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مندوق تطوير وإقراض الهيئات المحلية  
Municipal Development & Lending Fund



دولة فلسطين  
وزارة الحكم المحلي



**Endorsed by: Environment Quality Authority (EQA)  
The National Designated Authority (NDA)  
State of Palestine**

# **Concept Proposal Outline: Towards an Integrated Solid Waste Management in the West Bank & Gaza**

Presented by: Municipal Development & Lending Fund, a GCF accredited entity  
in association with the Ministry of Local Government  
State of Palestine

**December 2025**

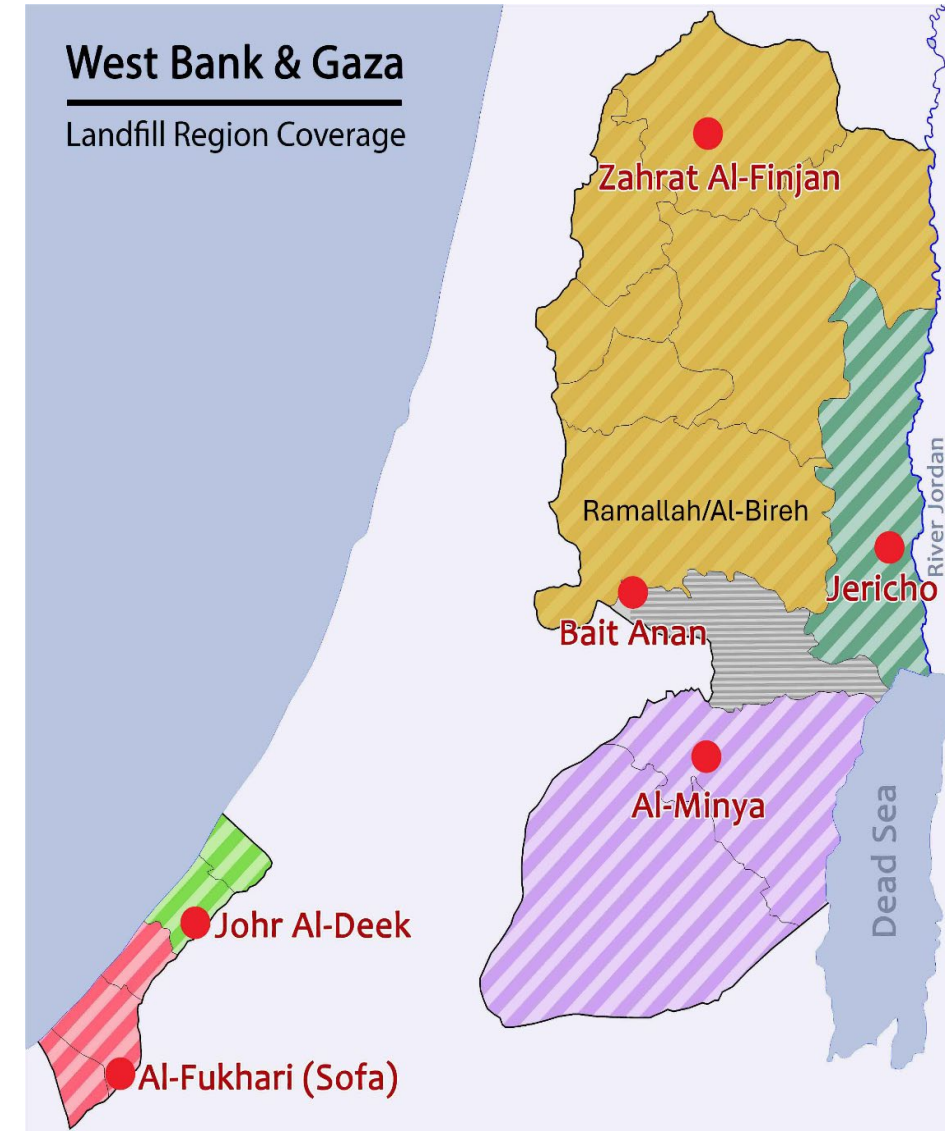


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# 1. Background

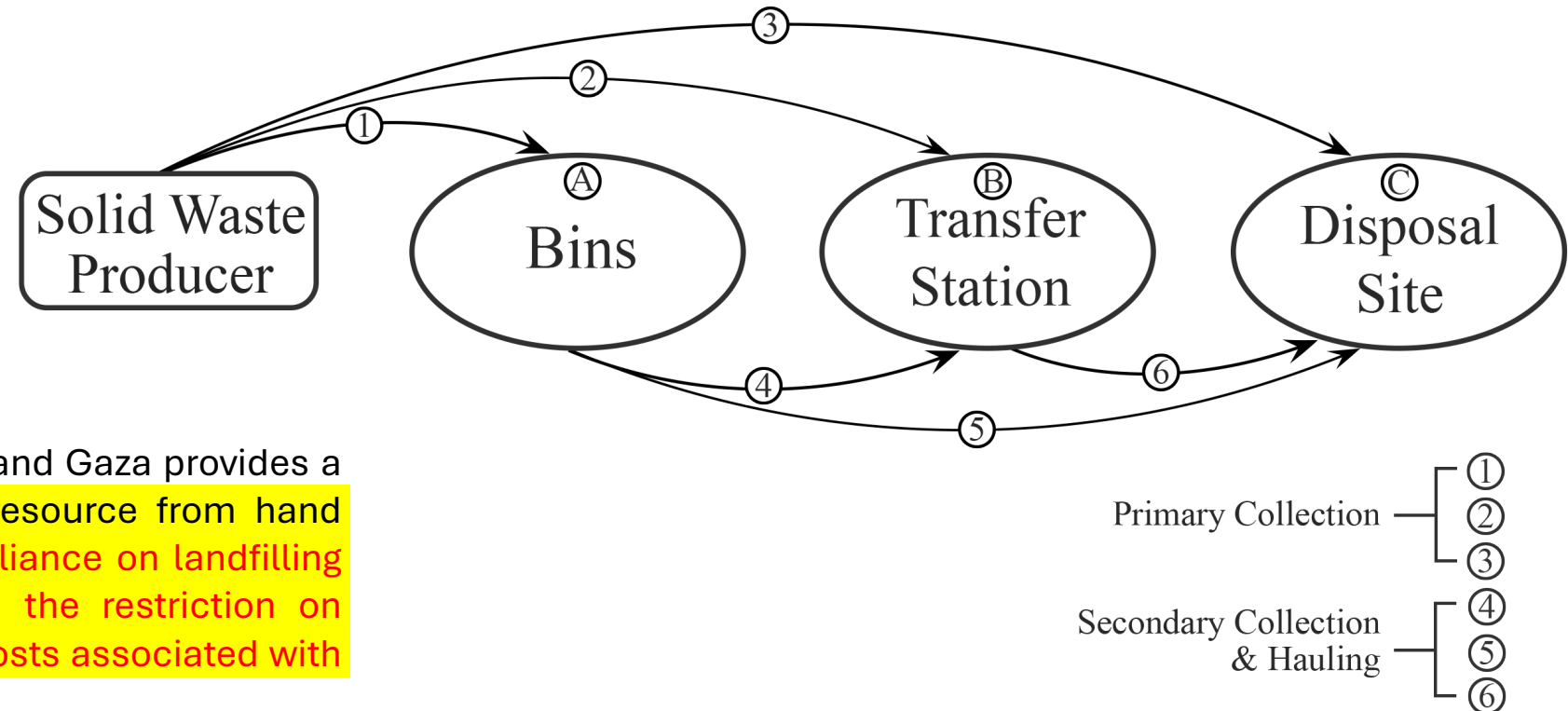
- The West Bank and Gaza cover 6,000 km<sup>2</sup> with a population of 5.5 million.
- Solid waste generation is significant—~1.1 million tons annually in the West Bank alone—yet **less than 1% is recycled or reused**, and most waste remains unsegregated and landfilled, creating environmental, health, and climate risks.
- Solid waste services are highly fragmented across **420 Local Government Units (LGUs)** and 17 Joint Service Councils (JSCs), with refugee camps managed separately by UNRWA.
- This decentralized structure **limits economies of scale, resource recovery, and climate resilience.**
- Current practices lead to **methane emissions from landfills, uncontrolled leachate, and vulnerability to flooding and heatwaves.**
- With rapid urbanization and limited infrastructure, the system **cannot meet growing demands or align with climate commitments.**
- **Political Fragmentation:** West Bank divided into Areas A (18%), B (22%), C (60%) → economic & social challenges. Impact on SWM:
  - Increased roadblocks post-Gaza war.
  - Transport to official landfills harder → longer trips, higher costs, lower efficiency.





# 1. Background

Scaling back, the overall SWM system in the West Bank follows the below simplified schematic. Each activity and stage in the SWM cycle suffers shortage in capital investment, adequacy, and sometimes inefficiency requiring support on the level of reform, tailored investment, capacity building, all within an overall need for paradigm shift in the way SWM is approached to move from the conventional methods to circular economy.



The challenges in the West Bank and Gaza provides a motivation to look at SW as a resource from hand promoting strategies to reduce reliance on landfilling that became more difficult with the restriction on lands, and help on cutting back costs associated with transport.

# 1. Background

## Impact of Area Fragmentation on SWM:

- Landfill coverage in the West Bank is **disproportionate due to accessibility issues**.
- Entire middle West Bank transports waste to **Zahrat Al-Finjan landfill in the north**.

## Reason for Limited Landfill Development:

- **Ramallah/Al-Bireh Governorate cannot obtain permits** for a sanitary landfill in mid-West Bank.
- **Viable landfill sites are located in Area C**, which is under Israeli control and beyond Palestinian Authority.

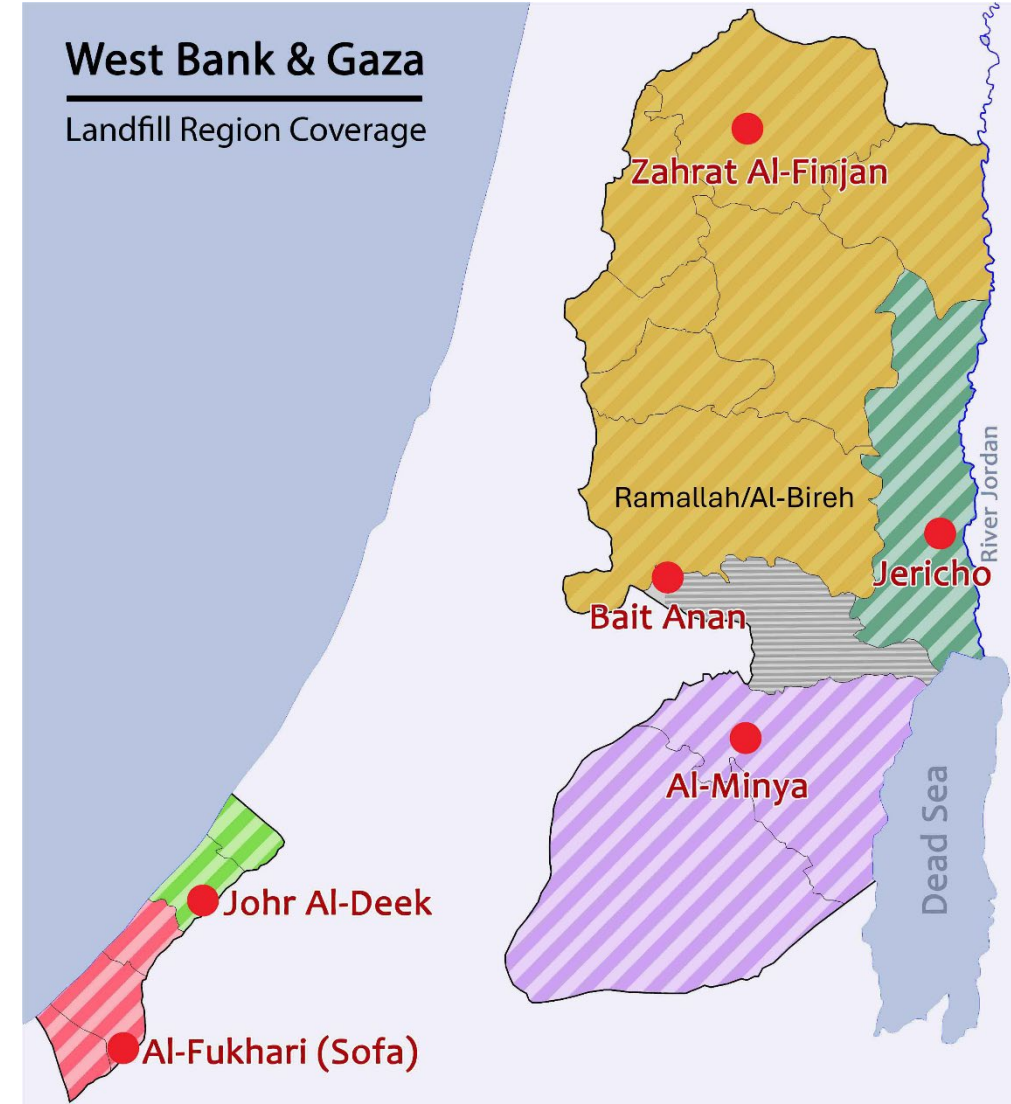
## Alternative Dumpsite Issue:

Bait Anan dumpsite is:

- Small.
- Insufficient capacity.
- Not accessible for Ramallah/Al-Bireh localities and JSC.

<sup>2</sup> Land was located supported by feasibility and environmental studies, however for the past 10 years permits were denied.

**Note:** map reflects operating official landfills in pre-war Gaza, the current situation in Gaza Strip is devastating across all sectors, with SWM requiring comprehensive interventions across all levels.





# 1. Background

## Largest Sanitary Landfill in WB&G:

- Size: 24 hectares.
- Exceeded its design capacity since 2018.
- Receives ~450,000 tons annually.

## Issues Due to Overuse:

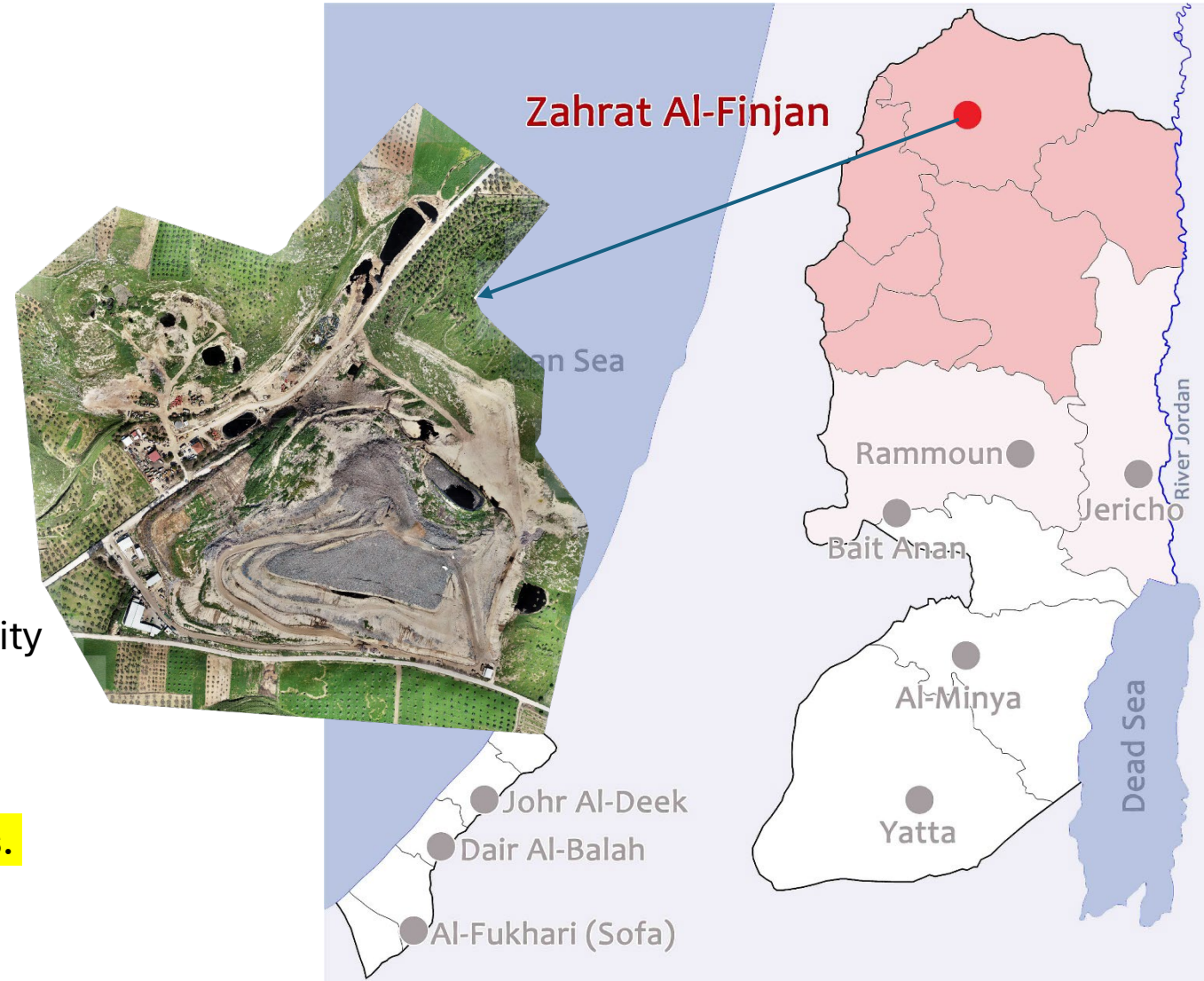
- Outbreaks of leachate.
- Waste mass instability.
- Difficulty in closing the site due to lack of alternatives.

## Government Response:

- Attempted to pilot a Waste-to-Energy (WtE) facility near the landfill.

## Consequences:

- Spread of random dumping across governorates. Driven by economic constraints and lack of accessibility to proper disposal sites.





## 2. Alignment with National Commitments & Plans

### Climate & Environmental Challenges and SWM

- Palestine's semi-arid to hyper-arid climate, combined with water scarcity and soil degradation, limits land availability for new sanitary landfills.
- Poor land management and advancing desertification reduce carbon storage capacity, while uncontrolled waste dumping and overused landfills emit methane, a potent greenhouse gas.



**SWM as a solution:** Introducing waste-to-energy (WtE), composting, and recycling reduces methane emissions, improves carbon balance, and minimizes land pressure.

### Political & Institutional Constraints and SWM

- Israeli occupation fragments land and restricts access to Area C, where most viable landfill sites exist, forcing long-distance waste transport and increasing costs.
- Movement restrictions and settlement expansion hinder the development of new SWM infrastructure, leading to random dumping and environmental hazards.
- Limited financial resources and asymmetric control reduce investment in climate-smart SWM technologies like anaerobic digestion and material recovery facilities.



**SWM as a solution:** Decentralized treatment facilities and transfer stations reduce transport costs, improve resilience, and align with climate adaptation goals.

## 2. Alignment with GCF Investment Criteria

Impact Potential	Substantial reduction of methane and CO <sub>2</sub> emissions while strengthening adaptation capacity.
Paradigm Shift Potential	Introduction of circular-economy models, technology transfer, and long-term institutional reforms.
Sustainable Development	Health improvements, job creation, and environmental benefits.
Needs of the Recipient	High vulnerability to climate impacts, limited fiscal capacity, and urgent need for modern waste systems.
Country Ownership	Aligned with Palestine’s Nationally Determined Contribution (NDC3) and national waste management strategy and other related laws and bylaws.
Efficiency and Effectiveness	Cost-effective interventions with measurable climate and socio-economic benefits.



### 3. Alignment with National Commitments & Plans

**Government Emphasis:** Environmental sustainability, pollution management, and climate change response.

**Waste Sector Impact:** Identified as the second highest source of national GHG emissions (23% of total emissions).

**Vulnerability:** Solid waste is one of six most vulnerable sectors in the 2016 National Adaptation Plan (NAP).

Updated NSSWM (National Strategy for Solid Waste Management):Emphasizes incorporating circular economy, sustainable production, and sustainable consumption as a national policy.

Key Focus Areas:

- Minimize solid waste reaching landfills.
- Upgrade existing landfills to utilize biogas.
- Additional Priorities:
  - Policy reforms and Institutional Dev. of JSCs
  - Increased private sector participation.
  - Enhanced community awareness.



This Concept Note outline is consistent with the Palestinian national plans and strategies, namely:

- Nationally Determined Contributions (NDC) to the Paris Climate Agreement.
- The National Strategy for Solid Waste Management NSSWM (2017 – 2023), and with the updated plan currently in final preparation.



### 3. Alignment with National Commitments & Plans

#### Roadmap for Sustainable Solid Waste Management in the West Bank<sup>1</sup>

Short-Term  
Recommendations

1. Establishment of 5 new transfer stations.
2. Supply of containers and **vehicles for primary and secondary SW collection**.
3. Vehicles and equipment for the efficient operation of the sanitary landfills.
4. Rehabilitation of the old cells at **existing landfills**.
5. Expansion of existing sanitary landfills (2 sites): with leachate treatment and **gas collection**.
6. **Clean-up illegal dumpsites and the closure/remediation of the dumpsites**.
7. Awareness raising and capacity building including planning and conducting awareness courses and environmental education campaigns for residents and workers.
8. **Establishment of Mechanical and Biological Treatment (MBT) plants at selected sites:**
  - a. Mechanical sorting plants for the separation of recyclable material to cover half of the total capacity of the plant with the possibility for a future extension.
  - b. Aerobic biological treatment and refinery of the organic fraction for the production of **compost to cover half of the total capacity of the plant with the possibility for a future extension**.
  - c. The reduction of the SW sent to the landfills **(by 40% to 50%)** of the received quantity to the MBT plant which leads to increases the lifetime of the cells.

<sup>1</sup> Study conducted by international consultant, which laid the grounds for the Integrated Solid Waste Management Program (ISWMP) currently in effect.



### 3. Alignment with National Commitments & Plans

#### Roadmap for Sustainable Solid Waste Management in the West Bank

Long-Term  
Recommendations

1. Establishment of WtE and GtE/GtF facilities at ZF and Al-Minya landfills.
2. Expansion of the MBT Plants to cover the full capacity of the plant.
3. Extension of the **Aerobic biological treatment and refinery of the organic fraction for the production of compost/CLO to cover the full capacity of the plant.**
4. The establishment of anaerobic biological treatment of the organic fraction for the **production of Biogas for Energy (GtE) (CHP).**
5. Production of RDF (Refuse Derived Fuel) or SRF (Solid Recovered Fuel) as fuel for the WtE plants.
6. Construction of new cells at the existing landfills.
7. **Clean up mass piles from illegal dumpsites and sanitary close and/or remediate the dumpsites in the Ramallah governorate (50 dumpsites) and North and North-West (N&NW) Jerusalem (1 dumpsite).**
8. Consider recycling and reusing waste reduction alternatives gradually through the implementation of governmental institutions, schools, and waste producers, e.g., hotels, restaurants, etc. in partnership with the private sector and Non-Governmental Organisations (NGOs).
9. Implement awareness raising and capacity building initiatives including the planning and conducting of awareness courses and environmental education campaigns.
10. Encourage private sector investment in the SWM by applying the PPPs type of investments.

### 3. Alignment with Ongoing ISWMP (phase 1) and the upcoming (phase 2)

The West Bank & Gaza Integrated Solid Waste Management Program (ISWMP)

	ISWMP-1	ISWMP-2
Timeframe	2025 - 2031	2030 - 2035
Financing Partner	The World Bank Group	-
Implementing Agency	MDLF	-
Estimated Budget	USD 25 million	USD 46.55 million
Available Financing	USD 25 million	-
Financing Gap	-	USD 46.55 million

The ISWMP came to fulfil the Road Map for the SWM Sector, with focus on urgent interventions in the first phase. The Road Map left the detailed feasibilities for the various interventions to be done at a later stage, whether under the ISWMP series or else, acknowledging the time needed for paradigm shift, and also for raising the necessary financing, in addition to the sequential and consequential nature of some activities.

- Serves as a stabilizing force to prevent system collapse.
- To drive forward the transformative reforms necessary for a sustainable and high-performing SWM sector.



## 4. Program Description

1. This Concept Note intends to complement the ongoing national programs, like the ISWMP-1, focusing mostly on **mitigation activities associated with carbon footprint in Palestine**, which shall advance Palestine **towards achieving its Nationally Determined Contributions**.
2. While the urgent interventions of **ISWMP-1 starting from the downstream point of the SWM cycle** in the West Bank (**expanding sanitary landfill and prevent system collapse**), the **proposed concept** under GCF focuses more **upstream in terms** of (i) waste collection, and on the middle of the cycle, that is concerned with (ii) transfer stations with sample of MBT/Wte and (iii) random dumping.
3. These three areas directly affect the carbon footprint, and a fourth area is also included concerning **landfills' biogas**, as part of the mitigation measures for the SWM infrastructure.
4. Similar to the approach of ISWMP-1 in terms of urgency; the proposed concept can start with most vulnerable areas in the West Bank, where the **middle shed of the West Bank (Ramallah/Al-Bireh Governorate is one of these areas (see earlier map in slide 6).**
5. **Synchronizing** this concept note outline with other **strategic programs like the ISWMP-1 is necessary to ensure effective implementation** via a calculated sequencing of activities in areas of common interest.





## 4. Program Description

### Component 1: Climate-Resilient Solid Waste Infrastructure

This component focuses on mid-points of the SWM cycle, transfer stations and downstream on existing landfills:

1. **Transfer Stations:** existing facilities are not adequate and do not conform to basic standards, and in other areas new transfer stations are needed. The expansion of use of transfer stations as material recovery centres (MRF) or further as Mechanical Biological Treatment (MBT) plants, and the introduction of anaerobic digestion; depending on the feasibility for each waste shed. Retrofitted or new facilities under this component will utilize clean energy (solar power or biogas); and it can act as a hub for recharging collection fleet proposed under component 3.
2. **Landfills:** upgrade existing major dumpsites and install gas collection and treatment systems.
3. **Feasibility studies and detailed designs are needed under this component.**

### Component 2: Land Reclamation

1. This component address the +100 random dumpsites scattered across the West Bank, it is envisaged to suspend use of random dumping and transform sites to either its original state (clean up) or upgrade into green parks and playgrounds, depending on size and risks associated with each site.
2. Detailed designs are needed under this component.



## 4. Program Description

### Component 3: Low-Carbon Waste Collection System

This component focuses on the upstream stage of the SWM process, which currently represents the highest OPEX for JSCs and LGUs, this component can support the following:

1. Modernization of municipal waste fleets with low-emission vehicles (electric/ hybrid); and utilize clean energy at transfer station sites for recharging.
2. Optimization of collection routes using digital dynamic tracking instruments to reduce fuel consumption.
3. Distribution of climate-resilient waste bins and community collection systems.
4. Capacity building to service providers and the establishment of Standard Operating Procedures (SOPs) with performance indicators and to leverage from the Grant Performance System being developed under the ISWMP- Phase 1.
5. Details and specifications are anticipated under a planned study under the ISWMP-1 (optimizing waste collection in the West Bank - 2026).



## 4. Program Description

### **Component 4: Institutional Strengthening and Policy Support (to be linked with reform and capacity building component under the ongoing ISWMP – Phase 1.**

This component support the reform at the central level:

1. Development of national climate-resilient waste management strategies.
2. Policies and incentives for recycling, extended producer responsibility (EPR), and circular economy pathways.
3. Digital systems for monitoring GHG emissions from waste.
4. This indicator intersects with ISWMP-1, collaboration will be in place for effective outputs.

### **Component 5: Community Engagement and Inclusive Livelihoods**

This component address the following activities:

1. Capacity building for informal waste pickers, women's cooperatives, and youth groups.
2. Public awareness campaigns on waste sorting and climate-related health impacts.
3. Grants for local circular-economy enterprises.

## 5. Summary of Hard Component Activities

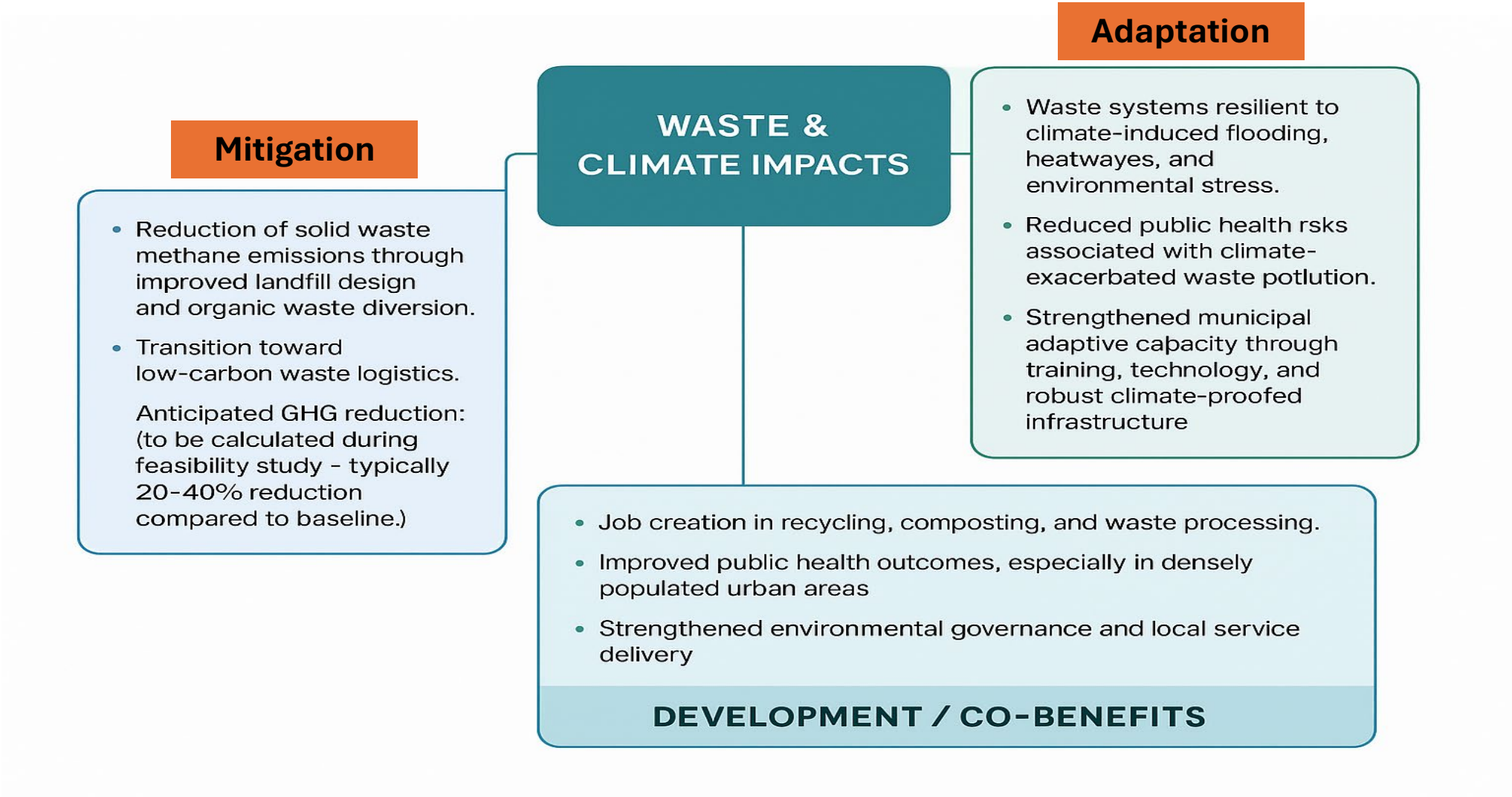
Comp.	Activity	Type	Effect in terms of:	
			Environmental and CC	Provided Services
1	Upgrade, retrofit, and construct new transfer stations.	Adaptation	TBD	
1	Establish new Transfer Station with MBT plant: Ramallah/Al-Bireh.	Cross-cutting	TBD	Reduce costs, create new incomes and jobs and improve service quality.
1	Rehabilitation and expansion of 4 Landfill in West Bank and Gaza; including methane capture and treatment system. Sites: Jericho, Bait Anan, Johr Al-Deek, and Al-Fukhari	Mitigation	500,000 tons of CO <sub>2</sub> /year	Extend life span.
2	Reclamation of random dumpsites in the West Bank.	Mitigation	2-8 tons of CO <sub>2</sub> /year/1000 m <sup>2</sup>	Recreational areas.
3	Replacement of SW collection trucks with EV and hybrid.	Mitigation	19.5-38.5 tons of CO <sub>2</sub> /year/replaced vehicle	More cost effective and higher level of service.
3	SW Collection Vehicles GIS-based applications for routing, monitoring and planning.	Mitigation	2,400 ton of CO <sub>2</sub> (assume 30% reduction: 12 tons of CO <sub>2</sub> /year/vehicle)	Reduce costs and improve service quality.
3	Distribution of climate-resilient waste bins and community collection systems.	Adaptation	TBD	Improve service quality and reduce pollution by waste scattering.

## 6. Estimated Budget

Comp.	Activity	USD
1	Feasibility and Detailed Design(s) for activities under component 1	1,500,000
1	Upgrade, retrofit, and construct new transfer stations.	10,000,000
1	Construct new Transfer Station with MBT plant and small scale Wte: such as Ramallah/Al-Bireh.	15,000,000
1	Rehabilitation and expansion of Landfills (currently controlled landfills) – such as Jericho and Beit Anan (transmissional)	15,000,000
2	Feasibility and Detailed Design(s) for activities under component 2	1,000,000
2	Reclamation of random dumpsites in the West Bank.	15,000,000
3	Replacement of SW collection trucks with EV and hybrid with necessary infrastructure	15,000,000
3	SW Collection Vehicles GIS-based applications for routing, monitoring and planning.	100,000
3	Distribution of climate-resilient waste bins and community collection systems	2,000,000
3	Capacity building to service providers	400,000
3	Permeance based incentives to service providers	3,000,000
4	Institutional Strengthening and Policy Support	1,000,000
5	Community Engagement and Inclusive Livelihoods	1,000,000
Estimated Total		80,000,000



## 7. Expected Results





Thank You