



Lao People's Democratic Republic
Peace Independence Democracy Unity Prosperity

SUSTAINABLE SOLID WASTE MANAGEMENT

STRATEGY AND ACTION PLAN
FOR VIENTIANE 2021-2030



Acknowledgements

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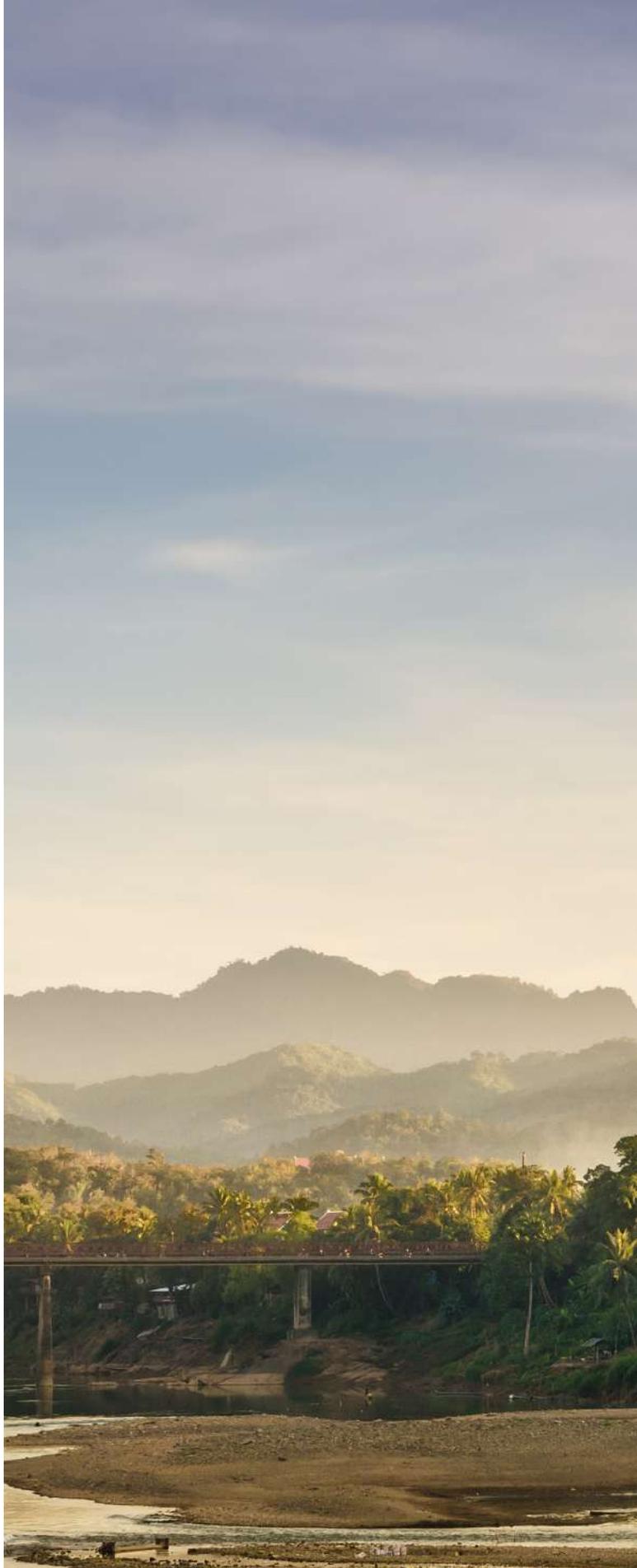




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ACRONYMS

3R	Reduce, Reuse, Recycle	JICA	Japan International Cooperation Agency
ADB	Asian Development Bank	KOICA	Korea International Cooperation Agency
CSO	Civil Society Organization	LAO PDR	Lao People's Democratic Republic
DAF	Department of Agriculture and Forestry	LAK	Lao Kip
DES	Department of Education and Sport	LSB	Lao Statistics Bureau
DOIC	Department of Industry and Commerce	MBT	Mechanical and Biological Treatment
DOH	Department of Health	MSW	Municipal Solid Waste
DPWT	Department of Public Works and Transport	MONRE	Ministry of Natural Resources and Environment
DONRE	Department of Natural Resources and Environment	NGOs	Non-Governmental Organizations
EEP	Energy and Environment Partnership	NGGS	National Green Growth Strategy
EPF	Environment Protection Fund	PPP	Public Private Partnership
EPR	Extended Producer Responsibility	RDF	Refuse Derived Fuel
EU	European Union	SDGs	Sustainable Development Goals
GCF	Green Climate Fund	SOs	Strategic Outcomes
GDP	Gross Domestic Product	TPD	Ton Per Day
GGGI	Global Green Growth Institute	USD	United States Dollar
GIS	Geographic Information System	VCOMS	Vientiane City Office for Management and Service
GOV	Government	VTE	Vientiane
HHs	Households	WB	World Bank
JFPR	Japan Fund for Poverty Reduction	WHO	World Health Organization



EXECUTIVE SUMMARY

Solid waste management is one of the most pressing urban challenges and strategic priorities of the city government of Vientiane, with the mayor calling for immediate actions to solve the waste disposal problem, including the illegal dumping and open burning that are routinely practiced by most citizens. More than half of the waste in the city is not collected, while the collected waste is uncontrollably disposed of at the landfill located 32 km away from Vientiane Capital.

Current waste handling and disposal practices, an example being open burning, have negative impacts on public health and the environment, as they can cause pollution and affect the respiratory system, thereby resulting in increased morbidity and mortality. Organic waste that is disposed of at the landfill and not properly treated also generates methane and contributes to greenhouse gas emission, which has the biggest effect on global warming. In addition, valuable waste that is not recovered implies economic loss which could have been recouped if well managed.

Despite the challenges faced by the city government, there are opportunities and political will for the transition to a more sustainable waste management system. The Vientiane City Office for Management and Service (VCOMS), with the technical support from the Global Green Growth Institute (GGGI) and the financial support from both the Korea International Cooperation Agency (KOICA) and the Environment Protection Fund (EPF), has developed a 10-year roadmap for the solid waste management vision and strategy 2030 that presents a vision, six strategic outcomes, medium and long-term targets, and associated work plan. It also lays out a basic framework for a paradigm shift from waste management towards resource management approaches that can eventually maximize waste-to-resource opportunities while minimizing waste generation.

The strategy entails four main chapters: i) the solid waste management situation in Vientiane, ii) Sustainable Solid Waste Management Vision and Strategy 2030, iii) Work and Activity Plan for 2021-2030, and iv) Implementation mechanisms.

The strategy development emphasizes the leading role of the city of Vientiane and the responsible entity (VCOMS) in ensuring the provision of sustainable public services to achieve a clean, green, and livable city.

01

**SOLID WASTE
MANAGEMENT
SITUATION IN
VIENTIANE**

1. HISTORICAL BACKGROUND

Before 1998, solid waste management in Vientiane mainly provided collection services to business entities i.e., markets, restaurants, and hotels, at that time being managed by the Urban Cleaning and Environmental Protection Authority, which is currently known as Vientiane City Office for Management and Service (VCOMS).

The city of Vientiane has received international development support since 1998 to improve and extend the solid waste management system. The first grant, worth 5.5 million USD, was from the Japan International Cooperation Agency (JICA) to deploy a waste collection transportation fleet and heavy machinery, an office building, and a warehouse at the landfill located at Km 18, which was later relocated and opened at Km 32, Phasouk village, Xaythany district, Vientiane Capital in 2009.

The grant from the Japan Fund for Poverty Reduction (JFPR), executed through the Asian Development Bank (ADB), focused on improving the environmental conditions and solid waste management practices in Vientiane. The Waste Picker Center was established in 2005 at the landfill located at Km 18, having been moved to Km 32 in 2009, and here the recyclables collected by informal waste pickers were exchanged for cash as a poverty reduction measure in the waste sector. This Waste Picker Center was under the responsibility of, and operated by, the waste picker community themselves.

Additional support from JICA was provided from 2011 to 2015 through the LPPE program - Laos Pilot Program for Narrowing the Development Gap towards ASEAN Integration, Environmental Management Component. The project focused on three cities (Vientiane Capital, Luang Prabang, and Xayaboury) and was aimed at improving the landfill itself and the access roads leading to it, in addition to the provision of the transportation fleet. The transfer center was built in Vientiane through this development aid program, and 50 new waste collection trucks, two large compactor trucks, one water tank truck, and three soil dump trucks were additionally provided. Despite the support from the international communities, the household waste collection rate still remains below 40% in Vientiane, with no formal waste-to-resource initiatives.

To increase the access to adequate waste collection services for all citizens and to promote waste-to-resource opportunities, GGGI, with KOICA's financial support, launched a project titled "Wastewater and Solid Waste Treatment Capacity Building Project for City Environment Improvement in Lao PDR" in 2019, which will be implemented until 2023.

2. INSTITUTIONAL ARRANGEMENT AND PERSONNEL

The Vientiane City Office for Management and Service (VCOMS) is the local authority responsible for municipal solid waste management. Waste collection services are provided by two government-owned collection companies and ten private collection companies, all of which are governed by VCOMS. The table below presents the list of collection companies and information on human resources.

TABLE 1 List of waste collection companies and staffing in Vientiane¹

#No	Name of companies	Number of staff		Total
		Permanent	Contract	
I	Government-owned	16	221	237
1	Division of Transportation Services, VCOMS	13	209	222
2	Waste Collection Services Unit of Chanthabuly District	3	12	15
II	Private collection companies	-	251	251
3	Waste Transportation Services Company (Xaysetha District)	-	50	50
4	Sisattanak Waste Transportation Company Ltd.	-	40	40
5	Chanthabuly Cleaning Company Ltd.	-	30	30
6	Lao Garbage Company Ltd.	-	23	23
7	Services Enterprise	-	18	18
8	SKD Cleaning Company	-	18	28
9	Dao Xay Waste Transportation Company	-	14	14
10	Waste Pro Company Ltd.	-	36	36
11	Top One Development Company	-	10	10
12	SS Company Ltd.	-	12	12
Grand total		16	472	488

3. WASTE GENERATION

Vientiane Capital consists of 9 districts, namely Chanthabouly, Sikhottabong, Sisattanak, Xaysetha, Xaythany, Naxaithong, Hadxaifong, Sangthong, and Pakngum. According to the Lao Statistics Bureau (LSB) and VCOMS, there are 481 villages and 161,655 households with a total population of 948,447, as of 2020.

Vientiane Capital is divided into 4 zones based on the population density: i) population density over 2,000 people/km² - Chanthabouly and Sisattanak districts, ii) population density between 650 to 750 people/km² - Sikhottabong and Xaysetha districts, iii) population density between 180 to 300 people/km² - Hadxaifong and Xaythany district, and iv) population density lower than 100 people/km² - Pakngum, Naxaithong, and Sangthong districts.

¹- Information retrieved from the summary report prepared by the division of waste collection and disposal at VCOMS (2018).

According to the survey conducted by GGGI in 2020, the waste generation per capita in Vientiane is 750g/day², while the total household waste generation was calculated as 711 ton/day according to the Vientiane Capital population data from LSB. With waste generated from other sources such as business entities and public buildings counted, the total waste generation in Vientiane amounted to approximately 970 ton/day in 2020.

- Waste generation per capita: 750g/day
- Total household waste generation: 711 ton/day
- Household waste collection rate: 31%³
- Estimated other waste generation: 259 ton/day⁴
- Total waste generation: 970 ton/day

To calculate projected waste generation per capita from 2021 to 2030, the World Bank's regression model (World Bank, 2018) is used as a methodology to capture the co-relation between GDP per capita and waste generation per capita. The World Development Indicator's GDP per capita (2011 PPP international \$/year) is applied to the GDP per capita projection for target year from 2021 to 2030 and to determine change in the proxy waste generation rate. The population projection data from LSB is used to calculate the projection of the total household waste generation from 2021 to 2030.

The average annual GDP per capita growth rate of 6% from 2021 to 2030, obtained from the time series analysis on the GDP per capita PPP projection, is applied to estimate the volume of other waste generation from 2021 to 2030.

The table below presents the projected waste generation from 2021 to 2030.

TABLE 2 Projection of MSW generation in Vientiane from 2021-2030

2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Population (person)									
968,990	989,289	1,009,272	1,028,914	1,048,170	1,067,286	1,068,217	1,104,975	1,123,532	1,141,911
Household waste generation per capita (g/person/day)									
766	783	799	816	833	850	867	884	901	918
Household waste generation amount (Ton/day)									
742	774	807	840	873	907	926	977	1,012	1,048
Other waste⁵ generation amount (Ton/day)									
275	291	308	327	347	367	389	413	438	464
MSW generation (Ton/day)									
1,017	1,065	1,115	1,167	1,219	1,274	1,315	1,389	1,450	1,512

2- A total of 40 households' samples from 9 districts were collected to estimate waste generation per capita in 2020.

3- The waste collection rate at the household level in 2020 was reported by VCOMS.

4- This amount was calculated based on the household waste collection rate (31% in 2020), recycling rate of household waste and other waste obtained from survey in 2020, daily waste disposal at the landfill (394 ton/day), waste collection rate of other waste (87%, estimated by JICA in 2011).

5- Other waste include waste from commercial areas (café, restaurants, hotels) and public buildings.

4. WASTE COMPOSITION

According to the waste composition analysis conducted in 2020 by GGGI, the largest share of the waste composition in Vientiane is organic waste (e.g., food, wood, bamboo, leaves) which accounts for 67% of total waste generated in Vientiane, followed by plastics for 12.1%, paper and cardboard for 8.8%, glass for 3.3%, and others.

FIGURE 1 Waste composition of MSW in Vientiane (%)⁶

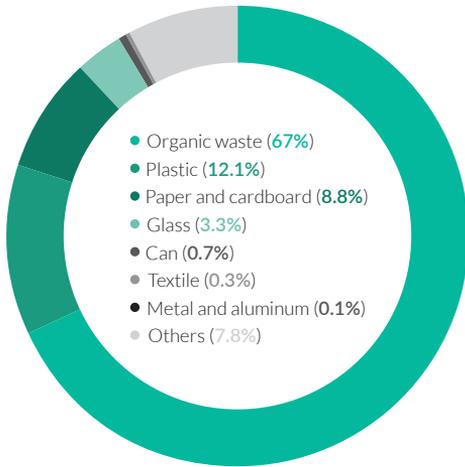
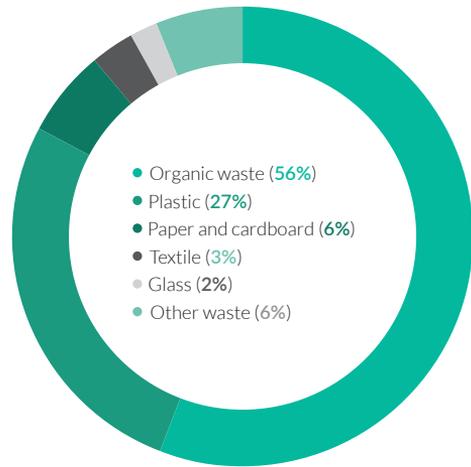


FIGURE 2 Waste composition at the landfill in Vientiane (%)



The following table illustrates the share of different waste types in its composition.

TABLE 3 Share of waste composition by waste type in Vientiane

Waste Stream	Type of Waste	Share of Waste Composition (%)
Organic Waste	Food waste	44.3
	Garden waste	22.7
Plastics	PET bottle	3.5
	EPE Foam	0.2
	Other plastics	8.3
Paper/Cardboard	Cardboard	4.8
	Paper	4.0
Glass	Glass	3.3
Can	Can	0.7
Textile	Textile	0.3
Metal and aluminum	Metal and aluminum	0.1
Others	Others	7.8

⁶- Based on the result of GGGI survey conducted in 2020.

5. WASTE COLLECTION COVERAGE AND RATE

The waste collection service does not reach the whole Vientiane Capital area, leaving 22,877 households, which account for 14% of the total households, out of the service areas. The VCOMS data on the contractual situations as of 2020 shows that only 31% (50,624 HHs) of all the households are currently using the municipal waste collection services.

According to the field study conducted by VCOMS and GGCI in 2017, actual user percentage at the household level is higher than the collection rate, as multiple households share one contract to access the collection service for a cost-saving purpose. Therefore, the current collection rate (31%) can be considered as undercounted compared to a real-life situation.

FIGURE 3 Waste collection coverage and rate in Vientiane as of 2020

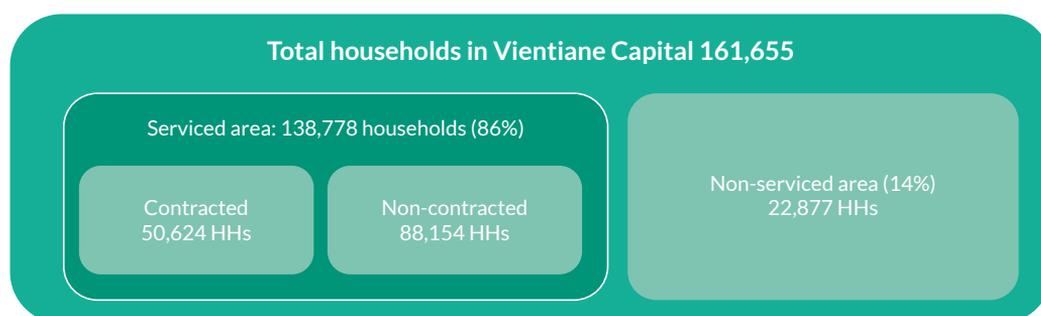


TABLE 4 Waste collection coverage and rate in each Vientiane district as of 2020

District	Total No. village	Total No. household ⁷	Serviced area				Non-serviced areas		Collection rate (%)	
			Village	No. of Household	Contracted	Non -contracted	No. of Village	No. of Household	HHs with Contract (%)	HHs without contract (%)
Chanthabouly	30	13,535	30	13,535	7,946	5,589	0	0	59	41
Xaysetha	48	24,064	46	23,593	9,730	13,863	2	471	40	60
Sikhottabong	60	26,656	59	26,600	8,129	18,471	1	56	30	70
Sisattanak	37	11,993	37	11,993	7,922	4,071	0	0	66	34
Hadxaifong	60	21,444	56	20,491	8,206	12,285	4	953	38	62
Xaythany	104	34,397	73	29,119	7,037	22,082	31	5,278	20	80
Naxaithong	54	13,413	40	10,595	1,200	9,395	18	2,818	9	91
Sangthong	35	6,187	1	394	38	356	32	5,793	1	99
Pakngum	53	9,966	9	2,458	416	2,042	44	7,508	4	96
Total	481	161,655	351	138,778	50,624	88,154	132	22,877	31	69

7- The number of households in each district is estimated based on the average household size which is calculated from the number of total households and the number of populations provided by LSB. On average, the household size was estimated as 5.3 members.

6. WASTE COLLECTION OPERATION HOURS

The waste collection services in Vientiane Capital are based on door-to-door collection, where waste collection trucks collect the waste at the door of residential houses/buildings, collection points, business entities, and office buildings once a week. A daily collection service is provided for business entities, and the frequency of the collection service is determined based on the negotiation with the collection company. To avoid traffic, the operation hours are officially from 8:00 p.m. to 5:00 a.m., however the private collection companies prefer to collect during working hours. Working days are between Monday and Saturday, as Sunday is a day off for the drivers and crew.

7. LANDFILL

In 1998, a landfill site was established, with JICA's assistance, in Vientiane Capital, Phokham Village, Xaythany District, located 18 km from the Vientiane city center. The landfill was relocated, in 2009, at Km 32, Phasouk Village, Xaythany District, with a 2.5-km access road from national Rd13 south to the landfill, with the total area of approximately 748 ha of land, while the utilized area is approximately 100 ha (Vientiane government order, No. 430/VTE GOV, dated September 10, 2007).

There are currently 700,000 tons of legacy waste buried at the landfill as of 2019, and the life expectancy of the landfill is around 10 years if no intervention measures are made.

General waste has been disposed of, compressed, and covered with layers of soil at the landfill to prevent attracting pests, such as flies, rats, and odor.

The private collection company pays 40,000 kip/ton as a tipping fee for landfill operation. There are currently 220 waste pickers operating at the landfill, scavenging recyclables and selling them to the buying center established within the landfill premises.

Based on the MSW generation estimation and volume of waste arriving at the landfill, 41% of the municipal waste generated in Vientiane is collected and disposed of at the landfill daily. The following table presents the volume of waste disposed of at the landfill from 2012 to 2020.

TABLE 5 Volume of waste disposed of at the landfill at Km 32 from 2012-2020⁸

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020
Daily waste volume (T)	236	248	273	284	278	312	349	405	394
Annual waste volume (T)	86,023	90,407	99,604	103,662	101,641	114,063	127,408	147,835	143,891

⁸- This information was provided by the Division of Waste Collection and Disposal at VCOMS in 2020.

8. HEALTHCARE WASTE

According to the definition by WHO, health care waste includes all the waste generated by health care establishments, research facilities, and laboratories, as well as the waste originating from “minor” or “scattered” sources which are produced during health care undertaken at home (e.g., dialysis, insulin injections, etc.).

Between 75% and 90% of the waste produced by health care providers is non-risk or “general” health care waste, comparable to domestic waste. It comes mostly from the administrative and housekeeping functions of health care establishments and may also include waste generated during the maintenance of health care premises. The remaining 10–25% of health care waste is regarded as hazardous and may create a variety of health risks, as they contain potentially harmful micro-organisms that can infect hospital patients, health workers, and the general public. Other potential hazards may include drug-resistant microorganisms which can spread from health facilities into the environment.

As some health care waste is considered hazardous, it is necessary to separate it from general waste. The infectious waste must be sterilized or treated by autoclave before being transported and disposed of at the landfill. However, some health care services cannot sterilize the waste due to lack of equipment, knowledge, and awareness.

In Vientiane Capital, the waste collection and disposal division under VCOMS is responsible for managing health care waste, transporting it to the Km-32 landfill, and disposing of it in the two combustion incinerators, which can take up to 200 kg and 600 kg per day, respectively. These incinerators are operated at 1,200°. and their total daily capacity is 800 kg/day, while the health care waste disposed of at the incinerators is approximately 338 kg per day as of 2019⁹.

Currently, 29 health care facilities in Vientiane Capital have signed the contract with VCOMS, with three types of waste coming from the health care sector: i) general waste, ii) sterilized waste and, iii) infectious waste. While general and sterilized waste are disposed of at the landfill, the infectious waste is required to be disposed of at the incinerators.

9- The data was collected from the VCOMS official at the Division of Waste Collection and Disposal.

9. WASTE COLLECTION TRANSPORTATION FLEET

There are 140 waste collection vehicles and these can be divided into 4 main types of vehicles, including 74 waste compactor trucks, 47 modified dump trucks, 17 detachable container trucks, and 2 trucks for health care waste.

TABLE 6 Types and number of vehicles used for waste collection and transportation services¹⁰

No	Sectors provide waste collection services	Compactor trucks	Dump trucks	Container trucks	Truck for healthcare waste
I	Public Sectors	42	6	8	2
1	Division of Transportation Services (DTS) VCOMS	40	5	8	2
2	Unit of Transportation Services (VCOMS Chanthabouly)	2	1		
II	Private Sectors	32	41	9	0
3	Waste Transportation Services Company (Xaysetha district)	3	12		
4	Sisattanak Waste Transportation Co., Ltd	16	2	3	
5	Chanthabouly Cleaning Co., Ltd.	1	6		
6	Lao Garbage Co., Ltd.	2	3		
7	Services Enterprise	1	4		
8	SKD Cleaning Company	2	5	2	
9	Dao Xay Waste Transportation Company		4		
10	Waste Pro Co., Ltd	4	1	3	
11	Top One Development Company		3		
12	SS Co., Ltd	3	1	1	
	Total	74	47	17	2

¹⁰- The information was reported by the Division of Urban Inspection and Management at VCOMS in year 2019.

10. WASTE COLLECTION METHOD AND SERVICE CHARGE

Waste generators are responsible for storing the waste they generate in safe containers in order to avoid negative environmental and health impacts for the community. The municipal waste should be separated, at the source of generation, into three major waste types:

1. **Non-organic recyclable materials** which can be processed, refined, and recycled, such as plastic, paper, cardboard, scrap metal, glass, and can/aluminum.
2. **Organic waste**, such as vegetable waste and garden waste. Organic waste accounts for more than 60% of the total amount of waste generated in Vientiane and has the potential to be turned into resources such as compost, fertilizer, bio-gas, and animal feed.
3. **Non-recyclable dry waste.**

The waste collection and transportation service charge is managed by service providers in accordance with the announcement of the Vientiane Capital authority. The waste producer must regularly pay the service charge for collecting, transporting, and disposing of the collected waste, as well as the transportation service each month according to the quantity and rate specified in the contract. The state companies under VCOMS collect the revenue and expenditure through the receipt payment at the VCOMS office, while private operators pay a commission fee of 5,000 Kip per contract to VCOMS. The village authorities assign a service charge collector, with 10-12% of the waste collection revenue being granted to the village authorities for their operations.

The waste collection service charge is determined based on the decree approved by the mayor of Vientiane Capital on the unit cost of waste collection services in Vientiane Capital, no. 175/VTE.GOV, dated November 23, 2015, the detail being shown below:

- **Transportation Fee**
 - 1 basket/bag (20-25 Kg) = 10,000 LAK/bag
 - Bin (32.5 Kg or 60 liters) = 13,000 LAK/tank
 - Container (2.5 Ton) = 500,000 LAK/container
- **Tipping fee for operation at the landfill = 40 LAK/kg**
- **Service charge for infectious waste incinerator = 10,600 LAK/kg**

11. CHALLENGES WITH THE MUNICIPAL SOLID WASTE MANAGEMENT IN VIENTIANE CAPITAL

- Despite the international development aid provided to improve the transportation fleet, the household waste collection rate remains at 31%, while the remaining 69% of the population is not using the municipal waste collection services, which results in most citizens practicing illegal dumping and burning their waste, thereby hampering public health and the environment. The survey conducted by GGGI shows the high waste collection service charge as one of the main barriers for accessing the service.
- Obstacles for VCOMS waste collection trucks in both urban and suburban areas are the narrow roads and poor road conditions which make it impossible for VCOMS collection trucks to access houses in remote areas. Developing decentralized waste service collection points with the use of smaller dump trucks could be an option to increase access to services, as well as create green jobs in the waste sector.
- There is no municipal-led source separation mechanism, therefore all the waste is mixed and disposed of together, which imposes high pressure on the landfill and leads to economic loss in the waste value chain, as the resources are not recovered.
- The Km-32 landfill is not a sanitary landfill. The waste disposed of there is neither adequately discharged nor treated and, as such, the rehabilitation of the landfill is critical.
- There are neither policies nor facilities that encourage waste-to-resource initiatives, making it difficult to promote the principle of the 3Rs (Reduce, Reuse, Recycle) at the city level.
- There is no municipal-led waste treatment facility to process the largest share of the waste items such as organic waste and plastics.
- The annual budget allocated for VCOMS to operate the waste collection service is around 18 billion LAK, with the operational cost mainly being covered by the collection service charge and tipping fees at the landfill. However, it is not sufficient to cover all expenditure due to the low collection rate at the household level.



02

**VISION AND
SUSTAINABLE SOLID
WASTE MANAGEMENT
STRATEGY 2030**

1. VISION

“ Clean, Green, and Livable Vientiane City ”

2. GOALS

- By 2030, Vientiane will have become a city where every citizen has access to adequate waste collection services, with a high share of waste recovered through municipal-led waste-to-resource initiatives and facilities.
- Source separation will be understood/practiced as the responsibility of all citizens, while per capita waste generation rates will have been reduced.
- Vientiane will have been recognized as a city where informal waste pickers are integrated into the formal waste management system thereby benefiting from social protection schemes.

3. STRATEGIC OUTCOMES (SOs)

1. Strategic outcome 1: Increase access to adequate waste collection services by ensuring 100% waste collection rates for all citizens by 2030.
2. Strategic outcome 2: Maximize waste-to-resource opportunities by adopting source separation and transportation mechanisms for source separation.
3. Strategic outcome 3: Maximize the material recovery rate by increasing waste treatment capacity through mechanical and biological treatment (MBT) facilities.
4. Strategic outcome 4: Minimize waste generation.
5. Strategic outcome 5: Improve the financial and operational efficiency of the sector and the roles and responsibilities of VCOMS in waste collection service provision and treatment.
6. Strategic outcome 6: Foster green/decent job opportunities for the informal waste management sector.

4. ROADMAP AND TARGETS FOR STRATEGIC OUTCOMES

The table below illustrates the roadmap and timeline for six strategic outcomes for a 5-year timeframe over a period of 10 years. The table also presents the specific targets and milestones to be achieved in each timeframe.

Goals

By 2030, Vientiane will have become a city where every citizen has access to adequate waste collection services, with a high share of waste recovered through municipal-led waste-to-resource initiatives and facilities.

Source separation (households) will be understood/practiced as a responsibility of all citizens, while per capita waste generation rates will have been reduced.

Vientiane will have been recognized as a city where informal waste pickers are integrated into the formal waste management system thereby benefiting from social protection schemes.

Strategic outcomes	Intermediate targets 2021-2025	Long-term targets 2026-2030
SO1: Increase access to adequate waste collection services by ensuring 100% waste collection rates by 2030	<ul style="list-style-type: none"> Waste collection rate increased up to 70% Decentralized waste collection services demonstrated and implemented Waste collection service charges adjusted based on the citizens' affordability and willingness to pay 	<ul style="list-style-type: none"> 100% of the population benefiting from waste collection services Decentralized waste collection services scaled-up citywide
SO2: Maximize waste-to-resource opportunities by adopting source separation and improved transportation mechanisms	<ul style="list-style-type: none"> Transportation mechanisms for separate collection of organic/dry waste established and enforced 20% recycling rates achieved Community-based models, such as waste banks, for the recovery of recyclables and waste recycling collection points deployed in 4 out of 9 districts Waste separation practices enforced in most public buildings and medical institutions in Vientiane 	<ul style="list-style-type: none"> Community-based models for the recovery of recyclables deployed citywide 40% recycling rates achieved Extended Producer Responsibility (EPR) schemes for e-waste and other recyclable materials (e.g., plastics and glass bottles) demonstrated by consumer goods companies Centers for upcycling for "added-value" recyclables established and operationalized

SO3: Maximize the material recovery rate by increasing waste treatment capacity through mechanical and biological treatment (MBT) facilities

- A mechanical and biological treatment (MBT) facility at the landfill established
- Decentralized waste treatment facilities (waste-to-compost, waste-to-energy) piloted
- Compost from solid waste certified as a fertilizer used in agriculture
- Fully operationalized mechanical and biological treatment facility at the landfill
- 40% legacy waste at the landfill treated
- 80% of waste disposed of at the landfill properly treated
- Decentralized waste treatment facilities implemented citywide

SO4: Minimize waste generation

- Progressive target for waste generation per capita set up for 2030
- Engagement programs set-up with consumer goods industries and retailers to provide options for consumers to reuse, recycle, and reduce materials e.g., no single-use plastic)
- Regulations on banning single-use plastic introduced
- Awareness and educational campaign conducted on minimizing waste generation
- Stabilized waste generation per capita in Vientiane
- Regulation on banning single-use plastics enforced all over Vientiane

SO5: Improve the financial and operational efficiency of the sector and roles and responsibilities of VCOMS in the waste collection service provision and treatment

- New contracting mechanisms on waste collection and treatment services by VCOMS introduced and piloted
- A new unit to manage waste collection in partnership with informal waste pickers established and operationalized
- Transparent and stabilized financial management of waste collection and disposal
- Waste collection routes optimized and the GIS systems for the VCOMS waste transportation fleet introduced

SO6: Foster green/ decent job opportunities for the informal waste management sector

- Informal waste pickers involved in the provision of decentralized waste collection services
- Material recovery centers owned and operated by waste pickers' cooperative piloted in support of VCOMS
- Informal waste picker members organized in a form of association/NGO/ cooperative
- Waste pickers own and operate material recovery centers/ recycling & upcycling centers and can formally provide waste collection service in Vientiane
- Waste pickers given improved employment opportunities through municipal-led initiatives

5. INDICATIVE TARGETS ALIGNED WITH SDGS AND NGGS

The long-term targets for sustainable solid waste management for Vientiane are developed for the achievement of the National Green Growth Strategy (NGGS) of the Lao PDR till 2030 and the Sustainable Development Goals (SDGs). The following table presents the indicative long-term targets for each strategic outcome which are aligned to associated goals specified in NGGS and SDGs.

Strategic outcomes	Targets (2030)	NGGS (2030)	SDGs
SO1: Increase access to adequate waste collection services by ensuring 100% waste collection rates by 2030	100% of the population benefiting from waste collection services	Improve the waste management system to make it more efficient and effective	SDG 11.6. By 2030, reduce the adverse environmental impact of cities, including special attention given to air quality and municipal and other waste management
SO2: Maximize waste-to-resource opportunities by adopting source separation and improved transportation mechanisms	40% recycling rates to be achieved		SDG 12.3. By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses

<p>SO3: Maximize the material recovery rate by increasing waste treatment capacity through mechanical and biological treatment (MBT) facilities</p>	<p>80% of waste disposed of at the landfill properly treated</p>	<p>Percentage of garbage or waste reused or disposed of through proper methods and sites is 50 %, being increased to 65 % in 2025 and 80 % in 2030</p>	<p>SDG 9.4. By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, all countries acting in accordance with their respective capabilities</p>
<p>SO4: Minimize waste generation</p>	<p>Waste generation per capita stabilized in Vientiane</p>	<p>Average production of garbage or waste per person was 237 Kg/person/year in 2015. In 2025, it will be 210 kg/person/day and in 2030, it will be 180 kg/person/year</p>	<p>SDG 12.5. By 2030, substantially reduce waste generation through prevention, reduction, recycling, and reuse</p>
<p>SO5: Improve the financial and operational efficiency of the sector and the roles and responsibilities of VCOMS in the waste collection service provision and treatment</p>	<p>Transparent and stabilized financial management of waste collection and disposal</p>	<p>SDG 8.4. Improve progressively through 2030, global resource efficiency in consumption and production and endeavor to decouple economic growth from environmental degradation</p>	
<p>SO6: Foster green/decent job opportunities for the informal sector in waste management</p>	<p>Waste pickers given improved employment opportunities through municipal-led initiatives</p>	<p>SDG 8.3. Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity, and innovation, and encourage the formalization and growth of micro-, small-, and medium-sized enterprises, including through access to financial services</p>	

03

WORK AND ACTIVITY PLAN FOR 2021-2030

1. STRATEGIC OUTCOME 1:

Increase access to adequate waste collection services by ensuring 100% waste collection rates for all citizens by 2030

Ending open dumping and waste burning is the major priority of the Vientiane Capital Government. An important means to controlling the risk associated with unsound waste disposal that has a negative impact on the environment and public health is the increase of waste collection coverage and the rate. In this context, achieving access to adequate waste collection services for all citizens has been identified as the main strategic outcome.

The first strategic outcome will be supported by the following measures and work plans:

1. Work Plan 1: Development of a new waste collection service charge structure

- a. Objective: To develop an affordable and fair collection service charge structure that encourages citizens to use the service and separate waste at source.
- b. Main activities:
 - Conduct a survey on the level of willingness to pay for the service and motivation for source separation.
 - Pilot reduced collection fees and monitor changes in the waste collection rate.
 - Develop a new decree on the waste collection service charge structure that can be applied citywide.

2. Work Plan 2: Development of waste collection service charge payment mechanisms

- a. Objective: To improve efficiency in the waste collection service charge and increase transparency in municipal own-source revenue generation through waste management.
- b. Main activities:
 - Develop an online platform i.e., smartphone apps for the waste collection service charge payment in partnership with major banks.
 - Propose integrating waste collection service charges with other utility bills (electricity, water) or property tax.

3. Work Plan 3: Decentralized waste collection services with engagement of informal sector

- a. Objective: To support the provision of waste collection services to non-serviced areas and to improve the efficiency of the collection routes.
- b. Main activities:
 - Deploy decentralized waste collection services in partnership with informal waste pickers/street sweepers.
 - Establish feeder points for the collection of separated wet/dry waste and garden waste.
 - Scale up the service upon the assessment of the pilot initiatives.

4. Work Plan 4: Law enforcement and raising awareness

- a. Objective: To raise awareness so as to mobilize public participation in the new policy and regulations on the waste collection service.
- b. Main activities:
 - Enforce the law on the use of municipal waste collection services.
 - Create educational campaigns led by village heads on the new collection services, service charge structure, and payment mechanisms.
 - Create educational campaigns in partnership with local NGOs on source separation and waste minimization.

2. STRATEGIC OUTCOME 2:

Maximize waste-to-resource opportunities by adopting source separation and separation transportation mechanisms

Strategic outcome 2 is formulated to fulfill its commitment to the circular economy where waste is handled as a resource from the point of generation up until its final use/reuse as a secondary material. The key to the successful operation of any form of waste-to-resource initiatives is the ensuring of source separation, which can additionally increase the economic value of any material by improving the quality of the byproduct or final products of the waste materials when recycled. The work plans are shaped based on the goal of ensuring source separation from the point of generation, transportation, and treatment, while the material recovery focuses on the highest share of the waste composition, including organic waste, plastics, and can/glass bottles.

1. Work Plan 1: Set-up of citywide source separation mechanisms and distribution of proper bins for source separation

- b. Objective: To encourage households, public buildings, and business entities to separate recyclable materials i.e., organic waste, plastics, glass bottles from residual waste at source.
- c. Main activities:
 - Distribute smart bins to store food waste at the household level.
 - Distribute bio-degradable bags at large waste generators (e.g., markets, restaurants, hotels) for organic waste collection.
 - Deploy smart recyclable bins in public spaces throughout the city.

2. Work Plan 2: Set-up of transportation mechanisms that ensure source separation and separate disposal of waste

- a. Objective: To establish waste transportation mechanisms to prevent a scenario where segregated waste streams are mixed up with unsegregated waste during transportation.
- b. Main activities:
 - Deploy separate collection/transportation of organic waste (food and garden waste) and dry waste.
 - Develop technical standards on waste transportation vehicles.
 - Enforce vehicles that meet the technical standards (e.g., collection trucks with separate compartments) for the separate collection of organic/dry waste.
 - Enforce separate collection and disposal of hazardous health care waste from hospitals, households, and other service facilities.

3. Work Plan 3: Decentralized organic waste collection and treatment system

- a. Objective: To identify and promote nationally appropriate decentralized biological treatment approaches.
- b. Main activities:
 - Deploy decentralized composting/bio-gas plants at commercial and residential buildings (e.g., fresh food markets, hotels, restaurants, and apartments).
 - Introduce and promote home composting.
 - Establish basic windrow organic composting facilities at the transfer center.

4. Work plan 4: Establishment of decentralized material recovery centers and waste upcycling facilities

- a. Objective: To introduce mechanisms to support the recovery of recyclables at source of generation, including community-based models.
- b. Main activities:
 - Establish multiple material recovery centers to be operated by informal waste pickers.
 - Establish innovation centers for upcycling to increase the recycling rate and generate income for the informal sector.
 - Implement Extended Producer Responsibility (EPR) schemes to create a value chain for the recycling of materials that are not usually recovered i.e., multi-layered plastics, e-waste to extend the responsibility of collection, reusing and recycling materials that industries produce.

3. STRATEGIC OUTCOME 3:

Maximize the material recovery rate through the establishment of appropriate waste-to-resource treatment facilities

There are currently 700,000 tons of legacy waste at the landfill in Vientiane Capital. Considering the amount of incoming waste, 400 tons of waste per day as of 2019, the lifespan of the landfill is expected to be 10 years if no interventions are made. Following segregation, the different waste streams need to be transported to facilities where they undergo either decentralized or centralized treatment. The identification and promotion of nationally appropriate mechanical and biological treatment facilities are needed for the city of Vientiane where there is no municipal waste treatment facility. Strategic outcome 3 is formulated so as to maximize the material recovery rate through the operation of the most appropriate technology to process and treat the largest share of waste streams.

1. Work plan 1: Identification/establishment of adequate waste recovery and treatment facilities at the landfill

- a. Objective: To increase waste treatment capacity in Vientiane.
- b. Main activities:
 - Carry out a feasibility study on a Mechanical and Biological Treatment (MBT) facility with technology to generate refuse derived fuel (RDF) in Vientiane.
 - Establish and operationalize an identified MBT facility.
 - Improve the existing landfill.

2. Work plan 2: Establishment of large-scale material recovery centers/facilities

- a. Objective: To improve the large-scale waste separation thereby recovering high-value recyclables and organic waste prior to being disposed of at the landfill.
- b. Main activity:
 - Carry out a feasibility study on large-scale material recovery facilities at the transfer center.
 - Mobilize resources for the establishment of material recovery facilities.

4. STRATEGIC OUTCOME 4:

Minimize waste generation in the city of Vientiane

The city of Vientiane expects increased waste generation per capita due to urban population growth and economic development. More waste generation means more waste disposed of at the landfill if not well managed, thereby increasing the negative environmental and social impact. As waste reduction/prevention is at the highest level of the waste management hierarchy, this intervention requires a long-term commitment by the local government and the citizens to move towards a circular economy and a zero-waste city.

1. Work plan 1: Set-up of a target for an absolute cap for waste generation as a whole

- a. Objective: To stabilize waste generation per capita.
- b. Main activities:
 - Establish a progressive target for waste generation per capita up to 2030.
 - Develop regular monitoring and report methodologies on the achievement of the waste generation per capita target.
 - Raise awareness and carry out campaigns.

2. Work plan 2: Engagement with consumer goods industries and retailers to provide options for end-user consumers to Reduce, Reuse, and Recycle materials

- a. Objective: To reduce waste generation through policy interventions.
- b. Main activities:
 - Introduce policy regulations on single-use plastics (banning of single-use plastics at designated shops).
 - Limit and avoid unnecessary packaging.

5. STRATEGIC OUTCOME 5:

Improve the financial and operational efficiency of the sector and the roles and responsibilities of VCOMS in the waste collection service provision and treatment

The solid waste management system from collection to disposal is under VCOMS' responsibility. The provision of solid waste management services is associated with the management of a relatively large set of processes and activities, including the operation of a waste collection fleet, landfill management, and oversight of contractual arrangements with several service providers, including private collection companies and buying centers, as well as households who use VCOMS collection services. Handling the wide range of work scope requires continuous efforts to improve the efficiency in service provision and contractual mechanisms managed by VCOMS, thereby ensuring financial stability and transparency in public service management. In this context, strategic outcome 5 includes the following work plans:

1. Work plan 1: Revision of roles and responsibility of VCOMS

- a. Objective: To improve the roles and responsibilities of VCOMS in the waste collection services contractual management and collection of service charges.
- b. Main activities:
 - Establish a new unit to manage all service contracts, including collection services by private collection companies.
 - Create green public procurement for private collection companies following the regulations on source separations and resource recovery to ensure sustainability and environmental friendliness.
 - Optimize waste collection routes and introduce the GIS system for collection trucks.
 - Establish a financial ring-fence for waste collection and disposal services.

2. Work plan 2: Capacity development for VCOMS staff

- a. Objective: To enhance the capacity of human resources within VCOMS.
- b. Main activities:
 - Develop training programs for VCOMS staff in areas of sustainable financial management of the MSW, as well as monitor and evaluate the green growth impact in waste management.
 - South-south knowledge exchange program for VCOMS staff with support from international development partners for the decentralized waste collection service and waste-to-resource initiatives.
 - Technical transfer in sustainable solid waste management with partner countries/cities.

6. STRATEGIC OUTCOME 6:

Foster green job opportunities for the informal sector in waste management

Informal waste sector members are important contributors and key players in the waste sector in Vientiane, supporting waste recovery activities of upstream waste value chain through the door-to-door collection of recyclables. Despite their vital roles in waste recycling, they remain the most vulnerable group of the stakeholders in the waste management, working in hazardous conditions and earning daily wages that fluctuate based on the market rates for recyclables. As they make the marginal income in the value chain, they are the most negatively impacted group when the market price for recyclables decreases. This strategic outcome 6 is formulated in an effort to recognize the role of the informal sector in waste management and to foster economic opportunities for them in fulfilling the solid waste management vision.

1. Work plan 1: Integration of the informal sector into the municipal waste collection services

- a. Objective: To provide social recognitions and green job opportunities for informal waste pickers through municipal solid waste management services.
- b. Main activities:
 - Set up a coordinating unit to engage informal waste pickers in the municipal waste collection services.
 - Set up social protection schemes for informal waste pickers integrated into the municipal waste management system.

2. Work plan 2: Establishment of municipal recycling/upcycling centers

- a. Objective: To foster income generation opportunities for the informal sector while increasing the waste recycling rate.
- b. Main activities:
 - Establish Vientiane recycling centers operated/managed in collaboration with waste pickers' cooperatives.
 - Establish upcycling innovation centers in partnership with informal waste pickers.



04

IMPLEMENTATION MECHANISMS

To ensure the effective implementation of the vision, strategic outcomes, and objective of each work plan mentioned in the Solid Waste Management Strategy for Vientiane, the following coordination and implementation mechanisms are to be established:

1. THE STRUCTURE, COMPOSITION, AND ROLES OF THE COMMITTEES AT EACH LEVEL

1. The Steering Committee (SC) will consist of:

- a. Ministry of Natural Resources and Environment (MONRE)
- b. Ministry of Public Works and Transport (MPWT)
- c. Vientiane Capital Administration

The roles of the SC include to:

- Provide general guidelines on the implementation of this strategic plan by monitoring the progress, mobilizing funding sources, and liaising with various development partners to implement the strategic plan needed to achieve the targets.
- Provide supervision to the relevant governments on the development of the strategic plan into projects and communicating detailed action plans on a regular basis.

2. The Strategy Implementation Unit (SIU) will consist of:

- a. The Vientiane City Office for Management Service (VCOMS)
- b. Department of Natural Resources and Environment (DONRE)
- c. Department of Public Works and Transport (DPWT)
- d. Department of Industrial and Commerce (DOIC)
- e. Department of Health (DOH)
- f. District Authorities
- g. Village Authorities

3. The Vientiane City Office for Management and Service (VCOMS) will be a leading entity responsible for implementing this strategy and its roles include to:

- Implement the strategic plan and projects under the overall guidance from the SC.
- Coordinate with the relevant organizations, district authorities, and village authorities to publicize the project, raising awareness at the community level. VCOMS is also responsible for encouraging the community members to use the waste collection services so as to increase the waste collection rate in Vientiane Capital.
- Develop regulations and the legal framework on waste management in Vientiane Capital in line with this strategy.
- Develop a new waste collection service charge structure and mechanisms for the waste collection service charge payment.

- Clearly define the target for waste generation per capita in the capital by conducting a robust technical assessment.
- Establish policies and integrate informal waste collectors into the waste collection system to provide the decentralized waste collection service in all city areas.
- Implement waste segregation activities at source and define the operationalization process of the separate collection service.
- Promote waste-to-resource activities, such as recycling biodegradable wastes (food waste and garden waste), and separate collection and transportation of organic waste into municipal-led composting sites.
- Promote and expand the collection of recyclable materials such as plastics, can/aluminum, paper, and glass bottles in all districts.
- Establish a large-scale recycling center to be managed by VCOMS as a place to recover materials from municipal waste.
- Revise the role of VCOMS and build the capacity of its staff – workers in waste management.
- Periodically monitor and evaluate the implementation of the strategic plan and report the progress to the Vientiane Capital Administration.

4. Department of Natural Resources and Environment (DONRE)

DONRE collaborates with VCOMS in the implementation of the strategy, as follows:

- Research on legislations under the relevant laws, regulations, and environmental impacts caused by municipal waste in the city.
- Contribute to redesigning the waste collection service charge structure and new mechanisms for the waste collection service charge payment.
- Coordinate with district authorities, DONRE district offices, and village authorities in raising awareness, creating educational campaigns, disseminating regulations, and enforcing various laws related to waste management and the environment.
- Promote the recovery of organic waste, such as food and garden waste, through home composting and decentralized composting facilities.
- Carry out a study to generate data related to waste management, such as waste generation per capita.
- Report the environment and social impacts from managing municipal solid waste to the Vientiane Capital authority.

5. Department of Public Works and Transport (DPWT)

DPWT collaborates with VCOMS in the implementation of the strategy, as follows:

- Provide technical assistance on the construction of new landfills and access roads leading to them in accordance with the strategic plan, certify construction techniques for waste sorting and processing plants, and introduce appropriate techniques for the use of waste transportation vehicles.

- Promote raising awareness, educational campaigns, disseminating regulations related to construction work; instruct construction operators on the proper disposal of construction waste.
- Provide guidance to the waste collection and transportation unit of VCOMS and the private sector operators on route planning and safety measures for the waste collection services.

6. Department of Industry and Commerce (DOIC)

DOIC collaborates with VCOMS in the implementation of the strategy, as follows:

- Provide guidance to business entities (e.g., shopping malls, markets, small-medium enterprises) on adequate waste storage, separation, and disposal.
- Promote the greening of industry and waste-to-resource opportunities with the industry players.
- Disseminate the regulation on the treatment of industrial waste and monitor toxic waste and hazardous chemical substances from industries.

7. Department of Health (DOH)

Department of Health (DOH) collaborates with VCOMS in the implementation of the strategy, as follows:

- Encourage district hospitals, central hospitals, and clinics in the Vientiane city to pay attention to the separation of infectious waste and proper disposal of health care waste as its collection and transportation should be separate from other municipal waste, with infectious waste being disposed of in a high-temperature incinerator at the Km-32 landfill.
- Disseminate and monitor the implementation of the Ministry of Health's decision regarding health care waste management (Resolution No. 1373/MOH, November 23, 2017).

8. District authorities

District administration authorities collaborate with VCOMS in the implementation of the strategy, as follows:

- Mobilize the citizens' participation through the Lao Front for National Construction, district organizations, and village authorities in the implementation of strategy, laws, regulations, and legislation on sanitation and waste separation at source.
- Instruct the village authorities to enhance monitoring on illegal dumping and to increase the contract signing for the municipal waste collection service.
- Implement measures against violators of laws and regulations on urban environmental protection and waste management in partnership with VCOMS.
- Prepare a site for a sanitary landfill or resource recovery facilities in the designated districts.

9. Village authorities

Village authorities collaborate with VCOMS in the implementation of the strategy, as follows:

- Mobilize the citizens' participation in abiding by the regulations and laws on urban cleanliness, environmental protection, and source separation.
- Monitor the behavior of each household and business entities on source separation and adequate waste disposal in close collaboration with the waste collection service providers.
- Implement strict measures against violators of the law and waste management regulations in their villages.
- Identify the waste transfer feeder point for the decentralized waste collection service project.
- Encourage citizens and business entities to sort organic waste, such as food waste and garden waste for composting at the integrated resource recovery center.
- Encourage villagers and business entities in the village to participate in cleaning activities on important national days.

2. MONITORING AND EVALUATION

1. The Steering Committee, which consists of representatives from the Ministry of Natural Resources and Environment (MONRE), the Ministry of Public Works and Transport (MPWT), and the Vientiane Capital Administration, should monitor the progress and evaluate the implementation of the project twice a year.
2. Representatives from relevant organizations and departments in the Strategy Implementation Unit (SIU) shall perform their duties to monitor and inspect the implementation of the strategy, check the progress in the implementation of the projects, and summarize the evaluation every three months.
3. VCOMS is the main entity in the implementation of the action plan and projects indicated in the strategy, ensuring that relevant departments perform their duties and waste facilities are operated in accordance with the technical and environmental standard.
4. The VCOMS district offices shall coordinate with the relevant departments within the district government, the village authorities, and the Lao Front for National Construction to report on the monitoring and evaluation of their activities to VCOMS regularly and in a timely manner.

3. AMENDMENT

This strategy can be revised or supplemented as appropriate if there are any implementation issues identified through the monitoring and evaluation, in consultation within the strategy implementation unit. Then, it will be presented to the Steering Committee, including the Vientiane Capital administration, and the amendment of the strategy will be reflected upon the approval.



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ນະຄອນຫຼວງວຽງຈັນ

ເລກທີ 806 /ຈນວ
ລົງວັນທີ 11 ຕຸລາ 2021

ຂໍ້ຕົກລົງ

ວ່າດ້ວຍການຮັບຮອງ ແລະ ປະກາດໃຊ້ ແຜນຍຸດທະສາດ ແລະ ແຜນຈັດຕັ້ງປະຕິບັດ
ການບໍລິຫານ ຈັດການຂີ້ເຫຍື້ອແບບຍືນຍົງ ສໍາລັບນະຄອນຫຼວງວຽງຈັນ 2021-2030

- ອີງຕາມ ມາດຕາ 19 ແລະ 20 ໝວດ IV ກົດໝາຍ ວ່າດ້ວຍການປົກຄອງທ້ອງຖິ່ນ (ສະບັບປັບປຸງ) ສະບັບເລກທີ 68/ສພຊ, ລົງວັນທີ 14 ທັນວາ 2015 ວ່າດ້ວຍພາລະບົດບາດ, ສິດ ແລະ ໜ້າທີ່ຂອງເຈົ້າແຂວງ, ເຈົ້າຄອງນະຄອນຫຼວງ;
- ອີງຕາມ ມະຕິກົມການເມືອງສູນກາງພັກ ສະບັບເລກທີ 107/ກມສພ, ລົງວັນທີ 30 ເມສາ 2020 ວ່າດ້ວຍການພັດທະນານະຄອນຫຼວງວຽງຈັນໃນໄລຍະໃໝ່;
- ອີງຕາມ ຂໍ້ຕົກລົງ ຂອງເຈົ້າຄອງນະຄອນຫຼວງວຽງຈັນ ສະບັບເລກທີ 104/ຈນວ, ລົງວັນທີ 11 ກຸມພາ 2020 ວ່າດ້ວຍການຮັບຮອງ 300 ບ້ານ ເຂົ້າເປັນເປົ້າໝາຍບ້ານອະນາໄມ ແລະ ກໍາຈັດຂີ້ເຫຍື້ອ ຂອງນະຄອນຫຼວງວຽງຈັນ;
- ອີງຕາມ ການສະເໜີ ຂອງຫ້ອງການຄຸ້ມຄອງ ແລະ ບໍລິການຕົວເມືອງວຽງຈັນ ສະບັບເລກທີ 4644/ຄບຕ.ນວ, ລົງວັນທີ 29 ກັນຍາ 2021.

ເຈົ້າຄອງນະຄອນຫຼວງວຽງຈັນ ຕົກລົງ:

- ມາດຕາ 1 ເຫັນດີຮັບຮອງ ແລະ ປະກາດໃຊ້ ແຜນຍຸດທະສາດ ແລະ ແຜນຈັດຕັ້ງປະຕິບັດການບໍລິຫານ ຈັດການຂີ້ເຫຍື້ອແບບຍືນຍົງ ສໍາລັບນະຄອນຫຼວງວຽງຈັນ ແຕ່ປີ 2021-2030.
- ມາດຕາ 2 ມອບໃຫ້ຫ້ອງການຄຸ້ມຄອງ ແລະ ບໍລິການຕົວເມືອງວຽງຈັນ ນໍາເອົາແຜນດັ່ງກ່າວໄປຈັດຕັ້ງປະຕິບັດ ຕາມພາລະບົດບາດ, ສິດ ແລະ ໜ້າທີ່ຂອງຕົນ ໂດຍສົມທົບກັບບັນດາອໍານາດການປົກຄອງເມືອງ, ບ້ານ ແລະ ພະແນກການທີ່ກ່ຽວຂ້ອງ ໃຫ້ໄດ້ຮັບຜົນດີ.
- ມາດຕາ 3 ຫ້ອງການຄຸ້ມຄອງ ແລະ ບໍລິການຕົວເມືອງວຽງຈັນ, ພະແນກຊັບພະຍາກອນທຳມະຊາດ ແລະ ສິ່ງແວດລ້ອມ, ອົງການປົກຄອງເມືອງ, ບ້ານ, ຜູ້ປະກອບການຂົນສົ່ງຂີ້ເຫຍື້ອ ແລະ ພາກສ່ວນທີ່ກ່ຽວຂ້ອງ ຈົ່ງຮັບຮູ້ ແລະ ໃຫ້ການຮ່ວມມືໃນການຈັດຕັ້ງປະຕິບັດຂໍ້ຕົກລົງສະບັບນີ້ຢ່າງເຂັ້ມງວດ.
- ມາດຕາ 4 ຂໍ້ຕົກລົງສະບັບນີ້ ມີຜົນສັກສິດແຕ່ມີລົງລາຍເຊັນເປັນຕົ້ນໄປ.

ເຈົ້າຄອງນະຄອນຫຼວງວຽງຈັນ

ບ່ອນສຳ:

- ເຈົ້າຄອງ-ຮອງເຈົ້າຄອງ ນະຄອນຫຼວງວຽງຈັນ ທ່ານລະ 01 ສະບັບ;
- ຫ້ອງການຄຸ້ມຄອງ ແລະ ບໍລິການຕົວເມືອງວຽງຈັນ 01 ສະບັບ;
- ເກັບມ້ຽນສຳເນົາ 02 ສະບັບ.

ອາດສະພັງທອງ ສີພັນດອນ



Lao People's Democratic Republic

Peace independence Democracy Unity Prosperity

Vientiane Capital

No. 806/VG

Vientiane Capital, October 11, 2021

Decree on the Approval and Endorsement of the Sustainable Waste Management Strategy and Action Plan for Vientiane 2021-2030

- Pursuant to Articles 19 and 20, Chapter IV of the Law on Local Administration (Revised) No. 68/NA, dated December 14, 2015, on the Roles, Rights, and Duties of the Provincial Governor, the Governor of the Capital;
- Pursuant to the Resolution of the Central Committee of the Lao People's Democratic Party No. 107/CPC, dated April 30, 2020, on the Development of Vientiane Capital in a new phase;
- Pursuant to the Decision of the Mayor of Vientiane Capital No. 104/VG, dated February 11, 2020, on the recognition of 300 villages as target villages for sanitation and waste disposal in Vientiane Capital;
- Pursuant to the proposal of Vientiane City Office for Management and Service No. 4644 /VCOMS, dated September 29, 2021.

The Mayor of Vientiane Capital issues a Decree:

Article 1: Approve and endorse the Sustainable Solid Waste Management Strategy and Action Plan for Vientiane 2021-2030.

Article 2: Assign Vientiane City Office for Management and Service (VCOMS) to implement this strategy and action plan in accordance with its roles, rights, and duties in collaboration with districts, villages, and relevant authorities.

Article 3: Vientiane City Office for Management and Service (VCOMS), Department of Natural Resources and Environment, district authorities, village authorities, the waste collection service operators, and other relevant parties shall strictly abide by this decree.

Article 4: This Decree is effective from the date of signing.

Copy to:

Mayor-Vice Mayor of Vientiane Capital 01 copy
VCOMS Office 01 copy
Archiving 02 copies

Mayor, Vientiane Capital

(Signed and sealed)

Mr. Athsaphangthong Siphandone

ANNEX I

PROPOSED PROJECTS AND RESPONSIBLE AGENCIES

		Time frame	Budget estimation (USD)	Responsible agencies
1	Development of a new waste collection service charge structure	2021-2022	50,000	VCOMS, DONRE, district authority
2	Development of waste collection service charge payment mechanisms	2021-2022	50,000	VCOMS & banks, private sector operators
3	Decentralized waste collection services with the engagement of the informal sector	2021-2024	4,500,000	VCOMS, district & village authorities
4	Law enforcement and raising awareness	2023-2030	300,000	Districts, villages, VCOMS
5	Set-up of citywide source separation mechanisms and the distribution of proper bins for source separation	2023-2026	2,600,000	VCOMS, DONRE, district & village authorities
6	Set-up of transportation mechanisms that ensure source separation and separate disposal of waste	2021-2024	2,000,000	VCOMS, DPWT, DONRE
7	Decentralized organic waste collection and treatment system	2021-2024	2,000,000	VCOMS, DONRE, DAF
8	Establishment of decentralized material recovery centers and waste upcycling facilities	2022-2026	300,000	VCOMS, DONRE, DOIC, DES
9	Identification/establishment of adequate waste recovery and treatment facilities at the landfill	2021-2023	300,000	VCOMS, DOIC
10	Establishment of large-scale material recovery centers/facilities	2023-2030	20,000,000	VCOMS, DOIC, DPWT, DONRE, DPI
11	Set-up of a target for an absolute cap for waste generation as a whole	2021-2025	20,000	VCOMS, DONRE, district & villages authorities
12	Engagement with consumer goods industries and retailers to provide options for end-user consumers to reuse, reduce, and recycle materials	2024-2030	300,000	VCOMS, DOIC, DES, producers
13	Revision of VCOMS roles and responsibilities	2021-2021	-	VCOMS
14	Capacity development for VCOMS staff	2021-2030	100,000	VCOMS
15	Integration of the informal sector into the municipal waste collection services	2021-2030	100,000	VCOMS, DONRE, district & villages authorities

ANNEX II

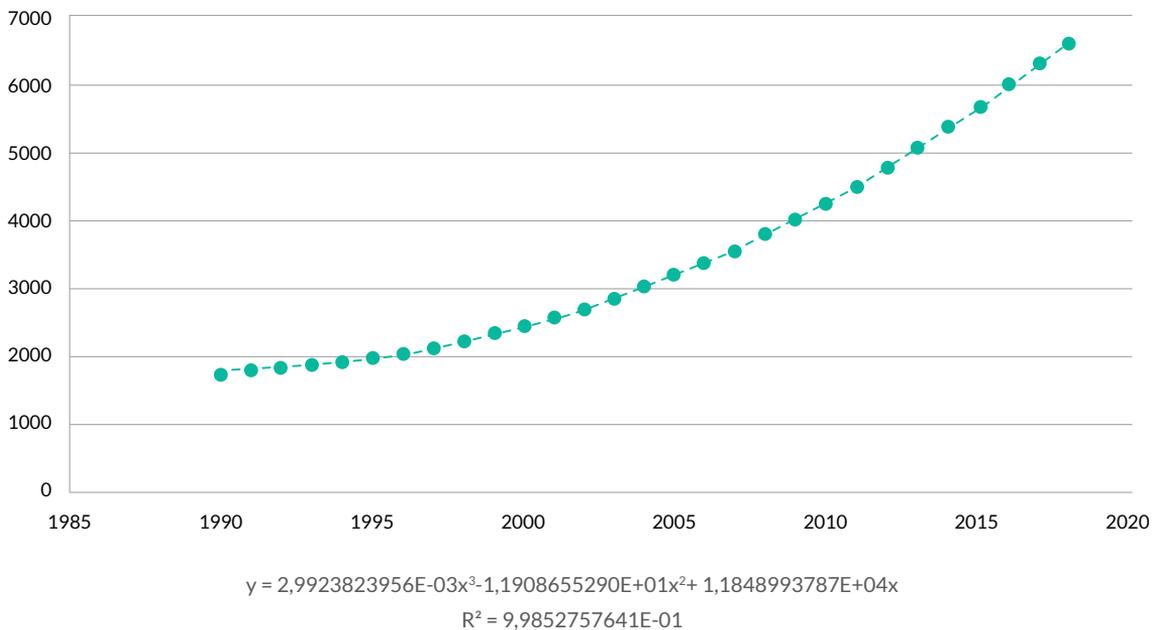
METHODOLOGY FOR WASTE GENERATION PROJECTION FROM 2021-2030

The methodology is based on the observed positive linear relationship between GDP growth and waste generation rate. The WB's regression model was used to estimate expected growth in the waste generation per capita based on the GDP per capita growth rate.

Based on the regression model, proxy waste generation rates per year were modeled for the base and target years, per equation, as below (World Bank, 2018):

$$\text{Proxy waste generation per capita} = 1647.41 - 419.73 \ln(\text{GDP per capita, PPP}) + 29.43 \ln(\text{GDP per capita, PPP})^2$$

Laos GFP per capita, PPP



To estimate the Laos GDP per capita projection, the World Bank Development Indicator's GDP per capita (constant 2011 PPP international \$) data from 1990 to 2019 was applied using the time series analysis, per equation in the graph.

The growth rate of change in proxy waste generation rates was applied to actual baseline waste generation (750g/day, year 2020) to estimate actual waste generation for the target year between 2021 to 2030 (World Bank, 2018).

Projected Waste Generation Target Year =

$$\frac{\text{Proxy Waste Generation Rate (target year 2021-2030)}}{\text{Proxy Waste Generation Rate (base year 2020)}} \times \text{Actual Waste Generation (Base Year, 2020)}$$



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