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**Kingdom of Cambodia
Nation Religion King**

THE REGIONAL PROJECT
Demonstration of BAT and BEP in Open Burning Sector in Response
to the Stockholm Convention on POPs

FINAL REPORT

Proposed Financing Mechanisms with Economic Instruments and Market- Based Incentive Concepts/Schemes For Solid Waste Management and Disposal in Cambodia

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UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

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For Solid Waste Management and Disposal
in Cambodia**

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ABBREVIATION

BAT	Best Available Technique
BEP	Best Environmental Practice
EPA	Environmental Protection Agency
MEF	Ministry of Economy and Finance
MOE	Ministry of Environment
Mol	Ministry of Interior
NGO	Non-Government Organization
PIP	Public Investment Programmes
PSP	Private Sector Participation
RGC	Royal Government of Cambodia
SMW	Solid Waste Management

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1 INTRODUCTION

1.1 Background

In Cambodia, enhancement of SWM faces various barriers. Main issues are lack of knowledge, financial resource and environmental awareness of stakeholders whereas poverty and other, more pressing needs delay community participation and cost recovery through user fees. With the release of the Law on Environmental Protection and Natural Resource Management and Sub-Decree No. 36 on Solid Waste Management adopted on 27 April 1999 and its guidelines, and the Sub-Decree No. 113 on “Solid Waste Management in urban areas, all municipalities were requested to establish segregation systems, to increase material recovery and to upgrade residual Solid Waste Management besides other enhancements.

1.2 Objective of the Report

The objective of this report is to provide guidance to the stakeholders concerning the economical instruments of management and disposal facilities for waste. This instrument addresses current economical instruments and financing methodologies to meet those Solid Waste Management and disposal facilities requirements. The report's also main focus is on new recommendation for setting up additional economical instrument to enhance Solid Waste Management and disposal in Cambodia.

1.3 Scope

The report considers the major economical instruments currently used for Solid Waste Management purpose and disposal for different kinds of wastes. The report on economical instruments for Solid Waste Management and disposal report included the following topics:

A. General Financial Mechanism

1. Funding Sources.
2. Sustainable Funding Mechanism.
3. Effective Use of Finance from Development Partner.

B. Current Economic Instrument for Solid Waste Management in Cambodia

1. Local Taxes
2. Fee;
3. Penalty and Fine;
4. Waste Bonds;
5. National Annual Budget;
6. Public Private Partnership.

C. Economic Incentives Instruments in Solid Waste Management; and

1. General Incentivize and Leverage Private Sector Finance.
2. The Purpose to Set the Collection Service Fees.
3. Current Economics Incentives in Solid Waste Management.

A recent report by the Ministry of Environment (MOE) indicates the challenge facing that waste collection has fallen short of expectations in both urban and rural areas. The ministry attributes these shortcomings to authorities' lack of capacity and funding (Pang 2016). A senior MOE official sums up three challenges that need serious attention:

- 1) renovation of the governance structure for waste management;
- 2) strategy to reduce, reuse and recycle waste; and
- 3) strengthening waste collection and transport (Blue Media Cambodia 2015).

2 OBJECTIVES OF ECONOMIC INSTRUMENTS IN SOLID WASTE MANAGEMENT

Economic instruments in SWM have two major objectives:

- ⇒ to cover costs and thus improve service delivery;
- ⇒ to influence behavior by means of the pricing mechanism in order to minimize waste, avoid negative impacts (e.g. from landfill) or to strengthen resource recovery and recycling.

3 ADVANTAGES OF ECONOMIC INSTRUMENTS FOR SOLID WASTE MANAGEMENT

Cambodia used the economic instruments as they are expected to provide waste policy-makers with flexible, effective and efficient options in realizing its objectives. They were also expected to lead to on-going pressure to further reduce waste generation and reduce emissions and to develop cleaner technologies.

Economists have therefore been critical of the direct regulation and standards approach to Solid Waste Management, despite the fact that this command and control strategy has been universally favored by RGC and their regulatory agencies.

3.1 Economic Efficiency:

Given a Solid Waste Management quality objective, the aim of society should be to achieve that standard at minimum cost. This is wholly consistent with the idea of sustainable development since it both ensures that acceptable waste standards are achieved and avoids wasting resources on expensive approaches when cheaper ones would suffice.

From the point of view of economic theory market, incentive policy instruments, e.g. effluent charges and rights, can be shown to be the lowest cost solutions of attaining waste standards. That is to say that they are the most cost effective way of controlling pollution of the waste.

The basic reason why charges are likely to be better command and control techniques is that charges enable waste generator to choose how to adjust to the waste quality standard. Waste generators with high cost of abating pollution will prefer to pay the charge. Waste generators with low costs of abatement will prefer to install abatement equipment. By making abatement something that "low cost" Waste generators do rather than "high cost" ones, charges tend to cut down on the total costs of compliance, (compliance costs are the costs that waste generators bear in meeting the standard).

There is no question of the charging mechanism reducing the waste quality standard. It is the same standard that would be achieved by command and control. The charge simply introduces flexibility into the compliance mechanism. Command and control because of its rigidity does not do this. The standard is set and waste generators are legally obliged to honor it at the best of their possibilities.

A tax adjusts market prices to reflect the use of waste services, which are otherwise erroneously treated as being free. Command and control policies adopt a regulatory stance which ignores the efficiencies of the market mechanism.

3.2 Dynamic Efficiency:

Economic instruments provide incentives for innovation/technological change. In presence of standards, the waste generator has no incentive and at the same time face no penalties to abate pollution if the releases are under that standard. But it may be socially desirable to encourage waste generators to search continually for lower cost technologies (BEP and BAT) for reducing pollution. Under the standard-setting approach the incentive does not exist. With a tax however, the waste generator still pays a tax on the optimal amount of pollution and hence has a continuing incentive to reduce pollution.

3.3 Economic Prevention

Economic instruments are perceived to be a more appropriate set of instruments in the prevention phase of waste policy. A number of obstacles to using economic instruments had been identified, such as unwanted distributional effects, administrative problems.

4 STRATEGY FOCUSES

The financial mechanism and incentive system will be used for the following strategy focus:

4.1 Prevention and Reduction of Waste Generation

- ⇒ Implementation of the collection fee based on the amount of waste generated.
- ⇒ Promotion of project implementation on waste reduction at sources.

4.2 Waste Separation at Source and Improvement of Collection and Transportation

- ⇒ Promotion of community participation in waste separation at sources for recycling including composting.
- ⇒ Awareness raising of importance of Solid Waste Management and recycling.
- ⇒ Capacity development of collection and transportation to business sectors.

4.3 Acceleration of Reuse and Recycle of Waste

- ⇒ Promotion and encouragement of reuse and recycle of waste.
- ⇒ Encourage industrial symbiosis, such as exchange of industrial waste with incentives for the use of products from processing through establishment of recycling fund.

4.4 Appropriate Treatment of Waste

- ⇒ Development of waste treatment infrastructures with Best Available Technologies including construction of new environmental sanitary landfills.

4.5 Rehabilitation from Environmental Pollutions

- ⇒ Introduction of planning and procedures of clean up the contaminated sites.

4.6 Introduction of Concept of Environmental Management System On Solid Waste Management

- ⇒ Development of data collection and information platform on Solid Waste Management.
- ⇒ Implementation of evaluation on this strategy based on the concept of PDCA (Plan, Do, Check and Action) cycle.

4.7 Existing Actions Related to The Solid Waste Management

There are existing actions plan related to Solid Waste Management, extracting from Draft National Environment Strategy and Action Plan 2016- 2030.

5 FINANCING MECHANISM FOR SOLID WASTE MANAGEMENT

The National Solid Waste Management Strategic Framework is the main mechanism of which the RGC works with its development partners in setting the national Solid Waste Management priorities. These priorities are then reflected in the National Solid Waste Management Strategies and Action Plans for Cambodia 2017-2030, 3-year rolling public investment programmes (PIP), and sectoral development strategies, and investment programmes and national budget.

There is a mechanism shown about various sources of financing in the national development framework as well as for Solid Waste Management strategic framework, including project-programme funding, trust funds - grant aids from donor agencies, NGOs and charities, national budget derived from taxation, fees and sale of resources, goods and services, and the rapidly growing private investment (domestic and international).

5.1 Funding Sources

This will include:

- ⇒ National Public Sector Source,
- ⇒ National Private Sector Source,
- ⇒ International Public Sector Source, and
- ⇒ International Private Sector Source.

5.1.1 National Public Sector Source,

This will include national government and local administration, sub-national administration, development banks, development partners and int'l financial institutions. The financial Instruments are as follows:

- ⇒ Domestic public spending,
- ⇒ Grants,
- ⇒ Technical Assistance,
- ⇒ Loans,
- ⇒ Concessions, and
- ⇒ Non-concessional.

5.1.2 National Private Sector Source

This will include blended Institutions e.g., innovative partnership e.g. and global funds, Infrastructure funds. The financial instruments are PPPs as guarantees.

5.1.3 International Public and Private Sector Source

This will remain financial instruments with the same characteristics of the national private sector source funding.

5.1.4 International Private Sector Source

- ❖ Private Investors: this will include investment, insurance, sovereign wealth funds etc., bank, cooperative banks, hedge fund. The instruments will be:
 - ⇒ Bank Loans
 - ⇒ Money markets
 - ⇒ Bonds
 - ⇒ Equities
 - ⇒ Derivatives

It is extremely important that Solid Waste Management priorities and budget requirements are incorporated in the national development framework and budgeting. It is urgent that an innovative and sustainable funding mechanism is established. Hence, Solid Waste Management will rely on an improved access to and use of existing and emerging budget through the national and international public financing, and those resources leveraged from private sector, development partners and global funds, as well as from progressive and innovative policy and fiscal instruments.

The potential funding sources and instruments will take time to materialize, it is important for the current Solid Waste Management to generate a key fund mobilization and implementing high-priority activities right away. The development partners and partner organizations involved in Solid Waste Management framework need to engage them in exploration for modality for funding and supporting BAT and BEP for Solid Waste Management either through trust fund/basket funding or other forms, while the conditions for a sustainable funding mechanism is being established.

5.2 Sustainable Funding Mechanism

The RGC recognizes that for a successful implementation of the Solid Waste Management framework, a profitable domestic waste collection and resource mobilization become the first priority. Public sector financing will be unable to fill the big financial gap in managing waste sustainability. To achieve sustainable funding mechanism for Solid Waste Management in Cambodia, it is important to systematically pursue the following steps:

- Better access to public financing;
- Deploying and further mobilizing economic and fiscal instruments to raise public finance and allocate them for Solid Waste Management sustainability purpose;
- Incentivizing and leveraging private sector finance and global funding opportunities for Solid Waste Management;
- More effective use of fund from development partners; and
- From piloting to up scaling financing mechanisms such as contracting for service provider, pay-as-you-throw, education, economics of recycling, open area for waste collection and composting, and tax exemption for waste recycling facilities.

6 CURRENT ECONOMIC INSTRUMENTS FOR SOLID WASTE MANAGEMENT

The Solid Waste Management is a duty of the local government through its own budgetary resources and environmental service by national government. Article 5 of Sub-decree 113 on garbage and urban solid waste management regulated that, MoE role is directing facilitation with development partners, private sector or public sector to raise financial resources, means, and materials in order to support the sub-national administration regarding the urban garbage and solid waste management. However, with rapid increase in waste generation rates and awareness for effective and efficient SWM practices to protect public health and environment, the demands for huge investments started rising, in order to increase the efficiency of the Solid Waste Management chain. This led the governments to adopt various financing modes.

6.1 Local Taxes:

This leads to more favorable price, (lower price), for waste-friendly products, and a less favorable price, (higher price), for waste-damaging products. Tax differentiation is similar to product charge except the waste sole purpose of tax differentiation is its incentive impact, while product charges also have a revenue-raising goal.

On the whole, tax differentiation seems to be one of the more successful economic instruments, which may be used to protect the environment.

Penalties for non-compliance with the tax regulations, or breaches of the tax regulations range from 10% to 40% of the unpaid tax. In addition, interest is levied at the rate of 2% per month on the unpaid tax. Officers of the taxpayer may be subject to criminal charges in cases of tax evasion.

Funds come from taxation to be used by municipal administrations for various activities to beautify the city including picking up litter, sweeping major roads, trimming trees and shrubs, installing garbage bins and putting up education banners. One municipality creatively used a portion of the fund to renovate the road leading to the dumpsite.

6.2 Penalties, fines and levy

The revenues earned from such instruments are becoming an important financing tool for governments to finance SWM. The terminology and rate of the penalty/fine/levy may vary from country to country. No similar system has been introduced in Cambodia so far. However, based on Cambodia Sub-decree 113, article 15 and 39 mentioned that:

- 1) Waste separation must be applied;
- 2) In case people not apply waste separation, they will be fined in amount of:
 - a. \$2.5 for residential waste per household,
 - b. \$25 for handicraft, services, condominium, apartment and Borey; and
 - c. \$59 for factories, enterprises and companies.
- 3) They will be fined in double pay over the primary fine if they are still continuing not make waste separation.

In other case, based on articles 16, 17 and 40 of the sub-decree 113 regulated that:

- 1) People must keep their own waste in the bin in their households, so to not cause any bad smell. People can deliver their own waste according to the time and schedule determined by the local authorities.
- 2) Anyone who release own wastes at different time than those set by local authorities, will be fined in amount of:

- a. \$5 for individual household;
 - b. \$37.5 for handicraft, services, condominium, apartment and Borey, and
 - a. \$100 for factories, enterprises and companies.
- 4) Violators will be fined in double pay over the primary fine if they are still continuing to deliver waste in the not permitted schedules.

Based on article 20 and 42 of sub-decree 113 regulated that:

- 1) Any kind of solid waste disposal in public areas, streets, open areas, sewage channel, source of public water, and private land is prohibited;
- 2) Violators will be fined in amount of:
 - a. \$5 for passenger and tourist with an additional fine to clean it up;
 - b. \$12.5 for sellers who selling goods on public road with an additional fine to clean it up;
 - c. \$37.5 for sellers who selling goods at home, restaurant and recreation side with an additional fine to clean and collect waste to the determined place.
 - d. \$50 for exploitation market, service and handicraft, and additional fine to collect and disposal at dump side;
 - e. \$100 for factories, enterprises and companies and additional fine to collect and disposal at dump side.
- 3) They will be fined in double pay over the primary fine if they are still continuing to dispose waste.

According to article 20 and 43 of sub-decree 113 regulated that:

- 1) Any kind of solid waste burning at public areas, streets, open areas, at public areas, streets, open areas and private land is prohibited;
- 2) Violators will be fined in amount of:
 - a. \$12.5 for passenger and tourist and fine to clean it up;
 - b. \$25 for house owner, seller who is selling waste on the road and public areas and additional fine to clean it up;
 - c. \$50 for market, restaurant, recreation side; exploration, services and handicraft and additional fine to collect waste, clean waste and transport to the landfill;
 - d. \$250 for factories, enterprises and companies and additional fine to collect waste and disposal at landfill.
- 4) They will be fined in double pay over the primary fine if they are still continuing to make waste burning.

According to article 21 and 44 of sub-decree 113, regulated that:

- 1) Individual persons who is organizing ceremony on public area, must pay waste service for the administration of municipality, district and Khan;
- 2) Who avoid to pay waste service for their ceremony, will be fined in amount of:
 - a. \$50 for wedding, Buddha ceremony and shop inauguration except funeral;
 - b. \$150 for meeting, and
 - c. \$500 for public concert.
- 3) They will be fined in double pay over the primary fine if they are still continuing to organize without pay waste service.

According to article 22 and 45 of sub-decree 113, regulated that:

- 1) Market owners, corporation establishments, services, companies, factories, recreation side, enterprises and handicrafts must provide rubbish bin for their customers;
- 2) Who do not apply above requirement, will be fined in amount of \$100;
- 3) They will be fined in double pay over the primary fine if they are still continuing to apply no rubbish bin for their customers.

According to article 23 and 46 of sub-decree 113, regulated that:

- 1) Building owner or contractor must collect and transport construction waste to the landfill or using local waste services;
- 2) Building owner or contractor who is applying improper management of construction wastes and materials, they will be fined in amount of:
 - a. \$100 for residential construction and additional fine to collect and transport to the landfill;
 - b. \$200 for big side construction and additional fine to collect and transport to the landfill.
- 3) They will be fined in double pay over the primary fine if they are still continuing to apply improper management of construction wastes and materials.

According to article 27 and 47 of sub-decree 113, regulated that:

- 1) All kinds of exploitation sludge from septic tank including pumping, transportation and disposal without permit from the administration of municipality, district and Khan, they will be fined in amount of:
 - a. \$100 for family exploitation; and
 - b. \$250 for company's exploitation.
- 2) They will be fined in double pay over the primary fine if they are still continuing to run their exploitation without permit from the administration of municipality, district and Khan.

According to article 48 of sub-decree 113, regulated that:

- 3) Who is keeping, packaging or collecting and transporting general wastes mixed with industrial solid wastes, medical wastes and hazardous wastes, will be fined in amount of:
 - a. \$125 for exploitation, handicraft, maternity hospital;
 - b. \$200 for factories, enterprise and companies; and
 - c. \$250 for waste collection and transportation service company
- 4) They will be fined in double pay over the primary fine if they are still continuing to mixing general wastes with industrial solid wastes, medical wastes and hazardous wastes.

Notice that US\$1=4,000Riel Cambodian Currency

Based on Article 51 of sub-decree 113, regulated that: Capital, city, district and Khan shall be responsible for setting up mechanism for more effective practice of the measures of transitional fine.

Procedures of managing, organizing, and using the money from transitional fine shall be determined by Prakas (proclamation) from inter ministries between Ministry of Economy and Finance, Ministry of Environment and Ministry of Economy and Finance.

6.3 Waste bonds:

Waste bonds are floated by local governments as a major source to arrange funds for environmental infrastructure and services including SWM and other developmental activities.

Article 34- of Sub-decree 113 on garbage and urban waste management, Municipal, city and district administration shall determine proper measures and procedures that are transparent and effective for collection, management and payment of fees for urban garbage and solid waste management services within their jurisdiction, with consultation with Khan, Commune-Sangkat and related institutions and stakeholders.

Revenue collected from these services is the revenue of municipal, city and district administration concerned. Municipal, city and district administration might use their own budget or budget from other sources to support additionally covering the costs of providing urban garbage and solid waste management services within their jurisdiction.

The MOE jointly with the Ministry of Interior (MOI) and Ministry of Economy and Finance (MEF) issued in 2015 the inter-ministerial Prakas on the Usage of Environmental Sanitation Service Fund (thereafter the fund). The initial budget of USD5 million was allocated between 26 municipalities across the country, with distribution of funds determined based on population size. Budget allocation set the stage for the transfer of the solid waste management function to subnational administrations. The subsequent Sub-decree on Urban Solid Waste Management operationalized the fund by assigning functional responsibilities to different tiers of subnational administration, namely the capital, municipal and district administrations. The municipal fund is currently only allocated to municipal administrations.

In addition, municipal administrations will be able to generate own-source revenue through collecting waste service fees based on a fee ceiling designed by central ministries. Based on the ceiling, municipal administrations can determine fee structures for their localities depending on business type, location, income level and waste volume. To arrive at a decision, municipal administrations must consult service users and other relevant stakeholders. Also, they are responsible for designing the mechanisms for the collection, management and settlement of waste service fees.

6.4 National Annual Budget:

Local governments allocate little portion of their development budget to finance SWM. This is usually cross-subsidized from the revenue earning sources of local governments. National government allocate some portions of national development budget to support national local administrations and Sub-national administration (districts) in improving waste management and 3 Rs (reuse, recycle and reduce) targets for a move to a recycling and green society and the local government has full authorization based on their request and budget proposed for arranging waste management.

Article 7 of Sub-decree 113 also regulated that, provincial administration shall provide support, coordination and encouragement of cooperation in urban garbage and solid waste management that is implemented by city and district administration and instructing city and district administration to prepare management plans and action plans and annual budget for urban garbage and solid waste management.

Currently, the Ministry of Environment and Ministry of Economy and Finance are using the national environmental sanitation budget package to strengthen municipality and provincial town waste management. The Ministry of Environment and Ministry of

Economy and Finance are setting financial mechanism to use this budget package in transparency, accountability, efficiency, and effectively manner. Both Ministries also plays the roles in determination of amount of the budget need to transfer to the sub-national administration for waste management.

With respect to resources, in 2015 the municipalities received additional funds over their regular annual budget in the range of USD45,000 to 90,000 depending on their population size. This represents major progress relative to the meagre provincial budget for solid waste management in the pre-transfer time (Pak and Craig 2008). The centrally allocated funds are generated from three sources, namely a 2 percent deduction in taxes on plastic and electronic products, contributions from individuals and contributions from development partners and international financial institutions under a cooperative grant agreement (MOE, MOI and MEF 2015).

6.5 Social and Environmental Fund

The RGC issued the Sub-Decree number 238 Or-Nor-Kror.Bor-Kor, dated 21 November 2016 on Social and Environmental Fund. Article 8 of this sub-decree regulated that, social and environmental fund sources will come from:

- ⇒ Contribution of public and private development projects owner which is mentioned in the environment management plan of EIA report and environmental protection contract;
- ⇒ Income of environmental protection actions, ecosystem services and biodiversity conservation;
- ⇒ Gift including financial assistances, facilities, equipment from donators, development partners, national or international private institutions;
- ⇒ Other environmental services; and
- ⇒ Other sources.

Based on article 10 of this sub-decree 238, regulated that, this fund will be used for environmental protection, infrastructure development and improvement of people livelihood who are living nearby development project area, environmental research, technology and science, and environment dissemination and others.

6.6 Public-Private Partnerships

Public-Private Partnership allowed the private sector participation (PSP) in SWM and this partnership has been built undertwo reasons: (a) Improvement in efficiency and effectiveness due to better management, and (b) New investment and provision of better technologies. In Cambodia, PSP has been attempted in collection of waste, street sweeping, transportation, composting, conversion from waste to power generation (not yet occur in Cambodia), and final disposal in a landfill. Since SWM has been a private sector activity for all the waste management process, there is very little experience in managing these partnerships.

There are many models of PSP which range from service contracts for waste treatment, privatization of disposal, etc. in different Cambodia's cities such as Phnom Penh, Siem Reap, Sihanoukville, Battambang, Kampong Cham...etc. There are also issues relating to contract labour, labour displacement, performance requirements, service to slums, and compliance with waste management rules which need to be considered. For example, the municipalities solid waste management rules require wastes separation at the household level, and the wastes separation have to be handled separately after

collected by the waste collection service providers. This kind of partnership cannot be applied yet to the current waste management situation.

The current Cambodia financial requirements for implementation of NESAP 2016-2023 in the next seven years are expected to be met by the RGC as cost-sharing/co-financing (in cash and kind), and from the development partners, relevant investment funds, and private sources. However, around 20% of total budget is pending in around \$263,500,000 to support public awareness, capacity development and technology and science transfer, financing sustainability and inclusiveness, and to build public private partnership, in green and sustainable development, chemical and hazard waste management, support to solid waste and waste water management. decentralization, strengthening and scale up inter-ministerial collaboration modalities for promoting sustainable and multi-uses of environment and natural resources.

It is important to mobilize financial and technological supports. The programme and project document designs for Solid Waste Management will be developed in close collaboration with concerned national and international funding agencies and key private stakeholders.

In order to success implementation for sustainable solid waste and landfill management, Cambodia need to set incentives scheme for private sector participation and investment. Currently, PPP is a one model created by private companies such as CINTRY, SASROM TRADING... and Government operated in waste management in Cambodia.

The all types of prevailing financial mechanisms at all levels of the Solid Waste Management chain are discussed. The information obtained was analyzed to identify gaps and weak areas and measures are suggested to fill the gaps and enhance the effectiveness of the institutions.

The municipality which uses a mixed model of public-private implementation of the function, other municipalities chose to contract private service providers selected through their procurement committees to carry out activities described in 6.1 of this report. In these cases, municipal administrations primarily focus on monitoring the performance of private contractors. In one municipality, Sangkat councils are asked to assist the monitoring and the information is reported to the municipal administration by phone.

Through these activities, municipal administrations uniformly expect better environment and cleaner cities as a result. Municipalities that were ranked lowly in the clean city contest in the previous year expect to see their rankings improved. For the MOE, as all municipalities have had a more or less functioning mechanism for waste collection and transport since the pre-transfer time to the local administration, the primary success criterion of the transfer is to “systematize” the existing mechanism via modernized waste transport facilities and better organized waste collection timetables and service fee schedules.

The information collected on financing mechanisms is presented as shown in Table 1. This should be followed by gap analysis and measures should be suggested to fill the gaps as shown in Table 1. This is an example of private sector involvement if municipality solid waste management.

Table 1: Example of Private Sector Involvement in Financial Mechanisms for Solid Waste Management Chain

Area of Application	Private Company	Financing Mode		
		Direct Revenue	Local Government/ National Government/ International Cooperation	Private Sector (Mention Type of PSP)
1) Collection	CINTRY	N.A	Local Government	N.A
2) Transportation	CINTRY	N.A	Local Government	N.A
3) Pre-Treatment	N.A	N.A	N.A	N.A
4) Recycling/ Recovery	Private Sector	N.A	N.A	Individual Proprietor
5) Disposal	CINTRY	N.A	Local Government	N.A

Table 2: Gap Analysis and Suggested Improvement Measures in Current Financial Mechanisms for Solid Waste Management Chain

Area of Application	Financing Mode	Gaps & Weaknesses	Suggested Improvement Measures
1) Collection	Direct Revenue		
	Government and International Cooperation	Generators are not responsible.	Generators should be charged
	Private Sector		
2) Transportation	Direct Revenue		
	Government and International Cooperation	Insufficient staff and Vehicles	Sufficient amount should be kept to fulfill the demand
	Private Sector		
3) Pre-Treatment	Direct Revenue		
	Government and International Cooperation	No pre-treatment is being done	Transfer station and pre-treatment facility should be built
	Private Sector		
4) Recycling/Recovery	Direct Revenue		
	Government and International Cooperation		
	Private Sector	No subsidy is given to private sector	Private sector should be encouraged and subsidy be provided.
5) Disposal	Direct Revenue		
	Government and International Cooperation	Improper disposal	Technical experts may be hired and proper disposal mechanism be established
	Private Sector		

This is another example of private sector involvement in industrial waste management through agreed upon Ministry of Environment's Prakas (Proclamation).

(unofficial translation)

**Kingdom of Cambodia
Nation Religion King**

Ministry of Environment

No: 83

Phnom Penh, 10 April, 2001

**Prakas
Minister of Environment**

- Having seen...
- Having seen...
- Having seen...

Hereby Decides

- Article 1: Licenses Sa Rom Trading Co Ltd, #122 Aeo, Street 430, Sangkat Toul Tum Puong, Khan Chamkarmon, represented by the company's director Mr. Yu Sa Rom, male, aged 29, Cambodian, holder of ID# 024215PP of 07 Sept 1992, to construct an industrial solid waste dump which is located in Phum Chambok, Khan Kombol, Srok Angsnuol, Kandal Province.
- Article 2: The company shall comply with the law on environmental protection and natural resource management, and the sub-decree on the environmental impact assessment process.
- Article 3: The company shall comply with the approved environmental management plan of the environmental impact assessment.
- Article 4: The company shall seek advice from the Ministry of Environment when it changes the location or constructs a new division.
- Article 5: The company shall be obliged to donate environmental fund to the Ministry of Environment until it ceases its operation.
- Article 6: Sa Rom Trading Co Ltd shall implement this Prakas.
- Article 7: This Prakas shall enter into force from the date on which it is signed

Minister
Signed and Sealed

CC:

- CDC
- Ministry of Industry, Mine and Energy
- Ministry of Land Management, Urbanization and Construction
- Provincial Hall
- Provincial Environmental Office "co-implementation"
- File-chronicle

7 CURRENT ECONOMIC INCENTIVES IN SOLID WASTE MANAGEMENT

Economic incentive instrument is aimed at strengthening the waste/Solid Waste Management in the urban and rural areas with transparency, accountability, efficiency and sustainability for ensuring the public health protection and environment. The term 3Rs are normally used in developed countries and also are introduced to Cambodia for reducing, re-using and recycling the waste materials.

Solid waste management as a public good. In part, this determination reflects the fact that uncollected and illegally discharged solid wastes adversely affect the general public, not only the individuals that are not participating in the proper management of their wastes. Also, everyone benefits from the actions of various individuals to properly manage their wastes.

When user charges and tipping fees are not acceptable to various households, establishments, and private haulers, they may resort to illegal dumping of their wastes. This supports the public good argument, as no one should be excluded from service or it would affect the service benefit to all. While a valid argument for many types of waste (such as demolition rubble), it is possible that a significant portion of illegal discharges of most solid waste types may be identifiable from mailing envelopes or other items with names and addresses found in the waste. This is a tool for enforcement that is unique to some solid waste categories, as opposed to the impossible task of trying to identify where an illegally dumped load of pumped septage might have originated.

Although solid waste management is a public good, there are limitations to the ability to act as a free rider and people are willing to pay for the service, so promoting cost recovery to the extent possible and affordable is good policy. Willingness to pay is greatly enhanced when local residents perceive accountability and transparency in the management of the fees charged for solid waste management services, thus collecting money in a segregated account for the sole use of the solid waste sector is a useful tool for financial management. Ideally, there should be one entity with full solid waste responsibility to enable accountable and transparent services. When the solid waste activities are disaggregated (e.g., collection equipment maintained by a central workshop, fleets managed by an engineering department, field supervision conducted by health inspectors, and collection workers operating under a solid waste manager) accountability is virtually impossible.

From the perspective of encouraging private sector participation in the solid waste sector, evidence of self-sustaining revenues at the local government level may affect the private sector's willingness to invest in solid waste infrastructure and enter into long-term service agreements. In a few cases, central government payment guarantees of have enabled city-wide contracting for all solid waste services (as in Senegal, where MIGA also provided a non-commercial risk guarantee).

7.1 General Incentivize and Leverage Private Sector Finance

The private sector is an important funding source. The RGC will also use development finance to unlock private sector investment. The RGC, in particular MEF, MoI, and MOE will play a more proactive role in incentivizing private sector investment in sustainable Solid Waste Management. Added support from development partners are seen as catalyst to incentivize the shift from “brown” to “green” investments, including supporting national Solid Waste Management Strategy and Action Plan, Solid Waste Management skill upgrading, and public private partnership financing arrangement.

7.2 The Purpose to Set the Collection Service Fees

Based on Article 33- Municipal, city and district administration, based on the maximum service fees determined by inter-ministerial proclamation of the Ministries of Interior, Environment and Economy and Finance, shall set service fees for cleaning, collection, transportation and fields for loading garbage and solid waste to implement in their local bases, respecting the following principles:

- Having to consult with people and stakeholders in their jurisdiction;
- Ensuring effectiveness and quality of the management of garbage and solid waste;
- Setting service fees according to categories of businesses, location, income, quantity of urban garbage and solid waste that need to be released; and
- Having review and approval from their council.

It is to keep the Solid Waste Management sustainable and the maximum fee to the private sector responsibility for waste collection. The waste collection service fee is depending on:

- Distance of transportation, labor and landfill;
- Quantity of waste;
- Livelihood and economic in that collection location; and
- Crowding location (capital, city or district).

7.3 Current Economics Incentives in Solid Waste Management

An economic incentives scheme is a tool for local authorities to use to encourage householders to cut down on what they throw away. For the first time it would allow for charges to be made for the amount of residual waste put out. Money collected as charges would then be used to pay rebates to those households who throw away the least waste. If wanted, any charges and rewards can be linked to difference tax bills.

7.3.1 Policy Options

Political will be important in order to implement transparency in financial management related to SWM services and the commitment related to additional or higher taxes or fees. People often lack sufficient knowledge about the environmental, social and economic costs of 'cheap' but inappropriate SWM practices, there is often opposition to new fees. When people are provided with the opportunity to participate and with comprehensive information on the fairness of the proposed economic instruments and incentives and on how fees will tangibly improve services, public support can normally be secured.

Various local policy waste management were proposed to provide concrete mechanisms and tools to better interact with 'users'. Main assumptions for introducing the BAT/BEP into new policies would be perceived as strong act of 'political will' and could be utilized to enhance people acceptance and participation within the SWM program. Further assumption is that the policy making process itself would increase knowledge, commitment and ownership by sub-national administration leaders as the main signatories of local policies. The new waste management policies were designed in Cambodia to open access a way to formulate and implement the SWM strategy and action plan, to enhance community participation and cost recovery for provided municipal services.

7.3.2 Contracting for Service Provider

Based on article 30 and 31 of sub-decree 113 regulated that: Municipal, city, district and Khan Administration shall be responsible for the management of cleaning, collection, transportation and fields of urban garbage and solid waste services within their jurisdiction effectively, transparently, accountably and environmentally safely. In the management of urban garbage and solid waste, municipal, city and district administration might be providing licenses of undertaking cleaning or/and collection or/and transportation or/and fields for loading garbage and solid waste to private sector to be responsible. Based on Article 32 regulated that the Providing licenses of undertaking cleaning or/and collection or/and transportation or/and fields for loading garbage and solid waste shall be valid not more than 10 years per period of contract and shall be implemented with applicable methods and procurement procedures.

7.3.3 Raising Awareness of the Public and Decision Makers

Effective management of solid waste requires the cooperation of the general public. Lifting the priority of, and allocating more resources to, the Solid Waste Management sector needs the support from decision makers. It is, therefore, important to ensure that public and decision makers' awareness activities are incorporated into the external support package. The aim of these activities is normally long term and it takes some momentum to build up before the effects are realized. But, once the interests of the public and decision makers in improving Solid Waste Management are created, the sustainability of Solid Waste Management projects will be significantly improved.

Enhanced awareness of decision makers may lead to changing national socio-economic and industrial development policies and associated government programmes in favor of improving solid Waste Management systems in Cambodia. For instance, more financial aid and tax incentives may be introduced to encourage the development of recycling industry and business, or labourer protection programmes may be provided to improve wages and working conditions of laborers, including solid Waste Management workers. Changing national policies in order to promote donor countries could also improve ways in which their technologies are transferred to Cambodia.

7.3.4 Economics of Waste Collection, Recycling and Composting

This incentive scheme is a way to provide incentive through awareness campaign and actions on waste collection, recycling and composting waste and minimizing negative impact of the current solid waste management. This will also promote the waste segregation at source by setting up the appropriate waste category and collection scheme. In term of economics of waste collection, recycling, the competent authority has to promote composting by providing subsidy to the composting facilities and composting users. A key strategy is to promote waste separation and collection at bulk source such as hotels, restaurants, markets etc. and at the same time the authority can also establish efficient economical waste collection scheme. The authority must consider in the best practices of effective incentive system to promote investment on the recycling

activities with appropriate recycling technologies for utilizing food waste and create the market of recycled products.

Based on Article 35- of Sub-decree 113 regulated that: In case of requests from communities, organizations or people who request for permission to collect urban garbage and solid waste to use for benefit purposes, municipal, city and district administration, with consultation with municipal-provincial departments of environment, might:

- A. Check and award permission for collection and transportation of urban garbage and solid waste to be recycled as compose fertilizers and gas if the collections of the solid waste do not have negative impacts on the urban garbage and solid waste management plans and living of surroundings and environment.
- B. Awarding permission to collect and transport stone and soil debris waste from road, building or residential building construction activities without mixing urban garbage and solid waste and without loading or mixing with hazardous waste to fill in the holes of land owned by communities, organization or private persons.

7.3.4.1 Collection and Transportation

Even though the collection and final disposal of municipal solid waste has been improved drastically, **the waste collection rate of the whole country is considered to be only around 64.76% in 2015**, deriving from comparison of amount of the estimated waste generation, waste disposal at landfill and collected recyclable waste by junkshops in 2015 (Table 3).

Table 3: Waste Generation and Collection Rate in Cambodia in 2015

No	Name of Province	Estimated Waste Generation (T/Year)	Waste Generation Per Capita (Kg/Person /Day)	Waste Collection		Recyclable Waste	
				Amount (T/year)	Rate (%)	Amount (T/year)	Rate (%)
1	Phnom Penh Capital	1,007,400	1	839,500	83.33	50,370	5
2	Kandal	379,600	0.83	205,495	54.13	18,980	5
3	Takeo	59,427.12	0.2	29,066.05	48.91	16,358.57	27.53
4	Kep	13,505	1	9,125	67.57	1,825	13.51
5	Kampot	304,410	1.28	120,450	39.57	78,840	25.90
6	Preah Sihanouk	46,063	0.61	43,800	95.09	438	0.95
7	Koh Kong	28,321.08	0.7	22,269.38	78.63	1,905.3	6.73
8	Kampong Speu	15,446.8	0.06	10,048.45	65.05	3,628.1	23.49
9	Kampong Chhanang	79,471.45	0.4	49,070.6	61.75	18,633.25	23.45
10	Pursat	4,365.4	0.03	3,149.95	72.16	164.25	3.76
11	Battambang	42,940.43	0.63	36,828.5	85.77	1,731.92	4.03
12	Paylin	32,850	1.3	22,630	68.89	4,745	14.44
13	Buteay Meanchey	142,532.5	1.16	91,615	64.28	22,630	15.88
14	Oudor Meanchey	4,764.345	0.08	3,266.38	68.56	0	0

15	Preach Vihear	4,745	0.6	4,380	92.31	182.5	3.85
16	Siem Reap	527,811.9	1.38	319,740	60.58	13,161.9	2.49
17	Kampong Tom	223,380	1	115,705	51.80	33,580	15.03
18	Kampong Cham	578,890	1.4	308,060	53.22	12,410	2.14
19	Tboung Khmom	214,002.8	1.36	110,350.5	51.56	1,167.63	0.55
20	Kratie	54,866.8	0.06	27,250.9	49.67	17,476.2	31.85
21	Steung Treng	18,980	1.74	12,410	65.38	0	0
22	Ratanakiri	30,660	0.5	18,980	61.90	1,569.5	5.12
23	Mondulkiri	4,781.13	0.18	3,540.5	74.05	373.76	7.82
24	Svay Rieng	20,239.25	0.09	8,654.15	42.76	2,441.85	12.06
25	Prey Veng	250,755	0.7	155,85	62.15	21,900	8.73
Total		4,090,209	0.73	2,571,240	64.76	324,512.7	10.37

Note: estimation based on the waste generation rate 0.50 kg/cap/day and population in 2014, obtained from Provincial Departments of Planning and has been compiled with data from Department of Solid Waste Management, MoE

Source of Recycling: Provincial Department of Environment (Inventory Data Collection by MOE 2015)

Coverage of waste collection and transport service is only limited to urban areas. That is the reason only Phnom Penh capital city and a few provinces such as, Kep province, Kampot province, Preah Sihanouk Province and Kratie Province have been estimated to high waste collection rate while waste collection rate and coverage in other provinces have been at low level.

Waste collection service of municipal solid waste management at the provinces is still limited in its capacity. In addition, contracted companies for waste management have not met satisfactory technical standard due to the lack of understanding on importance of waste management and the related investment. Citizen also has low awareness of the waste management and interests in public hygiene. As a result, there are many uncollected litters in roads, free lands, canals, river sides and beaches.

7.3.4.2 Disposal, Recycle, and Export of Solid Waste

Waste disposal at landfill as final treatment is common practice. There are 76 landfill sites in Cambodia and the most of them are open dumping landfills, emitting toxic and creating impacts on the environment and human health since most of provincial authorities don't have enough ability and budgets for development, operation and management of landfill infrastructures with sound technology (Ministry of Environment Cambodia, 2015).

People throw the trash along the roads, empty land areas, river side and open-burning as their old custom, when they don't get any waste collection and transportation service. Therefore, current solid waste management practices only **focus on cleaning city district and transporting outside from towns/cities to open dumpsites without any control or to the private/ temporary land.**

The collected waste is transported to landfill site at the most of the provinces. However, there are still illegal disposal at all provinces. This is result of the lack of waste collection

and transportation service at the cities/towns and it is assumed that citizen dumps the wastes at free land/ private land or burns their waste.

Table 4: Municipal Solid Waste Treatment Situation in Cambodia

No	Name of Province	Illegal Disposal	
		Amount (T/year)	Rate (%)
1	Phnom Penh Capital	117,530	11.67
2	Kandal Province	155,125	40.87
3	Takao Province	14,002.5	23.56
4	Kep Province	2,555	18.92
5	Kampot Province	105,120	34.53
6	Preah Sihanouk Province	1,825	3.96
7	Koh Kong Province	4,146.4	14.64
8	Kampong Speu Province	1,770.25	11.46
9	Kampong Chhang Province	11,767.6	14.81
10	Pusat Province	1,051.2	24.08
11	Battam Bang Province	4,380	10.20
12	Paylin Province	5,475	16.67
13	Bunteay Meanchey Province	28,287.5	19.85
14	Oudor Meanchey Province	1,497.96	31.44
15	Preah Vihear Province	182.5	3.85
16	Siem Reap Province	194,910	36.93
17	Kampong Tom province	74,095	33.17
18	Kampong Cham Province	258,420	44.64
19	Tboung Khmom Province	102,484.7	47.89
20	Kratie Province	10,139.7	18.48
21	Steung Treng Province	6,570	34.62
22	Ratanakiri Province	10,110.5	32.98
23	Mondulkiri Province	866.875	18.13
24	Svay Rieng Province	9,143.25	45.18
25	Prey Veng Province	73,000	29.11
Total		1,194,456	24.86

Reference: Provincial Department of Environment (Inventory Data Collection by MOE 2015)

In the contract of existence of the illegal disposal, recycling activities is also observed in several provinces (Table 4). However, due to the lack of information and data, actual recycling amount is quite fragmented.

Figure 1 presents the trends of generation of recyclable wastes such as paper, plastic (bags and plastic bottles), aluminums (broken items and cans), iron, lead, batteries and glass bottles/broken bottle glass (Ministry of Environment Cambodia, 2015).

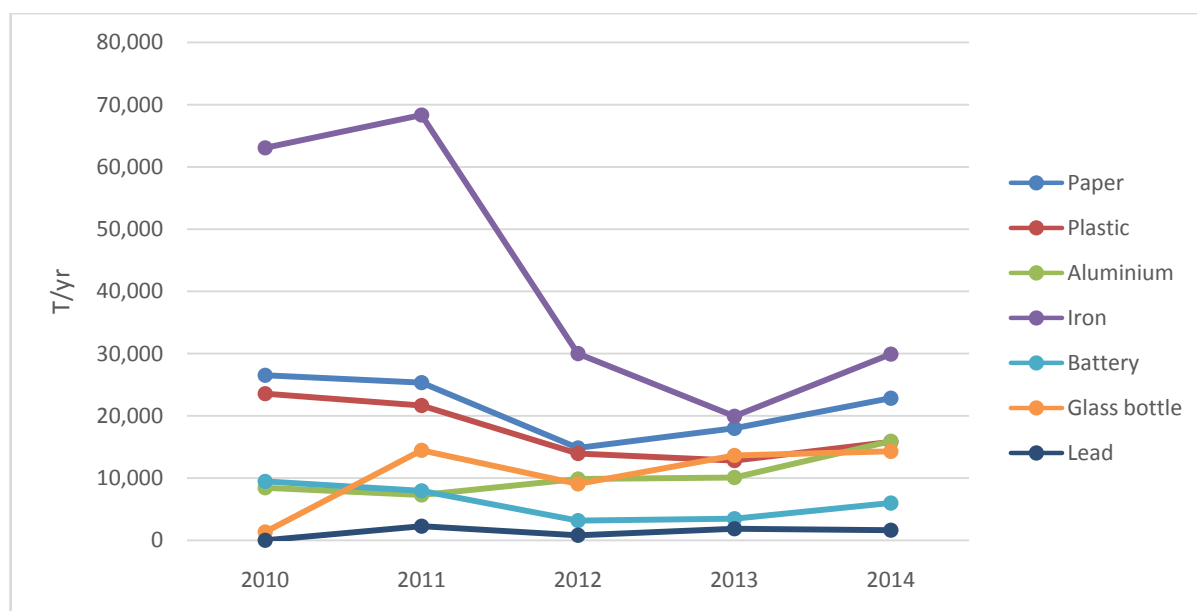


Figure 1: National Recyclable Waste Amount in 2014

Source: Modified from Ministry of Environment Cambodia, 2015

Even though certain amount of recyclable waste was produced and collected in Cambodia, recycling activities are limited domestically due to the lack of recycling market/ business sector and recycling infrastructures. Therefore, some of recyclable wastes and materials are exported for recycling purpose at neighbor countries. Data from Ministry of Environment in 2013 and 2014 suggests that recyclable wastes and materials such as aluminum scraps, copper scraps, paper, plastic scraps, iron scraps, broken bottle, recovered materials and e-scrap from WEEE were exported to other countries such as Thailand, South Korea, Vietnam, China, Singapore, Malaysia and Taiwan (Table).

Table 5: Amount of Recyclable Solid Waste Exportation and its Destination

Type of raw materials	Amount (T/year)		Exported to
	2013	2014	
Iron Scraps	3,300	4,300	Thailand
Aluminum Scraps	4,075	7,523	South Korea, Singapore, China, Taiwan
Copper Scraps	18,000	0	South Korea
Mixed Recycle Waste	6,700	3,250	Thailand, Vietnam
Paper Scraps	15,300	12,400	Thailand, Vietnam
Broken Bottle	1,417	3,277	Malaysia
Plastic Scraps	11,966	14,634	Vietnam, China

Source: Ministry of Environment Cambodia, 2015

7.3.4.3 Waste Composition

There is no national waste composition data. Only selected cities such as Phnom Penh Municipality, Battambang, Siem Reap and Kampong Cham cities has waste composition data through waste management survey at landfill site (Table 6). Generally, more than 60% of waste at disposal site is organic waste. Waste volume of plastic, wood and dry matter, and paper are followed accordingly 10%, 6%, and 4%.

It is worth to note that at generation stage, organic waste percentage may be lowered and recyclable waste may be higher since the recyclable waste such as hard plastics, PET bottles, cans, metals, is extracted at source and sold to the junk shop for recycling purpose (e.g.: 51.9% of organic waste and 19.5 % of plastic waste in Phnom Penh) (JICA and MPP (2005)).

Table 6: Waste Compositions in Selected Cities in Cambodia

City	Waste Composition at Disposal Site (%)							
	Organic	Paper	Plastics	Metals	Textile	Glass	Wood and Dry Matter	Others
Phnom Penh	70	5	6	2	3	2	6	6
Battambang	71	2	10	3	2	4	6	2
Siem Reap	54	6	11	1	3	3	11	11
Kampong Cham	60	5	12	1	1	2	3	16
Average	64	4	10	2	2	3	6	9

Source : Sang-Arun et al, 2011

7.3.5 Tax Exemption for Waste Recycling Facilities

Tax exemptions can be applied to incentivize the creation of small recovery, sorting or recycling enterprises or cooperatives, which can be exempted from taxes in their first years of operation or required to pay a reduced amount of taxes. These exemptions or rebates have the same effect as subsidies, the only difference being that they do not provide direct revenue to the private entity but, instead, reduce its outgoings.

The Article 17 of the final draft sub-decree on Plastic Bag Management regulated that State provides incentive for plastic bag recycling and its recycling facilities through offering certificate of admiration for environmental friendly management, reward and **special tax decrease**. This should be expanded for other waste recycling and its facilities.

8 PROCESS TO IMPLEMENT INCENTIVES

- Cambodia will review existing policies and economics situation, including fees, taxes, contracts, ordinances, permits and licenses. Review a manual for using incentivesystem developed by the expert and authorized by EPA of MoE.
- Conduct a meeting of key stakeholders to get their input and suggestions about manual for using incentive system. Contact other group of the stakeholders that have implemented the Solid Waste Management programs based incentive system to find out how they worked, and what they might do differently.
- Draft regulation to support incentive system and circulate that widely for stakeholder review. Notify the media of the work involved, and seek coverage to get the broadest possible public participation.
- Build consensus by being flexible in the details of how to implement the incentive systemguided by the manual and regulation in Solid Waste Management.
- Draft proposal for action by officials. Include options, pros and cons, and/or specific issues raised during the process. Invite stakeholders to participate in deliberations of officials.
- Implement the national waste management strategy and action plan 2018-2023.

9 CONCLUSION

Economic instruments for Solid Waste Management ensure the financial sustainability of WM services and, thus, good service delivery for citizens. The traditional living of the people should not be emphasized for the management of municipal solid waste under low-economic conditions; the implication of privatization of solid waste services should be considered as legally manner; the management of industrial wastes should include cleaner production, scavengers or informal waste pickers should be incorporated into the formal sector and be provided with sanitary working conditions and in the event that waste reduction and recycling activities are implemented, they should be promptly rewarded. In addition, economic incentives facilitate waste avoidance, recycling and other forms of higher-level waste treatment that are an essential part of resource-efficient WM systems. Strategic and financial issues are often discussed and decided on at higher government levels, but local authority officers need to be able to implement appropriate service costing and revenue collection. As such, local authority officers and decision-makers need to receive continuous training and guidance on financial management and cost recovery options. Local authority training agencies (whether state-run or private) and associations of local authorities need to tackle this issue more systematically. As such, cases where such economic instruments have been successfully applied should be shared among authorities.

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