KATHMANDU'S GARBAGE: SIMPLE SOLUTIONS GOING TO WASTE

Bhushan Tuladhar

> In Nepal the key problems relating to MSW [municipal solid waste] management are not really technical in nature. For the most part, the solutions to the technical problems of MSW management are readily identifiable and relatively simple. The key constraints to developing environmentally sound, cost-effective and sustainable solutions to the existing problems of MSW management are *institutional, organisational and economic/financial in nature* (Oeltzschner and Betts 1996:3; emphasis in original).

These were the findings of the latest German Fact Finding Mission which visited Kathmandu in May 1996 to identify areas for further technical cooperation in the field of municipal solid waste management. Although this statement is right on target, it is definitely not a revelation, especially for an organisation that has invested almost one and a half decades in managing Kathmandu's garbage. Over twenty five years ago, the first foreign consultant to study Kathmandu's waste had proposed house-to-house garbage collection using simple hand carts (Flintoff 1971). The first German consultant on solid waste management later wrote that this simple method was "quite successful in the beginning, however, shortly thereafter, a lack of organisation, trained personnel and financial means caused the town officials to drop the project" (Tabasaran 1976:5). If the basic problem in managing Kathmandu's solid waste has been recognised to be non-technical for the past twenty five years, the question is why both the Nepali government and foreign donor agencies continue to talk about technical assistance for solving Kathmandu's garbage problem.

This article examines waste management practices in Kathmandu from a historical perspective and analyses the current situation in order to propose measures for the future. Referring to some of the 19th and early 20th century descriptions of Kathmandu and the traditional culture and life styles in the Valley, the article argues that prior to 1951, Kathmandu had a fairly effective system of waste management. Rapid urbanisation since 1951, however, caused major problems in this system. The article then analyses the impact of the Solid Waste Management Project which was

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launched in 1980 with financial and technical assistance from the government of Germany and relates it to the current situation of waste management in Kathmandu. Although the project seemed to be successful till 1990, the events that followed the *Jana Āndolan* (People's Movement) of 1990 exposed some of its weaknesses. Centralisation without proper coordination with the municipalities, and dependency on donor expertise, machinery and finance ultimately led to the collapse of Kathmandu's waste management system. As a result, following the termination of the German project, Kathmandu is now left with confused municipalities, an incapable central government and a bankrupt institution which had been created for the sole purpose of managing Kathmandu's solid waste.

Traditional System of Waste Management

Prior to the rapid urbanisation and modernisation that started in the latter half of this century[1], waste management was probably not a major problem in Kathmandu because the amount of waste produced was not very significant, and the society had developed its own system of managing the waste, a system which was an integral part of the culture and life style in the Valley. At that time, almost all the residents in the Valley were farmers and the waste they generated consisted of agricultural waste, kitchen waste, sewage, and waste from religious activities and festivals. Because of the absence of sophisticated materials and excess packaging, the volume of waste was probably minimal and the waste was primarily organic in nature. The communities in the Valley had developed a fairly effective system for managing such waste. Although many houses were not equipped with toilets, many people used the nearby rivers as their toilets and dumped their waste, which was all organic in nature, in a pit near their houses to produce compost which they applied in the fields as a soil conditioner.

The few published accounts that describes the situation of Kathmandu before 1951 provide sketchy and sometimes contradictory images of Kathmandu's garbage. Tracing the history of garbage in Kathmandu, Abana Onta (1994) uses the evidence provided by three late 19th century

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1 Major changes in Kathmandu's society began in 1951 with the end of the Rana regime and the opening of Kathmandu's doors to the outside world. Prior to 1951, access to Kathmandu was restricted and even Nepali citizens needed permission to enter or leave the Valley. The first highway connecting Kathmandu to other parts of the Kingdom as well as India was only completed in 1956 (and opened officially only in 1957).

descriptions—from the pens of Daniel Wright, Lt. Col. G.H.D. Gimlette, and Henry Ballantine—to argue that while Kathmandu was never as dirty and polluted as it is today, it was probably not a very clean city in the past either. While the descriptions provided by the above mentioned three writers no doubt paint an image of a filthy and unhealthy city, there are other published works which suggest the contrary. Colonel William Kirkpatrick, who visited Kathmandu in 1793 described the streets of Kathmandu as "narrow and nearly as filthy as those in Benares," and also mentioned that the cities of Patan and Bhaktapur were much cleaner (1996[1811]:160-163). Laurence Oliphant who visited Kathmandu in 1851 and published his book, *A Journey to Katmandu with the Camp of Jung Bahadoor*, in 1852, described Kathmandu's streets as being "well drained and comparatively clean, contrasting most favourably in that respect with any other Oriental town I have ever seen" (1994[1852]:81). Another evidence of the clean streets of Kathmandu is the photographs from the earlier part of this century published in *Images of a Century* (Proksch 1995). Garbage piles are not visible in any of the photographs of Kathmandu streets published in the book.

There are two possible explanations for Oliphant's image of Kathmandu, which contrasts sharply with the images of Wright, Gimlette and Ballantine. It is possible that because Oliphant was a short-term guest of the then Prime Minister Jung Bahadur Rana, the most powerful person in the country, the streets had been cleaned just before his visit, as it is customary in Nepali culture to clean up areas where important persons or guests are to visit. As a result, Oliphant may not have witnessed the filth described by the other three foreigners in their books. Another possible reason for the contrasting descriptions is that Oliphant probably only saw the main streets of Kathmandu which were quite clean, while Wright, Gimlette and Ballantine were describing the lanes and courtyards of Kathmandu. Wright and Gimlette stayed in Kathmandu for a long period and must have seen parts of the town that Oliphant never saw. The latter reasoning also explains the clean streets pictured in the photographs presented in *Images of a Century*. This book has several photographs of the major streets and Rana palaces but does not have any pictures of courtyards or narrow lanes. Although the photographs published in *Images of a Century* were taken 70 to 100 years after Oliphant's observations, the fact that Kathmandu's doors were closed to the outside world during this period allows us to assume that there were no major changes in the characteristics of Kathmandu's garbage over this period. These published works thus suggest that while the main streets of

Kathmandu (prior to 1951) were adequately clean, some of the courtyards and narrow lanes were full of garbage.

The situation of Kathmandu's garbage prior to 1951 can also be speculated upon by examining the traditional culture and practices in the Valley. In the traditional Newar house, the kitchen, the place where most of the waste is generated, is located on the top floor. In the traditional system, housewives dumped kitchen waste in the cukaḥ (courtyard surrounded by houses) or a *sāḥgāḥ* (compost pit in the courtyard) and the ash from the kitchen went in the *naugaḥ* (space under the stairs on the ground floor). The organic waste used to decompose by itself in the *sāḥgāḥ* and turn into compost. The *sāḥgāḥs* were often emptied three or four times a year and the contents used in the fields as fertiliser. Some of the *cukaḥ* and *sāḥgāḥs* were, however, not emptied for an extended period of time, thus resulting in huge piles of garbage in these places.[2]

Waste management is also built into the Newar culture and religion. Waste from rituals such as child birth and death ceremonies (*karmakānda*), and *dān* (clothes, bedding and other belonging to the deceased person given away in the name of the deceased person's spirit) are disposed at the *chwāsa* (a particular place in each locality where two lanes cross) or *dokā* (place where one lane meets another). There is a belief that demons reside at the *dokā*, and the *chwāsa* is the place for the Goddess Ajima. Therefore, if anyone dumps waste that are to be disposed at *chwāsa* at the *dokā* or elsewhere and vice versa, then the person will be troubled by the demons and the Goddess. Similarly, there is also a belief that if the *sāḥgāḥs* and other areas in the house are kept dirty then the owners will have to bear the wrath of *Nāg Rājā* (the serpent king). Waste from various *bhoj* (feasts) is also traditionally disposed at the *chwāsa*. Similarly, it is customary to throw old clay pots at the *chwāsa* on the day of *Chwāsala Punhi*, the full

2 Gopal Singh Nepali's book *The Newars* (1965:56) does not mention *sāḥgāḥs* but notes that,

> Even today, the quadrangle of the house, known as *Chuka* is the ideal place for throwing refuse as it was in the good old days. Such quadrangles also serve in the majority of cases, as places for throwing stool. On inquiry with a municipal councilor of Kathmandu it was gathered that as a result of the deposition of filth, through inconsiderable years, these quadrangles had been filled up as high as the level of the first floor, about eight to fifteen feet in height.

This indicates that although there was a system for recycling waste, it was not always effective.

moon in the month of December (Prajapati 1986). These superstitions and practices help keep houses and surrounding areas reasonably clean.

The tradition of cleaning private and public places during major festivals is another mechanism that has been built into the Valley's culture to keep the urban areas clean. For example during the festival of *Biskeṭ Jātrā* in Bhaktapur, there is a belief that Gods and Goddess reside in the *cheṁdi* (space under the stairways) and in each *cukaḥ*. Therefore, in order to please the deities these areas are cleaned during the festival. Similarly, during the festival of *Siṭhi Nakhaḥ*, there is a tradition of cleaning a pond or other body of water and on the occasion of *Kumāri Ṣaṣṭhi*, the local well is cleaned (Prajapati 1986, 1990).

Garbage also plays an important role in some of the festivals celebrated in the Valley. One such festival is the *Cakaṁdyaḥ Jātrā*, which is celebrated on the full moon of Phalgun (February/March). At one point during the festival, the image of *Cakaṁdyaḥ*, the name given to a deified merchant of ancient Kathmandu, is carried quietly and mysteriously down a lane to a garbage dump where the neighbourhood people present him with offerings. This ritual is meant to be an enactment of one of the legends associated with *Cakaṁdyaḥ*, according to which *Cakaṁdyaḥ* once went against traditional social norms to accept offerings from a low caste woman sweeper. Because the woman was from a low caste, their meetings were conducted secretly in the dark of the night (Anderson 1988; Goodman 1992).[3] Although this festival may not have assisted in effective management of solid waste, it does indicate that garbage was an important part of Kathmandu's culture and society.

The traditional society in the Valley has assigned the tasks of cleaning the city and disposing the waste to special castes: *Cyāme, Hārā-Huru and Pore*.[4] While the women in the household, regardless of their caste, are responsible for keeping the house clean, once the garbage reaches the public domain, it is strictly the responsibility of the sweeper caste to

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3 Karunakar Vaidya while describing the *Cakaṁdyaḥ* festival in detail in his book *Buddhist Traditions and Culture of the Kathmandu Valley* (1986:225-231) does not mention *Cakaṁdyaḥ's* meeting with the sweeper or *Cakaṁdyaḥ* being carried to a garbage dump. Instead he only mentions that "the idol has to pass through an old, old lane just by the side of the present day D.S.P. office of Kathmandu." Vaidya also argues that "*Cakaṁdyaḥ*" refers to the festival of Dipankar Buddha and not Sinha Sartha Bahu, the merchant referred to in the legend.

4 According to Nepali (1965:186) the *Pore* are public executioners and skinners who also sell baskets and fish, while the *Cyāme* and *Hārā-Huru* are scavenger castes.

manage the waste. The sweepers collected garbage from the streets, *cukaḥ*, *chwāsa*, *dokā* and any other waste piles in public places and dumped them in the river banks. In order to keep the town clean, sweepers were made to live in the outer edges of the town, near the rivers. Although the rivers in the Valley are regarded as holy places and river banks are the sites of numerous shrines and temples, dumping of waste in the river was never considered to be an abnormal or unacceptable practice. Thus the sweepers either sold waste as compost to farmers or dumped it in the rivers.[5]

While this system of assigning the waste disposal responsibilities to a particular caste assures that there are always people available to manage the municipal waste, this same system is also responsible for creating a feeling among other people that they are not responsible for the management of any of the waste that is outside their dwellings. This tendency on the part of most of the citizens to neglect waste that is outside the house, may not have caused any major problems in the past, but today this attitude, which is still prevalent among a majority of the people in the Valley, is one of the main factors inhibiting the creation of an effective public waste management system.

In the latter half of this century, with a dramatic increase in Kathmandu's population and the society becoming increasingly modern, the sanitary conditions in the city began to deteriorate and garbage piles started to increase on Kathmandu's streets.[6] As the number of non-farmers

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5 Nepali (1965:45) mentions that *Cyāmes* collected waste and sold it to *Jyāpū* farmers for the nominal rate of half a rupee per kerosene-oil tin of garbage.

6 The first scientific census in Nepal was conducted in 1952/54. No reliable population figures are available for the period prior to 1952/54. Colonel Kirkpatrick, who visited the Valley in 1793 estimated the population of Kathmandu to be about 50,000 and the total population of the Valley to be about 186,000 (Kirkpatrick 1996[1811]:161). Francis Hamilton, however, believed that these figures were slightly inflated (1990[1819]:209). Oldfield's 1880 publication, *Sketches from Nepal*, estimates Kathmandu city's population to be between 60,000 to 80,000 (1974[1880]:108). The census of 1920, which is not considered to be a scientific census, put the total population of the Valley as 306,909. According to the 1952/54 census, the Valley had a total population of 410,995 of which 196,777 (48 percent) were urban. In the following four decades, the total population of the Valley grew at an annul rate of 0.91, 3.01, 2.16 and 3.73 percent, while the urban population grew at an annual rate of 0.83, 1.36, 3.83, and 5.11 percent. These figures show that the population, especially the urban population, has experienced significant growth since 1952/54. Because migration into the Valley was restricted prior to 1951, it is safe to assume that the population growth rate in the Valley prior to 1951 was less than the growth rate in the 1950s, i.e., less than .91 percent. According to the 1991 census, the Valley had a total

in the Valley began to grow, so did the number of people who simply dumped their waste in a convenient location instead of composting it. The composition of garbage also began to change along with changing consumption patterns and the introduction of modern materials and packaging. These changes occurred rapidly while traditional attitudes of the people, such as waste management being the job of only *Cyāmes*, remained.

Although municipalities responded to the changing garbage situation by sweeping the streets and dumping the garbage in river banks, solid waste management was nevertheless a low priority to the municipalities because waste management was viewed as a non-productive sector. The Nagar Panchayat Act of 1962 and its regulations made the municipalities responsible for arranging for the removal of garbage and any matter that can be hazardous to health, from the city streets (Kroll 1978:3; Bista 1986). However, proper management of the garbage including recycling and safe disposal was never expected from the municipalities by the Act or the relevant authorities (Pokharel 1985). As a result, the municipality's role was limited to hiring sweepers to clean the streets. Proper management of waste—including cleaning lanes and courtyards, timely pick-up of the collected waste and safe disposal of the waste—in order to ensure a clean and healthy city was not a priority for the local governments.

By 1970, the garbage piles on Kathmandu's streets had started to attract the attention of donors. Flintoff (1971) from the WHO Regional Office for South-East Asia studied Kathmandu's waste management practices for two months in late 1970 and proposed simple measures such as door-to-door collection using hand carts, construction of a sanitary landfill on the banks of Bishnumati river, and composting of waste. He also proposed a separate department for managing solid waste. The Tourism Master plan, prepared in 1972, once again called for improved sanitary conditions in the Kathmandu Valley (Aryal 1987). Most of the recommendations of these documents were, however, never implemented.

In 1976, the first German expert, Dr. Ing O. Tabasaran, arrived in Kathmandu to start a long period of German involvement in Kathmandu's solid waste management. Tabasaran conducted an analysis of Kathmandu's

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population of 1,105,379 and an urban population of 598,528 (54 percent). Overall, between 1952/54 and 1991, the total population in the Valley increased by 169 percent and the Valley's urban population increased by over 200 percent (NPC/IUCN 1995).

garbage management practices and proposed a major reorganisation in the then prevailing waste management system, to be implemented with help of German technical and financial assistance (Tabasaran 1976).

Centralisation of Kathmandu's Garbage Management System

As per the recommendations of Tabasaran, another German consultant, G. Kroll, reviewed institutional and legislative aspects of solid waste management and proposed the establishment of a Solid Waste Management Board (Kroll 1978). Reasoning that the municipalities lacked experienced personnel and a proper organisation, Kroll recommended that "the Town Panchayats of Kathmandu, Patan, and Bhaktapur should be exempted from their duties for waste disposal with the establishment of the board which would then be solely responsible for this task" (1978:13). He argued that the government could establish the Board, in accordance with the Development Board Act of 1956, in a simple and quick way. The Board, he added, will be designed to effectively implement the Solid Waste Management Project in partnership with the German aid agency, Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ). This suggests that Kroll's primary interest was a structure which would permit smooth implementation of HMG/GTZ's Solid Waste Management Project and not necessarily a structure which would establish a sustainable and effective solid waste management system in the Valley. Kroll himself notes that the purpose of the Act was to ensure smooth and expeditious implementation of development plans and projects and that the Act also suggested that the function of a board is intended to be limited to the implementation of a specific project or a series of projects.

According to Kroll's recommendation, the Solid Waste Management Board would be chaired by the Secretary of the Ministry of Public Works and Transportation and consist of nine members, of which only one was to be a representative from the three municipalities on a rotational basis. Other proposed members of the Board were representatives of the Ministry of Finance, Ministry of Health, Ministry of Home and Panchayat, Chief Engineer at the Department of Housing and Physical Planning, Chief Planner of the Kathmandu Valley Town Planning Team, a nominee from among the top businessmen, and the Project Chief of the Solid Waste Management Project, who would also serve as the Member Secretary of the Board. The Project Chief would be appointed by the Ministry of Works and Transport. Although the proposed Board included representatives of all relevant ministries, it was heavily dominated by

central level agencies, seriously undermining the role of the municipalities. Kroll thus began the process of centralisation of Kathmandu's waste management system.

Kroll's recommendation was implemented in 1980 with the creation of the Solid Waste Management Board and initiation of the Solid Waste Management Project (SWMP). The project, which was implemented in four phases from 1980 to 1993, had three long-term German advisors and several other short-term consultants. In the first phase, the Project established and operated a waste collection system in 16 wards of Kathmandu and Patan. The evaluation at the end of Phase I recommended further stabilization of the Solid Waste Management Board and expansion of the collection area. As a result, Phase II of the project (1983-1986) extended its areas of service, introduced computerized management and accounting, and acquired modern waste management equipment. This phase, also included the establishment of a mechanized compost plant at Teku and a sanitary landfill in Gokarna.

By the end of the third phase in 1990, the project seemed to be on its way in achieving most of its targets.[7] The project had prepared and enacted the Waste Act and by-laws for waste management, introduced a tariff system which recovered more than 50 percent of the operation cost, kept the operational budget more or less constant while increasing services by about 300 percent, and introduced many new services such as pubic toilets, slaughter houses, and a septic tank cleaning service (Spreen 1990). The Waste Act of 1987 had transformed the Solid Waste Management Board into the Solid Waste Management and Resource Mobilisation Centre (SWMRMC), an autonomous unit under the Ministry of Works and Transport, thus giving the project an institutional base.[8] The donor agency was very pleased with the outcome of the project and considered it to be a "model project" (GTZ/SWMRMC 1988:16). Encouraged by the success of the project, the evaluation team in 1989 recommended that the Nepali staff take over upon completion of the third phase in July 1990.

During Phase IV, however, as the Germans started to reduce their involvement just when the country was undergoing major political changes, some of the weaknesses of the project started to surface and the

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7 The two main objectives of the SWMP were: i) to reduce environmental pollution through collection and disposal of solid waste and, ii) to establish a waste management system based on a high degree of resource recovery (GTZ/SWMRMC 1988:28).

8 The Centre was later transferred to the Ministry of Housing and Physical Planning and then again to the Ministry of Local Development.

project began to collapse. The political changes that took place in the country from April 1990 to the general elections in May 1991 brought a halt to activity in some project areas, such as composting, collection of fines and the search for a new landfill site, and significant delays in others, mainly the release of funds by Kathmandu and Lalitpur municipalities. In August 1990, the Teku compost plant—an integral component of the waste management system which had been found to be working well by the 1989 review—had to be closed due to complaints from neighbouring residents regarding foul odour . The entire project could not function effectively because major decisions, such as the project agreement for phase IV, were delayed.

The democratically elected government which came to office in 1991 and the local elections in 1992 brought more problems to Kathmandu's waste management system. The appointment of a new General Manager for the SWMRMC in September 1991 created further changes and more confusion. The government, motivated by potential political gains, granted permanent employment to over 900 employees of the SWMRMC at a time when the Centre was trying to reduce cost and decentralise its activities. The newly created Nagarpalikas, which had their own sweepers, refused to take the SWMRMC sweepers and also refused to contribute to SWMRMC's cost as agreed by the Nagar Panchayats in 1989. This situation continues to be a major burden to the Centre because it cannot afford most of the staff and its sources of income have diminished significantly with the phasing out of the German Project and non-functioning of some of its cost-recovery mechanisms, such as sale of compost, collection of fines, cleaning charges and tariffs.[9] These developments led to the collapse of the system that had been built up since 1980.

Although political changes were a major factor in disrupting Kathmandu's solid waste management system, the 1993 project review report mentions that the project suffered from a number of shortcomings that cannot be explained by the advent of democracy alone (Reiger et al. 1993). While the report does not elaborate on these "shortcomings," a close look at the project and its outcomes indicates that although the project was quite successful in cleaning up various areas in Kathmandu

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9 According to SWMRMC's records, in the fiscal years 1988/89 and 1989/90—the two years prior to the *Jana Andolan*—the Centre's total annual income increased by 94.5 percent and 184.7 percent respectively. In the following two years, however, the total annual income decreased by 8.4 percent and 4.4 percent.

and raising public awareness on waste management issues, its main shortcomings were a centralised waste management system, lack of coordination with the municipalities and dependency on international expertise, machinery and finance. A recent GTZ publication states that "Experience during the last decade of German assistance in this sector [solid waste management] has shown that solutions to the problems of solid waste management have to be approached in a long term participatory way with due attention to sustainable and affordable technology" (GTZ 1996:17).

According to the project review of 1993, the project began to collapse in 1990/91 because "the collaboration between executing agencies of both partners [governments of Nepal and Germany] proved difficult in a period in which the deep schism in Nepali society became apparent and was reflected within personnel and management of SWMRMC" (Reiger et al. 1993:21). The report further states that, "In the previous hierarchical power system, pressure could be exerted by government to some extent. In the new system, however, the present government is understandably reluctant to revert to the political measures exercised by its predecessors, and this central power can obviously no longer be exerted to the same extent" (Reiger et al. 1993:22). These statements suggest that the project's strategy of working mainly with the central government, while undermining the role of the municipal authorities, and the lack of coordination between SWMRMC and the municipalities had back-fired and was at least partly responsible for the failure of the project in Phase IV.

From their experiences in Phases I and II, the Germans had realised that centralisation of waste management had not been a good move and that the active participation of the public and municipalities was essential for effective waste management.[10] A SWMRMC report written by a group of graduate students (Ali et al. 1987:60) argued that the "decentralised Nagar Panchayat approach has potential advantages in bringing the system closer to the community and offering greater

10 Ali et al. (1987:21) mention that, "By 1984, the need for community participation was recognized as there was poor public utilisation of the services. This led, in the same year, to a major redefinition of aims and objectives." In 1984, SWMP created a Community Participation and Training Section which launched campaigns for public awareness and training of local motivators. In 1987, GTZ started the Urban Development Through Local Efforts (UDLE) project with the aim of increasing the capacity of municipalities to plan and manage urban development.

community involvement." An agreement was signed on 10 March 1987 between the project and the Nagar Panchayats to decentralise waste management responsibilities. According to the agreement, the municipalities were to take on the responsibility for sweeping all roads with the exception of the major roads, known as VIP roads, while the project was to be responsible for cleaning the VIP roads and the centralised collection and disposal system. However, for various reasons, the implementation of decentralisation policies did not progress as anticipated.

Probably the biggest mistake of the SWMP was that it gave very little attention to coordination between the project and the municipalities. As mentioned earlier, the Solid Waste Management Board had only one representative from among the three municipalities in the Valley, which meant that the municipalities had very little influence on and knowledge of what happened at the project planning and steering level. At the operational level, the project employed three waste inspectors, one of whom was the Liaison Officer who was responsible for communicating with the municipalities. However, because the project covered 55 wards in two municipalities, the effectiveness of the liaison officer was limited. Ali et al. (1987) report that the liaison officer did not initiate communication and coordination but only responded to ward committees if some problems arose. The lack of coordination is also illustrated in the minutes of a meeting held on July 9, 1993 between SWMRMC officials and the Mayor of Lalitpur. The Mayor mentioned that he was not aware that SWMRMC had any cleaning task in Lalitpur and said that SWMRMC had not contacted the municipality to hand over street cleaning tasks, while the General Manager of the Centre stated that it had long been known that SWMRMC was responsible for cleaning A-class roads and that the issue of street cleaning had been discussed at various meetings (Spreen 1993).

The project's dependency on international experts, machinery, and finance has been demonstrated by the collapse of the system as soon as the German aid started to phase out. While the project ran effectively under the supervision of German experts, it failed to build capacity of its Nepali counterparts and the municipalities. This fact is highlighted by a recent GTZ Fact Finding Mission which justified the need for a long-term expert for planning and managing a new solid waste programme by mentioning that "it is most unlikely that a local person could be found with substantial experience in solid waste management, so arrangements for providing back-stopping of the solid waste management programme

should be put in place" (Oeltzschner and Betts 1996:55). The fact that 16 years after the SWMP began, a German Mission still believes that there is not a single Nepali person who can manage Kathmandu's garbage testifies either that the solid waste management system introduced by the SWMP is too complex for Nepalis or that the project failed to develop local capacity.

The project replaced the traditional waste management system by a modern and mechanised system, some of the components of which were not suitable for Kathmandu. An example of this is the mechanised compost plant in Teku, which cost the project Rs. 14 million but has remained idle since 1990. The plant will probably never be used again because an economic analysis of compost production in Kathmandu has concluded that "the operation of four to six small scale and labour intensive compost plants has definite advantages over one centralised, capital intensive plant, presuming enough land is available" (Mutz 1990: (section iv) 21). Another example is the compactor at the Gokarna landfill which is expensive to operate and not suitable for the kind of waste generated in Kathmandu (Oeltzschner and Betts 1996:30).

However it would not fair to put all the blame for the current state of Kathmandu's waste management system on the weaknesses of the SWMP. The impotency of the Nepali authorities, and the use of garbage as a political tool by rival politicians are equally responsible. The incompetence of the Nepali government in managing Kathmandu's waste has been clearly demonstrated by the 1993 garbage crisis and the developments that have followed.

1993 Garbage Crisis

In 1993, the SWMRMC's performance declined significantly due to lack of funds, mismanagement, breakdown of equipment and growing animosity between SWMRMC and the municipalities. SWMRMC faced a financial crisis when the municipalities refused to contribute to the budget of SWMRMC for the financial year 1992/93, as agreed in Board meetings of SWMRMC on August 23, 1992 and January 28, 1993. During the monsoon of that year, mismanagement of the Gokarna landfill site led to a further series of problems. In the absence of adequate preparations for the rainy season, waste was simply dumped at the site and

left uncovered.[11] Even the leachate—contaminated water from the landfill site—treatment pond at the site was buried under waste. The resulting odour and scattering of waste by birds led to strong protests from the surrounding community and the subsequent shut down of the facility by the public. The community put a lock on the gates of the landfill and prevented garbage trucks from entering the site. As a result, waste started to pile up in the Teku transfer station and all the streets in town creating a major health hazard for Kathmandu's residents. Unable to manage the landfill site and deal with the local people, Kathmandu municipality and the SWMRMC negotiated an agreement with the local community to close down the landfill permanently after six months.

This irrational and short-sighted agreement led to the next garbage crisis in Kathmandu. In the final six months of 1993, no attempts were made to seek an alternate to the Gokarna landfill. As a result, when the agreement expired on January 2, 1994, the locals once again put a lock on the gates of the landfill site and garbage started piling up on Kathmandu's streets. With the SWMRMC being paralysed by its own financial and managerial crisis, the municipalities were forced to make desperate attempts at disposing of the waste. Waste was dumped in various public places, river banks, along highways, and taken to places as far off as Nepalgunj in the Tarai.[12]

This system of haphazard waste disposal continued for the next 18 months as government and municipalities faced heavy criticism from the media and the public, and while politicians continued to make promises to put an end to Kathmandu's garbage problem. Even during this period of crisis, however, very little progress was made towards finding a new landfill site or finding alternate ways to manage the garbage. Various places, including Champi, Chunnikhel, Jitpur, Sundarighat, Bardibaas, Bhimdhunga and Okharpauwa, were mentioned by the government as possible landfill sites, yet no concrete measures were taken to study or develop them. This was partly because the success of public pressure in closing the Gokarna landfill encouraged other local communities to mount strong campaigns against landfills every time a site in or near their village was proposed. Politicians used the sentiments of the people to criticize

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11 The landfill was normally prepared for the rainy season by constructing roads that can be used by the trucks bringing in garbage. Sanitary landfilling involves placement of garbage in layers, compaction of the garbage, and covering it with a layer of soil.

12 "We used to collect waste and dump it in the middle of the night to avoid public criticism," says Mr. Chakra Man Dangol, Ward Chairman of Ward 12, Kathmandu.

rival parties and show solidarity with their constituencies. Meanwhile Kathmandu Municipality continued to build a "garbage road" along the Bishnumati river and Lalitpur struggled to find various low lying areas to fill with garbage.[13]

As soon as the Nepal Communist Party -United Marxist Leninist (UML) government, which had proclaimed Kathmandu's garbage problem to be one of the top ten items in its agenda, came to power in December 1994, it formed a committee which studied 11 possible sites and proposed a site in Setidevi VDC in Lalitpur . This was accomplished within a short period of three weeks in January 1995. The committee even secured the support of the local VDC officials by providing an incentive package worth Rs. 23.3 million which included roads, health post and ambulance service. However, in spite of this deal with the local village government, the Setidevi proposal had to be scrapped because of strong opposition from local people and political leaders who claimed that the public had not been consulted during the process. By this time both the people and the politicians had come to realize the power of public pressure and started taking full advantage of this tool. In fact, after being in a *gherau* (forcefully surrounded) by a vociferous group of locals for over two hours, environmentalist Anil Chitrakar came to the conclusion that, "Now no one will take Kathmandu's waste. It is now time to think towards reducing waste rather than dumping it" (Kantipur 1995b). Public opinion had now become the most critical factor in finding an appropriate solution to Kathmandu's garbage problem.

Unable to avoid public opposition in the process of finding a solution to the problem, the UML government finally decided to use force to reopen the gates of Gokarna. On 24 July 1995, the government used heavy police support and bulldozed its way into the old landfill, in a move that invited praise from party workers and massive criticism from opposition politicians. "The same UML leaders and party workers who earlier threw rocks and put a lock at Gokarna when we tried to use it as a

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13 The "garbage road" is a road built by Kathmandu Municipality along the west bank of Bishnumati between Shobha Bhagwati and Balaju. The road was built by dumping a layer of approximately 10 ft of garbage, compacting it, and covering it with a two inch layer of soil. When a portion of the road was swept away by a flood in the Bishnumati River on August 2, 1994, Kathmandu was once again covered with trash for two weeks. The road is not technically sound because of the lack of a proper base and garbage continues to pollute the river water. Today, the road is not well used and many local people, who had earlier agreed to building it, feel cheated.

temporary landfill, are now using police force and bulldozers to say to the people that Gokarna is an appropriate site," charged Chairman of the House of Representatives Ram Chandra Poudel at a workshop organised by the Free Student Union of Padma Kanya Campus (Kantipur 1995c).[14] Similarly Kamal Thapa of the Rastriya Prajatantra Party claimed that "Kathmandu's garbage and Nepal's politics are inter-linked with each other" (Kantipur 1995c).[15] On the same occasion senior politician Nilambar Acharya concluded that "Kathmandu's dirt and the government's dirty politics are the main challenges faced by the country today" (Kantipur 1995c). Kathmandu's garbage had become a hot political issue which was now being debated in all political arenas from Kathmandu's streets to Singha Durbar and the parliament.[16]

Besides providing material for attack against rival politicians, the garbage crisis also brought about a dilemma for several local representatives who were forced to decide on whether to pledge loyalty to the party or the people they represented. When the UML government proposed the Setidevi site, the UML Member of Parliament from the area was forced to criticize his own political party. Similarly, when the UML government forced open the Gokarna landfill, Kathmandu's Mayor, P.L. Singh, who is a Nepali Congress leader, voiced his support for the government's actions while everyone else in the party was criticizing the government.[17] Regardless of the political implications of the UML's decision to force open the Gokarna landfill, this action has brought a temporary relief to Kathmandu residents from stinking piles of garbage. The coalition government, which followed the UML government has

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14 Mr. Ram Chandra Poudel was the Minister for Local Development in the Nepali Congress government (1991-1994). It was during his tenure that the garbage crisis occurred and the Gokarna landfill was eventually shut down.

15 Mr. Kamal Thapa is the Minister for Local Development in the current Coalition Government (September 1995 to present).

16 Politicization of Kathmandu's garbage began earlier in 1993. Oeltzschner and Betts (1996:29) note that "the major reason behind the closure [of the Gokarna landfill] was not only the nuisance caused by odour and debris scattered by birds, but also a strong political interest." Similarly, when the proposal to construct a landfill at Setidevi fell through, Keshav Sthapit, who is a UML leader and the coordinator of the committee which proposed Setidevi, accused the Nepali Congress of creating the mess in Setidevi because they were afraid of the success of the UML government (Kantipur 1995a)

17 This tendency of putting the people's interest ahead of party interest is definitely a positive development for Nepal, where almost all sections of the society are distinctly divided along party lines and which party one belongs to is often more important than what an individual thinks or believes in.

continued to use the Gokarna site by negotiating a new agreement with the local people. Now the site is fairly well managed and public opposition has also been limited to occasional rallies and meetings. This temporary lull in Kathmandu's garbage crisis is, however, not the end of the story. Many of the problems which caused the 1993 garbage crisis still remain and the garbage issue is still clouded with uncertainty and confusion.

Current State of Confusion

Currently, the main questions being raised regarding Kathmandu's garbage are: i) who should be responsible for managing the waste? and, ii) where should the city's waste be dumped? Ironically, these are the same questions that Professor Tabasaran tried to answer during his first mission to Nepal in 1976. Today, after twenty years and a major donor-funded project, Kathmandu finds itself back at square one pondering the same issues, while the government still seeks foreign technical assistance to solve a problem which is not technical in nature.

Who is Responsible?

As discussed earlier, for the past decade there has been a realization that centralisation of waste management functions was a mistake and that responsibility should be given back to the municipalities. However, although Kathmandu's garbage has been a major headache for the government, there still seems to be some hesitancy on the part of the central government to hand over waste management responsibilities to the local governments. This is probably because of the potential of garbage to attract international funding and the possibility of using it as a political tool when necessary. The Nepal Environmental Policy and Action Plan explicitly recommends that wards be responsible for the collection of waste and delivery to a central point for collection by the municipality, which would then ensure safe final disposal (HMG 1993:33). This recommendation was however, not followed by the recently introduced Solid Waste Management National Policy (HMG 1996a) which mentions the need for improving the capacity of local government to manage solid waste but stops short of giving local governments full responsibility for managing the waste. The policy instead states that the government will create a new central agency and that local authorities are to manage the waste in coordination with this central agency. Moreover, HMG has recently established a high level Kathmandu Valley Development Council with 49 members, of which 39 are ministers and secretaries from various

ministries. Only three seats are reserved for the local municipal authorities. The Council's work plan does not mention decentralisation of waste management but rather mentions that the SWMRMC will be strengthened and the Ministry of Local Development will be responsible for this task (HMG 1996b). These developments indicate that although the government says that it prefers decentralisation, it is not yet serious about decentralising waste management functions.

As for the Germans, it is clear that they are in favour of partial decentralisation of waste management functions although they admit that "for political reasons, such an 'ideal' situation is unlikely to emerge in the near future" (Oeltzschner and Betts 1996:20). The latest Fact Finding Mission states that, "over the longer term, the development of some form of Valley-wide organisation for solid waste management (at least for transportation and final disposal of wastes) seems inevitable if environmental standards are to be improved and maintained, and costs are to be minimised" (Oeltzschner and Betts 1996:20). GTZ made it clear to the government back in 1993 that it will continue its cooperation in solid waste management only if the municipalities take responsibility for waste collection and transfer, and if Kathmandu, Lalitpur and Bhaktapur municipalities take over joint ownership of SWMRMC while maintaining the Centre's legal identity.[18] At a meeting in Germany between Kathmandu Mayor P.L. Singh, and officials from the Federal Ministry of Cooperation, Germany and from GTZ, the Mayor stated that Kathmandu Municipality was ready to take over SWMRMC, but the details needed to be worked out and approved by his Board (Spreen 1993). However, this has proved to be easier said than done, primarily due to political constraints and practical difficulties of jointly owning and managing the SWMRMC.

In the mean time, the government has been requesting support from the donor community to manage Kathmandu's waste and several donors have shown interest. Oeltzschner and Betts (1996:37) report on the formation of an informal forum of donors interested in the solid waste

18 Handing over of street cleaning and pick up services as well as turning over SWMRMC to joint ownership of the concerned municipalities was defined as the appropriate strategy by an Inter-Ministerial Working Committee in 1992. The committee had members from concerned HMG ministries, National Planning Commission, Kathmandu's three municipalities and the main political parties.

sector known as the "dirty donors group."[19] Because of their long involvement in this area, the Germans are naturally interested in seeing that Kathmandu's garbage becomes well managed and their past investment does not go to waste. However, although they have funds set aside for this purpose, they are hesitant to take a step until the government fulfills certain pre-conditions.[20] Currently, GTZ is providing limited support through another of its projects.[21] Some of the activities of other donors in this sector are listed below:

- In 1994, at the request of HMG, the Japan International Cooperation Agency (JICA) sent a mission to investigate the possibility of providing assistance for managing Kathmandu's garbage but it subsequently decided against it.

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19 The "dirty donors group" was created in February 1996 in an effort to coordinate donor assistance for management of Kathmandu's garbage.

20 A paper, jointly prepared by E. Spreen, GTZ advisor to SWMRMC, and B.B. Adhikari, General Manager of SWMRMC, on 23 April 1993 and handed over to the municipalities of Kathmandu and Lalitpur, stated that GTZ would continue its cooperation in solid waste management only under the following conditions (Spreen 1993:Annex B):

(1) the municipalities take over the street cleaning and pick up service till May/July 1993, as decided under participation of representatives by the Board of SWMRMC, or compensate SWMRMC for its costs.

(2) the municipalities take SWMRMC into their joint ownership keeping its legal identity.

These conditions have not yet been fulfilled because both the government and the municipalities are still unsure about the transfer of the ownership of SWMRMC and because, although the municipalities are ready to take over the responsibility of street cleaning, they are reluctant to take the sweepers of SWMRMC since they have their own sweepers. The most recent GTZ Fact Finding Mission report states that provision of donor support for recommended activities should be made contingent upon substantial progress being made towards completing those tasks identified by the Mission as having the greatest priority. These tasks include development and implementation of a national policy and strategy on waste management, development and implementation of practical cost recovery mechanisms for waste management services, and development and application of an integrated operational and financial model for different waste management options, scales and locations (Oeltzschner and Betts 1996:51).

21 UDLE is a GTZ project designed to assist municipalities in performing various functions including solid waste management. UDLE's involvement in solid waste management has, however, been limited to educating school children on the topic. GTZ already has DM 3 million set aside for renewed technical collaboration in Kathmandu's waste management.

- Finland has expressed an interest in providing assistance to this sector and sent a Fact Finding Mission in March 1996 to explore the potential for Finnish involvement.
- Although USAID has no plans to get involved in this area, in the past it (along with IUCN - The World Conservation Union) has supported a community waste management system in Teku, Kathmandu and according to Oeltzschner and Betts (1996:39), the US Ambassador to Nepal has played a key role in the establishment of the "dirty donors group."
- The government of India has recently provided a generous gift of various waste handling equipment and vehicles to Kathmandu Municipal Corporation.
- UNDP has supported the preparation of a "Preliminary Plan on Solid Waste Management for Lalitpur Municipality."
- The Asian Development Bank has provided a US $12 million loan to the Kathmandu Municipal Corporation for the Municipal Infrastructure Improvement Project, which includes environmental improvements along the Bishnumati river and Kathmandu's core area upgrading. The project is purchasing some modern waste management equipment with these funds and an international consultant for the project recently conducted a study on the potential for privatizing waste collection, and suggested collection of waste by private companies in two wards on a trial basis as a pilot project (Geier 1996). Moreover, Robert Dobias, an official from ADB Manila who visited Kathmandu in August 1996, mentioned that ADB was considering some sort of technical assistance in the area of solid waste management.

All this interest on the part of donors to provide assistance to a sector where the government is not yet clear on its policies and strategy can be dangerous. Politicians often use the amount of foreign aid they can lure into the country as a yard-stick to measure the success of their government or the amount of *bikās* they have brought about in the country. Furthermore, most politicians and high level government officials love donor assisted projects because they usually come with generous benefits in the form of extra allowances and vehicles, lucrative job opportunities for their *āfno mānche*, and the possibilities of participating in seminars or study missions to distant countries. Under these circumstances, the government will probably continue to hang on to

Kathmandu's garbage in anticipation of big projects and big money instead of handing over the responsibility to the municipalities.

In the meantime, while the central government is busy trying to sell Kathmandu's garbage to donors, the municipalities continue to manage the urban waste. Both Kathmandu and Lalitpur municipalities are confident they can manage their waste because: i) they did it till twenty years ago and are doing so even today and, ii) all other municipalities, including Bhaktapur, are doing it themselves. Therefore, if given a chance and proper recognition there is no doubt that the municipalities will step forward to answer the question: "Who is responsible?"

Search for the Elusive Landfill Site

Perhaps no other issue related to Kathmandu's development has attracted as much attention in recent years as the search for a new landfill site. Many articles have been written, committees have been formed, and consultants have been hired, yet the issue remains unresolved. The need for an environmentally sound landfill site for final disposal of Kathmandu's waste has been felt by everyone concerned with this issue.[22]

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22 Flintoff (1971) first suggested constructing a sanitary landfill protected against the river water on the banks of Bishnumati. Later, Tabasaran (1976) evaluated 12 potential landfill sites in the Valley and proposed an area south of the Gokarna forest, which was estimated to have a life of 200 years. The Gokarna landfill was constructed by the SWMP and it started accepting waste in 1986. The life of the landfill was later estimated to be significantly less than 200 years. The life was further reduced by the rapid growth of Kathmandu's population, failure of composting and inability to expand the landfill because of the presence of a religious shrine which would have to be relocated in order to do so. In 1991, the SWMP started the process of searching for a new landfill site by conducting a pre-feasibility study of a site in Lubhu. Although the study found that the site could potentially be used as a landfill and that it also had potential for utilisation of the landfill gas as fuel for the nearby brick kilns, further studies for the site were not conducted. A site at Champi was also studied and found to be quite suitable for a landfill, but it was rejected by the Department of Civil Aviation on the ground that it poses a bird hazard to flying aircraft because it lies within 13 km from the Tribhuwan International Airport and is directly under the main flight path for international flights. It should be noted here that the United States Environmental Protection Agency recommends that landfill sites not be closer than 10,000 feet (3.05 km) from airports used by turbojet aircrafts and 5,000 feet from airports used by piston-type aircrafts. The strict restriction, imposed by Nepal's Department of Civil Aviation, which does not have any scientific basis, is another reason for the difficulty in finding a suitable landfill site. Some of the other sites which have been proposed for a landfill are Setidevi, Ramkot, Bhimdhunga, Simpani, and Okharpauwa. The Simpani site was proposed by a private company which wanted to

However, too much attention has been placed on the search for a landfill site without looking at the solid waste management issue as a whole and learning from our history. As a result, other more appropriate forms of waste management have been for the most part ignored in the search for a landfill site.

It is well known and acknowledged that landfilling is one of the least desirable methods for handling solid waste, especially in a developing country like Nepal where recycling is widely practiced and has tremendous potential. Even the German Fact Finding Mission of 1996 states the following hierarchy of priorities as being internationally accepted (Oeltzschner and Betts 1996:19):

1. Waste reduction
2. Recycling/Re-use
3. Energy recovery
4. Treatment to eliminate/reduce potential to create environmental impacts/hazards
5. Controlled landfill or other deposit

Yet in the same Fact Finding Mission report, four of the seven recommendations deal with landfill sites for Kathmandu.[23] Very little

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develop and operate a private landfill site. Currently the government is considering construction of a temporary landfill site at Ramkot and a permanent site at Okharpauwa.

23 Oeltzschner and Betts(1996:52-53) recommend the following four activities as the first priorities for managing Kathmandu's waste:

- Review and finalise plan for completion and final restoration of Gokarna landfill site.
- Undertake a strategic study to identify the Best Practical Environmental Option for the development and operation of a new sanitary landfill site for the Valley. Once identified and agreed, prepare implementation plans.
- Carry out geotechnical study of Okharpauwa site, including the construction of an access road from the main highway.
- Using existing data and information, carry out a detailed assessment of the risks of bird strike in the Valley. Based on the results, prepare/agree specific criteria/guidelines for the siting and operation of landfill sites.

The report also mentioned the following activities as second priority actions:

- Prepare a long-term strategy for solid waste management in the Kathmandu Valley. Once agreed, prepare detailed implementation plans, including financing. Implement plans.
- Develop a concept, framework, control mechanisms and detailed documentation/procedures for contracting out solid waste management services in Kathmandu Valley.

effort has been made, by either the donor community or the government, towards solving the landfill problem through measures which would increase composting and recycling of waste instead of trying to find a place for dumping it.

The importance of composting and recycling can not be overemphasized for a country like Nepal. Composting is a simple technology which has been practiced in Kathmandu for centuries. If well managed, a compost plant produces minimal odour and other environmental problems and the final product is of great value for a Valley which still depends predominantly on agriculture. The role of compost in increasing soil fertility is accepted worldwide and well understood by the farmers in the Valley. This was demonstrated by the very high demand for compost when the compost plant at Teku was operating. Because approximately two thirds of the Valley's municipal solid waste is organic in nature (NPC/IUCN 1992:30), most of Kathmandu's garbage can be turned into a valuable product without too much investment or technical assistance from international consultants. Therefore, the right thing for the government to do would be to search for sites for compost plants, instead of landfills. In fact, because the final product has a market value, the government or municipalities do not have to do the composting by themselves, if they can encourage private sector to invest in it.

Private companies involved in composting will naturally seek a return on their investment. In the current market situation, however, simply collecting municipal waste and composting it will not be very profitable because of the high cost involved in waste collection and sorting, and competition from imported chemical fertilizers which are heavily subsidized. Therefore, as an incentive for the private sector, the government could: i) pay the private party a tipping fee for handling the waste and, ii) remove the subsidy on chemical fertilizers or subsidize compost so that it can compete fairly with chemical fertilizers in the market. If these conditions could be met, there is no reason why private parties would not invest in composting. Even now, when the profit margin is so low, some private companies are involved in composting organic waste from specific sources. For example, many nurseries in Kathmandu sell compost which they produce from their garden waste.

- In cooperation with local designers, develop a user-friendly bulk communal container system suitable for the towns of the Valley.

Similarly, Sher Bone Industry in Patan makes compost from animal waste and sells it as *Kisān Mal* (agricultural fertilizer). The tipping fee to be paid to the private company can be raised from waste generators such as residents, offices, and industries. A household survey done in 1987 showed that 70 percent of the people are willing to pay for waste management services (Ali et al. 1987:48). Today, the percentage of people willing to pay may be higher because of increased public awareness of waste management issues. *Unnati Ādhār Kendra*, a non-governmental organisation which is providing waste management services to about 200 households in Teku, reports that most of the people are willing to pay for the services.[24] The payment can be in the form of a nominal fee from every household, establishment and institution of which can be attached to the land tax or other existing tax or fee systems.

Recycling is another waste management tool that needs to be further encouraged. Here again, as in the case of composting, the expertise and willingness already exists on the part of the private sector (Tuladhar et al. 1996). For example, Brikuti Pulp and Paper Limited in Gaidakot has the capacity to recycle all of Kathmandu's waste paper. However, because of the lack of an effective waste paper collection system in Kathmandu, the company is forced to import waste paper from Singapore and the United States, while Kathmandu's scrap paper is either disposed or burned. Similarly Enviroplast, a plastic recycling plant in Tandi, is running well below capacity because it can not find enough scrap polyethylene. These are only a few examples. There are many other factories in Nepal which are suffering from the lack of scrap materials and many other factories can be established if the government adopts favourable policies and offers incentives to industries which use scrap as raw material. Incentives from the government such as tax cuts, low interest loans, and procurement of recycled products by the government could go a long way, not only in managing Kathmandu's waste but also in helping the economy by creating jobs and revenue.

At present there are no government incentives offered for private entrepreneurs operating scrap-based industries. Instead, the District

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24 *Unnati Ādhār Kendra* provides waste bins and complete waste management services including cleaning, waste collection and composting. The NGO currently charges Rs. 50 per month for houses without lawns and Rs. 100 per month for houses with lawns. Similar organisations are operating in several other neighbourhoods in Kathmandu, including Kupundole, Kumaripati, Battisputali and Chabhil. Most of these organisations, however, only provide waste collection services.

Development Committees of Kathmandu, Lalitpur and Bhaktapur, together with the SWMRMC, are charging a very high tax on all scrap materials leaving Kathmandu.[25] This tax is a major burden for all parties involved in recycling including scavengers, scrap dealers, scrap-based manufactures and consumers of recycled goods. At a time when most countries are offering various incentives to encourage recycling, this tax is definitely a step in the wrong direction.

After composting and recycling, very little of Kathmandu's garbage would be left for land filling. This has been proven by the experiences of *Unnati Ādhār Kendra*, which composts organic waste and sells the recyclables. After composting and recycling waste from 200 households, only about five percent of the incoming waste remains to be disposed of in other ways.[26] If this approach were to be adopted throughout Kathmandu, the municipalities could easily manage Kathmandu's garbage and there would be no need to search for a new landfill or international technical assistance.[27]

Conclusion

Kathmandu's garbage management has come full circle to where it was twenty years ago. A major project has come and gone in the name of *bikās*. The *Jana Āndolan* and the events that followed have ushered in major changes in the society. Yet today, the streets are still dirty and the municipalities are still confused about their responsibilities while the government is once again begging for international assistance. However, there is also a positive dimension to all that has happened in the past two

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25 The scrap tax was first introduced by SWMRMC in 1988 with the aim of raising funds and encouraging scrap-based manufacturing within Kathmandu Valley. However, at that time the rates were very low and as a result it had very little negative effect on recycling. The rates significantly increased after the District Development Committees also started to collect tax on scrap materials. For example, in 1995 the tax rate charged by SWMRMC on old newspaper was Rs. 0.18 per kg., but in 1996 a joint committee formed by the three District Development Committees and the SWMRMC started charging Rs. 2.00 per kg for scrap newspaper, an increase of over 1000 percent.

26 Personal Communication from H.D. Ranjeetkar of *Unnati Ādhār Kendra*.

27 If only non-recyclable waste were to be landfilled, the existing Gokarna landfill site can be used for many more years because of the significantly reduced volume of waste heading to the landfill. Furthermore, the disputes between the landfill authorities and the local people will also be minimised because non-recyclable waste usually does not cause foul odours or attract birds and other scavengers.

decades: these events have put garbage on centre stage and generated wide public awareness of the issue, and they have also provided lessons for the future. Some of the lessons that can be drawn from Kathmandu's experience with garbage over the years are as follows:

- Because municipalities are the institutions directly responsible to the urban residents, they should be given the full responsibility for waste management. Local governments should be technically and financially able to manage their own waste. The local governments may also involve the private sector in this task.
- The central government should provide overall policies which: i) set out the necessary prerogatives and directives for local governments to manage their own waste, ii) assist in the development of the recycling industry and, iii) encourage private sector involvement in this sector.
- The local as well as central governments should be committed to exploit domestic expertise and interest in the area of waste recycling, including composting, and to promote waste recycling as the main tool for waste management instead of landfilling. Landfilling should only be used as the last resort for managing waste that cannot be recycled.
- Although international technical assistance may be required for some specific tasks, such as research on bird hazards to aircraft near landfill sites, for the identification of a suitable process of privatisation of waste management, and management of hazardous waste, for the most part, the local knowledge and technology base will be sufficient for managing Kathmandu's waste. The government should, therefore concentrate on developing a waste management system by mobilising local knowledge and using local technology, instead of going for another large project. Another major donor-funded project will only serve the interest of a few politicians or bureaucrats, while the majority of Kathmandu's citizens are forced to watch political spectacles. Furthermore, because HMG and most donors tend to favour large scale and highly visible projects, it is likely that another donor-funded solid waste management system in Kathmandu will propagate inappropriate solutions such as landfills or incinerators instead of small compost plants and other recycling units managed by the municipalities or the private sector.
- The government needs to understand that the problem of Kathmandu's garbage is not technical in nature but rather

institutional. Sound institutions with a clear vision and a sincere commitment are what is required to manage Kathmandu's garbage.

If these lessons can be converted to policies, plans and programmes, we can go back to the days when the management of Kathmandu's garbage was not a major issue but simply a way of life for the municipalities as well as the residents of Kathmandu.

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