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Financial Innovations Lab Report



*Financial Innovations in Israel:
Revolving Fund for River Restoration*

FINANCIAL INNOVATIONS LAB REPORT



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Financial Innovations Labs bring together researchers, policy makers, and business, financial, and professional practitioners for a series of meetings to create market-based solutions to business and public policy challenges. Using real and simulated case studies, Lab participants consider and design alternative capital structures and then apply appropriate financial technologies to them.

This Financial Innovations Lab Report was prepared by Caitlin MacLean and Glenn Yago.

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TABLE OF CONTENTS

INTRODUCTION..... 5

PART I: ISSUES & PERSPECTIVE 9

- The Model: The U.S. State Revolving Fund
- The Financial Innovations Lab

PART II: FINANCIAL INNOVATIONS FOR DEVELOPING
A REVOLVING FUND FOR ISRAELI RIVER RESTORATION 17

- Step 1: Establish the Fund’s Governance
- Step 2: Identify Potential Revenue Sources
- Step 3: Map Potential Projects
- Recommendation: Establish Working Groups

CONCLUSION 25

APPENDIX: FINANCIAL INNOVATIONS LAB PARTICIPANTS 26

ENDNOTES 27



Each river or tributary offers unique potential revenue sources according to its geographic location, size, and primary usage.

INTRODUCTION

Sixty years after independence, Israel faces a severe environmental crisis: many of its rivers and streams are dying. Historic increases in population and economic output have brought escalating demands for water. In addition to the problem of overconsumption, many rivers have become dumping grounds for industrial, commercial, agricultural, or residential waste. Seasonal streams carry more sewage than water. Toxins seep into the Mountain Aquifer. And over-pumped wells along the coastal aquifers are refilling with seawater. Pollution, drought, and excessive extraction have brought water shortages that will have social and political ramifications for years to come.

In the historically significant Kidron Valley, which runs from Jerusalem to the Dead Sea in the east, the Kidron River experiences a constant flow—28,000 cubic meters a day—of raw sewage and wastewater along its narrow course, making it Israel's greatest sewage hazard.¹ Running from the Be'er Sheva Valley in the Negev to the Mediterranean, the Besor forms the largest river basin in Israel and flows past a UNESCO World Heritage Site. Yet for the forty miles from Hebron to Dimona, the Besor faces significant pollution from untreated sewage, industrial effluents, and agricultural and urban runoff that make their way into the shallow coastal aquifers.² Reputed to be Israel's most poisoned river, the Kishon flows through the Galilee and has suffered decades of chemical dumping, most notably of mercury, ammonia, and oil from Haifa's industrial parks. Increased cancer incidence and genetic toxicity in the river's fish are just a few of the consequences of years of devastation.³ All told, pollution has dramatically altered Israel's terrain, its climate, and its ecosystems.

Unfortunately, most communities along these rivers and tributaries have been unable to realize the full economic potential of their waterways through increased tourism, recreation, or environmental services, such as wastewater recycling, groundwater recharge, and land reclamation. Restoration⁴ on a national scale would reestablish the important ecological balance necessary to revitalize waterways, recharge the aquifers, and lessen the negative environmental impacts in areas of irremediable degradation. It would also generate economic growth for communities that have struggled in the current climate (Israel's economy contracted by an estimated 1.7 percent during the first half of 2009⁵).



The Kidron River experiences a constant flow of raw sewage and wastewater, making it Israel's greatest sewage hazard.

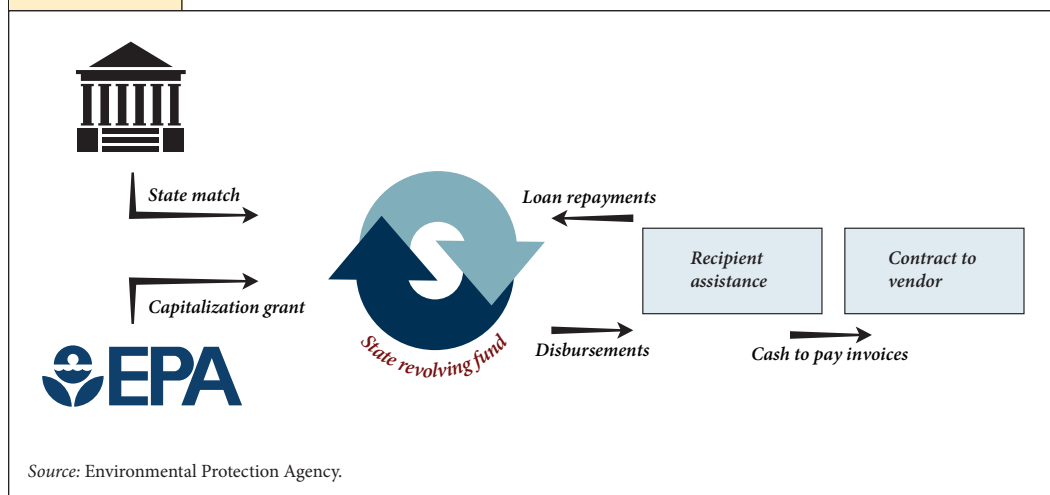
Photo courtesy of Ram Almog, coordinator of the Kidron master plan

Most Israeli river revitalization projects are funded solely by the government and local authorities, and structured as one-time grants. Such funding, however, is difficult to obtain and chronically delayed; and the one-time-only grant formula cannot meet the large-scale, long-term financial needs of river/stream revitalization. Capital tends to trickle down from ministries to local river authorities, and restoration projects find few sustainable funding sources. Grants don't leverage private investment—one of the solutions proposed later in this report—to generate larger financing pools and guarantee steady capital streams.

Over the past few decades, innovative ideas for water project finance and development have emerged around the globe. One model in particular seems well suited for adaptation in Israel. In 1987, the U.S. Congress enacted the Federal Clean Water Act and replaced the Environmental Protection Agency's aging grants programs with Clean Water State Revolving Funds (SRFs).⁶ In an SRF, a federal grant is pooled with a state's own funds, which can include bond sales to capital market investors. The state then makes loans to local municipalities and organizations, which repay the loans from project revenues and local taxes. The repayments also recapitalize the state fund, creating a sustainable resource for funding.

FIGURE
1

Model of a Clean Water State Revolving Fund



“With the SRF model, you’ve lowered the cost of capital, and it has brought a savings back to the local economy.”

Glenn Yago,
Milken Institute

SRFs have ensured a steady flow of capital into river projects. Through 2008, they provided over \$68.8 billion in assistance, serving more than 115 million people. Between 1987 and 2005 alone, the funds created more than 600,000 construction jobs and 116,000 additional jobs.⁷

With that success in mind, the Milken Institute convened a Financial Innovations Lab in Jerusalem on November 5, 2008. More than forty business professionals, scientists, ministry officials, capital market investors, and water experts participated. They examined the Israeli Government's current funding programs, as well as legislative and regulatory changes that will be necessary to develop the country's first revolving fund. They discussed which rivers might serve as case studies for a revolving fund model. They also addressed financial innovations and incentives, and analyzed next steps.

The Lab examined the following steps for creation of a revolving fund:

- **Establishment of the Fund's Governance.** Given the intricacies of water management, the structure of the revolving fund is critical. Its architects must also identify eligible projects and the specific types of financial assistance for each. Implementation of the fund will require new legislation from the Knesset, working with the Ministry of Finance.
- **Identification of Revenue Sources.** Each river or tributary offers unique potential revenue sources according to its geographic location, size, and primary usage. The cash flow projections will determine the fund's diversification; it could include a wide mix of projects, such as wastewater treatment, tourism and recreational sites, park and entertainment fees, and dedicated "green" real estate development. Existing government funds—quarry reclamation funds, water authority resources, etc.—might be allocated to the revolving fund in order to enhance capital investment and provide additional financial security.
- **Mapping of Project Case Studies.** Each proposed restoration project must be analyzed in terms of projected expenditures and potential income and cash flow, with follow-up studies to confirm actual finances.

*There isn't a difference—state or company or municipality,
they can each use the same tools.*

Norman Feder, Caspi & Co.

ISSUES & PERSPECTIVE

The operational requirements for river reclamation, restoration, and management are complex and expensive. For Israel, situated in an arid climate and coping with decades of pollution, over-extraction, and water politics, this is especially true. Current estimates for restoration of the Yarqon River alone run to US\$175 million and include oversight by seven municipalities, as well as eighteen ministries and legislative bodies plus the Yarqon River Authority.⁸ The Alexander River, which flows through northern Tel Aviv, has undergone \$13 million in revitalization efforts by the Alexander River Restoration Administration (created in 1995) and twenty other government entities.⁹

Israel's legislative and financial structures designated for river restoration have evolved little over the past sixty years, despite the dwindling of natural resources and rapid population and industrial growth. Over the past decade, this has begun to change. In 2002, the government undertook an aggressive initiative to treat wastewater, desalinate seawater and brackish freshwater, and restore or reclaim the country's dying rivers.¹⁰ Today Israel ranks No. 1 worldwide in recycled water usage, targeting 65 percent for agricultural purposes.¹¹ Six desalination plants are under construction, including the world's largest, at the southern city of Ashkelon.¹² But experts warn that major ecological damage may be irreversible unless the nation's rivers and streams are at least partially restored within the next few decades.¹³ Using cutting-edge technologies and financial structures that have already been applied to desalination and water recycling projects, Israel has the potential to make its river revitalization another success story of national innovation.

The coordination of a comprehensive river restoration project, Lab participants said, involves wading through the bureaucracies of too many local authorities and municipalities. The Ministry of Environmental Protection was only created in 1988 (in contrast, the U.S. Environmental Protection Agency began operations in 1970), and more than two decades later, it implements little public policy affecting rivers and streams, and less than one-tenth of the legislation pertaining to the environment.¹⁴ Twenty-one ministries and thirty-five local authorities share responsibility for enforcement of environmental protection laws, with little precedent for specific governmental entities working together. Moreover, for fiscal year 2008, the Ministry of Environmental Protection was allotted only about 0.08 percent of the government's total operating budget, approximately \$50 million. This does not, however, take into account the budgets of the other ministries and local public authorities that contribute to environmental governance, from the Ministry of the Interior and the National Parks Authority to the government-mandated Mekorot (Israel Water Company).¹⁵

Such bureaucracy has created a funding scenario plagued with delays and inconsistencies. Applicants—local authorities, private companies, or individual entrepreneurs—generally request one-time grants. They must then work with all the ministries and authorities that have jurisdiction over their specific projects.

In recent years, municipalities have created local river authorities that pool resources to manage water projects. The first of its kind was the Yarqon River Authority, established in 1988 (the same year as the Ministry of Environmental Protection) under the Streams and Springs Authorities Law. It is responsible for revitalization and development along the entire Yarqon watershed, and has undertaken a rehabilitation plan to reduce or eliminate significant pollution and to create pedestrian parks along the riverbanks. Working with other ministries and municipalities, the Yarqon River Authority has adopted an integrated approach but coordinates all areas of water management, from wastewater treatment to parks creation.

The Yarqon model illustrates how a community can enjoy the benefits of a revitalized river. Tel Aviv residents frequent the pedestrian parks, and townhome and high-rise construction has contributed to the area's economic growth. The Yarqon

success highlights the integrated management approach in which the legislative bureaucracies have been consolidated around the river projects. However, limits placed upon the river authority, including the inability to collect fees or taxes, demonstrate the regulatory barriers that hinder comprehensive river management.

Israel has unique funding challenges. Revenues used in models elsewhere around the world—municipal taxes, for example—do not apply in Israel. The search for new funding sources will be a major hurdle, participants predicted.

THE FUNDING CHALLENGE: TAX LAW IN ISRAEL

Israel's tax laws differ from those in most Western countries. At the beginning of each fiscal year, the Knesset determines the rate for the *arnona* residential property taxes. The *arnona* constitutes the largest residential property tax collection in Israel and goes to local municipalities to pay for local services, also determined by the Knesset. The *arnona* is not based on the value of a citizen's property; rather, it is based on the size of the property, the materials used in structural construction, and the zoning district within which the property falls. This makes using property taxes as a means of municipal revenue problematic because increases in property *value* from municipal improvements are not recalculated for the tax. Also, because the Knesset makes strict guidelines as to the specific uses of the *arnona*, it would be considered somewhat "backdoor" for local towns to redirect the municipal taxes to other uses.

From time to time Israeli citizens also pay a "betterment" tax. This tax is levied when authorities change the zoning of a neighborhood based on overall community improvements. But the proceeds of this tax do not go to the local government either. They head to the Israel Tax Authority, part of the Ministry of Finance. The Tax Authority allocates the revenue as it sees fit, not necessarily to the area from which the tax was collected.

The Tax Authority also collects on the sale and purchase of real estate, the amount based on levels of value. There is a tax in place on undeveloped land, which since 2000 has been entirely cut, though the legislation still exists for future collection.

Lab participants agreed that the cumbersome and tortuous processes involved with working through the numerous national and local bureaucracies pose a serious challenge to river revitalization. They agreed on the need for legislation that offers effective tax assessments and allocations, and generates real income for environmental projects. And they acknowledged that the solution to this issue will also involve the participation of the relevant ministries and communities, as well as capital market players. An integrated approach, strong leadership, and a clear vision are required to ensure a smooth transition, align incentives, and optimize results, noted one participant. This is especially desirable when trying to pool capital in a fund for use in different municipalities for different purposes.

THE MODEL: THE U.S. STATE REVOLVING FUND

When Congress established state revolving funds in 1987, the federal grant-awarding system resembled that in Israel today. At both the federal and state level, the Environmental Protection Agency disbursed one-time grants to local communities. However, as demand for funding grew, policy makers and capital market experts began to think creatively about how to leverage finances: to generate, for example, \$2 million of pooled capital from a one-time \$500,000 grant. Under the SRF structure, a state applies for a federal capital grant, which requires a 20 percent local match. The awarded grant is then supplemented with capital market investment. The state's funding allocation targets any number of projects at either the small town and city level, much as a fund in Israel would target various municipalities.

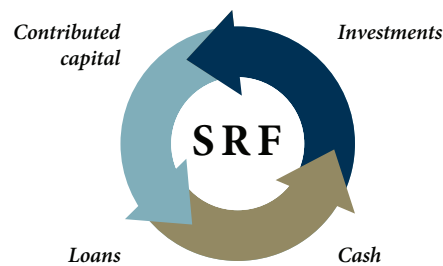
Because the funds are state-specific, their structures vary. All, however, start with the government capitalization grant and the state match. The state then uses the funding to make loans to cities and towns for restoration projects. Interest rates for these loans on average amount to 2.2 percent, well below market rates.¹⁶ Over time (generally, twenty years for repayment), the revolving fund loans save communities almost 20 percent toward capital costs. The repayment, generated through a combination of fees and surcharges placed on services, as well as municipal taxes, also recapitalizes the fund.

The fund's revolving structure allows it to continue making loans to local river and stream projects because they in turn generate sustainable income through local taxes or tourism fees, for example, which repay the original investment and recapitalize the fund. Finally, the fund is rated on the entirety of its program, not on the loans made to specific projects. This pooling of projects to reduce risk through diversity is an integral component to the SRF program's success.

Moving forward from Israel's current funding structures, local river authorities could leverage their existing governmental aid resources with capital market investment through the sale of municipal bonds, which would support more than one project at a time (see figure 2).

FIGURE
2

State revolving funds all begin with equity



Source: Susan Weil, Lamont Financial Services Corporation.

A state must consider the health of its economy when structuring its revolving fund. According to Lab participant Susan Weil of Lamont Financial Services Corporation, some states have no difficulty meeting the federal grant matching requirement, while others must seek out additional seed capital to leverage their financial resources to meet the 20 percent obligation.

CASE STUDY: MISSOURI STATE REVOLVING FUND

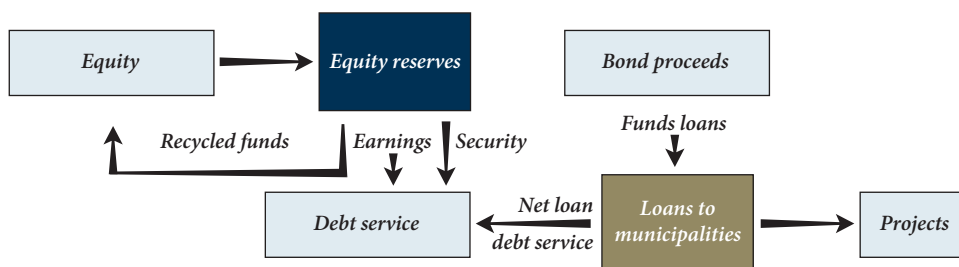
The “Show Me” state, Missouri counts tourism and agriculture as its top industries. The state also ranks twelfth in the nation for the volume of loans given through its SRF program.¹⁷ Despite a slow start, Missouri has completed 150 loans to its communities since 1987, resulting in over \$1.7 billion in construction. The state’s residents vote to approve any referendum for project financing and take an active interest in the success and subsequent repayment of any loan.

The state’s humid climate and rocky terrain present unique challenges; its SRF must accommodate an unusually diverse array of funding projects. Cities and municipalities have had to be creative in thinking of revenue sources to repay the SRF loans. Branson, for example, has a population of just 3,706 yet built itself into “the entertainment capital of the Midwest,” hosting 5 million tourists per year. When it was clear that the water infrastructure was inadequate for the needs of the community and the flood of tourists, the city council approved a \$56 million wastewater system capable of meeting both stringent discharge limits and increased demand. Because the project’s budget could not possibly be paid by the town’s small population, the city enacted a 2 percent tourism tax on the cost of hotel rooms and entertainment, and a 0.5 percent tax on restaurant tabs. Moving the debt responsibility to the tourism industry has enabled Branson to repay its SRF debt for the past fourteen years.

There are two basic SRF models. The “reserve” model, which Missouri employs, uses the original equity from the government to create a pool that secures the fund from potential default. The size of the reserve can vary anywhere from 30 percent to 70 percent of the amount of the overall transaction. Bonds are then issued, with the proceeds providing the loans to local communities for river projects (see figure 3). The interest from the reserve is used to subsidize the loans. At 70 percent, Missouri’s reserve is the highest in the nation and improves the creditworthiness of the SRF, ensuring a high bond rating from credit agencies. This in turn allows borrowers to obtain a 1.85 percent interest rate. “Early on in the program,” said Steve Townley of the Missouri Environmental Improvement and Energy Resources Authority, which oversees the SRF program, “we made an election to strive for a AAA rating from two of the rating agencies, Fitch and Moody’s.”

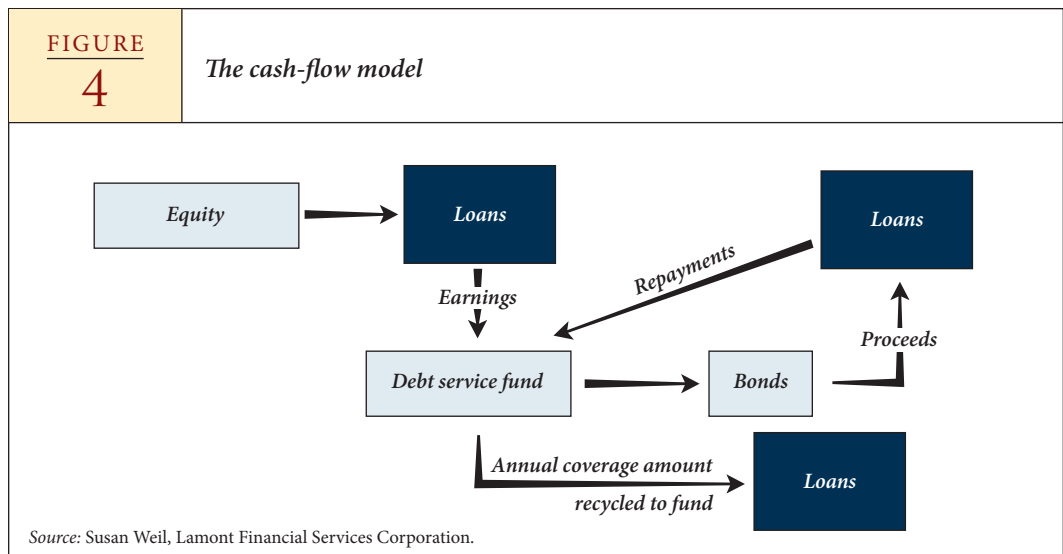
FIGURE
3

The reserve fund model



Source: Susan Weil, Lamont Financial Services Corporation.

The second model, a “cash-flow” model, uses the government equity to originate direct loans to a state’s communities. The repayment of these loans is pledged to the bond issuance. Proceeds from the sale of the bonds go to fund additional loans, creating a collateralized cash flow (see figure 4). “More loan payments are coming back than are necessary to pay the debt,” said Susan Weil, explaining the success of the program in California. Coverage from the direct loans provides both added security and the subsidy on the loans.



Some states use a hybrid model of these structures, setting aside a portion of the original equity for a reserve and the remainder to fund direct loans. SRF loans have benefited 2,262 communities around the country, saving local towns and cities almost 20 percent on total project costs over the period of the loans. They have provided returns to the state and tax payers of almost two and a half times on the federal investments. Nearly 22,000 loans have been made, including 1,900 to farmers to improve their agricultural management.¹⁸ In Missouri alone, SRFs have preserved \$600 million for local economies through loans that might normally have gone to outside firms, while creating 94,000 construction jobs and more than 38,000 permanent jobs. In 2008, U.S. state revolving funds contributed \$2.7 billion for water treatment facilities and \$2.9 billion for sewer construction.¹⁹ In 2008, SRFs also made more than \$220 million available for a variety of “nonpoint-source pollution” projects, which target pollution associated with seepage, drainage, or runoff issues. These include sanitary landfills and brownfield rehabilitation, urban storm-water runoff management, and agricultural best management practices.

Given the differences between U.S. and Israeli legislation and regulation both for funding and for capital market investment, Lab participants concluded that more research is necessary to determine the organizational guidelines for an Israeli revolving fund and to name the appropriate bodies for its oversight and governance.



Lab participants Shmuel Brenner and Steve Townley discuss current project revenue used through Israel's Ministry of Environmental Protection.

Photo: Milken Institute.

THE FINANCIAL INNOVATIONS LAB

The Lab focused on one financial innovation, the revolving fund, initiated by the U.S. Congress under the Clean Water Act and replicated in Eastern Europe, the United Kingdom, Asia, and Latin America. Lab participants agreed that Israel could localize and apply some variation of this model. However, creation of a revolving fund in Israel will require regulatory innovation.

Clive Lipchin of the Arava Institute for Environmental Studies moderated the first of three panels, “Defining the Problem: Current River Challenges.” Participants with interests in various rivers and tributary streams discussed current best practices in water management, as well as the challenges of working with Israeli governmental bureaucracies.

The second session, “Environmental Financing in Israel,” focused on the current governmental structures that fund river projects. Shmuel Brenner, who founded the Ministry of Environmental Protection, described how legislation generally makes its way through ministries and authorities on its way to river projects. Participants from the Ministry of Finance explained the funds they currently manage.

The third panel, “Structuring the Fund: Financing in the United States,” examined the model of the state revolving fund and addressed the differences between U.S. and Israeli funding regulations. U.S. experts discussed optimal structuring processes and outlined innovations that would best translate to Israel. Over the course of the Lab, participants developed three steps that would be necessary to implement a similar fund in Israel. A follow-up session was held in March with additional river and drainage authorities, and other regional stakeholders.



Creation of a revolving fund in Israel will require regulatory innovation.



The success of the fund is dependent on its sustainability amid national budget cuts or changes in government.

FINANCIAL INNOVATIONS FOR DEVELOPING A REVOLVING FUND FOR ISRAELI RIVER RESTORATION

In this section, we detail the three steps discussed at the Lab to implement a revolving fund in Israel. For each, we recommend action items representing benchmarks for development.

1

STEP

Establish the Fund's Governance

Participants agreed that both governance of the fund and its revenue sources must be transparent and quantifiable. They debated factors to be considered in designing the fund's structure and cited the specific categories of management/oversight that will affect the fund's creditworthiness.

Structure

The initial capitalization grant (or grants) of an Israeli revolving fund could come from various ministries, including Finance (MoF), Infrastructure (MNI), and Interior (MoI), three already working with river authorities.

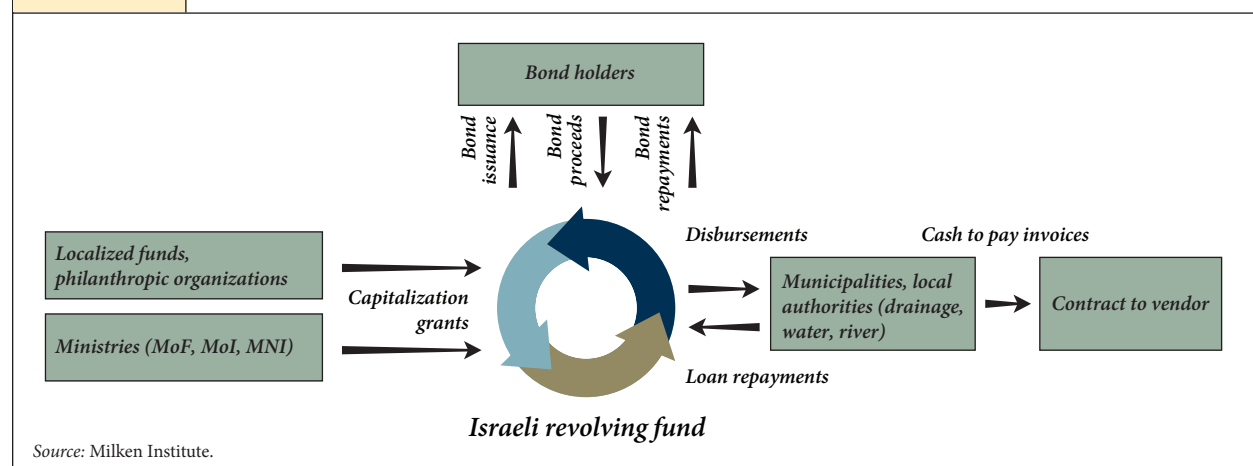
The pool of matching capital could come from philanthropic organizations, such as the Jewish National Fund, local and international foundations, the Society for the Protection of Nature, and foreign donors, as well as from local funds that already support river projects, such as the Ministry of Environmental Protection's "clean fund."

A portion of this capital could be used as a reserve fund to help secure against risk and attract investors, depending on the capital needs of the revolving fund structure. The resulting bond issuance would secure the loans to individual water, river, and drainage authorities, as well as to municipalities (see figure 5). The local governing bodies could then fund the projects necessary to restore watershed areas and incorporate integrated management approaches.

The funding model would not alter the internal structures governing any of the institutions but would open access to much-needed capital. Allowing loans to go to different authorities, and thus to different river projects, would also diversify the revolving fund's portfolio, mitigating risk against default.

FIGURE
5

Model: Israeli revolving fund



As in the U.S. model, there is some flexibility for determining the optimal debt services surrounding the origination of loans, as well as how to best distribute a reserve. Participants decided that more research is necessary to determine whether the reserve or cash-flow, or even a hybrid model, would be most easily transferable to Israel. Given the amount of philanthropic aid that comes into the country, they agreed that allocating at least a part of this capital for a reserve would not only make sense but would also necessitate transparency and allow for greater donor identification with specific project funding. Participants debated the use of philanthropic aid on a local or national level, as well as the best way to put it to use in a revolving fund.

According to Steve Townley, key financing issues must be resolved from the outset. These include management of the loan itself, such as setting a repayment schedule, interest rates, and dedicated repayment sources; refinancing any existing debt obligations; guaranteeing local debt obligations or purchasing insurance for them; guaranteeing the fund's debt obligations; reinvesting interest on the fund's accounts; and funding administrative expenses.

Lab participants acknowledged that a commitment from the Knesset will be necessary before any fundamentals are finalized. Once the general structure and the financial specifics are determined, it will be necessary to develop a system of management for the fund.

Operations

Lab participants were overwhelmingly in support of an integrated management approach based on the model developed by the Yarqon River Authority, in which the corporation—those who oversee the financial aspects of the project—works in coordination with those who manage the project's environmental aspects. The latter would consist of frameworks already in place (for example, the Yarqon Authority). Governance would likely always cross municipalities and local river authorities while remaining under the larger ministry umbrella. In the United States, SRFs operate in a similar fashion: the facility overseeing the financing of the SFR is a separate independent entity but works with various agencies that map policy and potential projects. New York State, for example, created the Environmental Facilities Corporation to function as its SRF facility. The corporation works with the New York Department of Environmental Conservation to select funding commitments.²⁰

It is equally important that the management structure be insulated from political process: the success of the fund is dependent on its sustainability amid national budget cuts or governmental changes, and therefore must be self-contained. The creation of a financing facility ensures accountability through requisite reporting. This oversight also ensures that the facility maintains its independence from political processes and serves to attract private investors.

The fund management must be structured so as to avoid systemic risk, including defaults. When structuring public-private partnerships, it is imperative, said participant Peter Taylor, formerly of Barclay's Capital and now at the University of California System, to create operations and maintenance (O&M) agreements to regulate construction and the scope of services, performance guarantees, rules for inspection, operating fees, insurance, etc. The equipment and technology used, for example, must be proved cost-effective and efficient. All operators, from financial to technological, must have documented experience in water management.

“Capital markets improve transparency for those not used to it. Rivers require business models for accountability.”

*Amos Brandeis,
Architecture, Urban &
Regional Planning Ltd.*

Just as any new business requires a plan, a revolving fund must include strategic planning to outline long- and short-term goals, available assets, and resources. The plan should have clear milestones to quantify and evaluate success.

Participants recommended that a feasibility study be undertaken to best ascertain the needs of Israel's river basins. Part of this study would focus on eligible projects. In the United States, SRFs fund a variety of projects, including construction of publicly owned wastewater treatment works, nonpoint-source pollution control management, or development of an estuary conservation plan. Each project must have a business plan that meets standards of creditworthiness as it pertains to the overall rating for the fund's project portfolio.

ACTION ITEM:

- Explore international guidelines for the revolving fund. Conduct a feasibility study to map international best practices, and determine optimal structure, operations, and demand for the revolving fund in Israel.

2

STEP

Identify Potential Revenue Sources

Many Israeli authorities and municipalities have faced considerable challenges when trying to find value in their natural resources. Yet identifying local sources of capital is integral to the fund's objective of using self-generating revenue streams to repay the loans back into the revolving fund.

In the United States, the easiest way for cities and small towns to raise income is through municipal taxes. Warrensburg, Missouri, needed significant improvements to its wastewater treatment system and borrowed \$6.8 million from the state's SRF to construct new facilities. The community, with a population of 15,244, was wary of raising user rates. As such, the SRF staff worked with the city to tailor its bond maturity schedule with a stairstep charge approach. User rates went up every other year, allowing the community to acquire the new system without having to shoulder massive upfront costs.

States have also used local sales taxes to repay SRF loans. In Taney County, Missouri, the population of about 40,000 authorized a \$30 million revenue bond issuance to create wastewater treatment for the area's lakes. In order to pay for the bonds, the community agreed to a half-cent capital improvement sales tax.

Participants agreed on three categories of potential revenue streams that would be applicable in Israel: (1) special fees, including drainage, flushing, sewage, and recreational charges; (2) taxes and levies, including betterment taxes, and local uses of Israel's property tax (*arnona*); and (3) project revenues, including income from local parks and events (see table 1 on the following page).

TABLE 1		<i>Potential local revenue streams</i>	
<i>SPECIAL FEES OR SURCHARGES</i>		<i>TAXES AND LEVIES</i>	<i>PROJECT REVENUES</i>
Drainage Flushing Storm-water runoff Sewage Drinking water Wastewater treatment Recreational fees (fishing licenses, entrance fees) Land development		Special purpose levies (betterment tax) Tax increments (through the use of local levies) Dedicated allotment of local or state taxes (from <i>arnona</i>)	Real estate Local parks Events Donations from nonprofits, NGOs

Special Fees or Surcharges

Elsewhere around the world, local governments have begun to charge special fees for necessary services, from tap water to wastewater and sewage treatment. In 2005, Maryland approved an annual \$30 flushing fee for all residents.²¹ The expected \$60 million to \$70 million in revenue goes to the Chesapeake and Atlantic Coastal Bays Restoration Fund, which upgrades sewage treatment to reduce the amount of nitrogen flowing into the Chesapeake and subsidizes farmers to plant crops that absorb the chemical. The fees have generated sustainable capital for restoration projects, and Lab participants debated the use of additional fees in Israel.

A benefit of integrated management is the ability of local communities to find creative ways to enhance the value of a river or stream. Looking past just the river itself, a river authority can work with the National Parks Authority to utilize open space surrounding the riverbanks or watershed to create parks. U.S. state parks charge entrance fees that can range from a \$4 day pass in California to a \$27 annual camping pass in Delaware.²² This practice may not translate to Israel, given the country's open-access parks; but some recreational fee increases, such as a small hike in the price of Sea of Galilee or Mediterranean fishing licenses, could generate income for the revenue pool.

Taxes

Small, incremental changes can bring an influx of capital to local governments. In the United States, many cities and towns collect local taxes to repay their revolving fund loans. In Israel, local governments collect the *arnona*, while the national government collects any additional taxes (see table 2).

These taxes and levies work within the current confines of local and national law. However, the Knesset and local municipalities can enact or emend statutes and legislation. Some Lab participants have worked on creating a tourism tax for specific watershed regions, such as the tourism businesses surrounding the Jordan River. Panelists also discussed the creation of a view tax, whereby homes and businesses a certain distance from a river would pay an additional increment on their taxes. These taxes, in theory, would go

TABLE 2		<i>Israel's taxation system</i>	
TAX	DESCRIPTION	COLLECTION AUTHORITY	
<i>Arnona</i>	Monthly tax for local authority services, calculated by property size and location	Local authority, pending Knesset approval	
Betterment tax	Paid after the sale of a property, varying from 25 percent to 50 percent of the increase in value	Tax authority	
Property tax	Paid with the purchase of a property, on three levels (from 0.5 percent to 5.0 percent)	Tax authority	
Purchase tax	Paid after the sale of a property, varying from 25 percent to 50 percent of the increase in value	Tax authority	
Sales tax	For property built before 2001, the sale of residential real estate requires a 2.5 percent tax on the value of the property	Tax authority	

directly to authorities or municipalities, and not to national governing bodies. Some municipalities have even been willing to forgo certain tax profits, opting instead to channel that revenue into river projects. The city of Petah Tikvah, northeast of Tel Aviv, has agreed to allow 50 percent of the residential *arnona* and 75 percent of the industrial *arnona* to go to the financing of Yarqon River restoration.²³

Project Revenues

The restoration projects themselves could serve as additional sources of revenue. For example, if a river authority were allowed to purchase land surrounding the waterway, and that land was used for commercial or residential property, profits of the sales could go toward repaying the loan. Similarly, a community could rent the land around the river for events. Bryant Park in New York City was once a breeding ground for crime and drug use, but after a restoration project the land is now used to host fashion shows and local merchant fairs. The revenues from events and licensing of site development could work within a revolving fund model through ecotourism and archaeological site development to increase tourism and recreation revenues.

In addition, Israel's various ministries could channel capital to an SRF from their own funds that already go toward river projects. And while a percentage of the funds could buttress the reserve, a portion could also subsidize repayment. Thirteen of Israel's ministries have reserve funds for raising additional money in lieu of additional taxes. Some of these—the "clean fund" that derives income from recyclable bottle deposits; a fund that supports cleanup of mine/quarry pollution, paid for by fees from mining operations; a fund for reducing ocean pollution that draws income from taxes on factories running wastewater into the sea—could help generate funding for river restoration.²⁴ Combining this capital with the other potential sources of capital would create a solid economic base for the river revitalization projects.

More work needs to be done to map the projects' revenue options, Lab participants agreed. Currently, there is insufficient information surrounding ongoing river projects and the capital that flows in and out of them. "A revolving fund can bring much-needed transparency," said Amos Brandeis of Architecture, Urban & Regional Planning Ltd.

ACTION ITEMS:

- Map current tax legislation.
- Draft legislation for new surcharges/taxes.
- Create a revenue model for a case study watershed.

Map Potential Projects

3

STEP

Participants reviewed ongoing cleanup projects for potential inclusion in the fund. Following the Lab, research has been gathered around five of those projects: along the Kidron, Kishon, Lachish, Besor, and Ayalon rivers or their tributaries. All five show substantial promise but must be studied more thoroughly to better ascertain their specific needs and potential.

Kidron

Running past some of the world's most important cultural and historic sites on its way from Jerusalem to the Dead Sea, the Kidron has provided a commercial and ecological lifeline for local communities for centuries. These days the river, which undergoes occasional winter flash floods, has a constant flow: more than 28,000 cubic meters of raw sewage and wastewater pour daily from Jerusalem and Palestinian urban centers, making it the greatest sewage hazard in Israel.

Years of pollution and neglect have devastated the politically contested Kidron Valley.²⁵ Drainage infrastructure is poor, illegal dumping is rampant, and groundwater contamination is toxic. Dead Sea vacationers face a constant health hazard. The biggest concern for environmentalists is the treatment of wastewater and other sewage. Nonpoint-source pollution is also a major concern.

Lab participant Richard Laster of Hebrew University presented his concept for a master plan for the Kidron River Valley, based on the successful revitalization of the Yarqon. Using integrated water resource management, the proposed plan takes into consideration the economic benefits of the river, not only as a potential revenue source for local communities but also as a potential tourist goldmine. Current figures indicate that the cost of preparing the final business plan would total \$187,500. A joint steering committee has been established with representation from both Israelis and Palestinians, as well as the Milken Institute, yet more research must be undertaken to determine potential revenue that can be generated from the river itself, including the capital from tourism derived from attaining World Heritage Site designation.



Pollution fouling the Lachish River in Ashdod

Photo: courtesy of Zalul Environmental Association

Kishon

The Kishon is reportedly the most polluted river in Israel. For more than forty years, industrial wastes, such as mercury, ammonia, and polycyclic aromatic hydrocarbons (PAHs) occurring in oil, have poisoned the channel. Dredging operations along the river and into the port of Haifa, where the Kishon empties into the Mediterranean, have dispersed pollutants throughout the river and into the sea.²⁶

Current figures indicate a cost of \$75 million to purify the contaminated soil in the riverbed. Given the amount of heavy-industry factories along its shoreline, where much of the pollution originates, an integrated plan must include all potential revenue sources, including those already in place, such as taxes on running wastewater into the ocean.

Lachish

In years past, the community of Ashdod, south of Tel Aviv, used the Lachish stream for fishing, agriculture, and recreation. But Ashdod became a city, manufacturing expanded, and the stream eventually became overrun with industrial wastewater and municipal sewage. A public campaign, initiated by Lab participants from the not-for-profit Zalul organization, led to a commitment to improve sewage infrastructure and wastewater treatment. The

Lachish–Ashdod Park was inaugurated in 1996, following years of intensive river restoration. A basin master plan to revitalize the river, which runs from the West Bank into the Mediterranean, is currently under development.²⁷ Focusing on potential revenue sources, numerous surveys have been prepared on the possible transportation and land uses, as well as any returns from tourism or cultural appreciation. The entire project is expected to cost \$10 million. One potential revenue source has been identified: the construction of a residential neighborhood adjacent to the park.

Besor

The Besor River basin is the largest in Israel, running seventy miles from the Be'er Sheva Valley through the Gaza Strip and into the Mediterranean. It is rich in archaeological history, from the prehistoric period to the Ottoman Empire, and UNESCO designated a section of the basin along the Be'er Sheva tributary as a World Heritage Site in 2005. But communities from Hebron to Dimona use the river to dispose of sewage, and the Besor and its many tributaries suffer from significant pollution. To realize the potential of the Be'er Sheva stream (which lies near a national park, as well), local authorities and national ministries have worked together to create the Be'er Sheva River Park. Modeled after the River Walk in San Antonio, Texas, it stretches for five miles and is expected to eventually boast a thriving waterfront district with gardens, a sports center, playgrounds, an amphitheater, and a manmade lake.²⁸ Park revenues, including the construction of new homes in the area, will aid in the river's revitalization.

Ayalon

Running northwest from Jerusalem to Tel Aviv, the Ayalon and the park that shares its name have seen significant philanthropic capital during the process of rehabilitation. The park, established in 2005 by a collaboration of the Ministry of Environmental Protection and the U.S.-based Beracha Foundation, spans almost 2,000 acres surrounding the Hiriya landfill and is reserved as a floodplain. Given that statistically, the Ayalon floods every twenty years and overflows every fifty years, the park is an integral buffer for the millions of Tel Aviv residents who live in the area.²⁹ Plans for park expansion include urban wetlands, a promenade with coffee shops, walking paths, archaeological site museums, and a recycling center.

The cost for the park is reported to total \$240 million. Planners have begun assessing the amount of capital that can be generated from view and usage fees, as well as from the economic benefit of using the river as a flood basin.

Because financial transparency is currently limited in river restoration projects, participants concluded that all future projects must offer complete business plans and integrated management approaches. After assessing the costs of each project, the potential revenue sources must be identified and appropriate legislative modification established.

ACTION ITEMS:

- Investigate river sites that could benefit from sponsorship.
- Explore relationships to build on possible sponsorships.
- Design a budget to determine financial feasibility.

RECOMMENDATION

Establish working groups to research and evaluate a strategic plan to implement action items.

Lab participants determined that more study, from market size to the feasibility of economic incentives, is necessary before concrete models can be selected. They agreed to convene working groups to address specific action items. The Milken Institute is committed to further engaging and organizing participants, as well as other industry experts, to continue the dialogue on water restoration in Israel. The working teams are expected to regroup at a future Financial Innovations Lab to put forth next steps.

CONCLUSION

Many of Israel's rivers and streams are dying. And while there has been a tremendous effort to rehabilitate the five rivers mentioned, much restoration work remains. These efforts come at a cost, which is the basis for this examination of innovative financing models. Integrated water management requires integrated funding and shared responsibility. All parties must come together to create a structure that will finance the revitalization of Israel's rivers and streams. Through the process, these environmental infrastructure projects will generate important stimuli for job creation.

In the United States, the revolving fund has seen significant success in leveraging public money with investment and philanthropic aid. Adapting this model to its unique circumstances, Israel can demonstrate its leadership in environmental protection and cutting-edge financing. Its river restoration projects may one day showcase the nation's reclamation technologies.

Public-private financing partnerships could resolve the problem of a scarcity of government funds. Utilizing public resources to attract private investment could break the funding crisis for these rivers and streams. The infrastructure financing innovations identified in the Lab have great potential to protect public health and bolster employment while restoring Israel's vital natural resources for generations to come.

APPENDIX

Financial Innovations Lab Participants

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