SOLID WASTE MANAGEMENT SOLUTIONS

Lessons Learnt from Lao PDR

First Decentralized Waste Collection Service System and Integrated Resource Recovery Center in Vientiane Capital

November 2024

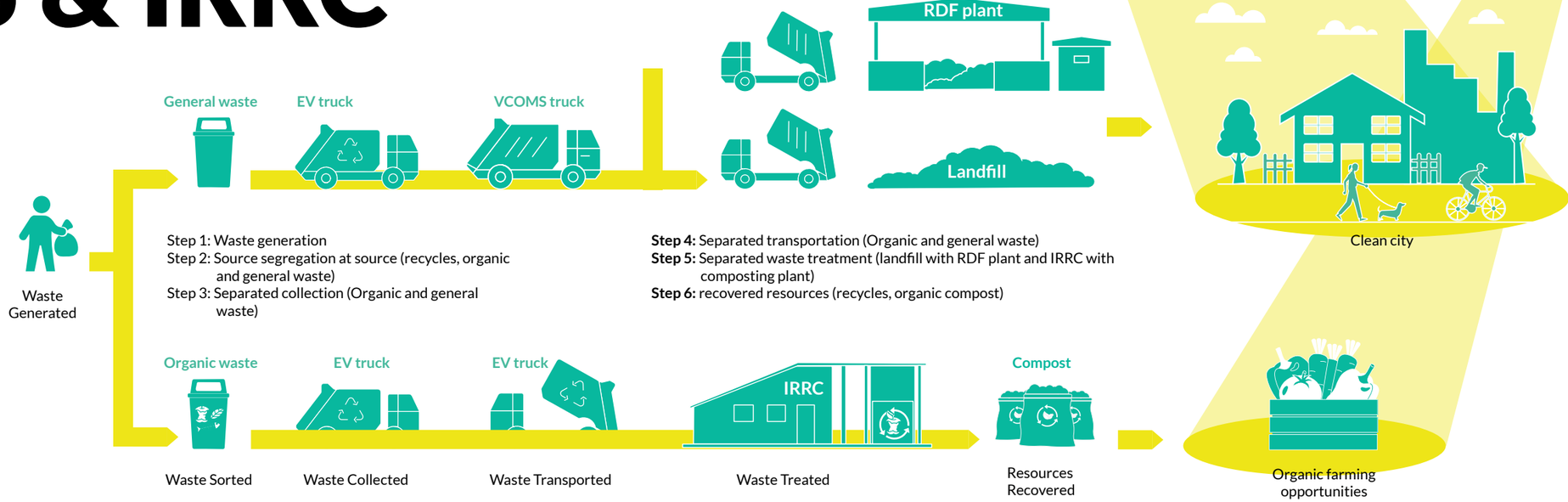
Vientiane Capital is the biggest and most developed city in Lao PDR and the centre for governance, education and social economy of the country. In 2015, Vientiane's population was 948,477 and is projected to reach 1.14 million by 2030. The rapid population growth has placed a significant strain on the city's infrastructure particularly waste management. **In 2021 GGGI estimated that solid waste generation was 354,050 tons annually and expected to rise to 551,880 tons by 2030.**

Despite significant spending on waste management, the city faces challenges in collecting, processing, and disposing of solid waste in a cost-effective and environmentally friendly manner. Currently, the commonest waste disposal methods are open dumping, burning and disposal at the landfill which is managed by the city administration. Open burning and improper disposal of waste at community level is leading to environmental pollution in Vientiane. Recycling is minimally practiced mainly by informal waste picker. City wide waste to resource solutions are yet to be established.

Recognizing the existing waste management challenges, the Lao government with support from GGGI and KOICA has launched the Wastewater and Solid Waste Treatment Capacity Building Project for City Environment Improvement in Lao PDR project to promote waste-to-resource practices, increase collection coverage rates through establishing the Decentralized Waste Collection Services (DEWACS), and organic waste processing capacity at the Integrated Resource Recovery Center (IRRC).

DEWACS & IRRC
Solutions

Mini electric waste collection truck



Results and Impacts

40-95%
increased collection rate

4(3.5m³)
pioneered using electric garbage trucks

700 tons
Organic waste collected and managed at IRRC

45 officials
Increased capacity to effective waste management

8,500 resident
Using DEWACS and increased awareness on source segregation

Decentralized Waste Collection Services (DEWACS)

DEWACS employs a segregated collection approach using electric trucks to access hard-to-reach areas. It comprises door-to-door collection, decentralized secondary collection points, and efficient waste transportation to processing facilities or landfills.

In building collaboration, the project distributed a total of 3,054 waste bins to all contracted households in the three target communities, including Nongbuathong Neua, Dongnaxok Tai, and Pakthang in Sikhodtabong district. Additionally, the project provided training sessions on proper use of the waste bins and raise awareness of waste separation and management to impact their community's well-being and the environment.

Integrated Resource Recovery Center (IRRC)

The Integrated Resource Recovery Center (IRRC) is an organic waste treatment and composting solution. The center processes organic waste and turns it into valuable resources, mainly high-quality compost. The organic material is mainly collected from fresh markets and the target households and transported to the IRRC using small electric trucks.

Unlike traditional large-scale composting plants, IRRCs utilize simple technology, lower operational and maintenance costs, and prioritize source separation. This makes them ideal for the socio-economic and physical conditions of low- and middle-income countries in Asia, particularly in secondary cities and small towns.

Mr Bounchanh Keosithamma
Director General of VCOMS

"This project has helped Vientiane Capital in many things including the development of waste management strategy and a cleaner city. With support from GGGI, waste collection facility has been provided through a system in Vientiane in order to foster a clean and green city of Vientiane Capital."

Mr. Atsaphangthong Siphandone
A mayor of Vientiane Capital

"Vientiane Capital, like many rapidly urbanizing cities, faces significant challenges in waste management. GGGI's initiative to establish the first municipal-led waste management facility is a commendable step toward a cleaner and greener city. This innovative approach, particularly in the largest district, could serve as a model for effective waste management and contribute to a circular economy for Vientiane Capital and Lao PDR."

Ms. Duangchit Bounthala,
Vice Head of Nongbuathong Neua Village

"It's very important to initiate waste collection and transportation services provided by the government. Despite this, our communities face many challenges in expanding waste collection and transportation services to inaccessible areas and turning them into a resource as we lack trucks to reach inside of the communities. This project has brought a comprehensive solution to our communities by providing small e-trucks to access hard-to-reach areas, contributing waste bins and encouraging the households to separate their waste. We appreciate the project's contribution, and it is very meaningful to our communities."

Lessons Learnt & Recommendations

Electric vehicle adoption: Transitioning to electric garbage trucks has significantly reduced fuel costs and emissions. However, challenges related to vehicle availability, quality, and maintenance remain. Partnerships with electric vehicle manufacturers and pilot programs can help address these issues. Additionally, training local mechanics is crucial for ensuring proper vehicle maintenance.

Capacity building and training: Ongoing training for operators and city officials is essential for the smooth operation of DEWACS and IRRC systems. Regular training sessions can enhance technical skills, improve operational efficiency, and promote best practices.

Public awareness and behavior change: Regular public awareness campaigns and consistent collection schedules are essential to ensure proper waste sorting at the household level. Effective communication strategies can motivate residents to participate actively in waste segregation and recycling programs.

Cost optimization and partnerships: Exploring cost-saving measures, such as optimizing operations and seeking grants, can help reduce the financial burden of running composting plants. Collaborating with private waste management companies can provide opportunities for sharing operational costs and expertise, leading to more efficient and sustainable waste management practices.

Public-Private Partnerships: Public-private partnerships are crucial for the successful implementation and long-term financial sustainability of new waste separation systems. By combining the resources, expertise, and innovative approaches of both public and private sectors, it is possible to achieve more effective and efficient waste management solutions.

Environmental benefits of separate waste collection: Separate waste collection provides key environmental benefits by minimizing waste contamination, reducing methane emissions through organic waste diversion, producing compost to support organic agriculture, and decreasing chemical fertilizer use. Additionally, it improves landfill waste quality, enhancing the efficiency of Refuse-Derived Fuel (RDF) production.

© GGGI Lao PDR, Source Separation from Household

© GGGI Lao PDR, Waste Collection with Mini Electric Truck

© GGGI Lao PDR, Organic Waste Moiture Controlling at IRRC

Implementers:
Global Green Growth Institute Lao PDR
Samsanthai Road, Vientiane City Office for Management and Services, Vientiane Capital, Lao PDR

Tel: +856 30 45 46 994

Follow us on
Facebook, X, YouTube
www.gggi.org

Vientiane City Office for Management and Services
Samsanthai Road, Vientiane Capital, Lao PDR

Tel: +856 21 244346-7

Donor:
Korea International Cooperation Agency (KOICA)
Tel: +856 21 263 331
Email: laos@koica.org.kr

Project Factsheet:

Lao

English