

**Ministerie van Ruimtelijke Ordening & Milieu (ROM)**

**Directoraat Milieu**

**Preparation of an Integrated Waste Management  
Plan (IWMP) for Suriname**

**Final Report**



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## List of Abbreviations

DFI	Development Finance Institutions
EZ	Economic Affairs, Entrepreneurship and Technological Innovation
ILACO	ILACO Suriname N.V.
IWMP	Integrated Waste Management Plan
LVV	Ministry of Agriculture, Animal Husbandry and Fisheries
MINOWC	Ministry of Education, Science and Culture
NIMOS	National Institute for Environment and Development in Suriname
OW	Ministry of Public Works
PMU	Program Management Unit
ROM	Ministry of Spatial Planning and Environment
ROS	Ministry of Regional Development and Sport
SWM	Solid Waste Management
VG	Ministry of Public Health

## 1. Objective and Activities

The Ministry of Spatial Planning and Environment (Ministerie van Ruimtelijke Ordening en Milieu, (ROM) has assigned ILACO Suriname N.V (ILACO) to implement the project “Preparation of an Integrated Waste Management Plan (IWMP) for Suriname” (DM1040/2021). This is the Final Report for this assignment.

The project consists of two phases. Phase 1 focused on an analysis of the current practices, challenges and risks of waste management and regulations and the main problems and underlying causes were outlined. During phase 2, additional baseline data was gathered on current waste management practices. Different stakeholders from the public and private sector, NGO’s and individuals were consulted either via an online meeting, a physical meeting or a questionnaire. Despite our many efforts, the response remained quite low. Furthermore, opportunities for improvements of the waste management system were identified in terms of priorities, milestones and planning, including related technical and financial interventions and financing options.

Based on the gathered information and the feedback from various stakeholders a Framework IWMP was issued on the 15<sup>th</sup> of July 2022. This framework was prepared based on the 5-R principles and focusses on household, industrial, institutional, medical, agricultural and sanitary waste. It was discussed intensively during a validation workshop in Paramaribo on the 27<sup>th</sup> of June 2022 and provides a road map by which Suriname can work steadily to reduce and better manage waste, so that Suriname’s environment is preserved and the health of its people is protected. Its objective is to support ROM with further Integrated Solid Waste Management and elaborating related waste management planning, policies and guidelines.

The IWMP has been elaborated based on the Final Framework (10<sup>th</sup> of August 2022) and includes goals, objectives and actions, waste codes and ordinances that may need to be developed in the future. This IWMP also takes institutional, social, financial, economic, technical, and environmental factors into consideration. A summary of the IWMP, the conclusions and the actions that can be taken immediately are described in this Final Report.

## 2. Deliverables

An overview of all project related deliverables is given below:

#	Deliverable/report	Number of hard copies	Language	Submission
<b>Planning phase</b>				
1	Minutes meeting (completed)	N/A	English	By email on 15 Dec 2021
2	Updated Work Plan (completed)	N/A	English	By email on 21 Jan 2022
<b>Phase 1</b>				
3	Draft Inception Report (completed)	N/A	English	By email on 01 Apr 2022
4	Final Inception Report (completed)	2	English	Hard copy and by email on 27 May 2022
<b>Phase 2</b>				
4	Draft Framework IWMP (completed)	N/A	English	By email on 17 Jun 2022 and 15 July 2022
5	Final Framework IWMP (completed)	N/A	English	By email on 10 Aug 2022
6	Final IWMP (completed)	4	English	By email on 28 Sep 2022 and hard copy on 30 Sep 2022
7	Final Report (This Report)	11	English(6)/ Dutch (5)	By email 14 Oct 2022 and hard copy on 17 October 2022

### 3. Summary of the IWMP

The objective of this IWMP is to support ROM with integrated solid waste management and elaborating related waste management planning, policies and guidelines. The IWMP has been developed at national level and is based on the 5-R principles. It has been developed also be in line with SDG 11 and 12 and the national Environmental Framework Act. The IWMP focusses on household, industrial, institutional, medical, agricultural and sanitary waste.

The 5-R principles include the following priority steps for waste management:

1. *Refuse*: ensure that waste material is not brought at home at all. For example, by refusing plastic bags at stores;
2. *Reduce*: this involves reducing the waste streams as much as possible, for example by repairing old devices;
3. *Reuse*: the function of the original product is preserved, so that the product has multiple use cycles;
4. *Repurpose*: waste materials are no longer used for the original function, but are used for other functions;
5. *Recycle*: the original product is no longer used, but is processed into separate materials, and new products are made.



After all the 5-R principles have been applied, remaining waste must be disposed of in a responsible manner without causing nuisance, or environmental and health risks, such as through sanitary landfilling.

#### Situation analysis

In 2022 Suriname will generate around 253 kilo ton of waste, including 140 kilo ton of household waste and 28 kilo ton of industrial waste. This will increase to 403 kilo ton of waste in 2040, including 263 kilo ton of household waste. Today, more than 95% of all waste, including dangerous hazardous and infectious waste, is dumped on open dump sites, without any environmental or public health protection. Uncontrolled burning of waste also creates emissions containing fine particulates and complex organic compounds, such as carcinogenic and persistent organic pollutants. Uncontrolled waste disposal also encourages disease vectors to breed, leading to increases in infectious diseases. Today less than 5% of all waste is reused or recycled, leading to loss of valuable resources.

The main underlying challenge today is that waste management is very heavily subsidized by the central government, without any collection of fees from households of companies. As a result, the operational budgets are limited. Where collection services are not provided, waste is dumped illegally on vacant lots in the city, in water bodies or randomly in rural areas.

Uncontrolled dumping leads to numerous health-related and negative environmental impacts, also due to exposure to hazardous and infectious waste. Lack of facilities and resources make that less than 1% of all hazardous and e-waste and less than 5% of all infectious waste generated in Suriname is collected and treated separately. The rest is dumped randomly on open dump sites. Reuse and recycling is done

on a very limited level, and only covers those waste streams that make recycling profitable. The reuse and recycling sector lacks governmental and financial support and is hampered by the lack of regulations and enforcement.

## IWMP

The key principles of this IWMP are the following:

1. Protecting the **public health and environment** according to the 5-R principles. This includes active implementation of the 5-R principles, including active support to reuse and recycling; Terminate open dumping and uncontrolled burning of waste as soon as possible; Separate and effective management of hazardous and infectious wastes; Until sanitary landfills are constructed: regulate current dumping practices in the best possible manner;
2. **Sanitary landfilling** as the preferred final disposal method, since sanitary landfilling is environmentally safe and requires much lower investment cost than a waste incinerator; Operating cost of landfills are also much lower, and can be done locally; Landfilling is much more robust against fluctuations, such as waste influx, operational problems or financing problems.
3. A **financially self-sufficient** sector, based on the Polluter Pays Principle: introduce appropriate self-financing mechanisms, including waste fees for households and industries; Establish a national waste fund; Ensure effective financial oversight, such as through a National Steering Committee for Waste Management; Ensure that impoverished households maintain access to waste services, such as through subsidy mechanisms.

These key principles have been elaborated into the following seven elements, each containing a series of short, middle term of long term actions:

### 1. Sound waste collection services and elimination of uncontrolled waste dumping

The vision is to ensure an efficient and cost-effective waste collection system that collects all generated waste in Suriname and prevents uncontrolled waste dumping.

Its targets are:

- An equitable system of charging for waste management (collection, disposal) based on the Polluter Pays Principle is fully introduced;
- Waste collection activities are regulated and conducted in accordance with best practices for example as outlined in the Standard for Garbage Collection and Disposal from the Suriname Standards Bureau (Surinaams Standaarden Bureau).

### 2. Safe treatment and disposal of waste on sanitary landfills and by means of other technologies

The vision is to ensure that all residual waste streams that cannot be processed after application of the 5-R principles, are treated or disposed of safely on sanitary landfills, based on sufficient storage capacities.

Its targets are:

- Waste management facilities, such as landfills, are designed to eliminate or minimize detrimental public health and environmental impacts, and are licensed and managed in accordance with best practices and approved environmental management plans;
- Dumpsites that are no longer used are closed in an environmentally sound manner and periodically monitored to minimize detrimental environmental and public health impacts;
- Safe treatment of waste streams that will not be disposed of on sanitary landfills, including paddy husk and (infectious) medical waste.

### **3. Sustainable management of chemical, infectious and hazardous waste streams**

The vision is to ensure a system that manages and treats all chemical, infectious and hazardous waste streams in an efficient and cost-effective manner without any negative impact on the environment or public health.

Its targets are:

- All chemical, infectious and hazardous waste streams are stored safely at the source, separate from other waste streams;
- All chemical, infectious and hazardous waste is collected separately, timely and safely without risks for the environment or public health;
- All collected chemical, infectious and hazardous waste streams are either reused, treated or disposed of in an environmentally safe manner, in accordance with national and international standards.

### **4. Creating a resource circular economy based on the 5-R principles**

The vision is a national waste management system that ensures good use of natural resources through the maximized application of the 5-R principles for waste streams.

Its target is to:

- Maintain the cleanliness of areas through the improvement of waste collection, expansion of service area and introduction of separate waste collection systems. The introduction of separate collection is aimed at the increase of the recovery amount of recyclable materials for reuse, minimizing discharge of waste into the environment, and reducing the cost burden for Solid Waste Management (SWM) and recycling, thus saving resources and reducing residual waste amount for final disposal.

### **5. Ensuring sustainable financing mechanisms**

The vision is a waste management sector that is financially self-sufficient, efficient and transparent, based on the Polluter Pays Principle.

Its target is to:

- Establish a vital SWM financial system and capacities through a series of tasks for minimizing the cost, allocating sufficient budget, maximizing recovery of waste fees, setting a fair waste tariff, and practicing a transparent and independent accounting system.

### **6. Awareness raising, public participation and capacity building**

The vision is a Surinamese society, including households, companies and product-importers, that is fully aware of the principles and benefits of sustainable waste management based on the 5-R principles, and of their individual tasks and responsibilities to implement these principles.

Its target is to:

- Raise awareness of all the stakeholders for conducting effective SWM activities, environmental conservation, establishing a sound resource recycling society, which can be achievable with fulfilling the responsibility of each waste generator or stakeholder.

### **7. Effective monitoring and enforcement**

The vision is a monitoring and enforcement system that follows up effectively all provisions and regulations of the integrated waste management system of Suriname.

Its target is to:

- Strengthen the activities and capabilities for monitoring, reporting and regular evaluation of the SWM activities through collecting, accumulating and analyzing the baseline data related with SWM activities. In addition, the reporting system will be regulated for preparation of monthly



and annual reports describing outcomes of the monitoring and enforcement activities in the month/year together with the analysis of achievement levels.

### Financing the Waste Sector

The total required operating cost for Suriname in 2022 has been estimated to be 8.7 Million Euro. This requires that appropriate financing mechanisms must be developed, including tariffs for households and industries. For example: a household fee of 90 SRD per month and an industrial fee of 1573 SRD per ton of waste would fully recover the operation expenses.

Year	2022	2027	2033
Domestic waste (ton)	140.000	182.000	231.000
Number of households	161.000	179.000	203.000
Proposed total revenues	€ 6.952.000	€ 9.288.000	€ 13.296.000
Domestic waste fee per ton	€ 50	€ 51	€ 58
Waste fee per household per month	€ 3,60	€ 4,32	€ 5,46
<b>Monthly household fee in SRD</b>	<b>90 SRD</b>	<b>108 SRD</b>	<b>136 SRD</b>
Industrial waste (ton)	27.630	29.320	31.500
Proposed total revenues	€ 1.738.000	€ 2.322.000	€ 3.324.000
Industrial waste fee per ton	€ 63	€ 79	€ 106
<b>Industrial fee per ton in SRD</b>	<b>1573 SRD</b>	<b>1980 SRD</b>	<b>2638 SRD</b>
Total revenues	€ 8.690.000	€ 11.610.000	€ 16.620.000

The total required capital investments for Greater Paramaribo, covering around 80% of the population of Suriname, has been estimated at 30 M€ including closing existing dumpsite of Ornamibo; Phased construction of a sanitary landfill at Ornamibo; Construction of one large transfer station; Construction of three small transfer stations; Construction of an organic waste composting facility; Additional collection bins, including awareness raising and other interventions. These capital expenditures will not all be required directly. For example, the new sanitary landfill at Ornamibo will consist of five different waste cells that can be constructed one after the other, with each cell having an operational lifetime of around five years.

Financing these capital investments might be partly realized through various Development Finance Institutions (DFIs), which are either bilateral, regional or multilateral institutions. DFIs generally have a mandate to provide finance for capital investments that promote development. The purpose of DFIs is often to ensure investments where otherwise the commercial markets would not invest.

It may also be considered to involve the private sector to manage (part of) the required capital investments, constructions, and / or part of the daily operations of SWM. The advantage would be that external private technical and financing expertise and experience can be introduced to Suriname, leading to potentially smaller operational risks and higher efficiencies.

### National Coordination

The tasks regarding regulation and management within the waste management sector are currently divided over various ministries and agencies, with sometimes overlapping responsibilities. It is advised to establish a permanent structure for national coordination of waste management related strategies,

policies, budgeting and major investments, in which an overall SWM Steering Committee would guide the strategic planning aspects and a dedicated number of Waste Management Utilities would be responsible for daily management of the operations, including contact management of private SWM Contractors. When major capital investments are done, it is advised to establish a separate Program Management Unit (PMU) to oversee these investments and related contracts.

The SWM Steering Committee will be able to take initiatives for implementing the plan and projects formulated in the IWMP. It will have the primary roles and responsibilities to formulate and update the IWMP, implement the priority projects, appropriate the project costs, procure the required resources through the proposed PMU, coordinate with the relevant authorities/parties, and other required functions for achieving the IWMP as intended and scheduled. The suggested organogram is presented below (Figure 1).

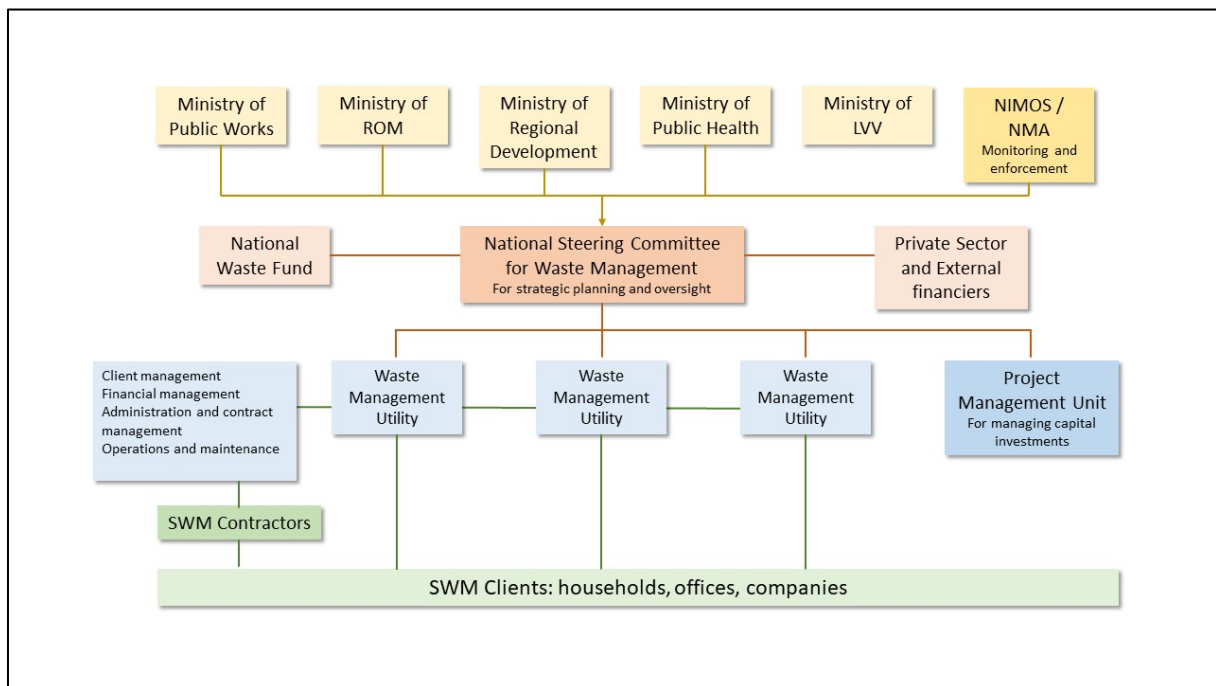


Figure 1: National Steering Committee for Waste Management

## 4. Conclusions and Immediate Actions

This IWMP has been prepared in accordance with the Terms of Reference of ROM with reference DM1040/2021. It addresses the key issues required to develop a sustainable waste management system for the Republic of Suriname, based on the relevant Sustainable Development Goals of the United Nations and the national Environmental Framework Act, including the 'Precautionary Principle' and the 'Polluter Pays Principle'.

This IWMP advises national authorities and districts on their responsibilities and related consequences in terms of sustainable waste management and applicable legislation, based on a thorough analysis of the key sources and waste characteristics, including types and amounts of waste streams generated, collected, recycled, beneficiated and disposed of, as well as of the current environmental and public health challenges at stake. It provides practical action on how to embark on the 5-R principles, including refuse, reduce, reuse, repurpose, and recycle and final treatment of waste streams on a national level, within an appropriate institutional and financial context. Actions have been elaborated for both the short-term, middle-term and long-term and addresses industrial, household, agricultural, hazardous and infectious waste.

This IWMP also provides an outline of the financing and proposed tariff structures, revenue collection and payment for services, including disposal, as well as a coordination structure for integration of the various solid waste management functions of the various stakeholders, a community, commercialization and public awareness program, as well as the implications of this IWMP in terms of legislation and policies.

Figure 2 gives an overview of the seven elements of the IWMP, as well as the enablers.

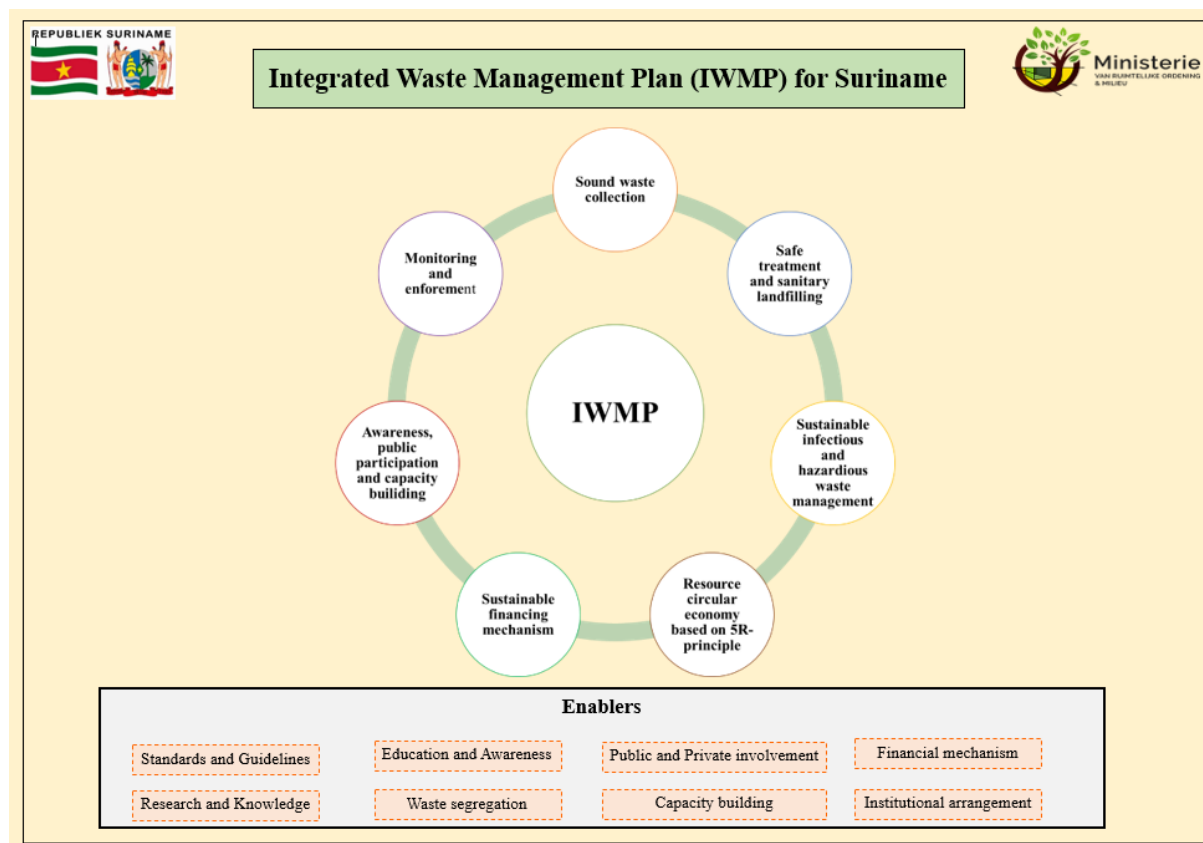


Figure 2: The seven elements and the enablers of the IWMP

We trust that with this IWMP, ROM and the other responsible ministries and authorities have been provided with an effective tool to further implement the principles and proposed actions of integrated solid waste management in Suriname and to elaborate this into related waste management investments, planning, policies and guidelines.

***“Low Hanging Fruits”***

A series of activities can be undertaken more or less immediately. These ‘low hanging fruits’ could be coordinated through the Ministry of ROM and for instance be included in the annual ministerial budgets.

These are presented in the following table (**Table 1**).

*Table 1: Low Hanging Fruits*

No.	Activity	Description	Involved organizations	Cost indication (SRD)
1.	Integrated SWM Standards and guidelines for the districts	Development of guidelines and operational standards for all districts in Suriname, based on the IWMP principles, with a focus on: <ul style="list-style-type: none"> <li>• Basic household waste collection and transportation</li> <li>• Separation of waste streams at household level to accommodate reuse and recycling, including composting</li> <li>• Operational rules for the current dumpsites, including fencing, entrance regulations, waste testing and acceptance procedures, faced disposal procedures, daily waste coverage and related environmental /health protection measures</li> <li>• Dissemination of all guidelines and standards towards the districts</li> </ul>	ROM – policy coordinator OW – main SWM executive ROS – executive in districts NIMOS – standards, monitoring and enforcement	500.000 SRD
2.	Hazardous waste management policies and guidelines	Develop standards and compliance mechanisms for managing and treating of hazardous waste, including waste oils, with a focus on: <ul style="list-style-type: none"> <li>• Definition and classification of hazardous streams according to international and local standards</li> <li>• Operational procedure for separate and safe collection, storage and management of small hazardous waste streams (klein chemisch afval)</li> <li>• Standards for separate collection and transportation of all hazardous wastes, as well as its storage and treatment in a manner that provides protection for the environment and human health;</li> <li>• Ensuring that hazardous waste is not diluted or mixed with other wastes</li> </ul>	ROM – policy coordinator VG - health standards OW – main SWM executive ROS – executive in districts NIMOS – standards, monitoring and enforcement	400.000 SRD

No.	Activity	Description	Involved organizations	Cost indication (SRD)
		<ul style="list-style-type: none"> <li>• Ensuring that hazardous waste is packaged and labelled in accordance with the classification standards (see first bullet)</li> <li>• Identification and development of temporary hazardous waste storage facilities in every district</li> </ul>		
3.	Infectious waste management	<p>'Infectious' waste is a special category of hazardous waste, containing viable micro-organisms or their toxins which may cause disease in man or other living organisms. Separate standards and compliance mechanisms shall be developed for managing and treating of infectious waste, with a focus on:</p> <ul style="list-style-type: none"> <li>• Definition and classification of infectious waste streams according to international and local standards</li> <li>• Standards for separate collection, storage and transportation of infectious wastes, as well as adequate treatment, such as incineration or autoclaving;</li> <li>• Ensuring that infectious waste is not diluted or mixed with other waste</li> <li>• Identification and development of temporary infectious waste storage facilities until sufficient treatment capacities have been developed.</li> </ul>	ROM – policy coordination VG - health standards OW – main SWM executive ROS – executive in districts NIMOS – standards, monitoring and enforcement	200.000 SRD
4.	Paddy husks waste management	<p>Development of a strategy for management and treatment of paddy husks waste, which is a major waste stream generated by rice producers, with a focus on:</p> <ul style="list-style-type: none"> <li>• Standards for separate collection, storage and transportation of paddy husk waste</li> <li>• Identification and development of adequate treatment technologies, such as incineration or digestion facilities, to transfer paddy husks into energy</li> </ul>	ROM – policy coordination OW - implementation LVV – rice production sector NIMOS – standards, monitoring and enforcement Ministry of Finance – financing Ministry of Natural Resources/ Energy Company Suriname – energy reuse	300.000 SRD

No.	Activity	Description	Involved organizations	Cost indication (SRD)
		<ul style="list-style-type: none"> <li>• Realization of pilot facilities to test the practical feasibility the proposed treatment technologies</li> <li>• Development of a strategy for national implementation of the proposed paddy husk waste management approach</li> </ul>		
5	Reuse/recycling policies	<p>Development of policies and incentives to support the expansion of the reuse and recycling of wastes, with a focus on:</p> <ul style="list-style-type: none"> <li>• Measures to promote the reuse and recycling of waste, by supporting reuse, recycling and repair networks, the use of economic incentives and tax instruments, based on the IWMP and recent pilot projects</li> <li>• Procurement criteria and strategy for equipment and facilities to enable collection of wastes suitable for reuse and recycling, such as waste bins, plastic bags etc., to be developed with the reuse and recycling sector</li> <li>• Public information campaigns to inform the public about rules and guidelines to separate reusable/recyclable waste materials</li> </ul>	ROM – policy coordinator OW – main SWM executive ROS – executive in districts NIMOS – standards, monitoring and enforcement	400.000 SRD
6	Tariff policies for industrial products and waste	<p>According to the IWMP, financing of the waste sector shall be developed according the Polluter Pays Principle, which includes the industrial sector. The following aspects are to be developed in cooperation with the key stakeholders:</p> <ul style="list-style-type: none"> <li>• Ensure that any entity who develops, manufactures, processes, treats, sells or imports products takes up an “extended producer responsibility”</li> <li>• Ensure that production and marketing of products in Suriname are durable, suitable for multiple use and suitable for proper and safe recovery and environmentally safe disposal</li> </ul>	ROM – policy coordinator EZ – public sector involvement Ministry of Finance – finance OW – main SWM executive ROS – executive districts NIMOS – standards, monitoring and enforcement	300.000 SRD

No.	Activity	Description	Involved organizations	Cost indication (SRD)
		<ul style="list-style-type: none"> <li>• Operational procedure for separate and safe collection, storage and management of all industrial waste streams</li> <li>• Tariff policies that include waste fees to be paid per ton for different categories of industrial wastes to be disposed in Suriname, as well as deposit arrangements (statiegeld), packaging charges (verpakkingsheffingen), and disposal fees on certain products (verwijderingsbijdragen)</li> </ul>		
7	Public awareness raising	<p>According to the IWMP, the public shall be fully aware of the principles and benefits of sustainable waste management based on the 5-R principles, and of their individual tasks and responsibilities to implement these principles. To this end this following shall be implemented:</p> <ul style="list-style-type: none"> <li>• Development of a national awareness campaign strategy on the principles of sustainable waste management based on the 5-R principles, directed to different target groups, such as households, offices, companies and educational centers</li> <li>• Preparation of methodological toolkits to support awareness campaigns and facilitate involvement of different subjects of integrated waste management, such as the 5-R principles, waste separation at the source, the use of separate waste collection bins and the management of hazardous wastes</li> <li>• Establish and implement national environmental education and awareness programs related to all aspects of integrated waste management</li> </ul>	ROM – policy coordinator MINOWC - education	450.000 SRD



No.	Activity	Description	Involved organizations	Cost indication (SRD)
8	IWMP National Steering Committee	<p>The IWMP advises to establish a permanent structure for national coordination of waste management related strategies, policies, budgeting and major investments. The following shall be prepared:</p> <ul style="list-style-type: none"> <li>• Develop of Terms of Reference for such a permanent steering committee, as well as for the establishment of a national waste fund, for which the steering committee will be responsible</li> <li>• Elaborate the tasks, responsibilities and financial arrangements for this national steering committee jointly with all ministries involved</li> <li>• Seek governmental approval for the setting up this steering committee.</li> <li>• Establish such a national steering committee to coordinate the short term actions presented in this overview and next the IWMP at large</li> <li>• Develop an effective licensing, monitoring and enforcement system for regulating the waste sector (IWMP / Nationale Milieu Autoriteit), including performance indicators to be used by the national steering committee</li> </ul>	<p>ROM – policy coordinator  OW – main SWM executive  LVV – agricultural waste  VG – public health  ROS – executive in districts  NIMOS – standards, monitoring and enforcement</p>	300.000 SRD