

INTRODUCTION

Municipal solid waste poses a major environmental and social problem in Morocco. Every year, 65 million tons of waste is generated but only 37% is disposed of in an environmentally acceptable manner, and there are more than 500 open dumps in the country. The resulting environmental degradation of poor solid waste management practices are estimated to cause a reduction of 0.5% of the national GDP. In addition, municipal solid waste volume grows by 1.36% yearly, which further exacerbates the problems. Most of the waste collection, sorting and recycling is performed by the informal sector, waste pickers, where activities are low-tech, fragmented, and do not meet minimal health, safety, environmental, or labour standards. The Moroccan government is determined to improve the situation, and has launched a 15-year Waste Program with the objectives of having all the municipal solid waste collected and disposed of in sanitary landfills, and having a recycling rate of at least 20 percent by 2022. Another objective of the program is to create at least 70,000 jobs in the waste management sector.

PROJECT OBJECTIVE

The governmental waste program can only be achieved when key success factors of transparency, accountability, and competition are present. The private sector is a key actor in achieving this. The Multimodal Platform project designed a business model including a partnership between the private and public sector. This assisted the Moroccan government in achieving the objectives of its Waste Program by providing the technological know-how to municipalities and increasing the involvement of the private sector. The project is also helping the government to reach its objective of job creation by integrating the informal waste collecting activities into a well-structured and organised sector.

RESULTS & NEXT STEPS

This project delivered a market study of the upstream and downstream waste market, as well as a technical study of different waste categories and types, and the related treatment processes. A Waste Reclamation Model has been developed as well as a household waste NAMA, where the Waste Reclamation Model can be integrated. A business model has also been designed for the multimodal platforms. As a next step, funds have to be secured to finance the pilot plant in Agadir.

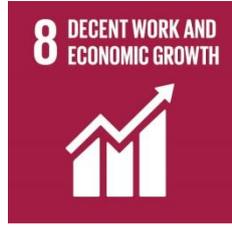
The private sector also has been engaged such as the BMCE Bank of Africa and the European Investment Bank, which showed interest in using the Waste Reclamation Model for feasibility studies for potential recycling projects of their sub-borrowers. Furthermore, there are ongoing conversations with the Strategic Investments (FONSIS), Bank of Africa, African Development Bank and European Investment Bank to replicate and implement the project in Senegal.

Following direct conversations with the Ministry of Energy, Mines, Water and the Environment (MEMEE), they showed strong interest in using the model as Measuring, Reporting and Verification (MRV) tool for the implementation of the waste NAMA. In addition, a senior environment expert working with the government expressed interest in integrating the results of the Market Study to the ongoing biomass-energy project of the Moroccan government.

POTENTIAL IMPACT

Total potential if up-scaled and replicated	GHG mitigation	Investment	Actors
	78,600 tCO2e/year for six plants	\$43.8 M for six plants across the country	One integral partner, 12 total actors engaged

SUSTAINABLE DEVELOPMENT GOALS



Reducing poverty through the integration of the informal sector into the formal economy, providing securer jobs and benefits.	The platforms provide employment, including for those currently in the informal sector. It also creates new products through recycling, and thus new markets for these.	Integrating workers from the informal sector into the formal economy provides them with a securer income, and access to social benefits.	A better waste collection and management in urban areas enhances their living qualities considerably.	Reducing the use of primary material by recycling and upgrading waste.
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MULTIMODAL WASTE PLATFORMS - WHAT ARE THEY?

The **Multimodal Waste Platform** is a place for waste separation, treatment and valorization. The Platform has the necessary technology for separation as well as the treatment processes for the four different waste fractions, which will be turned into marketable products such as bio-oil from organic waste, or egg trays from paper waste.

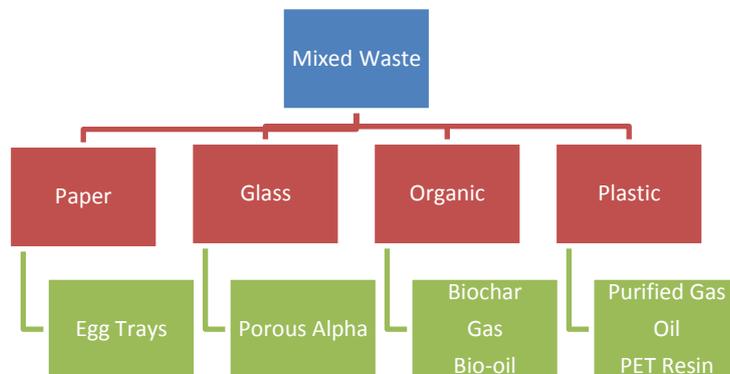
The platforms will be located throughout the country in small to medium size municipalities where there are no controlled landfills. The waste will come from three sources: first, at the municipal level from rural communities and small farms; second, from the private sector such as hotels and airports and third from so-called non-profit organisations 'Maisons Vertes', which are small-scale waste collection centres which incentive citizens to recycle their waste through a points and rewards system. The Multimodal Platforms not only increase the waste recycling rates of municipalities but also produce various goods.

The Multimodal Platforms are complemented by a **Waste Reclamation Model**, which is a decision-support tool for municipalities and potential investors to analyse economic viability for different waste recycling and valorization processes. The strength of this model is that users can input their own data in the model to generate an adapted and case specific business plan with over 300 variable parameters and 35 different waste streams. It calculates financial indicators such as the return on investment, net present value, and creates financial projections. The model also calculates the carbon footprint, avoided emissions, energy consumption and the water use.

THE BUSINESS MODEL FOR CLIMATE ACTION

Morocco's waste management system is poorly developed and the municipalities struggle to perform the responsibility of proper waste handling. As the majority of the waste is currently not being effectively collected and sorted, neither at household level nor by service providers, there is a large potential for tapping into this valuable resource. The current challenge is how to collect the recyclable waste effectively, and transform it into products demanded by the market.

The proposed business model of this project addresses this problem by establishing multimodal waste platforms which transforms the waste into sellable products. Examples include egg trays, made from recycled paper, for the rapidly growing egg industry in the country, or energy, produced from organic waste, which amounts to 50 - 70% of the total waste volume in Morocco. There is a market for these products, provided that their price is competitive with non-recycled products.



Under this business model, collection agreements with a large number of hotels have been established, from where the majority of the waste for the platforms is collected. This guarantees a steady flow of materials for the platforms, while at the same time relieves the hotels from waste handling.

The platforms would not only reduce the amount of waste going to landfill in Morocco, but will also provide jobs to currently informal waste pickers. The platforms can thereby contribute to formalise the sector of waste collection and strongly improve the conditions for the marginalized groups of waste picker.

PROJECT STAGES

The project intervention was implemented in three phases:

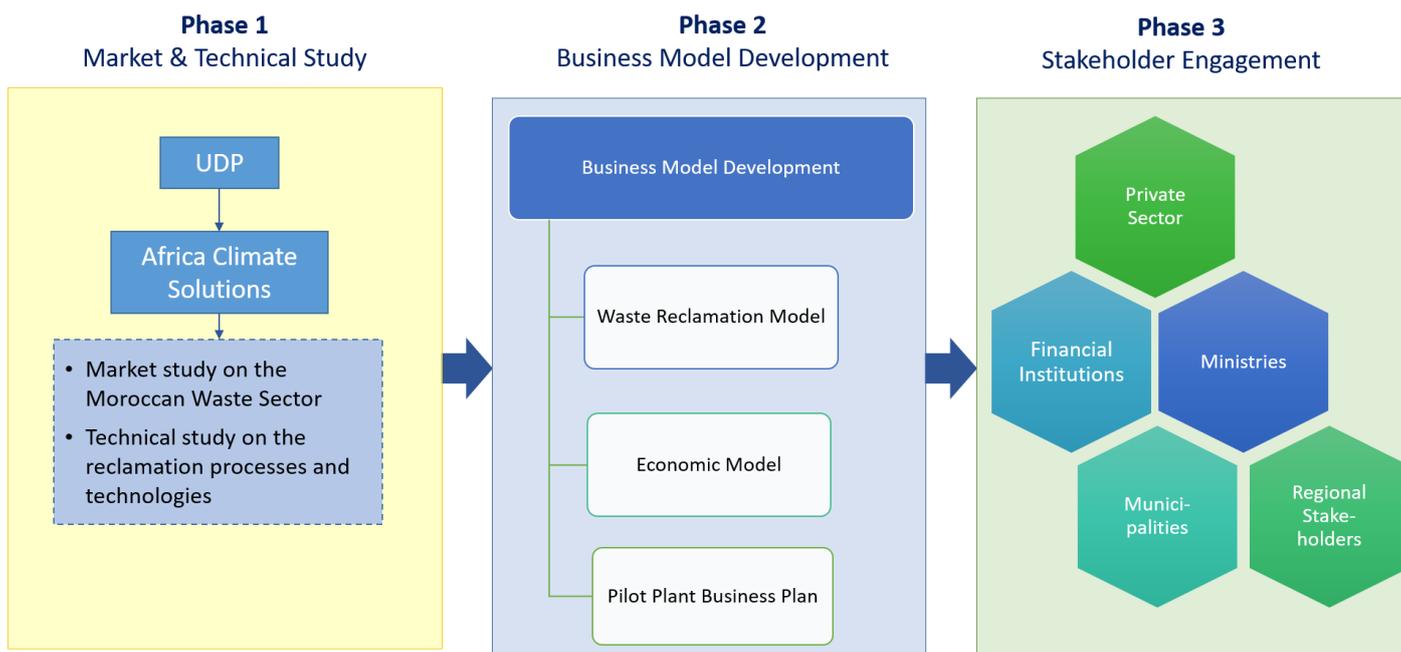


Figure 3: ADMIRE Intervention Phases in Morocco

Phase 1: Market & Technical Study

This phase delivered a Market and a Technical Study. The Market Study was conducted in two phases: the upstream and the downstream market. The objective of the upstream market study was to understand the composition, volumes, sources, availability, and costs associated with waste in Morocco. It also identified existing initiatives for collection, sorting and reclamation. The objective of the downstream market study was to compare the products of the reclamation process with similar products available on the market, and identify target markets and end users. The Technical Study identified the reclamation processes for the different types and categories of waste, evaluated the required technologies and characterised the reclamation chains for the different types of waste.

Phase 2: Business Model Development

A central element of the second phase was the development of the *Waste Reclamation Model*, which is a decision-support tool that enables municipalities and potential investors to make informed decisions on the best investment opportunity in waste recycling and reclamation plants. As a result of phase 1, and the financial projections from the Waste Reclamation Model, the final concept of the multimodal platform has been established. The concept is to create a company that will invest in multiple multimodal platforms across Morocco, starting with a pilot plant in Agadir, followed by plants in Marrakech, Casablanca, Kénitra then Tangier.

Phase 3: Stakeholder Engagement

This phase covered the dissemination to and the engagement with different stakeholders, most notably with different banks and investors to gauge their interest in the project. The banks perceived the 'Waste Reclamation Model' to be a useful tool in evaluating the bankability of future waste management projects.

RESOURCES

Waste Reclamation Model, incl. Guide - Decision-support tool to generate business plans for different waste recycling and valorisation processes with more than 300 variable parameters

Household Waste NAMA - NAMA for recycling, valorisation and incineration of household waste

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