Chapter 11

Toward 3R-Based Waste Management: Policy Change in Japan, Malaysia and the Philippines

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1. Introduction

Waste management is currently one of the key areas of public policy. Population growth in cities usually results in corresponding increase in waste generation. Basically solid waste generation has always been related to the economic status of a country and the lifestyle of its population. This in turn also affects the management style of the waste generated. Over the years, modern waste management has shifted from conventional, single-choice reliance on landfills to a more flexible waste hierarchy concept, also known as 3R (reduce, reuse, recycle) policies (Tanaka 1999; Wilson 2007).

Asia consists of two groups, developing and developed countries. Generally, the higher income countries generate more waste, recycle more and have the money to employ advanced technology to treat their waste. On the other hand, countries with lower income and greater rural populations are expected to produce more organic waste, such as kitchen wastes, and fewer recyclable items, such as paper, metals, and plastics. The developing Asia counts as the fastest and largest waste generator globally. In recent decades, however, type of waste also changed (including recyclables) even in developing countries due to increased urban migration and modern lifestyle. These facts present a complex policy challenge for governments to manage waste generation, especially when funding is scarce, and infrastructure is limited. A closer inspection reveals a mix of general and specific elements of policy dynamics in the evolution and adoption of waste management policies (UNCRD et al. 2009). A comparison of waste management across history and countries in Asia is a useful first step for policy learning to take place between both the developed and developing regions.

This chapter compares the pattern of policy development in selected countries in Asia, namely Japan, Malaysia and the Philippines. Section 2 outlines a simple framework for analyzing the process of policy change based on the case of Japan. Section 3 compares policy development in Malaysia and the Philippines against the stated framework. In Section 4, the progress of Malaysia's waste management is discussed in relation to the principles of 3R policies. The concluding remark reiterates key themes from the chapters discussed.

2. Policy Change in Waste Management

It is generally acknowledged that history matters in understanding policy development (Kraft & Vig 1994; Hezri & Hasan 2006; Cashore & Howlett 2007). More often than not, the elements of policy development differ from one jurisdictional context to another, be they sector- or country-based. Nevertheless, a generalization is still useful to explain patterns of policy development.

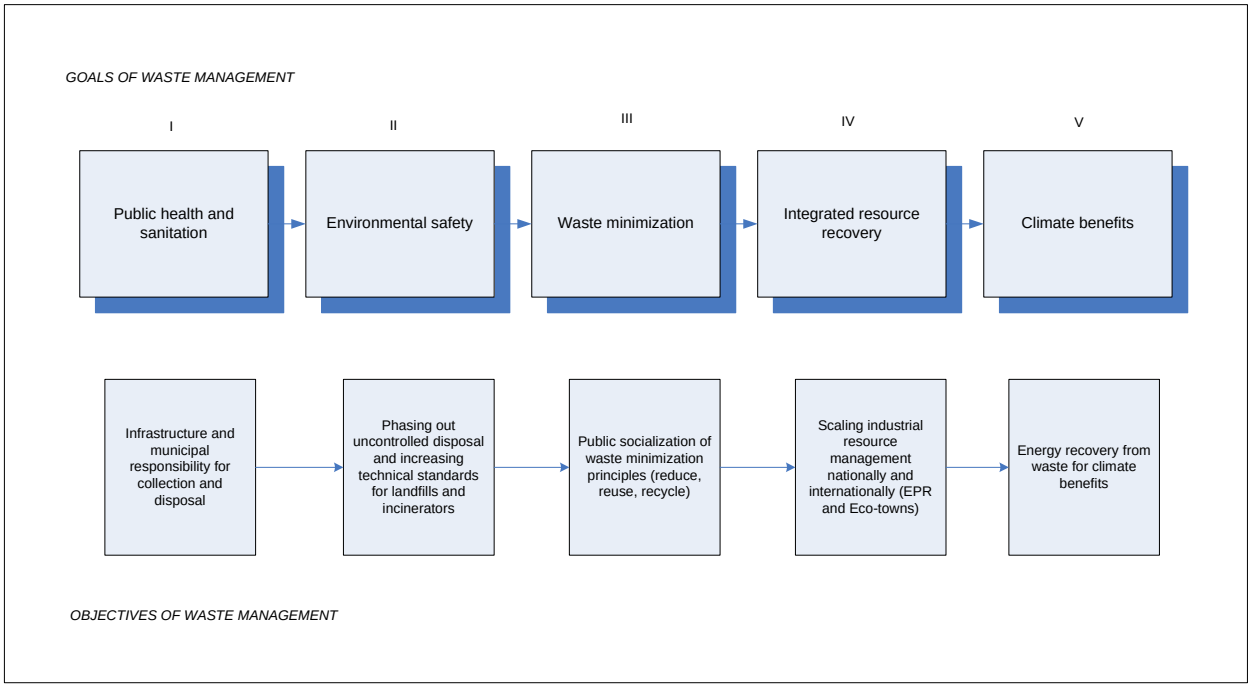
Instruction on how to study the process of policy development is available from the work of Hall (1993) and Cashore and Howlett (2007). In a simple term, policy content can be categorized into three main components. First is the abstract 'goals', demanding clarification on the types of ideas that govern policy development. The second component is 'objectives' to implement a goal in general terms. Underlying questions include what specific requirements are operationalized into formal policy, and what specific types of instruments are used? The third component is the 'settings' that specifically calibrate the requirements to implement those objectives in practice. This demands specification of on-the-ground aims of policy, and knowledge of the specific ways in which the policy instruments are utilized.

In the area of waste management, policy has evolved from a single-choice reliance on landfills to the waste hierarchy concept, also known as 3R policies. Essentially the 3R approach is based on the idea of using resources fully before its final disposal. Waste hierarchy is basically a precautionary principle that prioritizes the prevention and reduction of waste, then its reuse and recycling, and lastly the optimization of its final disposal. The ensuing discussion applies the disaggregated components of policy content in the waste management context, using the case of Japan as an example.

From historical perspective, the drivers of waste management have neither been static nor fixed (Wilson 2007). The changes depend to a great extent on economic structure of countries and the lifestyle of their growing populace. This section explores the case of Japan in order to trace the process of waste policy development. Figure 1, outlines five distinct types, or stages of solid waste management goals and objectives in Japan. These are, essentially: public health and sanitation; environmental safety; waste minimization; integrated resource recovery; and climate benefits. The first two goals can be considered health-related, while the last three are sustainability-related. Although these goals evolved in stages, their utility for analysis is limited

as only heuristic, as the actual expression of these goals in public policy varies between countries.

Figure 1 Changing Goals and Objectives of Waste Management Policy



2.1 Public Health and Sanitation (1900 – 1960s)

In pre-modern societies, small communities could bury solid waste just outside their settlement. As population density grew, a more organized form of waste management was needed to avoid odor and disease. The earliest goal in waste management action was driven by public hygiene measures in cities to prevent infectious diseases. In London, the Sanitation Commission made the first clear linkages between poor sanitation and cholera as early as in 1839, leading to the promulgation of the 1848 Public Health Act (Wilson 2007). Japan was a pioneer in Asia, initiated the municipal solid waste disposal by municipalities and regional governments in 1900 with the formulation of the Dirt Removal Law. The driver for this law was mainly the poor sanitary conditions of Japanese cities, which had caused epidemics of dysentery, plague, and other infectious diseases (Tanaka 1999). These laws prescribed the objective of cleaning up the city streets using organized waste collection and disposal. Maintenance of urban functions by preserving a living environment was the next objective in Japan with the

introduction of the Public Cleansing Law in 1954 to secure a hygienically sound living environment. This legislation constitutes the main framework for managing waste in Japan based on the sanitation goal and objectives.

2.2 Environmental safety (1970 – 1990s)

The 'sanitation movement' of the first goal focused on personal health. Once that is addressed and stabilized, the focus shifted to the health of communities (e.g., the proliferation of landfills, the odor problems associated with sewage treatment plants and the health-impacting air emissions from industrial and domestic sources). Therefore, environmental safety is the essence of the second goal of waste management. During this phase, which in some developed countries started sometime in the 1980s (and continues today), an emphasis was given on the objectives of phasing out uncontrolled disposal and increasing technical standards in the operation of waste facilities (Wilson 2007).

The increasing post war affluence and consumption led to the first landfill-related legislation in Japan, the formulation of the Waste Disposal and Public Cleansing Law in 1970. It was passed by the Diet during its "Pollution Session," extending the regulatory coverage, from municipal solid wastes to industrial solid wastes generated by industrial activities (Tanaka 2007). The Ministry of Health and Welfare encouraged construction and retrofitting of waste treatment facilities through subsidies made available under the National Program for Construction of Waste Disposal Facilities. However, stipulation of pollution prevention from leachate from landfill was not supported by detailed equipment and standards requirements. Further instructions for the setting up of barrier systems and treatment facilities for leachate were outlined in 'Instructions for Technical Standards on Landfill Facility for Municipal and Industrial Solid Waste' 1977 (Asakura et al 2009). More stringent standards followed suit in 1989 and 1998. For concerns over the danger of dioxin from incinerators, the Law Concerning Special Measures Against Dioxins was promulgated in July 1999 and enforced in January 2000. The objective of strengthened environmental standards was deemed necessary in response to land scarcity and the not-in-my-back-yard (NIMBY) attitude of the Japanese public. Opposition to the sitting of new landfills near their homes is a common movement (Asakura et al. 2009).

2.3 Waste Minimization (1995 – present)

The ever increasing per capita waste generation and the changing nature of the waste stream created doubt on whether disposal is a sustainable solution. As a result, an alternative thinking based on the principles of waste hierarchy, that is the options of 3R, became more popular as a policy goal. As the concept of sustainable development was being mainstreamed into public policy discourse, so was the agenda of 3R. Since the early 1990s, the discourse of recycling has found a new salience as part of a wider environmental sustainability agenda. This marked the shift from the 'end-of-pipe' waste management to sustainable consumption and production. As a policy objective, the waste minimization goal requires socialization of the 3R idea on a big scale. This urged governments to increasingly focus their activities towards the top of the waste hierarchy. Information campaigns were staged to promote 3R aiming to increase awareness and to change attitude and behavior.

Culturally in Japan, the 3R approach reflects the spirit of 'mottainai', a term conveying a sense of regret for resources that turn into waste without reaching its full usefulness. During the 1990s, recycling was legally mandated in Japan. In 1995, the Packaging Waste Recycling Law was formulated to respond to increasing packaging waste which accounts for approximately 60% of the total quantity of Japanese domestic waste. Under this law, business enterprises were requested to take back and recycle the packaging of their products. However, some of the electrical appliances were still disposed at the landfill sites (Tanaka 2007). In 1998, another policy innovation was put forth with the formulation of the Home Electric Appliance Recycling Law (Tanaka 1999, Yoshida et al. 2007). This law features the Extended Producer Responsibility (EPR) principles for four designated items namely air-conditioners, televisions, refrigerators, and washing machines. The recycling rates of the four items had been impressive with 11.62 appliances recovered in 2004 compared to 8.55 million in 2001 (Yoshida et al. 2007). In the year 2002, basic laws for waste management came into force to promote a recycling-focused society. The move was driven by the broader policy goal of sustainable development. The Basic Law for Establishing a Sound Material Cycle Society was supported by timeline target (baseline 2000) of waste generation reduction by 20%, recycling rate increase by 40%, and solid waste disposal reduction by 50%. It was reported that, in 2005, out of 53 million tones of solid waste managed, 19% was recycled (Shekdar 2009).

2.4 Integrated Resource Recovery (1997 – present)

Resource value of the waste has always been the driver for recycling. Earlier on, the underlying concept of recycling was a utilitarian one with a focus on the economic recovery from waste. Contemporary expression of resource recovery, however, is also driven by environmental conservation purposes. In other word, recycling is both essential, economical and environmental. Compared to the previous goal of waste minimization, the objective of the resource recovery stage is to target industrial scale resource management. Leading countries include Germany and Japan. The former aims for 'Factor 4' development, that is doubling wealth while halving resource use. The latter uses quantitative targets for material flow indicators to develop a recycling-based society. However, it must be recognized from the outset that there is a fundamental tension between the objectives of recycling and disposal of waste. The urban poor in developing economies are still relying on disposal site for livelihood. The integrated resource recovery stage marks a juncture where recycling is combined as a component of solid waste management, with conscious policy efforts to reconcile the said tension between recycling and disposal.

Japan has articulated the need for sustainable production and resource efficiency, in order to preserve natural resources and to minimize negative impacts on the environment. Two policy instruments from Japan are worth mentioning here for their pioneering quality. First is the EPR policy principle (Hotta et al. 2009), developed over concerns with new stream such as the polluting e-waste. Second is the strategy linking two new interconnected spatial organizing concepts by promoting the principles of regional self-sufficiency and proximity for recycling through the Eco-Town program (Van Berkel et al. 2009). The program was launched with the twin objective of encouraging new industry development (i.e. the recycling industry) and addressing the shortage of landfill sites. In recent years more than 60 innovative recycling facilities have been established with a combined capacity of 2 million metric tones of waste per year.

This policy goal also features Japan leadership in promoting '3R Initiative' on the global level. The increasing volume of internationally traded recyclables raised concerns in Japan about the need for an international regulation. The '3R Initiative' was proposed to G8 Summit by Japanese prime minister in 2004 and adopted by G8 leaders. The initiative encourages the members of the G8 to promote the 3Rs internationally and to outline the future directions for 3R

approaches. Following up on this development, the high level meetings were held in Japan in April 2005, in March 2006, and in November 2006, respectively to give shape to this policy goal.

2.5 Climate Benefits (2000 – present)

The most recent goal in waste management is co-benefits from climate change. An increased focus on climate change as well as the introduction of reduction targets for greenhouse gas emissions in the Kyoto Protocol have within recent years brought attention to the contribution to climate change (positive or negative) from management and treatment of waste (Sang-Arun & Bengtsson 2009). The corresponding objectives include the move away from landfill of biodegradable wastes (releasing methane) and energy recovery from waste. The Clean Development Mechanism (CDM) is an increasingly important international policy instrument that promotes climate benefits from waste management.

3. Comparison with the Philippines and Malaysia

To understand the applicability – and the limits – of the five stages of policy development described for Japan, this section compares waste policy development in industrializing Asian countries. Malaysia, a high middle income country with a population of 28 million, generates 0.8 kg. waste per capita per day. A low middle income country with close to 100 million populations, the Philippines generates 0.34 kg. municipal solid waste per capita per day (UNCRD et al. 2009). Waste composition in both countries is high on organic content, leading to comparable management challenges. The difference in economic structure results in the Philippines promoting community-based management while Malaysia favors a State-led approach to waste management. The following compares waste policy development in both countries in relation to the five stages outlined in the preceding section.

3.1 Public Health and Sanitation

The concern over public health and sanitation is also a key driver in the formulation of waste management policies in developing countries. The Philippines responded to the solid waste issue as early as 1938 with its Anti Dumping Law. In the ensuing years, greater clarity for the objective of waste collection and disposal was given to municipal waste management with

the establishment of more legislation such as the Garbage Disposal Law of 1975, the Sanitation Code of 1975, and the Local Government Code of 1991. In Malaysia, the policy response to municipal solid waste management came later than its Asian counterparts. Until the late 1960s, city streets were cleaned by the local district health office which also hauled away household wastes to municipal disposal sites assigned as authorized dumping ground. By the mid 1970s, the objective of urban function maintenance was introduced by the government through restructuring of local authorities. The Local Government Act 1976 and the Street, Drainage and Building Act 1974 provided for public cleansing services and sanitary disposal.

Malaysia and the Philippines shared a common problem with other rapidly developing countries. The laws enacted tended to be too general and open ended, promoting operation arbitrariness. Consequently, law enforcement record was far from satisfactory. Lack of resources and inadequate institutional facilities proved to be major hurdles. In addition, Malaysia, like most developing economies, was faced with municipal budget constraint. The waste collection budget ranged between 20% and 70%, depending on the size of the municipality or city, and roughly only 76% of generated wastes were collected (Hassan et al. 2000).

Dumping of wastes in open fields and rivers by industries and households is also common in both countries even until today. A study of waste disposal behavior in the squatters area in Kuala Lumpur disclosed that 31.9% of waste were disposed by open burning, while 6.5% were thrown into the river system (Murad & Siwar 2007). This situation is different to developed countries where the goal of sanitation and the objective of collection and disposal, even though not infallible, are generally considered as a thing of the past. Thus, the goals to ensure public health and sanitation are still considered a big challenge in managing solid waste in developing countries.

3.2 Environmental Safety

Unlike Japan, the concern with environmental safety in Malaysia and the Philippines was secondary compared to disposal priority and human well-being. Most municipalities in Malaysia were facing the problem of getting new disposal sites as most of the existing disposal sites were nearly exhausted (Hassan et al. 2000). Results from one assessment showed that there were 77 open dumps (mainly in the rural states), 49 controlled tipping landfills, and only 35 sanitary landfill sites (Idris et al. 2004). Although land scarcity situation is not as serious compared to

Japan, landfills may not continue to be a feasible option in the future. As population density increases, the land-filling of wastes, becomes more difficult and unacceptable for the nearby population. Kuala Lumpur, for instance, is on dire need to reduce its dependence on landfills because of population density. However, an alternative solution such as incinerator has proven to be equally difficult to implement. In 2003, a plan to build a 1500 tonnes thermal incinerator in Broga, Semenyih had to be scrapped due to citizen opposition. Partly concerned with dioxin contamination, partly driven by NIMBY syndrome, the Broga residents took the Federal government to court in 2005. As a result, the Federal government cancelled the project in 2006 ostensibly due to what was officially announced as 'high capital cost'.

The safety of waste disposal in the Philippines' cities had reached the point of crisis more than once. In the late 1980s, the case of Smokey Mountain epitomized the connection between poor waste management and urban poverty. Closure of operation at San Mateo landfill also stirred up national debate on waste management. Options for managing waste were further narrowed down when the 1998 Clean Air Act stalled plans to build incinerators. These culminated in the 2000 Payatas open dump tragedy whereby 234 people living or working on a dumpsite perished because of landfill failure.

3.3 Waste Minimization, Resource Recovery and Climate Benefits

Waste management practices in Malaysia and the Philippines indicate that both countries are looking towards innovative solutions to the problems of inadequate and inefficient services provided by local authorities. There is evidence of both countries gradually incorporating the principles of 3R policies, albeit only in a haphazard fashion.

In the Philippines, contrary to the past solid waste management legislations which have all taken a piecemeal approach, the groundbreaking Ecological Solid Waste Management Act of 2000, also known as theRepublic Act (RA) 9003 specifies the following activities: the achievement of a recycling rate of 25% or above by 2006 and increasing thereafter; segregation at source and collection; establishment of material recovery facilities (MRFs); and eco-labeling and green procurement. The law targets closure of open dumpsites by January 2007, but more than 850 (open and controlled) are still operating in 68 out 81 provinces, only 2,500 out of 43,500 *barangays* (villages) have MRFs. In Metro Manila, all of the 8 major disposal facilities had been converted into controlled disposal facilities (Serrona & Yu 2009).

According to the Philippine Legislators Committee on Policy and Development (2002), it is the most comprehensive piece of legislation addressing the country's waste problems that has ever been passed. The implementation of this law in the Philippines steadily increases recycling activities in major cities and municipalities. The law promotes the idea of waste as a resource and orders the diversion of at least a quarter of the waste generated through recycling, reuse and composting. To support this, the Department of Trade and Industry (DTI) was mandated to create local markets for recyclables. Since its enactment, the recycling rate has increased 300%, that is from 8% initially to 23% recently (Lisa C. Antonio, personal communication). The enactment of Republic Act 9003 reinforced the local government units' responsibilities for the collection of residual or non-biodegradable wastes. Because funds are not always available for waste management, waste collection and disposal are now driven by community initiatives. The *barangay* units are given the responsibility of segregating and collecting biodegradable, compostable, and reusable wastes (DENR 2003).

Institutionally, the Republic Act 9003 also called for the creation of the National Solid Waste Management Committee (NSWMC), a central body governing all aspects of waste management comprised by representatives from the government, the private sector and non-government organizations (NGOs). The NSWMC is mandated to create a national solid waste management framework that emphasizes community based approaches in waste reduction. However, some fundamental challenges remained. In December 2007, the Philippines Senate resolved to investigate NSWMC for failing to develop the Solid Waste Management Framework. Furthermore, appropriate policy design alone is not enough without adequate funding. Solid Waste Management Fund, remains underfunded. An annual fund of P7 million pesos (US$ 157,821) only is being received by the Environmental Management Bureau. The earlier target was P20 million pesos (US$ 451,365).

Similarly in Malaysia, efforts have been incrementally stepped up to embrace the waste minimization principles. Be that as it may, waste minimization programs cannot be carried out effectively without having reliable waste composition and generation rates data. Such information was absent in Malaysia until the 1990s (Hassan et al. 2000)[1]. In 1992, the amount of Malaysian solid waste being separated at source or by waste pickers for recycling purposes was

[1] The first nationwide compilation of waste generation and composition was carried out in May 1987 and published in 1988 by the Ministry of Housing and Local Government.

less than 2%. A recent estimate records the value of 5%, while a number of senior government officials believe that the actual rate could be as high as 15%. The 'National Recycling Program' was initiated in 2000 as a follow up to the first recycling program launched in 1993. In 2005, Malaysia released the 'National Strategic Plan for Solid Waste Management (2000-2020)', whereby waste minimization is recognized as one of the priorities. More recently, the government has carried out a pilot project on waste separation at source in Putrajaya. It aims to improve public awareness on recycling and to reduce the volume of waste to be disposed. The effort aims to reduce the volume of garbage sent for disposal by 40 per cent involving 170 apartments at 481 houses.

Beyond the waste minimization goal, lacking in Malaysia and the Philippines is a functionally differentiated stage of waste recovery at an industrial scale. This demands a parallel transition in industrialization process which is greener; or an 'ecological' modernization process akin to what had taken place in Japan. More modestly, expression of the resource recovery goal can be found in Malaysia's Solid Waste and Public Cleansing Management Act (Act 672) and the Solid Waste and Public Cleansing Development Corporation in 2007. There is a target of 22% recycling by the year 2020. The Solid Waste and Public Cleansing Management Act (Act 672) also features EPR principles, whereby the government can specify which kinds of products shall be collected by manufacturers. Article 102 of the Act stipulates that the government can place responsibility for the collection of products on the manufacturer, assembler, importer, or dealer.

For the goal of climate benefits, a number of CDMprojects to reduce methane emissions from sanitary landfills are currently being developed in Malaysia (Pedersen 2008).

4. Discussion: Are the Stages Applicable to Malaysia?

From the preceding discussions, developing countries such as Malaysia and the Philippines are both struggling with the earlier goals of waste management, while concurrently trying to embrace the newer goals. In these countries, the dynamics of policy development process, are constrained from attaining a "paradigmatic" change, or graduating onto the 3Rs stage. This essentially would require a process in which deep values in the policy contents and actors are altered, leading to a fundamental realignment of other aspects of policy development.

In other word, this can only occur only when the policy institutions themselves are transformed. This may happen through a reconfiguration of institutional relationships, or a general increase in policy capacity. In the absence of such processes any policy changes are hypothesized to follow "incremental" patterns (Cashore and Howlett 2007). Malaysia is yet to graduate from the waste collection and disposal objective or stage. In other word, the *means* of achieving the 3Rs goal in Malaysia is constrained by at least four factors, namely:

- First, the 2007 law provides for the 'federalization' of waste management, a trend comparable to water management, and increasingly forestry sectors in Malaysia. This is an inimical force to the 'bottom-up' or devolution of authorities to the lowest possible level, which is important in the case of waste management. For instance in the case of EPR, only large cities with substantial operating budget are able to impost EPR from producers but the smaller ones will be less likely to do so.
- Second, 3R implementation in Malaysia will proceed through the process of solid waste management services privatization, which in the past has proven to cause more problems than engender solutions (Milne 1992; Sun & Tong 2002). The political economy of public finance and fiscal regimes is complex and mirrors the various stakeholders and political interests present in contemporary Malaysian society. The high and increasing costs of waste collection and disposal provided the ground for the privatization of waste management in Malaysia. Therefore, the government opted for the privatization of the waste collection function of the local authorities, driven by the fact that the dual operational and regulatory roles of local authorities did not seem to be in the best interests of high environmental standards. The objective of privatization was to provide an integrated, effective, efficient, and technologically advanced waste management system. In addition, this was also expected to resolve the problems on waste management faced by the local authorities (lack of budget and expertise, illegal dumping, open burning, and a lack of proper solid waste disposal sites). However, privatization did not really solve the issues, but only transferred the problems from local authorities to the private companies. In particular, some concessionaires faced difficulties in generating income to cover expenditure.

- The third begs the question if it is socially desirable for the government and businesses to be the only actors in 3Rs implementation. Moreover, based on stipulations in the 2007 Act, the already small role of informal recycling is in Malaysia will be more uncertain.
- Fourth, the awareness of public on 3Rs is also low, affecting the push for modern solid waste management. Since the late 1980s, the Malaysian government had funded public information campaigns to establish awareness and to create environmental consciousness among the general public. In 1988, the Action Plan for a Beautiful and Clean (ABC) Malaysia was introduced. However, there were only minimal responses from the general public. A survey showed that 59% of respondents were moderately aware with some basic knowledge and were mildly alert to solid waste issues (Hassan et al 2000). This may come as a surprise to some because as much as 50% of public complaints lodged to the government are on waste and cleanliness issues.

In comparison to the Philippines, Malaysia's policy style exhibit characteristics of a strong state. More research is needed to ascertain how does this preference affect the calibration of 3Rs instruments, for instance in terms of recycling targets (Malaysia 22% by 2020; Philippines has now reached 23%, Japan, 40% by 2010). In theory, scaling for credible institutions (departments, legislation, etc) may be appropriate for a strong state only if enough funding and infrastructure are channeled to waste management purposes, such as in the case of Japan. Be that as it may, the enactment of the 2007 Act came with a few positive signs for the future. With the establishment of the Department of Solid Waste Management, a regulatory body established on 30 August 2007, solid waste management received an institutional boost. This agency is integrated in design compared to its predecessor with waste management function, that is, the Division of Engineering and Environmental Health and Division of Project Implementation, Department of Local Government. Efforts are currently underway at the Department to prepare a detailed regulations to implement this Act. More recently, in April 2009, the Ministry of Energy, Green Technology and Water was established to handle green technology development in Malaysia, whereby waste management is one of the thrust areas. The government has encouraged the private sector to invest in green technology to promote the usage of more environmentally sound waste management towards facing the changes in the global climate. In a nutshell, it remains to be seen in the forthcoming years if these efforts would enable

Malaysia to upgrade from the stages of waste management that focuses on public health to one that is sustainability-oriented.

5. Concluding Remarks

Two conclusions of pertinence can be drawn from preceding discussions. First, although pathways of mainstreaming 3Rs may differ between countries, some common denominators are apparent. The chapter identified five phases of waste management policy development. Japan, as a case of policy system with a long and diverse experience with waste management, serves as a distinctive example of a desirable policy evolution and by extension, a general guide as heuristic. The transfer of lessons to developing economies is possible although difficult, given the country-specific constituent and volume of waste.. As an environmental frontrunner country (Revell 2003), Japan plays a leading role exemplified by its shift in focus from a mere attention to basic regulatory problem within the country to the internationalization of 3R issues and goals. Through its bilateral mechanism, Japan is well on its way in building the capacity to implement 3R in countries such as Vietnam and Malaysia (Yoshida et al. 2007). This is a step in the right direction for widening the purchase of 3R policies in East and Southeast Asia. Policy makers in the developing countries, on their part, must develop the institutional capacity to respond in long-term policy development. The pathways and stages how 3R was mainstreamed in Japan can be emulated in rapidly developing economies.

Second, State, community, and business must all learn to integrate their goals and objectives. Integration requires the coordination of governmental bodies, businesses and the community, each of which is an agent for change. Each of the change agents comes from a different perspective and the ability to communicate between them is a crucial factor in achieving success. Process-wise, although the role of international trade is still a contestable idea, developing countries may want to combine back-to-basics strategy of developing domestic waste management capacity together with the promotion of international cooperation to ensure the upgrading to 3R-based policies.

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