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Development or Detriment? The World Bank and Economic Disincentives to Water Conservation: Jordan in the 1960s and 1970s

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DEVELOPMENT OR DETRIMENT?

THE WORLD BANK AND ECONOMIC DISINCENTIVES TO WATER CONSERVATION

JORDAN IN THE 1960S AND 1970S

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ABSTRACT

This thesis examines the impact of World Bank development policies on water shortages in the Middle East and North Africa. Analyzing primary sources from the World Bank Group Archives, I contend that in funding water development projects in the 1960s and 1970s the World Bank and its subsidiaries, the International Bank for Reconstruction and Development and the International Development Association, created economic disincentives to water conservation. These disincentives likely made authorities unable to effectively respond to water shortages that developed in the latter half of the 20th century. The Hashemite Kingdom of Jordan is used as a case study, which I argue illuminates active World Bank economic disincentive policies that were enacted throughout the MENA region.

DEDICATION

This work is dedicated to my friends, colleagues, and teachers in Amman who openly and honestly shared their experiences and educated me about so much more than just Arabic. Without their influence, I never would have considered resources and power in the way I do now.

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I would like to extend my gratitude to my advisor and friend Dr. Vivian Ibrahim for her guidance and support throughout this thesis and this Master's program. I am deeply indebted to her for our dozens of meetings, extensive feedback, and endless encouragement the past two years both in and out of the classroom. I would also like to thank my readers and professors, Dr. Nicolas Trépanier and Dr. Darren Grem for their feedback on this project and their inspiration last year in the classroom which led directly to this thesis. Thank you to Andrew Czuzak for being a one-man brain trust from the very beginning. Finally, thank you to my family for their loving support in my pursuit of this program and beyond.

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I. Introduction

This thesis examines the impact of World Bank funded development projects on water resources in the Middle East and North Africa. I argue that the water systems financed and developed by the World Bank and its subsidiary organizations, the International Bank for Reconstruction and Development (IBRD) and the International Development Association (IDA), were established with economic disincentives to water conservation. I argue that these economic disincentives have been a contributing factor to the ongoing water crisis in the region by making authorities unable to effectively respond to shortages. I use the Hashemite Kingdom of Jordan as a case study to understand these larger phenomena. As one of the largest recipients of World Bank financing for water projects, with some of the most significant examples of water infrastructure development by the World Bank, Jordan is well suited to illustrate the World Bank's development practices. This thesis primarily focuses on the 1960s and 1970s, with background taken from the Bank's preliminary work in the 1950s.

Why Water?

It is said that in 1985, the Egyptian Minister of Foreign Affairs and future Secretary General of the United Nations, Boutros Boutros-Ghali warned "The next war in the Middle East will be fought over water, not politics". World Bank Vice President Isamil Serageldin (1992-2000) reiterated this sentiment more broadly ten years later saying "The wars of this century have been on oil, and the wars of the next century will be on water unless we change the ways we manage

water."[1] This warning has been repeated so frequently when speculating on the future of the Middle East and North Africa that it has become cliche. In a 1991 *Foreign Policy* article, Joyce Starr drew comparisons between the invasion of Kuwait over slant drilling into Iraqi oil reserves to a potential future war over aquifer drilling.[2] In a 2002 article, Hussein Amery claimed that Lebanon's construction of a pumping station on the Wazzani Spring in 2001 nearly triggered a military response from Israel.[3] Considering the water scarcity, the growing population, and the highly-publicized military engagements of the 20th century in the region, the idea of a Middle Eastern water war is a fairly straightforward prediction. Although common, his water war narrative is largely an exaggerated concern. The next war in the Middle East was fought, and it was not over water. Recently discussion has pushed back on this narrative, with many scholars arguing water shortages will drive cooperation not conflict.[4] The water war proclamations may be exaggerated, but they do illustrate a real concern for the region.

In a 2019 analysis of their Aqueduct Database, the World Resources Institute ranked Jordan as the fifth-most water stressed state in the world.[5] The United Nations' Food and Agricultural Organization's AQUASTAT database indicates that total renewable water resources per capita have sharply declined from 235.6 m3/inhab/year in 1992 to 95.75 m3/inhab/year in 2017.[6] The 2019 Water Budget report from the Jordanian Ministry of Water and Irrigation acknowledges that

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[1] Ismail Serageldin. "Water: Conflicts Set To Arise Within As Well As Between States." *Nature* 459, 163 (2009).
[2] Joyce R Starr, "Water Wars," *Foreign Policy*, no. 82 (1991): 17–36.
[3] Hussein A Amery, "Water Wars in the Middle East: A Looming Threat," *Geographical Journal* 168, no. 4 (2002): 313–23.
[4] Ashok Swain, "Water Wars: Fact or Fiction?," *Futures* 33, no. 8 (October 1, 2001): 769–81; J Anthony Allan, "Hydro-Peace in the Middle East: Why No Water Wars?: A Case Study of the Jordan River Basin," *SAIS Review* 22, no. 2 (2002): 255–72; Aaron T Wolf, "'Water Wars' and Water Reality: Conflict and Cooperation along International Waterways," in *Environmental Change, Adaptation, and Security* (Springer, 1999), 251–65.
[5] Rutger Willem Hofste, Paul Reig, and Leah Schleifer, "17 Countries, Home to One-Quarter of the World's Population, Face Extremely High Water Stress," World Resources Institute, August 6, 2019.
[6] "AQUASTAT-FAO's Global Information System on Water and Agriculture" (Food and Agriculture Organization of the United Nations).

Jordan is one of the most water poor countries on earth. The Ministry attributes its water shortages to its arid climate, low rainfall, increased population, and its position in a transnational water basin where water resources must be shared with both Syria and Israel.[7] Several policy briefs from the Ministry reiterate the extent of the water shortage and the need for rapid response. A 2016 brief outlines the need for an extensive response to the water crisis because of predicted strain from climate change.[8] How can Jordan or the other water-poor states of the MENA address scarcity at this scale? Several strategies have been utilized or suggested to mitigate the water shortages of the region. Virtual water imports have been used extensively, but studies show that these are politically hazardous.[9] Desalination is a common suggestion, however the cost and energy intensity of the process have prevented large-scale implementation of this strategy.[10] Researchers and government officials alike point to the need to curb user demand.[11]

Yet, I argue that there is an oversight in this quest to find solutions to the water security question in the Middle East and North Africa. The literature fails to consider the historic roots of excessive water demand in the region. Population growth is blamed for excessive demand, however, researchers have paid little attention to the underlying water system of the Middle East and the international forces which helped shape them. Historicising the water crisis and examining the development of water systems could provide insights into the cause of the shortage. This thesis will examine the development of Jordan's water infrastructure, and the economics that were

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[7] Directorate of Policies and Strategic Planning, "Al Mwaznt al Mayy 2019" (Ministry of Water and Irrigation, 2019).

[8] "Siasat Sina' al Muneat Limuajahat 'athar al Taghayur al Munakhii Ealaa Qitae al Miah" (Ministry of Water and Irrigation, 2016).

[9] Marta Antonelli and Stefania Tamea, "Food-Water Security and Virtual Water Trade in the Middle East and North Africa," *International Journal of Water Resources Development* 31, no. 3 (2015): 326–42.

[10] Mousa S. Mohsen, "Water Strategies and Potential of Desalination in Jordan," *Desalination* 203, no. 1–3 (2007): 27–46.

[11] Joep F. Schyns et al., "Mitigating the Risk of Extreme Water Scarcity and Dependency: The Case of Jordan," *Water* 7, no. 10 (2015): 5705–30.

established at its inception. In particular, I examine World Bank development projects which formed a significant portion of Jordan's early infrastructure. This will bring to light factors that contribute to the Kingdom's water problems.

Discussion of Primary Sources

The bulk of the primary sources for this project are internal documents from the World Bank's archives. Within the last ten years, the Bank has disclosed and digitized a significant number of sector economic reports, staff appraisal reports, memoranda and recommendations to the president dealing with their activities in Jordan and the rest of the Middle East and North Africa. The Bank has additionally disclosed key documents that hint at the organizational culture that may be obscured in the purely technical and economic documents, including speech collections and the internal, secretary-compiled newsletter *International Bank Notes*. Staff appraisal reports constitute the greatest source of evidence for this thesis, with sector economic reports and memoranda and recommendations enhancing the discussion of the Bank's activities in the country and larger region. Internal speeches and newsletters are used to create a more complete picture of the Bank's approach to development in the region, as they hint at the Bank staff's perceptions of the states and peoples with which they worked.

II. Historiographical Overview

1. Contribution/Intervention

Despite the fact that these World Bank documents detail the establishment of key water infrastructure and economic systems for water distribution, they are noticeably absent from the literature surrounding water issues in the Kingdom. Even literature addressing the Bank's role in Jordanian development more broadly neglects this period and document set, and the secondary sources almost entirely fall outside historical analysis. Harrigan, El-Said, and Wang considered the roles of the IMF and the World Bank in Jordan, however, they focused only on the "economic liberalization program" era since 1989, much later than the scope of this thesis and do not consider their role in water.[12] Michael Goldman considers the role of the World Bank in water policy, but only in a later era, and with little consideration of their impact in the Middle East and North Africa.[13]

In 2013 (submitted in March 2011, published in 2013) Karen Bakker, an interdisciplinary water governance researcher, authored a historical analysis of the World Bank's policies on urban water supply networks from the 1960s to the 1980s, addressing some of the issues of Bank policy present in this thesis.[14] This work, however, focuses less on water supply constraints or conservation, and instead makes more general, global arguments about the emergence of "state

[12] Jane Harrigan, Hamed El-Said, and Chengang Wang. "The IMF and the World Bank in Jordan: A case of over optimism and elusive growth." *The Review of International Organizations* 1, no. 3 (2006): 263-292.
[13] Michael Goldman. "How "Water for All!" policy became hegemonic: The power of the World Bank and its transnational policy networks." Geoforum 38, no. 5 (2007): 786-800.
[14] Karen Baker. "Constructing 'Public' Water: The World Bank, Urban Water Supply, and the Biopolitics of Development." Environment and Planning. D, Society & Space 31, no. 2 (2013): 280-300.

failure" arguments in the 1980s and 1990s. She argues that rather than focusing on the failings of governments, scholars are better served by analyzing the flaws in particular models of development-- in her case those models pushed by the World Bank. She further contends, as I do in this thesis, that historical analysis of policy is relevant to contemporary debates over water issues.[15] Her contribution is likely the most similar to this thesis in the literature, but I build on her contributions by focusing specifically on a flaw in the World Bank's development models. In particular I focus on the theme of economic disincentives to water conservation. Additionally, I have found sources which conflict with Bakker's timeline. Her argument is predicated on assumptions about World Bank funding activities during the 1960s, which more recent sources show to be incorrect. Specifically, her timeline relies on the World Bank only providing loans for two water projects between 1961 and 1970.[16] Bakker argues that the 1970s brought about a shift in the World Bank's activities, however, the First Amman Water Supply Project and the Four Cities Water Supply projects discussed in my thesis show that the Bank was active in funding development projects in the 1960s. My analysis of the World Bank sources complicates her narrative, showing that the Bank's activities in the 1970s were the continuation of their operations in the 1960s. It is likely that Bakker's work was based on World Bank documents which were released before the set used in this thesis. I argue that the World Bank's reach in the Middle East and North Africa, its operations and its ability to inform policy, began in the 1950s and extended through the contemporary period.

The World Bank's website keeps track of total downloads of the available documents, and those numbers show that many of the sources used in this theses have been digitally accessed quite

[15] Ibid.
[16] Ibid.

rarely. The appraisal of the first Amman Water Supply Project has only been downloaded a total of 127 times, the 1954 sector report detailing the anticipated role of the Bank in Jordan has only been viewed 145 times, and many of the Bank's newsletter have been downloaded less than 100 times. While download numbers, of course, do not alone indicate these documents' absence in the literature surrounding water in Jordan or in the regional context, to the best of my knowledge, they have yet to be considered by historians to understand the water challenges faced by Jordan.

2. World Bank Historiography

Much of the literature concerning the intersection of World Bank development projects and water resource allocation deals with a later period than the focus of this project. While the First Amman Water supply project began in 1961, much of the literature focuses on the World Bank after it experienced a major transformation of its goals in the 1970s. Michael Goldman argues that the World Bank expanded its scope and began a program of "green neoliberalism" (especially to water supply projects) in the 1970s after former U.S. Secretary of Defense Robert McNamara was selected as the new president of the Bank. Goldman makes the argument that the frameworks laid down by McNamara, rather than the earlier, cautious developmentalism of the World Bank, focused on poverty alleviation and would serve as the basis for large scale water privatization in the Global South.[17] Both Goldman and Bakker consider themes relevant to the discussion of the World Bank's development policies, however, this thesis complicates their narratives. Goldman and Bakker argue that the 1970s and the tenure of McNamara brought about a shift in the World Bank's operations. This thesis, however, challenges this argument by taking a long view of the

[17] Michael Goldman. "How "Water for All!" policy became hegemonic: The power of the World Bank and its transnational policy networks." Geoforum 38, no. 5 (2007): 786-800.

World Bank's operations. It finds that the themes referenced by Bakker and Goldman are strongly rooted in the World Bank's policies of the 1950s and 1960s.

3. Middle East Environmental Historiography

Environmental history of the Middle East is a relatively new field, but one that has seen significant interest in the recent years. It is a common misconception, especially in the West, to view the Middle East and North Africa as an undeveloped desert wasteland. Misperceptions of the physical environment of the Middle East have led to dangerous misperceptions of the peoples of the Middle East and have given rise to harmful thinking towards them. Common throughout orientalist thought on the MENA is the idea of environmental determinism— that is the belief that there is something inherent in the environment of the Middle East which inevitably doom the people to collapse and eventual subservience to the West. In a 2010 roundtable published in the International Journal of Middle East Studies, Diana Davis warns of the dangers of such thinking emerging in environmental histories of the Middle East and North Africa. [18] Other scholarship on the physical environment of the MENA has described a constant struggle between man and environment in which humans have little agency. In recent years, new scholarship has emerged in the academy of Middle East studies which recognizes the need to study the environment of the Middle East and North Africa to fill the gaps in our knowledge.

One of the best efforts to fill this gap in the field comes from *Water on Sand: Environmental Histories of the Middle East and North Africa*.[19] This collection of eleven essays, published in 2013, serves as a demonstration of the necessity of integrating environmental history

[18] Diana K. Davis, 2010. "Power, Knowledge, and Environmental History in the Middle East and North Africa." *International Journal of Middle East Studies* 42 (4): 657–59.
[19] Alan Mikhail, 2013. Water on Sand: Environmental Histories of the Middle East and North Africa. Book, Whole. US: Oxford University Press.

into Middle East studies and, likewise, to integrate Middle East studies into environmental history. In his introduction, editor Alan Mikhail assess the current state of the relationship between Middle East studies and environmental history. He argues that modern Middle East studies has regularly borrowed and innovated techniques and methodologies from the historiographies of other fields, but until recent years has largely failed to utilize methodologies of environmental history.[20] The emerging scholarship of Middle East environmental history builds off of existing methodology from other regional studies of the environment. Taking the perspectives of environmental history would add additional depth to current debates within Middle East studies. Environmental history would fill in the gaps of actors key to the region's history, but remain missing from the literature such as animals, microbes, water, or oil. [21] Likewise, Mikhail argues it could allow for fresh examination of issues such as imperial decline, the end of the colonial era, and the role of oil in 20th century politics.

Mikhail further argues neglect of the Middle East leaves gaps in the larger understanding of environmental history. Without integration of environmental histories of the Middle East into the larger global environmental historiography, researchers and historians have only a piece of the story. For example, Mikhail argues that it is commonly thought (because of European and East Asian sources) that the Middle Ages was a period of global warming, however, contemporary Persian and Arabic sources from Iran indicate that the Middle East was experiencing a period of chilling.[22] Environmental histories could further benefit from an enormous number of sources which are the result of robust state systems that create a documentary record far longer than most

[20] Ibid. p. 10
[21] Ibid. p. 11
[22] Ibid. p. 8-9

other parts of the world. [23] It is likely that this thesis' examination of economic disincentives to conservation in the Middle East could contribute to the wider conversation surrounding the historiography of resource usage.

As is to be expected, several of the essays in *Water on Sand* examine current water issues in the Middle East and North Africa. In "Building the Past: Rockscapes and the Aswan High Dam in Egypt," Nancy Reynolds utilizes geology to add additional depth to discussions to one of the largest hydrological projects in the modern MENA.[24] By examining the geology of the dam site, Reynolds links the dam project to a history of works projects in the country and how Nasser used the project in his postcolonial nationalism efforts. In "State of Nature: The Politics of Water in the Making of Saudi Arabia," Toby Jones uses an impressive collection of primary governmental and nongovernmental sources to examine the supremacy of water in the building of the Saudi kingdom.[25] Rather than simply putting oil at the center of the story as often happens in studies of Saudi Arabia, Jones expands on existing scholarship to show how the scarcity of water shaped modern Saudi politics and international relations.

My thesis will contribute to this growing body of literature by incorporating the role of International Organizations into the narrative surrounding water and resource shortages. International Organizations like the World Bank, the United Nations, and state-sponsored development agencies have played a major role in shaping the Middle East and North Africa in the 20th century and beyond. Their policies, philosophies, and funds are inextricably linked to the region's infrastructure today. Despite the significant role the World Bank played in shaping the environment of the Modern Middle East its role has not been examined by environmental

[23] Ibid. p. 6
[24] Ibid. p. 182
[25] Ibid. p. 232

historians of the Modern Middle East. Unlike many environmental histories, this thesis does not delve into specific scientific analysis. Rather, I contribute to the field of environmental history by showing the economic factors which contribute to resource crises.

4. Cold War Historiography

The World Bank's operations in Jordan were conducted with the backdrop of the Cold War shaping global politics. While the World Bank is a nongovernmental organization, it is important to consider the ways this Cold War backdrop shaped the way states and international organizations interact with the environment. There is a growing body of literature in environmental history which considers just that. A recurring theme in this literature is that the need to counter Soviet international influence often trumped environmental preservation or conservation. Christopher Sneddon argues that the United States government deployed the Bureau of Reclamation across Latin America, Asia, and Africa during the Cold War. They were tasked with developing large damming projects (often at the cost of the environment) as a way to sow goodwill towards the United States in opposition to the USSR.[26] In *All the Boats on the Ocean*, Carmel Finley argues that the unsustainable fishing practices of today and the decline of global fisheries originated from the tensions between the USSR and the US. She argues that the United States subsidized the construction of bigger fishing fleets to compete with Soviet Fleets, and created fishing rights concessions to bolster loyalty from key allies. The Soviets countered with their own increased fishing, and in essence created a "fish race" between the two powers. [27] This competition between the US and the USSR and its consequential environmental degradation yielded some interesting

[26] Christopher Sneddon, *Concrete Revolution: Large Dams, Cold War Geopolitics, and the US Bureau of Reclamation*, Book, Whole (Chicago: The University of Chicago Press, 2015).
[27] Carmel Finley, *All the Boats on the Ocean: How Government Subsidies Led to Global Overfishing*, Book, Whole (Chicago, IL: University Of Chicago Press, 2017).

results. Jacob Hamblin argues that much of the modern environmental movement in the United States originates from the Cold War. In *Arming Mother Nature,* he finds that American scientists tasked with military research in the Cold War were awakened to the possibility of environmental decline from human action. He argues that those scientists who were tasked with researching nuclear warfare, climate manipulation, or the development of chemical weapons would go on to form the catastrophic environmentalism movement of the 1970s.[28] I propose to use this historiography to demonstrate the pressures of this global tension on local environments, and extend their arguments into the ways the World Bank exercised its influence on Jordan.

[28] Jacob Darwin Hamblin, *Arming Mother Nature: The Birth of Catastrophic Environmentalism*, Book, Whole (US: Oxford University Press, 2013).

III. Historical Background

1. The World Bank

On 1 July 1944, delegates from forty-four countries met at the Mount Washington Hotel in Bretton Woods, New Hampshire for the United Nations Monetary and Financial Conference. Over a twenty-two day period, these delegates roadmapped the anticipated plans for the international economic system for the postwar period. The International Monetary Fund and the International Bank For Reconstruction and Development (which would evolve into the World Bank) emerged from the conference, ready to respond to the impending economic challenges brought on by the end of the Second World War. The IBRD, initially conceived by delegates to reconstruct existing systems in countries devastated by the war, quickly shifted to providing development loans and assistance to states around the world. Reflecting on the Bank's history, Raymond Mikesell, a technical staffer at the Bretton Woods conference, argued that by 1957 the World Bank became concerned about its members' ability to service their loans. [29] In response, the International Development Association, an affiliate of the Bank, was inaugurated in 1960 as a project-lending institution. The IDA had greater flexibility in its lending criteria, allowing loans to be made in situations where the Bank was less optimistic about the debtor's ability to repay.

[29] Raymond Mikesell, "The Emergence of the World Bank as a Development Institution," in *Bretton Woods Revisited: Evaluations of the International Monetary Fund and the International Bank for Reconstruction and Development* (University of Toronto Press, 1972).

2. The World Bank in Jordan

In the earliest years of the bank, Jordan was on the fringes of the IBRD's attention. The IBRD's 1948 assessment of trade in the Middle East mentions Jordan only three times-- twice in footnotes.[30] A 1949 report detailing a series of discussions between the IBRD and representatives from the British Foreign Office on potential development projects in the former British holdings in the Middle East shows the IBRD had only secondary interest in the Jordanian projects proposed by the delegation. The IBRD noted in particular that projects in Jordan would not be eligible for funding as the Kingdom was not yet a member of the bank. [31]

The IBRD's interest in Jordan grew over the next two years as the Bank produced a preliminary report, *Development Prospects in Jordan,* in 1951. [32] The report details the IBRD's concern over the recent population explosion of Jordan brought on by the incorporation of Arab Palestine (i.e. the West Bank) and Palestinian refugees from territories now held by Israel. The former population of Transjordan was 490,000, but Jordan now incorporated 450,000 people in Arab Palestine and 350,000 refugees. The report found that Jordan was incapable of producing enough goods to supply the needs of the population, and argued that the situation could only be improved if resources were developed to supply more food for local consumption or if commodity production for export was increased to allow for greater external trade. The 1949 report and 1951 report both noted that the development prospects of Jordan were limited. The 1951 report's initial findings noted the possibility of increasing agricultural production and developing mineral

[30] Alexander Stevenson, "Trade of the Middle East" (International Bank For Reconstruction and Development, April 6, 1948).
[31] F. G. Bochenski, "British Development Proposals for the Middle East" (International Bank For Reconstruction and Development, December 12, 1949).
[32] A Basch, "Development Prospects in Jordan" (International Bank For Reconstruction and Development, June 25, 1951).

extraction and industrial production. It is against this backdrop that one needs to consider the policies implemented by the World Bank and their impact on water resources.

The IBRD's relationship with Jordan shifted in 1952 when the Kingdom was admitted as the 54th member of the Bank. [33] Earlier that year, F. G. Bochenski became the first staff person of the Bank to travel to Jordan, noting the potential for a brighter economic future if development projects (mineral extraction, Yarmouk River irrigation project, etc.) received funding. [34] In 1954, the Jordanian government expressed an interest in a survey mission from the IBRD. Largely relying on data gathered from other entities and supplemented by a few short visits to Jordan by Bank personnel between 1952 and 1954, the IBRD produced the 1954 report *Development Problems of Jordan and the Role of the Bank*. [35] The report states that the goal of development projects in Jordan should be to increase the standard of living of the existing population and, if possible, to further integration of the refugee population into the Jordanian economy. The development prospects were largely categorized into three economic objectives: increase agricultural output, develop mineral extraction and light industry, and improve transportation infrastructure.

The World Bank's early interactions with the Hashemite Kingdom culminated in 1957 with *The Economic Development of Jordan*. This expansive volume reports on an IBRD mission to Jordan which occurred in 1955. The mission consisted of a significant number of field experts who studied the state of the country and potential areas for development. The report served as a roadmap

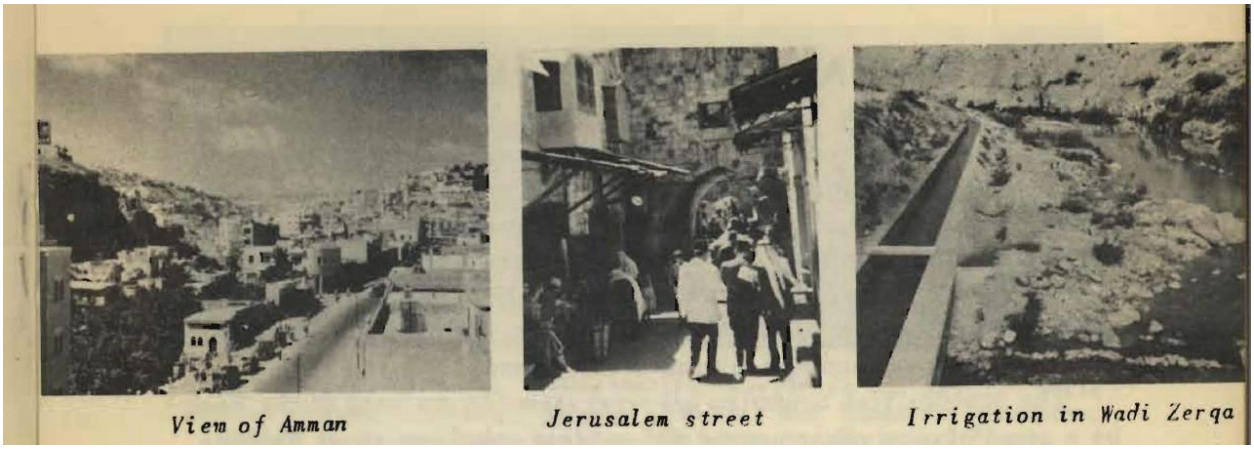
[33] Press Release, "Announcement That the Hashemite Kingdom of the Jordan Became a Member of the International Monetary Fund and the Bank on August 29, 1952" (International Bank For Reconstruction and Development, August 29, 1952).
[34] F. G. Bochenski, "International Bank Notes (Vol. 6, No. 10)" (International Bank For Reconstruction and Development, October 1, 1952).
[35] F. G. Bochenski, "Jordan- Development Problems and the Role of the Bank" (International Bank For Reconstruction and Development, July 31, 1954).

for World Bank involvement in the Kingdom, covering recommendations for developing everything from agriculture to transportation, as well as areas like education and healthcare.

World Bank Staff in Jordan

When examining the World Bank's activities in Jordan, it is worthwhile to consider the staffers who were part of the planning and implementation of development projects. The perception of a region can impact the way a group responds to the issues faced by a region. Diana Davis has cautioned against environmental determinism seeking into environmental histories of the Middle East and North Africa. Likewise, it is beneficial to understand how such beliefs may have impacted historic actors interacting with the region. Simply examining the main body of primary sources in this thesis, however, would provide only hints at the author's underlying perceptions of the Middle East and North Africa. These project appraisal documents, while evidencing the economic disincentives at the heart of my argument, use cautious, technical language. A much better picture of the Bank employee's perceptions and beliefs about the region can be found in speeches given by staff and by the Bank's internal newsletter, *International Bank Notes.*

Figure 1: Bochenski's 1952 Photographs Printed in *International Bank Notes*[36]



In October 1952, Feliks Bochenski, an officer of the IBRD who was deeply involved in the Bank's early activities in the Middle East published an account of his visit to Jordan in *International Bank Notes*.[37] Jordan had become the 54th member of the Bank in August of that same year, and according to the editor's notes, Bochenski was the first Bank staffer to visit the Kingdom. Bochenski largely characterized Jordan along its development issues, laying out the challenges faced by the Kingdom in the years following the 1948 War with Israel. He referenced the belief that Transjordan had largely been a "hinterland" of Palestine, and expressed that "it is obvious that a country where conditions were never easy and have become completely abnormal must depend to a large extent on foreign aid." He praised the Jordanians that he encountered, noting that they were "thoroughly and genuinely friendly to foreigners" and that "the dominating general impression is one of order, punctuality and hard work against unbelievable odds." While Bochenski seems to be referencing the Jordanianians and Palestinian refugees in a paternalistic tone, it is notable that he attributes to the challenges faced by the Kingdom as a resource issue,

[36] F. G. Bochenski, "International Bank Notes (Vol. 6, No. 10)" (International Bank For Reconstruction and Development, October 1, 1952).
[37] Ibid.

rather than a value jugement about an environmental inevitability. While the literature shows that historically the West has interacted with the environments of the Middle East and North Africa through the lense of environmental determinism, Bochenski's writing evidences a different attitude. Bochenski does not see the challenges of the region as a product of a people damaged by a harsh environment-- he sees them as an issue of economics.

In December 1954, Bochenski addressed a study group of the Bank on the role of the IBRD in the economic development of the Middle East. It appears that this speech was given behind closed doors, and it is likely that Bochenski spoke without concern of appeasing the Middle East governments which he discussed. Bochenski's transcript was not disclosed by the Bank archives until 2013. The speech, of course, provides an interesting assessment of the practical step the Bank believed it must take to assist in the economic development of the Middle East. Perhaps more interestingly, though, is that his speech hints at the way the region was perceived by the bank. Bochenski acknowledges that the common perception of the Middle East is that it is "undeveloped" or "underdeveloped."[38] While he points out that the per capita income for the six countries to which he refers (Iran, Iraq, Syria, Lebanon, Jordan, and Egypt) is low compared to other regions of the world, he adds surprising nuance to his assessment. He points out that groups in the Middle East would argue that "they are undeveloped only in a purely materialistic sense of the word."[39] Bochenski states that the Lebanese would point to their ancient pasts and their contemporary links to Western culture and the Egyptians would point towards their success in agriculture to rebut these perceptions. Bochenski expresses his praise that the countries under discussion do not have any "strong socialistic or etatistique tendencies" and that "There is a rather

[38] Feliks Bochenski, "The Role of the IBRD in the Economic Development of the Middle East" (World Bank Group Archives, December 1954), 1651388.
[39] Ibid.

general respect for commercial and financial obligations."[40] While his assessment of the Arabs and Iranians in question, of course, have orientalist overtones, they demonstrate a more complicated perception of the region than one might expect in the post-colonial era. Though a strict adherent to environmental determinism might argue the "under" or "undeveloped" economy of the Middle East was some sort of flaw with the peoples of the region, Bochenski instead characterizes the perceived deficiencies in simple economic terms. "Underdevelopment" of the region is the result of "an unfavorable ratio of people to existing economic resources."[41]

3. Economic Disincentives to Conservation

The early World Bank reports show that as the Bank designed and funded development projects in Jordan, they acted with the goal of supporting economic development of the Kingdom and increasing foreign exchange.[42] This need shaped the way they perceived the landscape of Jordan and its resources. A chief concern throughout the earliest reports was to increase exports to close the foreign trade gap. *Development Prospects in Jordan* made the case that development potentialities were limited for the Kingdom, but the Bank saw the possibilities in the mountains, deserts, and valleys of Jordan. The Bank argued that more fully utilizing the waters of the Yarmouk and Jordan rivers could allow for irrigation programs to increase agricultural production.[43] The 1954 report, echoed these visions arguing that range water spreading, better seeds and fertilizers,

[40] A Basch, "Development Prospects in Jordan" (International Bank For Reconstruction and Development, June 25, 1951). F. G. Bochenski, "Jordan- Development Problems and the Role of the Bank" (International Bank For Reconstruction and Development, July 31, 1954). Feliks Bochenski, "The Role of the IBRD in the Economic Development of the Middle East" (World Bank Group Archives, December 1954), 1651388. World Bank, "The Economic Development of Jordan," 1957.

[41] Feliks Bochenski, "The Role of the IBRD in the Economic Development of the Middle East" (World Bank Group Archives, December 1954), 1651388.

[42] F. G. Bochenski, "Jordan- Development Problems and the Role of the Bank" (International Bank For Reconstruction and Development, July 31, 1954), 4-6.

[43] A Basch, "Development Prospects in Jordan" (International Bank For Reconstruction and Development, June 25, 1951), 4.

and increased terracing of the mountain slopes could result in greater economic output by the Kingdom. [44] *The Economic Development of Jordan* argued for the same uses, but went into more specificity, seeing the greatest potential in the Jordan Valley. [45] Analyzing these reports makes it clear that the World Bank understood the future economic development of Jordan as inextricably linked to the development of its water resources. This link, however, is missing from the historiography of Jordan and is a contribution of this thesis to our historical knowledge.

The need for economic development inevitably drove the way the World Bank approached development projects in the country. In 1961, when the International Development Association completed its internal *Appraisal of the Amman Water Supply Project*, the group justified funding the plan with the rationalization that expansion of the water supply project (after initial investment) could be sustained through water revenues.[46] In effect, the World Bank designed a system where expansion could only come from usage. In essence, water authorities now had an economic disincentive to conservation. Regardless of the need for a reduction in water usage-- from drought, from climate change-- water authorities were disincentivized from encouraging reductions because a loss of revenue may cause the authority to operate at a loss.

Water systems in many countries have operated in this fashion prompting consideration from economists and other scholars (though neglected by historians). Janice Beecher notes that:

> The disincentive for water utilities to promote conservation appears to be strong. Traditional economic regulation tends to reinforce the disincentive for utility-sponsored conservation. Regulated utilities generally are more motivated to invest in supply-side resources and increase sales than to· engage in demand

[44] F. G. Bochenski, "Jordan- Development Problems and the Role of the Bank" (International Bank For Reconstruction and Development, July 31, 1954), 4-6.
[45] World Bank, "The Economic Development of Jordan," 1957, 14-15, 100-113.
[46] Department of Technical Operations, "Appraisal of the Amman Water Supply Project" (International Development Association, December 7, 1961), VII-49.

> management. Reductions in utility sales through conservation can cause revenue erosion and uncertainty, which in turn can reduce profits to investors and increase perceived risks.[47]

In the context of responding to climate change, Douglas Kenny, a water policy expert, argues that water authority conservation efforts, while politically challenging, is a viable strategy to respond to increasing water shortages.[48] He reiterates, however, Beecher's argument that utilities are disincentives from water conservation because of the economic system in which they operate. "If less water is sold, then revenues drop."[49] As utility costs are fixed, conservation can lead to budgetary shortfalls that can only be resolved by rate increases which can be politically problematic. Kenny acknowledges that these sorts of disincentives are present in many utility sectors, but emphasizes that these "throughput incentives for water utilities" has rarely been addressed by revenue model reforms.[50]

While this concept has been considered in water management journals and by conservationists, the historiography surrounding water shortages in the Middle East have failed to take it into account. To address the issue of water scarcity in the MENA, this thesis will use Jordan as a case study to show that water infrastructure planned and funded by the World Bank created economic disincentives to conservation. I analyze three major water supply projects in Jordan which I argue evidence the World Bank's role in creating economic disincentives to water conservation.

The first is the 1961 Amman Water Supply Project. This was the first development project funded by the Bank and illustrates the economics system which demonstrates these disincentives.

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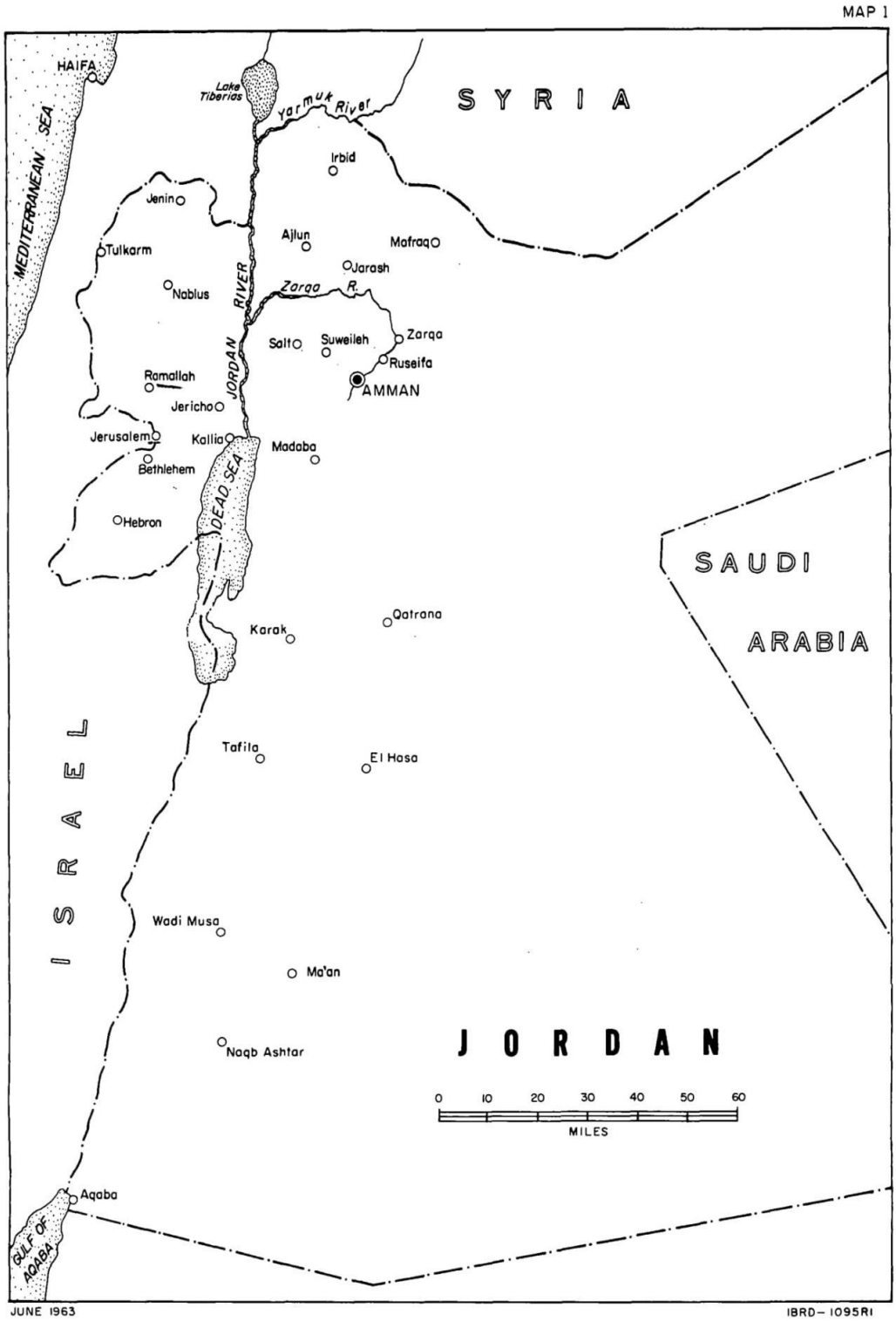
[47] Janice A. Beecher et al., "Revenue Effects of Water Conservation and Conservation Pricing: Issues and Practices," Columbus, OH: National Regulatory Research Institute, 1994.
[48] Douglas S. Kenny, "Understanding Utility Disincentives To Water Conservation As A Means Of Adapting To Climate Change Pressures." *Journal American Water Works Association* 106, no. 1 (2014): 37.
[49] Ibid.
[50] Ibid.

The next is a group of projects, collectively referred to as the Four Cities Water Supply Projects from 1963. In particular, I focus on the Irbid-Azraq and the Zarqa water projects, which evidence that the World Bank's use of this particular type of water economics was not limited to Amman. In 1973, the World Bank financed a second Water Supply project. It demonstrates the longevity of the water economics model used by the Bank which created economic disincentives to conservation in the early 1960. This complicates the narrative which implies that the World Bank's approach to water economics dramatically shifted to a new approach during Robert McNamara's tenure as Bank President. Secondary evidence for this project comes from The Hussein Thermal Power Project in 1973, and the 1968 National Water Supply Project in Tunisia. The power project evidences that the World Bank applied similar economic models to utilities other than water systems. Finally, the 1968 Tunisian project evidences that the World Bank's use of this system was not unique to the Jordanian context, but spread the model throughout the Middle East and North Africa.

Figure 2: 1963 IBRD Map of Jordan[51]



[51] Department of Technical Operations, "Appraisal of the Zarqa Water Supply Project" (International Bank for Reconstruction and Development and the International Development Association, September 12, 1963).

IV. World Bank Projects

Figure 3:1961 Signing of the Credit Agreement for the Amman Water Supply Project[52]

His Excellency Yusuf Haikal, Jordanian Ambassador to the United States (Left) and Sir William Iliff, Vice President of IDA (Right)

1. First Amman Water Supply Project

After the early reports indicated the urgent need of water supply development projects in Jordan, the International Development Association conducted its appraisal of the first major water project in the country in 1961. The IDA worked alongside American consultants, Brown Engineers International of New York, to develop the first Amman Water Supply Project. It would be the first of many such projects to increase access to water supplies, combat waterborne diseases, and open

[52] World Bank Group, *Credit Signing For Jordan Amman Water Supply Development Project*, 1961, photograph, World Bank Group Archives.

up pathways to economic development. The internal appraisal of the project prepared by the IDA's Department of Technical Operations evidences the early establishment of economic disincentives to conservation in the water-poor Kingdom.

Assessment of Existing System

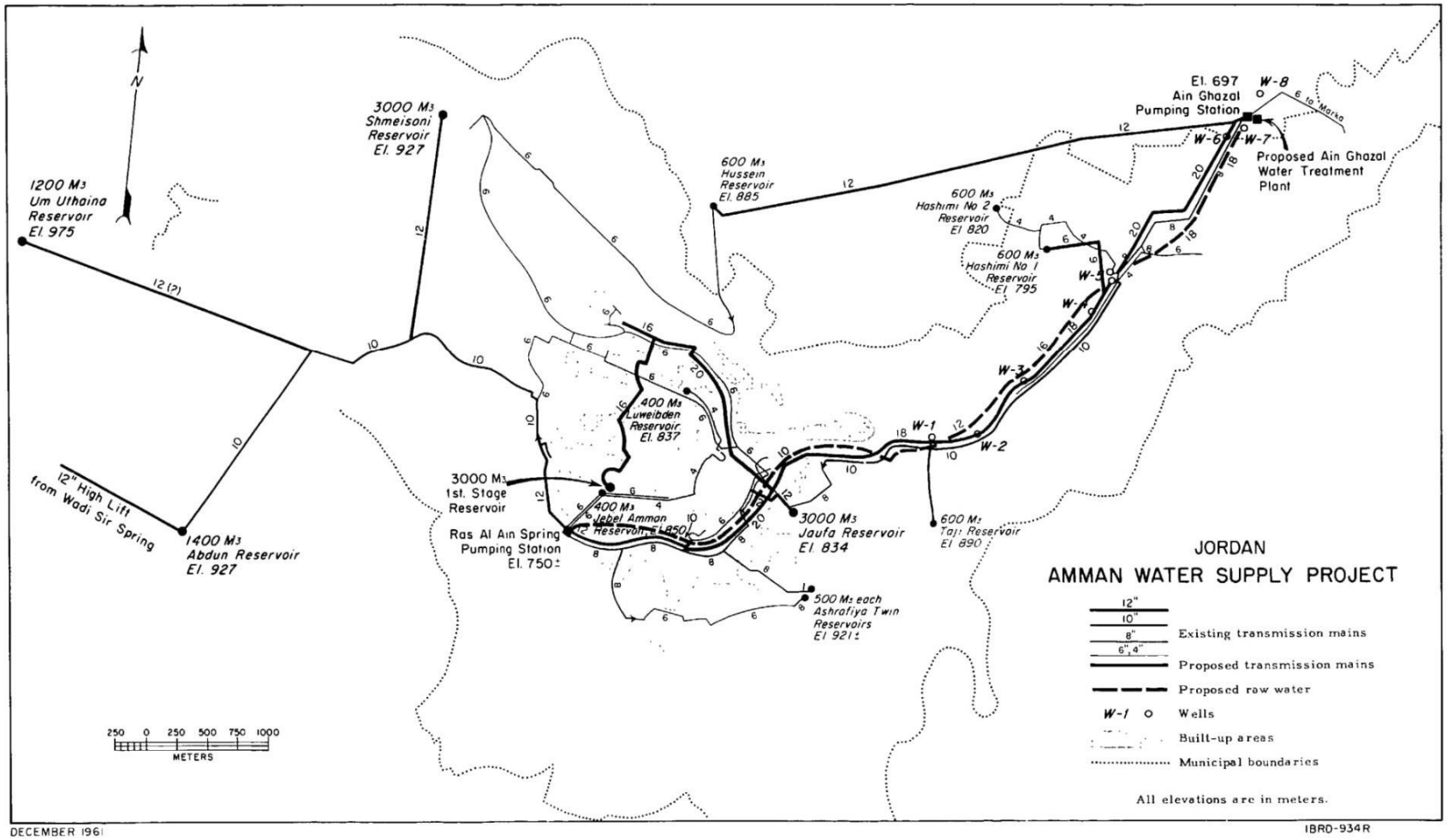
The appraisal found that the water infrastructure of the capital city was significantly insufficient for the needs of Amman's population and economy. Data for the appraisal was provided in part by the Jordanian government and by a field investigation from the IDA's staff and independent consultants. Rapidly growing water demand proved to be a serious concern of the municipality and the IDA. In 1952, Amman had a population of around 108,000. By 1961, that figure had grown to 203,000, largely from an influx of refugees from Palestine and from Jordanians relocating to Amman.[53] While this staggering population growth alone would be concerning, per capita usage was also rising rapidly. Per capita water use had increased in the prior few years at an average annual rate of 4%. The report also noted that there was significant disparity in water usage among residents at different economic levels. They found that the existing water supply system served only around two-thirds of the city's population.[54] The remaining third of the population not served by the municipal system, primarily Palestinian refugees, received their water largely from private charitable organizations trucking water to refugee camps around the city.[55] Much of the existing infrastructure was severely outdated. Up until ten years prior to the appraisal, the entirety of Amman's water supply was collected from an ancient Roman collection gallery, Ras al Ain.[56] This was subsequently supplemented by a spring seven kilometers west of Amman and a series of

[53] "Appraisal of the Amman Water Supply Project," 17.
[54] "Appraisal of the Amman Water Supply Project,"4.
[55] Ibid.
[56] "Appraisal of the Amman Water Supply Project," 5.

wells. All water supply for the city was treated using simple chlorination, and the report estimated a total capacity of 620 cubic meters per hour.[57] Industrial and commercial establishments in the city operated around 30 private wells, but the municipality had since prohibited the drilling of new private wells. The distribution system within the city was largely constructed on a piece by piece emergency basis, with much of it in poor condition. The IDA noted that water testing facilities were limited, and routine insufficient capacity in the system allowed for pollution to enter the supply.[58] Coupled with the lack of a public sewerage system, this led to a much higher than average rate of waterborne diseases. The report also found that leakages and "unaccounted for losses" amounted to around 39% of the total water output.[59]

[57]"Appraisal of the Amman Water Supply Project," vi.
[58]"Appraisal of the Amman Water Supply Project," 12.
[59]"Appraisal of the Amman Water Supply Project," 11.

Figure 4:1961 IBRD Map of the First Amman Water Supply Project[60]



[60] "Appraisal of the Amman Water Supply Project"

Proposed Project

To respond to these challenges, the IDA proposed a major development project to overhaul the water supply system of Amman. The group indicated that their projections of future demand were quite speculative due to a lack of statistics, uncertainty about continued immigration, and the unknown pent-up demand. They designed the project for an estimated municipal population of 360,000 in 1972, planning to increase usage from 35 LPCD (liters per capita per day) to 50 LPCD in 1972 and finally 83 LPCD in 1987. The project likewise relied on decreasing unaccounted water loss from 39% to 20% in 1972 and finally 15% in 1987. [61]

Much of the planning for this project was done by an American consulting group, Brown Engineers International of New York, with additional planning provided by Jordan's Central Water Authority. They proposed developing new wells and constructing new pumping stations at Wadi Sir to increase capacity from 620 cubic meters per hour to approximately 1500 meters per hour. Major improvements and reinforcements would be made to existing transmission and distribution mains, and reservoir storage capacity would be increased by around 3000 cubic meters. The project proposed transitioning to superchlorination rather than simple chlorination for water sanitation.[62] Superchlorination (or "shock-chlorination") was a common water sanitation method of the time, primarily used in instances where long detention periods of water supplies was not possible.[63] This likely would have been a significant improvement to water quality in Amman over the old system.

[61] "Appraisal of the Amman Water Supply Project," 22.
[62] "Appraisal of the Amman Water Supply Project," 5, 25.
[63] D. W. Ryckman and S. G. Grigoropoulos, "Use of Chlorine and Its Derivatives in Taste and Odor Removal," *Journal - American Water Works Association* 51, no. 10 (1959): 1268–74.

Superchlorinating equipment, dechlorinators, retention facilities, and high lift pumps would be built at Wadi Sir and Ain Ghazal. Water testing labs would be established at both springs, and the plan provided for additional water treatment facilities if need was demonstrated. The IDA estimated that construction of the basic facilities could be completed by the end of 1962, and construction of additional water treatment facilities would require 18 months.

Justification of the Project

The appraisal report recommended proceeding with the proposed plan and providing $2 million of the total estimated cost of $3.05 million. The IDA recognized that emergency measures taken by the Amman governorate had been inadequate to provide a minimum safe water supply for the fast growing population. Funding would be provided to ensure water supplies for the population and to reduce the rate of waterborne disease in the city. Justification for the project largely mirrored the goals of the World Bank outlined in the 1957 *Economic Development of Jordan* and other early reports. The IDA reiterated the potential of Amman to become a tourist attraction and increase foreign exchange earnings for the country. They believed that a safe and dependable water supply could increase Amman's status as a tourist center. While the IDA found that industrial water usage in the city was at the time insignificant, they partially justified the project for its potential to attract greater industrial activity to the city. Regardless if this occurred, they believed existing small-scale commercial establishments would benefit from improved water service. The IDA's final justification for the project was that extensions and improvements to the water supply would bring in revenues to further expansion of the system.

Evidence of Economic Disincentives to Conservation

From an examination of the appraisal, there is evidence that the IDA's proposed project would create economic disincentives to water conservation. This project envisioned further

expansion of the water supply system to meet ever increasing demand in Amman. The main goal of the proposed management team was to develop a regular program of extensions and improvements to the secondary water distribution system. While these expansions would no doubt be needed, the IDA's vision for funding them necessitated the creation of an economic system which required ever expanding water revenues. The IDA projected that earnings from their proposed water rates would provide substantial funds for this "urgently needed program of extensions and improvements." [64] This goal is reiterated several times throughout the appraisal "Financial projections indicate that adequate funds could be obtained through water revenues to operate and maintain the expanded system and to carry out a program of extensions and improvements which would bring public water supply to a larger community." [65] One of the main provisions of the agreement between the IDA and the Kingdom of Jordan was that "water rates will be maintained adequate to cover…the costs of a program of extensions and improvements to the secondary distribution system as well as a reasonable part of the cost of future major expansion." [66] While the goals of furthering water supplies to underserved populations, reducing the rate of waterborne disease, and expanding economic activities are clearly well intentioned, the system envisioned by the IDA would have unintended consequences. By creating this revenue stream for developing expansions to the system, the IDA created a scenario where the water authority could not encourage conservation of water resources as it would kill their ability to make necessary improvements.

[64] "Appraisal of the Amman Water Supply Project," 42.
[65] "Appraisal of the Amman Water Supply Project," 49.
[66] "Appraisal of the Amman Water Supply Project," 53.

2. Four Cities Water Supply Projects

Two years after the IDA appraised the Amman Water Supply Project, the association began the process of funding a series of water projects in the outlying towns of Jordan. They focused on four projects to be funded together in Ramallah-El Bira, Azraq-Irbid (service to Irbid, Mafraq, Ramtha, and Husn), Zarqa, and Nablus (see Figure 2). While all four are significant, the Azraq-Irbid and the Zarqa projects are the focus of this analysis as the West Bank would come under Israeli military occupation after the 1967 war. Although the Jordanian government would not formally sever its economic and political ties with the West Bank until 1988, it appears that the World Bank's activities in the occupied territories ceased in 1967. The 1969 *Current Economic Position and Prospects of Jordan* report from the World Bank shows that funding for projects in the territories had stopped, and seems to indicate that the World Bank had removed the West Bank from its future development plans in Jordan.[67] Further, appraisal reports for World Bank projects in Israel in the ensuing years stipulate that funded projects were wholly outside the occupied territories.[68] From the documents, the World Bank's stance on the occupation is unclear. It is, however, likely that these two documents indicate a neutrality by the World Bank's leadership towards a conflict between two of its member states. The fate of the Ramallah-El Bira and Nablus projects is unclear in the documentation, so they are not considered in this thesis. The goals of the Azraq-Irbid and Zarqa projects were substantially similar to the Amman project: increase access to water supplies, reduce waterborne diseases, and open pathways to economic development.

[67] Europe, Middle East and North Africa Projects Department, "Jordan- Current Economic Position and Prospects" (International Bank for Reconstruction and Development and the International Development Association, December 18, 1969).

[68] Transportation Projects Department, "Israel- Second Highway Construction Project" (International Bank for Reconstruction and Development and the International Development Association, June 12, 1971).

Assessment of Existing System

As with Amman, the IDA found that a lack of a reliable water supply system was perhaps the most pressing challenge to the development of the four areas under consideration. The population had grown in each area and had outpaced existing water supplies. The targeted towns had no sizable sources of surface water and the bulk of water supply came from small springs and deep wells.[69] Drought had exacerbated water shortages in recent years and the municipalities had to resort to rationing supplies or hauling in water by trucks to meet demand, especially in the dry summer months.[70]

In Zarqa, the water system was inadequate, unreliable, and subject to sewage contamination entering the catchment area above spring sources.[71] Water quality was low, and the IDA feared the real possibility of an epidemic of waterborne diseases.[72] Rationing was common, especially during the dry season, and at least two industries had been turned away by the municipality because of its inability to meet their water needs. [73] With the World Bank's goal of increasing economic activity, it is likely that this inability to support industrial activity on the current infrastructure would have been a significant motivating factor for the IDA's funding. Most streets had water mains, but they were undersized for the demand, and resulted in interrupted service and low pressures to its 8,120 metered connections. The municipality reported that around 70% of the population was served by these connections and the remaining population was believed to be dependent on neighbors for

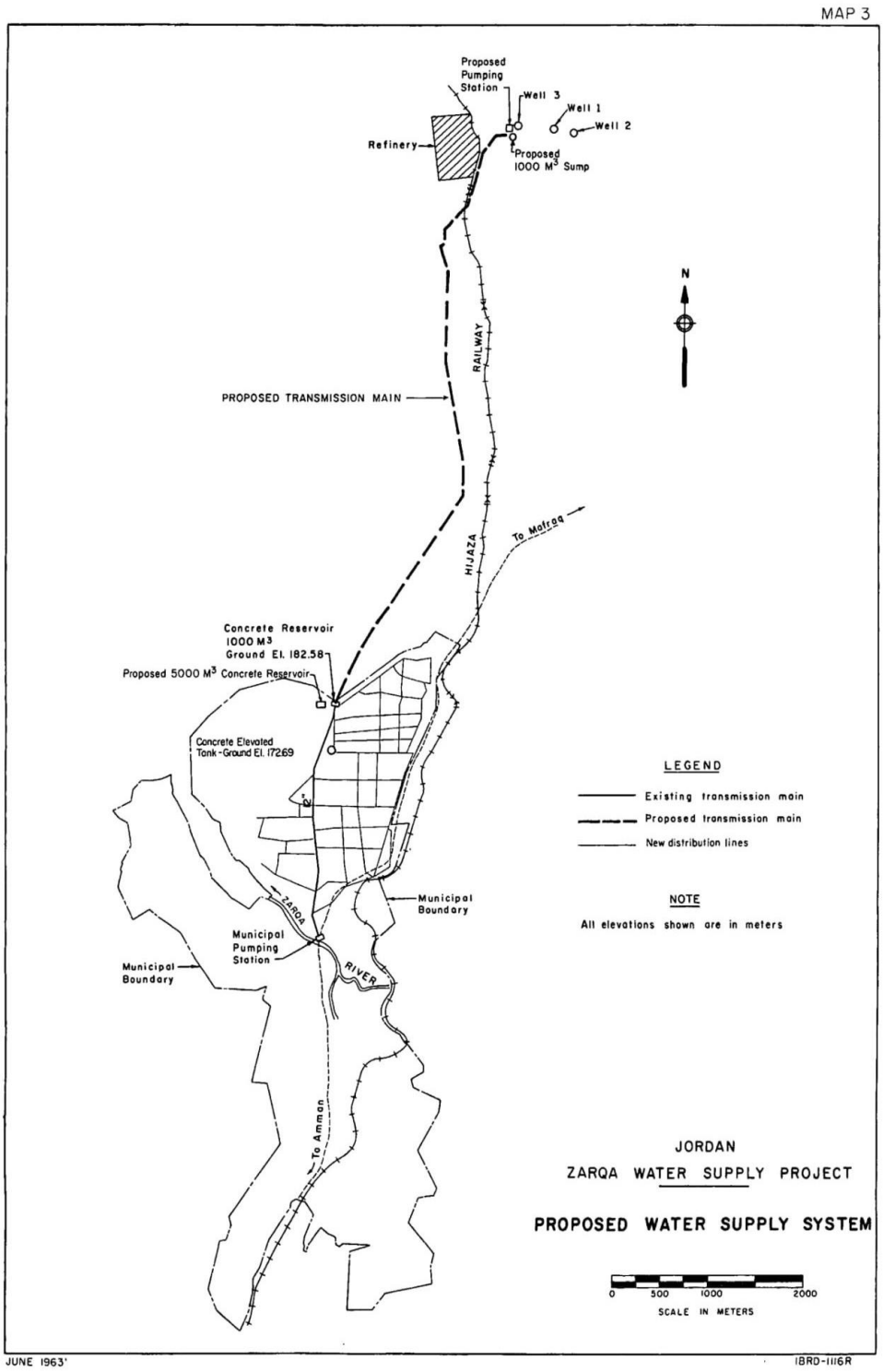
[69] Office of the President, "Report and Recommendations of the President to the Executive Directors on a Proposed Development Credit to The Hashemite Kingdom of Jordan For Water Supply Projects" (International Development Association, December 2, 1963), 9.
[70] Ibid.
[71] "Appraisal of the Zarqa Water Supply Project," ii
[72] "Appraisal of the Zarqa Water Supply Project," 81
[73] "Appraisal of the Zarqa Water Supply Project," ii

water. [74] An estimated 35% of water production failed to generate revenue, either from under registration of consumer meters or free water given to the Mosques, Churches, or the municipal government.[75]

As with Amman and Zarqa, the IDA found that the present water sources in the four municipalities to be served by the Azraq-Irbid project were insufficient. Irbid, Mafraq, and Ramtha were partially dependent on trucked water supplies, and Husn was entirely dependent on trucked supplies when rainwater cisterns became depleted.[76] The water distribution systems were limited in three of the municipalities, while no system existed in Husn. Water quality was unsatisfactory, largely due to contamination from periodic shutting off of supply and the handling of shipped water. As a result waterborne diseases were prevalent. Water consumption in the region was very low, ranging from 7 LPCD to 29 LPCD. [77] In Irbid, authorities estimated around 30% of extracted water was unaccounted for.[78] As with the Amman Water Supply project, the possibility of lost revenue because of unaccounted for water likely would have been a concern for the IDA.

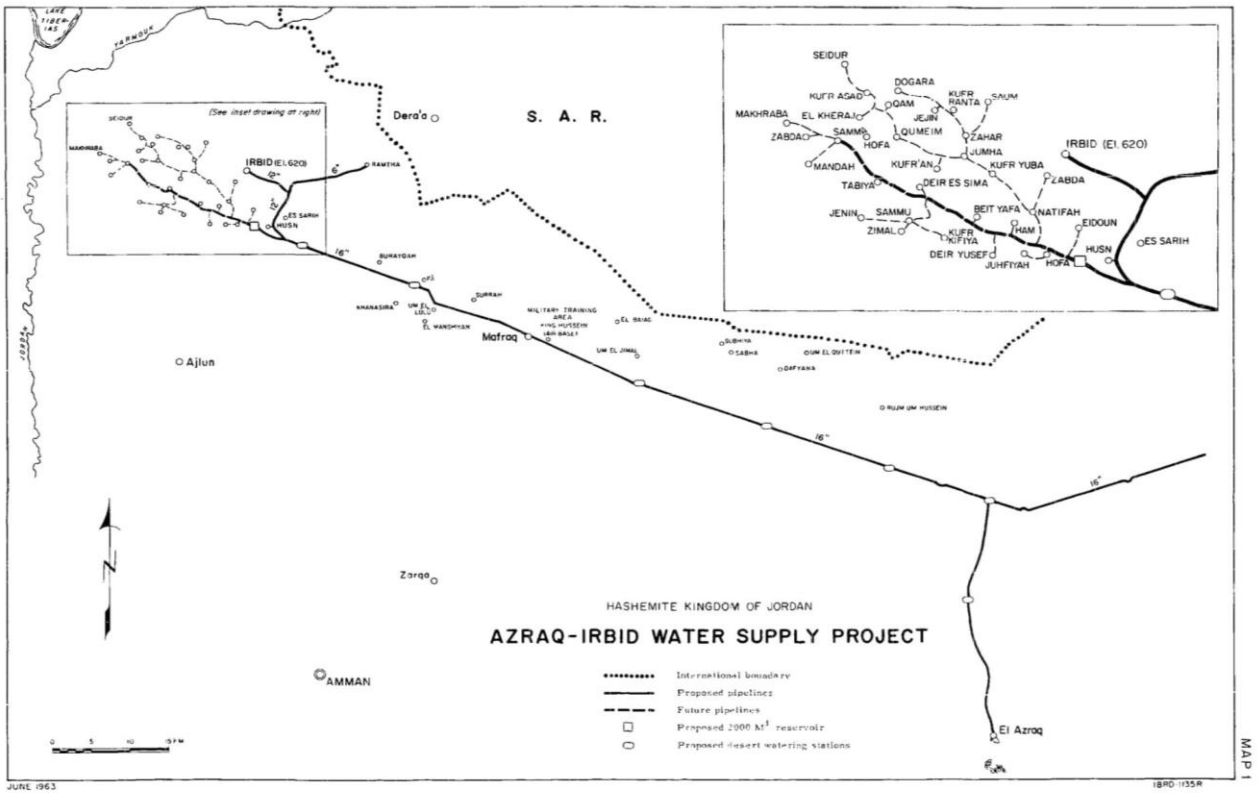
[74] Ibid.
[75] "Appraisal of the Zarqa Water Supply Project," 40
[76] Department of Technical Operations, "Appraisal of the Azraq-Irbid Water Supply Project" (International Bank for Reconstruction and Development and the International Development Association, September 16, 1963), ii.
[77] Ibid.
[78] Ibid.

Figure 5: 1963 IBRD Map Showing Existing Water Infrastructure and Proposed Infrastructure in Zarqa[79]



[79] "Appraisal of the Zarqa Water Supply Project"

Figure 6: 1963 IBRD Map Showing Proposed Azraq-Irbid Water Supply Project[80]



[80] "Appraisal of the Azraq-Irbid Water Supply Project"

Proposed Projects

The Zarqa and Azraq-Irbid projects, as well as the Ramallah-El Bira and Nablus projects, shared major components. The primary goal would be to open new collection works, build transmission mains, pumping facilities, reservoirs, and accessory facilities. The project appraisals evidence that these infrastructure developments would contribute to the World Bank's goal of promoting economic development of Jordan, and open new pathways to increase foreign exchange. All, except Ramallah-El-Bira, included the improvement or expansion of existing distribution systems. [81] For Zarqa, the plan provided funding for the development of a new well supply, a booster pumping station, a transmission main to the city, and major improvements and extensions to the distribution system. The present spring supply and pumping facilities were to be held in reserve.[82] Beyond the development of new infrastructure, the project proposed discontinuing preferential water rates given to schools and hospitals, eliminating free water to the municipality, and an overall increase in water rates to increase revenues.[83] The appraisal documents do not make any prediction as to how these rate changes would be received, but it is likely that the discontinuation would have been unpopular. This decision further evidences the supremacy of revenue generation to the World Bank.

The proposed Azraq-Irbid project was a much more ambitious project than the Zarqa. The project proposed developing new water supplies for Irbid, Mafraq, Ramtha, and Husn from springs near Azraq, and utilizing an unused petroleum pipeline to pump the water 137 kilometers northwest. Funding would be provided for expanding and improving the distributions of Irbid,

[81] "Report and Recommendations of the President to the Executive Directors on a Proposed Development Credit to The Hashemite Kingdom of Jordan For Water Supply Projects," 10.
[82] "Appraisal of the Zarqa Water Supply Project," VI.
[83] "Appraisal of the Zarqa Water Supply Project," 74, 75.

Mafraq, and Ramtha, and the construction of a distribution system in Husn. Provisions were also made to provide water to a Jordanian air base. Seven desert watering points would be constructed to provide water supplies primarily to Bedouins in the area. The appraisal notes that due to "difficulties of tradition" water from these stations would be provided at little or no cost. [84] The IDA does not indicate the reason for this decision, but this does evidence the Jordanian government's influence on the project planning. It is likely that these stations would be run without concern of revenues to aid in the government's continued control over the Bedouin groups in this area. The IDA also projected connecting around 46 villages to the pipeline in the future. As with the Zarqa project, the IDA project proposed a restructuring of existing water rates, including the discontinuation of free water to Mosques, Churches, and governments.[85] It is notable that these changes would be implemented despite the decision to provide free water to Bedouin groups along the transmission lines, possibly speaking to the level of institutional control the Jordanian government held over the villages as opposed to the bedou areas.

Justification of the Projects

As with the Amman project, the four cities projects were justified along the visions laid out in the early World Bank plans for the economic development of Jordan. The IDA believed that the services provided by the projects would substantially relieve chronic water shortages which had affected living conditions in the towns of Jordan, prevented the improvement of sanitary conditions, and obligated the municipalities to resort to expensive makeshift solutions during the periods of peak demand. [86] As with Amman, the IDA believe the projects would help reduce

[84] "Appraisal of the Azraq-Irbid Water Supply Project," 1, 45.
[85] "Appraisal of the Azraq-Irbid Water Supply Project," 44.
[86] "Appraisal of the Azraq-Irbid Water Supply Project," 16.

waterborne diseases and improve public health. Likewise, the IDA justified the investment as it would facilitate industrial expansion to further the goal of increasing foreign economic exchange.

Evidence of Economic Disincentives to Conservation

As with the Amman Water Supply Project, analyzing the Zarqa and Azraq-Irbid projects evidences the creation of an economic system with economic disincentives to water conservation. The IDA's proposed water rates to be collected by Jordan's Water Board and the municipalities were intended to be set high enough to yield revenues sufficient to cover operating expenses, repayments on long term debt, and normal year to year extensions and a reasonable part of the cost of future major expansions. [87] The IDA envisioned that the projects would be financially self-liquidating.[88] Based on Beecher and Kenny's assessment of economic disincentives to conservation in water infrastructure, this would have made it difficult for the Water Board and the municipal authorities to effectively respond to shortages. In the Zarqa appraisal, the IDA reported that the pro forma income projections would yield good returns, which would be used to expand the system. [89] The appraisal predicted that the project would increase the percentage of residents having their own connections, increasing individual water consumption, and generating larger revenues for system extensions.[90] For the Azraq-Irbid project, the IDA predicted that their proposed rate structure would encourage greater use of water form the new transmission main, especially in the early years. [91] Both projects required the borrowers to agree that water rates would

[87] "Report and Recommendations of the President to the Executive Directors on a Proposed Development Credit to The Hashemite Kingdom of Jordan For Water Supply Projects," 14.
[88] "Report and Recommendations of the President to the Executive Directors on a Proposed Development Credit to The Hashemite Kingdom of Jordan For Water Supply Projects," 16.
[89] "Appraisal of the Zarqa Water Supply Project," 76 ,77.
[90] "Appraisal of the Zarqa Water Supply Project," 84.
[91] "Appraisal of the Azraq-Irbid Water Supply Project," 77.

be maintained, in part, to cover normal extensions and a reasonable part of future expansion. [92] Again, these projects have quite reasonable goals for necessary improvements to the water supply system, but they create a system where the water authorities and local municipalities would be vulnerable if there was a decrease in water consumption. The need to maintain revenues for their expansion sets up a serious economic disincentive to conservation. As water shortages arose, whether through drought, an uptick in population, or an overall decline in available water sources, the authorities would not be able to curb water usage lest they operate at a loss-- unable to service the World Bank loans, expand the system, or maintain existing infrastructure.

3. Second Amman Water Supply Project

The First Amman Water Supply Project in 1961 had been designed to serve the needs of Amman for twenty-five years until 1985. However, in 1973, just twelve years after the first project, the Jordanian government requested an additional IDA credit for water infrastructure expansion and improvements. The original plan had been to use revenues from sales of water to fund extensions and improvements to the first supply project. Circumstance, however, had changed significantly since 1961. The first project had been designed to service a projected population of 360,000 in 1972.[93] In reality, by 1971, the population of Amman was estimated at 521,000.[94] Much of this rapid population growth can be attributed to the sudden influx of refugees who moved to the city following the Israeli occupation of the West Bank after the 1967 war.[95] As the water system was no longer sufficient for the city's needs, the IDA conducted a reconnaissance mission in

[92] "Appraisal of the Zarqa Water Supply Project," 89; "Appraisal of the Azraq-Irbid Water Supply Project," 86.
[93] "Appraisal of the Amman Water Supply Project," 21.
[94] Europe, Middle East and North Africa Projects Department, "Appraisal of the Amman Water Supply and Sewerage Project-II" (International Bank for Reconstruction and Development and the International Development Association, May 4, 1973) 2.02.
[95] Ibid.

Amman in April 1971, and sent two pre appraisal delegations to Amman and to Aqaba in 1972 and 1973 respectively. Working alongside the Jordanian government and consultants from Vattenbyggnadsbyrån of Stockholm, they designed a new project and credit to meet the city's needs.[96]

Assessment of Existing System

New boreholes, two pumping stations, two services reservoirs and 40 km of trunk mains and distribution systems, the bulk of the previous water supply project, had been completed in 1968 (original projection had been 1963).[97] A third pumping station for that project suffered from project delays and had to be re-sited. It was completed in 1972 and was, notably, constructed underground for "security reasons," potentially as a result of the 1967 war.[98] The IDA reported that even with the improvements from the 1961 project, water consumption in Amman remained very low. While the first project had been designed to increase water use from 35 LPCD in 1960 to 50 LPCD in 1972, the IDA estimated that in actuality consumption remained at around 35 LPCD in 1973.[99] This shows that despite the anticipated increase in consumption, the first Amman Water Supply Project had been unable to meet its supply goals. A significant concern of the first project had been to decrease unaccounted-for water loss, a key requirement for maintaining and increasing water revenues. While the first water supply project projected reducing unaccounted-for water loss from 39% in 1961 to 20% in 1972, the actual rate of loss in 1973 was around 64%.[100] This would have been a significant concern to the IDA, as more than half of Amman's water resources were

[96] "Appraisal of the Amman Water Supply and Sewerage Project-II," 1.03.
[97] "Appraisal of the Amman Water Supply and Sewerage Project-II," 3.04
[98] Ibid.
[99] "Appraisal of the Amman Water Supply Project," 22; "Appraisal of the Amman Water Supply and Sewerage Project-II," 2.04.
[100] "Appraisal of the Amman Water Supply Project," 11; "Appraisal of the Amman Water Supply and Sewerage Project-II," iv..

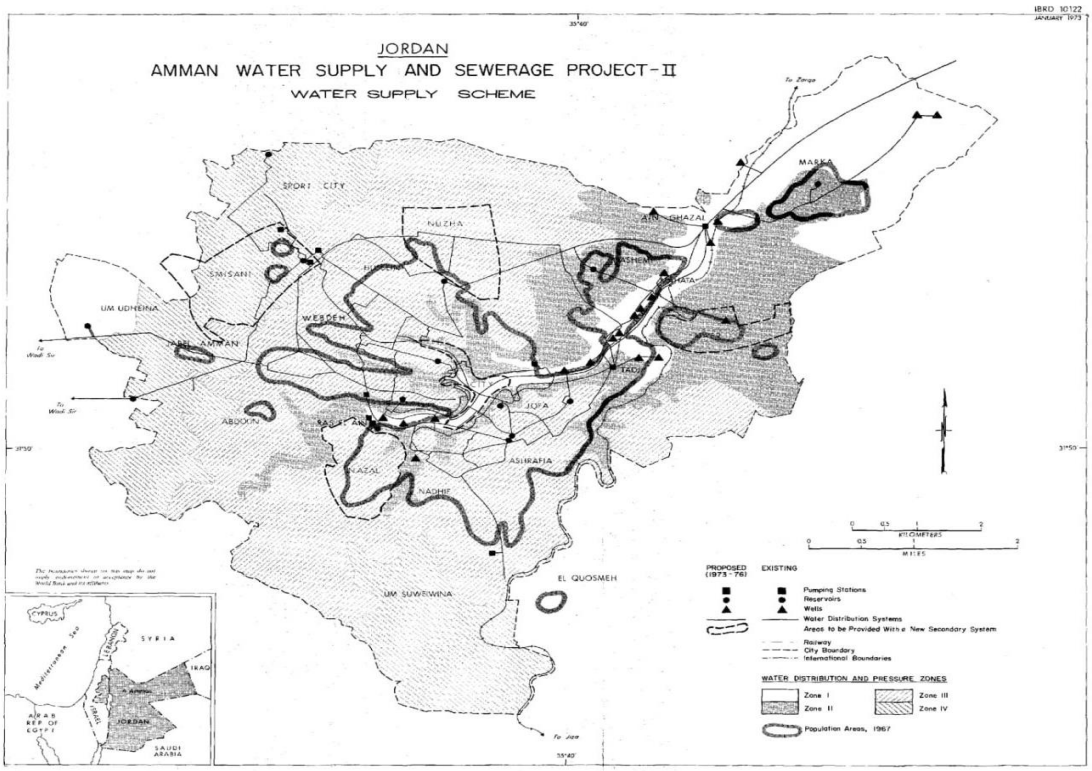
not generating the revenues necessary to maintain and expand the system or to service the previous loan. Chronic water shortages remained an issue in the city and around the country. Since the time of the first project, a sewage system had been built in Amman, however, the IDA noted that the system was insufficient to meet the demand of the expanded population and largely unhygienic.[101]

The Amman-Wadi Sir aquifer (Figure 5) remained the most important source of water for the capital. The first project had constructed additional wells and pumping stations to exploit this aquifer, and it provided the bulk of Amman's total water supply. In the second report, the IDA referenced that another aquifer system had been identified in northern Jordan and that it was under development.[102] While it did not factor into this second project, this new aquifer system could in the future provide further supply to Amman and reduce the city's reliance on the Wadi Sir aquifer. The appraisal also referenced that flowing artesian spring water had been discovered in limestone rocks near Amman, indicating a possible new source of water to meet the city's needs. [103]

The rapid population growth of the city had forced the government to implement emergency arrangements. Additional water was pumped from the Wadi Sir aquifer in 1970 to supply the existing distribution zones and areas outside of the system.[104] Soon before the IDA's report, the Jordanian government enacted a law creating the Amman Municipal Area Water and Sewerage Authority (AWSA) to oversee responsibility for the water and sewerage of the city under the Jordanian Natural Resources Authority (NRA). This decision was made in consultation with the World Bank, further evidencing the extent of the Bank's influence over the country.

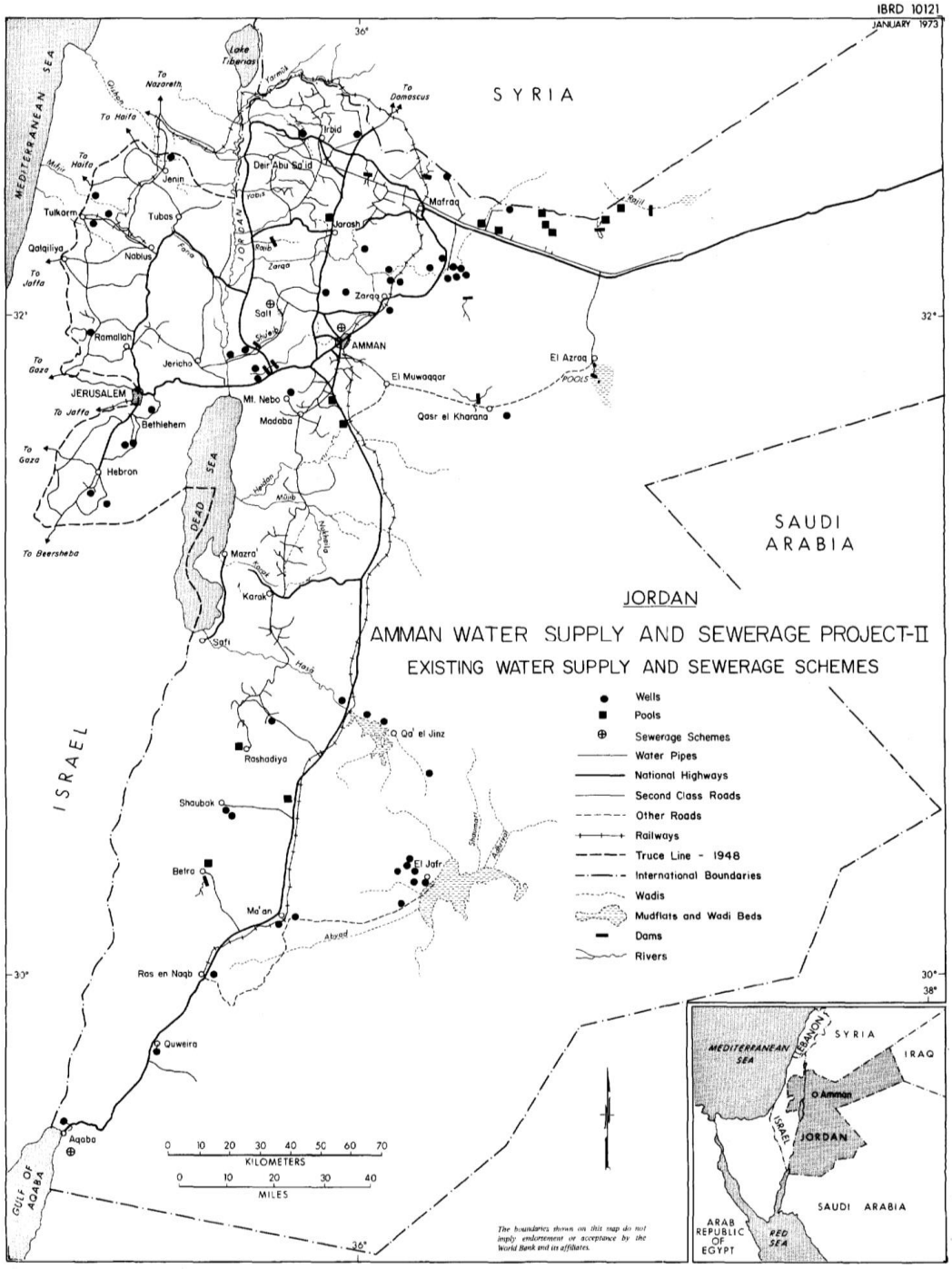
[101] "Appraisal of the Amman Water Supply and Sewerage Project-II," 2.05, 2.06.
[102] "Appraisal of the Amman Water Supply and Sewerage Project-II," 2.03.
[103] Ibid.
[104] "Appraisal of the Amman Water Supply and Sewerage Project-II," 3.03.

Figure 7: 1973 IBRD Map Showing the Amman Water Supply and Sewerage Project Water Supply Scheme[105]



[105] "Appraisal of the Amman Water Supply and Sewerage Project-II"

Figure 8: 1973 IBRD Map showing Existing Water Supply and Sewerage Schemes in Jordan[106]



[106]"Appraisal of the Amman Water Supply and Sewerage Project-II"

Proposed Project

To meet the rapidly growing water needs of the city, the IDA designed a major overhaul of the existing infrastructure. Such a project was predicted to meet existing and future water needs and contribute to the World Bank's goal of stimulating economic development and increasing foreign exchange. The IDA's actions would no doubt have been influenced by the World Bank's 1969 economic report of Jordan which showed the Bank's significant concerns about economic stagnation after the 1967 war.[107] The second Amman water supply project shares many characteristics with the original project: resources would go to the construction of new pumping stations, trunk mains, a reservoir, general system improvements, as well as extensions and improvements to the water distribution system.[108] The IDA projected that the improvements to the water system would be adequate to meet Amman's needs until 1982, with an anticipated 5% annual population growth rate. [109] The plan provided for additional developments that had not been present in the first Amman Water Supply Project or the Four Cities Water Supply Projects. This project provided for the construction of new sewer laterals, new service connections and improvements to existing sewerage facility usage.[110] The scheme would install hydrological equipment to collect data from storm water drainage around the city. [111] Additionally, the credit would provide funding to train Amman Municipal Area Water and Sewerage Authority (AWSA) staff in administration, operations, and maintenance and leak detection/repair. [112]

[107] "Jordan- Current Economic Position and Prospects"
[108] "Appraisal of the Amman Water Supply and Sewerage Project-II," v.
[109] Ibid.
[110] Ibid.
[111] Ibid.
[112] Ibid.

The credit agreement also included plans to conduct development studies of Aqaba. Aqaba, the Kingdom's only coastal city (325 km south of Amman on the Gulf of Aqaba) had been key in the World Bank's vision for economic development in Jordan. [113] Although the credit agreement was for a water supply project in Amman, the IDA would provide funding for an interdisciplinary committee in the National Planning Counsel to create a comprehensive design for the development of the region. The only justification given for this line item was that the Aqaba region had the potential for tourism and multisectoral development. [114] While largely irrelevant to the goals of the second Amman Water Supply Project, this evidences the Bank's increased concern for development after the 1967 War. Funding development projects in the city would allow for easier foreign trade and could potentially make up for lost tourism dollars from the loss of Jordanian control of pilgrimage sites in Jerusalem and the West Bank.

Evidence of Economic Disincentives to Conservation

As with the first Amman Water Supply Project, the second project evidences the World Bank's role in creating economic disincentives to conservation. The second project also relied on the generation of revenues from water sales to expand and improve the water infrastructure of Amman. While in the 1961 project the construction costs were funded entirely by credit and government funds, the construction of the 1973 project actually depended on internal cash generation. The total cost of the second project was estimated at $11.55 million USD, 75% of that cost would be covered by this loan from the IDA. The remaining cost would be borne by the Jordanian government and "internal cash generation" from the water supply system.[115] In order to fund this, water rates in the city had already been increased from 10 fils per cubic meter to 75 fils

[113] World Bank, "The Economic Development of Jordan," 1957.
[114] "Appraisal of the Amman Water Supply and Sewerage Project-II," 3.30.
[115] "Appraisal of the Amman Water Supply and Sewerage Project-II," vi.

per cubic meter in 1972.[116] The IDA projected a further increase of 10 fils per cubic meter over after 1977. The IDA noted that these water rates would bear heavily on the "poorer members of the community."[117] The AWSA agreed to conduct a study of the water tariff structure before 1974 to assess the suitability of further increases, however, the project was planned with the assumption that further rate increases would occur. The appraisal does not indicate how the project would be restructured in the event that the rate changes were found to be unsuitable. It is likely that this would further increase pressures on the water authority to maintain water revenues through consumption. These increases were, in the view of the IDA, necessary to not only service the debt undertaken by the Jordanian government, but also to fund improvements and extensions to the water system of Amman.[118] The appraisal also explicitly discussed their revenue projections from the system, estimating that the economic rate of return on the water supply component of the project would be at least 10%.

As with the first Amman water supply project and the four cities water supply projects, this system pushed by the IDA would create economic disincentives to conservation of water. The project is, perhaps, unique in illustrating the precarious nature of this economic system. This second project was largely the product of conflict. As with the first project, Amman had seen rapid population growth as a result of refugees fleeing Palestine for the eastern bank. While the system set up by the IDA in the first project was designed to be self-sustaining and self-replicating it was unable to respond to these surges. The IDA further expressed concerns that the efficiency of tariff collections had averaged only around 70% in recent years.[119] These systems set up economic

[116] "Appraisal of the Amman Water Supply and Sewerage Project-II," 6.04.
[117] "Appraisal of the Amman Water Supply and Sewerage Project-II," 6.05.
[118] "Appraisal of the Amman Water Supply and Sewerage Project-II," 6.04.
[119] "Appraisal of the Amman Water Supply and Sewerage Project-II," 3.10, 3.14.

disincentives to water conservation with a goal of funding expansions and maintenance through revenue generations, but they were unable to do so. Clearly the World Bank could not have predicted the war that brought about the need for the 1973 project, but this evidences that this system of economics was insufficient for Jordan's needs.

4. Secondary Evidence: Hussein Thermal Power Project

The World Bank's activities in Jordan were not limited to the funding of water supply projects. The same year as the second Amman water supply project, the IBRD extended credit to the Kingdom for the Hussein Thermal Power Project. As with its water supplies, Jordan's energy supplies were limited. Unlike neighboring countries, it possesses no oil reserves, nor coal or natural gas. The country's power problems, however, were not as severe as its water problems. Fuel could readily be purchased from outside the country as long as funds were available. But while these troubles were not as dire as Jordan's water shortages, this project evidences that the World Bank readily deployed these allegedly self-sustaining methods of expansion of vital infrastructure.

Recognizing the disorganization and limited capacity of the Jordanian electricity sector, the bank would provide a credit of 50% of the funding for a new power project of the Jordan Electricity Authority (JEA). The other 50% of the project's $24.4 million USD cost would be funded through a loan from the Kuwait Fund for Arab Economic Development.[120] The project would construct a thermal power station at Zarqa with two 33 megawatt steam-electric units and a 12 megawatt gas turbine to provide electricity for the country. Initially, the plan called for the generated electricity to be sold solely to the Jordanian Electricity Power Company (JEPCO) by the

[120] Europe, Middle East and North Africa Projects Department, "Appraisal of the Hussein Thermal Power Project" (International Bank for Reconstruction and Development and the International Development Association, May 3, 1973), iii.

JEA to supply energy to the Amman. The plan projected that by 1978 or 1979, the JEA would be able to begin sales of electricity to the Irbid District Power Company.[121]

While there are obvious differences between the IDA's approach to a water project and the IBRD's approach to an electricity generation project, the Hussein Thermal Power Project is evidences the same type of economic disincentives to conservation as the water supply projects. As with the water supply projects, the IBRD expected that expansion of the electricity system in Jordan under the JEA would be financed through internal cash generation from electricity sales.[122] The credit agreement stipulated that an agreement between the Jordanian government and the JEA that tariffs would be maintained at a high level to ensure an annual rate of return of at least 9% on average net fixed assets in operations.[123] The agreement likewise stipulated that the JEA would not incur additional long term debt unless said debt was expected to be covered at least 1.5 times by its internal net cash generation.[124] This would essentially force the authority to maintain revenues. If there was a need for further financing major expansions, the JEA would have to show that it could, through internal cash generation alone, service the debt. The JEA would not be able to encourage reduced consumption without being unable to finance expansions. With the World Bank's requirements for internal cash generation and its demand that the JEA avoid incurring additional debts to fund infrastructure, the Bank set up a system where sales had to continue for the very existence of the infrastructure.

[121]"Appraisal of the Hussein Thermal Power Project," vi.
[122]Appraisal of the Hussein Thermal Power Project," 6.07.
[123]Appraisal of the Hussein Thermal Power Project," 6.14.
[124]Appraisal of the Hussein Thermal Power Project," 6.15, 7.02.

5. Secondary Evidence: National Water Supply Project Tunisia

The World Bank's funding of water supply projects was not limited to Jordan during this period. The IBRD and IDA worked on development projects around the Middle East and North Africa, spreading its influence and vision of post-war development across the region. While the staff appraisal reports for water projects in other states demonstrate that the World Bank tailored designs to each country's unique needs, they evidence the bank employed the same economic principles in each case. These economic principles evidence the creation of disincentives to conservation across the region. One such project which evidences the creation of these economic disincentives is the National Water Supply Project of Tunisia.

There are several obvious differences between the water situation in Tunisia and Jordan. Tunisia was not subject to a massive influx of refugees. Tunisia had been subject to colonization and control by France rather than Britain, gaining independence in 1956. Many of the larger cities, especially those with sizable populations of European expat, had prior functioning water infrastructure. The two countries, however, shared several similarities in the eyes of the Bank. Both lacked sizable sources of freshwater. Both had concerning levels of population growth. The water systems in both were sufficient for their respective needs. And, perhaps most importantly, the World Bank believed that improved water infrastructure was critical for the economic development of both.

For the National Water Supply Project, the IBRD and the IDA partnered with the Government of Sweden's Swedish International Development Association (SIDA). The Bank and SIDA conducted three joint missions to Tunisia between 1966 and 1968. Based on their findings, they designed a three fold program to improve the national water system and ensure potable water

to important regions of the country.[125] These three phases of the water supply plan were largely independent elements, designed to stand alone, but the IBRD, the IDA, and SIDA planned the financing of the project and generated their projections on the assumption that all three would be completed as scheduled. The first phase was a group of high priority works to meet the immediate needs of the country, to be completed between 1968-1973. The second phase, envisioned as a second project, consisted of future works that had not yet been clearly defined, but was projected to be ready for execution between 1971-1973. The final phase consisted of a series of minor improvements and works already underway and financed by the Tunisian government during the 1968-1973 period. The first phase would consist mainly of improvements and expansions of the supply and distribution systems of the two most populous and economically important regions, Tunis and the Sahel, as well as the towns of Nabeul and Hammamet which were important for tourism.[126] The Bank noted that after independence in 1956, the Tunisian government had invested into water supply systems in smaller cities with had been neglected and that an increase in water sales from this investment was particularly visible in the Sahel and the northern provinces.[127] The Bank further emphasized that to avoid resorting to a costly scheme of desalination to meet the country's needs, all known freshwater resources would need to be exploited before 1985. [128]

In Jordan, the World Bank financed water projects that were largely creating new systems, both in the actual water supply and in the management of the supply. In Tunisia, however, a more robust, existing system already existed. The task for the World Bank and SIDA, then, was transformation rather than creation. Negotiations for the project were held between the World

[125]Projects Department, "Appraisal of the National Water Supply Project Tunisia" (International Bank for Reconstruction and Development and the International Development Association, October 28, 1968), i.
[126]"Appraisal of the National Water Supply Project Tunisia," iii.
[127]"Appraisal of the National Water Supply Project Tunisia," 2.05.
[128]"Appraisal of the National Water Supply Project Tunisia," 2.03.

Bank, SIDA and the Tunisian government in 1968. Evidencing the World Bank's influence, the Tunisian delegation announced that their government had successfully created the Societe Nationale d'Exploitation et de Distribution des Eaux (SONEDE), a national water authority. It would function autonomously from the government, and its administrative and accounting structures had been prepared by consultants approved by the World Bank. The appraisal evidences that the systems by which SONEDE would operate would create economic disincentives to water conservation. As with the Jordanian water supply projects, expansion of the Tunisian system was dependent on internal cash generation.[129] The project had been designed under the assumption that SONEDE would be able to internally finance its own improvements. The financial details of the project show that the Bank planned the system to reserve around 35% of its revenues for infrastructure investments.[130] The World Bank anticipated that SONEDE would only have to borrow further funds for "occasional large projects." [131] These details evidence that the same economics which created disincentives to water conservation in Jordan were applied across the region.

[129] "Appraisal of the National Water Supply Project Tunisia," 6.07.
[130] "Appraisal of the National Water Supply Project Tunisia," 6.11.
[131] Ibid.

V. Analysis & Conclusion

These projects show that the World Bank's involvement in development in the Middle East during the 1960s and 1970s directly lead to the creation of economic disincentives to water conservation. The first Amman Water Supply Project shows that the system was created from its inception in such a way that economic disincentives to water conservation were inevitable, whether intentionally or inadvertently. The Bank required that revenues be maintained to ensure the system could maintain and expand itself. These requirements are, of course, reiterated in the subsequent projects, both in Jordan and outside.

In 1972, a roundtable discussion, *Bretton Woods Revisited*, was published evaluating the two major institutions which emerged from the Bretton Woods conference: the IMF and the IBRD. In his essay, Raymond Mikesell, an economist who served as one of the technical staff of that conference, assessed "The Emergence of the World Bank as a Development Institution."[132] He argued that "The World Bank's operations have not been guided by any particular growth or development model[…] the Bank has eschewed any identification with target rates of growth or the achievement of a condition of self-generating growth." [133] The evidence presented in this project, however, contradicts Miksell's assessment. The World Bank and its subsidiary organizations, clearly promoted a model of water supply development that operated on expansion and maintenance through water revenue generation. This model was not isolated to a single

[132] Raymond Mikesell, "The Emergence of the World Bank as a Development Institution," in *Bretton Woods Revisited: Evaluations of the International Monetary Fund and the International Bank for Reconstruction and Development* (University of Toronto Press, 1972).
[133] Ibid, 78.

country, and it appears from the Hussein Thermal Power Project, that similar models were applied to other sectors. As both Kenny and Beecher's research into water management indicate, this revenue dependant model of expansion and maintenance puts water utilities in a difficult position. When water scarcity is on the horizon, a utility should be able to respond by encouraging conservation to ensure demand does not exceed supply. If a utility depends, however, on an economic system which requires maintained revenues for its survival, they will be unable to encourage that necessary conservation.

Examining the sources which hint at the World Bank's motivations, the speeches, the newsletters, even the reflections of Bretton Woods economists, do not appear to indicate that the economic model applied to the development of water systems in the Middle East and North Africa was known to be harmful. Indeed, the project appraisal documents appear to show good will and intentions on the part of the Bank staff when applying these models of development. This finding could open up an interesting discussion about the actions of International Organizations and Western state-sponsored development agencies. The goals of ensuring access to water supplies, improving public health, promoting economic development to reduce global poverty, are on the surface noble, though perhaps too optimistic. The purpose of this thesis is not to apply bad-faith criticism to the actions of the Bank during this period. That being said, it is clear that an unintended consequence of the organization's development efforts was creating economic disincentives to water conservation.

As the population of the Middle East and North Africa continue to rise, as water tables continue to fall, and as climate change exacerbates challenges faced by the region's peoples, water solutions must be found. It is likely that these solutions will become increasingly radical in the years to come. Virtual water importation will likely continue to rise. Desalination will continue to

be investigated. Fossil water sources will continue to be drilled. Perhaps open ocean mariculture will become a viable part of the solution. Regardless of the massive projects the governments of the Middle East and North Africa undertake, economics will remain a major factor. The solution to water insecurity in the region will be multifaceted, but states and international organizations should not neglect a thorough examination of the economic systems which underlie their water sectors. Water utilities must be able to respond to shortages effectively, and understanding the factors which disincentivize them from conservation efforts may make their efforts more effective.

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