Solid waste management in Nepal

This paper reflects the existing management systems practiced in various areas of Nepal in managing solid waste and contains initiatives of municipalities; national and local NGOs/CBOs; public and private entities. This paper helps to transfer the lessons and existing practices regarding soild waste managment and encourages urban, peri urban and emerging towns for similar initiatives in urban sanitation.

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WaterAid's mission is to overcome poverty by enabling the world's poorest people to gain access to safe water, sanitation and hygiene education.

Background

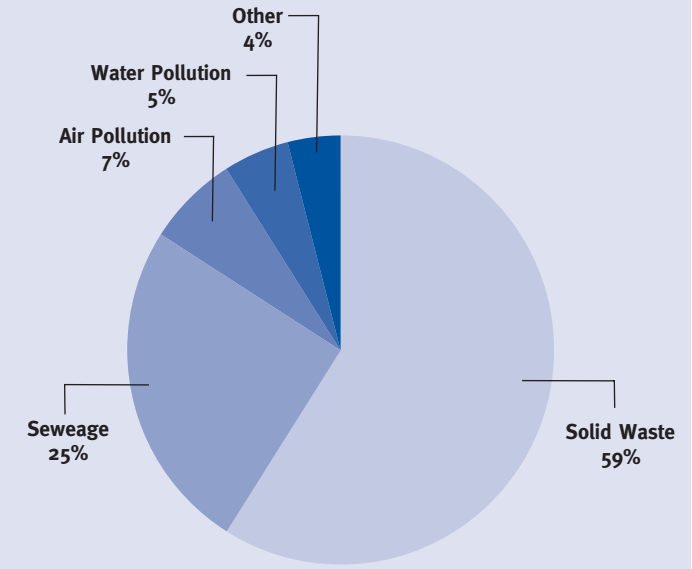
Solid waste is an byproduct of human activities which tends to increase with rapid urbanization, improved living standards and changing consumption patterns. Management of increasing amounts of solid waste has become a major challenge in many cities in developing countries. If solid waste is properly used, it can be a valuable resource, but if it is not effectively managed, it can result in serious adverse impacts on environment and public health. Solid waste management is therefore a critical component within urban sanitation and it is also one of the most important and resource intensive services provided by municipalities. According to a survey done by Nepal's Central Bureau of Statistics (CBS), most urban residents consider solid waste management as the most important environmental problem in urban areas of Nepal.

In Nepal, urbanization is increasing at an alarming rate putting immense pressure on municipal services, particularly to manage the ever increasing amounts of waste. At present most of the wastes generated in municipalities are not being adequately managed thereby creating a serious health and environmental hazard, particularly in the slum and squatter areas, where the residents have less capacity to pay for better services and are often ignored by the official agencies. Therefore, poor urban settlements are most affected because of indiscriminate dumping and lack of open spaces.

Shova Maharjan from Siddhipur front to the compost bin

WaterAid/ Marco Betti

FIGURE 1: PUBLIC OPINION ON MAIN ENVIRONMENTAL PROBLEMS IN URBAN AREAS



Source: CBS, 1997

According to the 2001 census, only about 15 percent of Nepal's total population live in urban areas. However, because of the lack of employment opportunities in rural areas and the concentration of many facilities and services such as education and health care in urban centres, the rate of urbanization is very high. With rapid urbanization and changing consumption patterns, solid waste management has become a major challenge in most urban centres in Nepal, particularly the larger ones. According to CBS (1997), only 17 percent of urban households have their waste collected by waste collectors. Furthermore, in low-income households, indicated by houses having no toilets, only 2 percent of the households have their waste collected. Open waste piles are a common site and the work of municipalities is often limited to sweeping the streets and dumping the waste in the nearest river or vacant land. Modern waste management techniques, such as source separated door-to-door collection systems, material recovery and recycling facilities, sanitary landfilling, and private sector participation have not yet been introduced in most municipalities.

According to the Local Self-Governance Act, 1999, municipalities are responsible for managing solid waste, but municipalities in Nepal generally do not have the necessary skills or resources to manage the waste in the proper manner. This act has empowered municipalities to take every necessary action at local level. On average the 58 municipalities in the country are spending about 13 percent of their total budget on waste management related activities (SWMRMC, 2004), but in most cases this amount is not being spent in an efficient manner.

Management of solid waste is a growing concern in Nepal as urban population densities increase and flat usable land is in short supply. Although small urban centres were declared to be municipalities, they suffer from a lack of infrastructural, technical and financial resources to tackle the problems of waste management. With increasing public awareness about good health and a clean environmental sanitation, solid waste management has now become the priorities of the municipalities in Nepal. Municipalities, for managing the waste, are expressing their desire to develop final disposal system even though collection systems are still not in place. They are also promoting waste reduction, reuse, and recycling among the communities.

However, in spite of the many challenges faced by municipalities, in some urban areas, municipalities have joined hands with local communities and the private sector to introduce innovative approaches for waste management that are cost effective and efficient. These include door-to-door collection system in some areas of Kathmandu and several other municipalities, plastic collection and recycling systems with community and private sector participation in Hetauda and Bharatpur, composting in Kathmandu and Bhaktapur, medical waste management in Hetauda and landfilling in Tribhuwannagar. The challenge now is to replicate and scale up these good examples. This paper has been prepared to document these positive experiences and transfer their lessons to other municipalities and encourage similar initiatives in urban sanitation.

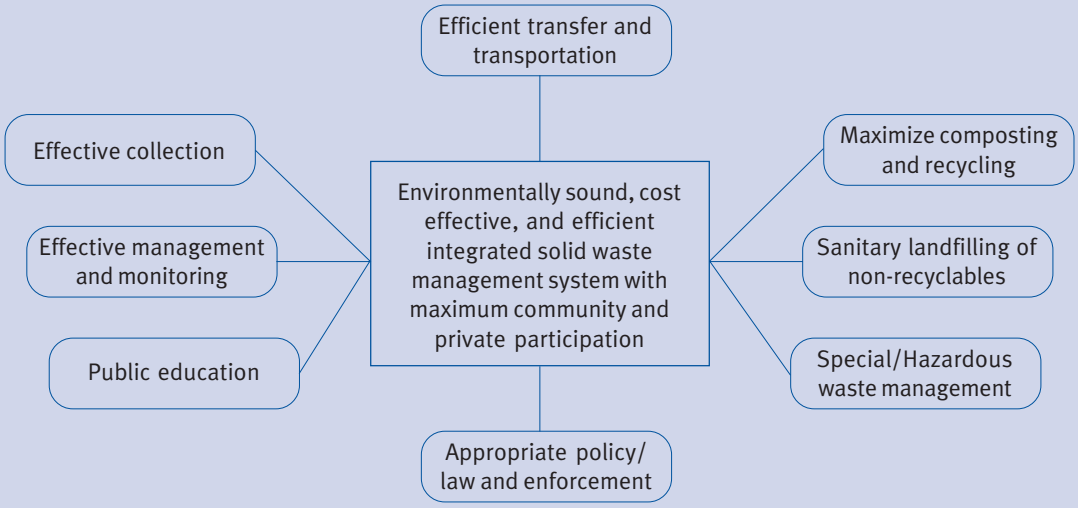
Integrated solid waste management

Effective solid waste management is more than just cleaning the streets or collecting waste and dumping of the collected waste, as practiced by most municipalities. It requires efficient combination of various components of solid waste management in an integrated manner. Integrated solid waste management is therefore a process of optimizing the waste management system as a whole with application of a variety of suitable technologies. This includes the following activities:

- Reduction of the amount of waste generated
- Proper segregation and storage of waste at source
- Efficient waste collection
- Street sweeping
- Waste transfer from preliminary collection vehicles to haulage vehicles
- Transportation of waste
- Waste composting and recycling
- Landfilling
- Hazardous waste management
- Public education and participation
- Formulation and enforcement of policies and regulations
- Organizational management
- Financial management

In order to ensure that all aspects of integrated solid waste management are addressed and the system as a whole functions effectively and efficiently, municipalities need a proper strategy as well as sufficient human and financial resources to implement the strategy. In 1998, Kathmandu Metropolitan City had drafted a SWM strategy which aimed to establish a cost-effective, environmentally sound and efficient integrated solid waste management system with active community as well as private sector participation. In order to achieve this goal, the strategy had eight objectives which are shown in Figure 2. The strategy is clear and comprehensive and it provides a direction for future activities. However, the strategy has not been fully implemented because of the absences of proper plans, adequate resources and effective monitoring. Therefore, municipalities need to formulate effective strategies for integrated solid waste management and back it up with annual plans and programmes as well as effective monitoring systems.

FIGURE 2: STRATEGY FOR INTEGRATED SOLID WASTE MANAGEMENT



Waste collection system

Waste collection is generally considered to be the most important component of any waste management system because it is the most expensive and visible part of the system. Therefore, properly designed and executed waste collection systems can result in significant savings and reduction in environmental and public health risks. The following issues generally need to be considered in designing a waste collection system:

- Containerization and on-site storage of waste
- Source separation
- Collection mechanism (roadside collection, door-to-door collection, communal containers, on-time collection etc.)
- Cleansing of streets and other public places
- Time of collection
- Type of vehicles used for collection
- Frequency of collection
- Route planning
- No. of staff used for collection
- Special collection for bulk waste generators
- Separate collection for special waste such as medical waste and household hazardous waste
- Transfer of waste from primary collection vehicles to larger vehicle for secondary transport

In Nepal, however, waste collection systems are not properly planned to effectively utilize available resources. It is estimated that the 58 municipalities in Nepal generate about 1,369 tons of municipal waste per day or 500,000 tons per year (SWMRMC, 2004). Less than half of this gets collected and almost all of the collected waste is dumped haphazardly in a crude manner. In many municipalities, waste generators generally dump the waste on the streets at

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« Solidwaste collection in Birgunj Sub-Metropolitan City

any place at any time and sweepers collect the waste and pile it up at a certain location before it gets scooped up again and placed in a vehicle for transportation. This multiple handling of waste during collection makes the entire system inefficient and ineffective. Although many sweepers clean the streets, the streets are generally dirty because all the waste does not get picked up and waste is dumped on the streets even after they are swept.

However, several municipalities have taken the initiative to introduce waste collection systems that are more efficient and effective. Some have distributed bins to encourage proper storage of waste at source and several municipalities have introduced door-to-door or on-time collection systems, where waste is transported straight from the source to a collection vehicle at a given time. This avoids the need for multiple handling of waste and also reduces the cost of street sweeping. In Kathmandu, it is now estimated that more than half the household have this type of system. In most cases, this service is being provided by private sector or community groups. This also makes it easier to collect service fee from the users, which is essential to make the solid waste management as a whole financially sustainable.

Although very few attempts have been made in Nepal to implement source-separated collection systems, experiences from other countries show that separation of waste at source makes recycling of waste much easier. Source separated collection system may be a bit more complicated because

different types of waste have to be collected separately, but the savings due to increased recycling will make the system as a whole more efficient. Consumer surveys have indicated that most people are willing to separate their waste at source, provided that the waste is also collected separately. Similarly, waste collectors are also willing to collect waste separately because of the income they can make from selling recyclable materials. In fact most waste collectors from private operators sort the waste as soon as they receive it and put recyclable scrap in separate bag, which is an informal system of source separation. Therefore, it would be wise for municipalities to introduce a system in which waste has to be sorted at the source by the generators themselves into at least two components - organic and inorganic. As the inorganic component is generally less in volume and does not degrade it can be collected only once a week. This will make the collection system more efficient and cost effective.

Once waste is collected in primary collection vehicles such as handcarts, rickshaws or tractors, it often needs to be transferred to larger vehicles for transportation to treatment or disposal sites. This transfer process is usually inefficient and ineffective because the waste from the primary collection vehicle is normally dumped on the ground and then loaded on to the haulage vehicle manually or using a loader. A more effective method is to transfer the waste from the primary vehicle directly on to the secondary transport vehicle by collecting the waste in detachable containers, such as sacks or bins within the primary vehicle which can be lifted manually and emptied into the secondary vehicle without having to put the waste on the ground during the transfer process. Another method is to use a split-level transfer process, where the primary collection vehicle is tipped to allow waste to fall in to the secondary vehicle that is placed at a lower level. Such transfer operations are practiced in a few locations in Kathmandu.

Source separated » collection

Composting and recycling

Recycling of solid waste as a resource will reduce the amount of waste that needs to be disposed as well as the cost of waste management. The potential for recycling the waste generated in Nepalese municipalities is high because most of the waste is recyclable and technologies for recycling most of the waste is readily available in the country. Furthermore, there is a market for most recyclable materials because of the demand created by the formal and informal private sector involved in this sector.

On average, about 70 percent of the household waste generated in Nepalese municipalities consists of organic matter, while about 20 percent consist of recyclable inorganic materials such as paper, plastic and metal, and about 10 percent is inert materials. As about two thirds of the waste is organic, recycling of organic waste through composting or the application of other appropriate technologies can play an important role in waste management. Composting of organic waste can also significantly reduce the cost and environmental impacts of waste management

as organic waste in dump sites invites problems such as smell, leachate, methane gas and scavengers. Similarly, separation of organic waste also helps keep the inorganic waste such as paper and plastics clean, which in turn increases their market value and potential for recycling.

Composting is a simple and effective way of recycling waste that is already being practiced by many people. There are several different ways to compost waste such as aerobic composting in piles or windrows, composting in bins or vessels, and vermi composting. Similarly, in terms of scale, composting can be done at the household level, institutional level, community level or municipal level. Household and institutional composting systems are designed to cater to the needs of a single house or institution, while community scale plants may treat up to 3 tons of waste per day, while at the municipal level usually large mechanized plants treat the waste from a whole municipality or part of the municipality. Although there aren't any large scale compost plants in Nepal, Bhaktapur Municipality has a small plant with a capacity to process about 6 tons of waste per day and several municipalities such as Kathmandu and Hetauda are promoting community and household composting. Hetauda is also in the process of setting up a 3 ton per day compost plant with community and private sector participation.

Although Bhaktapur municipality's compost plant is not operating at full capacity, the municipality has been operating the plant for more than 20 years and it is managing part of the municipal waste. The compost plant has a large platform where waste is piled to form long windrows that are about 2 meters wide and 1.5 m high. The windrows are turned manually about once every month. Effective Microrganisms (EM) is occasionally placed on the piles to assist in the degradation process.

After a few months, once the compost is mature it is screened manually using inclined screens and the final product is sold to farmers. Although there are ample possibilities to improve the quality of the compost and expand its market to make the compost plant sustainable (Tuladhar and Bania, 1997), this is still a good example of an initiative by a municipality to reduce and recycle waste. It demonstrates that municipalities can compost solid waste using very simple methods and with minimal investment. It also shows that in order to establish a sustainable composting system, more effort needs to be placed on preparing the waste for composting, controlling the composting process by ensuring adequate aeration, and properly marketing the compost.

Several NGOs such as WEPCO in Lalitpur and NEPCEMAC in Kathmandu, and some municipalities are also practicing community composting. In these systems, the waste is collected through door-to-door collection and then composted in piles or in large

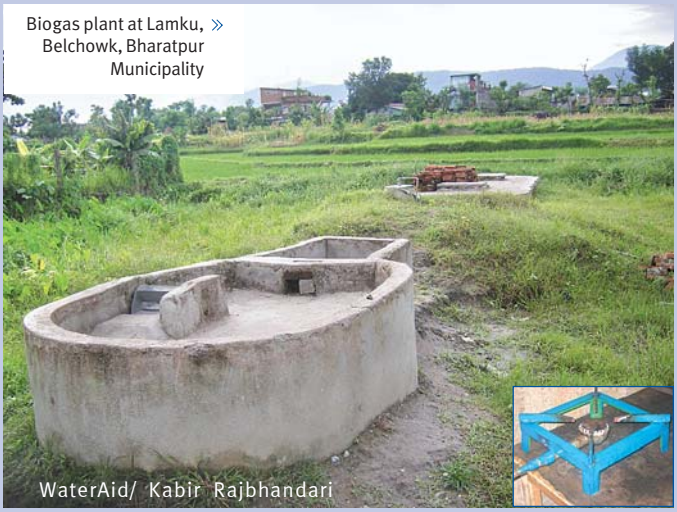
Compost bin: A women » from Khadipakha squatter community putting the solid waste in the bin

WaterAid/ Anita Pradhan

vessels or chambers. The compost is packed in bags and sold in the local market. Kathmandu Metropolitan City has also established a vermi composting system with a capacity to process about 1 ton of vegetable market waste per day.

In order to promote household composting, several municipalities are selling compost bins of various sizes at subsidized rates. Kathmandu, for example has sold more than 2000 compost bins of 100 litre capacity. The bins are designed to be attractive, light weight, durable and large enough to handle waste from one household. The bin has two compartments - the top one for waste and the bottom one for compost. In order to allow natural aeration, the bin has holes on the sides and a bar screen between the compartments. The municipality is currently selling the bins along with a set of necessary accessories, including a set of tools, a screen and a bottle of Effective Microorganisms for Rs. 750. The actual cost for the complete set is Rs. 1032. Similarly, other municipalities such as Hetauda and Laliptur are also selling compost bins. Kathmandu Metropolitan City also sells vermi composting kits, consisting of a plastic tub; a set of 300 worms of the species *Eisenia foetida*, bed material for the worms and a half-day training for Rs. 500. Such measures encourage households to reduce waste at source by practicing household composting.

Anaerobic digestion of waste to produce biogas and slurry is another way to recycle organic waste. In rural Nepal, thousands of households have set up domestic biogas plants to manage their waste, mainly cow dung and toilet waste, and produce biogas for use as a cooking fuel in their kitchen. More recently, some organizations and institutions have also started producing biogas from vegetable market waste and kitchen waste in urban areas.



Biogas plant at Lamku, Belchowk, Bharatpur Municipality »

With support from WaterAid in Nepal, UN-HABITAT, Practical Action and Lumanti Support Group for Shelter the people of Lamku in Bharatpur municipality have setup a 40m³ biogas plant. The installed biogas plant helped to manage the waste generated (from squatter community; vegetable market and nearby dwellings) through anaerobic digestion process and produce biogas for livelihood linkage from waste. The gas generated from this plant is being utilized by the poor squatter community for lighting as well as for cooking.

As for inorganic waste, most of the plastics, metal and paper in the waste stream can be recycled by private sector in Nepal. Some municipalities such as Hetauda and Bharatpur have initiated separate plastic waste collection programmes. Both Hetauda and Bharatpur Municipalities have joined hands with local community groups and the private sector to start a plastic waste collection programme. In these municipalities a simple metal hook called "*suiro*" is distributed to households so that they can collect their plastic waste. The plastic is collected once every fifteen days or as and when required. The collected waste is taken to industries for recycling.

Medical waste management

Medical waste from hospitals, clinics and other sources can be very hazardous as they can be infectious or can contain various chemicals. Although the total amount of such waste is normally a small portion of the overall municipal waste stream, they need to be separated at source and managed properly so that they do not contaminate other waste or pose a public health risk.

Hetauda Municipality has developed a simple and effective way to manage the medical waste generated in the city which can be a suitable model for other municipalities. All drug stores, clinics and pathology labs in the city separate their waste in to three categories - ordinary, hazardous and sharps - and the municipality has joined hands with a local NGO to provide a separate rickshaw for collecting the hazardous medical waste on a daily basis. Currently, the hazardous waste is taken to a location away from human settlements and burned, but the municipality is in the process of constructing a double chambered incinerator at the premises of Hetauda Hospital to manage the waste. The service fee (Rs. 50 to 200 per month) collected from the waste generators is sufficient for operating the system. Hetauda's medical waste management system is therefore a simple and sustainable system.

« Source separation at Hetauda Hospital

« Medical waste collection at Hetauda

Landfilling

While most municipalities in Nepal are simply dumping their waste in rivers or other public places, Tribhuwan Nagar, a mid-sized town in western Nepal has demonstrated that an environment friendly sanitary landfill can be built and operated successfully through a partnership between local community and the municipality. Tribhuwan Nagar is one of only three municipalities in Nepal that has an engineered landfill for waste management; the others are Kathmandu and Pokhara. What makes Tribhuwn Nagar's effort unique is that the landfill was built through local efforts and it is currently being managed by a community based group with active involvement of municipality and the private sector. While the landfill in Kathmandu and Pokhara often face problems and conflicts with the local community, the Tribhuwan Nagar landfill has been operating smoothly since its establishment and has become a model for other municipalities in Nepal.

Karauti Danda Landfill at Tribhuwan Nagar »

The landfill, which is spread over 20 ha of land at Karauti Danda in ward 9 of Tribhuwan Nagar Municipality, was established in 2005. The landfill is connected to the main town, which is

about five kilometers away by a paved road and there are no houses in the immediate vicinity of the landfill. About five tons of waste is collected daily by the municipality and brought to the landfill in covered vehicles. At the landfill the waste is first sorted to remove plastics and other recyclable materials. The organic waste is composted in pits and the remaining waste is landfilled and covered with soil. The landfill has drains for collecting storm water runoff and leachate along with a facility for treating leachate. Although the treatment facility is not functioning as the amount of leachate produced is very small, it is a good initiative. The area designated for waste disposal is surrounded by a buffer zone with forest as well as a garden. The landfill also has many bee hives and a sunflower garden for the bees, which adds to the aesthetics of the area. Overall the landfill is clean and well managed.

The special features of the Karauti Danda Landfill at Tribhuwn Nagar are as follows:

- The landfill is spread over a large area that can accommodate waste for many years.
- As the landfill is only about 5 km from the town centre the transportation cost is fairly low.
- Although the landfill is located within ward 9 of the municipal, the landfill does not have any settlements nearby.

Sunflower garden »

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- The landfill has a barbed wire fence around it to clearly demarcate its boundary and only authorized persons are allowed to enter the landfill.
- The landfill also has facilities for waste segregation and storing of recyclable materials such as plastics.
- Organic waste is composted within the landfill.
- Runoff and leachate is collected by a network of drains and the landfill also has leachate treatment system.
- A buffer zone that includes a forest and garden surrounds the landfill.
- A sunflower garden and numerous bee hives make the landfill very attractive.
- An office building has been built for administrative purposes as well as convenience of the staff.
- The landfill is managed by a committee involving local community, municipality and the local chamber of commerce.

Source: SWMRMC/ UN-HABITAT (2008)

Private sector participation

Private sector participation (PSP) in solid waste management can improve efficiency, reduce the need for municipal investment, and share risks associated with introducing a new technology or system. In spite of these clear benefits, many municipalities have not been able to take advantage of PSP in waste management. Some of the main challenges in introducing PSP in solid waste management are as follows:

- Lack of policies and guidelines
- Inadequate planning
- Lack of capable and reliable private parties
- Insufficient coordination between municipalities and private parties
- Resistance from municipal staff, who fear loosing their jobs and are satisfied with the status quo.

However, some municipalities including Kathmandu, Biratnagar, Hetauda, Bharatpur and Kirtipur have introduced PSP in waste

management. In most cases, the involvement of private sector has been in the form of management contracts where a private contractor is given the responsibility of collecting waste from a certain area for a fixed fee. This is the simplest form of PSP whereby the responsibility for waste collection or transportation is given to a private party and it usually does not involve collection of service fee from waste generators. This form of PSP may reduce the cost of waste management to a certain extent but it requires effective monitoring by the municipality. In some municipalities, such as Hetauda and Kathmandu, franchise system of PSP has been introduced, whereby a private company is given the responsibility to collect waste as well as service fee from waste generators in a designated area such as a ward. This form of PSP usually results in less cost for the municipality and the service provider becomes more accountable to the people. Another form of PSP is the concession system whereby private sector

Street drama by children »
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invests in waste management related facilities such as compost plants and operates it for a certain time. Although Kathmandu Metropolitan City initiated the process of inviting the private sector to establish a compost plant and also signed a memorandum of agreement with a private party for this purpose, it was not successful because of the lack of support from all stakeholders. Experience on PSP so far suggests that some municipalities have been successful in involving the private sector in waste management but these efforts need to be carefully monitored and evaluated to improve their performance and scale up the involvement of private sector.

Public participation

As waste is generated by the people, their participation is essential to ensure a well managed system. Some municipalities have realized this fact and initiated programmes to education local communities and involve them in waste management. Kathmandu Metropolitan City has a separate Community Mobilization Unit (CMU) within its Environment Department that is working with various community groups, youth groups and school children to raise awareness and provide training and necessary support for effective solid waste management. CMU's programmes include the following:

- Children and Environment - CMU has assisted 50 local schools in establishing nature clubs, building capacity of club members and organizing various activities within the school and surrounding community.

Explaining compost »


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- City Volunteer - About 100 youth have been trained to become "City Volunteers" (CV) who work as a link between the municipality and the community to promote household composting and recycling and community involvement in keeping their neighbourhood clean.

- Community Participation and Training - CMU is works with community groups and provides them technical and financial assistance where necessary. It has also formed and supported Ward Environment Committees in several wards.
- Demonstration of Environmental Technologies - CMU is promoting technologies such as compost bins and vermi compost kits.
- Community Recycling Centres - Community Recycling Centres have been established to encourage and assist people in recycling their waste.
- Mass Education - CMU is reaching out to the general public through radio programmes, message boards and regular exhibitions.

Several municipalities have established hundreds of Tole Lane Organizations at the local level, which are being mobilized to promote recycling and waste management at the household and community level.

Conclusions

Although proper management of solid waste is essential for urban sanitation, many municipalities are struggling with this problem. Municipalities are spending significant resources to address this problem, but the overall situation is far from satisfactory and rapid and haphazard urban growth is making the problem worse. However, several municipalities have demonstrated ways to effectively manage waste using simple measures such as door-to-door waste collection, promotion of household composting, distribution of "*suiro*" for plastic collection, separate management systems for hazardous waste and operation of an effective landfill with community participation. Almost all these successful efforts have been initiated locally without much external donor support but with plenty of support from local communities and private sector. These best practices demonstrate that local initiatives with extensive participation of local communities and private sector can go a long way in addressing the problem of solid waste management in urban areas.

The way ahead

Considering the serious challenge currently faced by all municipalities in managing their waste and the large amount of resources that is being wasted in this process, there is an urgent need for municipalities to learn from the few successful innovative practices and replicate them. For this to happen, the following steps need to be taken:

- All municipalities should develop strategies to establish effective and efficient integrated waste management systems with private sector and community participation. The central government and other partners can provide technical support and guidance in this process. Furthermore, as the experience from Kathmandu has shown, the strategies have to be formulated in a participatory manner and they have to be followed up with annual plans and budgets and the progress should be carefully monitored.
- Municipalities need to design systems that will maximize separation and management of waste at source in order to reduce the total amount of waste that is disposed and the cost associated with it. This will require active engagement with local communities to raise awareness, skills and motivation to do household composting and recycling. Source separated collection systems, distribution of compost bins and "Suiro" system for plastic waste collection are innovative systems that have been tried out and can be replicated.

- As waste collection is the most expensive part of any waste management system, municipalities need to increase the efficiency of their waste collection systems. This may be done by introducing on-time or door-to-door collection system. The practice of dumping waste on the street so that it can be swept and collected has to stop as it is highly inefficient and results in environmental pollution.
- In order to maximize waste recycling the private sector should be encouraged to set up and operate waste recycling and composting facilities.
- Non-recyclable waste should be managed in sanitary landfills with appropriate systems for pollution control such as buffer zones, proper drainage, and covering material. The landfill at Tribhuwan Nagar can be used as a model.
- Hazardous medical waste should not be mixed with ordinary waste. They should be collected and managed separately. Hetauda Municipality has demonstrated how this can be done in a simple and cost effective manner.
- As the cost associated with municipal waste management can be very high, the municipality should seek ways to optimize the system and collect service fee from the people to in order to ensure that the waste management system as a whole is financially sustainable. The private sector and community groups can be involved in waste management to reduce cost and increase efficiency. However the process of involving the private sector should be clear and transparent and the municipality should carefully monitor the performance of the private operator.

References

CBS, 1997: Urban Population Survey 1996, Central Bureau of Statistics, His Majesty's Government of Nepal, Kathmandu.

SWMRMC, (2004): A Diagnostic Report on State of Solid Waste Management in Municipalities of Nepal, Solid Waste Management and Resource Mobilization Centre, Lalitpur.

Tuladhar, B and Bania A, 1997: Technical and Economic Analysis of Bhaktapur Compost Plant - Nepal, Urban Waste Expertise Programme (UWEP), WASTE, Gourda, Netherlands.

Pokhrel D. et al (2005): Municipal Solid Waste Management in Nepal: Practices and Challenges, Waste Management 25 (555-562), Science Direct

Nippon Koei & Yachiyo Engineering (2005):The study on the Solid Waste Management for The Kathmandu Valley, CKV study report, Japan International Cooperation Agency (JICA) assistance to Nepal.

SWMRMC/UN-HABITAT (2008) 10 Steps for a Clean City Technical Guidelines for Solid Waste Management in Nepal (Draft), Solid Waste Management and Resource Mobilisation Centre, Lalitpur, Nepal

For more information, please contact:

ENPHO
Creating Eco Societies

Environment and Public Health Organisation
110/25 Adarsa Marga-1,
Thapagaon, New Baneshwor
GPO Box: 4102, Kathmandu, Nepal
Telephone: + 977 1 4468641, 4493188
Fax: + 977 1 4491376
Email: enpho@mail.com.np
www.enpho.org

WaterAid

WaterAid's mission is to overcome poverty by enabling the world's poorest people to gain access to safe water, sanitation and hygiene education.

WaterAid in Nepal
Kupondole, Lalitpur, Nepal
GPO Box: 20214, Kathmandu, Nepal
Telephone: + 977 1 5552764 / 5552765 / 5011625
Fax: + 977 1 5547420
Email: wateraid@wateraidnepal.org.np

www.wateraid.org/nepal

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