

# Improving Sanitation through Community-based Solid Waste Management: Experiences in Lao PDR and Cambodia

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## Key Message

- Effective solid waste management (SWM) among unserved, poor communities involves changing the behavior and practices of households, including strengthening their environmental awareness, role, and responsibility in the provision of a safe and healthy community.
- The success of a community-based waste management can also depend on the support of the private/public sector that manages the infrastructure and SWM facilities. Partnerships between local communities and the private sector in SWM can be successful if implemented with the full awareness of the needs of both the community and the private sector.
- A socialized user fee scheme can ensure that all users of the SWM system pay for services, but within their respective capacities. This can result in community

ownership and financial viability and sustainability of the system.

## Abstract

Solid waste has become an increasing concern in many developing countries, especially in poor urban areas, due to the rapid rate of population growth, increased per capita consumption, the complexity of waste and inadequate infrastructure to manage waste (Veasna, et al., 2006). While effective SWM is crucial to protecting human health and the environment, infrastructure in developing countries, including roads, waste management facilities, and equipment, are usually limited, making it difficult to effectively manage waste.

This case study documents experiences in selected urban areas in Cambodia and Lao PDR. The experiences show that the success of community-based

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waste management relies on a combination of approaches that addresses primary (from households to identified transfer points) and secondary waste collection (transfer points to dumpsites/landfill). This entails getting broad cooperation among various stakeholders and making SWM an economically viable endeavor for the community and the private sector.

## Background

Inadequate waste management and sanitation have consequences on the health and well-being of communities and the local environment. In Sihanoukville (Cambodia) and the Sedone Provinces of Champasack, Saravanne, and Sekong (Lao PDR), unsightly solid wastes were a major concern especially in locations relying on tourism for economic development and livelihoods. While a comprehensive analysis to determine the social and environmental impacts was not carried out, community members were aware of the problems related to the disposal of solid wastes, including blocking natural drainage systems resulting in flooding and the proliferation of vermin spreading diseases and causing illness to local inhabitants. Poor management of solid wastes was also having negative effects on the economy of the area, including devaluation of property, loss of investments (e.g., tourism, fisheries) and job opportunities.

The Sihanoukville ICM Program in Cambodia identified SWM as a priority concern in its Coastal Strategy Implementation Plan. A pilot project was initiated in Village 1 and Sangkat 4 in Sihanoukville Municipality in 2005, involving about 1,400 households (Veasna, et al., 2006; Figure 1).

When the Sedone Integrated River Basin Management Project in Lao PDR started in 2007, SWM was identified as a major concern especially in urban centers (DWR, 2007; PEMSEA,

2014). Similar to the Sihanoukville experience, a pilot-scale community-based SWM project was implemented in 12 selected villages in Sedone covering about 3,000 households. The objective of the project, implemented in 2011, was to address solid waste problems by strengthening local capacity to coordinate the implementation of SWM across different stakeholders.

Baseline studies in the Sedone River basin and the Sihanoukville Municipality indicated a daily per capita waste generation of about 0.3 kg to 0.5 kg, with urban areas producing the higher volume of wastes. About 45% of the waste produced was organic, while the rest was a mixture of nonbiodegradable/nonrecyclable materials. In Village 1, Sangkat 4 in Sihanoukville Municipality, there was no waste collection system with most wastes dumped in vacant lots in the village. In Sedone, waste was collected in Saravanne and Champasack Provinces twice a week while Sekong Province did not have a regular waste collection system (DWR, 2007; Sethy and Sothea, 2011).

## Approach and Methodology

### Organize lead teams at the village level where waste management problem is most evident

In both Sihanoukville and Sedone, three main problems were identified, namely: (1) limited awareness of the impacts of inadequate waste management on human health and the environment; (2) ineffective waste handling and collection systems; and (3) limited cooperation among private waste collection companies, communities, and local governments, resulting in poor services provided to communities.

To address these common problems, it was essential to get the community leaders involved at the beginning of the project to promote better understanding of the process of waste management and ownership. In Sedone, waste

**Figure 1.** Pilot scale waste management was implemented in Village 1, Sangkat 4, Sihanoukville, Cambodia, where no previous waste management scheme existed.



management teams were set up, composed of at least five members per team including the leader of the village, leaders of the youth and women's organization, heads or representatives of the security and environment units. The members were identified based on their critical role on waste management in the villages and their influence on the process. In Sihanoukville, the waste management team composed of leaders of the village, was organized with the provincial government providing technical and some financial support.

Upon organization of lead teams, workshops were conducted wherein the roles and responsibilities of the teams were discussed and agreed upon. The inception workshops also provided an opportunity for the villagers, representatives from the waste collection companies, and the local governments to participate in the planning process, thereby strengthening ownership of the project and getting better cooperation from villagers and the private waste collectors.

### **Determine what's wrong and why**

To come up with a solution, it was necessary to first understand the socioeconomic characteristics, environmental concerns, and behavior towards solid waste. Interviews were undertaken and observations were recorded at the sites as part of the baseline assessment. By conducting baseline data gathering, the project team members were able to familiarize themselves with the local conditions and the behavior patterns at the respective sites. For instance, waste characterization enabled the teams to identify potential opportunities for improving management, such as the application of composting and recycling processes since a high percentage of the household wastes in the communities were biodegradable.

In both Lao and Cambodia, the Royal University of Phnom Penh (RUPP), Department of Environmental Science, played an important role in the conduct of baseline data gathering

and planning. This external support provided the provincial authorities with additional human resources and the required skills for baseline data gathering, analysis, and SWM planning. In both Sihanoukville and Sedone, RUPP was also tapped to provide support for local implementation, while gradually building the competence of the local teams in implementation.

### Empower local stakeholders using a learning-by-doing approach

The RUPP support group provided training and on-site coaching in order to build the knowledge and skills of local teams. A “ladder” approach was used for the training, starting off from basic information on waste generation and the related social/human health and environmental issues, then moving into the concepts and approaches of improved waste management, and finally to concrete actions for improved waste management in the respective communities. In Sihanoukville, the local team members themselves became trainers for the village.

### Define the community's role and a means to execute

One of the major constraints to improved waste management in Sedone and Sihanoukville was limited accessibility by waste collection trucks. To remedy the situation, it was agreed that the waste collection system should consist of two stages: (1) waste collected from the households would be deposited at a transfer station (primary collection); and (2) from the transfer station, which would be accessible by waste collection trucks, wastes would be transferred (secondary collection) to a final disposal site (i.e., dumpsite or landfill). In setting up the collection system, an understanding of community behavior as well as road access was necessary.

In Sihanoukville, a map of the transfer points was prepared (Figure 2). Based on the map, waste bins were installed and households were encouraged to utilize the waste bins. Since road access was poor within the community, a worker was assigned by

**Figure 2.** Community mapping and identification of transfer points.



CINTRI (Cambodia), the waste collection company, to collect the wastes from the transfer points. CINTRI then transported the wastes to the dumpsite.

In Sedone, the households mainly used baskets and plastic bags for waste storage. One rubbish bin was assigned for every ten households. The community leaders were responsible for ensuring that the households were disposing of their wastes using the assigned bins. From the transfer points, secondary waste collection and transportation service was provided by the local government in both Pakse and Salavane and by a private contractor in Thatheng.

### Sustain the system through an equitable user fee scheme

An important and challenging dimension of waste management service was financing continuous implementation. A socialized user fee scheme was

developed for Sangkat 1, Sihanoukville. The idea was to “share” the burden of waste management across households, with relatively better off families paying a higher share of the waste management service. The monthly user fee was pegged from 1,000 riel (US\$ 0.25) to 8,000 riel (US\$ 2). The scheme is shown in Table 1 with the number of households and monthly collection. The scheme was based on two aspects: the number of family members and the type of dwelling or of construction materials used for the house. For instance, a family living in a relatively bigger house made of concrete would pay much higher than those living in smaller houses. Affluent families also tended to purchase more and create more wastes. The type of dwelling was used as a proxy indicator for wealth and income. The second criterion was the number of household members. Most households pay 4,000 riel or US\$ 1 per month for solid waste collection. By implementing the scheme, the village was able to collect US\$ 175 per month, which was used to maintain the primary and secondary waste collection services (Table 2).

This was not an easy task, particularly as some households were only renting, while others were

**Table 1. Projected collections for the socialized user fee scheme for Village 1, Sangkat 4.**

| Proposed scheme | No. of households | Payment scheme (in riel*) | Total amount (in riel*) |
|-----------------|-------------------|---------------------------|-------------------------|
| 1               | 20                | 8,000                     | 160,000                 |
| 2               | 20                | 7,000                     | 140,000                 |
| 3               | 20                | 5,000                     | 100,000                 |
| 4               | 120               | 4,000                     | 480,000                 |
| 5               | 50                | 3,000                     | 150,000                 |
| 6               | 30                | 2,000                     | 60,000                  |
| 7               | 1                 | 1,000                     | 1,000                   |
|                 |                   | 0                         | 0                       |
|                 | 261               |                           | 1,091,000               |

\*US\$1=4,000 riel.

informal settlers. Getting support from village leaders and engaging the households in regular dialogues resolved difficulties in collection.

User fee systems are usually established as projects mature and communities recognize the importance of sustaining the implementation. In Sedone, the pilot-scale project was unable to set up the scheme

**Table 2. Actual collection and use of user fee for Village 1, Sangkat 4, Sihanoukville (October, 2007).**

| Actual collection |                   |                           |                         | Use of user fee |                                       |                  |
|-------------------|-------------------|---------------------------|-------------------------|-----------------|---------------------------------------|------------------|
| Proposed scheme   | No. of households | Payment scheme (in riel*) | Total amount (in riel*) | Items           | Description of monthly expense        | Total (in riel*) |
| 1                 | 6                 | 10,000                    | 60,000                  | 1               | CINTRI second collection fee          | 350,000          |
| 2                 | 10                | 5,000                     | 50,000                  | 2               | Two workers (monthly paid)            | 300,000          |
| 3                 | 78                | 4,000                     | 312,000                 | 3               | 3% expense for administration         | 23,040           |
| 4                 | 108               | 3,000                     | 324,000                 | 4               | Expense for maintenance of facilities | 20,000           |
| 5                 | 7                 | 2,000                     | 14,000                  | 5               | Others                                | 10,000           |
| 6                 | 4                 | 1,500                     | 6,000                   |                 |                                       |                  |
| 7                 | 2                 | 1,000                     | 2,000                   |                 |                                       |                  |
| 8                 | 46                | 0                         | 0                       |                 |                                       |                  |
|                   | 261               |                           | 768,000                 |                 |                                       | 703,040          |

\*US\$1=4,000 riel.

due to legal issues. Despite this limitation, the cleanup activities and waste collection continued with public funding even after the pilot-scale implementation. The Province of Champasack has proposed a follow-up phase and expansion to cover more villages in the province.

### **Strengthen community awareness**

A key strategy in waste management is to get stakeholders involved by engaging them in community activities, such as cleanups. In Sihanoukville, the initial activities focused on getting rid of the accumulated wastes in public areas in order to demonstrate the immediate impact of the project and generate stakeholder support.

In Sedone, public awareness materials, including stickers and brochures on SWM were developed and used in various campaigns. Regular community cleanup activities were also conducted by the village members to demonstrate commitment to waste management and to maintain cleanliness in the village. These events proved popular and were continued on a weekly basis even after the project ended in most sites. Consultations with community members indicated that a positive behavioral change among local people was observed through greater public involvement in cleanup activities and reduced incidences of burning wastes and dumping wastes into the drainage systems and river.

### **Develop the legal framework for waste management improvement**

Using Lao PDR's Law on Environment Protection (LEP), local regulations on waste management were developed at district and village levels to provide a legal basis for implementation. In both Sekong and Saravanne Provinces, regulations were approved at the district level while in Champasack Province, a regulation was developed at the village level with support from the project and approval by the village committees (PCO, 2014).

## **Results**

### **Improved cleanliness and sanitation**

Early results are an important part of getting community buy-in. In Sihanoukville, an estimated 175 tons of accumulated waste in public areas were collected and properly disposed of at the start of the project. The visual and physical changes that occurred as a consequence of the initial cleanup sparked interest in the community to continue to participate in SWM improvements in the area.

In order to maintain cleanliness in Pakse, Champasack Province, waste collection was increased in frequency from twice a month to weekly service (Figure 3).

### **Village leadership continues after the pilot projects**

Organizing teams and getting village leaders to eventually lead the process entailed on-site coaching, close guidance, and collaborative planning and implementation. At the start of the Sedone project, support was provided and made visible by the provincial authorities as the village leaders were still acquiring knowledge and skills in waste management implementation. Eventually, village leaders were able to mobilize community support for regular community cleanup, even after the pilot project ended, indicating the overall commitment to promote better sanitation in those communities.

In Sihanoukville, the village leader eventually became a key resource person in the expansion of coverage of SWM to other villages in the province.

### **Institutional arrangements established**

Based on the experience of the pilot projects, village organizations have been set up to focus on improved SWM in Champasack Province. The organizations were composed of village leaders,

**Figure 3. Cleaning up accumulated wastes.**



senior/elderly people, women's groups, and youth associations.

#### **Improved relationship between local government officials and stakeholders**

The pilot-scale project was an effective exercise in getting communities and local government leaders to collaborate on community governance. By working together and showing visible changes in cleaning up the community, the stakeholders were able to see the benefits of collaboration and partnership, thereby improving understanding and trust in one another.

#### **Demonstrated success resulted in scaling up the efforts**

In Sihanoukville, the experience of the pilot-scale implementation was scaled up to cover more

villages in Sangkat 4. The growing recognition to address the problem of wastes generated more attention at the provincial and national levels, leading to enactment of policies and programs that assist urban centers across the entire province.

## **Challenges and Lessons Learned**

### **Getting the basic system started**

Experiences in the two countries have shown that, while a comprehensive system of waste management is ideal, the basic needs and capacities of the communities must be addressed first. In both situations, the basic need was to remove the waste from the communities in order to avoid human health and environmental hazards. The

implementation of waste segregation and recycling schemes can be introduced at a later point in time, when the basic setup has been established. For example, segregation of waste and waste recycling was introduced in collaboration with schools in Sihanoukville. Also, as people see the immediate impact of a clean environment, the basic system becomes its own advertisement.

### **Adapting to changes in behavior**

The location and size of the waste bins were important in maintaining cleanliness of the community and in encouraging communities to dispose properly. This was one of the key considerations of the baseline assessment. However, as the system was implemented, it was essential to monitor and adapt to change.

In Sedone, it was observed that as communities began to understand the importance of proper waste handling and collection, the waste bins provided at the start of the pilot project proved to be insufficient in capacity, particularly when secondary waste collection was being carried out only once every two weeks. In response, waste collection by the private collector was changed to once a week. While there was an increase in the frequency, there was no corresponding increase in cost of collection among the households.

### **User fee scheme pays for services rendered**

Collecting user fees was one way of sharing the costs of waste collection services between the local government and the households that benefited from the service. User fee schemes inherently entailed a process of consultation, awareness building, and negotiation among village leaders, households,

and local governments. A basic principle with such systems was that households pay within their respective capacities, but every household pays something. In addition, once the scheme was in place and implemented, transparency in managing the funds and demonstrating visible impacts were important in getting better compliance and collection.

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