

Business cases in solid waste management

Primary collection of household waste and sales of recyclables



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Young people in Mali often lack decent employment opportunities, leading to high levels of unemployment. Funded by the European Union, a consortium of ICCO, WASTE, APEJ, led by SNV, is implementing the Value Chain Development and Youth Employment in Mali (EJOM) project. The project takes place in the four regions of Kayes, Koulikoro, Gao and the district of Bamako, all areas where young Mali people face systemic employment challenges.

WASTE's interventions in the project focusses on setting up small businesses in solid waste management and improving existing ones to help them to grow and create employment. Participants of the EJOM training programs are asked to prepare a business plan. To assist the development of these business plans, WASTE developed a series of 4 illustrative business cases in solid waste management to serve as inspiration:

1. Primary collection of household waste
2. Primary collection of household waste and sales of recyclables
3. Grinding of hard plastics to produce flakes
4. Paving tiles out of low-grade plastics

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1. Collection of household waste including sorting and selling of recyclables

1.1 Key characteristics

Waste input type:	Collection of household waste including sorting and selling of recyclables
Product:	Service of waste collection (including awareness raising and fee collection) from households, sorting of waste and transportation of the waste to the transfer station. During collection and transportation recyclables are separated and stored to be sold to intermediaries/recyclers.
Value offer:	Providing the service of waste collection what else would be dumped somewhere in the environment. This results in less pollution in the neighbourhood (no dumping and no waste burning) and in an improved health situation of the citizens.
Organisation:	Waste collection enterprise (GIE), in partnership with the government/commune (PPP)
Scale of business:	Small
Investment needed:	150,000 CFA for a donkey with a cart up to 20,000,000 CFA for two tractors with trailers
Market/revenue:	Households pay directly for the service of waste collection to the collector however a registration is needed at GUICHET UNIQUE (the chamber of commerce) to have permission to collect waste in the assigned neighbourhoods. It is important to know the market for recyclables to know what waste items have market to be sold: paper, cardboard, certain types of plastic, metal, etc. Additional revenues can be achieved by offering other services such as street sweeping or public toilet management.
Examples of implementation:	Bo Klin, Sierra Leone; Salvage, Nakuru, Kenya; SANIYA, Bamako, Mali; SANUVA, Mali
Risks:	free riders: people that receive waste collection but do not pay for it
Health and safety:	Waste collection is a risky job because: <ul style="list-style-type: none"> • Waste contains germs which could affect those in contact with them. • Waste could have sharp edges which could injure the worker. • Waste encourages the breeding of insects and rodents which could act as agents for the transmission of diseases. • Waste workers could not only contact these diseases but could also serve as agents to spread them to other people.

Protecting oneself is one of the professional values of a waste collection worker. Use as much as possible to following protective working gears:

- Uniforms
- Masks
- Gloves
- Boots

Social impact:

Collection business/GIEs have the potential to create considerable amount of jobs as labour is needed to collect the waste

- For collecting mixed waste approx. 120 kg/load¹ with handcart: 2-3 workers per handcart.
- For collecting mixed waste 200 kg with donkey cart: 3-4 workers per donkey cart
- For collecting mixed waste approx. 1,500 – 5,000 kg/load² with tractor and trailer: 3-4 workers
- For collecting mixed waste 5,000 kg with small truck: 3-4 workers

Environmental impact:

By collecting the mixed waste from households less waste will be dumped in the environment.

Economic impact:

Creation of jobs and income

Key success factors:

Local governments are in favour of primary collection by GIEs and facilitate the establishment and/or subsidize infrastructure (containers, collection vehicles).

Professionalism in waste collection: providing a reliable service to satisfied customers using rational routes for collection service with appropriate type and size of vehicles, motivated workers.

¹ *Solid waste collection and transport, service delivery training module 1 of 4*

² *MOOC training solid waste management*

1.2 Place in the value chain

In waste management systems we identify two important chains that are interlinked: the service chain and the value chain (see figure 1).

The **service chain** is about providing services to remove waste from their point of generation to a (dump) site where they are burned, buried or stored. These services are traditionally a **public sector** activity; and removal and disposal of waste are considered a public responsibility but can be outsourced to private service providers. The **value chain** of solid waste (organic and inorganic waste) involves activities that add value to waste in such a way that as a result products can be sold to customers. To start a business in waste management it is important to know where your business is situated in the waste management system. Who are your suppliers? Who are your clients? In the case of collecting mixed waste from households, the business/GIEs are situated in the service chain. Customers are households paying for waste collection and intermediaries/recycling factories paying for the recyclables.

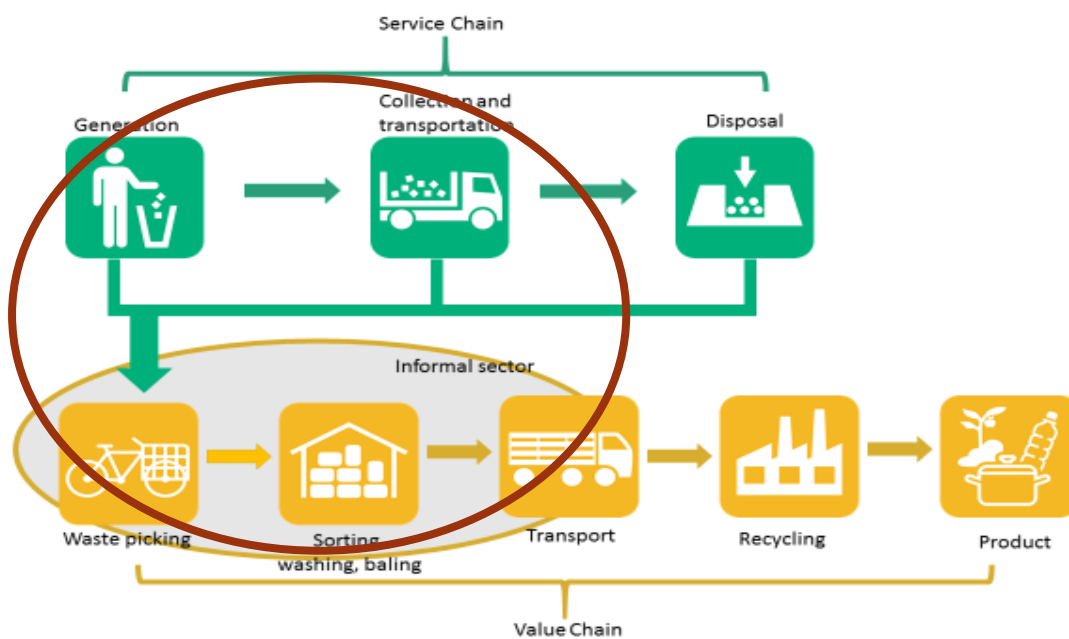



Figure 1: Schematic overview of service chain and value chain in solid waste management

2. Analysis of the profitability of a household waste collection enterprise with sales of recyclables

Households generate 0.66 kg waste/day : 1320 kg (2000 households) An rough estimate is that 10% of this amount is valuable recyclable material and can be taken out easily	Market: Households, recycling sector for sales of recyclables	Products: service of waste collection (2 times per week) and transportation to a waste depot, awareness creation, fee collection, sorting of waste and sale of recyclables Location: Bamako
Investment (CAPEX)	 <p>Investment total: 20,000.000 (2 tractors with trailer)</p>	
	Business plan	
profit-loss	Per month (CFA)	
	Sales/service : Collect waste from 2,000 households (60 % pay 3000 CFA/month)	3,600,000
	Sales of recyclables (plastic, glass bottles, metals, bags, paper, etc.) 61 CFA/kg	177,144
	Expenses	
	<ul style="list-style-type: none"> • Salaries (30 workers, 1 administrator, 1 manager) • Gasoline (20-30 km per day, usage of 5 l/hour, 8 working hours/day) • Other (rent, telephone, maintenance, etc) • Depreciation (Life time of 10 years) 	1,050,000 554,400 400,000 166,666
Total expenses	2,171,066	
Result per month	1,606,078	

2.1 Profit and Loss statement and break even point

The table below shows the profit and loss statement of the collection of waste from households with 2 tractors and trailers. This profit and loss statement is based on data given by the GIE SANIYA, Bamako (see assumptions below). The payback period is the length of time an investment reaches a breakeven point. In this case the break even point will be reached after **1 year and 9 months** based on the assumption that 2,000 households will subscribe, 60% pay the requested fees and that recyclables can be sold for a medium price of 61 CFA/kg..

3 Year Summary	Year 1	Year 2	Year 3
Profit and Loss			
Revenues	31,728,034	38,073,641	45,325,728
Operating Costs			
Payroll	9,600,000	10,080,000	10,584,000
% of revenues	30%	26%	23%
Raw materials	6,652,800	6,652,800	6,652,800
% of revenues	21%	17%	15%
General & Depreciation	6,800.000	6,800.000	6,800.000
% of revenues	21%	18%	15%
Water & Electricity	0	0	0
% of revenues	0%	0%	0%
Total Operating Costs	23,052,800	23,532,800	24,036,800
% of revenues	73%	62%	53%
Result	8,675.234	14,540.841	21,288,928
Accumulated cash flow	8,675,234	23,216.075	44,505,003
Repayment of investment of 20,000,000 CFA	8,675,234	20,000,000	
Profit (after 1 year and 9 months)		3,216.075	21,288,928

Assumptions

- 22 working days per month, 8 hours per day
- Capacity year 1: 70%, capacity year 2: 85%
- The price of diesel is 1.1 U.S= 640 CFA (Verified in Mali: 630 CFA/liter, July 2019) Source: https://www.globalpetrolprices.com/Mali/diesel_prices/
- An rough estimate is that 10% of this amount is valuable recyclable material and can be taken out easily. In a pilot in 2013 GIE Saniya sold 10.432 kg for a price of 639.170 CFA . This means a mean price of 61 CFA/kg for recyclables which can be recuperated from the households (Source: Projet de recuperation, de recyclage & de revalorisation de dechet dans le district de Bamako, Novembre 2013)

