

Chair's Summary

Fourth Regional 3R Forum in Asia

3Rs in the Context of Rio+20 Outcomes – The Future We Want

18-20 March 2013, Ha Noi, Viet Nam

I. Introduction

1. The Ministry of Natural Resources and Environment (MONRE) of the Government of Viet Nam, the Ministry of the Environment of the Government of Japan (MoEJ), and the United Nations Centre for Regional Development (UNCRD), co-organized the Fourth Regional 3R Forum in Asia from 18 to 20 March 2013 in Ha Noi, Viet Nam. The Forum was supported by the United Nations Industrial Development Organization (UNIDO), the United Nations Environment Programme (UNEP)/International Environmental Technology Centre, the United Nations Development Programme (UNDP)-Viet Nam, Institute for Global Environmental Strategies, and Japanese Technical Cooperation Project for Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries (J-PRISM/Japan International Cooperation Agency).
2. The Forum was attended by approximately three hundred participants, comprising of government representatives from thirty Asia-Pacific countries (Australia, Bangladesh, Bhutan, Brunei Darussalam, Cambodia, People's Republic of China (hereinafter, China), Fiji, India, Indonesia, Japan, Kiribati, Republic of Korea (hereinafter, Korea), Lao PDR, Malaysia, Maldives, Marshall Islands, Federated States of Micronesia, Mongolia, Myanmar, Palau, Papua New Guinea, the Philippines, Samoa, Singapore, Solomon Islands, Thailand, Timor-Leste, Tonga, Tuvalu, and Viet Nam), Subsidiary Expert Group Members of the Regional 3R Forum in Asia, international resource persons, representatives from various UN and international organizations, scientific and research organizations, non-governmental organization (NGO)s, representatives from the private and business sector, and local observers and professionals on waste management from Viet Nam. As a side event of the Forum, the NGO communities from Japan and Viet Nam jointly organized a NGO Forum, “Citizens’ Partnership and Cooperation towards Zero Waste Society”.
3. The Asia-Pacific region is faced with a number of critical challenges when it comes to integration of resource efficiency in overall policy, planning, and development. While many countries have become net importers of raw materials (fossil fuel, metals, timber, and other natural resources), the rapidly increasing volume, changing characteristics of urban and industrial waste, rising population, increasing consumption and per capita waste generation have posed serious challenges for the sustainability of the region.

4. Under the overall theme of "*3Rs in the Context of Rio+20 Outcomes - The Future We Want*", the Fourth Regional 3R Forum in Asia, 18-20 March 2013, hosted by the Government of Viet Nam, addressed 3Rs and resource efficiency measures towards achieving the *Rio+20 Outcomes - The Future We Want*; the new and emerging waste issues in terms of policy, institutional, and technological considerations; 3R infrastructures towards a resource-efficient and zero waste society; performance indicators in 3Rs and resource efficiency; 3Rs in small and medium-sized enterprise (SMEs) and industrial sector, and agriculture and rural sector; 3Rs for sustainable and resilient cities; 3Rs as the basis for sustainable waste management in Small Island Developing States (SIDS), and multi-stakeholder partnerships in advancing 3Rs and resource efficiency, among others.
5. Further towards demonstrating a firm commitment towards accelerating 3R policies, programmes, and projects in Asia in support of the *Rio+20 Outcomes – The Future We Want*, the participants agreed and adopted the "*Ha Noi 3R Declaration - Sustainable 3R Goals for Asia and the Pacific for 2013-2023*" (Annex 1). The decadal *Ha Noi 3R Declaration*, aims to provide an important basis and framework for Asia-Pacific countries to voluntarily develop and implement 3R policies and programmes, including monitoring mechanisms to measure their attainments of the goals and targets underlined in the legally non-binding and voluntary Declaration. The Declaration is also based on the fundamental understanding that the 3Rs are much more than the end-of-pipe solution for municipal waste management, but are intrinsically linked with resource efficiency in a wide range of key development sectors such as agriculture, industry, energy, and mining, among others, towards transitioning to a resource-efficient economy and society.

II. Opening Session

6. Welcoming the participants of the Forum, Mr. Nguyen Minh Quang, Minister of Natural Resources and Environment of the Government of Viet Nam noted that the Fourth Regional 3R Forum in Asia was organized when the world was facing many challenges. The world economy has not recovered from the economic crisis, environmental degradation is on the rise and the challenges of climate change have become more complicated and its effects have become more unpredictable. In this context, he noted that at the Rio+20 Conference held in June 2012, world leaders called upon countries to accept green economy paradigm to achieve sustainable development. The 3R concept has been recognized as one of the effective measures to achieve green economy as it can reduce wastes, increase resource efficiency, reduce environmental pollution and greenhouse gas (GHG) emission and at the same time also create jobs, increase income, and reduce poverty. In Viet Nam, after 25 years of renovation, we have achieved remarkable development progress and poverty reduction. However, there are still many constraints in waste management. Solid waste is not separated at source, mostly being landfilled in open dumping sites. Recycling is spontaneously developed without policy planning, using backward and primitive technology, causing environmental pollution.

Hazardous waste has still not been fully treated in an environmentally sound manner. In this context, the country has adopted the National Strategy for Green Growth and National Strategy of Integrated Solid Waste Management, which have emphasized 3Rs as one of the key activities to achieve green growth for sustainable development. However, real success is still some distance away from strategy. The 3R Regional Forum is an opportunity for Viet Nam and other countries to cooperate and achieve better 3Rs success for a greener economy in Asia.

7. Mr. Shinji Inoue, Parliamentary Senior Vice-Minister of the Environment of Japan expressed his deepest gratitude to the MONRE-Government of Viet Nam as well as UNCRD for co-organizing the Fourth Regional 3R Forum in Asia. Reviewing the history of the Regional 3R Forum since 2004 when the then Japanese Prime Minister Junichiro Koizumi proposed the 3R initiatives at the G8 Sea Island Summit, Mr. Inoue recognized the growing interest of Asian countries in 3Rs as well as the expansion of the Regional 3R Forum in Asia. Given the problems of massive resource use and waste generation intimately linked with urbanization and industrialization in the Asia-Pacific region, he stressed the significance of the co-benefit aspects of 3Rs. Noting Japan's significant contribution in promoting the 3Rs, he highlighted the importance of the adoption of the *Ha Noi 3R Declaration* by Asia-Pacific countries. He recognized the role of the Regional 3R Forum as a platform to foster multilayered networks of stakeholders such as national and local governments, academia, the scientific and research community, the private sector, media community, NGOs, and the informal sector in order to deepen discussion on the direction and measures for promoting the 3Rs.
8. Ms. Chikako Takase, Director of UNCRD, drew attention to the critical fact that Asia-Pacific is the fastest urbanizing region in the world, and this will have unprecedented impact on its urban environment, natural ecosystem, resiliency, and quality of life. Many of these issues are related to how we produce products, consume and finally discard or dispose of the generated waste. For rapidly urbanizing cities in Asia, unless alternate models of growth that prevent and minimize generation and end-of-pipe disposal of wastes are at the core of national, provincial, and city development policies and strategies, significant impacts will result. A system of production and consumption that imposes significantly lower pressures on natural resource stocks and the environment is indispensable for the sustainability of region in the twenty-first century. Acknowledging the multiple benefits of 3Rs, she reiterated the importance of adopting a life-cycle approach and of further development and implementation of policies for resource efficiency and environmentally-sound waste management. She also welcomed the fact that the significance of the 3Rs has gradually gained recognition in Asia-Pacific countries in recent years, and observed that several countries have adopted national 3R strategies and related laws and regulations. While encouraging countries to come forward to discuss and adopt the "*Ha Noi 3R Declaration - Sustainable 3R Goals for Asia and the Pacific for 2013-2023*" in support of *Rio+20 Outcomes* into action, she urged the attention of the international community on the critical waste management challenges faced by SIDS in view of their unique and particular vulnerabilities, including their small size, remoteness, and narrow resource base, among other constraints.

9. United Nations Resident Coordinator Ms. Pratibha Mehta stated that “Reduce, reuse, recycle” were fundamental for a resource efficient society. She considered that the Forum was a real opportunity for people from the region to come together to address how 3Rs could contribute to the implementation of *the Rio+20 outcomes document - “The Future We Want.”* Rapid industrialization, urbanization, and resource exploitation have driven economic growth in the region, but these drivers have also put pressure on the environment. The 3Rs life cycle approach requires efficient use of resources and avoids the production of waste through resource-efficient design and production. She noted that the Viet Nam Green Growth Strategy emphasised the need for low-carbon development, green production, restoring of natural assets and green lifestyles, and creating opportunities for the development of recycled product markets. The recycling industry in Viet Nam is recycling substantial amounts of urban domestic waste but it is highly informal and characterised by limited investment. She further pointed out that the National Strategy of Integrated Solid Waste Management was adopted in 2009, but implementation of 3R activities was still fragmented. The Asia-Pacific countries including Viet Nam need, for example, public awareness campaigns to encourage households to reduce and avoid waste. She noted that the UN has been privileged to work in Viet Nam and other countries of the region towards sustainable development and green growth. The UN will continue to share international experiences, build capacities, and support coordination for the advancement of 3Rs at national, regional, and international levels. Referring to the *Ha Noi 3R Declaration*, she considered that a common framework on Sustainable 3R Goals will provide an important basis for Asia-Pacific countries to develop and implement 3R policies and programmes, and move towards green economy and society.
10. Deputy Prime Minister Nguyen Thien Nhan highlighted the significance of the Fourth Regional 3R Forum in Asia. With its theme of “3Rs in the context of *Rio+20 Outcomes – The Future We Want,*” the Forum will address the promotion of more effective measures for waste management and reduction of impacts on the environment along with employment generation and economic growth in shifting towards green economy. With persistent economic crises and environmental degradation on many fronts, aggravated by climate change, he noted that there is a need to re-consider the growth model in a novel direction. He noted that the *Rio+20 Outcomes document, The Future We Want*, called for, among others, all countries to promote green growth, aiming at green economy for the objectives of improved human life and enhanced social equity, while minimizing environmental risks and ecological depletion. In 40 years since the 1972 Stockholm Conference, important changes have occurred in human thought on development. Priority has shifted from economic growth, development comes before environmental protection (1970s – 1980s), to the integration of environmental protection into economic growth (1990s – 2000s) and currently to investment in environmental protection, mitigation, and adaptation to climate change, preservation of natural capital to generate employment, increase income, alleviate poverty, and enhance long-term economic growth.
11. The Deputy Prime Minister further noted that one of the means for green growth and green economy is integrated waste management, regarding waste as a natural resource by

applying various measures to reduce, reuse, and recycle (3Rs). He explained that Viet Nam has adopted the National Strategy for Green Growth. One of the solutions emphasized in Viet Nam's Green Growth Strategy is strengthened reuse and recycling of waste through improved policies, legal systems, planning and development of waste recycling industry, and promotion of recycling by converting waste into energy, materials, and compost. However, there remains a gap in implementation. He highlighted the need to enhance cooperation among countries at the global as well as Asian regional scale in order to realize 3Rs and measures for green economy. He emphasized that the Forum is essential in raising the awareness of all and strengthening joint planning and implementation of policies to effectively enhance 3R activities in Asia. He believed that the Forum would be an opportunity for sharing and exchanging practical experiences, technologies, and policy instruments to promote 3Rs and considered that through the Forum, Asian countries would foster high-level policy dialogues towards sustainable development in the region.

12. In his keynote address, Dr. Prasad Modak, Executive President of Environmental Management Centre in India, observed that urbanization across the world was increasing at an alarming rate and most prominently in the Asian region. Besides population growth in urban centres, the Asian region has witnessed a sharp increase in resource consumption per capita and also increase in per capita waste generation. This has led to the generation of significantly large volumes of waste compounded with the emergence of complex waste streams like e-waste, household hazardous waste, and construction and demolition waste. Capacities of urban local bodies have remained weak and infrastructure investments on waste management are often fraught with financial and technical constraints. Weak enforcement has further compounded the situation. This has led to a significant impact on human health and the ecosystems, increasing the risks to security of precious and limited natural resources. Practicing 3Rs is the most practical way to deal with this situation. 3Rs help reduce the wastes across the life cycle, regenerate resources thereby improving promote resource security, green investments, and provide green jobs while spurring innovation. To promote 3Rs however, an enabling framework needs to be created consisting of appropriate policies and regulations, financing, and institutional mechanisms. Partnerships are the key. In these partnerships, central government and urban local bodies should set overarching 3R policy frameworks, provide viability gap funding and carry out enforcement; private sector should bring in investments, efficiency and technological innovations, and the community should ensure sustainability of the 3R projects by taking ownership.
13. Dr. Modak further noted that establishing waste-resource linkages at the national level was another key element to mainstreaming 3Rs. Countries like Japan, Korea, and China have taken a lead in this direction. Operation of regional material recovery facilities across urban local bodies and supporting community-driven decentralized waste and resource recycling hubs within urban local bodies should be concurrently followed. For the business or private sector, product design for sustainability and Extended Producer Responsibility should to be examined. Miniaturization of 3R technologies at the household level for zero waste, production of cost-effective and easy to operate waste

sorting machines to help waste pickers and development of high end and high value solutions for handling large volumes of construction and demolition waste are some of the technological challenges that should be addressed by R&D institutions. Finally, taming of consumption through Green Public Procurement is going to be the key. This would mean changes lifestyle and perhaps even revisiting or rediscovering earlier traditions of lean living. Only then will there be hope that cities of the twenty-first century will become sustainable and the dream of "cities with no landfills" will come true.

III. Towards Achieving the “Rio+20 Outcomes - The Future We Want” – Opportunities through 3Rs and Resource Efficiency Measures

14. The *Rio+20 outcomes* have demonstrated renewed international agreement on the importance of furthering sustainable development. It was recognized that poverty eradication, enabling sustainable patterns of consumption and production, and managing the natural resource base of social and economic development are important goals for all nations. These important goals will require international collaboration, knowledge exchange, and improved forms of governance to be successfully implemented. It was recognized that sustainable development will not occur spontaneously but will benefit from well-designed policies that deliver a triple dividend of increased standards of living, equitable participation in human development, based on a healthy environmental and resource base.
15. Overarching strategies of inclusive green economy, sustainable consumption and production, and sustainable use of natural resources were seen as important guidelines for the policy community across the globe to decide policies and policy instruments that are appropriate to achieving sustainable development. In this context, 3R policies and policy instruments will be one of the most important means of achieving improvements in resource efficiency and will help steer the region towards sustainable consumption and production and achieving sustainable development.
16. The need for resource-efficient economic behaviour is especially important in Asia because of its large population, population density, its growing dependence in sourcing natural resources from global markets, and the need to improve the material standard of living of its people. Over the past three decades, Asia has made remarkable progress in human development and improving the material standard of living of its people. Many countries have invested in public infrastructure and urban development and have established a manufacturing base.
17. The success story of growing human development in Asia has come at a cost, as the amounts of natural resources used and the related waste and emissions of production and consumption activities have grown substantially. Today, Asia has a great impact on global material use and waste generation, energy consumption and emissions, and water and land use. This impact will increase in the decades to come. The natural resource base in many countries of the region is already substantially diminished. The region has

become a net importer of many natural resources, most importantly fossil fuels. In many Asia-Pacific countries the landfill capacity for waste and the community acceptance of such facilities is in decline while the contribution to greenhouse gas emissions forcing global climate change is on the rise.

18. The background paper presented by Dr. Heinz Schandl of the Commonwealth Scientific and Industrial Research Organisation, Australia, highlighted important regional trends, including the projection of an additional three billion middle-class consumers by 2030, and an 80 per cent rise in steel and cement demand in that time frame because of rising costs of extraction of energy resources and metals at a time of rapidly increasing demand leading to supply shortages, price increases, and volatility. Large investments in resource supply systems will be needed and need to go hand-in-hand with recycling initiatives and demand side measures such as decreasing the currently large spending on natural resource subsidies that distort the market. Dr. Schandl underlined the fact that changes in policies for large systems of provision including housing, transport, energy, and food sectors had the potential to deliver 75 per cent savings in resource use, waste and emissions reduction, and also recommended that countries focus on these key priority sectors when planning their 3R initiatives and policies.
19. It is important for the Asia-Pacific countries to integrate 3Rs and resource efficiency objectives in their overall policy, planning, and development with an objective to achieve co-benefits – protection of natural ecosystems and resources, minimizing disposal costs through waste minimization, reduction of GHG emissions, contributing to energy security, achieving sustainable cities and human settlements, improving economic competitiveness of industries, business operations, and countries, and creating new business opportunities and green jobs, meaningful work for all and social protection, protection and restoration of the health and productivity and resilience of oceans and the marine ecosystem which is crucial in providing food security, nutrition, and livelihood especially in SIDS which are more exposed to a diminishing natural resource base.
20. Sustainable resource use, resource efficiency, and growing recycling and waste minimization are instrumental for future socioeconomic development in the Asia-Pacific region. During the past three decades, the Asia-Pacific region has transitioned from a biomass-based economy to a mineral-based economy creating new challenges for recycling and waste management caused by the new materials entering the economic process. At the same time, the region has become less material efficient driven by growth in consumption and the transition from traditional to urban/industrial systems of provision and lifestyles. The region has to increase the material efficiency of production and consumption using 3R policies and policy instruments to remain prosperous and competitive. A mix of incremental and transformative policies including green budget and tax reforms, pricing, and capping the use of natural resource at source, winding back resource subsidies, and increasing investment in “production service systems” and eco-projects such as eco-industrial parks, eco-cities, science parks, and recycling projects are all crucial for the region.

21. Asia-Pacific countries should aim to strengthen policy support for 3R policies in the form of national 3R strategies, by identifying a coordinative authority for managing policies, and growing the ownership for 3R policies and initiatives in all relevant line agencies. Cross-sectoral collaboration and mainstreaming 3Rs into national development strategies will be beneficial for achieving the goals of resource efficiency and waste minimization. There are a number of successful examples of macro-economic policies in the region – including Japan’s initiative for creating economic development through the establishment of a Sound Material Cycle Society; Green Growth policies in Korea; the Circular Economic Promotion Law and the comprehensive Law for Environmental Protection in China. These framework policies enable waste and resource management to be undertaken in an integrated way making use of synergies and avoiding trade-offs. The Government of India has made significant efforts to mainstream environmental policy objectives into all development decisions by implementing a number of initiatives including the solar mission, the energy efficiency mission, the sustainable habitat mission, the sustainable agriculture mission, and the water mission. All those programmes aim to achieve economic and human development at much reduced environmental costs through 3Rs and resource efficiency.
22. The Forum noted the large potential for using waste as a resource. As an example, 5 billion tons of waste agriculture biomass are generated globally equivalent to 1.2 billion tons of mineral oil – about 25 per cent of today’s global crude oil production. Asia alone accounted for 77 per cent of global biomass, and most of the biomass is left to decompose or burnt in the fields losing many economic opportunities, including climate mitigation and job creation. There is a large potential for industrial symbiosis in the emerging heavy and manufacturing industries in Asia and also an underutilized potential for metals recycling because of very low recovery rates for many metals and the considerable room for improvements in that domain.
23. In further strengthening implementation of concrete 3R projects post Rio+20, regional development banks such as the Asian Development Bank (ADB) could play an important role in providing investment capital and to incentivize resource efficiency and waste minimization. ADB is planning to engage with pilot cities in Asia to develop show cases for waste management in cities. Though there is significant potential for public–private partnership in municipal solid waste management, one of the critical challenges is the need to improve private sector investments in waste management in Asian cities. Such investments would be encouraged by a longer-term urban planning perspective of cities and could positively influence cities’ financial and environmental baseline.
24. The Forum recognized the need for stronger political support to further 3R policies and measures in the domains of greening industries and business operations, renewable energy, sustainable cities and human settlements, food security, poverty alleviation, sustainable agriculture and farming, water management and sanitation, and protection of the coastal and marine environment, among others. For instance, Organisation for Economic Co-operation and Development (OECD) countries have recognized the significance of 3Rs and resource efficiency. During the past three decades, resource

productivity of OECD countries has increased significantly resulting in lower resource use per unit of added value. Another notable example is the case of Japan, which has a small natural resource endowment and relies on imports of materials. Land availability for new landfill sites is also limited in Japan. The combination of resource scarcity and landfill limitation created a political context in which the framework policy of a Sound Material Cycle Society found bipartisan support and enabled targets, related policies, and regulation.

25. Despite successes stories identified in a number of countries, the overall resource and material efficiency is declining in the region as the countries grow economically and industrially. This is mainly caused by a stark shift in economic activity away from very resource-efficient producers (such as Japan and Korea) to less resource-efficient producers (such as China, India, and countries in Southeast Asia). Barriers and constraints such as a lack of institutional coordination and capacity, in particular cooperation between waste and resource managers; inadequate legal frameworks; financial constraints; and limited access to technologies – have further hampered success in resource efficiency and waste minimization. Policy formulation and capacity building for 3Rs should go hand-in-hand to ensure successful policy implementation. This will require investment and technical support for Asian developing countries. Implementation of 3R policies and programmes needs concerted efforts from all – government, private and industry sectors (including SMEs), and consumers in a tripartite cooperative framework.

IV. Policy, Institutional, and Technological Considerations in Addressing New and Emerging Issues

26. While new and emerging waste streams, such as electronic waste (waste electrical and electronic equipment, WEEE), health-care waste, plastics in coastal-marine environment, construction and demolition waste, mining waste, chemical and hazardous waste, waste agriculture biomass, used tires, and wastes linked to nano materials, etc. have become matters of serious concern for the sustainability of the region, appropriate adaptation of 3R policies and supporting infrastructures and technology penetration have been the major challenges for many countries.
27. In Asia, e-waste is the most important emerging waste, in terms of its growth rate and hazardous nature. At the same time, this waste stream has the highest potential for recycling to contribute towards resource efficiency and creation of green jobs. Also with the rapid increase in automobiles in Asian urban centres, used tires have become one of the “new” waste streams. Considering, the potential of “waste to energy” from this new waste stream, proper policy and monitoring activities could lead to attractive new recycle-based business opportunities in this sector.
28. Major issues related to these emerging wastes are: a) establishment of reliable data and knowledge base, thus local authorities will have access to this information; b) need for setting up targets for waste generation and comprehensive policy framework, while

focusing more on “sustainable production and consumption” than on tail-pipe solutions and measures (waste collection, handling, and treatment). One of the useful ways for the countries to monitor the progress of the country-level 3R activities is to institute benchmarks and indicators such as per capita resource consumption, waste generation rate, etc needs to be developed and measured periodically.

29. Recycling activities to a large extent are driven by technologies, among other enabling factors. In order to address the new and emerging waste issues, countries need to consider policies and programmes that will progressively support research and development and adaptation of these technologies. While these should be integrated by technology assessment and capacity-building addressing the operation and maintenance of these recycling technologies, due consideration should be given to the cost-benefit of such recycling technologies. In case of SIDS, appropriate technologies should be developed in close collaboration with the technology developers and the local communities keeping in mind their unique vulnerabilities and limitations, including the vital marine ecosystem that provides important means for their livelihood security and nutrition.
30. In order to promote advanced 3R technologies, e.g., waste-to-energy (WtE), demonstration projects are very useful in sharing and disseminating useful experiences on how the technologies could be modified and adapted to favour the local economy and conditions. In this regard, lack of market opportunities for recycled products is one of the major hindrances.
31. For SIDS, the most important challenge is the development of capacity to adopt recycling management and technology concepts appropriate to their local conditions and economy. Capacity-development activities coupled with implementation of pilot and demonstration projects employing a regional approach could be helpful for SIDS where major municipal solid waste generation is primarily linked to the tourism sector. Regional waste centres, through collective efforts of SIDS, could be useful in dealing with wastes generated from tourist resorts as well as other islands.
32. International cooperation is crucial in developing necessary capacity to address new and emerging waste streams. International development agencies and donors should extend important cooperation to developing countries, including SIDS, in fostering and enhancing institutional coordination and integration of 3Rs and resource efficiency in national development plans with a view to managing the majority of waste streams in an environmentally-sound manner. These capacity-development activities should not be limited to technological issues, but should also incorporate political, institutional, social, and financial considerations. At the same time, countries and the international community need to recognize the importance of science-based assessments of potential risks and opportunities posed by the new and emerging waste streams.

V. 3Rs in Greening Industries towards a Resource-Efficient and Zero Waste Society

33. In order to achieve resource-efficient and zero waste society, several 3R tools for greener industry are already available, while others are being developed internationally. Countries need to transform their extracting, manufacturing, and production sectors by introducing more efficient use of raw materials in order to achieve sustainable industrial development.
34. Industries and SMEs currently lack awareness on 3Rs or perceive the implementation of 3Rs as overly costly. To tackle this issue, strong leadership at the national level and the involvement of all stakeholders is required. In addition, the creation by governments of ad-hoc institutions, such as Resource Efficient and Cleaner Production centres in charge of capacity-building, and demonstration projects as well as facilitating collaboration among universities, NGOs, and the private sector are recognized. On the policy level, the establishment of financial incentives will facilitate and accelerate the adoption of 3Rs by SMEs and industries.
35. The Forum recognized a number of national and international initiatives. The Green Industry Initiative for sustainable industrial development was endorsed in Manila in 2009 by 21 Asian countries. During the follow-up Tokyo Green Industry Conference, decision was taken to implement the Green Industry Initiative through the Green Industry Platform. This high-level multilateral platform bringing together governments, international and civil society organizations, and private companies promotes the greening of existing industries and the creation of new green industries, in line with the 3R principles. It promotes technology innovation, offers access to information on green industrial policies and practices, and fosters networking and partnerships. Industries and SMEs from the rapidly developing Asia-Pacific countries can benefit from joining the platform and making a commitment to reduce their environmental footprints while increasing their social and economic benefits.
36. There are also a number of bilateral initiatives such as the collaboration between Japan (New Energy and Industrial Technology Development Organization) and the Viet Nam Government for a sustainable low carbon society. In this respect, a demonstration project for industrial waste incineration with power generation was developed at the Nam Son waste treatment complex. The main objective of the project is to reduce the volume of waste while producing renewable electricity through the recovery and utilization of exhaust heat. At the same time, the state of the art facility prevents the release of toxic emissions in compliance with local environmental standards.
37. At the national level, several examples of policy frameworks based on 3R principles are available such as China's Circular Economy Promotion Law and Korea's Green Growth Strategy. These policies include, among others, investment, taxation, and financing to support the growth of 3R industries. Another national initiative is the integrated solid waste management towards green economy promoted in Viet Nam. The purpose of this initiative is to accelerate ecosystem-based economic development, to invest in renewable and environmentally-friendly technologies as well as to develop environmental services and recycling industry.

38. At the SMEs and industry levels, Thailand has developed a 5-step approach to encourage companies to apply 3R principles starting from a commitment by the top management to environmental and health protection followed by the implementation of internal greening activities, ISO certification, and greening of the value chain. These efforts are then rewarded by the issuance of an official green certificate for the companies. Other initiatives include Korea's 'Resource Recirculation Complexes' and 'Web-based Resource Circulation' linking industries to provide useful information on which industry generates what. This allows industries to use waste as raw materials in their own operations. People are able to log onto the website to find the information they need. Korea has also developed voluntary agreements with the industry to introduce a fee for plastic bags and the reduction of disposable cups in coffee shops. A key driving force here is for the business sector to enhance their corporate image by participating in voluntary agreements.
39. The Asia-Pacific region is witnessing the emergence of eco-industrial parks and science parks, which represent a significant step forward for the promotion of resource efficient and zero waste society. The eco-town and the industrial land planning in Thailand, construction of dedicated eco-industrial infrastructures in India, and the implementation of eco-industrial projects in Viet Nam, are some of the initiatives aiming to create industrial symbiosis in which the waste of some industries becomes the input raw material of others contributing to higher resource efficiency.

VI. Performance Indicators in 3Rs and Resource Efficiency

40. In face of growing urbanization and rapid industrialization in Asia and the Pacific, the region requires alternative models of growth that prevent and minimize waste generation rather than focussing on end-of-pipe disposal methods. Many countries in the region are now focused on development and implementation of national policies, legislation, and strategies to promote 3Rs. Considering the increasing resource demands and consumption and associated waste generation in the region, it is important for the countries to set clear policy targets and review them regularly for monitoring material use and efficiency and waste management at the macro-level such as those based on Material Flow Analysis and Life-Cycle Analysis.
41. The 3R performance indicators are important in monitoring the effectiveness of existing 3R policies, programmes, and projects at the local and national levels. The 3R indicators could not only help identify existing good practices, but also facilitate comparative analysis across the region. Reliability, quality, availability, methods of sampling and measurement, including definition issues of data are some of the key challenges faced by many countries of the region.
42. There are several innovative efforts being undertaken by both national and international agencies in developing 3Rs and resource-efficiency indicators. For example, China, under its Law of Circular Economic Promotion, has been developing both quantitative and

qualitative indicators at macro and industrial park-level. Similarly, Indonesia has established incentive methods such as Adipura Program for monitoring, evaluating, and awarding the cities based on verifiable and comparable performance indicators. International agencies such as OECD and International Labour Organization have also developed comprehensive sets of performance indicators not only for monitoring 3Rs but also for environmental implications of material flows as well as for monitoring working and living conditions of stakeholders engaged in waste sector.

43. It is important to consider indicators that are easy to understand and use for practically monitoring current conditions as well as for assessing future risks to help prevent harmful practices in waste management. In addition to indicators related to public health, environmental conditions, and governance (enforcements, budget allocation, and compliance), due consideration should be given to develop indicators related to the labour force to effectively address issues such as child labour, skill of labourers, and principles of occupational health and safety of labourers.
44. For effective promotion of 3Rs in Asia and the Pacific, there is a need to institutionalize 3R information, indicators, and knowledge-base at local, provincial and national levels. Further, these indicators should be linked with national developmental goals and targets. A regional mechanism led by international organizations would be useful to evaluate the progress in this regard. Indicator-based incentives and awards systems could be considered to motivate national and local government agencies for effective action on 3Rs. Building partnerships among development agencies, scientific and research institutions, and regional policy bodies could be helpful in strengthening the capacity of countries for developing and using 3R performance indicators on a regular basis. The Forum welcomed the efforts on 3R performance indicators, including a core set of indicators, and further recognized the need to expand the existing collaborative research work on data, information, and indicators in resource-use efficiency and 3Rs.

VII. Country-Country Cooperation and Partnerships in the Promotion of 3Rs in Asia

45. Considering the varying capacity of countries in 3Rs, international cooperation will be beneficial to promote the formulation and implementation of 3R policies in the region by utilizing various collaborative opportunities. These include city-to-city cooperation under a framework of sister cities, intra-regional, south-south cooperation, and bilateral country-to-country cooperation. 3R concept is now widely accepted in Asia, owing partially to Japan's efforts in assisting the development of national 3R strategies in a number of countries including Bangladesh, Indonesia, and Viet Nam. However, to implement that effectively, for example for municipal, industrial, hazardous, medical or construction waste, the involvement of and partnerships among, stakeholders are essential.
46. The Forum recognized the importance of linking the 3R initiative to other international programmes such as the Climate and Clean Air Coalition (CCAC). In doing so, countries will benefit from synergies between different policy domains such as air pollution,

climate change, and 3Rs. CCAC is a global partnership committed to taking action on Short-lived Climate Pollutants (SLCPs), and aims for, among others things, mitigating SLCPs from municipal solid waste by working with cities and central governments. In order to mitigate emissions of methane and air pollution across the municipal solid waste sector, it would be important to provide technical assistance, capacity-building, and awareness-raising.

47. The Forum recognizes the International Partnership for Expanding Waste Management Services of Local Authorities (IPLA), the 3R Knowledge Hub, the UNEP Global Partnership for Waste Management, the Economic and Social Commission for Asia and the Pacific's Multi-stakeholder Partnership for Pro-poor Solid Waste Management in secondary cities and small towns through the development of Integrated Resource Recovery Centres, and Mobile Phone Partnership Initiative and Partnership for Action on Computing Equipment as important mechanisms to foster international cooperation to enhance the capacity of local and national governments to address existing and emerging waste issues. International cooperation is essential to address the trans-boundary issues of e-waste.
48. The Forum recognizes the importance of bilateral cooperation among the countries. Examples of successful bilateral cooperation between countries include the Japan and Malaysia partnerships on food waste management and the Japan and Viet Nam cooperation for supporting Viet Nam in developing 3R programmes. Cities can learn from other cities on effective community-based household waste management system, for example, particularly among cities in developing countries through a south-south modality.
49. The Ministry of the Environment of Japan has been implementing the project for technological transfer, capacity building and institutional support of Japanese waste management expertise in overseas countries in order to enhance circulatory use of resources and reduce global environmental pollution. Activities under this project include feasibility studies on sound overseas business operations, joint workshops by partners and stakeholders and training programs for responsible personnel from host countries.
50. Many other forms of partnerships among the community at country level have delivered successful results in 3Rs promotion. For instance, in 2011, Brunei launched the 'No plastic bag weekend' initiative in collaboration with few large departmental stores. This is now extended to Fridays. Recently Brunei also launched the promotion of paper bags as an alternative to plastic bags. These are all due to effective cooperation between government, private/business sector and consumers. Brunei's Environment Youth Envoy is a partnership that empowers the youth to champion and partake in various environmental initiatives and activities, and become change agents in moving their peers and the community towards environment leadership. Brunei also runs Eco-clubs which are self-run by the students and guided by the teachers involving environmental projects related 3R in schools. Another successful example is the Asia 3R Citizen Network of 20 Japanese NGOs, which has developed partnerships with the national and local

governments, private sector and consumers to reduce waste and promote resource efficiency. Activities of this group include cultivation of community leaders and facilitators who are capable of promoting 3Rs and energy efficiency, and creating sustainable communities. Similarly, Japan's multi-stakeholder partnership on PET bottle recycling has partnered consumers, municipalities, bottle manufacturers and bottlers to implement PET bottle recycling through voluntary design guidelines. These guidelines include plastic closures only made of PE or PP plastics, bottles made of clear PET only and labels removed by consumers prior to recycling. Collection rate over 70 per cent has been achieved since 2008.

51. International cooperation can also help share useful experiences on building 3R policies, programmes, and infrastructures in the context of building sustainable and resilient cities and communities. The keynote address delivered by Prof. Masaru Tanaka, Japan, shared useful lessons learned from 2011 Great East Japan Earthquake and Tsunami in managing the disaster waste. These experiences of Japan provides valuable means to disaster prone and low lying countries like Bangladesh and others to link waste management policies to impacts of climate and natural disasters. Japan's experience also shows inter-municipal cooperation is very helpful in managing disaster waste.
52. It is recognized that international collaboration will be especially important for SIDS because of their exposed geographical locations and vulnerabilities, and may include facilitation of the cooperation among small islands. Recognizing the need to quickly adopt 3R, SIDS recommended promoting sharing of good practices of 3R+RETURN, and enhancing capacity of regional experts who can help SIDS in implementation of 3Rs policies and programmes. SIDS also specified the need to collaborate with Asian region for the improvement in maritime transport, encourage eco-designed products, and promotion of green jobs. In order to monitor the progress of 3R implementation, SIDS called for the review of achievement on 3Rs by participating countries of the Regional 3R Forum.

VIII. The Way Forward

53. Countries in Asia-Pacific expressed their firm commitment to effectively promote 3R and the Forum unanimously adopted the "*Ha Noi 3R Declaration – Sustainable 3R Goals for Asia and the Pacific for 2013-2023*" (Annex 1). The *Ha Noi 3R Declaration* provides a comprehensive framework for countries in the region to voluntarily develop and implement 3R policies and programmes, including monitoring mechanisms to measure achievements against agreed goals and targets under the Declaration. The Ha Noi Declaration builds on the Tokyo 3R Statement and the Recommendations of the Singapore Forum on the 3Rs role to Achieving a Resource Efficient Society in Asia. The *Ha Noi 3R Declaration* complements the objectives and recommendations of the outcomes document of the Rio+20 Conference –*The Future We Want*. Its implementation would effectively contribute towards transitioning to a resource efficient and zero waste society.

54. The Forum identified the need for strengthening regional and international cooperation for achieving the *Ha Noi 3R Declaration's* objectives. In particular, the Forum highlighted a need for promoting knowledge exchange among countries to share good practice and to learn from country experiences. The Forum called for the development of new and innovative partnerships for the effective implementation of 3R. This may include development and transfer of appropriate and most suitable 3R technologies.
55. The Forum supports the development of a regional information networking and set of indicators that will support the agenda setting policy framing and monitoring and evaluation of 3R policy success. This may include a set of core indicators shared among countries and additional sectoral indicators that may vary according to specific 3R priorities of different countries. This new information base will allow establishing a baseline for 3R policy initiatives and will assist countries to set targets which are ambitious and achievable.
56. The Forum acknowledged the special waste management challenges faced by SIDS. Under a regional cooperative framework, SIDS could work together in sharing good practices, enhancing capacity with the use of regional experts, promoting intra-region recycling networks, and developing innovative ways of financing waste management system. This may include taxation in tourism sector, deposit-refund system, and develop network for exchange of recyclables.
57. Countries can work towards developing dedicated 3R policies, programmes, technologies and infrastructure to enhance their resiliency to climatic impacts and natural disasters.
58. The Forum concludes that the resource and waste management challenges of the twenty-first century will be comprehensively addressed by 3R policy initiatives and policy measures to achieve an inclusive and green economic development of our region.

IX. Closing Session

59. Dr. Ryutaro Yatsu, Vice-Minister for Global Environmental Affairs, Japan, was convinced that the Fourth Regional 3R Forum in Asia was very successful due to its adoption of the *Ha Noi 3R Declaration*, which was the world's first regional response to the outcomes from Rio+20. It is necessary to foster regional cooperation with various stakeholders, like local governments, private enterprises, researchers and NGOs, in order to achieve the goals identified by the *Ha Noi 3R Declaration*, while he encouraged UN agencies, multilateral and bilateral donor agencies, and other institutions on financial and technical assistance to actively join in Japan's endeavors.
60. Ms. Chikako Takase, Director of UNCRD, expressed special appreciation to the MONRE-Government of Viet Nam and the Ministry of the Environment of the Government of Japan, for co-hosting the Forum, and expressed her deepest gratitude to participating countries for adopting the *Ha Noi 3R Declaration*. The Declaration provides

a comprehensive framework for the Asia-Pacific countries to take necessary actions towards transitioning to green economy. She concluded her remarks by thanking the Government of Indonesia for officially announcing its intention to host the Fifth Regional 3R Forum in Asia in 2014.

61. H. E. Mr. Nguyen Minh Quang, Minister of Natural Resource and Environment, the Government of Viet Nam, extended his deep appreciation to the Ministry of the Environment of the Government of Japan and UNCRD for successfully co-organizing the Forum as well as for their 3Rs initiatives and supports to other countries in the region. He congratulated all the participants for adopting the *Ha Noi 3R Declaration*. He drew special attention to the importance of 3Rs in promoting green economy. The successful adoption of the Hanoi 3R Declaration demonstrates the firm commitment of the Asia-Pacific countries to promote 3Rs, and this agreement is also a foundation to enhance fruitful cooperation among the countries towards green economy in the Asia-Pacific region.

Annex 1: Ha Noi 3R Declaration - Sustainable 3R Goals for Asia and the Pacific for 2013-2023