Ricardo Energy & Environment

The State of Palestine's Nationally Determined Contribution (NDC) implementation plans: Waste – Improving waste management

Report for Palestine's Environment Quality Authority and the Islamic Development Bank under the NDC Partnership's Climate Action Enhancement Package

NDC PARTNERSHIP
ACCELERATING CLIMATE AND DEVELOPMENT ACTION

Environment Quality Authority

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List of abbreviations

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AFD	French Development Agency (Agence Francaise de Developpment)
EQA	Environment Quality Authority
GCF	Green Climate Fund
GIZ	German Development Cooperation
GPS	Global Positioning System
IT	Information technology
JICA	The Japan International Cooperation Agency
JG	Japanese Government
KFW	KfW Development Bank
MoLG	Ministry of Local Government
NAP	National Adaptation Plan
NDC	Nationally Determined Contribution
UNDP	United Nations Development Programme
UNWRA	United Nations Relief and Works Agency
WB	World Bank

1 Introduction

1.1 Overview

This plan for **"Improving waste management"** is intended to enhance Palestine's opportunities to access climate finance and thereby facilitate successful implementation and delivery of Palestine's Nationally Determined Contribution (NDC). Details of the methodology used to develop this plan are provided in Annex 1.

The plan lays out steps to deliver the following NDC actions that are conditional on being able to secure international funding:

- Improve management of leachate from landfill
- Reduce, re-use, recycle
- Improving the waste collection system.

The first NDC action listed above aims to improve the management of leachate from landfill by implementing technologies best suited to each specific landfill site. The second NDC action aims to promote the uptake of reduce, re-use and recycle practices throughout Palestine by raising awareness and developing the necessary enabling infrastructure for re-using and re-cycling. The final NDC action aims to improve the waste collection system in Palestine by modernising the system (including routes, vehicles and stations).

This plan is to be achieved through completion of ten activities, each contributing to the following targets that align with the NDC actions:

- Reduce the volume of leachate by 50% by 2030 from suitable landfill sites
- Reduce the amount of waste for final disposal in landfill sites by 30% by 2030 and by 50% by 2040
- Increase the amount of waste re-used or recycled by 30% by 2030 and by 40% by 2040
- Increase the amount of waste collected to 90% by 2030 and to 100% by 2040
- Modernise (replacement of working equipment) 70% of the collection system by 2030 and by 100% by 2040

The indicative total cost of achieving these targets is 52m USD. Taking national contributions into account, there is a total funding gap of 38m USD. Achieving the targets will provide considerable benefits for Palestine by substantially reducing GHG emissions and by reducing the sensitivity of ecosystems and populations to indirect impacts arising from the direct impacts of climate change on the waste sector. There is strong government support to undertake the NDC actions that are the focus of this plan, which feature in national and sectoral strategies.

The targets and activities of this plan focus solely on municipal solid waste in Palestine, and do not include medical waste. Management of medical waste is led by Ministry of Health and coordinated by the Ministry for Local Government (MoLG) and the Environment Quality Authority (EQA). Improving management of medical waste is a top priority for Palestine, and its importance has greatly increased due to Covid-19. The Master Plan for Medical Waste is being updated by EQA to address the next five-year period. Palestine has recently received funding for pilot projects regarding management of medical waste, including investment in a

microwave system, waste incinerators, collection vehicles and training for operation and maintenance of the new equipment. These pilot projects will be reviewed in due course in order to determine next steps for improving the management of medical waste. Nevertheless, there remains a need to develop a medium-term plan beyond five years.

1.2 Geographical scope

Activities in this NDC implementation action plan are an equal priority for the whole of the Occupied Palestinian Territory, i.e. the West Bank, including East Jerusalem, and the Gaza Strip. However, the consequences of Israel's military actions during May 2021 have major implications for the waste sector, its related infrastructure and the capacity of MoLG to provide services to the Palestinian people living in the Gaza Strip. As this plan was developed in the months immediately prior to Israel's military actions, there is an urgent need to reassess the waste sector's need for rehabilitation before implementing specific activities in the Gaza Strip . As this could not be done in the preparation of this plan, the activities laid out may need to be revisited to account for resultant damage to waste infrastructure, as well as the additional waste created.

2 Relevance of the GCF Country Programme

The Green Climate Fund (GCF) Country Programme includes a funding proposal for the "Promotion of Sustainable Waste Management programme to reduce greenhouse gas emissions and local pollution". This is to be achieved through three outputs, two of which are relevant to this plan: ***"Promotion of sustainable waste management system for municipalities (4Rs – collection, sorting, reduce, reuse, recycling, recovery, composting"*** **and** ***"Promotion of sustainable leachate management system at sanitary landfills".***

3 Reasons for prioritisation of NDC actions

The three NDC actions that can be implemented through this plan seek to improve waste management. National stakeholders scored the relevance and feasibility of these actions based on the extent to which the Government's existing national and sectoral policies, strategies and plans already acknowledge their importance (High = 10, 5, 0 = Low); their adaptation and mitigation benefits (Very positive = 10, 5, 0, -5, -10 = Very negative) and the capacity and technology available to achieve them (High = 5, 2.5, 0 = Low).

The capacity scores were assigned on the basis that the activities in this plan are not currently being implemented. This plan aims to increase the capacity available, as necessary, to address constraints. The results are shown in Table 1.

Table 1 Priority scores for NDC actions

NDC actions	Government support	Adaptation benefits	Mitigation benefits	Capacity available	Technology available	**Total**
Improve management of leachate from landfill sites	10	10	5	2.5	2.5	**30**
Reduce, re-use, recycle	10	5	5	2.5	5	**27.5**
Improving the waste collection system	10	10	5	5	2.5	**32.5**

These scores draw upon and are justified by information in the following sub-sections that address each of the priority criteria.

3.1 Government support

The NDC action "Improving management of leachate from landfill sites" is featured in the National Strategy for Solid Waste Management (2017-2022)[1]. In turn, the actions "Reduce, re-use, recycle" and "Improving the waste collection system" are featured in the National Development Plan (2021-2023)[2] and the National Strategy for Solid Waste Management (2017-2022)[3,4], which outlines multiple strategic objectives that align with the NDC actions[5].

According to input from national stakeholders, the strong backing from the Government to implement wide-scale reduce, re-use and recycle practices in Palestine is also illustrated by an existing pilot project that it is undertaking for waste reduction and recycling in Ramallah.

3.2 Benefits for adaptation to climate change

Future climate scenarios for Palestine project an increase in temperature and a decrease in average annual rainfall, translating into an increase in the risk of drought. The wettest days may also become more frequent, leading to an increased risk of flood.[6] Waste management operations are sensitive to such extreme weather conditions, and impacts on the waste sector affect local communities in the following ways:

[1] Text reads: "Given the annoyance impact of odours resulting from landfilling of waste and leachate, which the surrounding residential areas suffer from at Zahrat Al finjan and Al-Minya landfills, it is important to treat the leachate generated from these landfills…"
[2] National Policy 31: Ensuring a sustainable environment… promote integrated solid and hazardous waste management and recycling…
[3] Text reads: "Enhancing and developing the current management systems of SW collection and transport, in order to improve the quality and effectiveness of services and its availability to all citizens".
[4] Text reads: "Encouraging the policies and methods of SW reduction, recycling, reusing and regeneration before final disposal at regional sanitary landfills".
[5] Text reads: "…Strategic objective three: effective and environmentally-safe management of SW services. Strategic objective four: financially sustainable and efficient SW services and activities…. Strategic objective seven: A more participating and aware community. Strategic objective eight: Effective information and monitoring systems."
[6] The State of Palestine's National Adaptation Plan (NAP) to climate change. p.109-110. Accessible here

- Biological activities within treatment systems (such as for leachate management) are directly affected by high temperatures and storms[7]. Leachate from landfill sites can leak into nearby water sources, polluting and contaminating them
- Higher temperatures increase the odours, pests and diseases associated with waste, which have a direct impact on local communities' health and hygiene, as waste is, currently, left close to residential areas.

The NDC actions that are the focus of this NDC implementation action plan will help alleviate the above impacts:

- "Improve management of leachate from landfill sites" will protect ecosystems and water resources from contamination
- Implementing "Reduce, re-use, recycle" will reduce the overall amount of waste being sent to landfill and, hence, the quantity of leachate in times of intense rains and storms, and the negative impacts on local communities' health and hygiene
- "Improving the waste collection system" will reduce the population's potential exposure to odours, pests and diseases associated with uncollected waste, which will otherwise increase with rising temperatures.

3.3 Benefits for mitigating climate change

The NDC action "Improve management of leachate from landfill sites" will have some mitigation benefits, as it will lead to a reduction in methane. "Reduce, re-use, recycle" will also have some mitigation benefits, as reducing waste sent to landfill also contributes to reducing methane emissions. However, in both cases, these benefits will be small compared to the total emissions from the waste sector.

The current vehicle fleet used for waste collection in Palestine is extremely old[8]. Vehicles in the fleet are inefficient and, therefore, emit much larger quantities of CO_2 than modern vehicles. The NDC action "Improving the waste collection system" will have mitigation benefits by upgrading the vehicle fleet to newer, more environmentally-friendly vehicles. However, there is also a need to increase the numbers of vehicles in use. Hence, the reductions in emissions per vehicle may be counterbalanced by the increase in the number of waste collection vehicles emitting CO_2. Further mitigation benefits may arise from the improved waste collection system by decreasing the likelihood of waste being burned in-situ.

3.4 Capacity available

Palestine currently lacks substantive experience of using technologies for leachate management. The NDC action "Improve leachate management from landfill sites", therefore, requires training of key individuals to increase the capacity of Palestine to manage and successfully monitor the leachate management processes.

Regarding the NDC action "Reduce, re-use, recycle", Palestine currently lacks the capacity to implement recycling on a wide-scale, as it has limited infrastructure for sorting of waste.

[7] The State of Palestine's NAP to Climate Change, 2016. Accessible here

[8] Thöni, V. & Matar, S.K.I. (2019) Solid Waste Management in the Occupied Palestinian Territory, West Bank including East Jerusalem & the Gaza Strip. CESVI. Accessible here

Additionally, successful implementation of this NDC action requires behavioural change, as many people in Palestine exhibit negative attitudes and behaviours towards handling rubbish. Therefore, an awareness-raising campaign is required to promote the positive benefits of reduce, re-use and recycle practices and associated behaviours.

Finally, while Palestine has the necessary human resources to expand the waste-management workforce for "Improving the waste collection system", the current capacity of waste-collection vehicles is insufficient to address the needs across the whole of the West Bank and the Gaza Strip. Palestine has received some funding from the Japan International Cooperation Agency for new waste-collection vehicles for the period 2019 – 2021. However, the resultant fleet will still not be able to service the volume of waste.

3.5 Technology available

All three NDC actions in this plan requires equipment that is not available in Palestine, although it can be readily imported. In particular:

- "Improve leachate management from landfill sites" requires import of the technology for leachate management, including sophisticated nano-filtration technology
- "Reduce, re-use, recycle" requires import of equipment for sorting waste at source, on transfer and disposal, as well as for subsequent recycling[7]
- "Improving the waste collection system" requires import of new collection vehicles and equipment for transfer stations.

4 Gender mainstreaming

4.1 Rationale for mainstreaming gender in this plan

The impacts of climate change are not gender neutral[9]. Globally, women and girls are disproportionately affected by the impacts of the climate crisis, as existing vulnerabilities are intensified and intersect with a range of social, economic and political inequalities[10].
A business-as-usual approach is likely to exacerbate existing inequalities and limit the opportunities for gender-sensitive and, where appropriate, gender-responsive adaptation actions that may improve gender equality.

At the UNFCCC's 25th Conference of the Parties in 2019 the Enhanced Lima work Programme on Gender and its gender action plan acknowledged the need for gender mainstreaming through all relevant targets and goals, noting that gender-responsive implementation of climate policy and action can raise ambition, enhance gender equality, and promote a just transition of the workforce[11]. Integrating gender equality into development leads to better outcomes in terms of economic efficiency, productivity and policy choices[12].

[9] Toolkit for a Gender-Responsive Process to Formulate and Implement National Adaptation Plans (NAPs) (2019), p.2. Accessible here
[10] Climate change, agriculture and gender in Gaza: Assessing the implications of the climate crisis for smallholder farming and gender within olive and grape value chains in Gaza (2020), p.5. Accessible here
[11] Report of the Conference of the Parties on its twenty-fifth session, held in Madrid from 2 to 15 December 2019 (2019), p.6-15. Accessible here
[12] World Development Report 2012: Gender Equality and Development (2012). p.3-6. Accessible here

Gender responsive solutions can help to tackle poverty and inequality while providing better community representation and technical solutions[13].

4.2 Gender mainstreaming in this plan

All activities and targets under this plan have been reviewed by a team of gender experts, including a representative of the Ministry of Women's Affairs (MoWA). Activities identified as gender-relevant are planned in ways that ensure that they are at least gender-sensitive[14] and at best gender-transformative[15]. More specifically, this implementation plan addresses the following gender issues identified in the waste sector:

- Palestine's women are often responsible for household waste management, while also facing challenges regarding the accessibility and safety of public services. Hence, the plan ensures that women are a target of awareness campaigns, and that barriers for accessing waste management services are addressed.
- While being responsible for household waste management, women are also responsible for childcare. Hence, while ensuring access to women, the plan also considers how children can be shielded from waste and recycling facilities to avoid any health and safety issues.
- Women face more barriers than men in securing employment. This plan's deployment of technologies in leachate management is a good opportunity to create jobs for unemployed, highly-educated women. Hence, associated capacity-building activities will specifically target women's involvement.

5 Activities

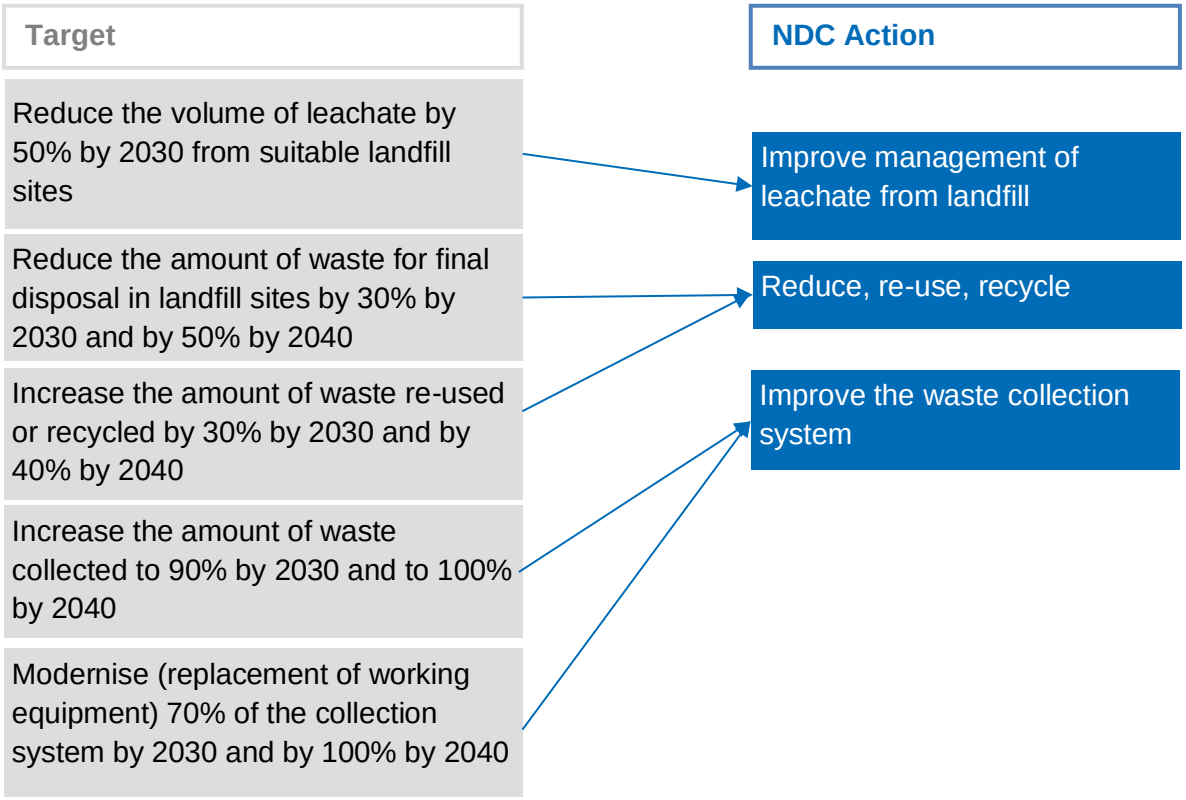
The targets set by national stakeholders to facilitate implementation of this plan and achieve the focal NDC actions are outlined in Figure 1.

[13] Implementation of gender-responsive climate action in the context of sustainable development (2016). Accessible here

[14] Gender-sensitive programmes and policies are Level 3 in the WHO Gender Responsive Assessment Scale and is defined as "Considers gender norms, roles and relations; Does not address inequality generated by unequal norms, roles or relations; Indicates gender awareness, although often no remedial action is developed". Accessible here

[15] Gender-transformative programmes and policies are Level 5 in the WHO Gender Responsive Assessment Scale, which is defined as "Considers gender norms, roles and relations for women and men and that these affect access to and control over resources; Considers women's and men's specific needs; Addresses the causes of gender-based health inequities; Includes ways to transform harmful gender norms, roles and relations; The objective is often to promote gender equality; Includes strategies to foster progressive changes in power relationships between women and men". Accessible here

Figure 1 Targets for improving waste management



In total, ten activities were identified in order to achieve these targets. They are listed in Figure 2 to Figure 4. Further details are provided in the subsequent sections.

Figure 2 Summary of activities to improve leachate management from landfill

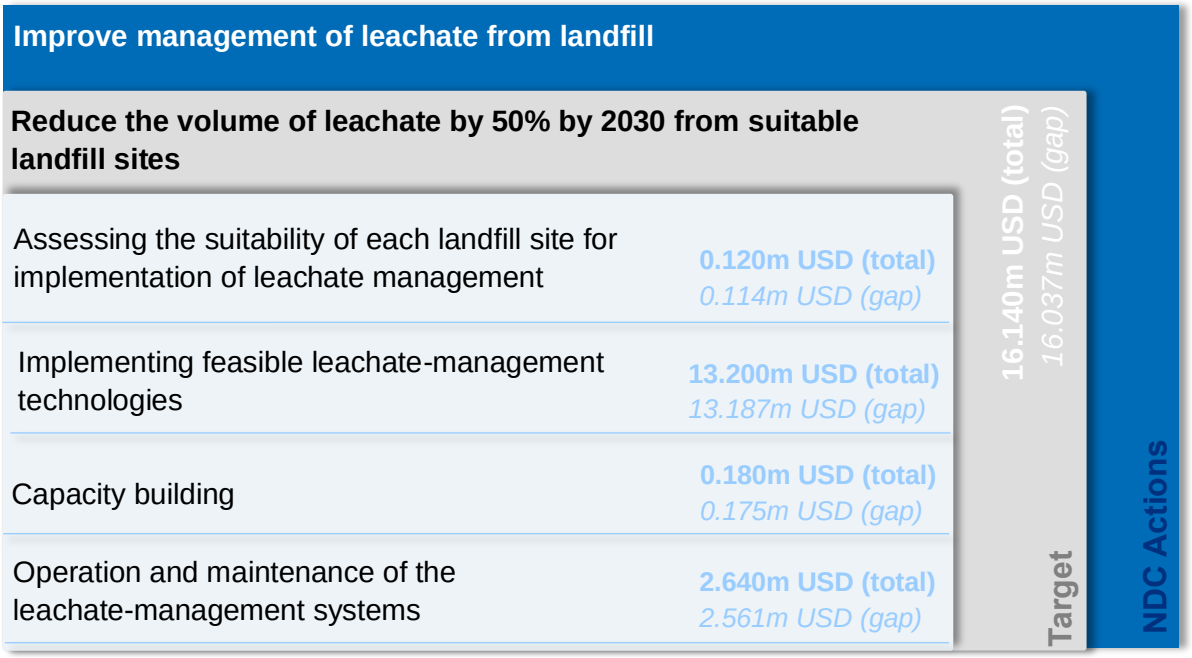
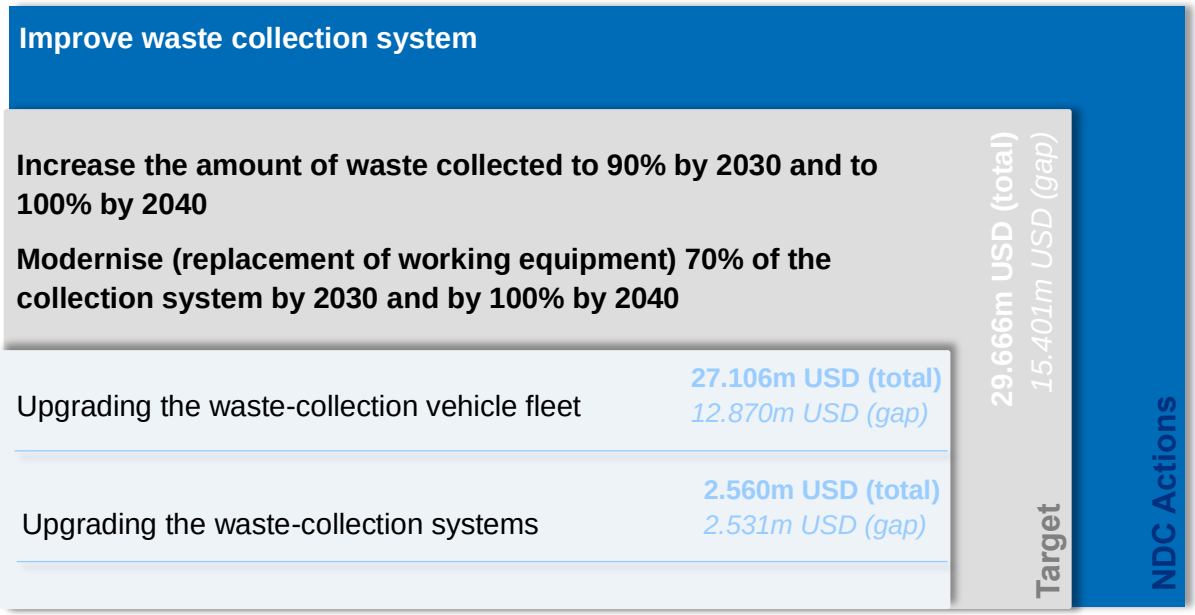


Figure 3 Summary of activities to reduce, re-use and recycle

Figure 4 Summary of activities to improve the waste collection system



5.1 Activities to reduce the volume of leachate from landfill

National stakeholders have identified the specific activities that need to be undertaken to achieve the following target: *"Reduce the volume of leachate by 50% by 2030 from suitable landfill sites"*. These activities are listed below:

1. **Assessing each of the landfill sites for its suitability regarding use of technology for leachate management**
   This will involve a study of the landfill sites in the West Bank and a separate study of those in the Gaza Strip to determine the most feasible technologies that need to be deployed for leachate management at each site. Potential leachate-management solutions include biological treatment, membrane treatment and evapo-concentration treatment.

   a. **Assessment in the West Bank**
   A study of landfill sites in the West Bank was previously carried out in 2018[16]. It assessed the leachate conditions at the Al Minya and Zahrat Al Finjan landfill sites, and developed feasible options for optimum-treatment technologies, given constraints at each of the sites. This study will be updated, and additional landfill sites in the West Bank will be assessed.

   b. **Assessment in the Gaza Strip**
   Landfill sites in the Gaza Strip have not yet been assessed. There is, therefore, a need for each of the landfill sites in the Gaza Strip to be assessed, including those at Al-Fukhary and Johr Al-Deik.

2. **Implementing the feasible leachate management technologies**
   Construction and operation of the leachate-management technologies identified as suitable at each of the selected landfills in the West Bank and the Gaza Strip will be commissioned. It is anticipated that a contract will be granted to an international company through a competitive bidding process.

3. **Capacity building**
   Relevant staff from the MoLG and local councils will receive technical training on the technologies adopted at each landfill site. This training will comprise theoretical and practical sessions, providing trainees with the knowledge and skills to operate the facilities. The capacity building will aim to attract and include women, as this is a good opportunity to create jobs for unemployed, highly-educated women.

4. **Operation and maintenance of the leachate management systems**
   Operations and maintenance activities will include maintaining a stock of spare parts (particularly those that may not be available on the local market) and addressing any technical problems that may arise during the implementation of the leachate-management systems.

   The first 20 years of operation and maintenance is expected to be commissioned to an international company through a competitive bidding process. The company will also be responsible for transferring knowledge to local professionals, who will continue the operation and maintenance of the systems beyond this initial period.

[16] Optimum Leachate treatment options in Palestine/Feasibility Study (Project 2).

5.2 Activities to reduce the amount of waste for final disposal in landfill sites and increase the amount of waste re-used or recycled

National stakeholders have identified the specific activities that need to be undertaken to achieve the following targets: *"Reduce the amount of waste for final disposal in landfill sites by 30% by 2030 and by 50% by 2040"* and part of *"Increase the amount of waste re-used or recycled by 30% by 2030 and by 40% by 2040"*. These activities are listed below:

5. **Assessing the current state of management practices in Palestine**
   This study will involve collecting data on the amounts of waste currently being created, and the share that is being re-used or recycled. It will also involve understanding how and why waste is or is not being re-used or recycled.

   Local small-scale studies have previously been undertaken. However, a comprehensive study of the whole of the West Bank and the Gaza Strip is urgently required in order to assess the current situation thoroughly and accelerate the uptake of these practices nationally.

6. **Promoting and raising awareness of reduce, re-use and recycle practices**
   The general public's lack of understanding about reducing, re-using and recycling waste is illustrated by poor cleanliness of residential areas, roads and public areas[17]. This activity will involve raising awareness of the need to reduce, reuse and recycle waste by showcasing the associated positive impacts on health and the environment, thereby encouraging a positive shift in people's behaviour.

   National awareness campaigns, delivered through the TV, radio and social media platforms, will aim to educate men and women of all ages in all communities' on how to reduce, re-use and recycle waste.

   It is likely that further incentives will be required to encourage recycling and re-use practices. Jordan has already implemented the 'Keep Amman Clean Project', involving the introduction of 'reverse vending machines'. These machines can be used to recycle plastic bottles and aluminium cans in exchange for a small incentive voucher[18]. Such ideas have the potential to be introduced in Palestine and will, therefore, be considered during the development of the awareness campaign.

7. **Developing the infrastructure for recycling**

   a. **Preliminary studies**
      A small-scale pilot project for recycling, mainly focused on cardboard, is currently being implemented in Ramallah. Further projects of this nature need to be implemented, focusing on other material than cardboard and applicable at a larger geographical scale in the West Bank and the Gaza Strip. Hence, a study of the West Bank and a separate study of the Gaza Strip will be carried out to gather data on the types and amounts of materials that need to be recycled, and the suitable locations for recycling facilities (i.e. away from households and inaccessible to children).

   b. **Building the infrastructure**

[17] National Strategy for Solid Waste Management in Palestine (2017-2022).
[18] JNCRS – Keep Amman Clean Project - https://jnrcs.org/en/content/keep-amman-clean-project

Based on the findings of the preliminary studies, recycling facilities and associated infrastructure will be constructed at the locations identified.

8. **Market evaluation study and development for recycled materials**
   This study will assess how to enhance and develop the markets for various recycled materials. It is intended that a market for recycled materials will be encouraged by regulating imports and the type of material that can be used in new products. These regulations will be further specified in order to incentivise the use of recycled materials (e.g. paper and cardboard, plastics, and fertilisers) by certain industries.

5.3 Activities to increase the amount of waste collected and to modernise the waste collection system

National stakeholders have identified the specific activities that need to be undertaken to contribute to achievement of the following targets: *"Increase the amount of waste collected to 90% by 2030 and to 100% by 2040"* and *"Modernise 70% of the collection system by 2030 and by 100% by 2040"*. These activities are listed below:

9. **Upgrading the waste-collection vehicle fleet**

a. **Assessing the current collection systems**
   A study in the West Bank and another in the Gaza Strip will be undertaken to determine the age and size of current vehicles in the waste-collection fleet, the quantity of waste being collected, and the state and capacity of transfer stations.

   The study will also assess the suitability of information technology (IT) tools, such as a global positioning system (GPS), for upgrading the waste collection system,

b. **Modernising the solid-waste-collection fleet**
   A large proportion of the 140 vehicles (100 large, 40 small) used for solid-waste collection by local councils and municipalities in the West Bank and the Gaza Strip are old, inefficient and not used optimally[8]. These vehicles will be replaced by new vehicles, which will be imported, to collect waste from households, commercial, and industrial properties and to transport it to transfer stations and sorting facilities.

   The old vehicles will be auctioned to the private sector, so that they can be salvaged and used for spare parts, where possible.

c. **Rolling out larger vehicles for transporting the solid waste**
   Additional, larger vehicles will be purchased to transport the waste from the transfer stations and sorting facilities to landfill sites and recycling centres.

d. **Using IT for fleet management and routing**
   The new waste-collection vehicles will be equipped with GPS systems to monitor their location. IT management systems will be installed in each governate to allow them to monitor and control the collection fleet, thereby ensuring its smooth and efficient operation and providing additional asset security.

10. **Upgrading the waste collection systems**

a. **Designing and optimising routes**
   One study for the West Bank and another for the Gaza Strip will be undertaken to determine the most cost-efficient routes for the waste collection fleets. In doing so, the studies will consider the needs of those who dispose of waste (primarily women

and children) to ensure the routes are accessible to them. The study will also determine the need for updating and/or building additional transfer stations along the routes, and their specific location.

b. Increasing the number of environmentally sustainable transfer stations

Currently, many of the transfer stations in Palestine are underdeveloped. They lack weighbridges and paved areas, leading to waste being dumped directly onto the soil[2]. There is also an insufficient number of transfer stations, which increases the distance that waste must be transported.

To improve the effectiveness of the waste-collection system and improve recycling practices, the existing transfer stations will be modernised, and new transfer stations will be built.

c. Implementing modernised and computerised solid-waste tariff collection systems

Current tariff and billing systems for solid-waste collection differ between municipalities and are mostly manual and paper-based. As a result, it is difficult to recover costs, compounding financial pressures on an already weak solid-waste collection system.

Hence, the solid-waste-tariff-collection systems will be updated and computerised to improve the tracking, collecting and processing of fees for: waste collection; transport of waste from transfer stations to landfill sites; and dumping waste at landfill sites.

6 Timeframes, indicative costs, existing funding and likely sources of funding

For each of the activities and sub-activities, Table 2 (below) identifies:

- The indicative implementation period
- Indicative costs
- National contributions, where relevant
- Existing international funding, where relevant
- Any remaining funding gap, and
- Indicative options to secure international public funding to address funding gaps. Note that international public funders' and development partners' priorities are subject to change and negotiation.

7 Institutional arrangements

Figure 5 (below) sets out the institutional arrangements for implementing this plan. It identifies the MoLG as the lead organisation for a cross-ministerial Project Steering Committee, as well as project delivery partners and other project stakeholders. The organisations involved will be specific to the activities, as relevant to their interests and may change over time. The MoLG is intended to be the main contact point with international public funders and development partners. The committee will aim for equal gender representation in order to encourage gender mainstreaming throughout plans and activities.

It will be of key importance for the MoLG to allocate appropriate financial and administrative resources and clearly secure internal ownership of each activity in the implementation plan. This way, the MoLG can ensure that the implementation plan is delivered, and the Project Steering Committee is functional, delivering the activities to achieve the targets of the plan while adhering to timescales.

8 Recommendations for an enabling environment

The successful delivery of this plan will be ensured by developing a supportive enabling environment where it does not yet exist. This may include updating or developing legislation, regulations, statutory guidance (and standards), national or sectoral policies and strategies, and incentives (including fiscal measures) that would contribute to ensure the successful implementation of the activities or remove potential barriers to implementation.

The wholly inadequate state of the solid waste management system in Palestine can partially be explained by a lack of relevant regulations and standards. Comprehensive legislation and standards, therefore, need to be developed and enforced in order to support the implementation of this plan and the NDC actions that it seeks to address.

Key recommendations for development of the enabling environment to support the implementation of this plan, identified by national stakeholders, that will be given further consideration include:

- **Palestine's Environment Law Amendment** that is yet to be enacted **should be used as an enabling context** for the development of the legislation, regulation, statutory guidance, policies, strategies or incentives that are relevant to this plan.
- **Harmonising strategies and plans**. The policy cycle of reviewing and updating strategies and plans regarding waste should continue to develop ever greater coherence of targets and activities within the sector, with other sectors, and across geographies.
- **The MoLG's ongoing update of the National Strategy for Solid Waste Management in Palestine (2017-2022)** should ensure that it:
    - References the NDC and NAP, as well as the targets and activities in this NDC implementation action plan.
    - Explains the relevance of solid waste management for climate change mitigation and adaptation, outlining the positive impacts which will be achieved through successful implementation of this plan.
- **Enforcing regulations at existing landfill sites.** Current legislation requires an environmental impact assessment of all new landfill sites to ensure that they comply with the standards in place regarding leachate management. It is the Environment Quality Authority's responsibility to enforce regulations associated with landfill sites by providing licenses and visiting the sites twice a year. However, there is a lack of financial resources to ensure the enforcement of these regulations. Upon successful implementation of this plan, sufficient resources should be made available to enable the Environment Quality Authority to enforce the regulations and standards.
- **Regulating the materials used in imported products.** New standards can be developed, requiring imported products to be made of recyclable materials. This

should be further defined in the market evaluation and development study included in the activities of this plan. Further incentives to recycle and re-use recycled materials should be developed for further consideration.

- **Updating the current tariff and billing systems for solid-waste collection**. As mentioned in the activities of this plan, the solid-waste tariff collection systems will be updated and computerised to improve: the tracking, collecting and processing of fees for waste collection; transport of waste from transfer stations to landfill sites; and dumping waste at landfill sites.
- **Exploring means of enabling the private sector to invest in "reduce, re-use, recycle"**, e.g. through changes to legislation, regulation and incentives (including fiscal measures)
- **Developing regulations for employers** to ensure that awareness-raising and training activities are included within the terms of their employment, so that individuals are paid to attend during working hours. This will improve women's access to such activities by addressing their time and economic constraints. Implementing this recommendation requires securing formal approval from the Council of Ministers.
- **Developing regulations and statutory guidelines to enforce gender budgeting,** i.e. analysing all budget lines and financial instruments for climate adaptation and mitigation from a gender-perspective, to ensure gender-sensitive or gender-responsive investments in relevant programmes (e.g. addressing technology transfer and capacity building), such as here in this plan. The MoWA can be responsible for taking forward this recommendation and securing formal approval from the Council of Ministers.

9 Challenges for implementation

Israeli control over Palestinian territories is no impediment to the implementation of this plan. Palestine's unique geo-political situation since 1995 means that the MoLG and its delivery partners have adapted to the requirements and restrictions enforced by Israel's various levels of control and occupation across the West Bank and the Gaza Strip[19]. Efficient decision-making and implementing structures have been developed to circumvent restrictions, including by communicating with the Israeli authorities.

Over the years, the MoLG has worked with a range of international development partners, including the World Bank, the French Development Agency, UNWRA, GiZ, KfW JICAand others. In doing so, it has assisted them in navigating the administrative procedures required to ensure that programmes can be successfully implemented.

[19] Palestine constitutes the Occupied Palestinian Territory, which is made up of the West Bank (including East Jerusalem) and the Gaza Strip, based on the borders of June 1967 and are separated by Israel, the occupying power. The Oslo II Accord, formally entitled the 'Interim Agreement on the West Bank and the Gaza Strip of 1995', created three territorial zones in The West Bank: Area A, where the Palestinian Government has responsibility for public order and internal security; Area B, where the Palestinian Government assumes responsibility for public order for Palestinians, while Israel controls internal security; and Area C, where Israel maintains exclusive control.

Regarding improving waste management, constraints arising from Israel's occupation may limit resources available to implement this plan and/or restrict the development of the waste-collection system and recycling infrastructure. In order to overcome these constraints, permission will be sought through official coordination channels between Palestine and Israel, particularly in Area C where Israel maintains exclusive control. International funding partners can also intervene to assist in facilitating permission and carrying out projects.

Table 2 Timeframes, indicative costs, existing funding (USD million) and likely sources of funding

Activity	2021 - 2025	2026 - 2030	2031 - 2040	Unit cost	No. units	Unit type	Total cost	National contribution	International funding	Funding gap	Indicative options to secure international public funding to address funding gaps
1				0.060	2[20]	Studies	0.120	0.006[21]	0	0.114	**AFD; WB; UNDP; JICA; JG; UNWRA; GiZ; KfW**
2				2.640[22]	2[23]	Landfill sites	5.280	0.005[24]	0	5.275	
				2.640[25]	3[25]	Leachate management technologies	7.920	0.008[26]	0	7.912	
3				0.006	30	Training courses	0.180	0.005[26]	0	0.175	
4				0.528[27]	2[25]	Leachate management systems	1.056	0.032[28]	0	1.024	
				0.528[27]	3[25]		1.584	0.048[31]	0	1.537	
5				0.060	2[22]	Studies	0.120	0.006[23]	0	0.114	
6				0.005	60[29]	Campaigns	0.300	0.006[23]	0	0.294	

[20] Studies (one for the West Bank and one for the Gaza Strip).
[21] Staff time, communication, data collection.
[22] Cost estimated for leachate management technology based on Al-Minya landfill which treats 1,200 tonnes/day of solid waste. Costs may vary based on technology selection and capacity.
[23] Landfill sites (Note that final number of units will depend on the outcomes of the assessment study in Activity 1).
[24] Staff time, providing information and logistics. Given cost does not include land cost, the Government might provide land if available next to the landfill sites.
[25] Cost estimated for leachate management technology based on Al-Minya landfill site, which treats 1,200 tonnes/day of solid waste. Costs may vary based on technology selection and capacity.
[26] Logistics, training venues.
[27] Note that the operational cost has been assumed to be 20% of the total capital cost of the system based on leachate management costs, Climate and Clean Air Coalition. The exact cost will vary based on final technology selection and capacity.
[28] Staff time and technicians working on landfill sites.
[29] Designing and implementing 15 campaigns for all governates annually hence (15*9 = 135 for period until 2030).

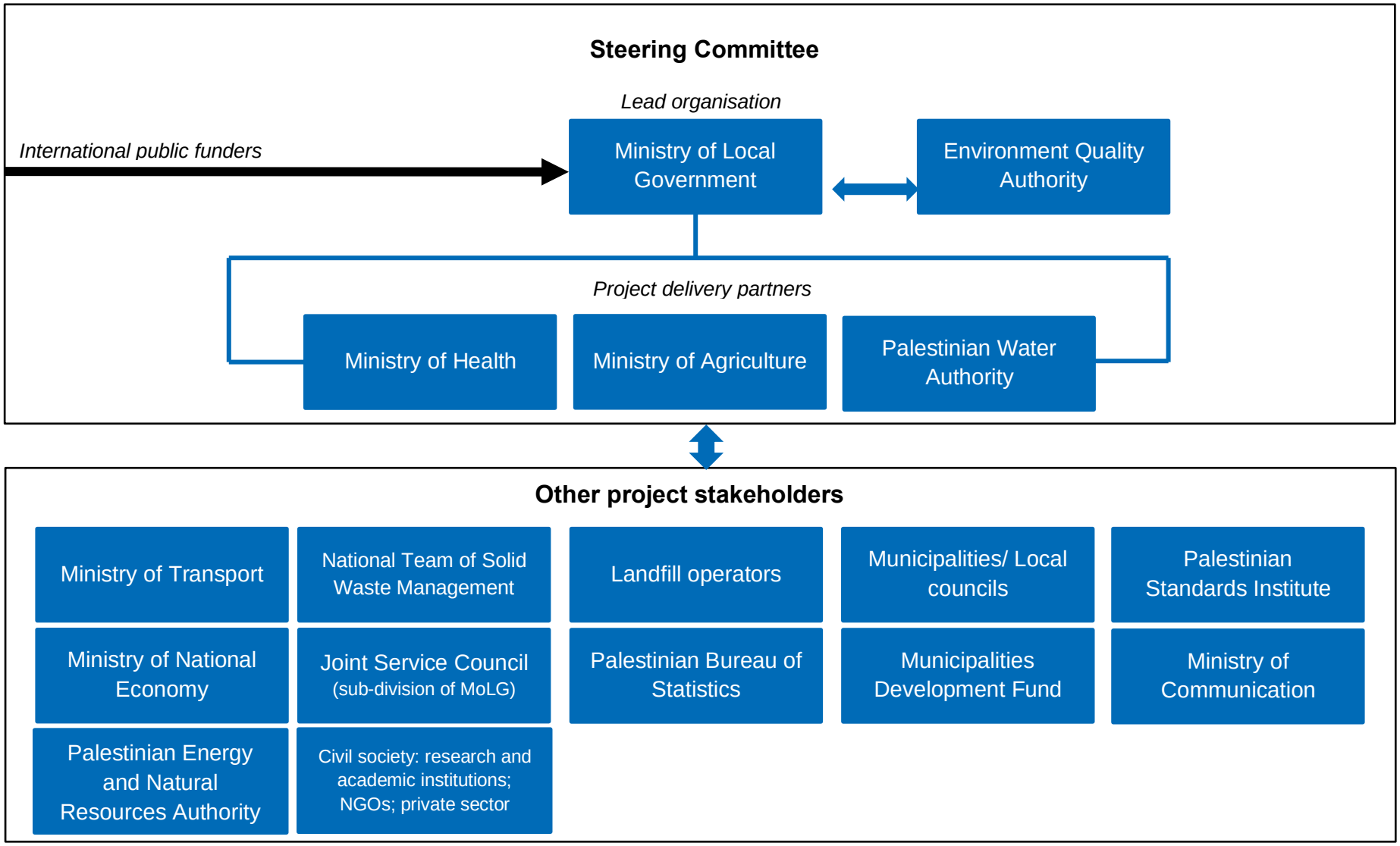
Activity	2021 - 2025	2026 - 2030	2031 - 2040	Unit cost	No. units	Unit type	Total cost	National contribution	International funding	Funding gap	Indicative options to secure international public funding to address funding gaps
				0.005	75[31]		0.375	0.008[23]	0	0.368	
				0.005	150[30]		0.750	0.015[23]	0	0.735	
7a				0.003	2[22]	Studies	0.006	0.001[23]	0	0.005	
7b				0.500 [31]	1	Recycling facility	0.500	0.010[23]	0.160[32]	0.330	
				1.500 [33]	3[34]	Recycling facilities	4.500	0.045[23]	0	4.455	
8				0.050	2[22]	Studies	0.100	0.003[23]	0	0.097	
9a				0.030	2[22]	Studies	0.060	0.003[23]	0	0.057	
9b				0.160	70[35]	Large vehicles	11.200	0.112[36]	7.840[37]	3.248	
				0.090	28[38]	Small vehicles	2.520	0.025[40]	1.764[39]	0.731	

[30] Designing and implementing 15 campaigns for all governates annually hence (15*10 = 150 for period 2030 to 2040).
[31] Cost estimated based on a pilot project in Ramallah, which recycles cardboard at a rate of approximately 10 tonnes/day. Costs may vary based on recycling materials and capacity.
[32] Funding from the Japanese Government for a pilot project for recycling of paper/cardboard.
[33] Cost estimated based on a pilot project in Ramallah, which recycles cardboard at a rate of approximately 10 tonnes/day. Costs may vary based on recycling materials and capacity.
[34] Per recycling facility: one in the North of the West Bank, one in the South of the West Bank and one in the Gaza Strip.
[35] Large vehicles to be modernised.
[36] Staff time and fees of transport on roads through MOLG and Ministry of Finance covering permissions and licensing.
[37] A grant from the Japanese Government is covering 70% of the total cost to upgrade the vehicle fleet.
[38] Small vehicles to be modernised.
[39] A grant from the Japanese Government is covering 70% of the total cost to upgrade the vehicle fleet.

Activity	2021 - 2025	2026 - 2030	2031 - 2040	Unit cost	No. units	Unit type	Total cost	National contribution	International funding	Funding gap	Indicative options to secure international public funding to address funding gaps
				0.160	30[38]	Staff time and fees of transport	4.800	0.048[40]	3.360[39]	1.392	
				0.090	12[40]	Small vehicles	1.080	0.108[40]	0.756[39]	0.216	
9c				0.168	42[40]	Vehicles	7.056	0.212[41]	0	6.844	
9d				0.030	13[42]	Systems	0.390	0.008[26]	0	0.382	
10a				0.050	2[22]	Studies	0.100	0.002[23]	0	0.098	
10b				0.100[43]	9[44]	Existing stations	0.900	0.009[23]	0	0.891	
				0.250	6[45]	New stations	1.500	0.015[23]	0	1.485	
10c				0.060	1[46]	IT system	0.060	0.003[47]	0	0.057	
TOTAL							**52.457**	**0.743**	**13.881**	**37.833[48]**	

[40] Number of vehicles (14 governates, each with 3 vehicles – cardboard, plastics, other).
[41] Permitting, registration and drivers.
[42] One system per governorate = 13 systems.
[43] Unit cost is an estimate as the final cost will depend on the assessment study in Activity 9a.
[44] Existing stations to be modernised.
[45] New stations to be build.
[46] IT system – one centralised system for all of Palestine.
[47] Staff time and data to be provided by the MoLG and local government.
[48] Total funding gap is subject to rounding errors.

Figure 5 Institutional arrangements for implementation



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بسم الله الرحمن الرحيم

State of Palestine

Ministry of Local Government

دولـة فلسـطيـن

وزارة الحكم المحـلي

Date....23/8/2021.....: التاريخ

No. .....4268.....:الرقم

Excellency Mr. Jameel Mtour

Chairman of Environment Quality Authority

Subject: Endorsement of the NDC Implementation Plans for the Solid Waste Sector

The Ministry of Local Government sends you best regards and wishes you good health in these difficult days of COVID 19, and would like to thank you for your extended and continued efforts to protect the Palestinian Environment.

Reference is made to the subject and to your kind request for an endorsement letter, and in my capacity as Minister of Local Government, this is to confirm that Ministry of Local Government fully endorse the NDC Implementation Plans for Solid Waste Sector, that was prepared with Ministry of Local Government, National Committee for Climate Change and key stakeholders as part of the project implemented by Environment Quality Authority and NDC Partnership and funded by the Islamic Development Banks.

List of Plans and estimated budget:

1. Reducing emissions in the waste management sector, estimated budget: 542.358 M USD
2. Improving waste management, estimated budget: 52.457 M USD

I would like to reiterate that these plans are in conformity with the National Priorities and relevant Sectoral Strategies as well as the guidance of the Palestinian Council of Ministers.

Majdi Al Saleh

Minister of Local Government

سليمان ابو مفرج

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بسم الله الرحمن الرحيم

State of Palestine

Ministry of Local Government

دولة فلسطين

وزارة الحكم المحلي

Date....23/8/2021.....: التاريخ

No. .....٤٢٦٨.....: الرقم

معالي الاخ جميل مطور حفظه الله

رئيس سلطة جودة البيئة

الموضوع: اعتماد خطط العمل لتنفيذ المساهمات المحددة وطنيا في قطاع النفايات الصلبة

Subject: Endorsement of NDC Implementation Plans: Solid Waste Sector

تحية طيبة وبعد،

تهديكم وزارة الحكم المحلي أطيب التحيات وتتمنى لكم موفور الصحه والعافية وتتقدم لكم بجزيل الشكر على جهودكم الموصولة والهادفة لحماية البيئة الفلسطينية، بالإشارة ألى الموضوع أعلاه وبناء على طلبكم يرجى العلم بأن وزارة الحكم المحلي **تؤيد وتدعم خطط العمل لتنفيذ المساهمات المحددة وطنيا** والتي تم اعدادها بالتنسيق والتعاون مع وزارة الحكم المحلي وأعضاء اللجنة الوطنية لتغير المناخ والشركاء ذوي العلاقة وذلك ضمن نشاطات المشروع المنفذ من قبل سلطة جودة البيئة وشراكة المساهمات المحددة وطنيا وبدعم من البنك الاسلامي للتنمية.

قائمة بأسماء الخطط والكلفة الاجمالية لها حسب رسالة سلطة جودة البيئة:

1. تقليل الانبعاثات الناتجة عن ادارة النفايات الصلبة، بموازنة تقديرية (542.358 M USD).

2. تحسين ادارة النفايات الصلبة، بموازنة تقديرية (52.457 M USD)

مع العلم بان هذهً الخطط تأتي انسجاما مع توجيهات مجلس الوزراء وبما يتوافق مع الاولويات الوطنية و الاستراتيجية الوطنية لقطاع النفايات الصلبة (2017-2022).

وتقبلوا فائق التقدير والاحترام

م. مجدي الصالح

وزير الحكم المحلي

دولة فلسطين State of Palestine وزارة الحكم المحلي Ministry of Local Government

سليمان ابو مفرح

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