Thailand, Tonga, Tuvalu and Viet Nam. Other participants included members of the 3R Forum's Subsidiary Expert Group, representatives from various UN and international organizations, universities, scientific and research organizations, nongovernmental organizations (NGOs), and the private and business sector, local observers and waste management professionals.

The 3R Forum adopted a "Chair's Summary," which calls for:

- integrating 3R and resource efficiency into national development plans and macroeconomic policy agendas;
- pursuing a resource-efficient and circular economic development approach, including realizing eco-efficient infrastructures in key development sectors such as urban design and planning, building, transport, energy, water and waste systems;
- engaging the private sector and finance industry, including small to medium-sized enterprises (SMEs), to enable expertise, technical knowledge and services to be activated in pursuit of sustainable consumption and production;
- supporting awareness of the benefits of circular economic development through government policies and programs;
- exploring new sources of funding to finance development of appropriate 3R infrastructures and to promote collaboration among key stakeholders and activate citizen participation.

IN THIS ISSUE

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A parallel Asian Mayors Policy Dialogue was held that discussed:

- the contribution of the 3Rs to achieving the 2030 Agenda for Sustainable Development and UN-Habitat III New Urban Agenda (NUA); and
- special waste challenges, such as plastics, chemical wastes, e-waste and medical wastes.

The Dialogue concluded with the signing by mayors and city authorities of 38 cities of an Indore 3R Declaration of Asian Mayors on Achieving Clean Land, Clean Water and Clean Air in Cities calling for collective efforts on 3R and resource efficiency to achieve clean land, water and air. Later in the Forum two more cities signed the Declaration, and the Forum said it will remain open for signature by the region's other cities until 2030.

A BRIEF HISTORY OF THE 3R FORUM IN ASIA AND THE PACIFIC

Acting on a proposal by Japan, the East Asia Environment Ministers Meeting in 2008 established the Regional 3R Forum in Asia as a platform to promote 3R in Asian developing countries. The new 3R Forum was intended to serve as a framework for high-level 3R policy dialogue among central and local governments, international organizations, aid agencies, private sector entities, research bodies, and NGOs. It also seeks to promote technical assistance for country 3R projects, and information sharing and networking for the promotion of 3R policies and practice.

First Meeting of the Regional 3R Forum in Asia: The inaugural meeting was held in November 2009 in Tokyo, Japan, with delegates participating from 18 Asian countries. Participants adopted the Tokyo 3R Statement, identified a list of priority activities, welcomed the establishment of a Subsidiary Expert Group to provide substantive technical input to the Forum, and requested the UNCRD to take the lead in facilitating the work of the 3R Forum.

Second Meeting of the Regional 3R Forum in Asia: The second meeting was held in October 2010 in Kuala Lumpur, Malaysia, on the theme "3Rs for Green Economy and Sound Material-Cycle Society." The meeting contributed to greater understanding and consensus around policy options, and illustrated innovations and achievements in 3R in the region. The meeting also contributed regional input to preparations for the 2012 United Nations Conference on Sustainable Development (Rio+20).

Third Meeting of the Regional 3R Forum in Asia: Held in October 2011 in Singapore on "Technology Transfer for Promoting the 3Rs – Adapting, Implementing and Scaling up Appropriate Technologies," the third meeting produced a set of recommendations linking waste management with resource efficiency in agriculture, industry, energy and other sectors, as a means of transitioning towards a resource-efficient and green economy. Singapore submitted the Chair's Summary of the meeting and recommendations of the Forum as an official input to the Rio+20 process.

Fourth Meeting of the Regional 3R Forum in Asia: Held in March 2013 in Ha Noi, Viet Nam, under the theme "3Rs in the Context of Rio+20 Outcome - The Future We Want," the fourth meeting focused on 3R in various sectors, including agriculture, industry and energy. It adopted the "Ha Noi 3R Declaration - Sustainable 3R Goals for Asia and the Pacific for 2013-2023," that outlines goals for waste management in urban, industrial and rural areas to be achieved between 2013-2023, addresses new and emerging wastes and cross-cutting issues, and includes a set of core indicators.

Fifth Meeting of the Regional 3R Forum in Asia and the Pacific: Now with a new name reflecting broader participation by Pacific nations, the fifth meeting held in February 2014 in Surabaya, Indonesia, on the theme "Multilayer Partnerships and Coalition as the Basis for 3Rs Promotion in Asia and the Pacific" included a focus on 3R in small island developing States (SIDS). The meeting adopted the Surabaya Declaration, which calls for multilayer collaborative efforts to promote and cooperative on 3Rs, including *inter alia* country-to-country, city-to-city, industry-to-industry and South-South cooperation, partnerships to promote sustainable business models, and a regional framework among SIDS.

Sixth Meeting of the Regional 3R Forum in Asia and the Pacific: The sixth meeting held in Malé, Maldives, in August 2015 on the theme "3R as an Economic Industry - Next Generation 3R Solutions for a Resource-Efficient Society and Sustainable Tourism Development in Asia and the Pacific," focused on water security, tourism, waste management and sustainable urban management, as well as economic and employment opportunities in 3R areas, especially in the context of the 2030 Development Agenda. The sixth meeting called for a regular expert assessment of progress in implementation of the Ha Noi 3R Declaration.

Seventh Meeting of the Regional 3R Forum in Asia and the Pacific: Held in November 2016 in Adelaide, Australia, on the theme "Advancing 3R and Resource Efficiency for the 2030 Agenda for Sustainable Development," the seventh meeting was attended by participants from 41 countries. The Meeting adopted the Adelaide 3R Declaration, which expressed a commitment to strengthen coordination among countries and within countries to progressively adopt and implement circular economy plans, a whole-of-value chain approach, and strategies and tools to reduce, reuse, and recycle natural resources in production, consumption and other life cycle stages.

REPORT OF THE EIGHTH REGIONAL 3R FORUM IN ASIA AND THE PACIFIC

INDIA NATIONAL 3R DAY PRE-EVENT

A pre-event for the Eighth Regional 3R Forum in Asia and the Pacific, celebrating India National 3R Day for Swachh Bharat (Clean India Mission) opened on Monday afternoon, 9 April.

Manish Singh, Commissioner, Indore Municipal Corporation, welcomed participants from 40 countries and many of India's cities. He said that the Eighth Regional

Manish Singh, Commissioner, Indore Municipal Corporation

Vinod Kumar Jindal, Ministry of Housing & Urban Affairs (MoHUA), India

3R Forum's themes should help give direction to cities, their officials and managers responsible for formulating and executing policies promoting clean and resilient infrastructure. He noted that Indore, named India's cleanest city in 2017, was proud to host the conference and have the 3R Declaration bear its name.

Birgitte Bryld, UN Department of Economic and Social Affairs (UN DESA), observed that each session of the Eighth Regional 3R Forum was directly relevant to the 2030 Agenda and the achievement of the Sustainable Development Goals (SDGs) and its targets. She said the Forum's outcomes would provide a timely and important contribution to the 2018 review of the 2030 Agenda and SDGs by the High Level Political Forum (HLPF) to be held in New York in July.

Vinod Kumar Jindal, MoHUA, welcomed all participants on behalf of the Government of India.

OPENING CEREMONY

On Tuesday morning, Durga Shanker Mishra, MoHUA, India, opened the Forum and welcomed participants. He stressed that the 3Rs are not new to India's culture and heritage. He discussed the Clean India Mission and its goal of achieving a clean India by the 150th birthday of Mahatma Gandhi, on 2 October 2019.

Maya Singh, Minister, Urban Development, Government of Madhya Pradesh, India, noted waste management efforts in her state, including the Jabalpur waste to energy (WTE) plant, Indore's efforts to clean the city, Bhopal's "wealth from waste" campaign, the organizing of 378 urban local bodies into 26 waste management clusters, and state plans for 6 WTE and 20 waste to compost plants.

Tadahiko Ito, State Minister, MOEJ, stressed the importance of the Japanese concept of *mottainai*, which means respect and appreciation for the planet's gifts, and said Japan has translated a popular kids' book on the concept into Hindi and English which will be provided to all India's children, since education is critical to achieving the 3Rs. He declared Japan's commitment to share its waste management experience and technologies with India.

Birgitte Bryld, UN DESA, highlighted the crosscutting nature of the SDGs in pursuing waste management solutions. She encouraged countries to strengthen engagement with stakeholders such as with the private sector and with Civil Society Organizations (CSOs) in the implementation of the SDGs. She noted the dynamic nature of stakeholders and industrial transformation in the Asia Pacific region and reiterated the need for national decision makers to share views with local implementing entities.

Hardeep Singh Puri, Minister of State, MoHUA, India, highlighted the Swachh Bharat Mission (SBM), an initiative implemented by the MoHUA and by the Ministry of Drinking Water and Sanitation (MoDWS) for urban and rural areas respectively, which contain a set of comprehensive guidelines for Local Bodies and State governments to fast track their journey towards becoming "Swachh cities." He said Indore was rated the Cleanest City in India under the Swachh Star system. He emphasized the importance of committed citizens and high-level support in achieving clean cities.

Sumitra Mahajan, Speaker of the Lok Sabha, Parliament of India, officially launched the book titled "Conservation in Lifestyle: Indian Heritage" by MoHUA. In her speech she focused on the efforts of her home city, Indore, in achieving the title of Cleanest City in India, and highlighted female leadership of Mayor Malini Gaur as a contributing factor. She encouraged Mayors to pursue solid waste management (SWM) plans in their municipal strategies to promote lifestyle changingthat integrate indigenous knowledge.

PLENARY SESSION 1: TOWARDS ZERO WASTE SOCIETY –THE 3R WAY

Vivek Aggarwal, Government of Madhya Pradesh, India, chaired the session on Tuesday morning, and Choudhary Rudra Charan Mohanty, UNCRD, facilitated the discussions.

Vinod Kumar Jindal, MoHUA, presented on the topic of SWM in India and the policy initiatives conducive to the development of a zero waste society. In his presentation, he outlined the work performed under the Swachh Bharat Mission in cities across India and the gradual changes taking place under the initiative from the baseline scenario to the present status in various regions.

Aggarwal followed with a presentation on the promotion of 3R through private-public partnerships (PPP) mode in the Indian state of Madhya Pradesh. He highlighted the means through which this PPP arrangement can make waste management physically and financially sustainable for the region.

Vaughan Levitzke, Chief Executive, Green Industries South Australia, provided an overview of the circular economy as the basis for moving towards zero waste society in the context of the state of South Australia. He presented on the value of a circular economy in the area of job creation for high-skill labor in scientific and technical services.

Niranjan Das, Government of Chhattisgarh, India, presented on the zero waste model of Ambikapur, Chhattisgarh, India. He demonstrated how the city became a model for SWM by comparing the local scenario prior to the launch of the model and the changes reflected after implementation. He also highlighted the re-engineering of the waste treatment processes employed in the city, including the impact of the detailed segregation that is now in place whereby everything in the city is reused or recycled, as well as the financial model implemented to pay for SWM costs.

PANEL DISCUSSION: Asked how to effectively promote collaboration between national and municipal authorities to overcome major challenges and barriers in integrating 3Rs and zero waste policies into policy, planning and development, N. B. Mazumdar, Director General, Sulabh International Social Service

Organisation, India, suggested there are four keys to achieving zero waste: the SDGs; the 3Rs; resource efficiency; and extended producer responsibility (EPR) for industrial waste. Levitzke said his state began its path to zero waste 40 years ago, starting with recycling promotion, then container deposit legislation, and later tipping fees that fund recycling promotion efforts. He explained the state has also worked closely with the private sector and invested in market development, new technologies and bringing together local governments to support such efforts.

Asked by Mohanty how best to advance PPPs to turn waste into useful resources, Chair Aggarwal noted the most important components are:

- the willingness of city governments to allow the private sector into waste management;
- working to understand the issues and problems faced by partners;
- working with technology vendors that are willing to invest and prove that their technology can actually support 3Rs and reduce waste generation.
- Wanich Sawayo, Ministry for Natural Resources and Environment (MNRE), Thailand, mentioned several examples of Thai programs between government and private sector to promote corporate social responsibility and EPR, and a plastic waste minimization program.
- Responding to audience questions, panelists:
- stressed that waste management programs need to address existing piled up wastes;
- emphasized the importance of educating children and youth, who in turn can educate their parents;
- suggested both financial and non-financial incentives can be employed to motivate active participation in 3R campaigns, including creating champions or ambassadors to advocate for changes, or subsidizing home composting equipment;
- noted that manual waste segregation can result in health problems;
- underscored the importance of grassroots organization to get households fully involved in source separation at home and to pay solid waste management user fees; and
- discussed challenges to selling recovered materials from construction and demolition (C&D) wastes.

PLENARY SESSION 2: THE 3RS AND CLEAN WATER - THE ROLE OF THE CIRCULAR ECONOMY IN REDUCING WATER POLLUTION

Dorji Choden, Minister, Ministry of Works and Human Settlement, Bhutan, chaired the session on Tuesday morning, and V.K. Chaurasia, MoHUA, India, facilitated the discussions.

Chettiyappan Visvanathan, Asian Institute of Technology (AIT), presented a background paper on what the 3Rs and a circular economy can offer to water quality and water security in Asia and the Pacific. He highlighted threats to water security in Asia Pacific which include *inter alia*: heavy population; accelerated urbanization rate; intensified industrial development; extensive agricultural development and; vulnerability to disasters.

J.B. Ravinder, MoHUA, India, presented on advancing the 3Rs in India and co-benefits for safe drinking water and reliable sanitation. He highlighted water security issues which include decreasing per capita water availability and increasing water demand patterns in urban areas. He said untreated wastewater is threatening surface water systems, noting that a large proportion of population depends on groundwater for drinking purposes.

Yuji Hirose, MOEJ, and Saurabh Pandya, Lixil Corporation, presented on Lixil's Global Sanitation Solution (SATO). Hirose highlighted decentralized wastewater treatment systems and its legal framework in Japan. He referred to the *johkasou* tanks which contain bacteria and other microorganisms, used to break down and purify the contaminants contained in wastewater. He also highlighted the Johkasou Act, which was enacted to promote the use of human waste and gray water treatment for conservation of water quality in public water areas, preservation of living environment and improvement of public health.

Pandya presented on the Lixil SATO Toilet, a project co-funded by the Melinda Gates Foundation. He said the Sato toilet is a solution for Indian twin pits for pour flush latrines and contributes to saving water consumption.

A view of the conference room

PANEL DISCUSSION: During the panel discussion, Asit K. Biswas, National University of Singapore, defined and elaborated on the issue of water scarcity and challenged the UN-backed definitions of water stress and scarcity. He noted that ascribing such a status may mask the fact that a city or country may not be facing a true water scarcity, but rather has a problem in managing water demand and supply.

Noting the importance of the 3R forum and the information being shared by all, Carine Van Hove, VITO NV, Belgium, and Global Science, Technology and Innovation Conference (G-STIC), highlighted key principles related to water management such as viewing water and wastewater management as a service and the potential of the sharing economy and discussed development projects being undertaken to support water management in India.

Speaking on the topic of the role of industry and private sector on water pollution, Wijith Wijayamuni Zoysa, Minister, Irrigation and Water Resources Management, Sri Lanka, highlighted the issues related to pollution arising from agricultural and industrial activities in his country. He briefly described some of the work being done to promote less freshwater contamination, less groundwater extraction and greater awareness of freshwater pollution.

Rene van Berkel, UN Industrial Development Organization (UNIDO), emphasized that the agenda for industry must be a two-pronged approach focusing on both net water extractions by returning as much to the environment as is being extracted and by limiting pollution levels being released by industry. He encouraged industry to focus on water efficiency, become water stewards and invest in catchment-based solutions.

Chair Choden wrapped up the session by observing that there was political will within the region to address the water scarcity and pollution issues but that there is still a need to address the problem of meeting water demand.

PLENARY SESSION 3: THE 3RS AND CLEAN LAND - THE ROLE OF THE CIRCULAR ECONOMY IN PREVENTING LAND POLLUTION

Abdullah Al Islam Jakob, Ministry of Environment and Forests, Bangladesh, chaired the session on Tuesday afternoon, and Carine Van Hove, G-STIC, facilitated the discussions.

Agamuthu Pariatamby, University of Malaya, Malaysia, discussed land pollution caused by oil spillage, improper waste disposal, open waste burning, landfill leachate runoff and infiltration, waste from industrial activities, agricultural chemicals and mining waste, pointing out that in many of these categories Asia is the most impacted region. He suggested 3R policies in municipal, industrial, agricultural and mining sectors that could reduce open burning and dumping, and reduce industrial wastes going into landfill. He also briefly discussed the options of bioremediation, biomass utilization and landfill mining.

Banwari Lal, The Energy and Resources Institute (TERI), India, discussed strategies for reducing agricultural wastes, such as rice straw, which is often burned which releases greenhouse gases (GHGs) and pollutes the air. He pointed out that agricultural wastes can be used to produce bioethanol, bio-chemicals that are high-value components of other chemicals, glycerol, and syngas, as well as to generate power. He said that often the problem with getting industry interested in such projects is finding a way to get sufficient agricultural residue into one place to make a production facility profitable.

Jinhui Li, Director, Basel Convention Regional Center for the Asia and Pacific Region (BCRC China)

PANEL DISCUSSION: During the panel discussion, Van Hove focused on crucial policy, institutional and technological shifts necessary to integrate 3R and resource efficiency with efforts to prevent land pollution and degradation and associated health impacts.

Jinhui Li, Executive Director, Basel Convention Regional Center for the Asia and the Pacific Region (BCRC China), highlighted social waste in China, and a recent Enforcement Act by the Ministry of Ecology and Environment which addresses the issue of open burning through the mobilization of enforcement personal to supervise industrial sites.

Levitzke discussed his country's move towards the effective segregation of waste, which is driven by responses to air pollution. He noted an increase in organic waste treatment facilities responding to a high demand from the horticultural industry for compost.

Rosa Vivien Ratnawati, Ministry of Environment and Forestry, Indonesia, said there are key elements to the management of solid waste, which include *inter alia*: effective regulation; infrastructure; changing mindsets; and enforcement.

In responding to questions, panelists focused discussions on land pollution in relation to health issues such as the consumption of contaminated fish, open burning, the impacts of landfill mining, and asthma, cancer and other diseases resulting from poor waste management practices.

PLENARY SESSION 4: THE 3RS AND CLEAN AIR - THE ROLE OF THE CIRCULAR ECONOMY TOWARDS PREVENTION OF AIR POLLUTION

Amir Hossain Amu, Minister of Industry, Bangladesh, chaired the session on Tuesday afternoon, and Sandra Mazo-Nix, Climate and Clean Air Coalition to Reduce Short-lived Climate Pollutants (CCAC), facilitated the discussions.

Mazo-Nix presented on the benefits to clean air and climate through the implementation of 3R policies and initiatives by examining the impact of air pollution at different scales and the short-lived climate pollutants arising from SWM. She discussed

the control measures for short-lived pollutants in the context of SWM and elaborated on the waste initiatives that she worked on in cities across the world.

A.L. Aggarwal, Amity University, India, presented on the topic of mitigating air pollution based on the Indian scenario, which covered the current status of the country in air pollution generation, the strategic planning that was being done, the past experience in this area and the way forward.

Pradeep Khandelwal, East Delhi Municipal Corporation (EDMC), India, also presented on air pollution in the context of SWM by focusing on the co-benefits of SWM for preventing air pollution based on the Indian experience. He focused on the New Delhi case study by describing the local situation, the past and present waste management scenario in East Delhi and the 3R policies employed at the local level.

Remaining with the topic of co-benefits of SWM for preventing air pollution, Guilberto Borongan, AIT Regional Resource Centre for Asia and the Pacific (AIT RRC.AP), Thailand, made his presentation in the context of prospects for the circular economy. Noting that air pollution would arise from poor waste management strategies, Borongan highlighted some case studies from within the Southeast Asian region and emphasized the need for proactive solutions to resolve air pollution from waste management and stated the need to develop appropriate policies and strategies or actions in technical, strategic, economic, financial, information and communication aspects.

Ong Soo San, National Environment Agency, Singapore, discussed the WTE experience of Singapore, which entailed a detailed description of the Singaporean transition in its physical landscape and SWM practice from one of direct landfilling only to the introduction and expansion of WTE and volume reduction and offshore landfilling, and an examination of the approach used in developing their WTE industry.

PANEL DISCUSSION: During the panel discussion, Sunee Piyapanpong, MNRE, Thailand, highlighted the importance of public involvement, awareness and education. She referred to two master plans in Thailand which address national burning prevention and solid waste prevention. On transboundary issues related to forest fires, she said her country has introduced a 3R system to address green agriculture and encouraged the use of residue and biomass.

Michikazu Kojima, Institute for Developing Economies, Japan External Trade Organization, highlighted the case of the Association of South East Asian Nations (ASEAN) regional transboundary agreement and the use of spatial analysis to manage transboundary issues. On recycling, he noted that sometimes recycling processes, such as lead acid battery recycling, can cause air pollution and reiterated the need for good investment and proper management of waste to reduce open burning and methane generation from open dumping sites.

On the SDGs, Piyapanpong noted Thailand has applied 3R and wastewater as an indicator of sustainable cities.

KEYNOTE ADDRESSES

On Wednesday morning Ali Amir, Ministry of Environment and Energy (MEE), Maldives, chaired a special session featuring two keynote addresses on 3Rs and water pollution. Keith Alverson, Director, UN Environment Programme International Environmental Technology Centre (UNEP-IETC), facilitated the session.

Asit K. Biswas, National University of Singapore, highlighted findings of his studies on water management practices and stressed the importance of good governance in managing the water crisis.

Sunee Piya Panpong, Ministry for Natural Resources and Environment, Thailand

Davendra Mathuria, Executive Director, National Mission for Clean Ganga, outlined the status of rivers in India, noting that pollution, availability of clean water and competitive stakeholder demands continue to be the main challenges. On key drivers for resource recovery, he stressed the importance of cost management, research, innovation, policy and regulation as effective means of ensuring clean rivers.

PLENARY SESSION 5: 3R FOR PROTECTION OF COASTAL AND MARINE ECOSYSTEMS

Ali Amir, MEE, Maldives, chaired the session on Wednesday morning, and Keith Alverson, Director, UNEP-IETC, facilitated the discussions.

Alverson made a presentation on integrating 3R principles and strategies with measures for the protection of coastal and marine ecosystems from land based activities. He outlined the health and environmental implications of plastic pollution, and the initiatives to beat plastic pollution and on waste management.

Hideshige Takada, Tokyo University of Agriculture and Technology, Japan, presented on the topic of preventing marine littering and learning from the Japanese experience. He described the impacts of plastic wastes from land into the ocean and their contribution to the growing issue of micro-plastics in the Japanese environment, the transfer of toxic chemicals to the ocean ecosystems via plastics and the importance of 3R in the management of plastic wastes.

PANEL DISCUSSION: During the panel discussion, Gil Jong Oh, Ministry of Natural Resources and the Environment, ROK, made a presentation on the management of floating waste in Korea, including the collection, recycling and disposal of marine litter. Commenting on the harm of marine debris to animals, Sunee Piyapanpong, MNRE, Thailand, called for cooperation among the Asian and Pacific members in order to solve the marine debris problem. Noting that 80% of marine debris comes from land sources, Piyapanpong said that stopping debris on the land is a key issue. Nguyễn Thế Chinh, Institute of Strategy and Policy on Natural Resources and Environment, Viet Nam, also highlighted the importance of cooperation among countries with coastal areas noting that his country has long coastal areas impacted by transboundary rivers and the need to cooperate with upstream countries to manage the debris accumulating downstream.

Zoysa, Sri Lanka, described his country's issues with dumping of wastes and pollution of rivers inland. He outlined some of the national strategies, actions and integrated programmes to address the issue of marine pollution and management of coastal resources.

G. Dharani, National Institute of Ocean Technology, India, summarized the discussions at the end by noting the importance of the micro-plastics issue and the fact that, although we cannot

Shikar Jain, National Productivity Council, India

place boundaries on this issue as it resides in international waters, our actions are largely limited to national boundaries, making international cooperation essential.

PLENARY SESSION 6: GREENING OF SMES AND ENHANCING NATIONAL PRODUCTIVITY- ROLE OF CIRCULAR ECONOMY

Virendra Sharma, Ministry of Micro, Small and Medium Enterprises, India, chaired the session on Wednesday, and Anjan Das, Executive Director, Confederation of Indian Industries (CII), facilitated the discussions.

Van Berkel, UNIDO, discussed the need to make the business case to SMEs on how low-carbon development and resource efficiency is relevant to them, helping them reduce resource dependencies, meet environmental requirements and lower environmental costs and liabilities. He outlined intervention options, with emphasis on resource efficient cleaner production (RECP), providing examples such as UNIDO-supported RECP projects in the Indian textile sector and in Thailand's auto supply chain.

Shikhar Jain, CII, discussed challenges CII faces in working with SMEs toward moving to low-carbon industrial development, including lack of knowledge about environmental and social impacts of their practices, lack of awareness of environmental requirements, and affordability of new technologies. He noted changes are underway as more Indian SMEs become involved in the global supply chain, where business partners demand certifying good environmental and social practices. He highlighted the Zero Defect Zero Effect (ZED) certification scheme's goal of ensuring Indian SMEs manufacture goods with "zero defects" while having zero adverse effects on the environment.

Jinhui Li, BCRC China, discussed the Chinese experience in greening SMEs and getting them involved in circular economy opportunities, noting 70% of industrial pollution in China can be linked to SMEs. He discussed the role of China's 45 national demonstrative eco-industrial parks that cluster SMEs and improve their environmental performance and pull them into an evolving national circular economy. He described efforts to green Guiyu's e-waste recycling industry. He asserted there is no polluting industry, only polluting technologies and polluting management, and stressed the importance for SMEs to have a complete set of legislation, economic incentives, and sufficient resources and networking opportunities to explore the benefits of circular economy opportunities.

PANEL DISCUSSION: Noting that some 99% of Bangladesh's formal business enterprises could be classified as SMEs, Amir Hossain Amu, Minister of Industry, Bangladesh, said SMES are increasingly aware of the need to close the loop, but often lack financial resources and technical skills to do so on their own. He suggested governments need to help by providing infrastructure, a strong and reliable legal framework and skilled workforce.

Wilson Lim Trajeco, Department of Environment and Natural Resources, the Philippines, said while SME interest in the circular economy is gaining momentum in his country, many well-known barriers exists such as the lack among small firms of an environmental culture, government support, and technical know-how, as well as "silent barriers" such as lack of time and manpower to put into distribution planning and planning reverse logistical support.

Saibal Das Chowdhury, Co-Founder and Chief Executive Officer (CEO), Urbanetic, Singapore, said that governments and green SMEs needed to shift from regulator to facilitator and catalyst, and design industrial parks that facilitate as a manufacturing network with a life cycle approach that allows SMEs to jump from linear production to circular production models.

Rui Owase, Daiki Axis Co., Ltd., Japan, explained his company manufactured packaged low-energy, small-scale decentralized wastewater treatment systems known as *johkasou*. He said with help from MOEJ *johkasou* technology is being introduced in Indonesia and India, and his company recently announced the establishment of a *johkasou* manufacturing plant in India.

Teddy Caster Sianturi, Ministry of Industry, Indonesia, noted Indonesia's law 3/2014 on Industry which includes SMEs, requires industry to use natural resources in an efficient, environmentally sound and sustainable manner, and reduce, reuse, recycle and recover. He described government efforts to green industry through setting green industry standards, proposing tax incentives to promote recycling, and promoting the creation of new products from recycled materials.

Christine Halim, Indonesia Plastic Recycling Association, discussed her Association's efforts to upscale plastic recycling, particularly polyethylene terephthalate (PET) bottles, including lobbying the government to reduce the value added tax (VAT) for plastics recycling and to require recycled content in plastic products, and working with the informal sector to integrate them into formal recycling chains.

PLENARY SESSION 7: RESOURCE SECURITY AND 3R TECHNOLOGIES

Ali Amir, MEE, Maldives, chaired the session on Wednesday afternoon, and Chowdhury, Urbanetic, facilitated the discussion.

Upendra Tripathy, Director General, International Solar Alliance, India, discussed the potential in India of cooperative recycling for energy with aggregation of demands, resources and raw materials, technology and capital at community, district and provincial levels, setting a special tariff for power from WTE

plants, and integrating India's WTE and Swachh Bharat Mission by allowing his corporation to expand its construction and management of WTE plants.

Chowdhury presented on the potential of monitoring, modelling and predictive tools and other applications of information and communication technology (ICT) to reduce waste generation and promote the 3Rs and circular economy, saying it was possible to use such tools to extend product life, reduce life cycle costs, organize recovery and recycling of materials, and increase resource efficiency. He highlighted the ReGenerate, Share, Optimize, Loop, Virtualize, Explore (ReSOLVE) Framework proposed by the Ellen MacArthur Foundation for circular economic approaches, and the role ICT can play in each framework component.

Atsushi Takano, General Manager, Isono Corporation, Japan, discussed his company's experience in offering to the Japanese car industry quality recycled plastics made from material taken from end-of-life vehicles. He said the key to their success was ensuring the recycled plastic was of equivalent quality as that made from virgin resin but lower cost, and custom design to meet the different specifications of auto manufacturers.

Sunil Herat, Griffith University, Australia, discussed 3R technologies for managing e-waste, with a focus on the Indian context. He noted the need for:

- establishing a science-policy-business interface focused on the economic utilization of e-waste;
- adopting a holistic and consultative approach that creates enabling conditions for relevant stakeholders to develop business and economic opportunities to recover materials from e-waste; and
- taking into account the financial, institutional, political and social aspects of e-waste management, in particular, incorporation of the informal e-waste recycling sector.

Payden Payden, Regional Adviser, World Health Organization Regional Office for South East Asia, presented on protecting health and environment through sound management of healthcare waste. She highlighted the dangers of mismanaging healthcare waste, noting that over 60,000 health workers are affected annually as a result of injuries from "sharps" such as syringes, needles or lancets. On environmental impacts, she said open burning and poor incineration practices lead to air pollution resulting in respiratory diseases especially in children.

PANEL DISCUSSION: During the panel discussion, Rohit Kakkar, Central Public Health and Environmental Engineering Organization (CPHEEO), India, highlighted the use of existing technology in the management of waste referring to the eco-box model which is a correction center for electronic waste in cities.

Rachna Arora, European Union – Resource Efficiency Initiative (EU- REI), emphasized on lifecycle-based approaches in policies. She said cities are drivers of transformational change due to high volumes of resources and the smart city movements.

Ajoy Raychaudhuri, Director, Battery Foundation International, India, reflected on waste management in China and Singapore and the need to capitalize on replicating good practices and engaging SMEs in the use of technology that works.

Kulwant Singh, CEO, 3R Waste Foundation, India, said water and land are correlated and that a linear approach needs to be taken to resolve the impacts of one on the other. On wastewater, he said only 400 cities in India have sewerage facilities and that capacity building on ways to reuse wastewater is essential to minimize the impacts on health and environment. Singh reiterated the need for better data and information to measure impact and progress, and to inform effective management and implementation of the right policies.

LAUNCH OF STATE OF THE 3RS IN ASIA AND THE PACIFIC

Yasuo Takahashi, MOEJ, chaired the session on Wednesday afternoon, and Shinichi Sakai, Kyoto University, Japan, facilitated the discussion. Chair Takashi expressed great pleasure in being able to be at this session and provided some background in the report's development. Yasuhiko Hotta, Institute for Global Environmental Strategies (IGES), Japan, presented a summary of the final report including objectives, outcomes and the final nine recommendations, which include:

- continued prioritization of resource productivity, waste prevention and reduction activities;
- infrastructure planning and allocation of appropriate budget for establishing an integrated waste management system comprising source segregation, collection, recycling and treatment of different waste streams;
- greater attention to e-waste, marine litter and coastal plastic waste, micro-plastics, food waste and food loss issues by both policymakers and experts in the region, including proper data management for understanding the magnitude of environmental impacts resulting from these wastes streams;
- stakeholder engagement and consensus-based policymaking;
- further institutional capacity building among developing economies in strengthening environmental regulations and enforcing standards, including the setting of appropriate targets, monitoring indicators and incentives;
- special attention to the specific challenges faced by SIDS and remote rural areas, with emphasis on the selection of appropriate, simple and affordable technologies together with the promotion of decentralized approach;
- highlighting 3Rs as part of the global sustainability agenda, particularly SDG 12 (sustainable consumption and production);
- continued support for the Regional 3R Forum; and

Yasuo Takahashi, Ministry of the Environment, Japan, giving closing remarks

- efforts to ensure comparable and credible data across countries in Asia and the Pacific through enhanced institutional capacity for improved data management for effective evidence-based policymaking.

Shun Fung Chiu, De La Salle University, the Philippines, elaborated on the key factors required to enhance the state of 3R in the region and implementation of the report's recommendations and emphasized the need for private sector inclusion in any process towards 3R and waste management. ATM Nurul Amin, BRAC University, Bangladesh, also noted that for better or worse the private sector is key and that it is necessary to charge service fees to achieve any effect in the sector.

Ma Bella Guinto, Secretariat of the Pacific Regional Environment Programme (SPREP), highlighted the challenge faced in data collection for the report and noted the need for improved data management and collection in the Pacific islands. Pariatamby, University of Malaya, Malaysia, remarked on the importance of national definitions of solid waste in the compilation of data. Manoj Kumar Gangeya, Ministry of Environment, Forest and Climate Change (MoEF&CC), India, highlighted some of the work in and around 3R in India but noted that the policy challenges still remained.

Chair Takahashi stated in his closing remarks that this state of 3R report can contribute to waste management and the SDGs in the region and that this should should be continued.

REPORTING BACK SESSION

Sirisamphanh Vorachith, Ministry of Industry and Commerce, Lao PDR, chaired this session, and Vladimir Marev, Director, International Centre for the Best Environmental Technologies, the Russian Federation, was the facilitator.

Rapporteurs reported from the country breakout groups held Wednesday afternoon sessions to hear country presentations focused on their major achievements, current initiatives, critical challenges, and major plans for 3R. Reporting on Country Breakout Group 1, Nurul Amin noted that his group heard presentations from Bangladesh, India, Indonesia, Kiribati and Thailand. He said:

- a major challenge for all countries in the group is source segregation, while other challenges raised include plastics burning;
- all countries are composting to various degrees;
- the less developed countries need transfer of 3R technologies; and
- the idea of a waste bank generated much interest among group participants.

Reporting on Country Breakout Group 2, Pariatamby noted his group heard presentations from FSM, Japan, Malaysia, Myanmar, Mongolia, Palau, Tuvalu and Viet Nam. He said:

- the level of progress in implementing 3Rs varies considerably in the group;
- almost all countries in the group have a waste vision and mission statement; and
- the most cited challenge involves waste management infrastructure.

He mentioned progress reported in the group by different countries, including Japan's revision of the Plan for Establishing a Sound Material Cycle Society, Malaysia's efforts to promote source separation, and Viet Nam's plans to extend the National Strategy for Integrated Management of Solid Waste from 2025 to 2050.

Reporting on Country Breakout Group 3, Sadhan Kumar Ghosh, Jadavpu University, India, noted his group heard presentations from Afghanistan, Cambodia, Kyrgyzstan, Lao PDR and ROK, He noted that four nations did not yet have specific legislation on waste management, although all four indicate strong interest in implementing 3R policies and the circular economy concept, whereas ROK was at a very mature stage in 3R policy, changing its waste management system to a resource circulation society with a target of zero landfilling by 2020.

Reporting on Country Breakout Group 5, Sunil Herat noted that his group heard presentations from Australia, the Philippines, the Russian Federation, Sri Lanka, and Tonga. He characterized most of the challenges identified as well-known, such as lack of infrastructure and limited financial, technical and human resources. On progress, he highlighted how Sri Lanka turned a landfill problem in 2017 into an opportunity to revise the National Solid Waste Management Policy and to introduce new activities or policies on clean air, zero waste and sustainable consumption. He also highlighted the "co-regulatory" public/private product stewardship scheme in Australia. He indicated his group desired more information on existing experience with plastic bag bans and eco-industrial parks.

Levitzke reported on the outcome of the Adelaide 3R Declaration and announced the launch of "Global Leadership Program on the Circular Economy," a week-long leadership training programme designed to help leaders deliver the circular economy in their own countries.

Ghosh reported on a pre-event held in December 2017 in Rajendranagar, Hyderabad, India, the 7th International Conference on Solid Waste Management (IconSWM 2017), attended by 500 people from 29 countries that had the 3Rs and circular economy as principal focuses.

Yuko Sakita, Chief Director, GENKI Network for Creating a Sustainable Society, Japan, and Roy Thomas, Jan Vikas Society, India, reported on Asia 3R Civil Society Event held in parallel to the Regional 3R Forum. They reported that the event discussed, *inter alia*: the SDGs, recycling and composting, food waste,

Sunil Herat, Griffith University, Australia

involvement of waste pickers and other informal recyclers, and the role NGOs can play as a mediator between government and industry and as educators/motivators for getting citizen buy-in to the 3Rs.

Sivaji Patra, South Asia Seas Programme (SASP), reported on the parallel event "Recycling of Land-based Marine Litter: Challenges and Opportunities in South Asia." He said the event discussed strategies needed to manage marine litter in the region, namely:

- formulation of management policies, international conventions, laws, regulations and treaties;
- implementation of direct development activities;
- research and surveys;
- implementation of enforcement programmes;
- monitoring and evaluation;
- education and awareness programmes; and
- market and economic instruments.

ASIAN MAYORS POLICY DIALOGUE ON ACHIEVING CLEAN WATER, CLEAN LAND AND CLEAN AIR THROUGH 3R AND RESOURCE EFFICIENCY

Throughout Wednesday a parallel event bringing together mayors and local officials from across Forum member countries focused on achieving clean water, land and air through application of the 3Rs and resources efficiency. The Dialogue was co-chaired by Malini Laxman Singh Gaur, Mayor, Indore City, India, and Manish Singh, Commissioner, Municipal Corporation, Indore.

MAYORS SESSION 1: THE 2030 AGENDA FOR SUSTAINABLE DEVELOPMENT AND THE UN HABITAT III NEW URBAN AGENDA AND THE CONTRIBUTION OF THE 3RS: This session was co-chaired by Mayor Gaur and Commissioner Singh. Kulwant Singh, CEO, 3R WASTE Foundation, India, facilitated discussion.

Kulwant Singh offered a background paper outlining urban trends in the Asia-Pacific region, how the 2030 Agenda and SDGs related to cities, the NUA tenets, and how the 3Rs can contribute to achieving the SDGs and NUA. He stressed, *inter alia*:

- substantially reducing waste generation;
- minimizing landfills and using WTE when waste cannot be recycled or when this choice delivers the best environmental outcome;
- reducing marine pollution through improved waste and wastewater management in coastal areas;
- focusing on the resource efficiency of raw and construction materials;
- establishing safe material recovery and recycling facilities; and
- prioritizing the use of local, non-toxic and recycled building materials.

Mayor Gaur and Commissioner Singh outlined how Indore is working to meet the seven specific targets of SDG 11 (sustainable cities and communities) before the 2030 deadline, including efforts on:

- access for all to adequate, safe and affordable housing and basic services;
- access to safe, affordable, accessible and sustainable transport systems;
- inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management;
- disaster and climate resilience;
- efficient municipal and other waste management, characterizing Indore as India's leading city in implementing the 3Rs and highlighting it was the first to become "bin free"; and
- access to safe, inclusive and accessible, green and clean public spaces.
- Singh stressed the importance of proper SWM to disaster resilience, flood control, public safety, sustainable housing, and reducing vector- and water-borne diseases and respiratory illnesses.

Takanori Arima, City of Kitakyushu, Japan, explained Kitakyushu evolution from a very polluted industrial city in the 1960s to a clean city now, and the role of partnerships between municipal government, citizens and private companies in realizing the improvement. He highlighted Kitakyushu's collaborative city-to-city projects in 60 cities in 14 countries, including Surabaya, Indonesia, and Phnom Penh, Cambodia.

View of the dais during the Mayors Session 2: Smart Cities of India - What Can 3R Offer in Terms of Sustainable Urban Development and New Business Opportunities?

Panel Discussion: A panel discussion followed with reflections by Yuji Kato, City of Kitayushu, Japan, Suryanto Ibrahim, Head of Environmental Agency, Indonesia, and Maung Maung Soe, Mayor of Yangon City, Myanmar. Panelists focused discussions on resource efficiency as part of urban development strategies and city development plans and shared scientific insights to the role of 3R in protecting the urban ecosystem and enhancing resilience of cities. They discussed green building regulations, processing waste at its source, and the critical lessons of Kitakyushu city in achieving 3Rs and trends in policy implementation across Asian cities.

MAYORS SESSION 2: SMART CITIES OF INDIA - WHAT CAN 3R OFFER IN TERMS OF SUSTAINABLE URBAN DEVELOPMENT AND NEW BUSINESS OPPORTUNITIES? This session was chaired by Seigo Tanaka, Vice Mayor, Osaka City Government, Japan, and Amit Dutta, Director, KPMG India, facilitated discussion.

Prasad Modak, Executive President, Environmental Management Centre, India presented on creating circular economic potential as a way for achieving smart and sustainable cities. He elaborated on regenerative economic systems and transitions from "take, make and dispose" models to a "take, make use of, regenerate" resource model, in line with sustainable development and green economy approaches, that redesigns production and consumption systems. Stressors according to Modak include rapid urbanization, rising consumerism, intense resource depletion and degradation.

Takako Ono, Manager, Kawasaki Environment Research Institute, Kawasaki City, Japan presented on the case of city-to-city collaboration between Kawasaki City and Bandung City. She said, the city-to-city approach has assisted in strengthening collaboration through the Asia Pacific Eco Business Forum which resulted in a waste management project between the two cities, and cooperation towards low carbon and sustainable cities.

Levitzke, Green Industries South Australia, presented on requirements for smart cities, and experiences in Adelaide. He highlighted measures implemented in Adelaide that use smart city technology to improve efficiency and good waste management practices across the city.

Anupam Mishra, MoHUA, India, presented highlights of India's Smart City Mission, which include area-based development, pan city development and smart city solutions such as electronic service delivery and intelligent traffic management systems. Through the Mission, 99 cities will promote clean energy through solar and wind waste. On the use of technology, Mishra referred to 12 kilometers of dedicated bicycle tracks in around 50 locations with 25,000 registered bikers through their system and the use of environment sensors to regularly monitor climate related hazards and natural disasters.

Deni Nurdyana Hadimin, Director of Waste Management, Bandung City, Indonesia, presented his city's waste management initiatives. On waste disposal, he said Bandung divides waste into organic, household and residual waste with organic being the highest and plastics being the second.

Panel Discussion: During the panel discussion, Avinash Singh, Municipal Commissioner, Kanpur City, India, stated that his city was following an integrated waste management model including door-to-door segregation of wastes, reuse of wastewater for agricultural purposes and the implementation of a plastic ban.

Dutta noted that in pursuing 3R as a sector can be a prospect for job creation and entrepreneurial ecosystems in these smart cities. Hadimin agreed, noting that there has to be consideration of institutional, financial and entrepreneurial aspects for there to be benefits.

Davesh Moudgil, Mayor, Chandigarh City, India, stated that once opportunities gain scale and become more viable in these cities there will be more offshoots for private sector entrepreneurship and informal sector involvement in waste management.

Tanaka concluded that the smart city concept is gaining attention globally and everyone including the public must be involved to ensure success.

MAYORS SESSION 3: PLASTICS ISSUES IN COASTAL AND MARINE ENVIRONMENT ~ OPTIONS FOR CITIES: This session was chaired by Ngo Nguyen Thanh, Department of Natural Resources and the Environment, Ho Chi Minh City, Viet Nam, and Manoj Kumar Gangeya, MoEF&CC, India, facilitated discussion.

Aditi Ramola, Technical Director, International Solid Waste Association (ISWA), highlighted global systematic failures such as single use plastics, insufficient infrastructure in cities to deal

View of the dais during the plenary session 8: Financing 3R - Domestic and International Investments

Malini Laxmansingh Gaur, Mayor, Indore City, India, signs the the Indore 3R Declaration on Achieving Clean Water, Clean Land and Clean Air in Cities

with waste, low demand for recycled products, and knowledge gaps in links between waste and marine agenda. She outlined core priorities in linking waste management and marine litter such as:

- sound collection for all;
- stopping fly tipping and littering; and
- closing down dumpsites near waterbodies.

Hideki Minamikawa, President, Japan Environmental Sanitation Centre (JESC) Japan, presented on recycling and resource recovery options of plastic waste. On waste types, he noted a total of 4920 tonnes of industrial waste, 4070 tonnes of domestic waste and 8990 tonnes of plastic waste discharge in 2016. The materials included PET bottles, wrapping film and home electronics which have been recycled into carpets, curtains and sewage manhole covers.

Sandeep Kulshreshtha, Director, Indian Institute of Tourism and Travel Management, India, presented on the journey towards plastic free tourism development in India highlighting key steps in minimizing plastics generated by the tourism industry, and impact of plastics on key tourism sites. He said plastics have had a negative impact on tourism which has resulted in untidy monuments and contamination of water used by tourists. Kulshreshtha said the tourism sector is actively exploring sustainable tourism practices that contribute to marine conservation and clean environment.

Panel Discussion: During the panel discussion, Ramola invited the presenters to speak on one or two of the discussion points prepared for the session. Noting that plastics were everywhere, Maung Maung Soe questioned the possibilities for substituting plastics today and the need for plastic-free zones in upper watershed areas. Levitzke noted that plastic water bottles can be a source of endocrine disrupting chemicals (EDCs) and that although work was done on biodegradable plastics as an alternative, the way in which some biodegradables were promoted can be considered unethical.

Ramola noted that plastic itself is not the problem but rather our relationship with it is and the limited amount of time it is kept in the circular economy. Gangeya remarked on the number of rules that are present in India to address plastic wastes and the number of states presently implementing plastic bag bans in the country. Levitzke remarked that what India has been doing has created ripple effects globally and has gotten the attention of plastic manufacturers. In closing, Chair Thanh noted that the issue of plastic will not go away once it has reached the ocean and broken up into micro-plastics that enter our food sources, that the issue was caused by mismanagement of waste collection and littering and that marine plastic pollution was now an emerging problem that South East Asian countries would need to deal with.

SIGNING OF DECLARATION "INDORE 3R DECLARATION ON ACHIEVING CLEAN WATER, CLEAN LAND, AND CLEAN AIR IN CITIES"

On Wednesday afternoon, mayors and city officials from 38 cities in the region considered and signed the Indore 3R Declaration on Achieving Clean Water, Clean Land and Clean Air in Cities calling for collective efforts on 3R and resource efficiency to achieve clean land, water and air. At the signing ceremony, Mohanty highlighted the value of the Indore 3R Declaration to the SDGs and underlined the value of coordination across sectors and stakeholders in the mission to achieve the goal of zero waste.

The Declaration pledges signatory city and local governments to:

- accelerate holistic waste management;
- implement local-level actions to make cities, clean, safe, smart, resilient, resource efficient, inclusive and sustainable through the effective implementation of 3R policies and promote tenets of circular economy;

- foster sustainable urban development planning and practices focusing on eco-products, green energy, rainwater harvesting, conservation of water bodies, urban farming with composting, safe disposal of agricultural waste, green city development, and green construction materials;
- inspire their citizens to take proactive ownership for managing their own waste;
- partner with CSOs, including integration of the informal sector with the formal waste management chain;
- leverage national and international collaborations to promote 3R as an economic industry, and 3R-related science, technology and infrastructure, as well as infrastructure, inter-municipal, inter-industry and city-to-city cooperation;
- work toward a complete ban on use of plastics in eco-sensitive or eco-fragile areas, including in tourist areas close to oceans, rivers, lakes, wetlands and other water bodies;
- work for wastewater treatment and reuse;
- focus on effective management of special waste streams such as micro-plastics, chemical wastes, hazardous wastes, e-waste and medical waste;
- promote the use of technology, including ICT, to strengthen the waste management value chain; and
- facilitate dissemination of national and international best practice in 3R among all stakeholders for wide-scale adoption and replication.

Following the signing ceremony Osaka, Japan, announced a new city-to-city cooperation and partnership initiative with Quezon City, the Philippines, to support the latter's efforts in climate change mitigation and adaptation as well as waste management.

PLENARY SESSION 8: FINANCING 3R- DOMESTIC AND INTERNATIONAL INVESTMENTS

P.K. Jena, Finance Ministry, India, chaired the session on Thursday morning, and Birgitte Bryld, UN DESA, facilitated discussion.

Takema Sakamoto, Japan International Cooperation Agency (JICA), presented on JICA's approach to financing 3R infrastructure in Asia and the Pacific. He explained that JICA always conducted research and survey in order to determine the appropriate "prescription," and stressing that JICA would not fund the projects or programs which were not feasible. He underscored the importance of all JICA projects to involve civil society for social innovation, promote awareness and environmental education, include the private sector through creating a better business environment, and involve a comprehensive public sector approach rather than just a technology fix.A.S. Harinath, World Bank Group, reviewed the region's waste management situation, the Bank's waste-related programmes and portfolio and the financing instruments and support activities it offers. He also reviewed challenges facing urban local bodies, the private sector and technology providers, and suggested possible responses, including:

- developing a national roadmap for integrated waste management;
- developing a national level "solid waste management network" to share experiences;

Durga Shanker Mishra, MoHUA, India

- building technical capacity and a professional cadre on waste processing and disposal; and
- establishing an apex body to set standards and provide technical guidance on all facets of waste management.

Ramachandran Sankaranarayanan, Small Industries Development Bank of India (SIDBI), outlined SIDBI's role in supporting industries for SWM, outlining its financing activities in SWM, sewage treatment, urban water supply, e-waste management, energy efficiency and green building. He also highlighted the SIDBI Make in India Loan for Enterprises (SMILE), which finances projects in renewable energy and green construction of sewage treatment and water supply, and SIDBI's Partial Risk Sharing Facility for Energy Efficiency (PRSF).

Yasuo Takahashi, Vice Minister for Environmental Global Affairs, MOEJ, described the Japan's government role in promoting international cooperation in environmental protection, stressing that many of the problems currently faced in other countries.In the 1960s, in parallel with rapid social evolution, Japan had overcame from serious environmental problems through a national regulation and partnerships with cities and the private sector. He said Japan was now eager to share its experience, knowledge, know-how and technology with Asia countries, as Japan moved itself from a mass consumption society to a sound material cycled society.

PANEL DISCUSSION: During the panel discussion, Abdul Halim, Director General, Prime Minister's Office, Bangladesh, discussed industrial waste management practices and financing opportunities through national funding mechanisms highlighting the Climate Change Trust Fund in his country. The Fund, he said, is implementing Clean Development Mechanism projects and encouraging further work on 3R by the private sector.

Osamu Mizuno, Director, AIT RRC.AP, emphasized the need to address the 3R challenge in the context of the SDGs, climate change and disaster risk reduction, as these issues are tied to established financing mechanisms and can address broader challenges. He highlighted the need for proper data and indicators to monitor progress at the national level and reiterated the importance of localizing global goals to meet national targets. Mizuno also encouraged capacity building for national officers in accessing climate financing such as the Green Climate Fund (GCF).

Vladmir Marev, Director, International Centre for Best Environmental Technologies, the Russian Federation, discussed national and international investments in the context of national legislation. He recommended a clearinghouse of relevant national legislation, technology and relevant information for potential investors interested in pursuing 3R enterprises in different countries, so as to ensure informed investment opportunities.

Jiten Hindocha, IL&FS Environment, India, underscored the value of developing markets for compost and 3R enterprises at the national level, and for government assistance in creating an enabling environment for 3R materials. He highlighted technology and innovation as key aspects to sustainable 3R enterprises.

PLENARY SESSION 9: VALEDICTORY SESSION

Mishra, MoHUA, India, and Mohanty, UNCRD presented a draft Chair's Summary of the Forum. Mishra facilitated discussion of the Chair's Summary. Delegates offered several minor edits, mostly regarding the paragraphs on country reports of their implementation of the Ha Noi Declaration, as well as accidental omissions in the review of pre-events and parallel events. Sanjay Kumar, Joint Secretary, MoHUA presented a brief oral summary of the meeting and its highlights, including the Mayors Dialogue and the signing of the Indore 3R Declaration, the launch of the State of 3Rs report, the release of the "Conservation Lifestyle" book, the exhibition to showcase best practices, and panel discussions.

Maya Singh, Minister for Urban Development, Madhya Pradesh, India, declared the Chair's Summary adopted at 1:56 pm.

The document includes the Indore 3R Declaration as an annex, and states the way forward, including to:

- integrate 3R and resource efficiency into national development plans and macroeconomic policy agendas;
- embark on low-carbon and green growth by pursuing a resource-efficient and circular economic development approach;
- engage the private sector and finance industry, including SMEs, to enable expertise, technical knowledge and services to be activated in pursuit of sustainable consumption and production;
- support awareness of the benefits of circular economic development through government policies and programs;
- explore new sources of funding to finance development of appropriate 3R infrastructures; and
- implement the Indore 3R Declaration.

The summary adoption was followed by announcement of 3R Awards given to Indian CSOs, NGOs and enterprises exemplary work in solid waste management and promotion of 3R principles to support the mission of a zero waste society.

In a formal ceremony, it was announced that the Ninth Regional 3R Forum will be held in Chiang Mai, Thailand, at a date still to be determined, and India handed over the chair of the Forum to Thailand. In accepting the chairmanship, Ekachai Chansri, MNRE, Thailand highlighted key initiatives in Thailand in 3Rs, which include efficiency of waste management practices, promotion of public involvement, and collaboration across sectors.

CLOSING SESSION

Yasuo Takahashi, MOEJ, praised the success of the Forum and acknowledged the work of organizers and the city of Indore. Reflecting on the theme, he recognized the continued importance of strong cooperation between local authorities and central government in pursuing 3Rs for clean land, water and air. He reiterated the need to work towards achieving the SDGs through implementation of 3R initiatives.

Birgitte Bryld, UN DESA, reflected on the discussions and encouraged strengthening implementation that is inclusive, accountable and builds capacity at all levels. She highlighted the drive and entrepreneurship among young Forum participants as an encouraging sign towards achieving the SDGs. She encouraged participants to take part and contribute to the HLPF in July in New York.

Durga Shanker Mishra, MoHUA, expressed his gratitude to all involved in the process and organizing of the meeting and encouraged continued engagement in 3R collaborations and engagement towards the next Forum.

Maya Singh, Minister for Urban Development, Madhya Pradesh, India, said the event has rejuvenated participants on ways to work towards effective waste management and creation of a zero-waste society.

Rajeev Jain, MoHUA, highlighted reliable sanitation and management of various types of waste on land, air and water and linked it to measures that can improve the climate that drives ecosystems.

Maya Singh officially closed the meeting at 3:03 pm.

India hands over the chair of the 9th 3R Forum to Thailand

UPCOMING MEETINGS

Second Meeting of the Expert Working Group on the E-waste Technical Guidelines: The Expert Working Group is expected to advance the work on further developing the technical guidelines on transboundary movements of electrical and electronic waste and used electrical and electronic equipment, in particular regarding the distinction between waste and non-waste under the Basel Convention, pursuant to decision BC-13/5 adopted at the 13th Conference of the Parties (COP13). **dates:** 17-19 April 2018 **location:** Geneva, Switzerland **contact:** BRS Secretariat **phone:** +41-22-917-8271 **fax:** +4-22-917-8098 **email:** brs@brsmeas.org **www:** http://www.basel.int

First Meeting of the Household Waste Partnership Working Group: By its decision BC-13/14 on creating innovative solutions through the Basel Convention for the environmentally sound management of household waste, the

Conference of the Parties to the Basel Convention established the Household Waste Partnership with the objective of promoting the environmentally sound management of household waste. **dates:** 13-16 May 2018 **location:** Port Louis, Mauritius **contact:** BRS Secretariat **phone:** +41-22-917-8271 **fax:** +4-22-917-8098 **email:** brs@brsmeas.org **www:** http://www.basel.int

GEF Sixth Assembly and Associated Meetings: The Global Environment Facility serves as the financial mechanism for the Minamata Convention on Mercury and the Stockholm Convention on Persistent Organic Pollutants, and has funded projects with waste components. The GEF Assembly is the governing body of the GEF and is composed of all 183 member countries. It meets every four years at the ministerial level to: review general policies; review and evaluate the GEF's operation based on reports submitted to Council; review the membership of the Facility; and consider, for approval by consensus, amendments to the Instrument for the Establishment of the Restructured Global Environment Facility on the basis of recommendations by the Council. **dates:** 23-29 June 2018 **location:** Da Nang, Viet Nam **contact:** GEF Secretariat **email:** https://assembly.thegef.org/contact **www:** http://assembly.thegef.org/

High-level Political Forum on Sustainable Development 2018: The theme of HLPF 2018 is "Transformation towards sustainable and resilient societies." Among the sub-set of SDGs to be reviewed in depth by HLPF 2018 will be SDG 12 (responsible consumption and production), which includes chemicals and waste management. **dates:** 9-18 July 2018 **location:** UN Headquarters, New York **contact:** https://sustainabledevelopment.un.org/contact/ **www:** https://sustainabledevelopment.un.org/hlpf/2018

Eleventh Meeting of the OEWG of the Basel Convention: The OEWG is expected to discuss, *inter alia*: the Convention's strategic framework, technical guidelines, the review of annexes, the Basel Convention Partnership Programme, and new agenda items on marine plastic litter and micro-plastics and waste containing nanomaterials. **dates:** 3-6 September 2018 **location:** Geneva, Switzerland **contact:** BRS Secretariat **phone:** +41-22-917-8271 **fax:** +4-22-917-8098 **email:** brs@brsmeas.org **www:** http://www.basel.int

World Circular Economy Forum 2018 (WCEF 2018): The World Circular Economy Forum is the global initiative of Finland and the Finnish Innovation Fund Sitra. The WCEF brings together business leaders, policymakers and experts to discuss how businesses can seize new opportunities and gain a competitive advantage through circular economy solutions, as well as how the circular economy contributes to achieving the SDGs. Hosted by MOE, this 2nd WCEF will consider the economic benefits and social equity of the circular economy, energy and climate solutions for a circular economy, global value chains and circular trade, as well as shared mobility and circular solutions for reducing marine plastic waste. **dates:** 22-24 October 2018 **location:** Yokohama, Japan **contact:** Sitra **email:** wcef2018@sitra.fi **www:** https://www.sitra.fi/en/projects/world-circular-economy-forum-2018/#wcef2018

Second Meeting of the Conference of the Parties to the Minamata Convention on Mercury: Among other things, COP2 is expected to adopt revised guidelines on interim storage and consider a report on waste thresholds. **dates:** 19-23 November 2018 **location:** Geneva, Switzerland **contact:** Minamata Convention Secretariat **fax:** +41-22-797-3460 **email:** mercury.chemicals@unep.org **www:** http://www.mercuryconvention.org/

Third Meeting of the Open-Ended Working Group (OEWG3) of the Strategic Approach to International Chemicals Management (SAICM): The OEWG is to consider the results of the first two meetings of the intersessional process addressing the possible post-2020 platform for addressing chemicals and waste, and prepare for the Fifth International Conference on Chemicals Management (ICCM5). **dates:** February 2019 **location:** TBD **contact:** SAICM Secretariat **phone:** +41-22-917-8273 **fax:** +41-22-797-3460 **email:** saicm.chemicals@unep.org **www:** http://www.saicm.org

Ninth Meeting of the Regional 3R Forum for Asia and the Pacific: dates: TBD 2019 **location:** Chiang Mai, Thailand **contact:** C.R.C. Mohanty, UNCRD **phone:** +81-52-561-9416 **fax:** +81-52-561-9374 **email:** mohantyc@uncrd.or.jp **www:** http://www.uncrd.or.jp/index.php?menu=308

For additional meetings, see http://sdg.iisd.org

GLOSSARY

3R	Reduce, reuse, recycle
AIT	Asian Institute of Technology
BCRC	Basel Convention Regional Centre
CEO	Chief Executive Officer
CSO	Civil society organization
EPR	Extended producer responsibility
FSM	Federated States of Micronesia
G-STIC	Global Science, Technology & Innovation Conference
HLPF	High Level Political Forum
ICT	Information and communication technology
IETC	International Environmental Technology Centre
MEE	Ministry of Environment and Energy. Maldives
MNRE	Minister of Natural Resources and the Environment, Thailand
MOEJ	Ministry of the Environment, Japan
MoHUA	Ministry of Housing and Urban Affairs, India
NGO	Non-governmental organization
NUA	New Urban Agenda
PPP	Public-private partnership
ROK	Republic of Korea
RRC.AP	Regional Resource Centre for Asia and the Pacific
SDGs	Sustainable Development Goals
SMEs	Small and medium enterprises
SIDS	Small island developing states
SWM	Solid waste management
UNCRD	UN Centre for Regional Development
UN DESA	UN Department of Economic and Social Affairs
UNEP	UN Environment Programme
UNIDO	UN Industrial Development Organization
WTE	waste to energy