

# Second International TouMaLi Conference

Effective Waste Management for Sustainable Tourism and Marine Ecosystem Protection

Marrakesh, 8th & 9th of November 2023

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# TouMaLi : Preventing Tourism Marine Litter

## Contribution of sustainable waste management system in tourism sector to the protection of marine ecosystems (2021-2025)

### Overview

## TouMaLi project: National Context



## National Strategy for Ecological Transition

### Governance and financing

Establish systemic, cross-sectoral and territorial institutional governance and make available appropriate and accessible financing systems.

### Culture, science & knowledge

Develop environmental culture, science, knowledge and the qualification of human resources in the fields of environmental protection, sustainable development and combating effects of climate change, and disseminate these values among the various actors.



### Climate change

Strengthen the adaptation and resilience capacities of sectors, environments and populations

### Natural resources & ecosystems

Ensure rational management of natural resources, preserve and restore ecosystems (terrestrial and marine).

### Sustainable production and consumption and pollution control

Establish the foundations of the green, blue and circular economy within the framework of sustainable consumption and production patterns, and eventually eradicate pollution hot spots, decontaminate and rehabilitate polluted sites.

# National Strategy for Green Economy

## Tunisian Context

- **Axis 1:** Promote efficiency in the use of natural resources.
- **Axis 2:** Ensure access to clean water and sanitation for all.
- **Axis 3:** Eliminate waste in an integrated framework by recovering recyclable waste and reducing greenhouse gas emissions.
- **Axis 4:** Improve the resilience of forest and Pastoral systems to the effects of climate change.
- **Axis 5:** Develop an economy that is less dependent on fossil fuels.
- **Axis 6:** Adopt clean energy and high value-added technologies in the industrial sector.
- **Axis 7:** Improve the quality and performance of public transport.
- **Axis 8:** Promote energy efficiency and adopt new systems linked to ecological structures.
- **Axis 9:** Promote sustainable tourism by offering a variety of services.

## National Strategy Littoral Plastic-free



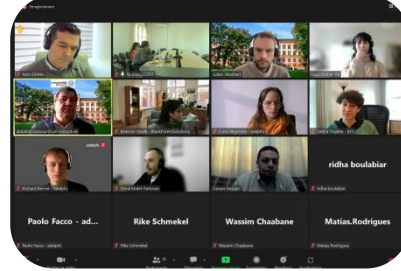
- ✓ **SO1:** Ensure good governance of plastic waste.
- ✓ **SO2 :** Design an effective financial model to prevent and reduce marine pollution from plastic waste.
- ✓ **SO3 :** Strengthen integrated management of plastic waste from land, coastal and marine sources.
- ✓ **SO4 :** Develop research and innovation to combat marine plastic pollution.
- ✓ **SO5** Strengthen education, awareness-raising and communication initiatives.

# TouMaLi activities, Achievement & Progress

**WP I:** Coordination, national networks, pilot areas & data analysis



**WP II:** Concepts for waste & marine litter reduction and mitigation



**WP III:** Development of EPR concept for the benefit of tourism sector at national level



**WP IV:** Monitoring, quantification & tools



**WP V:** Implementation of local waste reduction solutions



**WP VI:** Dissemination, awareness raising & capacity building



# Activity1: Coordination work, networking, pilot areas and basic data analysis

## Kick off and preliminary investigative visits

**Period:** 9<sup>th</sup> to 13<sup>th</sup> of November 2021.

**Objective:** Preliminary visits to identify sites to host project activities (03 sites)  
10<sup>th</sup> to 12<sup>th</sup> of November 2021.

**First monitoring campaign:** Mission coupled with the first beach sampling and monitoring campaign.





# Activity1: Coordination work, networking, pilot areas and basic data analysis

## Meetings of the steering committee

### ■ 1<sup>st</sup> meeting (11<sup>th</sup> of May 2022):

- ✓ Definition of areas of cooperation
- ✓ Implementation modalities of the various project activities and the role of the different partner institutions

### ■ 2<sup>nd</sup> meeting (21<sup>th</sup> of November 2022):

- ✓ Presentation of the progress of the work and choice of the pilot area of the project

### ■ 3<sup>rd</sup> meeting (17<sup>th</sup> of March 2023): 1<sup>st</sup> enlarged steering committee meeting after the choice of the pilot zone

- ✓ Presentation of the progress of the various activities
- ✓ Validation of the approach to be undertaken
- ✓ Next steps

### ■ 4<sup>th</sup> meeting (4<sup>th</sup> of October 2023):

- ✓ Presentation and discussion of the legal-institutional diagnosis of waste management in the HoReCa sector report.
- ✓ Presentation draft CCTP (Cahier des Conditions Techniques Particulières) related to the construction of a pilot center and the acquisition of waste management equipment.

# Activity1: Coordination work, networking, pilot areas and basic data analysis

## Kick off : launch of TouMaLi's Activities in the region of Hammam Sousse, 16 March 2023 in Hammam Sousse

- ✓ Announce the choice of the pilot area and the launch of the operational component in the municipality of Hammam Sousse,
- ✓ Ensure the involvement of local partners,
- ✓ Mobilize and engage the final beneficiaries of the project (HoReCa Services).



## Signature of two partnership agreements:

- ✓ CITET -Municipality of Hammam Sousse
- ✓ Municipality of Hammam Sousse -University of Rostock – CITET: linked to the implementation of the TouMaLi project

# Activity 2: Beach monitoring

## Methodology

**OSPAR method:** 100 m transect or less

- Method widely used in Europe (EU)
- Guarantees comparable data.
- Standardized method used since 2000

**Sampling frequency:** Seasonal monitoring (4 times / year)

**Beach type:**

- Urban,
- Semi-urban,
- Rural,
- Semi-rural,
- Touristic

**Target size:** Macro-litter > 25 mm



# Activity 2: Beach monitoring

- ❑ 10 Investigated sites: Bizerte (2), Embouchure de Medjerda (1), Hammamet (2), Hammamet Sud (1), Hammam Sousse (2), Monastir (1) Tabarka (1).
- ❑ 8 Monitoring campaigns: November 2021, March 2022, June 2022, November 2022, January 2023, April 2023, June 2023 and October 2023.

## Location and type of the surveyed beaches



### **Bizerte:**

- Cap Angela: Semi-rural
- Sidi Salem: Urban

### **Hammamet:**

- Dar Sebastien: Semi-urban
- Résidence Jannet: Urban

### **Hammam Sousse:**

- El Menchia: Urban
- Chatt Dar Chahed: Urban

# Activity 2: Beach monitoring

## Abundance of marine litter on beaches

24 surveys (November 2022 to June 2023) : 71796 items collected

Clean-Coast Index (CCI): Clean Coast Index (CCI) average per site calculated for Tunisian beaches

**Average: 2992 item/ 100 m**

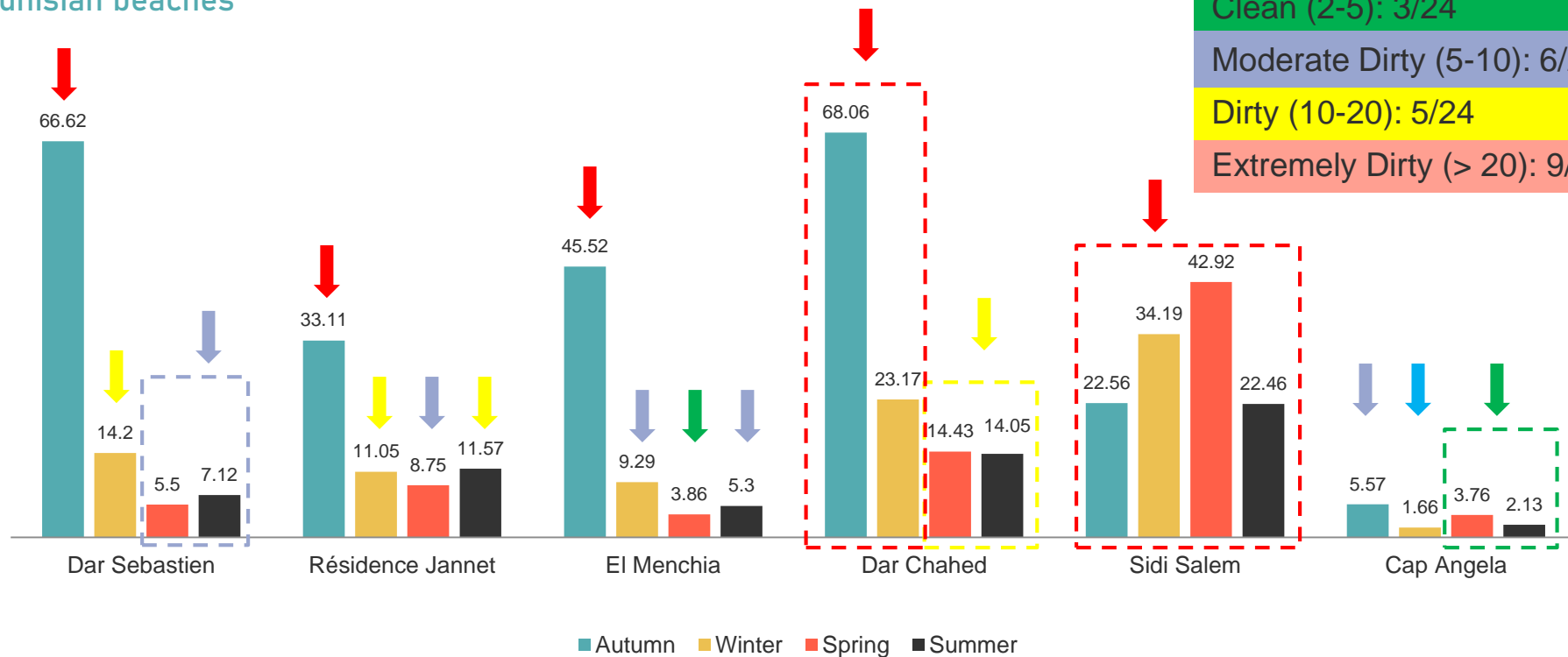
Very Clean (0-2): 1/24

Clean (2-5): 3/24

Moderate Dirty (5-10): 6/24

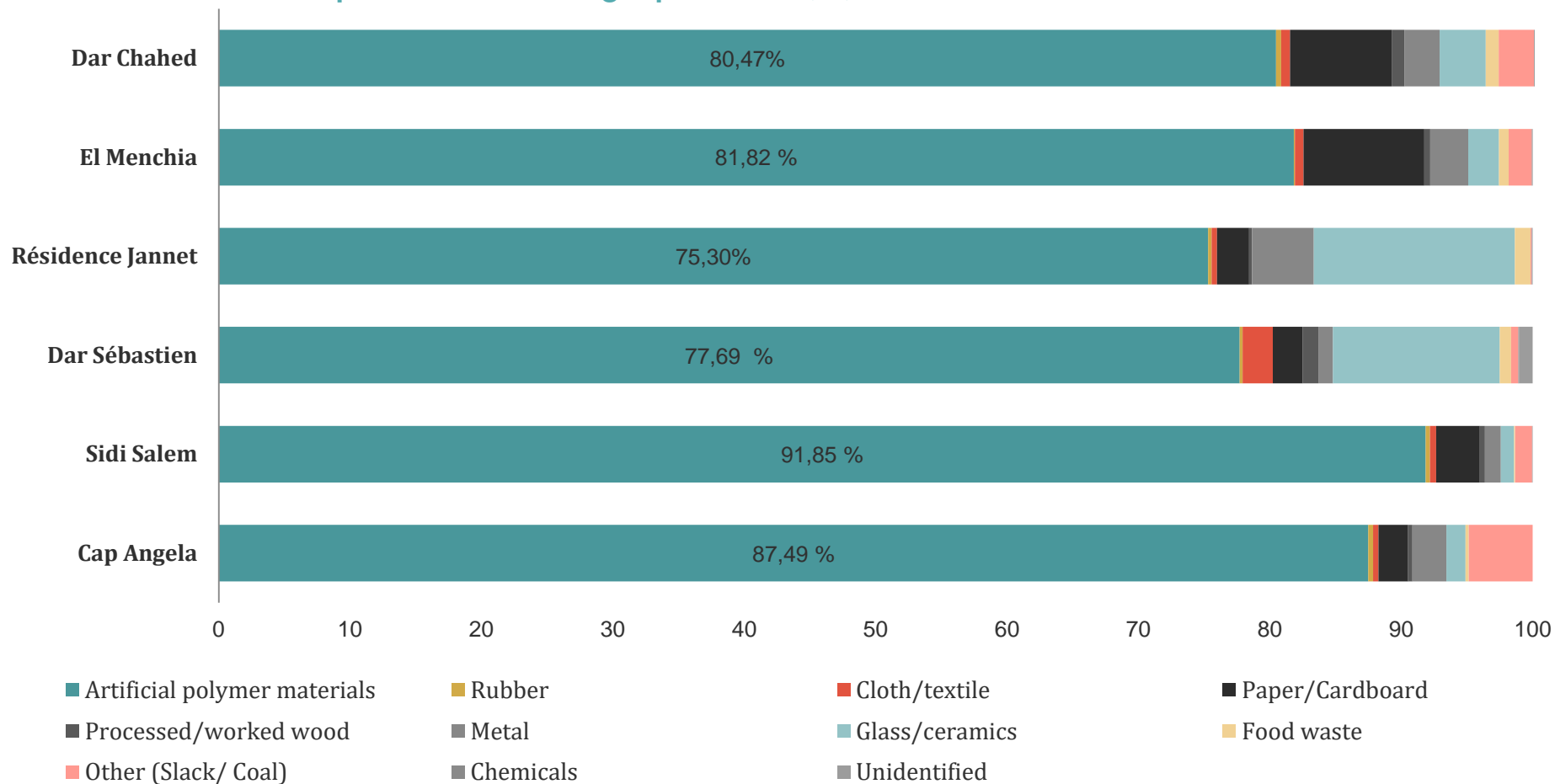
Dirty (10-20): 5/24

Extremely Dirty (> 20): 9/24



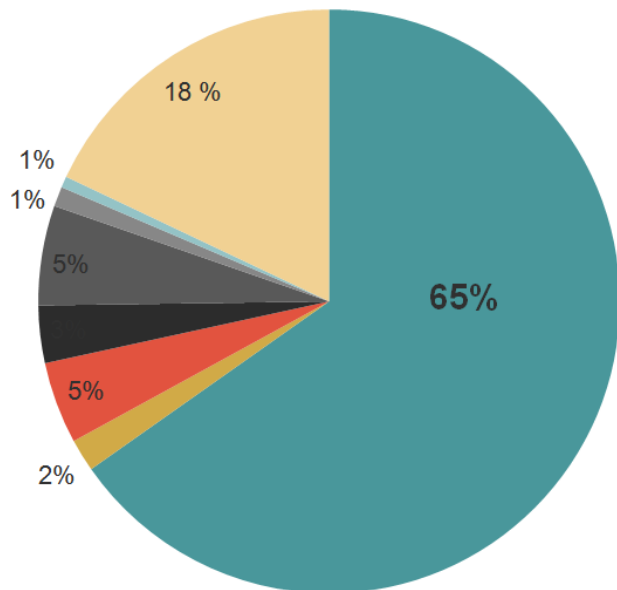
# Activity 2: Beach monitoring

## Marine Litter composition: average per site (%)



# Activity 2: Beach monitoring

## Source allocation



- Shoreline, including poor waste management practices, tourism and recreational activities (65%)
- Fisheries and aquaculture (2%)
- Shipping (5%)
- Fly-tipping 3%
- Sanitary and sewage related 5%
- Medical related 1%
- Agriculture 1%
- Not identified 18%

## Activity 2: Beach monitoring : Conclusion

- This study is the **first comprehensive nationwide statistics** on beach litter density, composition, and sources on Bizerte, Hammamet and Hammam Sousse.
- More **effective actions** based on the ML sources must be implemented by the local public authorities:
  - Inspection
  - disposal regulation
- **Public policies for awareness are a priority**: regular educational awareness campaign (educational institutes, local organizations) and a citizen science approach
- High levels of ML **threaten the tourism**, which is an important socio-economic activity in Tunisia: **well-planned monitoring programs** are the best way to verify the effectiveness of these policies.



# Activity 3: Establishment of a marine litter citizen science monitoring network

## Training sessions on marine litter monitoring: 07 to 15 October 2023

- Increase knowledge and awareness on waste and marine litter prevention among the participants.
- Know-how transfer

- IOW team,
- CITET team,
- NGO and municipalities members: (~ 40)



# Activity 3: Establishment of a marine litter citizen science monitoring network

## Training sessions on marine litter monitoring: 7 to 15 October 2023



# Activity 4: Selection and validation of the pilot site

## Pre-selection of areas that could host project activities based on:

- An overall evaluation matrix,
- Available data,
- Interviews with: municipalities, HORECA sector representatives and local waste treatment facilities.
- Local needs and requirements in terms of processing capacity and technological level and supports decision-making at the pilot site
- Field visits carried out by the project partners with CITET: July and November 2022.

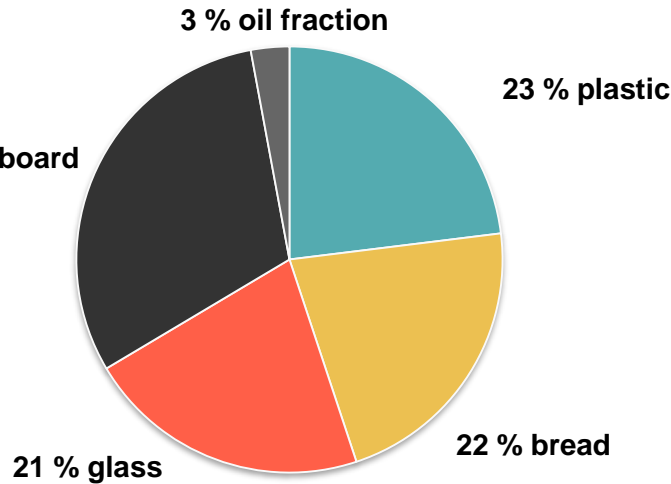


The steering committee validated the choice of **Hammam Sousse** as the **pilot zone of the project** (second meeting - November 2022)



✓ **2 missions of diagnosis and mobilization for (32) establishments in the HoReCa sector :**  
 from December 15 to 21, 2022 and from January 23 to 25, 2023.

✓ **Main results:**



**% of recyclable waste/category/customer produced in 2022 for the visited establishment -Hammam Sousse- Tunisia**



**3 categories**  
**Hotels**  
**Restaurants & Cafés**  
**Marina**

## Category 1: Hotels

### Subcategory 1: Hotels with effective waste management system

#### Sorting at source

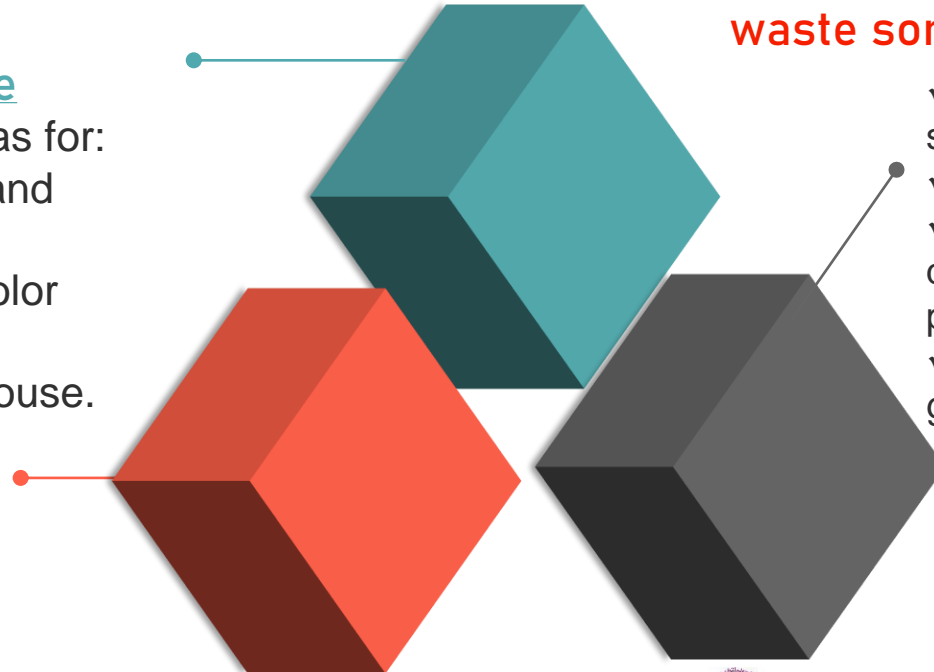
- ✓ Appropriate storage areas for: sorted waste; hazardous and miscellaneous waste,
- ✓ Selective sorting bins: color codes
- ✓ Composting unit/greenhouse.

### Subcategory 2: Partial sorting

- ✓ Inefficient system

### Subcategory 3: Absence of waste sorting (20% of hotels)

- ✓ Absence of waste sorting system,
- ✓ Absence of certification,
- ✓ Absence of data on the quantities of waste produced,
- ✓ Storage of waste in garbage rooms.



## Category 2: Restaurants & Cafés

- ✓Lack of a selective waste sorting system
- ✓Types of waste :Organic, plastic, paper, cardboard, glass, aluminum cans,
- ✓Lack of data on waste quantities,
- ✓Storage of waste in garbage rooms
- ✓Waste collected by the municipality

## Category 3: Port El Kantaoui

Multiple waste streams:  
Different types of waste produced depending on the activity



**Boats**

Organic  
Plastic  
Hazardous waste



**Restaurants**

Organic  
Plastic  
Cardboard/Paper  
Glass  
Hazardous waste



**Apartments**

Domestic waste:  
Organic  
Plastic  
Cardboard/Paper  
Hazardous waste



**Services**

Organic  
Plastic  
Cardboard/Paper



**Visitors**

Plastic  
Cardboard/Paper  
Aluminium

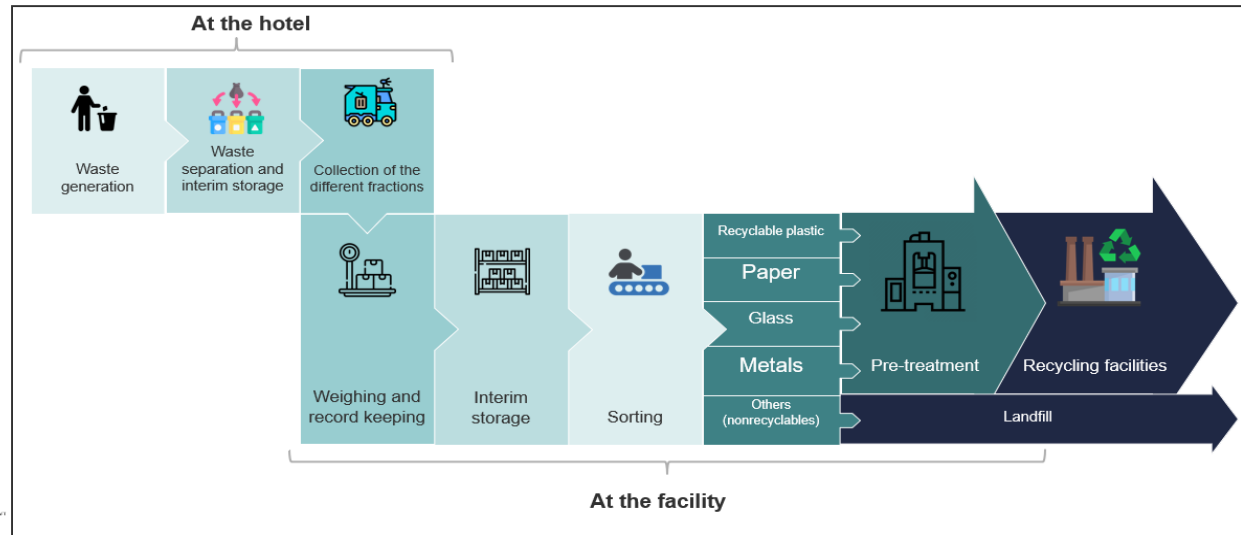
# Activity 6: Technical concept

The proposed concept presents a **global solution** for managing waste from the tourism sector in the Hammam Sousse area.

The concept integrates all sources of waste:

- HoReCa sector,
- beach clean-ups,
- Marina,
- Water channels,
- Public areas,
- water drainage channels.

**The concept offers innovative solutions for waste management**



# Activity 6: Technical concept

## 1<sup>st</sup> Lot

- Studies for the design and implementation of the plastic waste management center for the HoReCa sector
- Preparation of the execution file for the launch of the rehabilitation and development work of the center.

## 2<sup>nd</sup> Lot

- Acquisition, equipment installation
- Training.

- 2.1: Acquisition, commissioning of the Equipment necessary for the start-up of the Center and the transport of waste and necessary training.
- 2.2: Acquisition of different types of waste containers and sorting bins
- 2.3: Acquisition of equipment for cleaning beaches and water at the Marina.

## 3<sup>rd</sup> Lot

- Design and layout of water outlets in order to install macro-waste retention nets.



2<sup>nd</sup> Lot: -Acquisition, equipment installation  
-Training.

**Sub-lot 1:** Acquisition equipment for TouMaLi Center, waste transport and for the training.

➤ **Different size waste containers :** for safe storage of waste (plastic, paper, glass and organic) for collection points; trash room and kitchen waste.



**Kitchen waste**



**Brown:** Organic



**Bleu :** Paper/Cardboard



**Green:** Glass



**Black:** Mixed waste



**Yellow:** Plastic

2<sup>nd</sup> Lot: -Acquisition, equipment installation  
-Training.

**Sub-lot 1:** Acquisition equipment for TouMaLi Center, waste transport and for the training.

- Metal cage for cardboard
- Attractive bins for beaches
- Sorting bins for:
  - ❖ Marina,
  - ❖ cigarette butts,
  - ❖ Batteries,
  - ❖ Lamps,
  - ❖ Medicine,
  - ❖ electrical and electronic waste



2<sup>nd</sup> Lot: -Acquisition, equipment installation  
-Training.

**Sub-lot 1:** Acquisition equipment for TouMaLi Center, waste transport and for the training.

- PET bottle recycler
- Zigo filters to install on rainwater outlets



2<sup>nd</sup> Lot: -Acquisition, equipment installation  
-Training.

*Sub-lot 2: Acquisition of different types of waste containers and sorting bins*

- Metal weighbridge (01)
- Forklift (01)
- Bale press (02)
- Truck with metal cage (01)
- Van equipped with a tipping bin for waste collection (01)
- Maintenance equipment



2<sup>nd</sup> Lot: -Acquisition, equipment installation  
-Training.

**Sub-lot 3: Acquisition of equipment for cleaning beaches  
and Marina water**

- ✓ Robot for cleaning the beach
- ✓ Robot for cleaning the marina water



### 3<sup>rd</sup> lot: Design and layout of water outlets in order to install macro-waste retention nets.

- ✓ Design and sizing studies of the dike and nets
- ✓ Acquisition of macro-waste retention nets
- ✓ Civil engineering work



# Activity 7: Selection of legal and socio-economic experts and first advisory and support mission

## **Main objectives :**

- Study the proposal for the creation of the entity, its missions, its prerogatives and the stakeholders proposed to be part of this entity.
- **Legal advice** : 3 scenarios of the type of entity taking into account the objectives of the project, the regulations in terms of company law and waste management, and the will stakeholders involved in creating this entity.
- **Collection of regulatory texts** relating to the creation of comparable entities in the waste management sector.
- Develop a **socio-economic study** for the hierarchy of scenarios
- Prioritize the scenarios presented with an explanatory statement based, among other things, on the socio-economic study of the proposed scenarios to allow the project team to choose the best legal form of the entity.
- **Establish the legal status** of the entity to be created.
- **Assist the project team** with the creation of the entity (preparations and administrative procedures).
- To carry out the planned activities, the service provider in charge of the mission will use its own resources (staff from its structure and equipment on its property, etc.).

# Conclusion & Next steps



# Next Steps

- ✓ 8<sup>th</sup> monitoring campaign (6 beaches): **December 2023**
- ✓ 2<sup>nd</sup> session of a practical training for NGOs: **End of 2024: exit strategy**
- ✓ Publication of the Scientific paper
- ✓ Hydro-geological study: base to change the land use
  
- ✓ **Legal Study** :
  - Presentation of the three scenarios for the creation of the entity
  - Validation of the best scenario following the socio-economic study
- ✓ Launch of the tender related to the development of the pilot center and acquisition of waste management equipments.



Thank you for your attention !