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**Joint Management of the
Waste Crisis in Israel and
Palestine as an Environmental
and Political Opportunity**

Sondos Salah | May 2026

Written by: Sondos Salah
Graphic Design: Adi Ramot
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Joint Management of the Waste Crisis in Israel and Palestine as an Environmental and Political Opportunity

Sondos Salah^{1*}

1 * Sondos Salah is the Coordinator of Climate Resilience at the Shell Center for Sustainability & Society in the President's Forum on Readiness for Climate Change. She is the CEO of E.E COMPASS LTD, which works with local authorities on preparations for climate change. She was previously a Member of the Knesset. For this research she was assisted by Idan Ben Ari and Riham Khalil.

This document examines the problem of waste in the Israeli-Palestinian space, and its cross-border ramifications. The paper begins with a definition of the theoretical framework of cross-border waste management, its features and benefits. This is followed by a presentation of a number of test cases from around the world to illustrate the theoretical framework. The paper ends with a review of waste management in the Israeli-Palestinian space, describing the existing situation and its challenges, and recommends changes in the waste treatment methods used, which suffer from numerous professional and political strategic failures, and the adoption of a number of alternative guiding principles. The paper proposes that waste management be viewed as a shared cross-border mission: treating waste as a resource with economic and social value, and building on “circular economy” models to achieve its sustainable management, while gradually moving towards joint management of the Israeli-Palestinian space whereby, in addition to a national strategy for waste management, the parties agree on incentives, regulations, infrastructure and supervision that are jointly managed. The proposal is to build mechanisms and divide powers between the parties in a way that strengthens the sovereignty of each, and lays the foundation for trust and a political settlement between the parties. Finally the paper recommends reference to international regulations and institutions to support the process of transition to a circular economy and cooperation between the parties.

1. Introduction

Relations between neighboring countries are an essential factor in the promotion of regional stability, economic prosperity, and greater in-depth diplomatic cooperation.² In tension-filled geopolitical situations, shared environmental issues could become the lever for establishing new channels of cooperation and the creation of mutual trust. One of the central issues in this context is waste management – a field with direct consequences for public health, environmental quality, and economic infrastructures. The research literature indicates that cross-border waste management is a potential tool for creating “peace dividends” because it provides practical solutions for everyone involved, and encourages the development of collaborative relations even in situations of ongoing conflict.

In the Israeli-Palestinian case, joint waste management offers an opportunity to achieve a win-win situation, since effective solutions of the problem will improve the quality of life for people on both sides, lead to optimum usage of resources, and serve as the basis for a broader dialogue on civil and political cooperation. Moreover, integrated waste handling can also deliver direct economic benefits, such as the creation of jobs and the development of recycling industries, in addition to the contribution to civil dialogue thus facilitating closer relations between the two populations. In this sense, waste management is not just a technical or sanitary challenge, but a strategic arena that can promote regional stability and act as an essential component of any future settlement process.

In recent years there has been a growing understanding that there is a need for new solutions for waste management as an important element of dealing with the climate crisis. In this context, a circular economy

2 Saadeh, D., Al-Khatib, I. A., & Kontogianni, S. (2019). “Public-private partnership in solid waste management sector in the West Bank of Palestine.” *Environmental Monitoring and Assessment*, 191 (4), 243. <https://doi.org/10.1007/s10661-019-7395-2>.

proposes a basic change in the approach to handling waste: instead of looking at waste as a hazard to be disposed of, it should be viewed as a source of materials and resources that can be returned to the economic cycle, thus opening opportunities for regional cooperation and promoting environmental and economic objectives.³ This research aims to present a regional model in response to the absence of sustainable national and local waste management policy between Israel and the Palestinian Authority. Such policy must adopt a forward-looking approach that addresses regional aspects of waste management, not only in terms of climate and environment, but also in terms of regional cooperation and promotion of the Israeli-Palestinian peace process, while offering a solution to the profound economic problems of the Palestinian population in the West Bank. This model shows how better handling of the waste crisis in a regional framework is likely to benefit both sides in several ways.

In recent years there has been a deterioration in waste management in Israel, since the closure of the last recycling plant.⁴ At the same time, a practice has emerged of smuggling waste into the West Bank and burning it in unregulated incinerators. This phenomenon is extremely damaging to air quality, public health and water sources. Numerous studies as well as functioning models from elsewhere in the world show that a regional approach to waste management helps to focus the issue in a way that benefits all parties. These models propose cooperation between countries as a way of establishing mutual trust and strengthening ties in the long term. However preliminary and basic, such cooperation offers a cornerstone for broader economic, scientific and healthcare cooperation.

3 Kirchherr, J., Reike, D., & Hekkert, M. (2017). Conceptualizing the circular economy: An analysis of 114 definitions. *Resources, Conservation & Recycling*, 127, 221–232. <https://doi.org/10.1016/j.resconrec.2017.09.005>.

4 Rinat, Ts. (22 December 2025). *Burning waste is not 'environmental terror' but a multisystemic failure in which Israel plays a central role*. Ha'aretz.

The current paper proposes a triangular model, focusing on three main elements: the Israeli, the Palestinian and the international. This model allows for a multifaceted examination of the interests, strengths and barriers inherent in any cross-border collaboration. The choice of the three-sided structure derives also from international experience of conflict situations – for example in the context of Russia and Ukraine, where the involvement of international players has helped to frame the crisis in terms of institutional and environmental as well as security factors.⁵ Using this type of framework, the current research seeks to show how cooperation on waste treatment could serve as a mechanism for promoting more stable relations between Israel and the Palestinian Authority, with reference to international dynamics that can help or hinder these processes.

The knowledge base of this document rests on the existing theoretical literature and the collection of empirical data by means of semi-structured interviews. The paper opens with a presentation of the theoretical framework, explaining the fundamental concepts of cross-border waste management, the existing alternatives for sustainable policy, and the justification for the existence of a cooperative model in this field. This is followed by case studies from around the world that illustrate the contribution of environmental collaborations to the easing of political tensions and the advancement of peace processes. Next there is an analysis of the Israeli-Palestinian case, looking at legislative, institutional and operational aspects of the current situation. Another chapter focuses on existing cross-border aspects – in terms of the actual flow of waste, specific joint projects, and the mutual ramifications of waste creation by both parties. There is then a discussion of the opportunities and challenges of adopting cross-border waste management policy, and the paper shows how the adoption of such principles can help to improve waste management systems while also strengthening political relations. The paper ends with a presentation of the main conclusions, stressing the potential benefits of environmental

5 Saadeh et al., "Public-private partnership," 243

cooperations as an integral part of the process of building trust and defusing ongoing conflicts.

2. Cross-Border Waste Management: Theoretical Framework

The discussion of waste managements begins with a clarification of the concept of 'waste'. The literature stresses that the definition is not objective: something becomes 'waste' when its owner sees it as such, while another person may see it as a resource. There is therefore a need for a clear regulatory definition as the basis for policy. In addition, the historical trends of increasing urbanization and population growth have changed waste management from 'removal of hazards' to a vital urban infrastructure that affects public health.⁶ Conceptually, waste management is today perceived as a sociotechnological mechanism whose purpose is to minimize environmental impact and preserve resources through planning, incentives and regulations, and not merely to implement the final solution of 'disposal'.

The traditional concept of 'waste management' refers to the processes of collection, transportation, preliminary treatment/ processing, recycling or disposal, together with continuous monitoring of the situation, where the purpose is to minimize environmental effects, ensure sanitary conditions and protect public health.

Over time a new way of thinking developed which proposed a 'hierarchy of waste treatment', starting with the prevention and reduction of waste at source, followed by reuse, then recycling, and in the final stages the recovery of energy (controlled incineration of waste to generate power), with landfill only at the end. This hierarchy seeks to generate the maximum benefit from manufactured items while creating minimum waste.

⁶ Amasuomo, E., & Baird, J. (2016). The concept of waste and waste management. *Journal of Management and Sustainability*, 6(4), 88–96, <https://doi.org/10.5539/jms.v6n4p88>.

3. Key stages in the traditional waste management system

The traditional system created an integrated chain in which each stage affected the quality and efficiency of the next stage. An examination of these stages gives an understanding of the central challenges and the possible solutions at each level.

3.1 Separation at Source and Collection

Separation at source and collection, the first stages of the system, vary between regions and countries, and sometimes there are no formal collection arrangements. In many local authorities, waste collection is handled by the local government or private contractors. Effective planning requires knowledge of the composition of the waste (paper, plastic, metal, glass etc.) so that it can be forwarded to suitable treatment processes. For example, data regarding typical household waste indicate a broad range of paper and food items.⁷ In addition, the literature shows that the composition differs between towns and countries, and therefore direct technological ‘copies’ from different contexts are likely to fail.⁸

3.2 Treatment and Processing

At the treatment/ processing stage it is customary to distinguish between (a) physical processing – crushing, sorting, compressing; (b) biological processing – aerobic composting and anaerobic digestions; (c) thermal processing – incineration, pyrolysis, gasification.⁹

Anaerobic digestion converts organic material to biogas (mainly methane

7 Demirbas, 2011, p, 1282.

8 Amasuomo, E., & Baird, J. (2016). The concept of waste and waste management. *Journal of Management and Sustainability*, 6(4), 88–96, <https://doi.org/10.5539/jms.v6n4p88>.

9 Demirbas, 2011, 1280–1287.

and CO₂) through stages of hydrolysis – acidogenesis – acetogenesis – methanogenesis, and it can be used to power combustion engines, turbines and fuel cells. Composting generates products that are used to improve soil and as fertilizers. Thermal processing, particularly incineration, can produce energy but arouses controversy due to emissions (ash, APC residues) and therefore requires supervision to reduce pollution.¹⁰ On the other hand, the stage of physical – mechanical treatment includes sorting and separating a mixed flow of waste by means of crushing, sifting, magnets and optical sorters, so that materials can be sent for reuse and industrial recycling before any biological or thermal processing is needed.

3.3 Landfill and Post-Treatment

Landfill and post-treatment are the final stages but they are not marginal. Landfill uses a ‘sealed container’ whose purpose is to delay decomposition and protect the environment, but the high concentration of organic substances leads to the creation of leachates and the emission of methane into the atmosphere, showing the importance of separating (the organic flow) and recovery (by means of composting). Integrated approaches combine reduction at source, reuse, recycling, gas for energy and conversion of waste to energy, based on a cyclical view of the ‘life’ of a product and waste.¹¹

Although it is the last stage in the traditional waste hierarchy, landfill is still needed for materials that cannot be processed in other ways. Modern landfill facilities are designed to prevent ground and water pollution by means of impermeable layers, leachate collection systems, and trapping methane gas to generate energy.¹² In New Zealand, for example, in the production of biogas from landfill, greenhouse gas emissions have been reduced by some 95 percent in certain facilities.

10 Demirbas, 2011, pp. 1284–1286.

11 Demirbas, 2011, p. 1285

12 Seadon, J. K. (2010). Sustainable waste management systems. *Journal of Cleaner Production*, 18(16–17), 1639–1651, <https://doi.org/10.1016/j.jclepro.2010.07.009>.

However, a reduction in dependence on landfill is a central goal of sustainable policy, because of its long term costs and also because of its unavoidable impact on the environment.

These stages are not 'automatic': the success of each depends on policy and incentives. At European level, together with the waste hierarchy, EPR mechanisms have been defined – extended producer responsibility – which requires manufacturers to bear responsibility for the treatment and disposal of their products at the end of their lifecycle, using the principle of 'the polluter pays'. In addition, there are recommendations for behavioral incentives such as PAYT ('pay as you throw'), tax relief, and soft tools to increase public participation.¹³ The literature stresses that education and information reduce hazards, enhance efficiency and promote prevention and reduction at source.¹⁴ Effective policy is therefore a combination of technology, infrastructure and incentives, with mechanisms for measurement and constant improvement.

3.4 Other links in the chain of waste management policy: the 'circular economy' principle

More advanced waste policy rests on the principle of the 'circular economy' – the cycle of product design, prevention, reuse, recycling, conversion to energy, and finally landfill – reflecting the understanding that treatment begins with a plan for the product's chain of value. Implementation of this principle requires a combination of regulation, incentives and investment in infrastructures. The European Union, for example, has defined binding targets: restoring 65 percent of urban waste to use by 2035 and reducing landfill to 10 percent.¹⁵ This policy seeks to extract value from secondary materials with an array of tools and technologies to facilitate efficient processes of collection,

13 Zorpas, A. A. (2020). Strategy development in the framework of waste management. *Science of the Total Environment*, 716, 137088.143-147. <https://doi.org/10.1016/j.scitotenv.2020.137088>, pp 3- 4.

14 Demirbas, A. (2011) pp, 1280-1281.

15 Zorpas, 2020, pp. 3-4.

separation and treatment.

1. Product planning from a circular standpoint (before stage 1 of separation at source and collection)

The most effective way to decrease the volume of waste is to prevent its formation at the stage of planning and production. 'Eco-design' focuses on developing durable, repairable products made of materials that can easily be restored to circulation.¹⁶ It is customary to distinguish between materials that can be assigned to the biological/organic cycle – materials composed entirely of biological substances that can be returned to the ground or to a composting process, that break down quickly, and that can even 'nourish' the natural system, and materials that have to be treated with technology – such as plastic, metals, glass and so on. The purpose of their use in products is that they can be recycled endlessly without losing their value. EPR policy requires producers to fund or implement recycling at the end of the product's life, and thus incentivizes green innovation and production designed to recover materials for recycling. An example can be found in the field of electronics in the European Union, where there are specific systems for collecting electronic waste funded by the manufacturers. In addition, there are initiatives to improve food packaging and make it fully recyclable, thereby reducing plastic waste. A combination of binding regulation and market mechanisms can speed up the transition to sustainable design and reduce the quantity of waste even before the collection stages.

2. Separated collection (different planning of stage 1)

Separated collection is an important condition for a sustainable waste management system. When waste is collected by type – organic, paper, plastic, glass, metal – the quality of recycling improves, the costs of sorting are lower, and damage to the recycled raw materials can be avoided. An Italian study of 880 local authorities found that increasing

¹⁶ Seadon, 2020.

the rate of separated collection improved the profitability of waste management systems, while extending the area of collection damaged efficiency.¹⁷ An example of this can be found in Germany, where a separated system of collection based on separate bins in homes has led to one of the highest rates of recycling in the world – over 65 percent of urban waste. The success of these measures also depends on public awareness and ecological education, since separation at source (like the reduction of consumption) requires the full cooperation of citizens. In this context it is important to create a ‘reverse logistics’ where, just as there is a system to distribute consumer goods to the market, there is a system to collect them from the market and return them to the producer or for recovery.

3. Handling the organic flow (stage 2 – part of treatment and processing)

Organic waste often makes up more than a third of urban waste, and its treatment is a significant opportunity to create environmental and economic value. The two most common methods involve composting – the aerobic biological process that produces compost for use in agriculture and gardening, and anaerobic digestion that occurs in the absence of oxygen and creates a biogas that can be used to generate electricity and heat.¹⁸ In Austria, for example, urban anaerobic digestion facilities have been set up to supply electricity to some 20,000 households. It is important to distinguish between weight and volume: although the organic flow constitutes a relatively small volume of total waste, it can account for 40 percent or even more of the weight, and is therefore an important lever for reducing landfill and improving the operational efficiency of collection systems. Apart from its energy benefits, proper treatment of the organic flow reduces the quantity of buried waste, limits methane emissions, and improves the regional management of resources.

17 Bartolacci, F., Paolini, A., Quaranta, A. G., & Soverchia, M. (2018). Assessing factors that influence waste management financial sustainability. *Waste Management*, 79, 571–579.

18 Demirbas, 2011.

4. Generating energy from waste (stage 2 – as part of treatment and processing)

When waste cannot be prevented, reused or recycled, it is possible to use it to generate energy. WtE (waste-to-energy) facilities burn waste under controlled conditions, generating heat and electricity, and sometimes materials that can be used in industry. Advanced technologies include gasification and pyrolysis, that convert the waste into synthetic gas or fuel oil. However, WtE is controversial due to the emission of pollutants, and requires advanced filtering systems and the use of technology as a solution for residual flows only.¹⁹ Denmark, for example, generates about 5 percent of its electricity by incinerating waste, while maintaining some of the world's strictest air quality standards.

¹⁹ Demirbas, 2011.

Cross-border waste management

4.1 Environmental and economic aspects

Cross-border waste management means coordinating and regulating the treatment of waste when it flows from one country to another. The need for this arises primarily from environmental considerations: the harmful effects of waste – air, water and ground pollution – do not stop at national borders. For example, burning waste in open Palestinian areas contaminates air that reaches Israeli territory and harms populations on both sides of the border. Global problems such as plastic waste in the oceans and greenhouse gas emissions from landfill sites show clearly that waste is a challenge that involves all countries. Waste treatment must therefore be handled from a supranational perspective with agreements between states.²⁰

In economic terms, cross-border waste management offers both opportunities and risks. One opportunity reflects that waste is now being perceived more and more as a source of resources, materials that can be recycled and energy that can be produced. For example, the sale of recycled raw materials and energy generated from waste help to finance the operation of the waste system, to the benefit of the economy.²¹ A significant risk originates in industrialized countries where the costs of local treatment are high and there is a financial incentive to export waste to countries where the costs are lower or the standards are less strict. This creates an international ‘trade in waste’. Societies prefer to send their waste overseas and thus save costs, a phenomenon also dubbed ‘waste tourism’.²² Strict regulation in one country, with no dependency, coordination or ties with a neighboring country, creates

20 Reno, J. (2015). *Waste and waste management*. Anthropology Faculty Scholarship, 1. Binghamton University, https://orb.binghamton.edu/anthropology_fac/1

21 Bartolacci et al., 2018.

22 Reno, J. (2015)

motivation to break the law – to send waste to the neighboring country illegally as a money-saving measure. This situation must be properly dealt with, since the economic consideration encourages countries to export ecological hazards to the poorest countries, instead of handling them in an ecological way within their own borders. As soon as waste becomes an expensive nuisance, there is a temptation to abuse the regulatory and supervisory gaps between countries, creating cross-border crime based on the waste resource. When waste is managed as a resource, it creates economic opportunities for all countries and communities involved.

4.2 The international regulatory framework

At international level, cross-border waste management is essential to achieve environmental justice and prevent the abuse of global differences. In the 1980s there was growing awareness that rich countries were sending toxic waste to developing countries, and the response was the creation of a global regulatory regime: The Basel Convention (1989) forbids sending hazardous waste from OECD countries to non-member countries, to prevent the transfer of hazards to the backyard of the developing world.²³ At the same time, efforts are increasing to coordinate waste management policies by means of regional organizations as well. The European Union, for example, has instituted binding directives for all member states that define uniform principles for waste management according to the hierarchy of treatment and the objectives of the circular economy. This regulatory coordination is intended to ensure that each country bears responsibility for treating waste within its territory, while preventing the distortion of trade in which waste is sent to areas with weaker regulation.²⁴ In fact, the Treaty of Rome in 1957 already announced the need to harmonize environmental standards in order to prevent the creation of trade

23 Reno, 2015, pp. 614–619.

24 Bartolacci et al., 2018, pp. 571–572.

barriers between countries due to regulatory differences,²⁵ a principle that continued to develop over the following decades in international environmental policy.

Cross border waste management is a direct continuation of the development of sustainable waste policy. In recent decades many countries have adopted sustainable waste management which stresses the handling of waste in a manner that ensures long term protection of the environment and its resources. This approach is based on a holistic view: waste is not just a 'local problem' but part of a broader system of production and consumption, and therefore sustainable solutions demand a holistic and long term approach.²⁶ One of the main tools is the hierarchy of waste management at international level. This principle has been accepted worldwide as the basis for responsible waste policy, based on an understanding that the goal of minimizing waste and maximizing the value of materials is shared by all. Cross-border waste management complements this approach by facilitating the implementation of the hierarchy on a larger scale. Collaborations between countries help to divert waste from landfill and bring it back into the production cycle on a regional and global scale.

Inter-state cooperation is a condition for successful implementation of the waste hierarchy and the establishment of a true circular economy. In most cases a single country cannot optimally treat all the types of waste that it produces, particularly when it lacks suitable infrastructure for all types of flow, or markets for recycled materials. Therefore countries work together and rely on each other to supplement the missing links in their treatment chain. Indeed, what is considered 'waste' in one location could be deemed a valuable raw material in another location. The definition of waste is often subjective, depending on the view of its owner.²⁷ Thus, by means of supervised trade in waste materials, it is

25 Zorpas, 2020, pp. 119–123.

26 Seadon, 2010.

27 Amasuomo, E., & Baird, J. (2016). *The concept of waste and waste management*. *Journal of Management and Sustainability*, 6(4), 88–96, <https://doi.org/10.5539/jms.v6n4p88>.

possible to move materials from countries where they are not needed to countries that wish to make use of them. In the European Union, for example, countries with shortages of raw materials and surplus waste work together to recover materials for their economies.²⁸ This new EU strategy – the European Green Deal – has even set itself the objective of turning Europe into a low-waste and low-carbon economy, an objective that cannot be achieved without cross-border cooperation in resource flows.²⁹ In other words, the circular economy is naturally global, or at least regional: for circular trade in resources to flourish, there must be an international network of treatment facilities, standards and suitable regulations, as well as import-export agreements on sustainable waste treatment.

However, cross-border waste management presents numerous challenges. Gaps between countries in regulation and enforcement ability can lead to abuses of transportation routes: unscrupulous elements can disguise waste as products or recycled materials and thus bypass legal restrictions.³⁰ Particularly in the age of globalization, ‘gray areas’ have appeared – such as electronic waste that is sent from developed to developing countries as ‘second hand equipment’ or ‘recycled materials’, when in fact it contains pollutants and is handled in a primitive way that is harmful to the environment and health. Apart from legal flows of waste with permits, there are also illegal flows: it is worrying to learn that waste is smuggled to weak areas where it is discarded. For example, there have been reports that every day hundreds of tons of electronic waste are smuggled to the West Bank, where it is subject to uncontrolled incineration in order to retrieve metals. This action breaches Israeli law and the Basel Convention, and causes severe air pollution and health risks to the local population. Such cases illustrate how in the absence of coordination and supervision between authorities in neighboring countries, waste seeps into a regulatory ‘black hole’.

28 Bartolacci et al., 2018 pp 571-571.

29 Zorpas, 2020

30 Reno, 2015

Moreover, even legal flows can arouse controversy, such as conflicts over the responsibility for handling problems (for example when a consignment of waste is sent that does not meet the environmental demands of the destination country). Differences in policy, economic differences and political disagreements often make it hard to reach agreement over sharing the burden and the risks of waste management between countries.

The research literature and worldwide experience show that the solution to these challenges lies in strengthening enforcement, improving regulations, and enhancing mutual trust. First of all, international supervisory mechanisms must be reinforced: strict enforcement of treaties such as the Basel Convention, together with the development of complementary frameworks (such as the Bangui Treaty in Africa, or the European Union directives on waste transportation) will ensure that cross-border waste is moved along legal channels only and treated in suitable conditions. Secondly, countries must ensure that they are acting in accordance with their international commitments and that their national legislation matches global norms.³¹

From an international aspect, it appears that in recent years implementation of the **LCA (Life Cycle Assessment)** methodology for SWM (Solid Waste Management) has become more common in many countries, including the United States, Singapore and China. This trend reflects the general expansion of the use of the LCA methodology, as shown by the significant increase in the number of software tools and models developed to implement the approach.³² These models are generally based on broad collaborations between governmental and professional institutions, and can therefore serve as a source of inspiration for the development of collaborations between regions

31 Seadon, J. K. (2010). Sustainable waste management systems. *Journal of Cleaner Production*, 18(16–17), 783–787,. <https://doi.org/10.1016/j.jclepro.2010.07.009>

32 Bovea, M. D., Ibáñez-Forés, V., Gallardo, A., & Colomer-Mendoza, F. J. (2010). Environmental assessment of alternative municipal solid waste management strategies: A Spanish case study. *Waste Management*, 30(11), 2383–2395, <https://doi.org/10.1016/j.wasman.2010.03.001>.

and countries, in particular in areas characterized by cross-border movement of waste or joint environmental projects.

Potential shared projects could also rely on regional experience in the smart use of resources. For example, in Israel it has been reported that *“Unlike other places in the world, we have decided to make desert areas fertile, mainly thanks to two things – thanks to the organic material that we add to the ground, and also thanks to the treatment of almost 90 percent of our waste water that is recycled for agriculture”*³³ This model shows the potential for regional cooperation in areas where there is a shortage of water and resources, by using recovered water and increasing soil fertility, including areas over the border.

Another experiment that illustrates the possibility of joining forces is the ‘Catalonian model’, in which the government divides the country into areas for different types of waste, sets up facilities in each area, operates them and requires the authorities to bring their waste to these facilities.³⁴ This model that was developed in Catalonia, Spain, is based on dividing the territory into defined Waste Management Zones, and erecting specialized treatment facilities in each zone – for sorting, composting, WtE (waste-to-energy) and controlled landfill sites, based on the needs of the area and its population. The facilities are operated by a central body (the government or a specialist company), and the law requires all local authorities to bring waste to these shared facilities. In this way, the model cancels the need for small scattered facilities, streamlines the allotment of resources, and allows for a high standard of environmental control and enforcement.

The main advantage of the Catalonian model is the ability to combine economic efficiency with environmental protection: centralization facilitates the use of advanced technologies, sharing the costs and

33 Media Conference, 2023. Quoted in The Shmuel Ne’eman Institute (2023): The Waste Treatment Crisis – A National Project: Summary and recommendations of the Waste Forum. P. 12.

34 The Crisis of Waste Treatment – National Project, 2023, p. 13, based on Nesher Cement Works Israel, 2023.

benefits between authorities, and compliance with strict international standards. In the cross-border context it is possible to envisage a similar arrangement between Israel and the Palestinian Authority, with the definition of joint treatment zones and the construction of shared central facilities. Such a move could lead to significant cost savings, elimination of duplication, improvement of recycling processes and energy recovery, and a reduction in cross-border environmental and health hazards – thus creating a model of ecological regional cooperation of strategic value to both parties.

Information sharing between authorities, coordination of standards and the formation of joint action teams – these are practical steps for increasing trust and control. In fact, since the hazards and benefits of waste management are shared, there is a pragmatic incentive to introduce cooperation from which everyone gains. Avoidance or unilateral action will only increase the costs and the long-term damage for all countries involved. It is also essential to develop mutual trust; without such trust, each country will fear becoming its neighbor's rubbish dump. Acting 'in good faith', recognizing the needs and concerns of all sides, is a condition for achieving stable agreement. When countries believe that their partners are fulfilling their commitments and treating their waste properly, they will be more committed to cooperation with them. But trust must be built gradually, on shared successes, transparency and fairness in sharing the load – in this way it becomes a strategic resource for cross-border waste management.

4.3 Cross-border Waste Management: test cases from around the world

In order to understand how the principles of waste management are actually managed, it is necessary to examine how other countries and regions handle the challenges of waste in the framework of cross-border collaborations. The test cases presented in this section reflect a broad range of approaches – from bilateral arrangements in western

and northern Europe, through regional projects involving countries that are not subject to the same regulatory systems, down to cases of tensions and diplomatic failures in North America and South Asia. This survey shows how waste management is not only a technological or environmental issue, but also a space for economic, regulatory and political relations.³⁵ By examining the successes, challenges and failures, it is possible to learn lessons and formulate insights relevant to environmental policy and waste management in both local and international contexts.

1. Western Europe: Germany-Holland

The first test case illustrates close bilateral cooperation between Germany and Holland. Cities along the border, such as Munster (Ger.) and Enschede (Holl.), drew up an official public legal agreement based on the Anholt Treaty (2018), to create an integrated network of waste removal and recycling facilities on both sides of the border. The agreement was intended to ensure effective use of the capacity of facilities in each country, according to the principles of the EU Waste Directive, that stresses the construction of an integrated network of facilities through inter-state cooperation.³⁶

The economic aspect of this cooperation is prominent: by sharing existing resources and facilities, both countries enjoy savings and costs while avoiding duplication of investments in infrastructure. The move is also effective in ecological terms – it avoids unnecessary journeys by garbage trucks and reduces landfill, by encouraging recycling and energy recovery. In addition, there is an important diplomatic aspect: mutual trust and the bilateral contractual framework support the implementation of regulations and limit potential tensions between the national and local authorities in both countries.

35 Borbon-Galvez et al., 2021; Unfried & Mertens, 2024; Zawahri, 2018.

36 Unfried, M., and R. Mertens. 2024. *Cross-border Waste Management in the EU: The Case of Germany and the Netherlands*. Institute for Transnational and Euregional Cross Border Cooperation and Mobility (ITEM), Maastricht University, p. 3

Although the German-Dutch cooperation is perceived as a success story, it exposes the need for constant regulatory coordination. For example, the Dutch government defines a ceiling for waste imports (importplafond) in its national waste management program, limiting the quantity of waste it can accept from other countries. This restriction created uncertainty for the partners, who were concerned that Holland would reject cross-border shipments of waste if the quantity exceeded the permitted threshold.^{37 38}

Such a situation is problematic not only in economic terms – it threatens Munster’s ability to comply with North Rhine-Westphalia state law, which requires ensuring waste removal solutions for a decade in advance – and it also raises a diplomatic-legal issue: how to resolve a contradiction between national waste policy and the spirit of bilateral cooperation.³⁹ The proposed solution is greater regulatory coordination, including **either** the exclusion of agreed regional projects from application of the ceiling, **or** prior joint regional calculation of the ceiling, applying regulation and joint and transparent enforcement.

2. Northern Europe: Sweden-Norway

Similarly to western Europe, the Nordic countries have also developed cross-border waste management cooperations, characterized by mutual ecological and economic benefits. Sweden and Norway present a model in which urban waste is used as fuel to generate energy: Sweden, owner of an extensive array of incinerators to produce heat and electricity, imports hundreds of thousands of tons of urban waste from Norway every year. In 2018, for example, some 750,000 tons of mixed waste were exported from Norway to Swedish incinerators.⁴⁰

37 Unfried & Mertens, 2024, p. 4.

38 Unfried & Mertens, 2024, p. 3-4.

39 Miljødirektoratet. 2019. *Avfall i Norge 2018: Statistikk over avfallsmengder og behandling*. Norwegian Environment Agency, p. 72.

40 Klima- og miljødepartementet. 2021. *Meld. St. 45 (2020-2021): Waste and Circular Economy*. Norwegian Ministry of Climate and Environment, p. 164.

The economic arrangement is that the Norwegian authorities pay Sweden for accepting the waste, and thus avoid having to bury local waste, while Sweden gains fuel to burn as a source of energy, as well as monetary income. The diplomatic aspect of this cooperation is relatively slight, since the countries share ecological values and a free trade zone. Norway is part of the EEA zone and follows the waste regulations of the European Union, so that the legal basis for the movement of waste is agreed and clear.⁴¹ The arrangement allows for a stable cross-border flow of waste to produce energy.

In spite of the advantages, the Swedish-Norwegian cooperation also presents environmental challenges, since waste incineration in Sweden reduces reliance on landfill and generates power, but also creates toxic fly ash (industrial dust), which must be treated and safely disposed of. In fact, a significant quantity of fly ash from Swedish incinerators – over half a million tons in the course of five years – is sent for treatment and landfill in a special facility on the island of Langøya near Oslo in Norway, and the waste plants in Sweden pay the Norwegian company NOAH for these services as part of the commercial arrangement between the countries.⁴²

This situation caused outrage among Norwegian environmental organizations, who claimed that Sweden was ‘exporting’ an environmental problem to Norway, risking heavy metal contamination of the fjord in Oslo. The Norwegian company that operates the site mixes the ash with concrete and buries it in an old limestone mine, in the attempt to reduce leakage into the environment.⁴³

This case stresses the need for shared ecological responsibility: the diplomatic aspects of the cooperation come under scrutiny when one

41 NOAH AS Services for Swedish Waste Producers. The company notes that it provides treatment of toxic fly ash services for the Swedish market as part of a commercial model. <https://www.noah.no/en/sverige/>.

42 The Local. 2015. “Sweden Sends Toxic Waste to Norway.” *The Local Sweden*, April 10, 2015. <https://www.thelocal.se/20150410/sweden-sends-toxic-waste-to-norway>

43 The Local. 2015. “Sweden Sends Toxic Waste to Norway.” *The Local Sweden*, April 10, 2015; Miljødirektoratet, 2019.

community feels the burden of pollution from its neighbor. The solutions include developing technologies to handle fly ash within Sweden, extending producer’s liability to include hazardous by-products, and reinforcing supervision and bilateral agreement over hazardous waste flows.⁴⁴

3. Southern Europe: Switzerland-Italy

The third test case looks at the southern border of Switzerland (that is not an EU member) with Italy, and shows an innovative approach using industrial symbiosis in waste management. The Swiss canton of Ticino and the Italian region of Lombardy have set up a joint project to treat mountains of construction and demolition debris, with the aim of recycling materials and replacing raw materials in the construction industry. This cross-border collaboration enables building waste to be moved from one country to another for sorting and recycling, and aggregates to be efficiently transported from quarries for reuse in joint construction projects.⁴⁵ Building debris from Italy is sent to Switzerland for sorting and advanced treatment, while recycled aggregates and processed building materials are sent from Switzerland back to Italy and used in joint regional projects.

The financial benefit is considerable: instead of each country trying to deal with all its building waste separately, Switzerland and Italy share facilities and infrastructures, thus reducing costs and producing secondary building materials of value to the local construction market. The ecological aspect is also significant, with an expected reduction of 61 percent in carbon dioxide emissions relating to waste transportation. The plan has also saved about 81 percent of the external environmental cost of transportation, partly thanks to the use of the railway for transportation, thus cutting the number of trucks on the roads.

44 Borbon-Galvez et al., 2021 p. 313.

45 Borbon-Galvez et al., 2021 p. 319.

The success of the Swiss-Italian project involved dealing with differences in regulation and the objectives of the authorities on either side of the border. Switzerland, which is not directly subordinate to EU legislation, and Italy as an EU member, had to bridge policy gaps in the treatment of building waste – for example, standards for reuse of aggregates and financial incentives to recycle. However, joint steering committees for coordination, use of incentives (such as subsidies and tax relief) to align the financial interests of all partners, and coordination of regulatory mechanisms – all these proved essential for sustainable management of this cross-border symbiosis.⁴⁶

In addition, the case stresses the broad independence of local governments in both Switzerland and Italy. The project was not a central government initiative but grew from below – from the region itself. The Ticino and Lombardy authorities began the cooperation, based on economic logic and a shared environmental perception, and then received government backing. This pattern illustrates how independent regional organization can lead to innovative policy and build trust between countries, even when there are policy differences.

4. North America: Ontario/Michigan

Not all attempts at cross-border waste management are successful. A striking example of a failure is the dispute of many years between the province of Ontario (Canada) and the state of Michigan (USA) over the export of urban waste. Since the late 1990s, the municipalities of Toronto and other cities in Ontario have increasingly relied on burying waste in large landfill sites in Michigan, due to a lack of local capacity and lower costs in the USA. At the height of the crisis, some 4 million tons of Canadian waste were transported annually to Michigan, with about 400 trucks crossing the border each day.⁴⁷

46 Granholm, Jennifer M. 2006. "Statement by Governor Jennifer M. Granholm on Ontario Waste Shipments." Office of the Governor, State of Michigan, August 29, 2006.

47 McCarthy, J. 2008. *Waste Management and Canada-U.S. Relations*. Parliamentary Information and Research Service, Library of Parliament, p. 5.

In the short term this arrangement was probably economically successful for the Ontario authorities and for the American companies that operated the landfill sites, but it exposed a significant regulatory gap: a 1986 bilateral treaty between the USA and Canada only dealt with shipments of hazardous waste with prior warning and approval, while solid urban waste was not included in the supervision.⁴⁸ As a result, Canadian waste was exported in mass with no binding regulatory mechanism, arousing public and political anger in Michigan.

Residents and elected officials of the state described it as ‘Canada’s garbage bin’ and tried to introduce prohibitions and special fees for imported waste.⁴⁹ However, in legislative terms the authority was federal; thus the dispute dragged on for a decade with no agreed solution, until it became an outstanding example of a cooperation that failed due to defective regulatory coordination and nonaligned interests.

The failure of the Canada-North America collaboration was due to a combination of causes: **legal gaps** – the absence of binding binational regulation of urban waste, allowing the free and uncontrolled flow of waste; **regime differences** – American federalism limited Michigan’s ability to act, while decisions were taken at provincial level in Canada without considering cross-border implications; and **diplomatic failures** – reliance on short-term market solutions instead of a sustainable environmental agreement.⁵⁰

Ultimately, public and political pressure paid off: in 2006 Michigan senators and the Environmental Minister of Ontario achieved a voluntary agreement to stop the burial of urban waste from Ontario in Michigan until 2010. The Governor of Michigan Jennifer Granholm announced that the agreement “will release us from acting as the garbage bin” and blamed the federal US government that failed to enforce the 1992

48 Granholm, 2006.

49 Heins, E. 2010. “Waste Export Disputes Between Canada and the United States: The Case of Ontario and Michigan.” *Environmental Politics* 19(1): 42–60, <https://doi.org/10.1080/09644010903396041>, p. 45.

50 Granholm, 2006..

amendment of the bilateral treaty.⁵¹

The voluntary agreement – which lacked binding legal force but was honored – enabled Ontario to prepare for permanent solutions (expanding landfill sites and improving recycling facilities), while Michigan restored its own environmental control.

A number of lessons can be drawn from this failure. Firstly, existing international treaties should be anchored in law so that they will also apply to ‘non-hazardous’ waste in large quantities, thus closing any loopholes. Secondly, there is a need for multilevel coordination mechanisms, including involvement at various levels of authority (the United States, for example, has federal, state and provincial authorities), in order to bridge any gaps. Thirdly, each party must consider what it can contribute and not only choose the cheapest solution of passing the buck to others: shared long-term waste management must be promoted.

5. The regional case: The European Union

Contrary to the North American case, the European Union example shows how a joint regulatory framework can support efficient, coordinated cross-border waste management. EU waste policy is based on the principle of proximity and self management, and therefore over 90 percent of EU waste is treated in the country of origin⁵². However, for the remainder – particularly waste that can be recycled – the internal EU market enables waste to be transported to countries with optimal waste treatment capacity.

This mechanism is anchored in the EU Waste Shipment Regulation (EC 1013/2006) which applies the Basel Convention and defines a uniform system for supervising waste transportation within the EU. Under this regulation, every shipment of waste crossing a border within the EU is

51 European Environment Agency. 2021. *Waste Shipment in Europe: Data and Trends*. EEA Report No. 4/2021, p. 4.

52 European Commission. 2021. *Waste Shipment Regulation (EC No 1013/2006): Review and Implementation*. Publications Office of the European Union.

subject to defined criteria of prior notice and approval, or exempt in the case of ‘green’ recycled materials in certain conditions.

The close regulatory coordination is expressed by the fact that all 27 member states have adopted the same environmental standards for waste treatment, including restrictions on the export of hazardous waste to developing countries and a sweeping ban on sending waste to be buried overseas.⁵³

The economic dimension of the regional approach is considerable. In 2020, the internal EU market for recyclable waste was valued at some 12 billion euros, of which 69 percent consists of ferrous metals.⁵⁴ Thus the EU exploits its advantages of size – the waste flows accumulated by each country make it possible to justify investment in advanced recycling technologies and to ensure a supply of cheap secondary raw materials for industry.

At the same time, the diplomatic cooperation between EU members on this matter reduces tensions: there is less incentive to smuggle waste or for bilateral conflicts, because the uniform rules are jointly enforced by the national enforcement agencies (IMPEL) with the help of EU institutions.

It is important to stress that the regional EU model is not free of challenges, but there is an institutional mechanism for ongoing improvement. In recent years there have been cases of illegal waste shipments within the EU and outwards from it – for example, illegal export of electronic and plastic waste to developing countries – leading to claims that the existing regulations needed reinforcement.⁵⁵ In response, the EU is working to update the regulations in order to achieve stricter implementation of the principle of expanded responsibility and ‘the polluter pays’. Proposed steps include digitization of the system

53 European Environment Agency, 2021 No. 4/2021, p. 6.

54 Kummer Peiry, Katharina. 2019. “Global Governance of Hazardous Wastes: The Basel Convention.” In *The Handbook of Global Environmental Politics*, 2nd ed., edited by Robert Falkner, 274–287. Edward Elgar Publishing.

55 European Commission, 2023.

for monitoring shipments, more severe punishment for breaches of the law on waste trading, and further restrictions designed to limit the export of recyclable waste to countries with suitable infrastructure.⁵⁶ At the same time, pursuant to its cyclical economic policy, the EU strives to cut cross-border shipments even more, by reducing waste at source and expanding local recycling capacity in each country.

6. The Eastern Mediterranean: Cyprus

Cyprus, which since 1974 has been divided between the Greek community in the south and the Turkish community in the north, had to deal with a build-up of hazardous industrial waste along the separation line ('the Green Line') – an area that is administered by a UN peace keeping force (UNFICYP), which tends to focus on military security rather than environmental issues.⁵⁷ The waste included chemical substances, benzene, heavy metals – which not only threatened to pollute the ground, but also created a real public health risk on both sides of the line. In a situation of diplomatic stalemate with no formal mechanisms for cooperation, a creative solution could not emerge from within national regulatory boundaries but only from an international intermediary.

In 2007, as part of a joint UN and EU project called ACT – Action for Cooperation and Trust, a mechanism for coordinated removal of waste was launched: separate working teams from the Greek and Turkish sectors worked under the technical supervision of international mediators, and waste was shipped to suitable EU member states for treatment and burial.⁵⁸ The project focused on the rapid and controlled removal of dangerous materials, using technological lines and formalizing logistical coordination.

56 UNFICYP. 2007. *United Nations Peacekeeping Force in Cyprus: Environmental Risks Along the Buffer Zone*. United Nations, p. 1.

57 UNFICYP. 2007. p. 1.

58 UNDP. 2008. *ACT – Action for Cooperation and Trust: Environmental Projects in Cyprus*. United Nations Development Programme, p. 15.

The move was a success in environmental terms: it reduced the risk of pollution of water sources on both sides of the line, and improved the technical infrastructure for handling hazardous waste.⁵⁹ Similarly, it created a channel for limited technical communication between the parties to the conflict, and served as a positive precedent – if only at the level of a specific project. The absence of a sustainable mechanism for cross-border environmental management in a political crisis illustrates the difficulty of maintaining these successes in the long term.

7. South Asia: India-Pakistan

The basis for the environmental cooperation between India and Pakistan is the Indus Waters Treaty, signed in 1960 under the auspices of the World Bank, which focuses on distributing water resources between the countries, and also includes the establishment of joint committees to manage water quality and monitor environmental hazards.⁶⁰ For decades this mechanism led to regular meetings between representatives of both countries, to discuss not only water allocation issues but also reports on industrial plants and potential sources of waste affecting the shared rivers.

One example is a collaboration in the 1990s to deal with urban sewage leaks in Lahore in Pakistan, that were flowing into the Ravi River and causing pollution in India. Joint measures were taken to rehabilitate affected sections of the river.⁶¹ Alongside the institutional framework, there were also technical projects initiated by international organizations such as UNEP and WWF, that linked expert teams from India and Pakistan for joint monitoring of pollutants. For example, under the *Living Indus Initiative* (2022), water quality monitoring stations were set up on either side of the border, where data was collected in a uniform

59 Zawahri, Neda A. 2009. "Third Party Mediation of International River Disputes: Lessons from the Indus Waters Treaty." *International Negotiation* 14(2): 281–310, <https://doi.org/10.1163/157180609X432855>, p. 134.

60 WWF Pakistan. (2005). *Ravi River pollution and restoration initiative*. World Wide Fund for Nature, Pakistan.

61 UNEP, 2022.

format and sent to a third party for processing and distribution to both parties.⁶² This method made it possible to maintain cooperation even in periods of political tension, since the information flowed indirectly through international mediators.

Apart from that, a protocol was agreed for storage and transportation of hazardous waste from textile factories in the Indian Punjab region to regulated treatment sites, with funding obtained from the Asian Development Bank. Although the Indus Waters Treaty mechanisms focused primarily on the prevention of water pollution and rehabilitation of shared waterways, rather than on solid waste management in the classic sense, they also included aspects relating to industrial waste. For example, treatment of chemical residues and sludge from textile factories in the Punjab was organized within the framework of cross-border cooperation, and was part of a broader system to preserve environmental quality around the rivers. These cooperations had a dual effect – both environmental and diplomatic. Environmentally they contributed to a measured drop in the level of heavy metals and organic pollutants in certain parts of the Indus River and its tributaries.⁶³ Economically, the improvement in water quality helped local agriculture and fishing, an essential source of income in both countries. Diplomatically, the existence of a mechanism for joint work – even if quite limited – provided a permanent channel of communication between the countries and ‘an island of cooperation’ in a largely hostile relationship.⁶⁴

62 Sharma Heins, 2010, p.72.

63 Zawahri, N. A. 2018. “International Rivers and Riparian States: The Indus Waters Treaty and Beyond.” In A. Dinar & K. Schwabe (eds.), *Handbook of Water Economics*, pp. 215–230. Edward Elgar Publishing, p. 220.

64 State of Israel (1993). Hazardous Materials Law, 5753–1993. The full version of the law is available on the Nevo website: https://www.nevo.co.il/law_html/Law01/063_001.htm.

5. Study of the Israeli-Palestinian case in the West Bank

5.1 The waste situation in the shared space

1. Legislation and Regulations

Legislation concerning waste treatment in Israel is based on the Hazardous Materials Law (1993), the Maintenance of Hygiene Law (1984), and the provisions in the framework of the Business Licensing Law,⁶⁵ but these laws treat waste as a nuisance to be disposed of. There is also an Extended Producer's Responsibility (EPR) Law that requires manufacturers and importers to bear direct responsibility for the collection, treatment and recovery of the waste generated by their products,⁶⁶ and the Packaging Law (2011) which embodies this principle and states the encouragement of recycling as one of its aims. In fact the regulation focuses mainly on recycling and end treatment objectives, and does not require companies to integrate mechanisms for reuse as an integral part of the production and consumption chain.⁶⁷ Thus in effect responsibility is passed to the final stage of waste management, while companies themselves are exempt from dealing with the problem of limiting waste at source and extending the life of products.⁶⁸ In addition, existing regulations barely refer to mechanisms of supervision, licensing and cross-border coordination on the subject of waste.

65 Ministry for Environmental Protection, Division for the Implementation of Producer's Responsibility Laws – Waste (explanatory pages on the EPR principle and laws based thereupon).

66 Regulation of Treatment of Packaging Law, 5771-2011, The Shmuel Ne'eman Institute (2023), The Waste Treatment Crisis – A National Project:.

67 Shmuel Ne'eman Institute (2023), op.cit.

68 The Ministry for Environmental Protection, 2022. Survey of national waste composition, 2012–2013; Neshar Cement Works Israel, 2023. Urban waste and RDF processes – the challenges of landfill in Israel.

The legal situation in the Palestinian Authority is also not glowing. The Palestinian Authority presented a national strategy for solid waste management for the years 2010–2014 and 2018–2022, promoting collection, recycling and private sector involvement.⁶⁹ However, these plans are also deficient in many aspects and do not include an orderly legal framework for inter-territorial transportation of waste or formal coordination mechanisms with Israel.

2. Institutional System

The institutional system for managing waste in the Israeli-Palestinian space involves a combination of government entities, local authorities, research institutions, civil society organizations and the private sector, each with their own specific roles and structural challenges.

In areas controlled by the Palestinian Authority, overall responsibility for waste lies with the Ministry of Local Government (MoLG), the central government entity that supervises local authorities and regional service frameworks. Below it are the Joint Services Councils (JSCs), regional bodies combining a number of local authorities and operating systems to collect, transport and treat waste for their member municipalities.

In the West Bank there are twelve JSCs dealing with the management of solid waste, operating in collaboration with the MoLG through a specific administration – The General Administration of Joint Services Councils.⁷⁰ Some Councils have initiated collaborations with the private sector, but to date only two of them have active contracts, while two others are in the stage of drawing up agreements. The Councils are struggling with an increase in demand for services and financial limitations that prevent them from covering their operating costs or investing in necessary

69 SWEEPNET. 2014. *Country Report on the Solid Waste Management in Occupied Palestinian Territories*. Retrieved October 9, 2018, from <http://www.environment.pna.ps/ar/files/Country%20report%20on%20the%20solid%20waste%20management.pdf>; Ministry of Local Government (MoLG). 2017. *National Strategy for Solid Waste Management in Palestine, 2018–2022*. Ramallah, Palestine.

70 SWEEPNET, 2014.

infrastructures.⁷¹

In Israel, the institutional system includes the Ministry for Environmental Protection as the central regulator, the Local Government Center, local authorities, research institutes, the private sector and civil society. The division of responsibility is complex: the Ministry for Environmental Protection acts as regulator and defines policy, but is not an executive body; local councils are responsible for actual operation but often lack incentives and resources; and the Local Government Center acts as coordinator but with no binding powers. This structure sometimes creates duplication, for example between licensing and supervisory powers, as well as institutional 'holes', such as the absence of one entity charged with actual implementation of the national plan.

According to the Ministry for Environmental Protection (2016), one of the proposals was to set up a joint administration for the Ministry for Environmental Protection and the Ministry of Local Government to manage waste, with powers to grant approvals, supervise, handle and combine processes. In a more up-to-date outline,⁷² the collaboration between these elements is intended to overcome public opposition (NIMBY – 'not in my back yard') and to make operations more efficient.

The Shumel Ne'eman Institute runs the Waste Forum, which provides a multi-sectorial platform for professional discussions with experts from the government, local government, academe, industry and civil society organizations.⁷³ According to the report *The Waste Treatment Crisis – A National Project* (2022) from the Shmuel Ne'eman workshop, public and professional discussions show the need for a professional executive body with powers and budgets, since the Ministry for Environmental Protection admits that at present there is no such body and it is unable

71 New Vision. 2009. *Study of Public Private Partnership in the Municipalities*. Municipal Development and Lending Fund, Ramallah. Retrieved November 17, 2018, from <http://www.mdlf.org.ps/Files/Docs/Study%20of%20Public%20Private%20Partnership.pdf>

72 Ministry for Environmental Protection, 2023. *Report of the Internal & Environmental Protection Committee on the Ministry's activity: Discussion of 20/03/2023*.

73 Shmuel Ne'eman Institute, 2023, op. cit. p. 1.

to lead implementation on the ground.⁷⁴ It also discusses a need for stable green policy designed to cover the next 20 years at least, recruitment of professional personnel, and a definition of mechanisms for coordination between central government, local government, the third sector and the private sector.

There is also a legal gap between Israel and the West Bank. Israeli environmental law applies to Israeli settlements in the West Bank under the Settlement Law (2008) and Israeli facilities linked to them, and are thus subject to the relevant regulations and laws on hazardous waste. On the other hand, the Israeli law does not fully apply to Palestinian facilities in the area.⁷⁵

5.2 The National Waste Treatment Situation: quantities, treatment methods and educational programs

1. The Gaza Strip

The current situation in the Gaza Strip requires preliminary clarification: in the wake of the 2023-2024 war, the area is undergoing a severe humanitarian crisis, and its waste management infrastructure was almost entirely destroyed. In the coming years there will be particularly complex challenges – massive debris removal, treatment of sewage, water pollution, purification of soil and rehabilitation of basic infrastructures. These challenges will require long term planning, international investment, humanitarian aid and dedicated rehabilitation mechanisms.

However, this document does not deal with the case of Gaza, because of its unique and complex nature, and the need for a separate document devoted to the rehabilitation of waste management in Gaza after

74 Shmuel Ne'eman Institute, 2023. *The Waste Treatment Crisis – A National Project: summary and recommendations*.

75 Made in Israel – Research & Policy Association (2017), *Use of Palestinian areas to deal with Israeli waste: Summary Report* (p. 12). December 2017. https://www.btselem.org/sites/default/files/publications/201712_made_in_israel_heb.pdf

the war. Significant work on the subject of building debris in Gaza is already being promoted by the Mitvim Institute.⁷⁶ This section focuses only on the West Bank, where there is an active and functioning waste management system – an essential basis for understanding infrastructure, institutional and regulatory needs.

In essence, notwithstanding the present uniqueness of the situation in Gaza that differentiates it from the rest of the region, the Gaza Strip must be deemed a completely integral part of the political-environmental Israeli-Palestinian space, and the same principles that should be applied to cooperation between Israel and the West Bank should also apply to Gaza.

2. The Waste Situation in the West Bank

The situation in the West Bank indicates a functioning but challenging waste management system. On one hand, it is a central focus of interest due to its direct impact on social, economic and environmental conditions. On the other hand, apart from its importance, it is struggling with essential structural problems expressed by rapid urbanization, a lack of skilled personnel, considerable budget restrictions and frequently insufficient technology.⁷⁷

To this must be added the political element that creates significant systemic failures in the waste management issue, due partly to the absence of full Palestinian sovereignty over management of their resources and consequential difficulties such as transport and connectivity problems, and ongoing conditions of uncertainty.

76 See: "Model for a diplomatic environment to manage construction debris in Gaza", Adi Magar, Mitvim Institute (2026).

77 Al-Khatib, I. A., Monou, M., Abu Zahra, A. S. F., Shaheen, H. Q. & Kassinos, D. (2010). Solid waste characterization, quantification and management practices in developing countries: A case study: Nablus district – Palestine. *Journal of Environmental Management*, 91(5), 1131–1138, <https://doi.org/10.1016/j.jenvman.2010.01.003>.

A considerable share of waste treatment in Israel takes place in West Bank territory, including hazardous waste, in facilities that operate under environmental regulations far more limited than those applying within Israel's borders, while Palestinian residents have no authority over these decisions. The result is environmental and health risks for the local inhabitants, including exposure to air pollution and damage to natural resources, since there is no effective mechanism to supervise or regulate the operation of the facilities.⁷⁸ This situation illustrates the closeness of the link between politics and the execution of the waste management system.

An examination of volumes and types of waste shows that the West Bank produces about 1.15 kg of waste per head per day.⁷⁹ The proportion of organic waste is particularly high, and while some of the organic material was previously used to produce compost, in the absence of an organized system to generate energy from waste, much of it was buried and not reused. In total, in the West Bank some 1,500 tons of urban waste are produced every day⁸⁰, showing the scale of the subject and the need for efficient management.

An examination of the distribution of landfill sites reveals a far more complex picture. Only some 33 percent of West Bank waste is buried in proper landfill sites, while the rest is sent to pirate sites (of which there are about a hundred) or incinerated, creating a significant environmental and health hazard.⁸¹ Although three main landfill sites have been set up: Zahrat Al-Finjan in Jenin, Al-Minya in Bethlehem and a third site in Jericho, their operation is affected by restrictions on movement

78 Made in Israel, *Summary Report* (p. 7). December 2017.

79 Bovea, M. D., Ibáñez-Forés, V., Gallardo, A., and Colomer-Mendoza, F. J. 2010. "Environmental Assessment of Alternative Municipal Solid Waste Management Strategies: A Spanish Case Study." *Waste Management* 30(11): 2383–2395, <https://doi.org/10.1016/j.wasman.2010.03.001>.

80 Made in Israel, *Summary Report* (p. 7). December 2017. https://www.btselem.org/sites/default/files/publications/201712_made_in_israel_heb.pdf

81 Applied Research Institute—Jerusalem (ARIJ). (2015). *Status of the environment in the State of Palestine*. Bethlehem, Palestine. Retrieved December 10, 2018, from https://www.arij.org/files/arijadmin/2016/SOER_2015_final.pdf

and access permits given by the Israeli authorities, showing the direct impact of political-security conditions on the system's operation.⁸²

In this context, waste management in the Zahrat Al-Finjan facility in Jenin is considered a relatively good example of landfill, but it is currently overloaded due to serving larger areas than was originally planned. Similarly, at the Al-Minya site there is a prominent gap between the orderly landfill solution and the absence of proper treatment at the interim stages of waste management. The level of separation at source in the local authorities using the site remains limited, and in fact most of the waste that arrives is mixed and unsorted. The scope of recycling activity is also limited, and not a significant part of the whole system.

In addition to the regulation of waste burial, there is a need for greater attention to other elements of waste treatment: reduction of waste at source, separation of paper, plastic and glass waste, separate treatment of hazardous waste, regular lab checks to prevent contamination, and an end to random burial. There are also proposals for long term solutions, such as producing energy or organic fertilizer (compost) from waste, which can provide environmental, economic and social benefits.⁸³ Combining these solutions could reduce the load on the sites and contribute to more sustainable waste management.

Implementation challenges are also revealed in cooperation initiatives. A striking example is the recycling project of the Jenin-Tubas JSC, which was managed in the framework of a public-private partnership for three months but failed. The reasons for the failure included traffic congestion, higher transportation costs, lack of stable funding, poor coordination between the various bodies, plus a lack of skilled

82 German Cooperation (GIZ). (2014). *Country report on the solid waste management in Occupied Palestinian Territories*. Retrieved December 15, 2018, from <http://www.environment.pna.ps/ar/files/Country%20report%20on%20the%20solid%20waste%20management.pdf>

83 Abu Qarab, A. (2016, May 17). *Disposing of solid waste and the dilemma of Zahrat Al-Finjan landfill*. MAAN News, <https://www.maannews.net/articles/847509.html>.

manpower and sufficient technological infrastructure.⁸⁴ This situation stresses the constant tension between theoretical plans and the actual ability to implement them.

Education to reduce consumption and change consumption patterns is marginal and is not backed by consistent policy or practical incentives. This strengthens the reliance on burial as the main solution, without exploiting the potential for reducing volumes, recovering resources or changing behavior in the long term. The combination of environmental education, separation at source, and recycling mechanisms could reduce the load on the site and contribute to more sustainable waste management in the area.⁸⁵

In terms of public education to promote awareness of waste treatment, the Palestinian Authority has recently initiated reference to environmental education and increased awareness of sustainable consumption. In a program called 'Youth for the Environment and Climate', **funded by the UN Food & Agricultural Organization (FAO)**, young boys and girls acquire knowledge and skills in the field of environmental protection, natural resource management and promoting sustainability. The program combines theoretical and practical training, developing environmental leadership skills and encouraging communal initiatives, and seeks to increase responsible environmental awareness and inculcate the principles of reducing consumption and sustainable consumption behaviors. This activity helps to broaden environmental education, strengthen social responsibility for natural resources, and

84 Saadeh, D., Al-Khatib, I. A., & Kontogianni, S. (2019). Public-private partnership in solid waste management sector in the West Bank of Palestine. *Environmental Monitoring and Assessment*, 191(4), 243. <https://doi.org/10.1007/s10661-019-7395-2>; Al-Khatib, I. A., Monou, M., Zahra, A. S. F., Shaheen, H. Q., & Kassinos, D. (2010). Solid waste characterization, quantification and management practices in developing countries: A case study: Nablus district—Palestine. *Journal of Environmental Management*, 91(5), 1131–1138, <https://doi.org/10.1016/j.jenvman.2009.12.015>. <https://doi.org/10.1016/j.jenvman.2009.12.015>

85 Mohammad, J. (2024, September 1). *Has the citizen felt the impact of solid waste recycling in the West Bank?* Afaq Environment and Development (MAAN Center). <https://www.maan-ctr.org/magazine/article/4339/>

increase understanding of the connection between consumption patterns, climate change and long term sustainability.⁸⁶

Finally, taking an overall view, a picture emerges of several important challenges in the west Bank: a high proportion of waste that is not properly handled; limitations on access to organized landfill sites; heavy dependence on political and security conditions; absence of facilities for recovering energy from waste; and high per capita waste generation leading to almost complete reliance on landfill. This situation stresses the urgent need for infrastructural, regulatory and institutional solutions to strengthen the existing system and facilitate a move to a more efficient and sustainable model of waste management.

5.3 The Waste Situation in Israel

Every year Israel produces around 5.7-5.8 million tons of urban waste, of which more than 40 percent is sent for landfill.⁸⁷ In fact some 45 percent of the waste – about 5.4 million tons – is sent for burial, while the rest is treated by recycling and reuse.⁸⁸ The per capita volume of waste is higher than in the West Bank at about 1.7-1.81 kg per day, similar to the amount of commercial waste and reflecting high levels of consumption and routine waste-creating behavior.⁸⁹ Moreover, organic waste accounts for some 40 percent of all waste in Israel – considerably

86 Environment Quality Authority. (2025, October 9). *Environment Quality Authority launches youth training program "For Environment and Climate" funded by FAO*, <https://environment.ps/eqa-15/>

87 Ministry for Environmental Protection, 2022. *Survey of national waste composition, 2012-2013*; Shmuel Ne'eman Institute, 2023, *The Waste Treatment Crisis – A National Project: Summary and Recommendations of the Waste Forum*.

88 Central Bureau of Statistics (2020). *Waste Data – Vision and Waste Identification in Israel 2017*.

89 Elimelech, A., Ayalon, E. & Art, A. (2018). *What is measured is management: A new method for measuring domestic waste in Israel (including urban and commercial waste) for some calculations in the country*; *Waste Management*, 76, 68-81. <https://doi.org/10.1016/j.wasman.2018.03.012>

higher relative to European countries where it amounts to about 25 percent, and to the United States where it is only about 15 percent.⁹⁰

From the infrastructure aspect, over 80 percent of waste in Israel is buried in various sites throughout the country. The rest is sent to transit sites, sorting facilities and interim treatment sites, as well as recycling and recovery processes, before final treatment. The annual rate of burial stands at about 4.6 million tons, of which 70 percent is done in the southern region, thus increasing geographical dependency on isolated facilities. According to Ministry for Environmental Protection forecasts for 2018 and 2022, available space for landfill in Israel was expected to be filled by 2024, and the capacity of Efeh site was about to be filled.⁹¹ These forecasts reflected the assessment of risk and future trends, but do not determine that landfill capacity had been fully utilized at that time. The situation creates constant pressure on the development of infrastructure alternatives, including facilities to recover energy, advanced sorting centers and expansion of recycling processes.

At the same time, the existing system is causing significant environmental damage. About 80 percent of carcinogenic emissions in Israel are caused by burning waste, sometimes in unregulated places. In addition, some 12 percent of all greenhouse gas emissions in Israel consist of methane gas from buried organic waste – burial without biological treatment produces gas emissions that are stronger than regular carbon pollution. These figures indicate the significant contribution of the waste sector to the climate crisis in Israel.⁹²

There are also considerable infrastructure gaps at all stages of waste management. The report on the Crisis of Waste Treatment – A National Project (2022) indicates that there are no facilities in Israel to recover energy (WTE – waste-to-energy), contrary to the absolute majority of

90 Ministry for Environmental Protection (2022). *Survey of national waste composition, 2012–2013*; Shmuel Ne’eman Institute, 2023, op.cit.

91 Shmuel Ne’eman Institute, 2023, op.cit.

92 Amidad Lapidot (2023). *Emissions from landfill and their long term impact on greenhouse gas emissions – Israel compared to Europe and the USA*.

OECD countries. The only government-approved facility was intended mainly to provide a local response and is not a broad national solution. Apart from that, there are coordination difficulties between central and local government, and a lack of financial incentives to help local authorities meet the high costs of advanced projects. A combination of institutional, administrative and economic barriers creates a system in which most waste treatment is still based on landfill, instead of models based on the circular economy which include recycling, reuse and energy production.

In Israel there are a range of environmental education programs in the formal education system, initiated by the Ministry of Education in conjunction with various bodies. According to the Ministry's online portal for educational staff, from kindergarten to grade 12 pupils can participate in programs dealing with the environment and sustainability, including ecological investigation, preserving nature, natural resources, climate change and sustainable development. The programs are tailored for different age groups and include experiential learning, research activity, inculcation of environmental values, and development of civic responsibility. However, school participation in these programs is not uniform and relies on local initiative, available resources and priorities, which affects the actual extent of exposure to environmental education.⁹³

Separation of organic waste at source is a critical element of Ministry for Environmental Protection policy, since it enables some 35 percent of urban waste in Israel (over 2 million tons per annum) to be converted from a pollutant to a valuable resource. At present about 78 percent of waste in Israel is buried, but separation at source offers a huge potential for producing high quality compost for agriculture and generating renewable energy (biogas), while significantly limiting emissions of methane gas that accelerates global warming. The focus on the institutional and commercial sectors – including large kitchens, hotels

⁹³ Ministry of Education (undated). *Programs on the environment and sustainability*. Education Staff Portal. <https://pop.education.gov.il/sustainability-education/sustainability-education-programs/environmental-sustainability-programs>

and supermarkets – is deemed particularly effective due to the higher operating feasibility compared to households, in spite of barriers such as the lack of space for placing separate collection bins and the need for additional regional end facilities. The gradual adoption of regulation, as many countries are doing, can bring about changes in awareness and economic change as businesses absorb the costs of the pollution they create and work to limit it at source.⁹⁴

In spite of official recognition of reuse as a vital link in the hierarchy of waste treatment, actual implementation in Israel remains limited and is not supported by suitable infrastructure or regulation. On the ground, most activity relies on local initiatives, associations and civic activity, such as second hand stores and centers for collection and repair, and is not an integral part of the urban waste management setup. Most local authorities do not operate dedicated mechanisms to collect, sort and direct items for reuse before they become waste, and reuse is perceived largely as desirable consumer behavior rather than a binding operating stage in the chain of waste treatment. This means that important potential for reducing waste volume and extending product life is neglected in favor of recycling and end treatment solutions.⁹⁵

This difficulty is particularly striking in view of regulatory attempts to implement the principle of EPR (Extended Producer Responsibility), which makes producers and importers fully responsible for collecting and treating the waste generated by their products. The main example of this is the Packaging Law (2011), which defines the encouragement of reuse as one of its formal goals, but in practice is only partially implemented and focuses largely on the enforcement of recycling and end treatment objectives. In this way it misses the opportunity to make reuse an integral, binding and regulated stage in the value chain

94 Ministry for Environmental Protection, 'Separation at source of organic waste in the institutional and commercial sectors'. Written by Neta Elul, Yarden Shani Rockman, Livnat Goldberg, Yogev Gross and Tal Reichstein.

95 Ministry for Environmental Protection, Waste Treatment Division, 'Preparing a master plan for combined waste treatment – reduction at source, reuse, recycling, production of energy and landfill.'

of companies, and perpetuates structural preference for end solutions over preventive and circular mechanisms.⁹⁶

Israel, which is perceived as a developed society and OECD member, produces large quantities of waste, reflecting extensive economic activity and high levels of consumption.⁹⁷ Israel generates 2–3.6 million tons more of waste than the West Bank.⁹⁸ There are especially large amounts of construction and demolition debris, estimated at 2–350,000 million tons annually. This waste reaches the West Bank and contributes to environmental pollution.⁹⁹ In view of the challenges and gaps revealed, the picture indicates significant failures at both infrastructure level and at the level of policy and regulation.

Israel and the Palestinian Authority, each in its own field, have failed to deal with the waste issue, which is now one of the most burning (in all senses) environmental issues. They are far from adopting the new concept of managing waste as a resource, although landfill and incineration damage critical natural resources that have a direct impact on the conflict: land, water, air. Both entities lack a long term strategic concept of the move to a circular economy and treating waste as a sustainable resource, and they also lack suitable physical and institutional infrastructures. The regulations are outdated, supervision and enforcement are slight or absent. Central governments have abandoned waste management, each for their own reasons, leaving it to crime families in the area. The ongoing reality of the occupation, making Area C into no-man's land, while Israel attempts to extend its control of these areas, exploit them for Israeli needs and remove the Palestinian population, have created a situation that both sides exploit for undesirable waste treatment, whether consciously or unconsciously.

96 Division for Implementation of EPR laws – Waste, Ministry for Environmental Protection; The Waste Treatment Crisis – A National Project, 2022; Saleh, 2025.

97 Made in Israel – Research & Policy Association (2017). *Use of Palestinian land to treat Israeli waste: Summary Report* (p. 5). December 2017. https://www.btselem.org/sites/default/files/publications/201712_made_in_israel_heb.pdf

98 Made in Israel. *Summary Report* (p. 7). December 2017.

99 Made in Israel. *Summary Report* (p. 7). December 2017.

5.4 Cross-Border Aspects of the Israeli and Palestinian Waste Systems

The cross-border aspect of waste management between Israel and the Palestinian Authority involves the flow of substances, economic and operational links, and security and political restrictions that affect both sides. For example, cardboard waste that is separated in Palestinian Authority territory is sold to Israeli recycling companies, showing the existence of a direct economic link between Palestinian waste management and Israeli recycling facilities, and actual movement of waste across the Green Line.¹⁰⁰ This link does not exist in a vacuum, but is affected by political factors: changes in the placement of IDF roadblocks sometimes require the Joint Services Councils to compensate the private sector for longer than planned transportation channels. This shows how fluctuations in the political and security situation have a direct effect on operating costs, the flow of resources, and the whole waste management system.

At the same time, the existing situation of cross-border waste flow between Israel and the West Bank involves the movement of large amounts of mainly hazardous waste from Israel to Palestinian Authority territory, driven by the economic interest of processing waste beyond Israel's borders.¹⁰¹ Estimates show that about 38 percent of all treated Israeli waste is sent to the West Bank, where waste from Israel accounts for **44 percent** of treated hazardous waste.¹⁰² The illegal smuggling and transportation of Israeli waste, including hazardous and medical waste, is estimated to involve between 15 and 40 percent of Israel's general waste.¹⁰³ The main types of waste smuggled or transported for treatment include hazardous waste such as used oils, since about 5,000 tons (40 percent) of the 12,500 tons of used lubricating oil

100 Made in Israel. *Summary Report* (p. 5). December 2017.

101 Made in Israel. *Summary Report* (p. 5). December 2017.

102 Made in Israel. *Summary Report* (p. 14). December 2017.

103 Made in Israel. *Summary Report* (p. 7). December 2017.

produced in Israel are illegally smuggled or dumped in the West Bank each year.¹⁰⁴ To this must be added electronic waste (WEEE), tires, plastic and various raw materials. Professional reports indicate clearly a widespread phenomenon of smuggling waste from Israel to the Palestinian Authority territory. Collecting reliable data on the extent of this smuggling is complicated and limited, partly because it is unofficial activity and there are few reporting mechanisms. For example, there is an institutional framework for ‘recognized recycling’ in Israel: according to the Electronic Waste Law (2012, in force since 2014), manufacturers, importers and marketers are required to collect and treat electronic waste – through a ‘recognized implementer’ that must send the waste for legal treatment. Israel’s waste management and recycling laws should prevent the smuggling of waste, but estimates of unofficial flow of electronic waste to Palestinian Authority areas give a different picture. According to a Knesset report (2022), ‘in 2022 between 57,000 and 65,000 tons of electronic waste alone were smuggled from Israel to Palestinian Authority territory’.¹⁰⁵ Thus electronic waste – which should be included in legal recycling mechanisms – often finds its way through illegal routes to Palestinian areas, where it is broken down or incinerated by uncontrolled means. This action causes clear environmental and health damage.

As for regulatory mechanisms, the legal framework designed to regulate the cross-border movement of waste between Israel and the West Bank is complex, split and lacking in strong mechanisms for enforcement and cooperation. Although the International Basel Convention dealing with cross-border movement of hazardous waste has been accepted by both Israel (ratified in 1995) and the Palestinian Authority (adopted in 2004),¹⁰⁶ the Oslo Accords do not include explicit

104 Made in Israel. *Summary Report* (p. 9). December 2017.

105 Citizens for Clean Air (2025). *Incinerating Waste in Israel and the Palestinian Authority Territory: background, failures and solutions*. Report submitted to the Knesset’s Interior & Environmental Protection Committee. https://fs.knesset.gov.il/25/Committees/25_cs_bg_9694084.pdf.

106 Made in Israel. *Summary Report* (p. 11). December 2017.

arrangements for such movement between Israel and the Palestinian Authority. The Settlement Law (Judea and Samaria) – Temporary Provisions (Dayan Law, 2008), applies the relevant Israeli laws and regulations, including on the subject of hazardous waste, to Israeli settlements and associated facilities in the West Bank.¹⁰⁷ However, in the absence of orderly mechanisms, Israel continues to exploit the West Bank to deal with its waste, while completely ignoring environmental needs and the rights of Palestinian residents. The situation is evidence of a significant **regulatory gap** permitting environmental abuse with lack of accountability for Israeli operators who make use of unauthorized facilities in the West Bank.¹⁰⁸

The geographical and political situation in Israel and the West Bank creates mutual dependence on waste management systems with direct environmental consequences for both parties. For example, the establishment of three orderly landfill sites in the West Bank – in Jenin, Bethlehem and Jericho – was halted by the Israeli authorities¹⁰⁹, leading to the continued dumping or incineration of waste in about 100 pirate sites scattered over the West Bank and in the Gaza Strip¹¹⁰, leading to further ecological damage, with potential ramifications for land, water and air resources shared by the two regions. All the above stress the regulatory and environmental gap and the exploitation of West Bank land to treat Israeli waste.

107 Made in Israel. *Summary Report* (p. 12). December 2017.

108 Made in Israel. *Summary Report* (p. 15). December 2017.

109 German Cooperation (GIZ). (2014). *Country report on the solid waste management in Occupied Palestinian Territories*. <http://www.environment.pna.ps/ar/files/Country%20report%20on%20the%20solid%20waste%20management.pdf>

110 Applied Research Institute—Jerusalem (ARIJ). (2015). *Status of the environment in the State of Palestine*. Bethlehem, Palestine. https://www.arj.org/files/arijadmin/2016/SOER_2015_final.pdf

5.5 Cross-Border Waste Management in the Israeli-Palestinian Space

A combined examination of the state of waste management in Israel and the West Bank shows a real potential for building a cross-border system, based on shared environmental, operational and economic interests. Both sides are facing similar challenges: growing overload at landfill sites, lack of advanced infrastructure, absence of facilities to recover energy, and a high percentage of organic waste acting as a significant source of polluting emissions.¹¹¹ Similarity of needs together with the immediate geographical proximity between Israel and the West Bank, as stressed in the international cases presented above, is a key factor driving the need for joint waste management. Physical proximity makes waste an issue that does not stop at national borders, since air, land and water pollution affects the whole region.

The bad situation, the management failures, and the environmental and health price paid by local residents, support the call to adopt cross-border waste management. Needs and resources are clearly matched and complementary: while Israel has advanced technological knowhow, professional manpower and experience of environmental regulation, in the West Bank there is a system of regional councils (JSCs) with access to the territory, basic infrastructures and mechanisms for daily management of waste.¹¹² Combining these resources could facilitate the transition to integrated management including collection, sorting, recycling and rehabilitation of sites, while cutting costs and increasing efficiency for both parties.

The model of cross-border waste management rests on three principles: 1) a fundamental change of perception on both sides regarding strategic,

111 Ministry for Environmental Protection (2022). National survey of waste composition, 2012-2013. Shmuel Ne'eman Institute (2023): op.cit.; Amidad Lapidot (2023). Emissions from landfill and their long term effects on greenhouse gas emissions – Israel compared to Europe and the USA.

112 SWEENET, 2014; Saadeh et al., 2019

sustainable resource management based on circular economy principles from a cross-border perspective; 2) using the environmental issue as a political lever to build institutions that further Palestinian statehood (as well as Israeli governance) and an Israeli-Palestinian political settlement; 3) incorporating assistance from regional and international communities and various treaties.

1. Strategic cross-border management based on a circular economy

Cross-border waste management is based on the concept of moving from treating waste as a nuisance and danger to an understanding that it can be an economic, environmental and social resource of great potential. The basic understanding is that waste is not the 'end of the road' for materials, but a further stage in their life cycle. The status of waste is not inferior but dynamic, as it is transformed from a useful product to materials of economic and environmental potential.

In this context, waste can become an important component of the regional economy: a source of income, employment and the development of advanced infrastructures. This is already happening at the beginning of the value chain of resources – for example, with the adoption of strict standards for imports of repairable products, or materials that can be returned to the organic cycle as compost. It continues with public education on separate collection at source, and obliging producers to take full responsibility for the reuse and recycling of their products, all the way to economic and physical support, with the creation of incentives in the value chain of handling resources – sharing of resources, composting, repairs and recycling.

The geographical proximity between Israel and the Palestinian Authority, and particularly the overlap created in the ongoing situation – in which the space is managed almost as a single unit, means that infrastructures should be regarded spatially in the new circular economy. Ecological cooperation between Israel and the Palestinian Authority must start in the early stages of the treatment chain, by adopting a long term

strategic plan for both parties, with joint regulation and shared national mechanisms for treatment and supervision around cross-border arrangements. Recycling and composting plants will show greater economic feasibility if they handle Israeli and Palestinian waste jointly. Adjacent areas on both sides of the border should treat waste in shared local facilities. In Israel and the West Bank, where a high proportion of waste is organic, there is a real potential for producing energy, compost and other industrial products – potential that is not yet being exploited.

It is possible to find areas where the parties complement each other, which can lead to mutual gains. Israel brings regulatory knowledge, technological abilities, expertise in setting up advanced treatment facilities, and an urgent need for solutions due to a lack of space; the Palestinian Authority offers manpower, experience of local authorities, and an immediate need for employment opportunities and economic development. Combining these capabilities will create a more efficient single system: shared sorting, composting and anaerobic digestion facilities can reduce landfill in Israel, improve the environment of the West Bank, create jobs and establish a new economic foundation.

The status of waste must change from that of a lost resource to a positive component of a cross-border economy, and use the transition to a circular economy as an engine of growth for both parties. Waste will gain a new status – that of a shared regional resource, rather than a local nuisance to be disposed of. From a threat to public health and driver of crime, it will become an engine of employment, income, innovation and cooperation.

In the Israeli-Palestinian context, this change has dual significance: a shared view of waste as a resource will allow cooperation to start in the earliest stages of the treatment chain, where the economic potential is the greatest and where trust is built. Instead of struggling only with the last part of the chain (landfill), both sides can share knowhow, technology, manpower and resources right from the stages of sorting, collection, organic treatment and recovery. The divisive local logic

which has so far characterized waste management in Israel and the West Bank should be abandoned in favor of a shared, synergetic, stable and supervised system with international involvement.

1. Creating a lever to promote the construction of institutions and an Israeli Palestinian political settlement

Environmental collaboration is not simply a technical solution for waste management, but an engine for building trust, creating regional stability, and transforming waste from a focus of hostility to a source of mutual benefit. The transition to a circular economy is an opportunity to replace competition and conflict with shared benefit, from a structure in which each party contributes its strengths, and receives environmental, economic and social gains.

Since the move to a circular economy and sustainable waste management is a systemic and institutional change, there is a real opportunity to leverage this change and build functional mechanisms on both sides that have the power to determine, execute and enforce policy. For example, mechanisms such as an Israeli waste authority and a Palestinian waste authority could operate in coordination according to shared regulations, with powers to work with government ministries and local authorities in their own regions.

Israeli and Palestinian waste authorities could work together, planning reverse logistics infrastructure, recycling, turning waste into energy, operating composting facilities with a cross-border perspective, jointly selecting the contractors for the work, operating shared supervision systems, and ensuring that the dividends reach the local populations. These authorities could jointly define the criteria for taking waste across borders, set up a shared enforcement system, and recognize their mutual authority. Such technical, economic and regulatory cooperation could serve as a successful and important pilot for cooperation between Israeli and Palestinian Authority government mechanisms. It could be an example of how professional arrangements strengthen the sovereignty and authority of each party over its own population and

territory, while building mutual trust and practical cooperation for the good of the inhabitants.

2. Involving and seeking the help of the international community

Adopting the paradigm of cross-border waste management, particularly between societies engaged in a conflict or arising out of conflict and lack of trust, stresses the critical role of international players as a stabilizing, mediating and supervising mechanism. The experience of stopping the fighting in Gaza sharply demonstrates the decisive role of the international community, since it was a coalition of countries in the region, together with Europe and under American leadership, that managed to impose on Israel and Hamas a ceasefire and a deal to release the hostages. The successful mediation between hostile and deeply mistrustful elements shows that such a coalition is capable of creating reliable mechanisms for coordination even in the most complex situations.

Stable models similar to the technical cooperation between India and Pakistan over waterways, which rely on neutral frameworks and third party supervision,¹¹³ can be implemented in the field of waste management, resting on the same principles. A three-way system in which an international entity – such as UNDP, the World Bank or the European Union – acts as mediator, funder and supervisor – facilitates the creation of a technical work environment free of political baggage. This third party ensure transparent management, clear division of roles, and professional enforcement of agreed objectives.

The involvement of international players also provides a partial response to failures of the existing waste system in Israel and the West Bank, characterized by lack of coordination, institutional gaps, overload of infrastructures and the absence of uniform regulations. A joint model with international involvement leads to a transparent, professional system, based on data, in which waste is not simply transferred between

113 Zawahri, 2009

private competing entities, but managed in a centralized, supervised and balanced way. This helps to reduce crime, limits illegal incinerators, and facilitates better environmental control.

6. Initial steps towards cross-border Israeli-Palestinian waste management

The social and economic gains from a move to cross-border waste management in the Israeli-Palestinian case are considerable and clear. However, there are many challenges to be faced. First and foremost is the matter of political will. The current Israeli government does not wish to strengthen Palestinian sovereignty, and is in fact working to undermine the Palestinian Authority. Therefore it has no motivation to promote processes that, even if they include optimum treatment of waste, will also help to reinforce the effectiveness, governance, institutions and capabilities of the Palestinian Authority on the way to an independent state. Other challenges deriving from the ongoing conflict include the absence of mutual trust, local difficulties with free movement, problems of coordination, the difficulty of surrendering absolute independence in favor of cooperation, and more. To these must be added the objective challenges facing any collaboration – need for resources, problems of translation and synchronization of two different systems, gaps in knowledge, technology and resources, different public perceptions, and so on.

This study does not seek to ignore these significant challenges, but rather to argue that even in the existing circumstances, it is important and possible to promote practical moves in the direction of cross-border waste management. The seriousness of the waste situation in Israel and the West Bank and the high price paid by citizens, could persuade even a government that does not support the adoption of a joint model and is not interested in building Palestinian institutions or encouraging international involvement, to adopt the necessary steps for cross-border waste management. These steps, however preliminary, can serve as a better basis for dealing with the other challenges ahead. Below are examples of steps that can be taken even now.

7. Recommendations with reference to various time frames

7.1 In the immediate term – recommendations for implementation now

Due to the absence of direct government coordination,¹¹⁴ these recommendations focus on ‘bottom up’ action, steps that can be implemented immediately by local authorities, civil and international organizations.

First, the promotion of a **feasibility study by an external element** – the basis for systemic change in the shared space requires a shift in the perception of waste, from a nuisance and environmental hazard to an economic resource that can create value, employment and energy. For this purpose there is a need for a technical-economic feasibility study looking at the division into areas of treatment, location of recycling facilities and allocation of resources, based on models of bilateral cooperation and effective regional management.¹¹⁵ MEDWISE, a European project dealing with innovation in waste management in the Mediterranean Sea, is a potential partner for funding and professional assistance.¹¹⁶ The study could be carried out by elements from civic

114 See: Tsafir Rinat (2025). “Incinerating waste is not ‘environmental terror’ but a multi-system failure in which Israel plays a central role”, *Ha’aretz*, 22 December 2025 (describing the situation as the result of failures on both sides of the Green Line); The Shmuel Ne’eman Institute (2023): *The Waste Treatment Crisis – A National Project* (pointing out institutional ‘holes’ and the absence of a coordinating executive body within the Israeli system).

115 Unfried, M., & Mertens, R. (2024). *Cross-border waste management in the EU: The case of Germany and the Netherlands*.

116 EU Project MEDWISE – Innovation in waste management for a sustainable environment in Mediterranean regions, 2025. (See also: European Framework Directive on Waste and the 2018 updates, Circular Economy Package).

society, international organizations (such as UNDP or the EU) and the business-environmental sector.

Secondly, it is possible to promote **cooperation in the field of enforcement** by setting up an array under existing cooperation committees to combat the consequences of illegal dumping and incinerators that harm public health on both sides of the Green Line.¹¹⁷ This could be led by the heads of local authorities adjacent to the fence, the Civil Administration and existing technical coordination committees.

The adoption by Israel and the Palestinian Authority of **joint regulatory standards** is a crucial component which can also be immediately implemented. The joint regulations should be based on separation of waste flows at source and setting uniform standards for electronic products, packaging and other products, turning waste from a nuisance to a resource.¹¹⁸

In order to realize this potential, there must be legislation that encourages the creation of value from waste through economic incentives for recycling and composting, plus support for setting up organic treatment facilities, such as anaerobic digestion to produce energy, and advanced sorting facilities. The regulations must cover cross-border waste traffic, set restrictions on the quantities transported, and define treatment capacity in shared facilities, similar to the Catalonian model that streamlines resource allocation by means of defined administrative zones.¹¹⁹

An essential component in the adoption of standards is the extension of the EPR mechanism, imposing the environmental and treatment costs on producers and importers. This can be based on existing legislation in

117 Tsafir Rinat, "Incinerating waste is not 'environmental terror' but a multisystem failure in which Israel plays a central role", *Ha'aretz*, 22 December 2025

118 Amasuomo, E., & Baird, J. (2016). The concept of waste and waste management. *Journal of Management and Sustainability*, 6(4), 88-96. <https://doi.org/10.5539/jms.v6n4p88>

119 Shmuel Ne'eman Institute (2023): The Waste Treatment Crisis – A National Project: Summary and recommendations of the Waste Forum

Israel, including the five main laws of the EPR Division whose principles should be applied to both parties. The laws include the Environmental Treatment with Electric & Electronic Equipment and Batteries Law (2012), the Regulation of Packaging Treatment Law (2011), the Deposit on Drink Containers Law (1999), the Removal & Recycling of Tires Law (2007), and the Reduction in the Use of Single-Use Carrier Bags Law (2016).¹²⁰

Implementation of these regulations requires cross-border means of enforcement and supervision, including fines for ecological crime, plus pilot tests on the assimilation of new recycling technologies, such as energy recovery facilities. Thorough regulatory coordination, combining transparency and knowledge-sharing between authorities, will prevent the abuse of regulatory ‘black holes’ and improve ecological and political stability in the shared space. Separation at source and uniform regulations are necessary to maintain the quality of materials and the ability to utilize them as a valuable resource. Prior separation and the assimilation of consistent rules on both sides ensure that the materials remain clean and suitable for processing, without the risk of contamination that makes them a useless environmental nuisance.

It would also be valuable for the Palestinian Authority to adopt European standards and regulations. For example, a unilateral decision by the Palestinians to adopt the EU circular economy package would provide a shared regulatory basis for future cooperation and transfer of materials for recycling.¹²¹

Establishing a **shared database** is a further step for collecting data on quantities and the composition of waste in a uniform format, similar

120 Ministry for Environmental Protection, Implementation of EPR Laws – *Waste, About the Implementation of EPR Laws Division*, accessible on https://www.gov.il/he/departments/units/producers_responsibility_law_dept

121 The EU Waste Framework Directive, as updated in 2018 in the framework of the Circular Economy Package. For a discussion of the need to adopt these standards as the basis for regional cooperation and the national strategies of the Palestinian Ministry of Local Government, see: National Strategy for Solid Waste Management in Palestine 2018–2022.

to the water monitoring model in India and Pakistan, and based on the processing of data by a third party.¹²² Research institutions such as the Shmuel Ne’eman Institute can serve as an inclusive professional factor.

In addition, it is possible to promote public education programs with consistent content for all parties, to prepare the ground for cross-border collaborations in terms of educational perception. Local and international environmental organizations can play a key role here.

7.2 Medium range – integration and regional planning

At this stage, the issue of waste must be incorporated into broader diplomatic and infrastructural systems. A central recommendation is to direct attention to international players: the technocratic committees for Gaza rehabilitation must be required to involve Israel and the West Bank as a single circular economy unit, in order to ensure inclusive and equal treatment of waste,¹²³ and connect this with the Peace Council, the International Rehabilitation Administration, and the World Bank.

In the medium range the focus should be on pilot testing a **joint regional recycling facility**, to serve as a physical and economic anchor for managing resources in the cross-border space. Instead of sorting facilities only, the proposal is to set up an **advanced recycling facility** (such as recycling for plastic or electronic waste, or anaerobic digestion for organic waste), or order to produce valuable secondary raw materials and transform waste from a lost resource to an engine of growth.

122 Zawahri, N. A. (2018). 'International rivers and riparian states: The Indus Waters Treaty and beyond'. In A. Dinar & K. Schwabe (Eds.), *Handbook of water economics* (pp. 215–230). Edward Elgar Publishing.

123 German Cooperation (GIZ), *Country report on the solid waste management in Occupied Palestinian Territories*, 2014; Applied Research Institute—Jerusalem (ARIJ), *Status of the environment in the State of Palestine*, 2015. Zawahri, N. A., "International rivers and riparian states: The Indus Waters Treaty and beyond", 2018; Unfried, M., & Mertens, R., "Cross-border waste management in the EU: The case of Germany and the Netherlands", 2024

The principles for constructing and operating the facility include strategic location in the border area or an agreed West Bank location with good logistical access for both sides, exploiting the availability of land and low costs on the West Bank, and providing a solution to land shortages and the capacity of treatment sites within Israel. For ownership and operation, the PPP (public private partnership) model is recommended, in which construction and operation is assigned to a neutral and professional international company or a joint Israeli-Palestinian company under the supervision of the international community, for example the EU or UNDP. The involvement of an international player is crucial as a stabilizing force to ensure transparent management and professional enforcement.

Material flow in the facility will be planned to receive input from both sides, thus increasing economic feasibility and exploiting advantages of scale, while creating a focus to create high quality employment for both Palestinians and Israelis, and strengthen the dynamic of the 'peace dividend' through routine professional collaboration. The profits from the sale of power, fertilizer or recycled raw materials will be split between the parties and used to develop environmental infrastructures in local communities, thus creating a stable incentive to continue the cooperation. Joint recycling facilities will operate as 'power stations' generating trust.

7.3 The long term – Setting up institutions and facilities (if there is political will)

Once the political will for cooperation is clear, it will be possible to set up a joint waste treatment administration – covering the parallel work of a Palestinian waste authority and an Israeli waste authority with shared infrastructure for recovery and waste treatment, reverse logistical systems, and joint sorting.¹²⁴ This administration would engage in the formulation of long term policy, financing, executing cross-border strategic treatment plans for the move to a circular economy, building incentives, enforcement, and the regulation of powers and division of roles between the parties.

124 A proposal to set up a joint waste management administration, with powers to approve, supervise and unify processes, was already raised by the Ministry for Environmental Protection (2016). The model to divide the area into administrative zones and set up joint central facilities (such as for sorting and composting) to serve several local authorities in the region, is based on the Catalanian model implemented in Spain (see Shmuel Ne’eman Institute, *op. cit.*, p. 13. (For implementation of reverse logistics systems and managing the value chain of materials according to the EPR principles, see: Ministry for Environmental Protection, EPR Laws Implementation Division, 2025; and the multi-phase logistical model (collection, sorting and final treatment) proposed in Bovea et al. (2010), which can serve as the basis for integrated systems. Precedents for technical coordination and joint supervision mechanisms in combat zones can be found in the model of joint committees in the water treaty between India and Pakistan (Zawahri, N.A., 2018), and in the bilateral cooperation on the use of integrated infrastructures and facilities between Germany and Holland, and also between Sweden and Norway, see Unfried & Mertens, 2024; Miljødirektoratet, 2019).

8. Summary

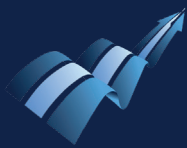
This document examines the challenges of waste management in the Israeli-Palestinian space. It opens with a presentation of the development of various approaches to the issue in recent decades, and proposes the adoption of an up-to-date approach based on a circular economy which will fundamentally transform the cycle of production, consumption and handling of resources. In this framework the document claims that it is vital to promote a cross-border approach to waste treatment and resource management, describing the benefits and challenges of the approach, and looks at some test cases of cooperation on issues of waste and resources from round the world. In this context, the document examines the failures of policy and separate management in a shared space where environmental problems do not stop at the border. It proposes a transition to regional management based on a circular economy using a triangular model consisting of Israel, the Palestinian Authority and an international element, in order to create an integrated and supervised technical framework for waste management.

Waste is presented as a shared ecological, sanitary, security and economic issue, whose cross-border impact harms both sides, and therefore cannot be subject to a unilateral solution. Regulatory and enforcement failures have made it a focus of pollution, health hazards and criminal activity, increasing inefficiency and damage to the environment.

This document shows how changing the perception of waste from a nuisance to a resource can turn a shared problem into the foundation of cooperation, through the establishment of joint systems to sort, treat and recycle waste, using it to produce energy, create jobs and income, and replace pirate systems with an orderly, transparent system based on data.

Joint Israeli-Palestinian cross-border waste management could

be an important test case for the creation of shared administrative mechanisms in a region of ongoing conflict and war. Cooperations in this field are based on mutual environmental, health and economic interests, demanding a shared vision, coordination, joint planning and development of integrated models for waste collection, treatment and recycling. These processes create an institutional platform for a shared, consistent policy to deal with this unique issue with its shared environmental hazards, and to build joint operating capabilities in order to generate economic and political gains. Apart from the practical benefits, this type of ecological cooperation could help to build partnerships, reduce tensions, strengthen trust between communities, and demonstrate the feasibility of joint action, even in the absence of an overall political settlement. In this way waste management becomes a strategic tool for bridging political gaps, promoting regional stability, and establishing the foundations for broader collaborations in the future.



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