



**Environmental Management in the Coastal Zone ~  
Cambodia  
Ministry of Environment and DANIDA**



# Solid Waste Management in Sihanoukville

# SOLID WASTE MANAGEMENT IN SIHANOUKVILLE

Chim Kalyaney

September 6, 2003

## TABLE OF CONTENTS

1.INTRODUCTION.....	2
General information of Sihanoukville, Cambodia.....	2
2. SOLID WASTE MANAGEMENT.....	4
3.SOLID WASTE MANAGEMENT IN SIHANOUKVILLE.....	4
3.1 Collection and transportation of waste.....	4
3.2 Landfill.....	5
3.3 Legal Framework.....	6
3.4 Institutional Framework.....	6
3.5 Main Constraints Identified.....	7
SUMMARY.....	8
REFERENCE.....	8

## 1- INTRODUCTION

### General information of Cambodia, Sihanoukville

Cambodia is situated in the Southeast Asia between 10 and 15 degrees latitude north and 102 and 108 degrees longitude east. The country occupies about 181,035 square kilometers. Cambodia shares its 2,428km land border with Thailand on the North -West, Laos on the North- East and Vietnam on the East and South. On the South -West, the coastline extends for 435 kilometers along the gulf of Thailand (see map 1.).

The coastal zone of Cambodia contains a lot of forest and numerous bays and beaches. There are several offshore and islands belonging to Cambodia. The coastal areas and islands provide the basis for developing a variety of the national



Map 1: Sihanoukville, Cambodia

economy. The largest town on the coast is **Sihanoukville**, which has been developed with deep seaport facilities and is considered as one of the economic centers of Cambodia.

Sihanoukville, historically known as Krong Kampong Saom, is located 234 km southwest of the capital Phnom Penh, along the Gulf of Thailand. It is located within the coordinates 10° 25' to 11° N and 103° 30' to 104° 00' E (see map 1.). Sihanoukville has a total land area of 1,283 square kilometers including the 119.5 km coastline.

The population of Sihanoukville is appropriately 155,690, comprising 76,940 males and 78,750 females, with an average population density of 179 people/km<sup>2</sup> (National Census, March 1998). Of the population 50.8% is working in the agriculture sector, 11.3% in the industrial sector, 7.9% in the services sectors and 4% unemployed.

The average annual income of a person is US\$208. The division of the population between the districts also reflects the job opportunities. In Prey-Nub district, the majority of the populations are farmers. In Steoung-Hav district, the majority of are fishermen. Government officials, businessmen, workers, and service providers are found in the Mitapheap district.

## 2- SOLID WASTE MANAGEMENT

The management of solid waste in urban centers along the coastline as well as in the whole country is a major environmental problem. Solid waste from the cities and other provincial centers disposed improperly. Although Cambodia does not have a high of waste generation, almost all urban areas have significant waste disposal problems. All kinds of waste are disposed of in open areas, or illegally dump into roads, rivers, stream, lakes borrow pit, vacant lots, private properties, in public places and into the sea. This contributes to unsanitary conditions in urban centers such as unpleasant smells, blockage of drainage systems resulting in flooding, and rainwater run off all this wastes causing surface water pollution as well as soil quality degradation.

The amount estimated of waste generated, collected and uncollected and disposal into the water- ways or other public areas show in table 1.

*Table 1: Amount of Solid Waste in Coastal Zone*

<i>Location</i>	<i>Population, people</i>	<i>Estimated solid waste amount, T/day</i>	<i>Collected solid waste, T/day</i>	<i>Uncollected solid waste, T/day</i>	<i>Disposal solid waste into water system, T/day</i>
Coastal Zone	109,740	95,8	3,3	21,9	13,4

*Source: Ministry of Environment, Department of pollution control, 1997*

## 3- SOLID WASTE MANAGEMENT IN SIHANOUKVILLE

As the above mentioned, the management of solid waste in the urban centers along the coastline is a major environmental problem, especially in Sihanoukville. Although Sihanoukville does not have a high waste generation, almost all urban areas disposed of significant amount of waste each day. All kind of waste are disposed in open areas, road, rivers, coastal water system, and into the sea. The estimated amount of the solid waste generation, collected, uncollected and disposed of into the waterways in Sihanoukville is shown in table 2.

*Table 2: Solid Waste in urban centers in Sihanoukville*

<i>Cities and Provincial center</i>	<i>Population</i>	<i>Estimated solid waste amount, T/day</i>	<i>collected solid waste, T/ day</i>	<i>Uncollected solid waste, T/day</i>	<i>Disposed solid waste into water system, T/day</i>
Sihanoukville, Mitapheap district	55.440	27,7	16.6	11,1	6.64

*Source: Ministry of Environment, Department of pollution control, 1997*

### 3.1 Collection and transportation of waste

In the past, solid waste is collected by the private company namely Chung Long and by 1 January 2001 it was transferred to another company called PM.RASY. The company has signed a contract with the Governor of Sihanoukville. The contract is valid to 15 years,

which gives the company the responsibility to collect and transport all solid waste in the town. However, the company only collects waste from households, hotels and restaurants, which have made a request and only from places, which are accessible.

The Department of Environment of Sihanoukville reported that only 30% equal in 19 tons of solid waste is collected per day (1999). Based on this report, 63 tons of solid waste is produced per a day. Daily waste collection of Sihanoukville is shown in table 3.

*Table 3: Daily waste collection, Sihanoukville*

<i>Waste producing units</i>		<i>Amount, kg/day</i>
<i>Name</i>	<i>No. collected location</i>	
International Port (own collection)	1	2,000
Household	150	450
Market	3	8,000
Factory	8	1,950
Service	70	2,100
Hotel	35	1,050
Guest house	20	300
Store( coastal area)	25	625
Hospital	2	100
Clinic	5	75
Car park	4	200
Oil station	10	50
Restaurant	22	1,870
<b>Total</b>		<b>18,770</b>

*Source: Department of Environment in Sihanoukville, 1999*

Presently, as the population of the municipality as well as the visitors to Sihanoukville is growing very fast, the production of waste also increased. The solid waste figure from the private waste collection company reveals that in this year (2003) about 40 tons of solid waste is collected per day .The company has confirm that the amount of collected waste is about 40% of all produced waste in the province. That means around 100 tons of solid waste is produced per a day.

### **3.2 Landfill**

At present, the only landfill is sitting very close to the water- fall area, with the area is about 8 ha. It is situated 23km north- east of the Town, in Sangkat Betrang, Prey Nub district, Sihanoukville.

The waste collection company has a responsibility to construct the landfill and roads for transportation and disposal wastes, but they only have done without technically, that means improper landfill has been used. There is no professional landfill for domestic and industrial solid waste disposal, all kind of wastes are disposed into the open landfill with improper manage

### **3.3 Legal Framework**

#### *Environmental Law*

The main objectives of this law are to protect, manage and enhance the environment, and to promote socio-economic development in sustainable way. This law is a general framework of

environment protection and management throughout the kingdom, including the protection, conservation and management of the coastal zone and marine resources.

*Sub-decree on Solid Waste management ( No. 36)*

Sub-decree on solid waste management was prepared by the Ministry of Environment and was approved by the Royal Government of the Kingdom of Cambodia on 27 April 1999. This sub-decree covers all activities related to disposal, storage, collection, transport, recycling, dumping of garbage, and hazardous waste. Main factors were focused by this sub-decree as follows:

- General provision relevant to the identification of the meaning of solid waste, household waste and hazardous waste.
- Household waste management relevant to the establishment of guideline on disposal, collection, transport, storage, recycling, minimizing, and dumping of household waste in province and cities.
- Hazardous waste management relevant to collection, transportation, storage and disposal of waste from factories, clinics or hospitals shall be separately from domestic wastes.
- Monitoring and inspection of hazardous waste management relevant to the monitoring procedure by Ministry of Environment's on packing, storage, transport, recycling, incinerating, treatment and disposal of hazardous waste.
- Penalty procedure to violators and environmental staffs itself, if they do not obey the sub- decree's regulation.

### **3.4 Institutional framework**

Important authorities in waste management system in Sihanoukville are:

Department of Environment  
Department of Public Works and Transportation  
Department of Industry, Energy and Mine

***Department of Environment (DOE)***

The DOE is establish in 1994 and is under administration of the Governor, but the department refers directly to the line Ministry of Environment. The goal of the Ministry is to deal with problems related to the management, conservation and protection of the environment throughout the country. Thus the planning and management of waste, the monitoring and controlling of waste streams fall under its responsibilities.

The main responsibility of the DOE at province level in waste management is planning, monitoring and controlling activities.

***Department of Public Works and Transportation (DPWT)***

The DPWT is a department under the administration of the Governor but refers directly to the line ministry, which is the Ministry of Public Works and Transportation.

The Ministry of Public Works and Transportation is responsible for the development and implementation of policies and legislation for transportation sector. The ministry is also responsible for all transport infrastructures in the country including roads, sewage and solid waste disposal, railways, airport, port and inland waterways, development of infrastructures, as well as for public buildings.

Although, the collection and transportation service has been privatized by the private sector,

relevant to solid waste management in Sihanoukville, the department of Public Works and Transportation is responsible to cooperate with the company in collection and transportation of all wastes.

### ***Department of Industry, Mines and Energy( DIME)***

The DIME is a department under administration of the Governor, but department refers directly to the line ministry, which is the Ministry of Industry, Mines and Energy. The goal of the ministry is to promote and facilitate an industrial and economic development while ensuring the welfare of the people and the environment. Regarding to solid waste management, the DIME has the responsibility to take care of waste related matters, and report on waste from industries.

### **3.5 Main constraints identified**

The current waste management situation in Sihanoukville is not effective. Only a minor part of the households are covered by collection service from the private collection company. The same situation apply to industries, market places, beaches. Only the International Port Authority has a solid waste collection system, which covers all wastes in the port.

Observations in the town and the surroundings verify that the waste problems are conspicuous through some parts of the town at first sight show acceptable conditions.

Through the meeting with different authorities and stakeholders and observations the following constraints are identified:

#### ***Institutional aspects***

The Department of Environment (DOE), the Department of Public Works and Transportation( DPWT) and the Department of Industry, Mine and Energy(DIME) are all involved in the waste management. DOE is responsible for planning, monitoring and controlling activities. DPWT is the department, which is responsible for the collection of all wastes while DIME has the responsibility to report on waste from industries. The reason for this breakdown of responsibilities has not been investigated. Reporting is to the Governor and the line ministries. No reporting lines between the three departments.

DOE has no equipment for measuring control. There is no appropriate information collection system on waste management and preparation of a waste management plan has not been initiated. The DOE enforces through Sub-decrees but there is a lack of regulation to clarify the responsibilities and functions of the department as well as the demands on waste producers.

***The efficient of waste management plan*** has not been develop, because of the limited of knowledge and understanding of technical and methods on waste management planning.

#### ***Inappropriate landfill***

As the above mentioned, landfill is not property managed. There is no environmental and sustainable landfill. No professional landfill for domestic and industrial solid waste disposal, all kind of waste are disposed into the open landfill with improper manage. At present, the only landfill is sitting very close to the water- fall area. This is the main environmental problem for Sihanoukville.

#### ***Waste producers***

The main constraint regarding the waste producers is the fact that there are no regulations, which force the producers to have their waste collected.

### ***Waste collection***

There are several constraints. The equipment of the company is not up-to-date and the consequence is often irregular collection and complains from the clients. The trucks used are apart from the technical problems not suitable for waste collection.

### ***Public Awareness level***

. Observations of the inhabitant way of conduct also demonstrate that many do not care about the waste outside their own houses. The main part of the produced wastes are disposed of by the producers themselves. Wastes are either burn, buried, thrown into the water system, the sea or disposed of along the roads or in some other arbitrary places.

## **SUMMARY**

Solid waste management is a major environmental problem in Cambodia, especially in Sihanoukville. Efforts in waste management required:

- Capacity building through local government to improve the knowledge, increase the understanding of how to develop an environmentally, sustainability and financially waste management plan and other efficient methods and technology related on waste management including establish a proper landfill.
- Institutional arrangement strengthen between the Governor and departments involved with the waste management.
- Law enforcement, political will.
- Inform and train waste collection workers to improve their working conditions and to motivate them to operate in more environmental sound manner.
- Required waste collection company for more up-to-date equipment for improving the waste collection and transportation.
- Improve public awareness.
- Public support and multilateral cooperation.
- Financial support.

## **REFERENCES**

1. Progress report and activities by land-based pollution component. Ministry of Environment, Department of Pollution Control, February 2003.
2. Waste Management on the Beaches and in the Town of Sihanoukville, Ole Kaysen Petersen, DANIDA, October 1999.
3. Sihanoukville Coastal Strategy.