



How the Volume-based Waste Fee Policy Increased Household Recycling Rates in the Republic of Korea (1995–2009)



**Knowledge
Sharing
Program**

PROJECT DATA

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KDI School of Public Policy & Management

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Improvement of waste management

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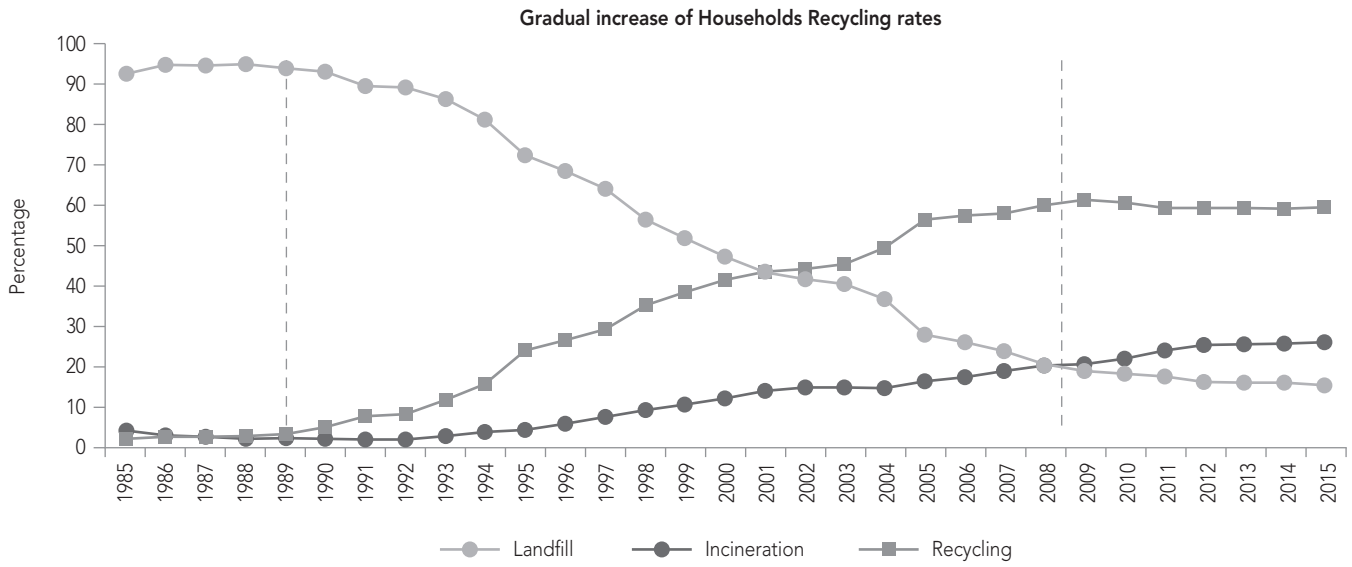
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Abstract

With approximately 60 percent recycling and composting rates, South Korea has been heralded as one of the highest recyclers of municipal solid waste among OECD countries. The Volume-based Waste Fee (VWF) policy, which South Korea introduced in 1995 as a developing country, has helped increase household recycling rates. As a result, the increased amount of recycled and composted waste has diverted waste from landfills and incinerators and relieved the burden of municipal governments to find or site new waste infrastructures in Korea.

To reap the benefits of a VWF policy, all key stakeholders play an important role in the implementation loop: citizens who separate wastes and purchase designated plastic bags; local government who collect recyclable materials; and recycling industries who reprocess those materials. The delivery challenge is to make citizens see waste separation as convenient and to believe their behaviors will make real and positive impacts on environment. Stakeholder engagement and coordination become very important in overcoming such challenges, so it is important that governments solicit and incorporate citizens' ideas on more convenient waste separation schemes into its policy. The story of the VWF policy in Korea is about a story of trial and error, and navigating through a complex arrangement of factors in the waste management system in order to connect the dots in the implementation loop through the gradual engagement of all stakeholders.

Figure 1. Evolution of Recycling Rates and Waste Disposal Methods in Korea (1985–2015)



Source: MOE.

With the increased level of awareness of the serious waste problem in Korea, the government built up administrative capacity step-by-step with legal provisions, creating necessary organizations with human resources, and providing budget line items as appropriate. However, the road to success did not start perfectly. Pilot tests were monitored, evaluated, and gradually improved upon. The key to success was how to navigate through the complex arrangement of factors in the waste management system. Ultimately, communication was the key to getting to know the interests of the stakeholders and ascertain their concerns about the VWF policy. Participation of non-governmental actors was critical to success as it allowed their opinions to be incorporated in policy adjustments.

Introduction

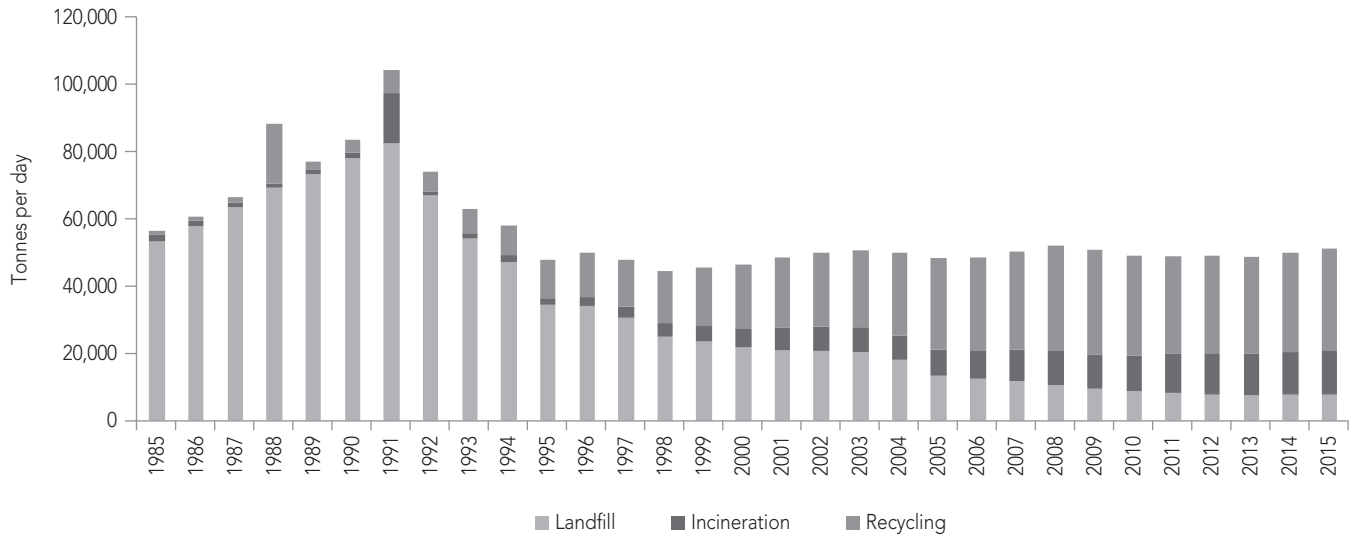
This case study examines how the Volume-based Waste Fee (VWF) policy, introduced in South Korea (hereafter Korea) in 1995, helped to increase household recycling rates in Korea.¹ Under the VWF policy, households and small businesses are required

to purchase standardized plastic bags sold by local governments to dispose of household waste. At the same time, recyclable wastes, such as plastic, paper, and cans are collected from containers or bins outside households or small businesses at no charge (Kim 2002). This plan motivates users to minimize waste generation and increase recycling to save the cost of purchasing the plastic bags.

Korea is the only country in the world that adopted a VWF policy at the nationwide level² and also the only country that adopted a VWF policy as a developing country (Welivita et al. 2015). For more than a decade, Korea has been heralded one of the highest recyclers of municipal solid waste among OECD countries, with around 60 percent recycling and composting rates (OECD 2015) (Figure 1). The Ministry of Environment (MOE) in Korea and other international organizations claim that the VWF policy in Korea helped to increase recycling rates (MOE, 2011, 2012; OECD, 2017; UNESCAP, 2002). Scholarly assessments suggest that Korean VWF policy was highly successful in increasing recycling rates (Dong, 2006; Hong, 1999; Jeong et al., 2007). As a result, the increased amount of recycled and composted waste has diverted waste from landfills and incinerators and relieved the burden of municipal governments to find

¹ Recycling rates mean the ratio of the amount of recycled materials to the total amount of waste generated at the same time. Therefore, if the amount of waste generation is significantly reduced, recycling rates may increase.

² Germany, Switzerland, and Japan have implemented a VWF policy at the local or regional level, but not at the national level.

Figure 2. Changes in the Amount of Wastes by Different Disposal Methods in Korea (1985–2015)

Source: MOE.

or site new waste infrastructures in Korea (Figure 2.) This study particularly focuses on the implementation of the VWF policy, the delivery challenges that emerged during implementation, and how those challenges were overcome.

Development Challenge

In the early 1990s, Korea faced a “garbage crisis,” as increases in economic growth led to skyrocketing consumption in urban areas. Increasing consumption resulted in increased generation of household waste and trash. This phenomenon is almost universal, as illustrated by the prior or current experience of many countries.³ Consumption skyrocketed in cities due to economic growth and urbanization, and so did waste along with it. Faced with staggering estimates of waste growth and increased toxicity, municipalities plunged into panic as the capacity of landfills that accommodated most urban waste shrank rapidly. While new landfills proved almost impossible to site due to residents’ opposition, professional and political preference for waste disposal veered toward costly waste-to-energy (WTE) incinerators as an alternative technological

option. However, concerned citizens and environmental groups became more effective at blocking construction of proposed incinerators that might emit toxic air pollutants and create perverse incentives for citizens not to recycle but to generate more waste as feedstock for incinerators.

The gross national income of Korea had increased dramatically from US\$2,229 per person in 1985 to US\$5,886 per person in 1990, and increasing to US\$8,998 per person in 1994. Korea’s urbanization rate was 74.4 percent in 1990. Mass consumption followed this economic growth and urbanization in Korea. In 1992, 75,096 tons/day of municipal wastes were generated, marking annual increases of 7 to 10 percent since 1988. Waste generation per person per day was 1.8 kg, which was higher than that of the US (1.3 kg), Japan (1.0 kg), UK (0.9 kg), and Germany (0.9 kg). Economic growth also changed consumption patterns, thereby changing the kinds of waste generated. Municipal wastes started to contain more plastic goods, textiles, batteries, aluminum cans, and Styrofoam (Ministry of Strategy and Finance 2012).

Before the VWF policy was introduced in 1995, residents placed household wastes in receptacles in front of their houses and were collected by public workers with wheelbarrows on days designated by local governments. Collected wastes were transported to neighboring fields or paddies and dumped in landfills. Although the amount of household waste kept growing, landfill sites near

³ See Aleluia and Ferrão (2016) for urban waste management practices in developing Asian countries; see Buclet (2002) for municipal waste management in Europe; see Pollans (2017) for the history of US waste management.

large cities became less and less available. Mass media editorials warned about the growing waste crisis and urged the government to solve the waste problem.

As a response to the public outcry, in 1987 the government proposed the construction of waste incinerators and landfills all over the country. However, opposition by residents near the proposed sites caused construction delays or suspension. Opposition was based on concerns about negative consequences of the facilities, such as ground water contamination, bad odors, polluted air, and decreased property values.

The crisis created a strong impetus for the national and local Korean government to consider turning to individual citizens to reduce, reuse, and recycle wastes. The national environmental administration in Korea launched a national pilot recycling program in 1981, which took approximately thirty years to achieve a recycling rate peaked at 61.1 percent in 2009 (Figure 1). However, the Seoul metropolitan government initiated its pilot recycling program in 1978, providing a bit longer administrative history of recycling efforts in Korea. Between 1981 and 1988, governmental efforts, both national and local, did not significantly increase recycling rates for several reasons: insufficient infrastructure to contain and dispose of separated wastes; no clear standards for separating wastes; and conflicts among waste collectors. Although housewives separated and placed wastes in different bins, collectors put all the separated wastes into the same cart, which nullified the efforts of citizens. There were no incinerators to dispose of separated waste. All the separated wastes were just dumped in landfills. Low-income waste collectors did not have any incentives to collect separated wastes, such as newspapers, plastics, or cans since there was no profitable market for those wastes. There were no factories to transform plastic wastes into usable products. The public was skeptical about separating wastes since it was very inconvenient and did not produce any tangible benefits such as environmental protection. Even after separating wastes became mandatory by law in 1991 and those who did not separate wastes were supposed to pay a penalty of up to 1,000,000 Korean won, separation of different categories of waste did not take root in among citizens.

The government needed more financial resources to manage municipal wastes by building more waste facilities such as incinerators, containing facilities for separated wastes, hiring more collectors, and purchasing

more waste collection trucks. In 1994, the cost of waste disposal was estimated at 962 billion Korea won. However, the collection fee paid by citizens was only 142.8 billion Korean won. The fiscal self-reliance rate for waste management was only 15 percent. Waste collection fees at that time were calculated proportionally to the size of the apartment and property tax, under the assumption that rich people would generate more wastes—there was no clear relationship between the amount of waste generated and collection fees.

Delivery Challenges: Coordination and Engagement

To reap the benefits of the VWF policy, all key stakeholders play an important role in the implementation loop. A major plan component is that citizens will separate waste first and purchase official plastic bags to dispose their waste. Experts on pro-environmental behavior suggest that convenience and perception of efficacy of action (e.g., people believe that they can reduce adverse consequences for environment or future generations) are major influential factors to affect behavior changes (Guagnano et al. 1995; Stern 2000; Miafodzyeva and Brandt 2013). Thus, the challenge is to have residents perceive waste separation as convenient and to believe their behavior will make real and positive impacts on the environment. Stakeholder engagement and coordination become very important in overcoming such challenges, so it is important that governments solicit and incorporate citizens' ideas on more convenient waste separation schemes into its policy.

Other stakeholders also play important roles in the implementation loop. Local governments should have human resources to collect and manage waste. Once recyclable materials are collected, recycling companies should process collected waste. Line ministries should provide financial resources, political support, and adequate legal foundations. Any missing part in this implementation loop could hamper coordinated effort, causing people to think that the system does not work properly, and therefore stop separating wastes. The story of the VWF policy in Korea is about a story of trial and error and navigating through a complex arrangement of factors in the waste management system in order to connect the dots in the implementation loop through the gradual engagement of all stakeholders.

Tracing the Implementation Process: From Pilot Tests to Comprehensive Implementation—Orchestrating the Coordination of All Important Stakeholders in the System

From Policy Idea to Actual Implementation

In the late 1980s, as effective waste management became more and more important in Korea, related institutions such as legal provisions and agencies to implement them were strengthened. In 1986, a new independent Waste Management Act was enacted that incorporated two existing Acts related to waste management: the Waste Cleaning Act and the Environmental Pollution Prevention Act. The new Waste Management Act introduced the first legal provision for the concept of recycling. The Waste Management Act (1986) mandated the central government to devise a basic policy for waste management and provide technical and financial support to the local government, addressing the fact that financial resources for waste management had been lacking since waste management had not been the priority of local government (Ministry of Strategy and Finance 2012). In 1992 the Waste Management Act (1986) was amended to create a new Act on Promotion of Resources Saving and Recycling. The Act on Promotion of Resources Saving and Recycling (1992) specifies the roles and responsibilities of government, businesses, and citizens for promoting waste recycling. As a result, the budget for waste management also increased gradually from 7 billion Korean won (equivalent to US\$7.0 million) a year in the 1980s to 24.5 billion Korean won (US\$33.4 million) in 1991. As the local self-government system⁴ was introduced in 1995, the budget for waste management increased dramatically to 145.6 billion Korean won (US\$188.0 million). However, the government needed more financial resources to provide necessary infrastructure to cope with increasing

municipal wastes and promote recycling. That situation was the ultimate motivation for the VWF policy.

Researchers who were members of The Korean Society of Waste Management conducted research sponsored by the MOE and in early 1993 published a policy report suggesting the introduction of the VWF policy. Introducing the VWF system meant a paradigm shift to a “polluter pays” principle, creating huge implications for politics, the economy, and society as a whole. It was, therefore, very important from the start to persuade lawmakers and other stakeholders to buy into the potential benefits of the new policy, and to legislate the new law and comply with the new policy.

The MOE solicited the opinions of various groups on the VWF system through public hearings and consultation sessions from February to August, of 1993. These groups included waste management experts, waste management companies, consumer groups, housewife associations, waste bag makers, and local government officials. While local governments supported the idea of the VWF system, environmental non-governmental organizations (NGOs) and other civil society organizations were not enthusiastic. They criticized the new policy on the grounds that the government passed on its own responsibility to manage wastes to citizens and facilities.

The pilot program of the VWF system was first conducted in 15 cities and provinces where each city and province selected one urban area and one rural area as a testbed for pilot projects from April 1 to December 31 in 1994. With the pilot test producing positive effects in recycling and waste reduction, other regions voluntarily participated in more tests. As a result, the number of municipalities who participated in the pilot programs increased from 33 to 89 by November 1994. More interestingly, citizens changed their behavior: using their own shopping bags; reducing food wastes; and removing packing materials when they buy in the market. As a result, waste was reduced by 40 percent and recyclable materials increased by 100 percent.

To get the support from civic groups who opposed the policy at the beginning, the MOE asked the civic groups to assess the performance of the pilot tests of the VWF policy. The groups were impressed by their own assessments of the VWF policy outcomes in pilot tests and later collaborated with the government to create policies related to waste management.

Mr. Shim, Jae-Kon, as the Director of Waste Policy Department of the MOE in 1990 emphasized the

⁴ Local self-government refers to a governing system in which eligible residents who live in a bounded geographical area select their representatives and let them run their local government with relative autonomy from the central government.

importance of communication with stakeholders in an interview,

“There were many objections from inside out. Concept of VWF system was very new and most people were skeptical about its success... Cooperation from other government department was necessary and it was very difficult to persuade them. The cooperation from local government and the Ministry of Home Affairs was prerequisite for the implementation process...We spent much time to sell the VWF system to government officers and the public. For that reason, we tried to collaborate with NGOs since they have nationwide network to communicate with the public.”⁵

In a workshop setting in June 1994, the MOE shared this the success of the pilot programs, including the positive evaluations, with 330 local government officials in the field of waste management and scholars, experts, and journalists. The participants discussed both the problems identified in the pilot tests and plans for improvement.

On September 8, 1994, the MOE prepared the national implementation of the VWF policy by providing each local authority with enforcement manuals for national implementation the policy. On November 7, 1994, the MOE again asked local authorities to assess the feasibility of VWF policy, and on December 7, 1994 established the headquarters and situation room of the VWF policy inside the MOE, allowing the MOE to check the preparation status of 260 local governments daily and resolve any potential problems for future implementation. Before January 1, 1995 related ordinances were amended and manufacturers and sellers of plastic bags for waste disposal were designated. From December 20 to 23, 1994 the MOE and the Ministry of Home Affairs jointly checked the preparation status of local governments.

In order to change the perception of the citizens who were not receptive to the idea of the VWF policy, the MOE actively conducted public promotion activities such as TV advertisements, newspaper advertisements, TV debate shows, brochures, and posters.

Nationwide Implementation of the VWF Policy, Tangible Outcomes, and Unanticipated Problems

On January 1, 1995, the VWF policy was implemented nationwide, marking the first nationwide VWF policy in the world. Unanticipated problems emerged. Local governments lacked adequate preparation time because necessary ordinances related to waste fees were imposed from the MOE only a few days before the implementation of the VWF system. Additionally, the policy was implemented during the new year holidays when only a few local officials were involved in implementing the policy.

After 100 days of implementation of the nationwide VWF system, the MOE publicly reported the results: a 37 percent national reduction of waste generation (from 53,546 tons/day to 33,841 tons/day). Big cities showed larger reduction rates than small- and medium-size cities and rural areas. According to a survey of housewives in various cities conducted in February 1995, 98.6 percent of respondents said that they complied with the VWF policy thoroughly. Another workshop with local government officials was held in November 1995 to get feedback from them about their implementation problems.

The MOE’s assessment of the first-year implementation of the VWF policy was that the total annual amount of waste decreased by 27 percent, and recyclable materials increased by 35 percent. That meant a savings of 300 billion Korean won and landfills as much as 661,157 m². However, one year after implementation, compliance with the VWF system decreased and waste generation increased again. Also, while citizens committed to complying with the VWF system, the support of the public sector was insufficient, and the recycling infrastructure was inadequate (Ministry of Strategy and Finance 2012). Food waste became an additional problem since there was no developed technology to process it as animal feed or fertilizer. There were not practical measures to dispose of workplace wastes, which had increased more than 10 percent annually. Plastic recycling facilities were not enough to treat piling plastic garbage. On May 7, 1996, a conference on the institutionalization of the VWF policy was held in Seoul where civic groups, experts, and government officials evaluated the first-year performance of the VWF policy and discussed improvement plans.

While the success of the VWF policy depended on the compliance of citizens with the new policy

⁵ 2011 Modularization of Korea’s Development Experience: Volume-based Waste Fee System in Korea (Ministry of Strategy and Finance 2012).

measure, it was very important to monitor whether citizens actually complied with the regulation and to penalize illegal dumping. In order to monitor citizen's behavior, members of local civic groups were involved in monitoring teams. According to the policy, violators of the VWF policy who did not use designated VWF plastic bags for waste disposal, or who disposed of them indiscriminately in inappropriate places were imposed a maximum fine of 1 million won. Also, violators were required to take a mandatory education program, and collection of wastes for them was delayed. Local government officials in waste management departments were assigned to monitor different places at different times. However, it was very difficult to spot violators and search waste in non-standard plastic bags in order to find any information on the violator. To solve this issue, some local government invented "honorary VWF policy squads" so that residents could monitor their community themselves. The residents took a 90-minute education program for 21 days on waste management systems.

The successful outcome of VWF policy manifested itself as rapidly increasing amounts of recycling materials, including paper, cans, and plastic, in designated storage areas. However, until there were recycling industries with appropriate technologies to reprocess plastics or cans, collected materials could not be recycled. Thus, development of industries and technologies became of primary importance, leading directly to the opening of recycling industries, and the gradual improvement of technologies. Also, external factors, such as the global economic downturn, posed unexpected challenges to governments that managed waste system. The price of recyclable materials went down severely. Due to the lack of demand, those materials stayed piled up in storage, making it impossible to store more materials collected from residents.

Lessons

The VWF ultimately had considerable impact, due to a number of pivotal factors that allowed implementers to overcome challenges that they faced.

Institution and Budget

To implement a new, paradigm-shifting policy nationwide, a government needs a solid legal foundation, competent organizations with enough human resources,

and adequate budget. The perception inside and outside the government of the garbage crisis grew significantly, and the status of the responsible government agencies were been upgraded accordingly. To facilitate recycling, Korea Resource Recycling Corporation (now Korea Environment Corporation) was established on September 11, 1980 based on the Article 5 of the Compound Waste Treatment Corporation Act. This public corporation had the mandate to designate, collect, store, and recycle appropriate materials. Also, as the primary government agency for waste management, the Environmental Office was upgraded to the Environmental Agency in 1990 and to the Ministry of Environment in 1994. Accordingly, the Office of Waste Management inside the Environmental Agency was strengthened into a new Department of Wastes and Resources that include sub-departments of Waste Policy, Waste Management, Waste Facilities, and Waste Recycling.

Also, local governments in Korea were afforded more administrative power with increased budgets in 1995, when the local self-government system was introduced in Korea. It is not an exaggeration to say that the core pillars of current waste management policies of Korea were formulated during 1991 and 1995, just before the introduction of the local autonomy system. Increased mandate, human resources, and budget gave government officials, both national and local, a greater sense of self-esteem, important since waste management was not very popular in government. With the increased revenues from the VWF policy, financial independence rate⁶ of the waste administration increased from 14 percent in 1994 to 29.6 percent in 2000 (Ministry of Strategy and Finance 2012).

Participation of Civic Groups

The government strategically approached civic groups since their help was crucial. First, civic groups, particularly environmental NGOs, had fought with the government to improve environmental quality. There was tension and distrust between the government and civic groups. The civic groups were not enthusiastic, and opposed the idea of VWF policy since it was first proposed, both on the grounds that the government shifted its responsibility of waste reduction to the residents, and the belief that the policy would promote illegal waste discharge. Persuading

⁶ Financial independence rate of local administration is defined as (Local tax + Non-tax revenue – Local debt)/ General account budget.

the civic groups to buy into the VWF policy was a priority for the government. Second, civic groups had started begun to establish extensive network in Korea connecting local regions. This network could be a positive factor in facilitating implementation of the VWF policy by public awareness campaigns, monitoring, and evaluation.

Civic groups, such as YMCA, YWCA, Korean Federation of Housewives, Korean Federation for Environmental Movement, Citizen Society for Solving Waste Problems, played important roles in raising awareness about the VWF policy and its implementation. They actually participated in the process of creating the VWF policy, from design and preparation to implementation, monitoring, and evaluation. Members of civic groups helped government understand regional characteristics of waste management, such as characteristics of residential styles, waste discharge practice, and methods to separate and collect recycling materials. Ms. Kim Mi-Hwa, described the atmosphere in 1995, when she was involved as the leader of a civic group called “Citizen Society for Solving Waste Problems”;

“When the VWF policy was proposed first, the government asked NGOs to participate in the effort to evaluate the feasibility of VWF policy. Since civic group was usually against government side, it was very rare to find these two groups working together. The nationwide networking of NGO just started at that time and this was why government wanted to work with NGOs to utilize this network to promote and evaluate VWF policy. Since VWF policy was central government policy, local government officers were indifferent to it. For local government officials, the VWF policy was additional administrative burden. Convincing the public was also tough task. The government should advertise the policy, educate the public and conduct various surveys to get their feedbacks on the VWF policy.”

Coordination with other Important Stakeholders in the System

Any recycling regime or system has various stakeholders who can contribute to the success of the system. For example, private recycling businesses—mostly small and

medium sized enterprise who lack human and financial resources—can be mobilized to collect and process recycling materials separated and put out by citizens only when collection makes sense in terms of profit. Thus, there should be a profitable market for materials to be recycled. Additionally, there should be a supply and demand in the market for products made from recycled material. Therefore, it is important that the government consult these stakeholders during policy creation and implementation so that their interests and feedback are considered. The Korean government established the Korea Environment and Resources Corporation (now Korea Environment Corporation) in 1980, which overtook many tasks that private recycling businesses had been doing. And that public corporation consulted those stakeholders to make whole the recycling system work properly. For example, the Korea Environment and Resources Corporation had provided long-term, low-interest loans to revitalize the recycling industry to support the installation of recycling facilities, technical development, and stable management (Ministry of Strategy and Finance 2012).

In March 1995, the owners of recycling centers organized an association called The Korea Life Resources Recycling Association. The association collected electronic products used in households and offices (such as TVs, refrigerators, washing machines, electric fans), furniture (such as electronic products, sofas, beds, desks) and sporting goods. The goods were repaired and sold as secondhand goods or donated to orphanages or nursing homes.

Combination of other Related Policies

To make the most out of the VWF policy and boost recycling behavior by citizens, the government implemented other complementary policy measures. For example, a separation by mark system was introduced. In the first phase, for packaging materials, 12 different marks were used for aluminum, metal, glass, cartons, paper, HDPE, LDPE, PET, PP, PS, PVS, and others. Later, the MOE simplified those marks into five (can, glass, cartons, paper, and plastics) to make separation more convenient for citizens.

Regulation of disposable products started in 1994 based on Article 10 of the Act on the Promotion of Saving and Recycling of Resources. This measure banned the use of disposable knives, spoons, chopsticks, and

⁷ 2011 Modularization of Korea’s Development Experience: Volume-based Waste Fee System in Korea (Ministry of Strategy and Finance, 2012).

toothbrushes in restaurants or other business locations and also restricted the free distribution of plastic bags. That policy curbed the rapid growth of the use of plastic bags in markets.

Article 10 of the Regulations on the Standard for Methods and Materials of Product Packing mandated that the products should use refill containers as part of packing for a certain volume of the total products at a specified ratio. The policy on restricting excessive packaging not only prevented unnecessary waste from being generated through the reduction in packaging layers but also promoted the gradual phase-out of polyvinyl packaging and its replacement with paper materials (Ministry of Strategy and Finance 2012).

Also, since 1992, in order to facilitate recycling, public institutions have put a priority on recycled products when they needed to procure certain products in accordance with Article 32 of the Act on the Promotion of Saving and Recycling of Resources.

Conclusion

The VWF policy originally aimed to reduce waste generation by residents by using an economic incentive to save the costs of purchasing plastic bags to dispose of their wastes. In doing so, people were motivated to separate their wastes for recycling. However, in order for those separated materials to be actually recycled and reused—so that citizens can perceive the efficacy of their behavior—considerable effort needed to be invested by all of the stakeholders in the waste system.

Considering a VWF policy as waste management policy requires collection of baseline data on waste management and identification of all important stakeholders who should be involved in implementation of such system. With the increased level of awareness of the serious waste problem in Korea, the government built up administrative capacity step-by-step with legal provisions, necessary organizations with human resources, and budget. However, it was not possible to be perfect from the outset. The story of the VWF policy in Korea is about trial and error. There were pilot tests that were monitored, evaluated, and gradually improved. The key to success was navigating through the complex arrangement of factors in the waste management system. Ultimately, communication was the key to getting to know the interests of the stakeholders and ascertain

their concerns about the VWF policy. Participation of non-governmental actors was critical to success as it allowed their opinions to be incorporated in policy adjustments.

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