

Abstract

Title of Thesis: Wastewater and Wasted Water: A Comparison
Environmental Management Institutions in Israel and the
West Bank

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Israel and Palestine offer a complicated example of an environmental management problem. They are in conflict with each other but share the same ecosystem and environmental problems. Additionally, Israel is a prosperous developed nation, while the West Bank is a territory under great economic strain. Given these diverse features, evaluating the contrasts and interactions between environmental management in Israel and the West Bank provides insight into approaches to handling climate change and depletion of common resources in a global context. In this thesis, I investigate the question: How do environmental management institutions associated with water quality, water scarcity, and waste management in Israel compare to those in the West Bank? I find that Israel's environmental management is more developed than that of the West Bank in terms of infrastructure and precision of legislation. Both, however, face enforcement challenges rooted in inefficient institutional frameworks and lack of public engagement. Given their proximity and interdependence, they simultaneously damage their own and each other's environmental and public health. This interdependence also precludes unilateral change. Neither can solve its environmental problems on its own; they must collaborate, but this collaboration necessitates radical political and institutional change. Nonetheless, recent developments provide hope on this front.

Wastewater and Wasted Water:
A Comparison Environmental Management Institutions in Israel and the West Bank

By

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Chapter 1:

The Israeli-Palestinian Conflict and Environmental Management

Introduction

In the summer of 2018, I studied abroad in Israel-Palestine, and we divided our time between the West Bank, where we worked on a farm, and Israel, where we visited museums, schools, and monuments. As we crossed back and forth between the territories, I noticed how much more litter there was in the streets of the West Bank compared to the Israeli cities we visited. The dirt road leading to the farm entrance was lined with plastic wrappers, and there was paper caught in plants along the roads in Beit Sahour and Bethlehem. There was also no recycling system in the area that our host families participated in. At the same time, however, there was strong awareness of water and electricity conservation. Massive black water jugs and shiny solar panels lined the roofs in Palestinian cities and towns across the territory. After witnessing the visible differences in waste management and apparent cultural differences in water use between the West Bank and Israel, I wondered how and why two territories, so intimately connected by resources, conflict, and livelihood managed their environments so differently enough that it was visible to a visitor.

The Global North, the world's richest and most powerful countries often export their environmental problems in the form of trash and resource extraction to the Global South. The developing countries must therefore deal with these issues imposed by the developed countries in addition to their own increased vulnerability to climate catastrophes given their geography, resources, and technology (Benedict, 2019). These relationships are marked by power asymmetries and conflicting interests. The relationship between the West Bank and Israel is an example of the relationship between the Global North and Global South. Yet both face the same

environmental issues given that they occupy the same space – they share the same ecosystem – making this particular situation both unique and universal. Israel and the West Bank both face issues concerning water scarcity and waste management, but they are also in conflict with each other, a conflict that lies fundamentally in control over the land and thus control of the natural resources and environment (Wolf, 1995).

This context and my own observation while visiting led me to the question: How do the environmental management institutions associated with water quality, water scarcity, and waste management in Israel compare to those in the West Bank? In particular, why do they lead to differing environmental management practices and outcomes? Additionally, what constrains their ability to adopt a more efficient and cooperative approach to management of their shared environment? In my investigation, I have found that Israel's environmental management is more developed than that of the West Bank, in terms of infrastructure and precise legislation, but both face enforcement challenges that result in negative environmental and public health impacts for each other as well as themselves. The inevitably interdependent relationship between the two territories' environmental management means that neither can solve its own environmental management problems without the other doing the same in addition to working together for the protection of the environment and public health.

In this chapter, I will first give a historical overview of the Israeli-Palestinian conflict, focusing specifically on territory control, as it applies to environmental management. Next, I include a literature review focusing on two primary issues in environmental management: institutional issues and problems posed by the general public. The literature is both general and specific to Israel and the West Bank. The following section explains the methodology and design

of this project, outlining the comparative methodology and sources used. Finally, I provide an overview of the next four chapters.

Historical Overview

The land of Israel and Palestine has been fought over for centuries for its cultural significance as well as its geographical advantages. Researchers argue that natural resources, specifically water, have been a primary source of these conflicts, but cultural claims to the land have also played significant roles in justifying conflicts throughout history, particularly in the past century (Giordano, 2018; Wolf, 1995). The past century has perpetuated the land's reputation as a conflict zone, now known for the Israeli-Palestinian conflict, a topic of much controversy and debate.

Over the course of the twentieth century, the land of Israel, the Golan Heights, Sinai Peninsula, West Bank, and Gaza Strip changed hands several times. Following the first World War and the fall of the Ottoman empire, Britain took control of Palestine (and Transjordan, which was separated in 1922 and became the kingdom of Jordan). Under Britain, the land was called Mandate Palestine. Meanwhile, Zionism had been growing in popularity, inspiring many Jews to move to Palestine in the late-nineteenth and early-twentieth century, and in 1917, Britain gave support for the settlement of Jewish Zionists in Mandate Palestine in the Balfour Declaration ("Israel profile," 2019). Britain had also, however, ambiguously promised the land to the Palestinians in 1915 in an attempt to gain Arab support against the Ottoman (Tahhan, 2018).

As anti-Semitism grew in Europe, growing numbers of Jews immigrated to Palestine, and tensions grew between Britain, the Palestinians, and Zionists, resulting in violent outbreaks aimed at all three. This tension and conflicting pressure eventually pushed Britain to plan for withdrawal from the area in 1947. That year, the United Nations made a resolution to partition

the land into two states, Israel and Palestine, and leave Jerusalem under international control, depicted in part one of Figure 1.1 (“Israel profile,” 2019). Both populations wanted more land than they had been portioned; most of the Palestinians had been living on the land for centuries, and their population was significantly larger than that of the Zionists who had received half the land in the partition plan. The Zionists felt that they had a right to the land and that they needed more to create a Jewish state that would be safe for Jews. Additionally, there were some Jews who had been living on the land as Palestinians their whole lives, complicating the issue further. People’s opinions on the matter varied but were colored with an overall dissatisfaction (“Israel profile,” 2019).

Figure 1.1: UN Partition Plan - 1947



(New poll finds far-right views gaining prominence in Israel, 2019)

In the end, Israel accepted the UN partition plan, and the Palestinians rejected it. The British Mandate ended on 14 May 1948, leaving the situation unresolved. That same day, Israel declared its independence, and the first Arab-Israeli war began, resulting in the diaspora of about 750,000 of 1,200,000 Palestinians (“Israel Profile,” 2019). Following the first Arab-Israeli war, the land distribution was as follows: Jordan had control of the West Bank; Egypt controlled the Gaza Strip; Israel controlled the rest, about 78% of the land (Tahhan, 2018). Part 2 of Figure 1.1 shows the land occupied by Israel after this war, which did not change for over two decades.

Another notable period for environmental management and land control is the mid-1960s. In 1964, Israel completed the construction of the National Water Carrier, bringing water from the Jordan River into the Negev desert, raising tensions with Jordan and the West Bank over water allocations (“Israel Profile,” 2019). That same year, the Arab League, a collection of Middle Eastern countries, met and created the Palestine Liberation Organization, an umbrella organization including various Palestinian organizations working toward an independent Palestinian state, via both peaceful and violent means (Pike, 1998). Tensions between Israel and its neighbors built over the next few years, leading to the 6 Day War of 1967. Israel dominated over its opponents (Egypt, Syria, and Jordan) and stationed occupying forces in the Sinai Peninsula (Egypt), Golan Heights (Syria), Eastern Jerusalem (UN proclaimed international), and the West Bank (“Israel Profile,” 2019). Figure 1.2 shows the territory distribution following the 1967 war:

Figure 1.2: Israel and Palestine Borders 1967



(Klein, 2020)

Israel returned the Sinai Peninsula to Egypt after a series of negotiations much later, but the remaining territories gained in the 1967 war remain under Israeli occupation or blockade to this day, though to varying degrees. The late 1980s was marked by violence for Israel and Palestine. Protests in the Palestinian Occupied Territories starting in 1987 were initially non-violent, but some Palestinian groups soon turned to violence, and Israel responded with force as well (*Timeline*, 2009). This period of uprisings became known as the First Intifada (“Israel profile,” 2019).

In November 1988, the Palestinian National Council declared Palestine to be a state, accepting UN resolutions 181, 242, and 338, which include the 1948 partition of Israel and Palestine. Soon after, the leader of the PLO, Yasser Arafat, condemned any form of terrorism,

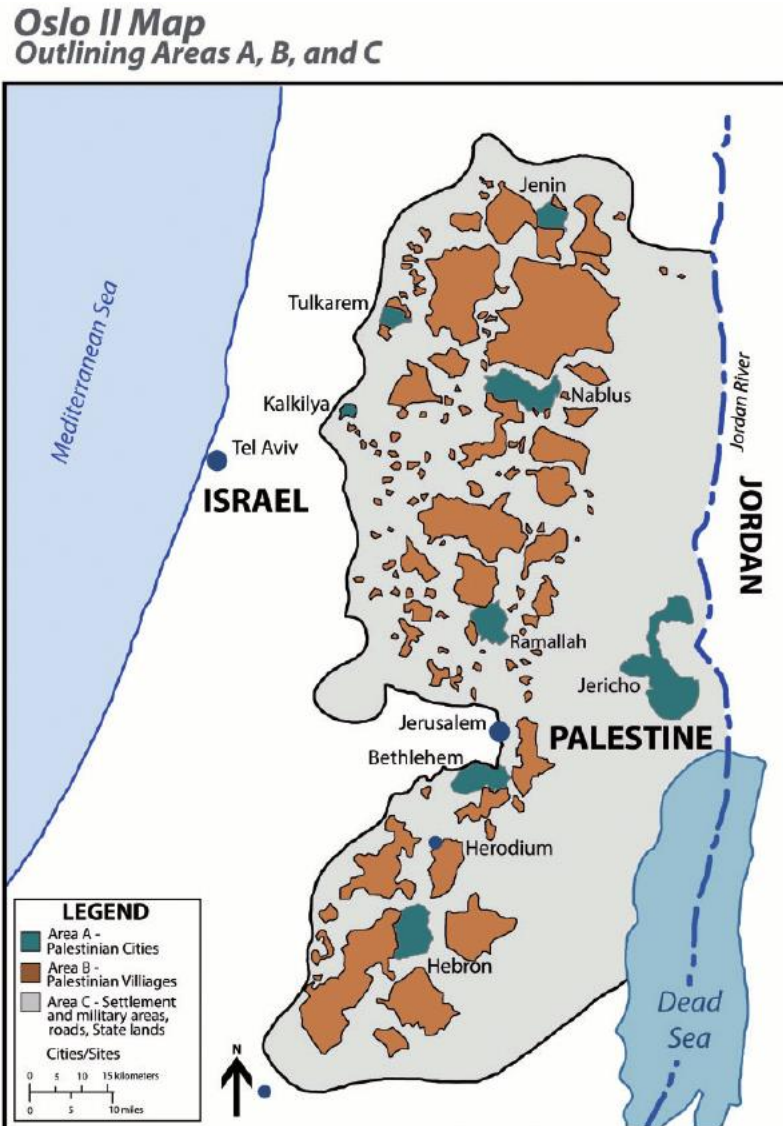
and the US agreed to open “substantive dialogue.” Palestine was not internationally recognized as a state, however, so its recognition of the 1948 borders was unacknowledged (*Timeline*, 2009). Nonetheless, the early 1990s saw several steps toward an independent Palestinian state following decades of Israeli occupation and acts of Palestinian terrorism. In 1993, the leaders of Israel and the PLO, representing Palestine, met at what is now called Oslo I, the first of two sessions called the Oslo Accords. The first meeting involved mutual recognition of the legitimacy of each party; the PLO recognized Israel as a state, and Israel recognized the PLO as the representative of the Palestinian people. This meeting also established the agenda for Oslo II, which took place in 1995 (*Oslo Accords*, 2018).

The resulting agreement, simply known as the Oslo Accords involved gradually increasing Palestinian independence over the course of five-year plans. They agreed upon the establishment of the interim governing body, the PNA (now known as the Palestinian National Authority or PNA), which would be allowed to govern the Gaza Strip and sections of the West Bank for five years. The West Bank was divided into three areas: A, B, and C, shown in Figure 1.3. The PNA was put in charge of most affairs in Area A, which covers about 18% of the West Bank. In Area B, the PNA was given limited power over internal affairs, and this area is about 21% of the West Bank. Area C, the remaining 61% or so, remained under Israel but was intended to be gradually transferred to the Palestinians (*What are areas A, B, and C of the occupied West Bank?*, 2019). After the first five years, border issues and possible expansion of PNA would be discussed with the eventual goal of creating an independent Palestinian state (*Milestones: 1993–2000*, 2020).

The Oslo Accords also included discussions about water management, which resulted in the Water Agreement as part of the Interim Agreement. Oslo I acknowledged that cooperation is

necessary and included proposals for studies and programs on water rights, the development of infrastructure, and desalination in appendices three and four. Oslo II included a section titled “Water Supply and Sewerage Issues” in the 1995 Interim Agreement, also known as the Water Agreement (*The Issue of Water between Israel and the Palestinians*, 2009). Israel recognized the Palestinian water rights in the West Bank, and these would be “discussed and finalized in the framework of a permanent arrangement,” an arrangement that has yet to be reached. The agreement did ensure that Palestine would receive 118 million cubic meters (MCM) per year in addition to an extra 28.6 MCM to provide for “future needs,” such as population growth (*The Issue of Water between Israel and the Palestinians*, 2009). Both sides agreed to use the resource sustainably, treating its sewage, and protecting the natural resources. The agreement also established a permanent Joint Water Committee, which met regularly from 1995 to 2008 when the agreement fell apart. The JWC was in charge of denying and approving construction of water infrastructure such as wells in the West Bank, but funding for these projects came from international donors. The agreement deteriorated with dissatisfaction for both sides and finally ended in 2008 (*The Issue of Water between Israel and the Palestinians*, 2009). It lasted much longer than the original 5-year interim period, however, and outlasted the Oslo Accords negotiation series.

Figure 1.3: Areas A, B, and C in the West Bank



(Kersel, 2014)

The next round of negotiations was marked by rising tensions and failed to reach an agreement. They finally came to a halt when the Israeli Prime Minister, Ariel Sharon, refused to continue the negotiations in 2001. Shortly afterward, a wave of Palestinian protests and terrorism erupted, known as the Second Intifada. This series of uprisings inspired even harsher reactions from Israel, which have shaped the current political and environmental landscape of Israel and the West Bank (“Israel Profile,” 2019). The early 2000s marked the beginning of Israel’s

construction of the separation walls surrounding the Gaza Strip and dividing the West Bank along the 1967 border and Areas A, B, and C from the Oslo Accords (“Israel Profile,” 2019).

The distribution of the land is shown in part four of Figure 1.1.

Because the negotiations were stopped prematurely in 2001, Israel maintains control over Area C, including environmental management and is considering annexing parts with valuable natural resources such as fertile soil and water. The PNA still controls most affairs in Area A and education, health, and the economy in Area B. Israeli martial law applies to the occupied territories, however, and Israel controls all external affairs for the entire West Bank, including security and trade (Haavisto, 2003). The West Bank is therefore enclosed by the Israeli checkpoints, which control internal movement within the West Bank and into Israel (*What are areas A, B, and C of the occupied West Bank?*, 2019).

Literature Review

The Middle East region faces some of the greatest water scarcity issues of the world, and researchers point to resource allocation as an aggravator, if not primary source, of conflict in the region (Giordano, 2018; Wolf, 1995). Water scarcity is affected both by natural water flow and water quality, often affected by waste management (Al-Khateeb et al., 2017; Al-Khatib et al., 2010; Ghanem et al., 2019; Tal, 2002). Climate change will exacerbate these issues, which could lead to increased conflict as resources become scarce and hence more valuable. The literature presents an alternative to conflict, however; increased interdependence between neighboring lands based on resource exchange could foster peace (Giordano, 2018).

The land of Israel and Palestine is culturally significant to people across the world as well as the people living on it, yet the environment in this area suffers from poor management (Al-Khatib et al., 2010; Ghanem et al., 2019; Tal, 2002). The literature points to two primary reasons

for this environmental degradation: trends among the general public, and a lack of resources and efficiency among institutions (El-Hamouz, 2008; Hukkinen, 1998; Tal, 2002; Wolf, 1995).

Trends among the general public including population growth, urbanization, and environmental management perceptions play a key role in defining the land's waste and water management.

The other challenge is the institutions' lack of resources and efficiency (El-Hamouz, 2008; Hukkinen, 1998; Tal, 2002; Wolf, 1995). Although Israel and the West Bank face varying degrees of inefficiency and resource scarcity, both struggle with environmental management enforcement and suffer the repercussions of the other's environmental difficulties (Giordano, 2018; Tal et al., 2010; Wolf, 1995). Much of the literature focuses on individual issues in one of the territories, and those that do compare both focus on one issue, most often water. I offer a comparison of Israel and the West Bank's legislative and actual management in two intimately connected areas that are facing challenges exacerbated by climate change and population growth: water and waste management.

Institutional Issues

The conversation concerning institutional inadequacy of environmental management reaches beyond the Israeli and Palestinian situation into both the developed and developing worlds. Hukkinen (1998) considers the dynamics between institutions and individual perceptions in environmental management in two Western countries. Hukkinen finds that institutional frameworks are often an impediment to developing and implementing sustainable policies because of their power over the development of organizations and economy (Hukkinen, 1998). Although Hukkinen's studies represent stable and peaceful political situations, the conclusions are still relevant to my study. I consider how these ideas are reversed in Israel's history; the people's attitudes toward environmental management shaped the institutional framework, which

now impede sustainable management (Tal, 2002). Sources directly concerning the West Bank and Israel also note the issue Hukkinen discusses; Saadeh et al. (2019) and El-Hamouz (2008) both highlight the negative effects of poor governance on waste management in the West Bank.

As the West Bank population grows, so does its waste generation. However, according to Saadeh et al.'s (2019) study of the potential for private-public partnership (PPP) in municipal waste management, the West Bank does not have enough facilities to accommodate this growth. Space is limited for landfills and waste management facilities, and, as El-Hamouz (2008) also points out, public institutions do not manage the space or resources available to their fullest capacity. Saadeh et al and El-Hamouz suggest turning to PPPs to solve these inadequacies by delegating waste management responsibilities to other organizations. Saadeh et al find a successful example of this model in Hebron and Bethlehem but note that it would most likely not work without the 50% funding agreement with the World Bank that these cities receive. Saadeh et al as well as other papers note the crippling effect that irregular fee collection by the waste management authorities has on public institutions (Al-Khateeb et al., 2017; Saadeh et al., 2019). The paper, however, focuses primarily on what individual municipalities do, rather than considering issues or solutions for waste management at the regional level, which I will consider in my evaluation of the national legislation and local effectiveness.

El-Hamouz focuses on the failure of the waste management institutions in Tubas, a district in the West Bank. He notes the importance of financial security, which was ultimately the downfall of the district's private-public partnership with a Jordanian organization, but the paper fails to address the need for other donors. Instead, it focuses on how much money the Tubas Joint Service Council might save with an efficiently run private-public partnership (El-Hamouz 2008). Although both of these studies consider the poor execution of the West Bank's waste

management and compare it to potential private involvement, neither look at the situation in Israel, which faces similar issues, controls the West Bank's border, and shares many of its resources and space (Tal, 2002). I will address this similarity in my research and consider the role of Israel's occupation of the West Bank and its government in the realistic application of public-private partnerships.

Although Israel is an independent country in the Global North, it also has severe environmental management issues. Alon Tal (2002) discusses the environmental compromises necessary to make Israel function as it does and the system's negative impacts on public health, specifically referencing insufficient sewage treatment in Arab Israeli neighborhoods as an issue of environmental injustice. He notes, however, that this pollution does not stay within the Arab neighborhoods and also affects Israeli sections of cities. Tal does not, however, discuss the effects of the occupation in the Palestinian territories on Israel's environment. I elaborate on this interaction, particularly how the occupation affects enforcement of environmental management of both Israeli and Palestinian law and enforcement and thus affects both territories.

Additionally, although Tal's assessment of Israeli environmental management covers many of its functions and faults, it has a primarily historical and political development focus, and I will consider more practical applications that have resulted from this development.

The perceived dichotomy of economy versus sustainability appears throughout the discussions of environmental management enforcement and application in Israel and the West Bank (El-Hamouz, 2008; Giordano, 2018; Saadeh et al., 2019; Tal, 2002; Tal et al., 2010). El-Hamouz brings it up as a primary reason for poor waste collection in the Tubas district and, similarly to Saadeh et al., therefore emphasizes the economic incentives of PPPs both for the people and for the public institutions. Al-Khatib et al. (2010) also note the heavy price tag

associated with environmental management, citing it as a primary reason for inconsistent environmental management. Tal et al. (2010) focused on this issue in the context of environmental policy enforcement in Israel by comparing criminal enforcement to administrative enforcement. The study found that criminal enforcement was more effective in part because of its stronger deterrence than administrative enforcement, but criminal enforcement took more time. It also required more resources, which were not available in the budget allocated to environmental management (Tal et al., 2010). Each of these sources reference the apparent trade-off between economic growth and sustainability, but few connect it to the mentality of the general populations, which I find to be a significant component of the effectiveness of enforcement in environmental management in my research.

Issues in the Population

Tal (2002) discusses the origins of respect for land and resources in Jewish and Israeli culture. He notes, however, that the deep Jewish connection to water has often been surpassed by greed. Water was a fundamental piece of Zionism, acting both as a commodity and ideology that allowed immigrants from Europe to change the Middle Eastern landscape into a green and fruitful land. This mentality produced both innovative water projects and an unrealistic water-dependency that could not be sustained in Israel's climate but that has since remained the cultural norm, shaping the country's foreign and defense policy (Tal, 2002). This mentality has made it difficult to make the necessary shift to an environmentally conscious society, thus posing a strain on the Israeli and neighboring environments. This challenge also points toward the second main reason for environmental management issues in the region: population mentality (Al-Khateeb et al., 2017; El-Hamouz, 2008; Hukkinen, 1998; Tal, 2002).

El-Hamouz (2008) and Saadeh et al. (2019) explain the importance of the general population in waste management practices because without individual action, waste management is not possible. Both papers note the lack of enthusiasm in the population, however, especially in terms of financial contributions and simple efficiency. Al-Khateeb et al.'s (2017) study of attitudes concerning waste management also indicate predominantly negative perceptions of the waste management services and their effectiveness. El-Hamouz found that the Tubas district had a 10% community satisfaction with its municipal waste system, which left many people with the responsibility of walking their waste to a collection facility. As a result, 74.1% of these households decided to burn their waste (El-Hamouz 2008).

This lack of awareness of proper environmental management actions and poor accessibility to environmental management systems is even present in higher education in the West Bank, as indicated by Al-Khatib et al.'s (2018) study. According to their study on solid waste management trends in higher education institutions, only 25% of higher education institutions in the West Bank implement programs aimed at raising awareness on solid waste management, and many of the universities separate and manage their waste poorly (Al-Khatib et al., 2018). Its findings reflect the society's mentality toward waste management, also seen in the resulting poor water quality found in Ghanem et al.'s (2019) study on water quality in Palestine's Natuv catchment. These studies reveal the popular mentalities and, in most cases, their immediate consequences, but I will consider these within the larger context of both Israel and the West Bank and their potential work together.

Environmental Management Collaboration

According to the literature on environmental management initiatives, attitudes of the public play a large role in determining the success of environmental management and

collaboration. While people in the West Bank face more blatant and severe consequences of poor environmental management, Israel also has pollution but comes from a place of comfort and plenty in terms of water (Giordano, 2018; Wolf, 1995). Israel has historically faced water scarcity, but because of its strong economy and infrastructure, it has rapidly developed innovative solutions to water scarcity, including waste-water recycling and desalination (Giordano, 2018). The literature points to the complacency that this innovation has produced, and Wolf (1995) notes that states in a better hydrostrategic position will be less interested in water-sharing agreements. Giordano (2018), however, points out that the solutions Israel has found crave large amounts of energy, which may become unsustainable, and that is a weakness that its neighbors may be able to leverage to reach a water and energy-sharing agreement.

The literature explains several necessary components for managing the environment and its natural resources. The rapid consumption and focus on human development noted in Wolf (1995), Tal (2002), and Giordano's (2018) is an example of the Tragedy of the Commons, a concept developed by Garrett Hardin in 1968. Hardin claims that individuals are driven by short-term interests on an individual level. They will therefore inevitably degrade their shared natural resource. Hardin asserts that the only way to prevent this degradation is through socialization (government ownership) or privatization (Ostrom et al., 1999). Elinor Ostrom contested this theory in the 1990s, however, based on observations of communities sustainably managing their environmental resources on their own; governments and privatization do not always result in sustainable environmental management, and communities can develop systems for sustainable management as well (Ostrom et al., 1999).

Ostrom developed a framework for collaboration on common pool resources based on these observations. The framework emphasizes the necessity for users to understand how

sustainable natural resource use will benefit them and their responsibility in contributing to this sustainable management (Ostrom et al., 1999). Other work on environmental management collaboration also supports this claim. Wondolleck and Yaffee (2000), for example, note that collaboration in environmental management is more likely to happen when there is a shared sense of place and responsibility to take care of that place combined with recognition of shared problems as well as goals or interests (Wondolleck & Yaffee, 2000). Neither of these works is directly about the Israeli-Palestinian conflict, and they do not provide methods for managing the environment of conflict zones. They do, nonetheless provide a sound foundation for collaboration on environmental management, and I will build on these ideas by applying them to the situation in Israel and the West Bank.

Wolf (1995) does consider the potential for collaboration around water sources in Israel and the West Bank. He highlights the importance of equity in control and information sharing, which has been an issue throughout the Israeli-Palestinian conflict, particularly during the Israeli occupation (Wolf 1995). Opening up space both physically and politically to discuss these issues on equal grounds, as Wondolleck and Yaffee (2017) suggest in their more recent work, is thus an essential step toward mobilizing people and institutions. Wolf notes the limited success of the “Picnic Table talks” between Jordan and Israel concerning day-to-day operations, which reduced minor tensions. While Wolf (1995) suggests that small doable steps such as these talks will lead the way to water stability, Giordano (2018) examines EcoPeace’s proposal to create interdependence for water and energy between Israel, the West Bank, and Jordan. These two sources focus on the issues of water scarcity and water quality, and I will add to this conversation by considering waste management in this light as well, drawing on the suggestions for private-

public partnerships as well as environmental initiative collaborations and the formation of interdependence to ensure a more stable region.

Methodology and Design

In this study, I use a comparative methodology to answer the research question: How do environmental management institutions associated with water quality, water scarcity, and waste management in Israel compare to those in the West Bank? More specifically, what is similar, and what is different? Why do they lead to differing environmental management practices and outcomes? What constrains their ability to adopt a more cooperative approach to management of their shared environment?

I first outline the two territories' individual institutional environmental management systems by drawing on legislation and independent, NGO, and IGO studies assessing their effectiveness. The Israeli legislation is primarily implemented by the Ministry of Environmental Protection because it is the ministry specifically designed for environmental management, although other ministries are also involved in environmental policy. Their website includes a description of all of their laws and amendments in English, making it accessible and detailed enough to use for this study. The website has not been updated since 2012, however, leaving some of the legislation out of date. Nevertheless, the information available still allows for interpretation of legislative patterns over time and the history of environmental legislation in Israel. Additionally, the ministry's summary and website are the most accessible resources concerning environmental legislation in Israel due to language and regional access barriers. I face similar difficulties with information about the West Bank. However, since the Palestinian National Authority provides more updated evaluations and revisions of their own legislation and governmental structure than does Israel, the sources for legislation and government information

are more updated. They also publish self-reports about every three years, evaluating environmental management in the region, which can be compared to third-party evaluations for accuracy and expanded perspectives.

I also use independent studies because of their critique and assessments of the environmental management system in Israel; they are not controlled by PR or directly connected to political parties and are thus less likely to be politically influenced, unlike some government reports. I use NGO reports from EcoPeace and IGOs such as the World Bank and United Nations for similar reasons in both the sections on Israel and the West Bank. In the case of the West Bank, the third-party organizations often provide support and donations to environmental management and therefore have an interest in candid information concerning the environmental management situation in the region. These studies are thus highly useful and, especially when compared to each other and the PNA's self-evaluations, seem reliable. Additionally, as a third-party, they do not necessarily have a political stake in the Israeli-Palestinian conflict and can therefore point out the power asymmetries and challenges posed by the occupation for either side.

Overview

In Chapters 2 and 3, I outline the environmental management institutions and their effectiveness in each of the territories. Chapter 2 focuses on Israel's management based on its laws and independent studies on its environmental management structure and its effectiveness. In this chapter, I find that the Israeli population has historically supported unsustainable management of the environment, thus producing inadequate environmental management institutions and legal frameworks. Therefore, despite recent changes in public opinion, Israel still

faces significant environmental management challenges which threaten its own population and natural environment's health.

Chapter 3 focuses on the West Bank, drawing on its laws and IGO, NGO, and independent reports on its environmental management. In this chapter, I find that the West Bank's waste and water management systems are highly decentralized, leaving most of the services in the hands of local authorities. This decentralization allows individual municipalities to respond to local events but also results in large quality gaps between municipalities. The environmental laws do regulate certain behaviors and specify punishments for violations, but most of the legal framework focuses on delegation and includes few specific requirements. This delegation to the local municipalities has resulted in large variations in the quality of management across the territory, depending on funds, infrastructure, resources, and independent decisions made by the local authorities.

In Chapter 4, I compare the environmental management structures of Israel and the West Bank outlined in Chapters 2 and 3. First, I compare the policy implementation structure, followed by the legal framework, and then enforcement policies and practices. The final section of this chapter focuses on the political context of the environmental management institutions of each of these territories. This comparison reveals that Israel and the West Bank both face limited resources for environmental management but for different reasons. Israel has superior infrastructure and substantive legislation detailing management procedures, but there is a disconnect between the contemporary popular support for sustainable environmental management and Israel's institutional framework. This institution perpetuates Israel's historical lack of political support for sufficient funding and enforcement resources for environmental management and protection. The West Bank lacks basic infrastructure, funding, and manpower

in addition to facing practical challenges and resource restrictions imposed by the occupation. Its municipalities also have less guidance from the legislation and little ability to enforce the existing laws, resulting in little confidence on the part of the public and thus less participation in proper waste and water management.

Finally, in Chapter 5, I evaluate the conclusions of Chapter 4 by using Ostrom's environmental collaborative framework, which focuses on community initiatives within a larger support network. I use this discussion to consider waste and water management in the context of potential future collaboration between Israel and the West Bank. Ostrom's and other environmental collaboration frameworks establish foundations for successful collaboration, including sense of community, responsibility surrounding a shared resource, and community engagement, all of which are impeded by the current manifestation of the Israeli-Palestinian conflict. Nonetheless, both sides recognize the growing importance of proper water and waste management, an acknowledgment that could lead to a new environmental agreement and collaboration. As I find in my research, although Israel's environmental management is more developed than that of the West Bank in terms of technology and precise legislation, both face enforcement challenges that jeopardize each other's and their own environmental and public health. These common problems can become the foundation for an agreement leading to sustainable water and waste management in the region and potentially increased political stability.

With the continued exacerbation of climate change, conflicts will continue to rise over resources and land. If today's global patterns continue, the disparities between the Global North and the Global South will continue to grow, though both will ultimately be impacted by each other's waste and environmental mismanagement. Thus, Israel and the West Bank provide an

opportunity to compare the environmental management of a state of the Global North and one of the Global South and their mutual impacts on each other and their environment. Their experience may give insight into potential approaches on global and local scales across the world as environmental management urgency and conflict rise.

Chapter 2:

Israel's Environmental Management

Introduction

Situated in one of the driest parts of the world, Israel finds itself in a precarious environmental situation (Phillipe Marin et al., 2017). Historically, Israel's government has a tradition of prioritizing its population's needs and consumption ahead of environmental health. Despite an emerging trend among the public toward environmental protection, the country's institutions and legislation do not reflect this shift. Israel experiences problems of institutional stagnancy created by precedent and problematic frameworks, which is at odds with shifts in the general public.

Israel drew on its environmental resources freely as it became a state, using large quantities of water, in particular (Tal, 2002). This mentality of environmental domination rather than preservation or conservation was built into the framework of Israel's environmental management institutions; environmental management and protection was not prioritized in Israel's governing institutions. Both historically and currently, implementation of environmental management legislation is distributed across Israel's ministries, requiring efficient communication and coordination between departments for effective management and enforcement (Tal et al., 2010; Tal, 2002). This distribution of power leaves the Ministry of Environmental Protection, whose main objective is public and environmental health, with little independent influence to achieve its goal.

The popular activism and legislation of the past three decades, however, indicates a shift in the general public toward growing concern for responsible waste and water management. The number of non-governmental environmental actors has drastically increased, and participation in

local environmental management has improved environmental quality (Tal, 2002; Yerushalmi, n.d.). Nonetheless, the lack of a strong environmental tradition, particularly in institutional frameworks, remains a constant issue in Israel's environmental management system and its effectiveness. The Israeli government's environmental management was originally informed by trends in the general public focused on consumption rather than sustainable management; Israel initially faced the first of the two main environmental management problems discussed in the literature: attitudes among the general public (El-Hamouz, 2008; Hukkinen, 1998; Tal, 2002; Wolf, 1995). This problem, however, created and exacerbated the other as well: lack of resources and efficiency in institutions.

The original prioritization of economic and human development rather than environmental protection influenced the government's allocation of resources and environmental management framework. Therefore, even after the shift in public opinion in favor of environmental protection, the institutional and legal framework for environmental management remains a barrier to effective environmental management. This chapter will outline the Israeli government's environmental management actors and their roles, followed by a summary of relevant legislation concerning waste management, water quality, and water scarcity. After these sections, I discuss the challenges the environmental management system faces and, finally, how the Israeli population is trying to set a new status quo for environmental management and how the recent changes in water management may be an example to follow.

Government Actors and Roles

Israel's government consists of twenty-two ministries, each with its own area of governing and legislative responsibilities (Choshen & Laster, 2005). These responsibilities sometimes overlap, so some laws are under the authority of more than one ministry, requiring

efficient communication and coordination within the government. Because environmental management covers a broad range of issues, most ministries are involved in the laws concerning environmental management in some form (Choshen & Laster, 2005). The Ministry of Environmental Protection is, however, nominally the main environmental actor of the Israeli government. It is “responsible for the formulation of a nationwide, integrated, and inclusive policy for the protection of the environment” (*About Us Home*, 2012). The ministry works at three levels to achieve this goal: national, regional, and local. The representatives at the national level are responsible for developing policy, strategies, standards, and priorities for environmental protection. The regional districts are responsible for the implementation of these national policies (Tal et al., 2010). The Ministry of Environmental Protection uses the same six geographical districts as the Interior Ministry, which is also heavily involved in environmental policy (Choshen & Laster 2005). These districts are Central, Jerusalem, Northern, Haifa, Tel Aviv, and Southern, shown in Figure 2.1. The district of Judea and Samaria (the West Bank) is also considered a district of Israel, but it is not under civilian law. Therefore, the same laws do not apply (*About Us Home*, 2012). Finally, the local level includes fifty-two unit and town associations, also referred to as corporations, which advise local authorities and provide services for 85% of the Israeli population (*About Us Home*, 2012; *The Israel Water Authority*, 2012).

Figure 2.1: The Districts of Israel



(Israel Districts Map, 2020)

The Israel Water Authority also works with these fifty-two corporations on water management and distribution in Israel. These municipal corporations are responsible for the distribution of water, sewage collection, and wastewater treatment, but the Water Authority is the primary authority on water management in Israel, as it is in charge of planning, allocation, and

tariff regulations. Other entities also contribute to water management, however, including the government-owned company, Mekorot. Mekorot Water Company functions as the national bulk water provider. It provides 85% of Israel's domestic potable water and 70% of Israel's total water consumed (Phillipe Marin et al., 2017). Several ministries including the ministries of Environmental Protection, Interior, Agriculture, Health, and Finance are also involved in setting guidelines for water management implemented by these actors through policies and legislation (Phillipe Marin et al., 2017).

Legislation

The Ministry of Environmental Protection was not formed until 1988, but laws, bylaws, regulations, and administrative orders concerning environmental management have been in place in Israel since 1940 (Homolka et al., 2017). The legislation has since been revised, supplemented, and divided among the appropriate ministries. It primarily assigns the responsibilities of ministries, local authorities, and individual actors concerning environmental management. The legislation both targets specific environmental issues such as point-source pollution and provides comprehensive laws which create frameworks for resource and land use. This section will explore the main laws concerning water and waste management, listed in Table 2.1, which are mostly under the authority of the Ministry of Environmental Protection and Ministry of Interior.

Table 2.1: Israel Environmental Management Laws	
Law	Year of Enactment
Water Law	1959
Abatement of Nuisance Law	1961
Local Authorities Sewage Law	1962
Streams and Springs Authorities Law	1965
Licensing of Business Law	1968
Maintenance and Cleanliness Law	1989
Prevention of Environmental Nuisances (Civil Action) Law	1992
Collection of Disposal of Waste for Recycling Law	1993
Freedom of Information Law	1998
Municipal Water and Sewage Incorporation Law	2001
Sewage Effluents Quality Standards and Sewage Treatment Rules	2010
Packaging Law	2011
Electrical and Electronic Equipment and Batteries Law	2012
Sanitary Quality of Drinking Water Law	2013

Waste Management Legislation

The Ministry of Environmental Protection and local authorities are responsible for preventing and eliminating “nuisances,” which include air pollution, odors, and unsanitary conditions, all of which affect water quality and are potential results of poor waste management (*Waste and Recycling*, 2012). The Ministry therefore oversees many laws that regulate the management and disposal of waste, outlining proper disposal, prohibitions, and locations for disposal.

The “Maintenance and Cleanliness Law,” written in 1984 and updated as recently as 2011, establishes expectations for waste management by authorities and individuals. It directly prohibits littering or waste disposal in the public domain and mandates that local authorities establish and publicize sites for the “disposal or collection, and treatment of construction and demolition debris, yard waste, tires, and vehicle scraps” (*Waste and Recycling*, 2012). To encourage compliance with the law, it defines severe fees and imprisonment sentences, requiring up to three years imprisonment or a fine of 404,000 NIS (New Israeli Shekel) for individuals and double for a corporation (*Waste and Recycling*, 2012). This law also establishes a fund, the Cleanliness Maintenance Fund, to which all fines are paid to ensure the violators contribute to amends. In 2007, Israel amended the law to include a levy for every ton of waste dumped into a landfill to be paid by the landfill operators to the Cleanliness Maintenance Fund. Importers and manufacturers of common litter are also charged levies for their products. These levies are part of an effort to internalize the costs of waste treatment and disposal as well as increase recycling and recovery (*Waste and Recycling*, 2012).

The “Collection and Disposal of Waste for Recycling Law” focuses on recycling. “When required by the Minister of Environmental Protection,” local authorities are obligated to allocate and install recycling center sites, facilities, and containers (*Waste and Recycling*, 2012). The law also requires all businesses and homeowners to install and maintain recycling receptacles “within a municipality which operates recycling centers” (*Waste and Recycling*, 2012). It gives municipalities the authority to specify recycling procedures through bylaws but specifies that waste must be separated at the source. The law also set recycling goals when it was created in 1993; by December 1998 the goal was to recycle 10% of Israel’s waste, 15% by 2000, and 25% by 2007 (*Waste and Recycling*, 2012). These standards have, however, been revised downward

as Israel has struggled to reach them in the past two decades. The recycling rate stood at 21% in 2019 (Lidman, 2018). Other laws specify the disposal and recycling of specific materials such as construction and demolition debris, tires, and electrical and electronic equipment, but they have been passed more recently (since 2000) than the collection laws establishing waste management frameworks discussed above (*Waste and Recycling*, 2012). Both the amendments and new laws share the goals with which the Ministry of Environmental Protection is tasked: to reduce waste and environmental effects that could damage public health and the environment (*About Us Home*, 2012).

Water Management Legislation

The main legislation regulating water sources and use in Israel is the “Water Law.” The government established the law in 1959 and has regularly updated and expanded it since then (*Water and Wastewater*, 2012). The law establishes a framework for the control and protection of Israel’s water sources, designating this framework as the responsibility of the Ministry of Agriculture, Ministry of Infrastructure, the Water Commissioner (now replaced by the Water Authority), and the Ministry of Environmental Protection.

Fundamentally, this law designates “all sources of water in Israel as public property,” giving every person entitlement to the water, “as long as that use does not cause the salination or depletion of the water resource” (*Water and Wastewater*, 2012). Much of the remaining sections of the law specify “salination or depletion” by designating limits on chemicals, contaminants, sewage, and other pollution that can be disposed of into water sources or other areas of the environment that may affect water sources. The law directly outlaws “any act which directly or indirectly causes, or may cause, immediate or subsequent water pollution” (*Water and Wastewater*, 2012). It specifies regulations for industries regarding chemical substances for

agriculture, sludge, wastewater, and cesspools for factories, pipeline and gas station regulation for the oil industry (*Water and Wastewater*, 2012).

The “Water Law” also deals with sewage, detailing maximum levels for chemicals and substances allowed to be exposed to sewage, a bar that was raised in 1992. The “Local Authorities Sewage Law” established the role of local authorities concerning sewage systems in 1962; each local authority is required to maintain a sewage system in proper condition, which must be approved by the regional planning commission and health and environment authorities. In 2001, the Municipal Water and Sewage Incorporation Law was enacted to promote “agglomeration of services into regional utilities,” centralizing the country’s sewage management. Public health regulations such as the “Sewage Effluents Quality Standards and Sewage Treatment Rules” and “Sanitary Quality of Drinking Water Law” set the standards for reused sewage effluents and drinking water (Phillipe Marin et al., 2017).

These laws also address industrial sewage; the “Local Authorities Sewage Law” proposes recommendations for sewage maintenance including treatment and disposal of industrial sewage, though it prohibits industrial plant sewage from being discharged into regular sewage systems. Industrial sewage must instead follow the 3-stage cascade rinsing process outlined in the “Water Law” (*Water and Wastewater*, 2012). There is also a tariff charged for industrial sewage; the Sewage Law sets this tariff and other charges and fees for sewage systems across the state (*Water and Wastewater*, 2012).

In the case that these laws fail to protect one of Israel’s water sources, the Minister of Environmental Protection has the power to enact the “Streams and Springs Authorities Law.” This law allows the Ministry of the Environment to establish an authority for a particular water source with permission from local authorities and the Ministry of Interior. The water source

authority can then instate extra fees, licenses, and regulations to improve the condition of the water source. The Streams and Springs Authorities Law was enacted in 1988 for the Yarkon River Authority and the Kishon River Authority in 1994, both of which were established to diminish pollution in the rivers caused primarily by industrial activities (*Water and Wastewater*, 2012).

Penalties and Enforcement

The government as well as the people have the power to initiate official action to order people and other actors to remove environmental nuisances and pollution. Laws such as the “Abatement of Nuisances Law,” “Maintenance and Cleanliness Law,” and “Prevention of Environmental Nuisances Law” permit the Ministry of Environmental Protection to mandate action and take necessary measures in case of failure to comply (*Waste and Recycling*, 2012).

The Ministry of Environmental Protection is the main actor in charge of environmental compliance, although ministries such as those of interior, health, and infrastructure also have some influence (Tal et al., 2010). Local municipalities are also involved in compliance, primarily through business licensing, response to local nuisances, and public education (Tal et al., 2010). Israel has two methods of environmental policy enforcement: administrative and criminal. In Israel, the administrative method relies on six regional offices, one in each of the districts previously mentioned, which oversee the distribution of permits, monitoring, advising, and public education. In the case of an environmental nuisance complaint, they first issue letters of warning followed by a hearing. If these methods are unsuccessful, however, the case goes to the Green Police (Tal et al., 2010).

The Green Police are one of two departments in the Ministry of Environmental Protection in charge of criminal enforcement. The other department is the legal department, composed of

attorneys who take cases to court once they pass out of the hands of the Green Police (Tal et al., 2010). The Green Police work at the national, regional, and local level to enforce environmental laws and address complaints for a set list of environmental issues, including waste waterflow, sewage, hazardous substances, and handling complaints (*Enforcement Methods*, 2016). Despite this wide range of responsibility, as of 2010, the Green Police was composed of about forty inspectors with limited powers to arrest, interrogate, and issue penalties as well as document environmental nuisances. As of 2011, they are allowed to open investigations and remain working on a case until it is prepared for indictment (*Enforcement Methods*, 2016). The first nationwide Green Police operation took place in 2016. It inspected 245 sites for “illegal sources of air pollution, underground water contamination, and hazardous materials offenses” and issued 34 fines (*First Nationwide Green Police Enforcement Operation*, 2016). The operation involved the combined manpower of the Green Police, Israeli Police officers, and “workers from the MoEP [Ministry of Environmental Protection] and environmental units” to have 150 people work on the operation (*First Nationwide Green Police Enforcement Operation*, 2016). Although this team appears to have carried through an effective operation, it had to draw from four groups to get 150 people to work on an operation meant to cover the whole country, serving as a testament to the small amount of manpower Israeli environmental law enforcement have.

Israeli environmental law penalties are based on a polluter-pays policy, meaning that the violator pays for the damages caused, often with an additional penalty. The penalties involve either imprisonment or payment based on the crime. The laws set upper limits on imprisonment time and fines, so the penalty can be applied according to the severity of the crime. The upper limits for improper disposal, collection, and treatment of “construction and demolition debris, yard waste, tires, and vehicle scraps,” for example, is up to three years imprisonment or a fine of

404,000 New Israeli Shekel (117,023 USD) (*Waste and Recycling*, 2012). Additionally, the court may seize the vehicle used to illegally dispose of the waste, and it is required to do so if the violator repeats this offense within three years. The law also specifies that penalties are doubled for corporations. The penalties for this law are among the harshest penalties for violating waste and water management laws in Israel (*Waste and Recycling*, 2012). Regardless of these penalties and Israel's enforcement mechanisms, Israel still faces environmental management issues stemming both from violations and the institutional framework (Lidman 2018; Tal et al., 2010).

Challenges

Despite Israel's comprehensive collection of waste and water management legislation, it still struggles with environmental issues such as pollution, water scarcity, and waste disposal (Kalifa, 2019; Lidman, 2018; Tal et al., 2010). Its recycling levels remain at 21% despite goals made in 1998 to reach 25% by 2007, leaving Israel with the lowest recycling rates among the developed countries (Lidman, 2018; *Waste and Recycling*, 2012). Israel's waste production also increased at a 2% annual rate from 2013-2016, with average waste per capita at 1.7kg per person per year in 2019, which is higher than the Organisation for Economic Cooperation and Development average and falls just under the United States average of 2kg per person per day (Lidman, 2018). As the laws outline above, this waste is legally required to be safely collected and disposed of at approved facilities (*Waste and Recycling*, 2012). Israel's waste does not always end up in properly regulated landfills or "waste-to-energy" facilities, however. Often waste producers and collectors illegally dump the waste, either in nature, which is protected as "the public domain," or it is transported to places like the West Bank where people sort through and burn the trash (Kalifa, 2019; Lidman, 2018). These types of unregulated and illegal disposal feed into the issues of water quality and water scarcity because the waste pollutes water sources,

making them dangerous for human consumption and destroying ecosystems. This type of water contamination led to the closing of 282 wells between 2000 and 2010 because of pollution concentrations in Israel's coastal aquifer (Tal et al., 2010).

The compliance difficulties with environmental laws in Israel may be attributed to the country's historical lack of environmental management prioritization. As several scholars point out, two main factors causing poor environmental management are trends among the public and lack of resources and efficiency in institutions (El-Hamouz, 2008; Hukkinen, 1998; Tal, 2002; Wolf, 1995). Both of these issues appear in Israel's environmental management scene. Although the environment, particularly water, was an important part of Zionism, greed has often fueled the country's treatment of water; Israel's pioneers used its water with the aim of replicating a lush European aesthetic in the Middle East. "The original political focus on water both produced innovative water projects and developed an unrealistic water-dependency that could not be sustained in Israel's climate" (Tal, 2002). The mentality of the people was more focused on using the resources than protecting them, and the government, a republic meant to reflect the opinions of the people, followed trends in public opinion. Thus, the first main factor of environmental management, trends in the general public, shaped the government's approach to environmental management and produced the second factor: lack of resources and efficiency in environmental management institutions.

Although Israel had laws regulating the use of resources such as water since the late 1940s, they were spread across the ministries without a common goal of environmental protection. Instead, they served the purposes of other ministries such as maximizing agriculture or strategic defense uses in the region (Tal, 2002). In 1973, the Environmental Protection Service was established within the Ministry of Interior in an attempt to "create a comprehensive and

modern environmental administration” (*About Us Home*, 2012). The EPS was, however, poorly funded, and environmental management and protection remained a subsection of a ministry (Tal, 2002). It was not until 1988 that this field had its own ministry, and even then, it was only created because of a political “fluke” (Tal, 2002). The government faced a political stalemate in the dead-even 1988 election in which the ministers outnumbered Israel’s ministries by one, so the government formed a new ministry: The Ministry of the Environment (now known as the Ministry of Environmental Protection). Even after its formation, however, the new government office faced many obstacles in its path to protecting and managing the environment, including lack of prestige, poor financing, and limited actual control.

The Ministry of Environmental Protection started out with a budget of 0.018% of the government’s overall budget, and this number has remained low (Tal, 2002). As of 2005, the budget was still merely 0.1% of the total budget, significantly lower than the allotment to most ministries (Choshen & Laster, 2005). The poor funding and enthusiasm for the ministry has not been divided among political lines; it has simply been guided by the status quo, which has come from a history of poor environmental management, consistently resulting in poor sewage management and contaminated drinking water (Tal, 2002). Due to this status quo, the position of Minister for Environmental Protection has been vacated and filled frequently, as politicians have moved on to more prestigious positions, using the Ministry of Environmental Protection as a steppingstone rather than investing in and advocating for it (Tal, 2002).

The ministry’s weak reputation has also made it difficult to gain actual political power. After its foundation, it had to fight other ministries to expand its scope and jurisdiction (Tal, 2002). The Environmental Protection Service, originally under the Ministry of Interior, became the foundation of the new ministry and was slowly built upon by additions from other ministries.

The Ministry of Agriculture gave up the National Parks Authority to the Ministry of Environmental Protection, but it kept the Nature Reserve system and Water Commission, maintaining direct control over pesticide registration and oversight policies. The new ministry also took over the Licensing of Businesses Law from the Ministry of Health, along with power over regulations on hazardous material, pest control, air pollution, and other nuisances (Tal, 2002).

Table 2.2: Division of Environmental Laws Among Israeli Ministries as of 2005 (based on data from Choshen and Laster's 2005 report)	
Ministry/Government Entity	Number of environmental laws over which the ministry has authority (shared and exclusive authority)
Interior	52
Agriculture and Rural Development	48
Transportation	37
Health	35
Environmental Protection	33
Finance	24
Industry and Trade	20
National Infrastructure	19
Education	19
Labor and Welfare	15
Construction and Housing	13
Tourism	11
Water Authority	9
Prime Minister's Office	1

Despite these expansions of the new ministry's powers, it was condemned to the role of "supporting actor" concerning key environmental issues by other ministries that wanted to maintain control, a role that the ministry often continues to occupy today (Tal, 2002). The Ministry of Environmental Protection ranks fifth among the ministries in the number of environmental laws under its control and is involved in under 10% of the country's environmental laws (see Table 2.2 for the number of environmental laws under each ministry)

(Choshen & Laster, 2005). The Ministry of Interior has the greatest number of environmental laws under its authority, and this number has increased since 1988 despite the government's official statement: "all of the Ministry of Interior's activity related to environmental protection will be transferred to the Ministry of Environment" (Choshen & Laster, 2005). Other ministries managing environmental legislation related to water quality, water scarcity, and waste management include the ministries of health, agriculture and rural development, transportation, industry and trade, and national infrastructure (Choshen & Laster, 2005; Tal et al., 2010). As mentioned previously, the laws are also often under the authority of more than one of these entities. Thus, the Ministry of Environmental Protection has exclusive authority over less environmental management than its thirty-three environmental laws imply (Choshen & Laster, 2005).

This system also requires cooperation and communication across ministries to enforce, change, and sometimes create new laws. The process becomes an issue for three reasons: bureaucratic complications within the government; the reputation of the Ministry of Environmental Protection; lack of historical prioritization of environmental management legislation (Choshen & Laster, 2005; Tal, 2002). The ministry's background gives it little prestige from all political sides as the office is not divided along political lines. Both insufficient financing and the ministry's reputation limit its capabilities and have resulted in poor environmental management such as the poisoning of Israel's largest source of drinking water, which took two years to clean up because the ministry lacked the power and support to stop it (Tal, 2002). The condition of the ministry in charge of environmental management is a testament to the poor reputation of environmental management among both politicians and constituents in Israeli history.

Increasing Pressures for Change

Despite the historical disregard for environmental management in Israel, the past few decades have seen a change in attitude among the people and increase in environmental legislation, including a total reformation of the water sector. Throughout the 1990s, Israelis began to take actions to properly manage their environment themselves. The decade saw an 80% increase in the number of environmental organizations in Israel, a number that continued to grow after 2000 (Tal, 2002). Funding for these organizations also grew into the early 2000s; in 1996, less than 20% of the organizations reported budgets over \$30,000, but by 2000, 28% had budgets over \$100,000. The non-profit NGO, the Israeli Union of Environmental NGOs, Life and Environment (also known as L&E) had nearly eighty member organizations by 2000. As of 2019 it represents and serves over 120 environmental organizations by fostering cooperation and professional aid (Yerushalmi, n.d.). Organizations like Life and Environment have facilitated the rapid expansion of grassroots environmental movements across Israel as well as encouraged legislative changes, which have given the public increasing power in the realm of environmental management.

The government has given citizens increasing power in environmental management both in terms of reporting and accessing information concerning pollution and the environment (Tal, 2002; *Water and Wastewater*, 2012). For example, the “Prevention of Environmental Nuisances Law” of 1992 gives citizens the ability to file environmental lawsuits against polluters on behalf of themselves or NGOs. They can demand restraining orders, prevention of recurrence orders, and corrective orders (*Waste and Recycling*, 2012). The “Freedom of Information Law” allows individuals and public organizations to request information from public authorities, and in 2005 it was amended to expand the publication and accessibility of environmental information relevant to public health. This amendment was intended to make information accessible through

websites and other public means, reducing the need for application and request fees, thus reducing prices and barriers to information for both the public and the government (Homolka et al., 2017).

The increased public participation and pressure from the 1990s environmental movement and increasing environmental constraints have also influenced legislative changes. As discussed above, many of the older laws pertaining to environmental management have been amended since the 1990s, and many of the laws concerning waste disposal, such as the “Electrical and Electronic Equipment and Batteries Law” and the “Packaging Law” were passed in the past fifteen years (*Waste and Recycling*, 2012). The most dramatic environmental management changes in the past twenty years, however, have been in water management.

Israel experienced three major water crises going into the turn of the century, which “built gradual momentum for major reforms” (Phillipe Marin et al., 2017). The first crisis was a major drought in 1986, which led to a 15% reduction in agricultural water supply. The next significant drought was in 1989/90 and required “severe and unpopular water restrictions” (Phillipe Marin et al., 2017). It was, however, followed by an unusually rainy winter in 1991-92, so residents were able to forget the gravity of drought until 1998, which saw “severe water shortages and rationing in most Israeli cities” (Phillipe Marin et al., 2017). The culmination of this series of crises “provided a political window for action,” encouraged by the public and government (Phillipe Marin et al., 2017). In 2000, the Israeli government began remodeling the water sector through policy changes to water management, using a plan to gradually institute a sustainable framework for water management to guarantee water security for Israel (Phillipe Marin et al., 2017).

The reformation is significantly based on recommendations by the 2002 Parliamentary Investigation Committee of the Water Sector. It replaced the Water Commissioner with the Israel Water Authority in 2007, centralizing authority over water management of the whole country instead of having it spread across entities (Phillipe Marin et al., 2017). The committee recognized that too many entities were involved in managing the water sector, an assessment which may also be applied to waste management. The new framework centralized many of the decision-making processes involved in water management by outlining the responsibilities and reach of each entity involved in the water sector, designating the ministries, Water Authority, and Mekorot as being responsible at the national scale, municipal and regional water utilities (such as the fifty-two corporations) at the municipal or regional scale, and drainage and river authorities focusing on national basins (Phillipe Marin et al., 2017).

Another notable result of the reformation of the water management sector is the crucial move toward self-financing. The government instituted nationwide tariffs, implemented institutional reforms, and encouraged partnerships with the private sector. These changes were made to gradually phase out direct budget subsidies for the water sector, a plan that has had substantial, though incomplete success (Phillipe Marin et al., 2017).

The new sustainable management plan as well as changes in water management regulations and laws pushed Israel to find new ways of obtaining and recycling the precious resource. Many farms now use treated sewage to water plants; 87% of sewage generated in Israel is used in agriculture, where it can be safely recycled rather than polluting or simply being lost in the environment. The government has also recently turned to desalination as a solution for water scarcity, now drawing 85% of its drinking water from its five desalination plants (“Arid Middle East faces political battles over water shortfalls,” 2018).

Although the desalination plants have made costs of water drop significantly over the past decade, it still comes at great energy cost, and the Water Authority still warns people against wasting water (Lidman, 2018). Israel plans to pump desalinated water into its depleted sources of freshwater, but this demands lots of fossil fuel energy and can only benefit the state if people are still careful in their water use. Such measures highlight the importance of individual action, as noted in much of the legislation (“Arid Middle East faces political battles over water shortfalls,” 2018). Additionally, the water management sector itself still needs to make significant improvements to be entirely sustainable and ensure water security. For example, although the self-funding of the water-sector has been successful in some ways, it has also led to economic inefficiencies in water resource allocation. Another major unsolved issue is the restrictions on aquifer abstraction and water allocation for the Palestinian population (Phillipe Marin et al., 2017).

Conclusion

The Israeli government’s wide dispersal and sharing of environmental management policies and responsibilities across ministries requires the prioritization of cooperation and coordination across ministries for the legislation to be effective and enforced. For the legislation to function, the ministries also need effective and efficient communication between each other to reach agreements on enforcement and policies. Environmental management, however, has not historically been a priority for the Israeli government, so this coordination is generally lacking. Part of what made the reformation of the water sector successful was the minimization of this particular issue by centralizing national responsibilities and clearly outlining the duties of each entity.

Despite the cultural value of the land and water to the Jewish people, consumption has dominated the historical narrative of environmental management (Tal, 2002). This consumption mentality has led to the depletion and contamination of Israel's few water sources, shared with its neighbors, thus negatively affecting both itself and surrounding populations such as Palestinians and Jordanians (Tal, 2002). This combination of disregard for environmental management and poor intragovernmental coordination heightens challenges at the transboundary level, particularly in light of research indicating water use as a primary cause for conflict and instability in the Middle East (Barnard & Wahab, 2018; Giordano, 2018; Homolka et al., 2017; Tal, 2002; Wolf, 1995).

This issue is exacerbated by the financial burden it creates; as demonstrated by the history of the Ministry of Environmental Protection, environmental management and its primary ministry holds little prestige among politicians regardless of the population's changing sentiments. In part due to this reputation and lack of political prestige, environmental management receives little financial support, exemplified by the Ministry of Environmental Protection's budget, which lags behind most Western countries, impeding its power and enforcement capabilities (Choshen & Laster, 2005). Since its founding, the Ministry of Environmental Protection has grown, along with its budget, but the two remain small.

Despite Israel's legislative efforts and the actions of local and regional organizations, the lack of government efficiency and effectiveness both creates and prolongs the consequences of poor environmental management. While movements toward increased waste management accountability are reflected in legislation, actual enforcement is still a problem, the results of which can be seen in the poor water quality and low national recycling levels in Israel (Tal et al., 2010). Poor general compliance with Israeli waste management policies can also be seen in the

waste and pollution in the West Bank where e-waste from Israel is a major pollutant. Although Israel and the West Bank worked on an agreement to limit the flow of e-waste and properly dispose of hazardous waste, bureaucratic issues persisted, and still exist today (Kalifa, 2019). Thus, although Israel has a complex environmental management framework, it is not effective enough to maintain water security or high levels of environmental quality. The factors contributing to these inadequacies are: the complexity of the management framework, the internal cooperation the framework demands, a lack of funding and limited enforcement power, all of which come at least in part from Israel's history of low prioritization of environmental management.

Chapter 3:

The West Bank's Environmental Management

Introduction

The West Bank's environmental management system is highly decentralized, so the quality of management varies enormously across the different municipalities (Al-Khateeb et al. 2017; Nour and Al-Saidi 2018). Even so, the same primary issues of inadequate infrastructure, management, and resources prevail throughout the entire territory (Ghunaim, 2016). The West Bank faces the environmental challenges that Israel and other growing populations of the Middle East face in addition to the challenges posed by the Israeli occupation, which limit mobility, resources, and institutional effectiveness (Ghunaim, 2016; Haavisto, 2003; Nour & Al-Saidi, 2018). These limitations severely constrict the West Bank's water and waste management operations and effectiveness, resulting in public health and environmental consequences (Ghunaim 2016; Haavisto 2003; Nour & Al-Saidi 2018; Ghanem et al., 2018). This chapter provides a brief overview of the Palestinian National Authority's environmental management system and main actors with specific attention to water and waste management. It identifies the main problems faced by this system and its institutions based on internal strategy plans and third-party studies.

The Palestinian National Authority's Environmental Management

The Palestinian National Authority (or PNA, formerly the Palestinian Authority) was established in May 1994 following the first round of Oslo Accords. These accords were talks between Israel and the Palestinian Liberation Organization, the recognized representative of the Palestinian people at the time. The Palestinian National Authority was established as an interim governing body for the Palestinian people in the Gaza Strip and parts of the West Bank

(*Palestinian Authority: History and Overview*, 2020). The authority was intended to increase its independence and power in five-year intervals to reach a point of domestic self-governance with a close security relationship to Israel (*Palestinian territories—Timeline*, 2019). The second intifada in the early 2000s and 2006 Palestinian election results made Israel feel threatened, which derailed the plan for the Palestinian National Authority's power progression; the Gaza Strip has since been blockaded and most of the West Bank occupied (*Palestinian territories—Timeline*, 2019). As a result, the power of the Palestinian National Authority applies in varying degrees to each of the territories. The West Bank is divided into three areas: A, B, and C (see Figure 1.3 for a map), each of which is under different jurisdictions and levels of occupation. The occupied territories of the West Bank are under Israeli martial law where Israeli environmental legislation applies only if a military order says so (Haavisto, 2003). Thus, the environmental laws of the current Palestinian National Authority are primarily enforced and applied in area A of the West Bank, which is what this chapter will focus on (Haavisto, 2003).

Environmental management has been a persistent part of the Palestinian government since its foundation and continues to be a primary area of concern for the Palestinian National Authority and Palestinians. The governing bodies in charge of environmental management have changed several times since its foundation due to administrative changes in the rest of the government and, more recently, because of reform processes in attempts to increase environmental management effectiveness (Haavisto, 2003). In October of 1994, six months after its foundation, the Palestinian National Authority formed the Environmental Planning Directorate in the Ministry of Planning and International Cooperation, the first Palestinian environmental governing entity (Haavisto, 2003). The environmental governing body has changed three times since this initial form. First, in 1996, following Oslo II, the Palestinian

Environmental Authority was formed; in 1998, Presidential Decree No. 2 by Yasser Arafat created the Ministry for Environmental Affairs, and in 2002, Presidential Decree No. 6 made it an authority once again: the Environmental Quality Authority (Haavisto, 2003).

Similarly to Israel, the Palestinian environmental governing entity has changed hands and degrees of power many times, causing some confusion over the division of environmental responsibilities between ministries and difficulty enforcing policies. As in the Israeli government, environmental responsibilities are distributed across ministries and authorities in the PNA. The ministries and authorities involved in water and waste management include the Ministries of Local Government, Health, Industry, and Interior and the Palestinian Water Authority (Haavisto, 2003). Each of these entities is involved in executing, enforcing, and creating environmental management in a different way, but most of the practical responsibilities of water and waste management lie with the local municipalities themselves, resulting in varying quality of management across the territory (Ghunaim 2016; Haavisto 2003).

Since 1995, Palestine has had a governing body specifically for water management: the Palestinian Water Authority (the PWA). The PWA's responsibilities and powers have grown over time as the authority has become increasingly independent. In 2002, Water Act No. 3 put it in charge of managing the water sector, specifically the regulation of private and local government relationships (*About PWA*, 2017). More recently, the new Water Law of 2014 restructured the West Bank's water sector in an attempt to make it more efficient and sustainable (Nour & Al-Saidi, 2018). Even after the reformation, local authorities, particularly in rural areas, still bear large responsibilities for water management (Nour & Al-Saidi, 2018).

The Palestinian environmental management structure means that waste management relies on local municipalities' funds, which are inconsistent across the territory, so certain

municipalities may have much better waste management systems than others due to available funding. Additionally, those with poor management may cause environmental degradation, threatening not only their own area but also water sources and other natural resources used by other municipalities. The Ministry of Local Government is “involved in the operation and financing of solid waste collection and disposal,” but, in actuality, the municipalities and village councils are responsible for carrying out the collection, transport, and disposal of municipal wastes (El-Hamouz, 2008; Haavisto, 2003). In the municipalities, the Joint Service Councils (JSCs) are in charge of solid waste management, so the management differs between the municipalities depending on decisions made by individual JSCs, attitudes and size of the population, and funding available (El-Hamouz, 2008). Funding is necessary for adequate infrastructure, but poor infrastructure such as a lack of roads prevents waste services from reaching everywhere they are needed (Saadeh et al., 2019). Therefore, the quality of infrastructure is both a result of these factors and a contributing determinant of the success of the waste management systems. Other issues affected by the variation in these factors include water quality and thus environmental and public health.

Water management is also primarily controlled by the municipalities (Haavisto, 2003). In the early 2000s, many developing countries shifted toward “Integrated Water Resources Management” models, which focused on “the interdisciplinary and inter-sectoral nature of water issues” (Nour & Al-Saidi, 2018). Although the initiatives failed in many places due to fragmentation in the institutional structures, lack of resources, and poor coordination, the PNA also started a reform process in 2009, resulting in a National Water and Wastewater Strategy in 2013 and a new water law in 2014 (Nour & Al-Saidi, 2018). These reforms attempted to bring in third-party analysis and monitoring to increase water service quality by incentivizing

effectiveness among local authorities with economic instruments and service standards. The new plan, however, still leaves local authorities with the responsibilities of supplying water and sanitation services. The water itself comes either from local wells or is bought through the West Bank Water Department from the Israeli government-owned company, Mekorot (Nour & Al-Saidi, 2018). Israel, however, controls the amount of water Mekorot sells to Palestinians, and as a result many communities must buy additional water transported by truck at a much higher price (*The Occupation of Water*, 2017). The new water law established the National Water Company, a Palestinian-owned bulk water distributor, as a part of the water sector reformation. The National Water Company was intended to decrease Palestinian dependence on Israel's water service, but due to errors in the reformation such as the neglect of rural areas and poor distribution of information, the development of the new company has taken a long time and has had little public support. Consequently, the West Bank still buys water from Mekorot (Nour & Al-Saidi, 2018; *The Occupation of Water*, 2017).

The reformation of the water sector and the new water law attempt to establish several independent regulatory bodies under the PWA for different areas of water management. These bodies include the National Water Company mentioned above, the Water Sector Regulatory Council, Water Users Associations, and Regional Water Utilities (see Table 3.1 for a list). The PWA is itself responsible for a wide variety of areas, primarily at the administrative level to support sustainable water use. These responsibilities include surveying water resources, preparing policies, developing water quality standards, and protecting water resources (Water Law, 2014). It is funded by its allocated amount from the government's budget, other grants, donations, loans, and fees for licenses and permits. It has the most sources of income of the regulatory bodies in the water sector. The Water Sector Regulatory Council is in charge of

monitoring production, transport, distribution, wastewater treatment, and supply agreements. Its funding comes from fees for licenses and grants, aid, and loans approved by the Palestinian Cabinet of Ministers (Water Law, 2014). The Water Users Associations are non-profit organizations that manage irrigation water supply at the local level and are financially independent, meaning they do not receive funding from the government (Water Law, 2014).

Finally, the Regional Water Utilities are the “institutions and utilities which provide water and wastewater services directly to the consumer” (Water Law, 2014). They are responsible for providing water and wastewater services within their specified administrative and geographical scopes. They are “financially independent,” meaning that they must fund the water provision services independently from the PWA and fees collected from licenses and permits (Water Law, 2014). Thus, despite the reformation of the water sector, water distribution and sanitation are still left up to the system each municipality decides to employ, resulting in variation depending on funding, the population, and the decisions of the local authority.

Table 3.1: Water Management Governing Bodies in the West Bank (Water Law, 2014)		
Governing Body	Summarized Responsibilities	Designated Funding
Palestinian Water Authority	<ul style="list-style-type: none"> - Preparing policies - Surveying available water resources - Protecting water resources - Develop standards for water quality - Establish monitoring systems - “Build institutional capacities for the management of shared water resource and deepen regional and international cooperation” 	State budget allocation; grants, loans, donations; fees from licensing and permits
Water Sector Regulatory Council	<ul style="list-style-type: none"> - Approve water prices - Monitor operation processes - Monitor water supply agreements - Develop performance incentives for providers 	Fees for licenses; grants, aid, and loans approved by the Cabinet of Ministers
National Water Company	<ul style="list-style-type: none"> - Supply and sell bulk water to local distributors - Extract water - Provide for development of all activities and infrastructure related to supplying bulk water 	Distributor and consumer payments
Regional Water Utilities	<ul style="list-style-type: none"> - Provide water and wastewater services to designated administrative and geographical scope 	Independent
Water Users Association	<ul style="list-style-type: none"> - Manage and supply irrigation water at the local level 	Independent

To mitigate drastic differences in waste and water management across the territory, the PWA helps provide “essential financial resources” with funds from donors “especially to the local authorities who were not able to get the funds needed for the development of infrastructure” (Ghunaim, 2016). This goal intentionally aims to overcome the fundamental hurdle of poor infrastructure, which easily distinguishes effective and ineffective waste and

water management. Another attempt to equalize the waste and water management systems across the country is written into the PNA's main environmental legislation: the Palestinian Environmental Law, which states that the Ministry "in coordination with other specialized agencies" will set comprehensive plans for solid waste management and "standards and norms" for the treatment of water (Palestinian Environmental Law, 1999). If the national authority has a plan in place for how to go about waste and water management, the services provided across the territory should, in theory, be relatively uniform.

Legislation

The main legislation governing environmental management and protection issues in the PNA is the Palestinian Environmental Law. Passed in 1999, this piece of legislation is a comprehensive law including ten chapters and eighty-two articles covering a wide variety of environmental management and protection issues (Haavisto, 2003; Palestinian Environmental Law, 1999). The law's objective is to protect the environment, promote public health, and preserve biodiversity by "preventing all types of pollution." The law aims to foster a sustainable approach to the environment "for the benefit of present and future generations on the basis of intergenerational equity" (Haavisto, 2003). The law is divided into five parts based on the contents of its chapters and their articles. The second section is titled "Environmental Protection" and includes five chapters, each of which have articles pertaining to a different environmental issue. Table 3.2 identifies the key sections and topics discussed in this chapter.

Table 3.2: Key Palestinian Environmental Management Law Sections & Articles		
Palestinian Environmental Law Section	Articles	Topic
Section 2: Environmental Protection	7-10	Solid waste management
Section 2	11-13	Hazardous waste
Section 2	28-30	Water and the environment
Section 5: Penalties	30	Illegal discharge of substances (article 13)
Section 5	63	Illegal importation of hazardous waste management

Waste Management

The “Environmental Protection” section of the Palestinian Environmental Law covers a variety of issues including solid and hazardous waste. Articles seven through ten outline basic guidelines concerning Solid Waste Management, assigning responsibilities to the Ministry, often in coordination with “other specialized agencies” (Palestinian Environmental Law, 1999). These responsibilities entail setting comprehensive plans for solid waste management on the national level, including supervision of the implementation on local levels, and setting standards for solid waste disposal sites. The specialized agencies are also required to “encourage undertaking appropriate precautions to reduce the generation of solid waste to the lowest level possible” (Palestinian Environmental Law, 1999). The law specifically emphasizes reusing and recycling waste in order to reduce the amount of waste produced by Palestinian communities. Other than the requirement to “encourage” waste reduction precautions, these articles on solid waste do not specify how the waste should be managed, though regulations on solid waste do appear in other articles when there is overlap (such as water regulations). Instead, these articles simply delegate

the responsibilities among the Ministry and other “specialized agencies” (Palestinian Environmental Law, 1999).

Articles eleven through thirteen fall under the heading of “Hazardous Waste.” They, too, require the Ministry to work with specialized agencies, but in this case, it is to form a list of hazardous waste, and the other articles regulate the management and disposal of the hazardous waste. Article thirteen specifies that “it is forbidden to import any hazardous wastes to Palestine” and that passing through Palestine with hazardous waste requires a permit from the Ministry (Palestinian Environmental Law, 1999).

Water Management

Water and the environment are addressed in Section Two, articles twenty-eight through thirty. Similarly to solid waste, articles twenty-eight and twenty-nine declare which actors are responsible for setting standards and norms for water sanitation, namely the Ministry and specialized agencies. Article thirty addresses water contamination and how it applies to the management of solid waste as well. It says that it is illegal to “discharge any solid or liquid or other substance unless such a process conforms to the conditions and standards that the specialized agencies determine” (Palestinian Environmental Law, 1999). Unlike the solid waste articles, the articles on water management do not establish a national or local plan nor do they specify the actors responsible for water management. Article thirty does, however, give specialized agencies the power to determine what may be disposed of in waterways, thus indirectly giving the specialized agencies the responsibility of water management.

Penalties and Enforcement

Penalties for violating the Palestinian Environmental Law are addressed in Section Five. Each article specifies the penalty for the violation of an article in the previous sections. The

variation in penalties reveals the PNA's priorities and values, as the worst violations are assigned the harshest punishments. For example, violations of article thirty (discharging substances not allowed by specialized agencies) only require a fine of 200 to 1000 Jordanian Dinars (282-1,410 USD) and one to six months imprisonment, "or one of them." The last part ("or one of them") appears to mean the penalty of a fine, imprisonment, or a combination of the two will be applied depending on the severity of the offense.

Although these are not particularly light penalties, especially the upper limit, the severity is among the lowest of the punishments for violation of environmental laws. Article sixty-three addresses the violation of article thirteen, which forbids hazardous waste importation and unauthorized transportation through Palestine. Violation of this law results in a fine of 3,000 to 20,000 Jordanian Dinars (4,231-28,209 USD) with an imprisonment of three to fifteen years, "or one of them," whereas the penalty for the illegal importation of hazardous waste is "eternal imprisonment with hard work" as well as the payment of clean-up expenses (Palestinian Environmental Law, 1999). This prison penalty is the harshest in the entire Palestinian Environmental Law, showing the PNA's adamancy and concern for hazardous waste dumping in the Palestinian Territories. This fear may be rooted in the large amounts of hazardous waste produced by Israel and other developed neighbors.

The enforcement mechanisms for these penalties and laws are not especially clear in Palestinian environmental law. In place of strong central enforcement, various municipalities have developed their own methods of enforcement. Some municipalities based their enforcement mechanisms on Jordanian law, using municipal and Ministry of Health inspectors to find violations and bring them to the local courts (Ziad Amra, 1998). The 2014 Water Law does specify that the judicial police are in charge of enforcing the Water Law, whose regulations on

water pollution overlap with the Palestinian Environmental Law. The judicial police have the power to apprehend violators and collect evidence on the crime “for the investigative and judicial authorities,” but law does not specify any further enforcement procedures (Water Law, 2014). Hence, Palestine’s environmental management enforcement system is not clearly defined, resulting in inefficient enforcement and frequent environmental law violations (Nour & Al-Saidi, 2018).

Challenges

Despite the PNA’s legislation, ministries, and agencies, the West Bank still faces major challenges in water and waste management. The biggest issues cited in third-party studies, sector strategy plans, and regulation reform reports are infrastructure, mismanagement, resource restrictions, and poor public participation (Al-Khateeb et al., 2017; El-Hamouz, 2008; Nour & Al-Saidi, 2018; Saadeh et al., 2019; Haavisto, 2003). Through sector strategy plans and regulation reform reports, the authorities admit to their own large-scale mismanagement, particularly concerning infrastructure, but the power ultimately lies with the municipalities. Municipalities were the main environmental service providers before the establishment of the Palestinian environmental sector, so the local management practice was continued even with the formation of a centralized environmental management sector, despite the resulting disparities across the territory (Haavisto, 2003).

Local public entities are responsible for supplying water and sanitation services as well as collection and proper disposal of waste, as explained above, but they each go about this slightly differently (Nour & Al-Saidi, 2018; Haavisto, 2003). Public-private partnerships are a significant contrasting feature of municipal waste management across the West Bank. Although public-private partnerships could theoretically decrease costs and increase service coverage, local

authorities, such as the Joint Service Councils, struggle to cooperate with private partners efficiently. The struggle is partly due to financial and political restrictions from “improper MSW service management practices,” which continue inefficient and costly services and lead to negative health and environmental issues (El-Hamouz, 2008).

Infrastructure and resource issues are both a consequence of and cause for the mismanagement. Throughout the literature on both water and waste management, poor technology, roads, and pipe quality prove to be major barriers to water and waste services since the services simply cannot reach the people they are meant to serve (Al-Khatib et al., 2010; Nour & Al-Saidi, 2018; Saadeh et al., 2019). Waste management services lack both experienced personnel and functioning equipment, including trucks to collect waste, so water services struggle to obtain the water Palestinians need (Al-Khatib et al., 2010; Ghunaim, 2016). This lack of resources is a motivation for forming public-private partnerships, but several failed agreements with private partners have limited environmental management to only using the municipality’s poor equipment and resources, thus defeating the purpose of the partnership, resulting in little progress (El-Hamouz, 2008).

The financial stability of the private partner is also vital, and some municipalities such as Tubas and Jenin have attempted to partner with Jordanian companies in the past. Because of the companies’ weak financial standings, however, the agreements collapsed following management and financial issues on both ends (Saadeh et al., 2019). The Israeli occupation also deters local authorities from partnering with private parties; the Joint Service Councils are often required “to compensate the private sector in case Israeli checkpoints change and end up in longer routes than those initially identified,” making the partnership a drain on resources rather than an improvement (Saadeh et al., 2019).

Despite these issues, the Hebron and Bethlehem municipalities have created a successful joint public-private-partnership, covering more people with better infrastructure and technology than the other municipalities. The main reason for this successful partnership is financial; the local authorities must only cover 50% of the cost, while the World Bank covers the other 50% (El-Hamouz 2008; Saadeh et al., 2019). Researchers suggest that the World Bank's funding is the main reason for the partnership's success (El-Hamouz, 2008; Saadeh et al., 2019). The national government tries to overcome this financial issue by providing aid to municipalities (Nour & Al-Saidi, 2018). The central government does not, however, effectively control how the money is spent, resulting in poor investments and inefficient spending and management. Lack of centralized management and poor coordination between municipalities prevent investments in joint infrastructure projects such as landfills, thereby limiting system improvements despite the extra aid (Saadeh et al., 2019).

The Palestinian population experiences a “noticeably large gap between demand and supply in the water sector” (Ghunaim, 2016). Although demand for water is increasing due to both development and population growth, the supply remains low because of a lack of developed groundwater retrieval infrastructure and distribution and sanitation services. Some Palestinian communities have no water network service at all, and in some cases, drinking water has been contaminated due to poor waste management (Ghanem et al., 2019; Ghunaim, 2016). The possibility of contamination makes clear the need for proper sanitation facilities and technology as well as distribution systems.

The 2014 water sector reformation attempted to address these problems by creating new governing bodies and specifying their roles. The Palestinian authorities made fundamental mistakes in their redesign, however, which has impeded the success of the reformation. One

issue is the lack of public awareness of the changes in water management. The public was not involved in the reformation process, so the people and local authorities were not able to offer their perspectives and were not properly informed of changes in services. This lack of awareness jeopardizes the legitimacy of the National Water Company as a public company in the eyes of Palestinians, which compromises the company's success (Nour & Al-Saidi, 2018). Additionally, some rural areas were neglected in the reformation process, which mainly focused on urban areas, resulting in gaps in Palestinian water services across the territory (Nour & Al-Saidi, 2018).

At the moment, however, the West Bank's water consumption is limited by Israeli restrictions on Palestinian water use. Palestinians cannot extract over 100 million cubic meters per year from groundwater even though the annual renewal is over 700 million cubic meters per year. Consequently, to meet the most basic needs of the people living in the West Bank, local authorities must buy water from Mekorot, the bulk water provider for Israel, owned by the Israeli government (Ghunaim, 2016; Haavisto, 2003). Thus, municipalities with less money are not able to provide as much water due to both their inability to extract groundwater for infrastructural and conflict reasons and their lack of funding to buy extra water.

These challenges and poor environmental management also influence public opinions and thus public participation in environmental management. Public participation is a vital component of management, particularly in terms of waste management because waste must be properly disposed of at the source to reach its proper destination. Researchers have found predominantly negative attitudes among the population toward waste management in the West Bank due to its unreliability and poor efficiency (Al-Khateeb et al., 2017; Ghanem et al., 2019). Given poor public perception of waste management, people are less likely to participate, resulting in

improper disposal of waste, which can cause contamination of water sources or air pollution from burning waste (Al-Khateeb et al., 2017; El-Hamouz, 2008; Ghanem et al., 2019).

For example, Ghanem et al.'s investigation into water quality in the Natuv water basin near Ramallah found that the water in the area contained unsafe concentrations of bacteria, notably higher than the World Health Organization minimum standards for consumable water. The study determined that the contamination came from leakage from nearby sewage systems and cesspits, consequences of improper environmental management both on the part of the municipality and local residents (Ghanem et al., 2019). Al-Khateeb et al.'s study surveyed the attitudes toward waste management in a population sample which overlapped with Ghanem et al.'s study. Al-Khateeb et al found predominantly negative behaviors and attitudes toward waste management in this area as well, again showing that poor attitudes toward waste management can result in alternative waste disposal, which negatively impacts the environment and other resources (Al-Khateeb et al., 2017).

Negative public attitudes due to insufficient water services also result in negative environmental consequences. With insufficient water supplies, Palestinians look for alternatives to obtain water, such as building illegal wells, which negatively affect both Israel and the West Bank, particularly in the agricultural sector. An Israeli report on the Water Agreement from the Oslo Accords notes the building of unapproved wells by Palestinians, claiming that "250 unapproved wells have been drilled, affecting Israeli production in the northern valleys" (*The Issue of Water between Israel and the Palestinians*, 2009). In response, the Palestinians "routinely state that the unapproved wells are affecting them as well and that they too are trying to combat the phenomenon" (*The Issue of Water between Israel and the Palestinians*, 2009). As discussed above, however, Palestinians do not have enough water for the population, in part due

to the inefficient and inadequate water management system but also because of Israeli restrictions (Ghunaim, 2016; Nour & Al-Saidi, 2018; Haavisto, 2003). Thus, the struggles of Palestinian environmental management are exacerbated by public dissatisfaction and the general public's consequential actions.

Conclusion

Despite the laws and institutional management provided by the PNA, environmental management in the West Bank still lacks the resources and management necessary for success. Lack of a centralized management plan and uneven financial distributions across the territory have resulted in uneven management effectiveness in the West Bank, leaving some communities without any services at all, while others thrive due to outside aid. These disparities bring up the question of the effectiveness of nearly complete local power over water and waste management with blanket restrictions from the occupying Israeli forces; just because this arrangement precedes the PA, it may not be the best way to address such important problems.

In the 2018 Regulation Reform Process report for the water sector, the Palestinian water authorities discussed the inefficiency of this model and created a new institutional framework, which is expected to be implemented fully by 2027. It redistributes responsibilities and communication among donors, service providers, and the water sector officials in the hopes that better mutual understanding will lead to better investment from all sides (Nour & Al-Saidi, 2018). Another major contributor to the improvement of water and waste management in the West Bank are NGOs, which already play a significant role in providing various services to Palestinians (Haavisto, 2003). Growing the role of NGOs in collaboration with local and regional authorities may be key to solving issues such as water and waste management funding and infrastructure, but the Palestinian waste and water authorities also acknowledge the importance

of collaboration across borders to obtain necessary resources. Water flows between states and across borders, and waste can be better sorted, recycled, and dealt with by the states with the strong infrastructure to do so. Thus, working with the states surrounding the West Bank is essential to continuing the growth and improvement of the West Bank's environmental management system, be it through NGOs or bilateral or multilateral agreements, all of which have been attempted with varying degrees of success.

Chapter 4:

Israel and Palestine's Environmental Management Compared

Introduction

Israel and the West Bank share the same natural environment and resources, but because of differing political and social circumstances, the two have developed different institutional environmental management frameworks. They do, however, share some approaches, such as delegation to local municipalities, and some challenges, such as wide distribution of management responsibilities among government agencies. Nonetheless, the two governments are characterized by different primary issues, falling into a different primary category of environmental management challenges: general public and resources (Al-Khateeb et al., 2017; Barnard and Wahab, 2019; El-Hamouz, 2008; Tal, 2002). Israel struggles to enforce its growing environmental legislation because of a tradition of lacking governmental and public support, although there is a growing popular support for environmental practices (Tal, 2002). The West Bank primarily faces the resource challenge, with poor infrastructure, which subsequently results in poor popular support (Al-Khateeb et al., 2017). This chapter compares the institutional environmental management of Israel, outlined in Chapter 2, with that of the West Bank, explored in Chapter 3. Specifically, it describes how each government's structures, legislation, and enforcement for water and waste management affects their environmental management internally as well as how they impact each other's management.

Policy Implementation Structure: Ministries vs. Municipalities

Both Israel and the PNA disseminate environmental responsibilities broadly across ministries and other governmental agencies, and both face problems of inefficiency due to this

decentralization. Israel's Ministry of Environmental Protection was formed in the late 1980s, several decades following the foundation of the government of Israel. Until this time, environmental responsibilities had been addressed by other ministries up to this point, such as the Ministries of the Interior, Agriculture, and Health (Tal, 2002). Although many of the responsibilities were shifted to the Ministry of Environmental Protection, many laws concerning environmental management remain under other authorities, sometimes in conjunction with each other or the Ministry of Environmental Protection (Choshen & Laster, 2005). The Ministry does, however, play a significant role in implementing waste and water management legislation, as these areas often fall under its responsibility "for the formulation of a nationwide, integrated, and inclusive policy for the protection of the environment" (*About Us*, 2012). Even as the Ministry of Environmental Protection passed from minister to minister, it has taken part in amending and creating laws and policies concerning waste and water management.

The PNA's primary environmental entity, the Environmental Quality Authority, plays a similar role, although its responsibilities, too, are shared by several entities within the government. The main actors involved in water and waste management are the Environmental Quality Authority, Ministry of Health, Palestinian Water Authority, and Ministry of Local Government (Haavisto, 2003). Thus, both Israel and the PNA must coordinate environmental management legislation and actions across bureaucratic entities. In Israel, this has proven to be an obstacle, resulting in poor enforcement and development of new laws, an issue exacerbated by the Ministry of Environmental Protection's poor funding and reputation in the government (Tal, 2002; Choshen & Laster, 2005). The PNA realized that the distribution of environmental responsibilities might become an issue with similar results to Israel's and therefore created the Sector Working Group on the Environment. The purpose of this group is to facilitate

coordination between government agencies and donors to share information and enable efficient environmental management (*Environment Sector Working Group, 2017*). Despite this attempt to improve water and waste management in the West Bank, its distribution of power still poses issues for environmental management.

Both Israel and the PNA give local municipalities a significant amount of responsibility for waste and water management. In Israel, the Ministry of Environmental Protection works at the national level to develop policies, strategies, standards, and priorities for environmental protection, but the implementation of these national policies is left to the districts (*About Us, 2012*). The amount of power given to local authorities varies depending on the management area. For example, local authorities are responsible for designing and constructing their own sewage systems, but the regulations and standards set by the national government still serve as guidelines (*Water and Wastewater, 2012*). Thus, the municipalities are given some flexibility in their implementation of the law through duties such as the approval and distribution of permits and design of sewage systems, but the regulatory power remains with the ministries. One prominent change during the reformation of the water sector was centralizing more of the water management decisions. Although certain ministries are in charge of policy, the Water Authority became the head of water management in the country, producing results in water management efficiency that were previously unattainable (*The Israel Water Authority, 2012*).

The PNA gives even greater power to its municipalities. Because the PNA was not founded until the 1990s, Palestinians in the West Bank needed other systems of environmental management, so local municipalities were the main environmental service providers (Haavisto, 2003). This system has resulted in uneven distribution of services and environmental management infrastructure across the territory, an issue that continues to this day. Because of the

tradition and existing local foundation of environmental management, however, the PNA instituted a similar system, giving municipalities primary control of their waste and water management and mainly serving to provide financial support and basic guidelines (Ghunaim, 2016). This system thus allows for more flexibility in the implementation of water and waste management across the territory than Israel allows. Both systems have drawbacks, but considering the context of both territories, their respective models make sense. Although the Palestinian model has resulted in management disparities across municipalities, their power gives them the flexibility to respond to circumstances that may not be affecting other municipalities, a condition that is particularly pertinent to the West Bank under occupation. Since the West Bank is divided by checkpoints and its different parts are affected differently by settlements and decisions by the Israeli Defense Forces in charge of the occupation, Palestinian municipalities must be prepared to react to changes in circumstances that may not permit the same environmental management strategies across the entire territory. Israel, meanwhile, does not have internal checkpoints and is therefore a much more cohesive and accessible territory, so its individual districts require less flexibility in their environmental management and are therefore delegated responsibilities.

Legal Framework: Detailed National Standards vs. Flexible Role & Goal Guidance

Israel and the West Bank's environmental management structures are reflected in their laws. Israel's waste and water management laws are more detailed and precise than the PNA's environmental legislation. This serves to allow their respective structures to function (or not) as dictated by tradition. While Israel's laws set specific standards and outline disposal of waste and permissible behavior concerning water, the PNA's laws set the framework for an environmental management system by assigning roles and goals with few specifics on implementation.

As outlined in Chapter 2, Israel's laws concerning environmental management delegate responsibilities, set standards, outline legal and illegal activities, and establish punishments. Some sections are highly specific, particularly concerning the disposal of hazardous waste and construction and demolition debris, requiring the same treatment of such materials across the country (*Waste and Recycling*, 2012). The law also sets specific national standards for waste management, attempting to incorporate sustainable goals into the structure of environmental management. The "Collection and Disposal of Waste for Recycling Law," for example, has set and updated national recycling goals since 1993, requiring all districts to contribute to the overall goal for the country (*Waste and Recycling*, 2012).

The PNA's environmental law focuses more on delegating management responsibilities, assigning duties to the ministry (now the Environmental Quality Authority) and "other specialized agencies" (Palestinian Environmental Law, 1999). The language used in the law itself indicates the ambiguity of the Palestinian legislation compared to the Israeli; the law does not specify which agencies qualify as "specialized agencies," even when discussing specific matters such as solid waste disposal or water management. The language and structure of the legislation reflects the lack of centralization in the West Bank's environmental management system. It gives more flexibility to its municipalities, allowing them to respond as necessary to various challenges.

Additionally, the relative lack of specificity could make the law easier to enforce or, in other words, to obey. If the law included exact numbers for water treatment or waste disposal, there would be less "wiggle room." More simply, the PNA would have more to enforce, for which it does not have sufficient resources. These vague laws also make it easier to find loopholes in environmental policies but remain legally compliant (Koremenos, 2016). The

differences in municipal power in Israel and the West Bank over waste and water management exemplify the differences in the territories' respective environmental legislation. Furthermore, the specific laws that are included draw more attention and potentially show an area of concern or priority. For example, hazardous waste has several specific laws, including forbidding the importation of any hazardous waste to Palestine, calling attention to the importance of hazardous waste disposal and the challenges faced by the PNA in this area (Palestinian Environmental Law, 1999).

Both Israel and the Palestinian National Authority include a polluter-pays policy in their environmental laws, serving as an indicator for each of their environmental priorities. Both Israel and the PNA punish the illegal dumping of hazardous and construction and demolition waste most harshly. In the West Bank, the penalty for the illegal importation of hazardous waste is either a fine of 3,000 to 20,000 Jordanian Dinars (4,231-28,209 USD) or an imprisonment of three to fifteen years, or both (Palestinian Environmental Law 1999). In Israel, the penalty for improper disposal, collection, and treatment of "construction and demolition debris, yard waste, tires, and vehicle scraps" is up to three years imprisonment or a fine of 404,000 New Israeli Shekel (117,023 USD) (*Waste and Recycling*, 2012). These two examples are among the harshest environmental mismanagement penalties in the respective governments' laws, clearly marking hazardous and uncommon waste as an area of priority management. The penalties themselves vary significantly, however; while the Palestinian imprisonment is significantly longer than the Israeli maximum imprisonment (up to five times shorter), the Israeli maximum fine is over four times as much as the Palestinian maximum fine. Perhaps these differences indicate the difference in population wealth; the Palestinian fine is not as high as Israel's simply because it would be ineffective since no one would be able to pay it, leaving imprisonment to be

the main effective penalty. In any case, despite these harsh penalties outlined by the law, both Israel and the West Bank struggle with enforcement of environmental management.

Enforcement Policies and Practices: Limited Political & Public Support vs. Limited Infrastructure & Funding

Israel and the West Bank face environmental management enforcement challenges, indicated by poor water quality, poor and dangerous waste disposal, and underperformance on goals such as recycling levels. The lack of enforcement on both sides has resulted in negative consequences for both Israel and the West Bank, emphasizing the need for cross-border cooperation concerning environmental issues if sustainability is ever to be achieved. Both territories lack the resources for proper enforcement, however (Choshen & Laster, 2005; El-Hamouz, 2008; Saadeh et al., 2019; Tal, 2002). Israel lacks these resources due to poor political support and the opinions of the general public, and the West Bank lacks the infrastructure and funding for proper enforcement.

Israel has included recycling goals in its legislation since 1993, with a progression of increased recycling levels over the ensuing fifteen years. The country struggled to meet the standards, however, because the government failed to invest adequately in public education and recycling encouragement (Lidman, 2019). Thus, “Israel is consistently among the lowest countries in the OECD [Organisation for Economic Cooperation and Development] when it comes to recycling,” states the Ministry of Environmental Protection’s head, Oded Nezer (Lidman, 2019). The current recycling system in Israel requires separation of the waste at the source (Lidman, 2019). This system requires public education and cooperation since they must know how to separate their waste and divide their materials for recycling. Because of the increased effort on the consumer end, in general, source separation often results in less

participation in recycling among the public, but it results in less contamination and more effective recycling of the material that does end up recycled (Benedict, 2019). The Ministry of Environmental Protection considers the lack of public knowledge about waste management to be the main reason for this poor performance, which has wider consequences; because so little of Israel's waste is recycled, waste usually ends up in twelve growing landfills, which come with their own issues. Landfills take up a large amount of land and pollute the land and the area's groundwater. Israel is developing "waste-to-energy" facilities as well to address this issue and to reach the goal of a 50% recycling rate by 2030, but "waste-to-energy" facilities also have detrimental environmental consequences since they involve burning waste. This process, even with filters, pollutes the air of both Palestinians and Israelis, as well as contributing to greenhouse gas emissions (Lidman, 2019).

The Israeli enforcement agency, the Green Police, exemplifies Israel's enforcement problems. Although the department is in charge of investigating violations of environmental law across the whole country, it has too few inspectors to be effective without the support of other departments. The budget for the entire Ministry of Environmental Protection is about 89 million USD, a fraction of which is given to the Green Police to cover all expenses (*State Budget Proposal 2017-2018*, 2016). These financial constraints and the agency's lack of manpower are accompanied by limitations posed on the investigators' power. They are allowed to interrogate, document, take samples, and issue certain penalties, but if the violation is serious enough to be a criminal offense, the legal department takes charge, involving bureaucratic processes and a much lengthier process (Tal et.al., 2010). There are currently few prospects of a solution to this problem. A lack of political support among politicians for the Ministry of Environmental

Protection ensures that the Ministry continues to struggle with insufficient resources and enforcement.

The West Bank also struggles with public education concerning environmental management, particularly concerning waste. The Palestinians' struggle, however, also lies in a severe lack of resources and services. In several cases, because of lack of waste collection services, waste has been disposed of near water sources, resulting in contamination of drinking water from cess-pools or the burning of trash (El-Hamouz, 2008; Ghanem et al., 2018). Similarly to Israel, the PNA faces a shortage of trained manpower, and in districts like Tubas and Nables, they lack the basic infrastructure and equipment, such as waste collection vehicles or roads, for a functioning and reliable environmental management system (El-Hamouz, 2008; Saadeh et al., 2019). Waste management is therefore particularly difficult and often ineffective, which results in a lack of faith and support from the public. Hence, instead of relying on public waste management services, many people choose other methods of disposal, such as burning or unofficial dumping. These actions exacerbate environmental issues such as water scarcity (Ghanem et al., 2019; Saadeh et al., 2019). Thus, even with municipalities in charge of their own environmental management, they are not always capable of creating and implementing a plan to address their own needs because they lack the necessary resources, even when supplemented by aid from the PNA.

Both Israel and the West Bank face difficulties in enforcing all basic environmental management regulations and practices in their own territories, but evidence also suggests that they fail to enforce the policies they consider most important, namely hazardous waste disposal. Both Israel and the PNA assign the most severe penalties to the violation of proper hazardous waste disposal, yet e-waste as well as construction and demolition debris from Israel are

regularly disposed of in the West Bank, violating both Palestinian and Israeli law. Some Palestinians, however, have grown to rely on the steady supply of waste from Israel, scavenging for valuable parts such as metals and burning the rest (Kalifa, 2019). This cycle has had detrimental environmental effects, blackening and contaminating once-fertile soil. The fires also contaminate the air, resulting in “black rain,” which, in turn, falls into water sources (Kalifa 2019). While this issue has been brought to the attention of the Environmental Quality Agency, it has insisted that the local municipalities take over the decontamination process, despite their lack of resources (Kalifa, 2019). The Environmental Quality Agency has little power to actually stop the dumping of e-waste and other hazardous waste in the West Bank since it does not have control over its own borders (*What are areas A, B, and C of the occupied West Bank?*, 2019). This situation ultimately renders the law against the importation of hazardous waste ornamental and the threat of imprisonment and fines ineffective. This issue brings to light the challenge at the base of the PNA’s environmental management system: the occupation. The way in which the occupation has progressed ultimately hurts both the Palestinians and Israelis when it comes to environmental management since they share the same natural resources: the same air, water, and soil.

Political Context: Conflict and Occupation Power Asymmetries

The Israeli-Palestinian and Arab-Israeli conflict have resulted in many challenges for both Israel and the West Bank, including issues concerning environmental management. As discussed in the last section, poor enforcement of proper hazardous waste disposal in Israel has resulted in its dumping in the West Bank and a Palestinian reliance on the materials for livelihood (Lidman, 2019). Subsequent burning of waste pollutes the air and other natural resources of the area on both the Israeli and Palestinian sides, causing deleterious health and

environmental effects for both parties. This dumping of hazardous waste is a clear violation of Article Thirteen of the Palestinian Environmental Law, which forbids the importation of hazardous waste into the West Bank (Palestinian Environmental Law, 1999). Because of the Israeli occupation of the West Bank, the Palestinians do not have control of their own border and are thus handicapped in enforcing their environmental policy, rendering some of the few specific laws ineffective. The decision about enforcement lies with the Israeli guards at checkpoints; as indicated by the regular dumping of waste from Israel in the West Bank, the Israeli guards let the violation pass, demonstrating the environmental consequences of power asymmetries, particularly in conflict zones. Thus, the management of both waste and water is tied directly to the occupation and conflict.

Israel also restricts certain activities within the West Bank, which impairs the West Bank's water and waste management. There are checkpoints throughout the West Bank that Palestinians must pass through to travel between zones under the PNA, and these checkpoints often result in lengthy waits with unpredictable closures. The checkpoints pose a challenge for the transportation of resources and other materials such as waste, a consideration that many private companies take into account when hired by municipalities in partnership on waste management. These companies often require extra payment in the case of extended waits at checkpoints, further draining the local authorities' financial resources. This extra cost is also a disincentive to pursuing public-private partnerships, which could theoretically and if done properly, help to increase the effectiveness and lower the cost of waste management (El-Hamouz, 2008; Saadeh et al., 2019).

Israel also controls resource use, including water. Palestinian researchers argue that Israel has purposefully restricted the Palestinian access to water to keep Palestine from developing and

to restrict access to this valuable resource to Israel (Ghunaim, 2016; Haavisto, 2003). Even if this is not the case, Israel has set restrictions on the amount of water Palestinians are allowed to extract from their water sources. The limit is about a seventh of the annual renewal of the groundwater and is much less than the growing population needs, so when they meet this limit, the municipalities in the West Bank must buy water from the Israeli company Mekorot (Ghunaim, 2016; Nour & Al-Saidi, 2018). The need to buy additional water puts even more financial strain on local authorities, making proper water management even more difficult than it already is in the desert. The PNA attempted to lessen this dependence and extra cost by reforming its water sector and creating its own National Water Company with the 2014 Water Law, but poor dissemination of information among the public and the continued decentralization of water and wastewater management and payments has impeded the reformation's success (Nour & Al-Saidi, 2018). The West Bank continues to be strongly dependent on either water from Mekorot or expensive, imported water (Nour & Al-Saidi, 2018). The restrictions posed by the occupation impact the West Bank's water management directly and its waste management indirectly; because of the increased financial strain and limitations on water use (for highest need purposes), the local municipalities' and PNA's resources cannot be put toward development of other areas of environmental management such as waste management. Since poor waste management results in land, air, and water pollution, as discussed above, Israel also suffers from its own occupation policies.

Israel does not appear to acknowledge this connection, however. In a report requested and published by the Israel Water Authority, written by independent experts, titled "Water Issues between Israel and the Palestinians," the PNA is accused of violating the Oslo Accords Water Agreement and purposefully prioritizing its own water management development over Israel's

environment and its compliance with the agreement. The report highlights that the Joint Water Committee approved the drilling of 59 drinking water wells, 11 irrigation and agricultural wells, and 22 observation wells. At the time, the West Bank had not yet built all of the approved wells “because of their order of priority regarding the utilization of funds from donor countries,” states the report (*The Issue of Water between Israel and the Palestinians*, 2009). It accuses the Palestinians of having built 250 unapproved wells, however, damaging Israel’s agriculture. While “the Palestinians routinely state that the unapproved wells are affecting them as well and that they too are trying to combat the phenomenon,” the report does not consider the reason for this phenomenon (*The Issue of Water between Israel and the Palestinians*, 2009). The drastic difference in the number of wells approved and the unapproved number built indicate that there is an insufficient water supply for Palestinians. Rather than considering this issue and the underlying reasons for it, however, the report attributes the need for illegal wells and other negative impacts on Israel’s environmental resources on the PNA’s poor management of resources. It criticizes the Palestinian environmental enforcement problem and its negative effects on Israel without acknowledging the Israeli environmental enforcement problem and how it negatively affects the Palestinians. The report even urges the Palestinians to invest more in desalination plants rather than wells, again demonstrating a lack of understanding of Palestinian resources (*The Issue of Water between Israel and the Palestinians*, 2009). Electricity is an essential part of the desalination process, and the West Bank does not have its own power stations; it buys 95% of its electricity from Israel Electric Corp, Israel’s state-owned electric company, and the remaining 5% from Jordan (Rami Ayyub, 2019).

The report also criticizes the “Palestinians” for not putting enough resources into wastewater treatment. It states: “An examination of financial investments made by the

Palestinians in wastewater treatment as compared with the total investments in water supply and wastewater installations illustrates the lack of interest on their part to treat wastewater” (*The Issue of Water between Israel and the Palestinians*, 2009). The comparison shows that the Palestinians had a total budget of 500 million US dollars in the period 1996-2002 (See Table 4.1). They spent \$200 million on “Wells, reservoirs, transmission mains and distribution lines,” \$130 million on “Internal sewage systems,” and the remaining \$170 was split between “Routine maintenance” (\$80 million), “Stormwater diversion” (\$60 million), and “Construction of institutions and training personnel” (\$30 million) (*The Issue of Water between Israel and the Palestinians*, 2009). This allocation of money means that the Palestinians spent nearly a quarter of their budget on their sewage systems, which involves a significant portion of wastewater treatment and diversion.

Table 4.1: Allocation of Donor Funds by the PNA 1996-2002 (<i>The Issue of Water between Israel and the Palestinians</i> , 2009)	
Area of Spending	Amount Allocated in USD (of 500 million)
Wells, Reservoirs, Transmission Mains, and Distribution Lines	200 million
Internal Sewage Systems	130 million
Routine Maintenance	80 million
Stormwater Diversion	60 million
Construction of Institutions and Training of Personnel	30 million

As discussions in this chapter and Chapter 3 have shown, the West Bank struggles to keep its water clean, making it more difficult to provide safe water to its people. At the same time, because the people do not have enough clean and drinkable water, they need to find new sources and distribution methods, and in many cases, individuals take this into their own hands

rather than rely on the inconsistent municipal services. Consequences of this independent action include illegal well-digging. The dilemma then becomes a question of how to address both issues without compromising either, which ultimately comes down to funding, infrastructure, and environmental management institutions, all of which are insufficient or ineffective. The Israeli report criticizes the Palestinians for insufficiently addressing both issues without acknowledging the underlying problem of lacking resources, infrastructure, and an effective environmental management institution (*The Issue of Water between Israel and the Palestinians*, 2009). It also does not grasp the reciprocal nature of environmental issues between the two entities. The report is not representative of all of Israel's environmental institutions' opinions or approaches. It was, however, published by the Israel Water Authority, a governmental institution, and shows how deeply the conflict and disillusionment about the occupation penetrates. Even a report on a progressive resource agreement brings in harsh judgment of Palestinian leadership and people without acknowledging their position or restrictions due to Israeli occupation.

Conclusion

Israel and the West Bank are both challenged by limited resources devoted to environmental management, though for different reasons. Israel's lack of resources is a result of poor political support and public education on the matter. While the West Bank also struggles with a lack of public education concerning environmental management, its primary issues lie in restricted funding, lacking basic infrastructure, and the resource demands of the occupation. Both face the similar structural issue of a wide distribution of responsibilities across government agencies, but their legislation varies significantly. Israel specifies how the responsibilities are to be carried out, whereas the PNA's environmental legislation does not. Although the PNA's lack of specificity provides flexibility for its local municipalities, the municipalities themselves are

restricted by a lack of resources as well as little control over enforcement and resource use due to the occupation. Israel also struggles with enforcement due to poor governmental support and resources, which consequently negatively affects itself as well as the West Bank. Thus, the Israeli and Palestinian environmental management structures are inevitably intertwined and are affected by the consequences of each other's challenges. This is a lose-lose situation that begs the question addressed in Chapter 5: What constrains their ability to adopt a more cooperative approach to management of their shared environment?

Chapter 5:

Could it be different?

Summary

Israel and Palestine's environmental management institutions both face significant challenges in the areas of waste and water management which negatively affect their environments and threaten public health. Israel has an outdated institutional framework for environmental management and a political status quo that conflicts with growing trends in popular opinion and environmental needs. The West Bank struggles with insufficient resources and infrastructure and an ineffective institutional framework crippled by restrictions under the occupation. Due to Israel's more advanced infrastructure and power in the Israeli-Palestinian conflict, its environmental management system is more effective than that of the West Bank, which faces the additional challenge of being under occupation. The question, then, is how to ameliorate this situation.

Israel has historically used large and unsustainable amounts of water and other natural resources with little regard for environmental sustainability, which is reflected in the paucity of governmental support for environmental legislation and resources (Tal, 2002). Some of the public has shown increased concern for sustainable environmental practices in the past three decades, as demonstrated by growing numbers of environmental NGOs (Tal, 2002; Giordano, 2018). An increase in environmental legislation and reformation of the water sector in the past two decades shows the effects of public agitation and increasing environmental pressures. However, recycling, water-use, and other resource consumption numbers from the past decade do not show significant improvements in this area (Kalifa, 2019; Lidman, 2019; Tal et al., 2010).

Illegal waste dumping and lack of funding for the enforcement department, the Green Police, also shows lack of actual investment in sustainable environmental management (Tal et al., 2010). Thus, although Israel has built a legislative foundation for environmental management and shows promise in its reformation of the water sector, its institutional framework, lack of investment and superficial commitment to sustainable environmental management make this foundation insufficient. More recently, this outdated framework has come at odds with public opinion and has created an environmental management system that is inadequate for Israel's geographical position and increasing pressures from climate change.

The West Bank also faces poor investment and commitment to sustainable waste and water management, but in this case the environmental management issues come from a lack of basic resources. The PNA has decentralized waste and water management, delegating most responsibilities to the municipalities of the West Bank (El-Hamouz, 2008, Saadeh et al., 2019). Although this decentralization gives the municipalities the flexibility to respond to different challenges that may appear given the conflict and occupation, it has also resulted in large variations in the water quality and waste services across the territory. Management depends on decisions made by the municipalities' governing bodies, the resources available, infrastructure, and funding. Across the territory, Israeli restrictions on movement and water extraction also impact the quality of the West Bank's environmental management. Restrictions from the occupation require the municipalities to use more funding on services such as acquiring water and compensating private partners who must detour or wait at checkpoints for hours. Thus, the occupation takes a significant toll on the West Bank's environmental management. With or without the occupation, however, the institution also faces challenges of resource distribution, funding, and basic infrastructure at its foundation.

Environmental management in the West Bank and Israel is inextricably connected through physical location, access to resources, and political relationships between the two bodies. This interconnectedness of environmental management is becoming increasingly evident across the world, including between the Global North and Global South. In the case of Israel and the West Bank, this connection is easy to see and consider in environmental management because of their physical proximity, similar challenges, and different environmental management approaches; each entity has its own governing body with different environmental management laws and policies. While Israel's laws delegate management responsibilities and dictate how they should be carried out, the PNA's laws primarily delegate power to local municipalities and declare the goals of Palestine's environmental management. Both the content of Israeli and Palestinian laws as well as their enforcement and implementation structures differ even though both entities face challenges in terms of obtaining sufficient resources from these structures.

The political relationship affects Palestinian environmental management more clearly than Israeli, but both feel direct and indirect impacts. The West Bank is technically under Israeli martial law, so even though the PNA has some authority over areas A and B, movement and resource extraction are both controlled by Israel (*What are areas A, B, and C of the occupied West Bank?*, 2019). Restrictions on movement and resource extraction directly impact Palestinian water management and impacts waste management at both the institutional and individual level. The unreliability of these services in the West Bank result in individuals extracting their own water or dumping waste illegally, both of which have severe consequences for the environment (El-Hamouz, 2008; *The Issue of Water between Israel and the Palestinians*, 2009). These areas of management are therefore inefficient and ineffective, and due to the physical relationship of the two territories, Israel's environment and resources are negatively

impacted as well. Given this context, could it be possible to change Israel and the West Bank's environmental management into a functional, comprehensive and cooperative system? What challenges stand in the way of achieving that end?

Applying Ostrom's Common Pool Resource Framework

The Ostrom framework offers a lens through which to consider what might be done for Israel and the West Bank to be able to manage their common pool resources in a more sustainable manner. As discussed previously, these two actors face internal institutional challenges in addition to a conflict between each other, all of which influence their environmental management and resource use. Scholars such as Aaron Wolf (1995) and Alon Tal (2002) as well as the NGO EcoPeace have encouraged the application of such a framework to develop sustainable environmental management in the region in addition to building clear interdependence and community, which they note could perhaps extend to help manage and de-escalate the conflict (Giordano, 2018). In order to establish cohesive environmental management in the region, however, the region requires a larger framework acknowledging environmental interdependence, each other's resource needs, and the need to sustainably manage the environment. Given the current political and institutional settings in Israel and the West Bank, forming this larger network will only be possible with political changes in both territories.

Shared natural resources such as bodies of water, un-privatized land, and air are called Common Pool Resources or simply the "commons." In 1968, Garrett Hardin argued that the public will inevitably destroy the common resource on which it depends because each consumer uses the commons as if they were the only one, thus depleting the resource. This dilemma is called the Tragedy of the Commons (Ostrom et al., 1999). Hardin claims that the only solutions to this problem are socialization, meaning centralized regulation of the commons, or

privatization. Both of these solutions also degrade resources, however (Ostrom et al., 1999). In Israel, for example, although the water law regulates the use of its common pool water resources, they have faced degradation due the government's historical focus on consumption and human development rather than environmental health (Tal, 2002; *The Issue of Water between Israel and the Palestinians*, 2009; *Water Authority Home*, 2019). Elinor Ostrom investigated the shortcomings of Hardin's solutions to the Tragedy of the Commons and pointed out that there are cases in which people have built systems of common pool resource community-management that have functioned for decades and centuries (Ostrom et al., 1999). She constructed a framework of eight principles that lead to successful management of common pool resources. The framework includes conditions that must be met in some form to overcome the incentive for people to follow their short-term interests, the mentality that leads to environmental degradation and depletion of the commons (Williams, 2018).

Ostrom's first principle states that "*commons need to have clearly defined boundaries*" (Williams, 2018). The community must understand the benefits it gets for taking care of a resource and setting an ecosystem's boundaries helps define this broader community. A resource with defined boundaries has a community that can gather around a sense of mutual responsibility for the resource. It asks the question: "Who is entitled to access to what" within these boundaries? (Williams, 2018). This is the underlying question of the Israeli-Palestinian conflict and will not be solved in a broad discussion about who is responsible for which natural resources.

Nevertheless, perhaps considering it from a more local perspective could help lay a foundation for a bigger answer to the question. For example, communities could re-define boundaries and resource access based on geographical proximity to the resource. It would force

people and institutions to recognize which resources serve which people, and these people could be both Israelis and Palestinians. Geographical communities could be composed, for instance, of Palestinian housing surrounded by an Israeli settlement. This recognition could be a step toward fostering the sense of a shared place or community, joined around a common responsibility for a natural resource, an understanding Wondolleck and Yaffee (2000) recognize as a vital component of collaboration around natural resources.

Fostering this sense of community in any environment is difficult, but in the case of Israel and the West Bank it seems nearly impossible. The infrastructure itself is built to keep Palestinians and Israelis apart. Even when they are practically neighbors, living meters apart, there is a fence several meters high keeping them separate (*The Palestinian family with its own checkpoint*, 2020). Thus, even when sharing a common natural resource, there is no space for people to convene or build a community. Even attempts over social media and other online platforms such as Zoom have been met with criticism and sometimes consequences as severe as imprisonment (Halbfinger & Abuheweila, 2020). Perhaps environmental matters are a chance to work past these obstacles, however, since the question of environmental management is something both Israelis and Palestinians must deal with on both the local and institutional levels. The urgency of environmental matters today might also contribute to a sense of “community of necessity.”

The second principle states that “*rules should fit local circumstances*” (Williams, 2018). This principle may seem evident, and Israel and the West Bank’s institutions are incorporating this principle to some extent already. However, they are not following mutually agreed upon rules for resource use in the shared ecosystem; they are following their own rules for their own portion of the ecosystem. The PNA’s delegation of power to its municipalities, for example, is an

attempt to let local circumstances determine management. The power of environmental management institutions in those municipalities can only pertain to Palestinians, though, at the moment, so it is unable to take into account the whole local circumstance. An application of this principle to Israel and the West Bank would involve local agreements concerning the resources and methods of waste disposal within the boundaries defined by the first principle. To help this principle be realized, rather than have the authorities discuss and make rules for their environmental management from the distant perspectives of Israeli and Palestinian politicians, locals should do so for their own resources and the individuals connected to those resources. Initiatives and discussions like this already exist under the guidance of NGOs and institutions such as the Arava Institute of Israel and EcoPeace Middle East (*Community Project*, n.d.; Mayo, n.d.). The Arava Institute in particular is focusing on peacebuilding through local environmental initiatives that involve Israelis and Palestinians (as well as some work with Jordanians and Moroccans) to develop local environmental improvement and management systems (Mayo, n.d.). These initiatives show that approaching environmental management at a local level can lead to collaboration between Israelis and Palestinians, marking this principle as a key approach to moving toward a more cohesive management system in the region.

Ostrom's third principle relates to community engagement as well: "*Participatory decision-making is vital*" (Williams, 2018). The West Bank already has a system that works from the local level, and Israel leaves some of the decisions to local actors, particularly concerning waste management. This system already lays a foundation for implementing the third principle, but there are still major obstacles to fully realizing it. The Israeli and Palestinian environmental institutions interact with each other minimally, and Palestinians themselves are not well-informed or influential participants in their waste and water management systems. As discussed

previously, in order to be successful, the region needs a comprehensive environmental management system and understanding, but decisions concerning regional environmental management do not involve both sides equally in the decision-making process at the moment. Historically, Israel's military and political power has also given it the bigger voice in such matters as well (Wolf, 1995). As Wolf points out, "the two conditions at the core of political viability of water-sharing are *equity* of the agreement or project, and *control* by each party of its own primary water sources" (1995). Israel has consistently dominated resource control, and even in the Water Agreement, had significant influence in dictating the PNA's management of its water sources (*The Issue of Water between Israel and the Palestinians*, 2009; Wolf, 1995). In this context, working at a local level to involve as many people as possible in the decision-making process for local environmental management may be the most "equitable" approach; it establishes a form of local democracy which transcends borders and allows previously silenced voices to be heard. It also addresses Palestinians' mistrust of their management systems, since they would have some power in securing their reliability. Conditions of equity and popular control over natural resources is a fundamental element of Arava and EcoPeace's local initiatives, which give decision-making power to the locals involved (*Community Project*, n.d.; Mayo, n.d.). With individuals in charge of decision-making, they are more likely to comply because they had a say in how things function. In other words, they have some level of ownership over the decisions given that they were informed by local interests, concerns and capabilities. This does not mean that everyone will always comply, however, leaving us with the question of how we know that everyone is complying and if not, then who is not, as well as how to deal with people who do not comply. Ostrom's fourth and fifth principles deal with these questions.

The fourth principle considers the question of the position of authority in the context of environmental management. It states that “*commons must be monitored*” (Williams, 2018). This principle is designed to deter noncompliance and the dominance of individuals’ short-term interests over the common good and is therefore an essential component of the system. One of the main reasons Israel and the West Bank’s environmental management systems are faulty is that they do not have effective enforcement mechanisms, including monitoring. Effective and efficient monitoring is therefore a component that the region must develop. But who is to monitor communities of both Israelis and Palestinians? Should it be an institutional mechanism involving both Israeli and Palestinian authorities? Will they be able to trust each other enough to collaborate at a higher institutional level, and does either side actually have the resources to successfully monitor? Given the current environmental management institutions, their lack of resources and infrastructure, and political tensions, the answer to these questions seems to be “no.” In an environment where so much has been essentially dictated “from the top,” monitoring may be an extremely divisive issue and may actually encourage resistance and symbolic noncompliance.

A potential solution might be to designate a third-party monitor, a method many international agreements turn to when there is a lack of trust among members (Koremenos, 2016). Although this approach does not solve the top-down issue, it may mitigate accusations of noncompliance and political tensions between parties on a local and higher level. The third party would have to be a non-partisan actor, however, thus ruling out most states. A non-partisan environmental NGO might be a promising candidate since NGO expertise in environmental areas renders them credible and reduces concerns over political bias. This NGO must be credible to both the Palestinian and Israeli citizens and governments. Additionally, since neither side has

effective enforcement mechanisms, introducing a third party to monitor may bring in new resources to build a foundation for effective monitoring and enforcement in the future.

The fifth principle involves those who misuse the commons: “*Sanctions for those who abuse the commons should be graduated*” (Williams, 2018). Graduated sanctions involve a system of warnings and fines to avoid resentment and further misuse (Williams, 2018). Both Israel and the West Bank’s environmental management systems have graduated punishments already, as both include a range of progressive punishments for breaking environmental laws. These systems of punishment do not take into account the ecosystem as a whole, instead focusing on the jurisdiction of Israel and the West Bank and their resources. Thus, two issues arise in the application of this principle: building a cohesive system of sanctions that affect Israelis and Palestinians in the same way to protect the commons as a whole and deciding who enforces these sanctions. In this case, similarly to monitoring, there is the question of which institution will carry out sanctions against violators.

Ostrom’s framework is based on the development of a common governance system built by the communities sharing the commons, so the first issue may be addressed by focusing on developing common systems of punishment on local levels among communities that share commons. The issue of trust arises again, however, particularly when considering the second issue as well; will Israelis be as strict among themselves as with Palestinians and vice versa? Here, the establishment of written rules and agreements is necessary and may help, and if a credible third party is in charge of monitoring, then neither side will have to worry about the other being unfair. If the written rules clearly outline what the graduated sanctions are, then they will leave little room for interpretation. Thus, the monitor will become the actor determining which sanctions are to be implemented because it will be aware of the severity of the abuse. In

theory, this combination of precision and delegation could help to establish a long-term cooperative framework.

Even with sanctions and a solid agreement, conflicts will inevitably arise. Hence, principle six: “*Conflict resolution should be easily accessible*” (Williams, 2018). Ostrom’s framework emphasizes that everyone should be able to “take their problems for mediation, and nobody is shut out,” which is particularly relevant given tensions and mutual lack of trust in the region (Williams, 2018). It is imperative that problems be managed rather than ignored. In order for this problem management to occur, there need to be physical spaces to convene, where both parties are comfortable or at least feel that they are equal and, moreover, will be treated fairly. The political situation, trust, and infrastructure each pose significant barriers to implementing this principle. Because infrastructure across the West Bank is purposefully built to separate Israelis and Palestinians, it would be difficult to find such a place. Perhaps the location of natural resources themselves could work in some cases; the site might provide a physical place for equality, since both sides use it. Additionally, meeting at the location of the natural resource could emphasize “recognition of shared goals and interests” embodied by the resource and “shared problems or fears,” understandings that Wondolleck and Yaffee (2000) recognize as essential parts of successful collaboration. When the resource is an underground aquifer or landfill and used by more than just the surrounding locals, it makes this solution more difficult, however, so perhaps specific buildings near the resource should be designated for this purpose.

The principle additionally calls for a moderator, which may again require a mutually-acceptable third party to manage the distrust between Israelis and Palestinians. Issues may, of course, arise between people of the same side as well, but in order to maintain equity and structure, this mediator for internal disputes should also be the same third party. The two main

challenges here would be finding a credible moderator and making the place of meeting convenient and accessible for anyone with a complaint. As discussed under principles four and five, the moderator could be a credible environmental NGO with the environment as its foremost interest. Making a convenient and accessible place of meeting and complaints would require resources and accessibility in addition to political space that neither party has at the moment.

The seventh principle states that “*commons need the right to organise*” (Williams, 2018). Again, the issue of common spaces arises, an issue at the foundation of the conflict and occupation. If there is no space to convene, discuss, relate, a community cannot come out of it united around a common resource. “The right” referenced in the principle is also a major obstacle because in some cases it is against the law to convene. Under an Israeli martial law, Israelis are not permitted to enter Area A of the West Bank without explicit permission, so although there are Israeli settlements such as the Hebron settlement beside Palestinian towns in Area A, they are not permitted to interact (Mishkin, 2018). Therefore, establishing the right to convene will need to come directly from political change in addition to social change and initiative. All of these requirements from the Ostrom framework do involve political change to some extent, however, including principle eight.

Principle eight states that “*commons work best when nested within larger networks*” (Williams, 2018). Hence, although individual initiatives may contribute to the improvement of environmental management, they function at a higher level when they are part of a larger system. This concept makes sense from an ecological point of view as well because ecosystems and their resources are all connected. Thus, if one common pool resource is well-managed and the others are not, then that resource will still be negatively impacted. Likewise, if Israel has an excellent environmental management system, and the West Bank does not, neither will be entirely

successful. In order for each community commons management and environmental initiative to work, a larger framework must be realized, inevitably involving authorities. Given the current political context, including that of Israeli and Palestinian environmental institutions, significant political changes must occur for the successful management of common pool resources.

Conclusion

The main issues challenging adoption of Ostrom's framework in the Israel and West Bank context are: lack of trust between Israelis and Palestinians; lack of physical and social space to convene and form a community; conflict over defining boundaries of resources and who has access to them; insufficient environmental management capacity; and lack of political will to institute the changes discussed here. There are, however, possible ways of addressing these issues. Introducing a third party recognized as non-biased by both sides may be a way of providing monitoring and enforcement without forcing both sides to trust the other with power. Bringing in a third party capable of monitoring would also help address the issue of insufficient management resources and tools. This third party could be an environmental NGO perceived as unbiased by both sides with its primary focus on environmental and public health. These focuses would make the organization more credible and draw attention farther from the conflict and closer to the issues begging collaboration. Many NGOs around the world have already set a precedent as credible monitors of behavior such as environmental management and human rights. Approaching common pool resource management from a local level and involving consumers in decisions about the resource can help build a community around the resource and build a sense of trust. Communities that do have physical spaces in which Israelis and Palestinians might convene can set precedent for communities that are blocked by law or physical barriers who can find ways to circumvent these obstacles. Some communities in Gaza

have started online conferences simply to establish friendship through platforms such as Zoom, for example (Halbfinger & Abuheweila, 2020).

Despite these potential solutions, the success of collaborative environmental management in Israel and the West Bank is ultimately contingent upon political change at least as far as environmental management is concerned. Local initiatives cannot be entirely successful if they are not part of a larger system also working toward sustainable environmental management, and in order to create a functioning network in Israel and the West Bank, both authorities must make fundamental changes to their environmental management institutions. They must also be open to collaborating together on this management of mutual resources and waste management. The Israeli population's trend in support of environmental sustainability holds potential for Israel's internal environmental transformation, but the current political scene in Israel concerning Palestinians must also change. The Palestinians have less control over reforming their environmental institutions because of their lack of resources and infrastructure. These problems must therefore be addressed by economic means either before or in the process of changing environmental institutions. Given the current challenges faced by Israel and the West Bank, collaboration on environmental management on a large scale does not appear particularly promising.

Nonetheless, both sides acknowledge the growing importance of water and waste management as populations grow and climate change makes resources less reliable. Perhaps this knowledge will bring the two sides together in environmental management, if not in anything else. In order to better understand how this collaboration might happen, further research is needed on the political and environmental position of Israeli settlements because their environmental management is separate from those of Israel and the West Bank. Another

important actor affected by Israel and the West Bank's water and waste management is Jordan. It shares the Jordan River and is near enough to be directly affected by other forms of pollution in Israel and the West Bank and vice versa (Wolf, 1995). Therefore, further research on regional interactions with Jordan and on potential collaboration for both water and waste management would be a vital addition to environmental and peace studies in the region.

From an optimistic perspective, environmental management cooperation could be the first step towards a larger cooperative framework (Wolf, 1995). Parties outside the region could focus on environmental cooperation in order to promote peace without implicating ideological or political positions; environmental problems are universal and do not take "sides." Scholars and NGOs are proposing methods of collaboration, taking into account the increasingly urgent need to address issues such as water scarcity in Israel and the West Bank. EcoPeace has proposed a policy of interdependence between Israel, the West Bank, and Jordan based on the development of desalination as the main source of freshwater in Israel and the West Bank. They would also provide this water to Jordan in exchange for renewable solar-powered energy from Jordan (Giordano, 2018). The plan would provide water and sustainable energy to the region, helping Israel reach its climate goals set at the Paris climate summit and decrease the Palestinian reliance on Israeli electricity and water (Giordano, 2018). In many ways, these activities by NGOs in the region are building the needed foundation upon which future cooperation might be instituted.

Plans such as this one from EcoPeace take into account many of the factors of Ostrom's framework, especially the need for a larger network, a concept that applies to the whole world's environmental management. In the case of greenhouse gas emissions, for example, even if one country is carbon neutral, the atmosphere, including the air in that country is still polluted by the rest of the world. Therefore, the case of Israel and the West Bank can serve as an exemplary case

for the rest of the world to evaluate as it attempts to solve environmental management issues that everyone will face on a larger scale in the near future.

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