



Potential of plastic waste sorting in the commune of Touba - projection of the model to the village of Darou Miname

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With funding from the Grand Duchy of Luxembourg, the Global Green Growth Institute (GGGI) is implementing a project in Touba, Tivaouane and Dakar on the management of solid waste, electrical and electronic equipment and wastewater through an innovative business model since January 2019 for a duration of four years.

The impact of the project is threefold:

- The reduction of greenhouse gas emissions;
- Job creation through an innovative business model; and
- Improving the solid waste management service.

The sustainable waste management component of the project is being implemented in Touba in partnership with the UCG, which will become SONAGED in 2022, the Touba Mosque Town Hall and the NGO Eau Vie Environnement. It aims to lay the foundations for a circular economy around plastic waste in the city of Touba.

The objective of the pilot is to introduce selective sorting of plastic waste in households downstream of the value chain, to facilitate collection, treatment and recovery. One of the four neighbourhoods in the village of Darou Miname, Darou Miname 1, was chosen in agreement with all stakeholders to host the pilot phase. 200 households were selected for this test phase. A pre-collection system and an awareness and communication campaign for behavioural change accompanied the implementation of the pilot phase activities. The demonstration project has seen important milestones marked by results that will be presented in the following paragraphs.

The first year of implementation of the pilot was marked by the following important dates:



Each of these dates is marked by specific results, related to the level of sorting in households, the quantities of plastic waste collected, the number of jobs created, the creation of income-generating activities, the drafting of a business model, the improvement of waste management for the pilot households.

Some figures to remember:

*Population of Touba 2022 : **996 746 inhabitants** (source : projection ANSD)*

*Numbers of households for the pilot experience : **200 households***

*Estimation of affected population : **2 000 people***

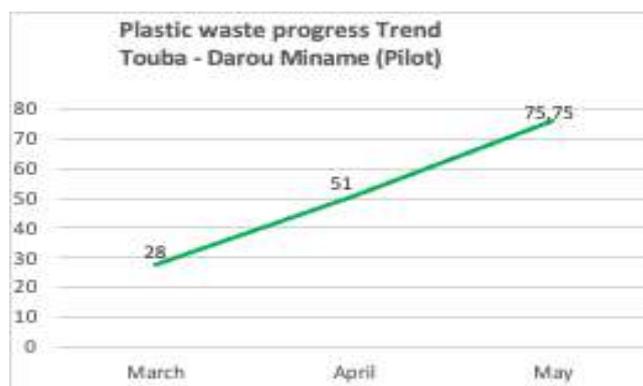
*Association embedded in the value chain : **1 Association***

In order to promote better waste management, after twelve months of implementation of the activities around the pilot several aspects were noted.

Level of plastic waste sorting

Throughout the year, the sorting practice was monitored and evaluated at the level of the pilot households and was marked by fluctuations. The graph below shows the evolution of the sorting practice from November 2021 to May 2022.

The practice decreased in February can be explained by the introduction of a new player in the value chain. Intensified awareness-raising and support for this actor has helped to improve sorting practice, which seems to have stabilized between March and May at an average of 63%.

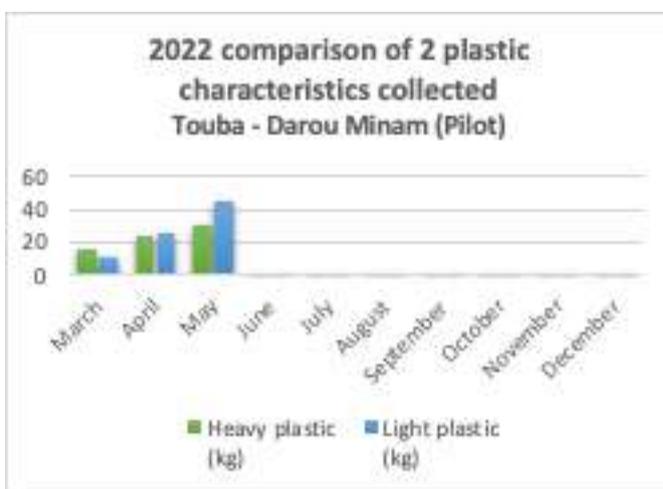


The waste collection has been carried out in two phases, the first of which collected plastic waste from 640 households including the 200 pilot households from June 2021 to February 2022. Since March 2022, the quantities of plastic waste collected from the pilot households have been weighed separately.

Thus, from March to May 2022, 140.75 kg of plastic waste was collected from the 197 pilot households, i.e., a monthly average of about 0.24 kg of plastic waste per household.

In the case of the period 63%, the estimated waste generation, relative to the percentage of households that sort, is 0.46 kg of plastic waste per household per month.

It should be noted that the average obtained here will be corrected over the months and stabilized by December 2022. This average will consider peak periods linked to specific events such as the great Magal of Touba. The graph opposite shows the evolution of the quantities of waste collected within the pilot between March and May 2022.



Two types of plastic waste are identified and referred to as «light plastics» and «heavy plastics» respectively. During the period March to May, there is an upward trend in the collection of «light plastic». The figure below shows the proportion and progression of the quantities collected per waste type.

This increase can be correlated with the entry into the winter season. This season is marked by high temperatures, but also by religious events. Based on the pilot data, over the period, the proportion of heavy plastic waste is 46% compared to 54% for light plastic waste.

As part of the promotion of the circular economy around the plastic waste value chain, the collected plastic waste is sold to a recycling structure while waiting for the Boukhatoul Moubarak Recycling and Marketing Centre to become operational. The average unit price for all sales of heavy plastic is 107 CFA francs in May 2022. Opposite is the evolution of sales from November to May 2022.



On the environmental front, the sorting of plastic waste has made it possible, in a mixed sample of about 637 households in the village of Darou Miname, to reduce 4,000 KgeCO₂ based on the quantity of waste sold for recycling and recovery since November 2021.

This represents a reduction of 0.09 kgeCO₂/inhabitant.

Job creation

Thanks to the pilot, the organization of pre-collection and sorting has generated 3 direct jobs. The awareness campaign for behavioral change generated 20 partial jobs. It should be noted that these jobs are on-demand services, not permanent jobs. For a sustainable behavior change, the inclusion of these jobs in the business model is crucial to ensure the sustainability and availability of the deposit.

At scale

Data on the population of the city of Touba is varied, and opinions differ according to the source. In the case of this study, we will take as a reference the basic data of the 2013 General Population Census projected to 2022 for the minimal scenario, and the data of the Town Hall as the optimal scenario. For each scenario, two options will be proposed, the high option where 100% of the city's households sort and the medium option where 63% of households sort.

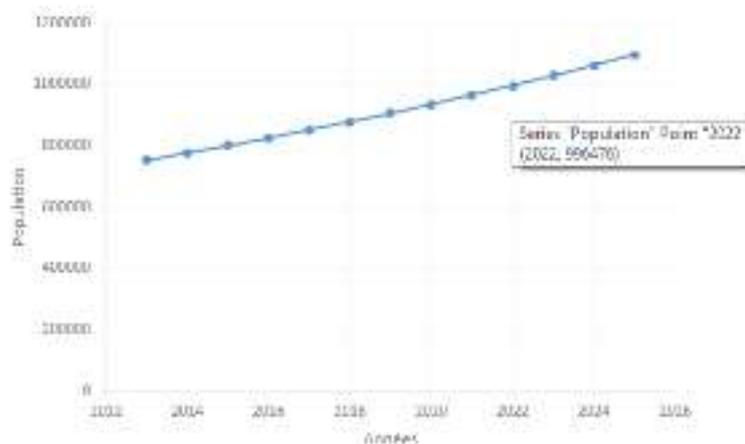
The value chain for both scenarios include:

- Households who are the direct target;
- The relays who oversee raising awareness among households for a sustainable change of behavior.
- The pre-collectors in charge of collection from households.
- Buyers of raw recyclable material for recycling and recovery.
- SONAGED, (ex. UCG) for the removal of all waste and sorting waste and the supervision of the pre-collection system and manager of the infrastructure and public equipment.
- The Town Hall in charge of waste management, a competence transferred by Act 3 of the decentralization.

The minimal scenario

The minimum scenario is based on the projection of the population of Touba in 2022 according to the Agence Nationale de la Statistique et de la Démographie (ANSD). The population of the city of Touba in 2022 is estimated at 996,476 inhabitants according to the ANSD projections. The table below shows the population projections to 2025.

Graphique 3: évolution de la population de Touba de 2013 à 2025



Source : Fayr BABOU, 2020 (à partir des données de l'ANSD)

The optimal scenario

The optimal scenario is based on the demographic range given by the Municipality of Touba. According to the Town Hall, the city of Touba would have more than 2,000,000 inhabitants. The reference value of 2 000 000 will be used in the second scenario.

Case study		
Minimal scenario		
Projection of population (2022)	996 746	
Estimation of number of households (Hypothesis, 10 inhabitants per households)	99 675	
Platic waste collection	Ideal Case	Soft Case
	<i>Hypothesis 1 : 100% of population</i>	<i>Hypothesis 2 : 63% of population</i>
Estimation of collection (t/an)	4 970	3 131
Heavy plastic deposit (t/an)	2 320	1 462
Light weight plastic deposit (t/an)	2 649	1 669
Economic potential (Fcfa)		
Average price per ton (Fcfa)	107 000	107 000
Cost of management (Fcfa)	26 563 770 627	16 735 175 495
Job creation		
Direct job (3 jobs for 200 households)	1 495	942
Potential of direct job (23 jobs for 200 households)	11 463	7 221
Potential of indirect job (Ratio 5 jobs for 1 direct job)	57 313	36 107
Reduction of emissions (KgeCO₂) /an	89 707	56 515
<i>Projection made based on data collected from November to May 2022</i>		
Case study		
Optimal case		
Projection of population (2022)	2 000 000	
Number of households (Hypothesis, 10 inhabitants per households)	200 000	

Plastic waste collection	Ideal case	Soft case
	<i>Hypothesis1 : 100% of population</i>	<i>Hypothesis2 : 63% of population</i>
Estimation of collection (t/an)	9 971	6 282
Heavy plastic collection (t/an)	4 656	2 933
Light weight plastic collection (t/an)	5 316	3 349
Economic potential (Fcfa)		
Average price per ton (Fcfa)	107 000	107 000
Cost of management (Fcfa)	53 300 982 652	33 579 619 071
Job creation		
<i>Direct job (3 jobs for pour 200 households)</i>	3 000	1 890
<i>Potential of direct jobs (23 jobs for 200 households)</i>	23 000	14 490
<i>Potential of indirect job (Ratio 5 jobs for 1 direct job)</i>	115 000	72 450
Reduction of emissions (KgeCO₂)/an	180 000	113 400
<i>*Projections made based on data collected from November to May 2022</i>		



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The Global Green Growth Institute was founded to support and promote a model of economic growth known as «green growth» that targets key aspects of growth that targets key aspects of economic performance such as poverty reduction, job creation, social inclusion and environmental sustainability.