



Mobilizing Capital for Natural Infrastructure in Canada:

A guide for project champions
and funders

IISD REPORT



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with contributions from
Dimple Roy



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Executive Summary

Natural infrastructure systems and actively managed ecosystems—for example, wetlands, salt marshes, floodplains, and forests—can generate significant economic, social, and environmental benefits for surrounding communities and regions. Despite the increasingly compelling evidence in support of nature-based infrastructure projects, large-scale investment is still lagging.

Much of the research on different types of natural infrastructure to date has focused on assessing the broad benefits of potential interventions rather than making a business case for specific projects. This report offers a template for Canadian project champions and funders to bridge the gap between early-stage valuation and feasibility studies and project finance. Rather than starting with general categories of nature-based projects and their overall benefits, this report outlines a path to investment based on identifying specific drivers and project champions for nature-based solutions and then aligning the design of natural infrastructure projects with available financing tools.

Why Do We Need a Different Approach to Mobilize Capital for Natural Infrastructure?

Unlike many other types of infrastructure projects where the primary beneficiary is also the most likely project initiator, natural infrastructure solutions are more likely to emerge from outside experts and researchers who see the opportunity to do something different and better than conventional practice. As a result, mobilizing capital for natural infrastructure projects requires a strong focus on: Who benefits? How much? And what level of effort are they willing to commit up front to lead?

Broad approaches to valuing benefits rarely reveal specific beneficiaries. Similarly, catalogues of available funding resources and financial tools are only useful if there is already a leading beneficiary willing to champion a solution, work through challenges associated with non-traditional projects, and secure early-stage resources for effective design, community engagement, and implementation.

Generating a preliminary business case or seeking funding to develop one is often a prerequisite to mobilizing a project leader. This report offers guidance for researchers and project champions on how to lead from the outside and for funders to address key barriers to scaling up essential catalyst and predevelopment support.

Guidance for Project Champions

Early-stage, nature-based project champions should avoid the temptation to focus on funding opportunities. It is easy to think that available funding should, in and of itself, be sufficient motivation to pursue new ideas; however, this is rarely the case. Project developers of both



conventional and greener infrastructure solutions know that putting together funding and financing applications is often onerous—even for the most straightforward projects and funding types. Natural infrastructure champions are most likely to succeed in developing innovative and pragmatic solutions when they focus on the following five basic steps:

1. **Start with a driver:** Identify clear, time-sensitive environmental mandates, resource needs, disaster risks and losses, or policy goals.
2. **Identify a lead beneficiary or project implementer:** Focus on quantifiable benefits attached to clear and specific beneficiaries (the fewer, the better).
3. **Develop a pitch:** Do the preliminary analysis to motivate further action.
4. **Establish a partnership:** Set up collaborative agreements, as needed, to pursue the next stage of planning and project predevelopment support.
5. **Secure catalyst/predevelopment funding:** Create a path to implementation.

Recommendations for Funders and Green Investors

Public, private, and philanthropic funders can also play a catalytic role in accelerating the development, implementation, and scale-up of large natural infrastructure. The most important thing to recognize is that simply creating a new fund or source of capital is unlikely to help early-stage champions initiate projects or do essential predevelopment work. Four things funders and investors can do immediately to increase investment in and use of natural infrastructure solutions are:

- Fund targeted research to fill data gaps and develop performance metrics
- Convene and align potential natural infrastructure beneficiaries
- Support efforts to achieve scale
- Provide dedicated predevelopment support

Large-scale natural infrastructure projects are unlikely to emerge on their own. This report is intended to serve as a roadmap for both funders and project champions to collaboratively mobilize capital and forge a path from catalyst and predevelopment funding to project design and the implementation of nature-based solutions.



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1.0 Introduction

Natural infrastructure systems and actively managed ecosystems can generate significant economic, social, and environmental benefits for surrounding communities and regions. However, mobilizing up-front resources to design effective nature-based interventions and securing project capital to construct and maintain these systems over decades are often major barriers to implementation.

Over the last several years, there has been tremendous progress in characterizing the value of nature-based solutions relative to traditional infrastructure projects. Many studies show that natural infrastructure systems, such as constructed wetlands and living shorelines, can achieve similar or better performance outcomes as comparable “grey,” “hard,” or traditionally engineered infrastructure projects (International Institute for Sustainable Development [IISD], 2020; TD Economics & Nature Conservancy of Canada, 2017). In addition, these projects can generate significant co-benefits, such as water quality, habitat, and biodiversity improvements (U.S. Federal Emergency Management Agency, 2020). Despite the increasingly compelling evidence in support of such projects, large-scale investment in natural infrastructure is still lagging.

Infrastructure Canada has established major funding programs for both green infrastructure (starting in 2016)¹ and disaster mitigation and adaptation (starting in 2018)² to respond to climate change, protect communities from increasingly frequent and severe natural hazards, and support the transition to a clean growth economy. However, these funds are targeted at urban water and wastewater systems and large-scale infrastructure projects with an emphasis on strengthening existing municipal infrastructure or supporting projects at a scale of CAD 20 million and above, respectively.

Although natural infrastructure projects could help meet the priorities of both funding programs, natural solutions are generally at a disadvantage because landscape-level interventions often extend beyond municipal areas, and they require more significant up-front planning and coordination funding among multiple stakeholders to reach the minimum funding thresholds for large-scale projects. Even early-stage planning and project design funds are often tilted toward municipal projects. For example, the Federation of Canadian Municipalities offers funding for a wide range of sustainability and environmental planning and project implementation activities, but grants and loans are exclusively for municipalities and their partners.³

These barriers to entry for natural infrastructure solutions are compounded by a lack of data, research, and performance metrics. Much of the research on different types of natural infrastructure to date has focused on assessing the broad benefits of potential natural

¹ For a program description, see: <https://www.infrastructure.gc.ca/plan/gi-iv-eng.html>

² For a program description, see: <https://www.infrastructure.gc.ca/dmaf-faac/index-eng.html>

³ For more information on funding opportunities, see: https://fcm.ca/en/funding?f%5B0%5D=filter_by_topicf%3ASustainability



infrastructure interventions rather than making the business case for specific projects. This report offers a template for bridging the gap between natural infrastructure valuation research and project finance by outlining an approach for identifying *capturable* value with a focus on inland freshwater ecosystems in Canada.

1.1 What Is Natural Infrastructure?

Natural infrastructure systems are actively managed ecosystems that provide essential services that can substitute for those provided by comparable engineered infrastructure systems. These systems differ from just “plain old nature” in that they are specifically designed and optimized to generate greater benefits than they would otherwise if left unmanaged (Roy, 2018).

Examples include wetlands, salt marshes, floodplains, and forests. These types of systems typically differ from urban green infrastructure—for example, green roofs or bioswales that are integrated into the built environment—in both scale (larger or covering wider areas) and location (more remote from the beneficiaries they serve).

1.2 Why Do We Need a Business Case for Investing in Natural Infrastructure?

Some natural infrastructure solutions have demonstrably lower capital and/or operating and maintenance costs than engineered or constructed grey infrastructure systems, but others remain stuck behind a lack of comparable performance data. Even when the cost effectiveness of a natural infrastructure project is firmly established, mobilizing funding for projects still remains challenging for five key reasons:

1. **Infrastructure, in general, is chronically underfunded:** A primary and understated barrier to financing and implementing natural infrastructure solutions is that many of the legacy grey systems that these solutions could replace are also difficult to fund and finance in an era of scarce and dwindling public infrastructure investment. In many parts of the world, studies have highlighted the issue of chronic underinvestment in major infrastructure systems, from water and wastewater systems to energy, transportation, and coastal protection assets (Woetzel et al., 2016). The result is that the aging grey systems that could benefit most from replacement with green and natural solutions are themselves difficult to maintain and upgrade.

For example, comparing the cost of an existing asset, like a reservoir, with an alternative green or natural solution, such as a system of wetlands or detention ponds, misses how the original system was funded or financed. If building or replacing that reservoir today would also pose a financial challenge, then comparing a nature-based solution to an existing project that would also be “unfundable” in current political and budgetary circumstances does not offer a sound basis for investment in either type of project.



2. **Ecosystem services are not reflected in infrastructure budgets:** Most ecosystem services and benefits are not part of current public or private sector capital planning and budgeting processes. In other words, current beneficiaries of ecosystem services, such as upstream clean water resources, rarely pay for the services or benefits they receive, even when critical functions, like urban drinking water systems, depend upon them. Unless an essential ecosystem service is somehow threatened or disrupted, investing in natural infrastructure systems is often a problem of needing to find entirely new or additional resources outside of existing budgets and capital plans for critical assets and services that are taken for granted.
3. **Performance measures and standards are missing for natural infrastructure:** There are still significant gaps in knowledge and a lack of familiarity with natural infrastructure options to complement or replace conventional projects, such as concrete pipes and water treatment plants. Although data about the benefits of different types of natural infrastructure systems are improving, there remains significant uncertainty about the long-term performance of different types of interventions under different conditions among project designers, planners, engineers, and developers.

Even when feasibility studies show that natural infrastructure solutions can outperform traditional options, legal and regulatory uncertainties can make these solutions more complicated to defend and finance. As a result, the leading experts on these types of projects often come from non-government or research institutions outside of the public agencies, utilities, or companies that have the incentives and authority to implement specific projects.

4. **Success is often something that doesn't happen:** Political support for major infrastructure investments is often focused on shiny new projects and ribbon-cutting opportunities, not preventive measures or long-term operations and maintenance cost savings. This is one reason why many cities and utilities find it easier to find funds for new projects rather than address significant “deferred maintenance” project backlogs to maintain a state of good repair.

These challenges are even greater for natural infrastructure projects, where success is often something that doesn't happen at all—the flood that wasn't. Some of the highest-value investments might be conserving or preserving an existing ecosystem versus building something new. The larger the project, the more likely its economic, environmental, and social benefits are spread out over long time horizons that span decades (or longer) and are misaligned with creating short-term, visible political or investment success stories.



5. **Focusing on co-benefits can detract from making a clear business case:** A final challenge is that nature-based solutions generate multiple benefits. The fact that this is a challenge at all can be counterintuitive since it is also one of the main reasons natural infrastructure can be so valuable. The problem lies in parsing diffuse benefits across sectors and aligning beneficiaries who may all receive different value from the same system. Being able to disaggregate the primary benefits of any given natural infrastructure project from more diffuse co-benefits is essential for identifying and engaging leading beneficiaries who are most likely to champion and invest in a project.

It is important to emphasize that this framing runs opposite to many studies that seek to demonstrate the full value of natural infrastructure relative to grey systems. Effective project finance instead requires a clear delineation of which benefits are worth monetizing and can pay back or justify a project investment and which co-benefits are positive spillover effects that are not worth the effort to aggregate and capture. Separating the two takes up-front time and resources that can make early project design and predevelopment phases more costly than narrower, single-function solutions.

These barriers are not insurmountable, but mobilizing capital for investing in specific natural infrastructure solutions requires clearly addressing each issue head on. This report offers an approach to doing just that. Rather than starting with general categories of nature-based projects and their broad benefits, the following sections outline a path to investment based on identifying specific drivers and project champions for nature-based solutions and then aligning the design of natural infrastructure projects with their top priorities for investment and available financing tools.



2.0 Bridging the Gap Between Demonstrating Value and Financing Projects

Most studies on the business case for natural infrastructure fall into two main categories. The first focuses on characterizing and monetizing the overall value created by ecosystems and nature-based interventions relative to existing systems. These types of studies are important for raising awareness of the value of natural infrastructure in general, and there are excellent examples of robust valuation methods and applications in Canada already. For example, the June 2019 IISD report titled *An Application of the Sustainable Asset Valuation (SAVi) Methodology to Pelly's Lake and Stephenfield Reservoir, Manitoba, Canada: Assessing the Value of Nature-Based Infrastructure* (Bassi et al., 2019) makes a strong case for where natural solutions can be more cost-effective and offer higher performance benefits than comparable grey systems. The second category typically focuses on financing tools for green and natural infrastructure (Colgan et al., 2017). These resource guides generally start with the money and identify sources of funds for promoting natural infrastructure investment (U.S. Federal Emergency Management Agency, 2020).

The missing link between these two approaches is that neither one specifically addresses who has the incentive to act, why, and at what threshold. In other words, both of these types of studies miss three key points for mobilizing capital for specific projects: (1) who benefits? (2) how much? and (3) what are they willing to pay?

Broad approaches to valuing the benefits of natural infrastructure rarely disaggregate results by specific beneficiaries, and financial tools are a means to an end—they are only useful if there is already a strong project beneficiary willing to champion a particular solution; work through the challenges of pursuing a non-traditional project; and secure the early-stage resources required for effective design, community engagement, and implementation.

2.1 Examples of Large-Scale Natural Infrastructure Investment

Table 1 offers a new framework and the missing middle ground. The leftmost column highlights four main drivers that have shaped large-scale natural infrastructure projects around the world to date: environmental mandates, natural resource needs, near-term financial losses and/or risks, and longer-term risk management or policy goals. The second column identifies the primary beneficiary of the project. The remaining columns highlight the primary objectives for pursuing a project and the type and scale of investment. Drawing out these different elements offers some insights into what made these examples successful and how to mobilize capital for future natural infrastructure projects.



It is important to note that the primary beneficiaries in the table below are the types of public and private authorities that are typically the lead decision-makers for infrastructure project finance and implementation. However, these actors are not always the earliest champions of nature-based solutions. In many cases, non-governmental organizations and research partners are critical early-stage project initiators, and private sector partners play leading financial structuring and implementation roles. These relationships are discussed further in the next section.

Table 1. Examples of large-scale natural infrastructure projects

Driver (Why/Why now)	Primary Beneficiary (Who)	Objective (What/Where)	Ecosystem Intervention (How)	Financing Mechanism (How)	Project Size/Cost (How much)
Environmental Mandate	County – Prince George’s County, MD, USA	Manage upstream non-point source runoff to Chesapeake Bay	Green infrastructure and enhanced watershed management	Public-private partnership (PPP) and performance contract	USD 165 million expended to date (of USD 210 million budget)
	Public utility – DC Water, Washington, DC, USA	Pollution (combined sewer overflow) reduction	Urban green infrastructure	Public revenue bonds and private finance via environmental impact bond (EIB)	USD 25 million EIB in overall USD 2.6 billion compliance program
	Municipal government – City of Philadelphia Green City, Clean Waters Program	Pollution reduction, reduced flood risk, and heat island effects	Urban green infrastructure	Local and federal funds (U.S. Environmental Protection Agency revolving loan funds/public bonds)	USD 125 million for stream restoration and wetlands creation out of a total USD 2.4 billion plan



Driver (Why/Why now)	Primary Beneficiary (Who)	Objective (What/Where)	Ecosystem Intervention (How)	Financing Mechanism (How)	Project Size/Cost (How much)
Resource Need (Short- to Mid- Term Demand)	Municipal government – New York City Department of Environmental Protection	Maintain existing (paid) services and avoid higher-cost grey solutions	Sourcewater protection via land conservation and agriculture best management practices	Public funds (water rates, tax dollars)	USD 1.5 billion for watershed protection from 1993 to 2013
	County – Pike River Restoration, Wisconsin	Flood protection and recreational space	River restoration and wetland creation	Public funds (federal, state and local grants)	USD 11 million from 1986 to 2001
Financial Loss or Near-Term Risk	Local government – City of Toronto Lower Don River West Remedial Flood Project	Sedimentation and flood risk reduction	Floodplain naturalization	Public funding (federal, provincial, local)	CAD 1.25 billion in tri-government funds
	State government – State of Iowa, Conservation Reserve Enhancement Program	Nitrate management	Land set-asides for wetland restoration and prairie buffers	15-year land rental/ easement payments	USD 38 million over 15 years (80% federal, 20% state funding)
Long-Term Risk or Policy Goal	Public utility – Yuba Water Agency, California	Wildfire risk reduction and watershed protection	Forestry best management practices	Public funds and forest resilience bond (social impact bond)	USD 4.1 million state and local funds and USD 500,000 in grants

Sources: American Society of Landscape Architects, n.d.; Betts, 2017; City Parks Alliance, n.d.; Shenker, 2017; The Nature Conservancy, n.d.; U.S. Department of Agriculture, 2011.



2.2 Deconstructing the Drivers of Successful Projects

One of the most important take-away messages from Table 1 is that nothing in the objectives or financing columns substitutes for a clear driver. All of the largest and most successful natural infrastructure projects around the world to date have been in reaction to a time-sensitive forcing event. What varies is the urgency and scale of the incentive to act. Simply demonstrating that a project has merit through a valuation study is unlikely to replace a financial motivation in the form of a heavy compliance cost or financial loss. Being forced to allocate scarce resources to solve a problem creates an inherent motivation to get the highest value for that expenditure.

In other words, it is much easier to persuade a primary beneficiary to pursue a natural infrastructure alternative if they are already considering how to take action by, for example, trying to finance a new water treatment plant, rather than trying to convince them to act at all. This speaks directly to the first barrier to both green and grey infrastructure highlighted in the introduction. It also reinforces the point that valuation studies or even the creation of new funds are unlikely to intrinsically motivate natural infrastructure investment, but they can have the catalyst effect of shifting a grey project to a greener, more natural option if it offers higher value.

Taking advantage of this insight requires understanding who is going to be required to spend scarce resources anyway, to what extent their motivations are reactive or proactive, and how natural infrastructure can become a part of the solution where it is not currently being considered. For champions or proponents of natural infrastructure in general, this means taking a new approach to project predevelopment. Unlike many other types of infrastructure projects, where the primary beneficiary is also the most likely project initiator, natural infrastructure solutions are more likely to emerge from outside experts and researchers who see the opportunity to do something different and better than conventional practice.

The successful projects highlighted in Table 1 reflect this dynamic. For example, DC Water's EIB was initiated by the social impact firm Quantified Ventures with early-stage funding from The Rockefeller Foundation. Private investment from Calvert Impact Capital and Goldman Sachs followed (Goldman Sachs, 2016). Similar relationships exist between the engineering firm Corvias and Prince George's County for the Clean Water Partnership and Blue Forest Conservation, the World Resources Institute, and the Yuba Water Agency in California for the Forest Resilience Bond (The Clean Water Partnership, n.d.; World Resources Institute, 2018). Where innovative finance or performance-based implementation tools are blended with traditional sources of capital, these early-stage collaborative design processes and partnerships are especially important.

As a result, generating an initial business case (or seeking funding to develop a preliminary business case) is often a prerequisite for reaching out to and mobilizing a project leader. Below are three steps to help champions or proponents of natural infrastructure start the process.



Step 1: Identify a driver for action. Champions must identify strong drivers for action—for example, federal or provincial compliance mandates, natural disasters, or catastrophic losses (including mitigating the risks associated with future disasters)—and determine which major actors and asset holders are most significantly impacted. Examples include water quality regulations aimed at public utilities, resource constraints affecting specific industries or business supply chains, or rising costs, such as flood damages or insurance coverage costs. Another way to think about creating a starting line for action is to ask, *who loses money if this driver takes effect or if the status quo deteriorates?* It is important to remember that new project funding sources are not in and of themselves drivers for initiating action but rather incentives for more timely implementation.

Step 2: Identify a strong primary beneficiary. Instead of trying to find and aggregate all the possible diffuse benefits and co-benefits of a natural infrastructure solution, champions should identify the biggest winners (or losers) with the greatest financial motivation to act and bring other stakeholders along. Unlike most natural infrastructure valuation and finance reports, this approach argues against over-emphasizing the co-benefits of natural infrastructure. Many studies make the case that the wide and diverse benefits of nature-based solutions can build greater public support for project implementation. This is often true. That said, it is important not to confuse community support for capturable value. Doing so can muddle the business case for any given project.

Projects have a far greater likelihood of success when there is one clear and specific beneficiary or a consolidated group of beneficiaries (like an industry cluster) who have both the incentive and the authority to act. Table 1 offers several examples of different scales and types of these kinds of primary beneficiaries from the public sector. It can be tempting to assume that having more direct beneficiaries is better, but what often follows is that no single beneficiary has the incentive to lead or absorb the early-stage convening, coalition-building, and project development costs on behalf of all other beneficiaries (who then benefit as free riders). If everyone can reasonably expect someone else to be equally motivated to act, then it becomes less compelling to take direct individual action. This is not to say that projects with many diffuse beneficiaries are not worth pursuing, only that they are significantly more complex to initiate and more costly to coordinate over time.

In short, the predevelopment process for natural infrastructure should focus on the largest-scale and highest-quality benefits that are reasonably quantifiable (sufficient data, limited uncertainty, and high investor confidence), attached to clear and specific beneficiaries (the fewer, the better), and large enough to motivate action. Other positive externalities or public goods should be an important part of stakeholder engagement processes but not necessarily part of developing an investment thesis.



Step 3: Separate out current value from future value. As Table 1 shows, the biggest investments in natural infrastructure projects are in response to large, certain, and urgent drivers of change, such as impending regulation or major financial losses.⁴ Future benefits and policy goals are more frequently motivators for smaller pilot projects or exploratory impact investments. Differentiating between these reactive and proactive motivators can help set expectations for both project designers and potential funders about the appropriate size of any potential project and investment.

2.3 Creating a Path to Mobilize Capital

Once the main drivers and potential beneficiaries of specific natural infrastructure solutions have emerged, the next step is to identify sources of capital for the critical stages of project development. Most infrastructure studies and reports focus on three main phases of major infrastructure projects: project preparation, construction, and operations and maintenance (O&M) (Government of Canada, 2017; Institute for Government, 2018; Organisation for Economic Co-operation and Development, 2015; The New Climate Economy, 2016; U.S. Department of the Treasury, 2015;). Given the additional up-front work required for most natural infrastructure projects, this report breaks it down further into five key “colours of money”:

1. **Catalyst Funds:** Support to identify and frame infrastructure options that respond to a primary beneficiary or stakeholder(s)’ need. For natural infrastructure projects where the project proponent is not necessarily the direct implementer, this early-stage capital is especially important.
2. **Predevelopment Support:** Resources to develop initial project concepts, design specifications, and feasibility studies.
3. **Planning and Design Funds:** Funds for detailed design, engineering, permitting, and public/community engagement activities required prior to construction.
4. **Construction Funds:** Funding for implementation and “earth-moving” activities.
5. **O&M Resources:** Long-term support for ongoing O&M.

Most public and private project developers need all of the colours of money above in sequence to get to successfully complete a project. However, of the five, construction funds are the most widely available. Without access to the first two colours of money (catalyst and predevelopment) and a clear line of sight from one to the next, natural infrastructure proponents often fall short of designing projects at the level of detail and with a sufficiently compelling business case to reach

⁴ Note that climate change is deliberately not called out as a separate driver here because, in some areas of the world, the costs of specific climate impacts are already being felt as near-term financial losses and increasing financial risks, such as disaster recovery costs and rising insurance prices, where in other parts of the world, the current costs are less evident but the future impacts are potentially very large. The urgency to act and the scale of the incentive to act in each of these cases is very different. Table 1 offers examples where climate change is reflected as a priority for projects in both categories of drivers without placing it exclusively in either category

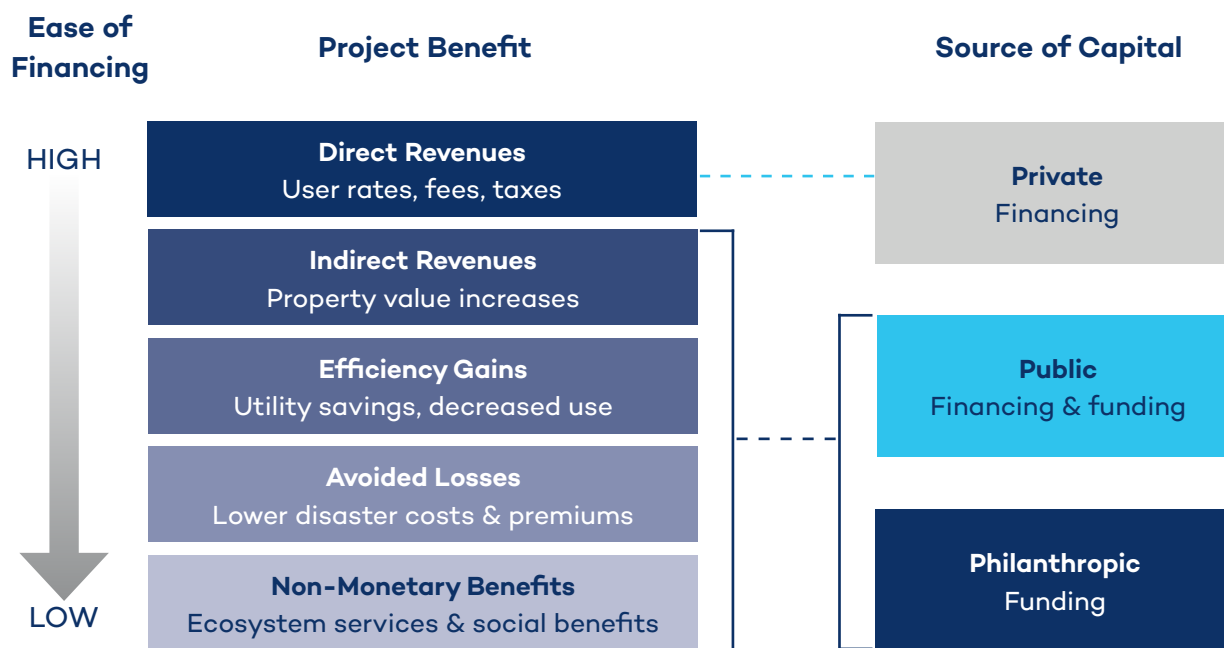


the planning and construction stages for which funding is more widely available, such as the Infrastructure Canada and Federation of Canadian Municipalities funding programs described in the introduction.

So what are the options for natural infrastructure project champions and developers? The three most common sources of capital for both conventional and natural infrastructure projects are private financing, public funding and financing, and philanthropic grants. Each of these funding sources typically comes with different requirements. The key motivation for private financing is the ability to repay project capital at a projected interest rate in a set time frame. Public funds, such as federal grants with no repayment required, and public finance, such as low-interest loans, are generally more focused on achieving a public purpose predetermined by a funding agency or authority. Finally, philanthropic grants are typically much smaller sources of project support that are mission- or cause-driven and intended to spark catalytic change in a field or region.

Figure 1 highlights how the main benefits of natural infrastructure projects align with each of these key sources of capital.

Figure 1. Potential sources of capital for natural infrastructure projects



Accelerating investment in the design, implementation, and scaling up of natural infrastructure systems requires a thoughtful approach to secure the most efficient and accessible forms of capital for each relevant stage of project development. In the case of nature-based solutions, very few projects are associated with direct revenue streams. As a result, projects are most likely to be funded via a combination of early philanthropic catalyst grants and larger, longer-term sources of public funds.



As Table 1 shows, most successful large-scale natural infrastructure projects to date have had significant public investment. Innovative finance is rarely the sole or even primary source of project implementation capital. Where private capital does play a role, it is often a small layer in a much larger public funding and financing stack motivated by corporate social responsibility or environment, social, and governance impact investment priorities. Given that natural infrastructure finance is still an emerging field, these types of innovative finance pilots have an important role to play in demonstrating where efficiency or performance benefits can generate a payback and serve as the basis for scaling up future private investment. However, project champions should be realistic about the role these funds can play in their own projects.



3.0 Guidance for Researchers and Project Champions

Based on the approach to mobilizing capital outlined in the previous sections, a key lesson for natural infrastructure project champions is to focus on the basics and seek the easiest, most direct sources of capital. It can be tempting to pursue the newest or most innovative types of funds, especially when they explicitly target green and natural infrastructure projects. However, these sources of capital are often experimental themselves, or they require significantly more up-front documentation and detail to access and use effectively.

Understanding the expectations and terms associated with different types of project capital (public, private, philanthropic) is far more important than focusing on any specific mechanism. For example, municipal bonds and green bonds both require repayment. Although it may sound like green bonds would make it easier or cheaper to secure funding for natural infrastructure projects, this is rarely the case. Even when there are pricing benefits that let project developers borrow or secure funds at lower costs for later-stage project implementation and construction, more often, the up-front application and documentation requirements for these dedicated funds are more onerous and costly than conventional project grants and loans. Moreover, focusing on narrow late-stage funding opportunities does not make it more likely that a project will make it through the early stages of predevelopment and design.

Instead, natural infrastructure champions both within and outside organizations that directly implement projects are most likely to succeed in developing innovative and pragmatic solutions when they focus on the following basic steps:

Step 1: Start with a driver. Do not start with a general ecosystem service or natural infrastructure opportunity. Develop a back-of-the envelope assessment of how one or more of the drivers in Table 1 impact specific beneficiaries who may not already be aware of the natural infrastructure options available to them. Get a sense of the scale (order of magnitude) of the potential benefits available to these specific beneficiaries.

Case example: The Living Breakwaters project is a USD 60 million nature-based coastal protection project currently under construction in Staten Island, New York (New York State, n.d.). The driver for the project was the catastrophic damage caused by Superstorm Sandy and the availability of federal disaster recovery funds through the Rebuild by Design competition.



Step 2: Identify a lead beneficiary or project implementer. Develop a short list of potential beneficiaries from Step 1 who can reap the greatest value from a natural infrastructure alternative. Seek points of contact with clear budgetary and decision authority or influence. Where no single project beneficiary is immediately obvious as the biggest winner (or loser) of a specific driver, consider if there is a consolidated group of beneficiaries—such as an industry cluster, homeowners association, or insurance pool—who could act cooperatively or come together around a shared benefit.

Case example: The Well Farm at Voris Field is a ~USD 2 million integrated community agriculture and green stormwater management pilot (Greenprint Partners, n.d.). The project champion, Greenprint Partners, worked with the City of Peoria to engage the community, develop the project in response to federal environmental mandates to reduce sewer overflows, and secure funding for implementation.

Step 3: Develop a pitch. Consider how to frame a preliminary analysis to highlight the opportunity and scale of benefits for a potential project lead in a manner that would persuade them to act. This type of preliminary analysis is a prerequisite for both initiating a partnership with an effective implementer and securing funding for more detailed planning and analysis.

Case example: In 2016, Quantified Ventures introduced the first-ever EIB with Washington, DC's water utility (see Table 1). Leading up to this issuance of the financial product, the firm developed a comprehensive pitch (with philanthropic support) and did extensive outreach and market education on the opportunity (Quantified Ventures, 2018).

Step 4: Establish a partnership. Recognize that natural infrastructure predevelopment requires skill sets that extend beyond any single organization. Set up collaborative agreements, as needed, with project leaders and stakeholders to pursue the next stage of planning and project predevelopment support.

Case example: In 2018, Blue Forest Conservation established agreements with the U.S. Forest Service and multiple California state and local partner agencies to launch the Yuba Project, a USD 4 million ecological restoration program across 15,000 acres of national forest (see Table 1) (Blue Forest, n.d.).



Step 5: Secure catalyst/predevelopment funding. Create a plan for the next phases of project design and analysis, including making the business case for specific design alternatives. When developing the business case, consider the following strategies for moving from general characterizations of benefits to options for generating revenue and capturing financial value:

- Separate current benefits from future value
- Look for opportunities on recent-year budgets and balance sheets to identify and reduce areas of increasing costs and significant losses

Case example: Starting in 2013, re:focus partners worked with the City of Hoboken to design financeable green flood mitigation solutions. Using early-stage philanthropic funding to develop a preliminary design, re:focus was able to help the city secure USD 30 million in loan funds for land acquisition and the next phases of project implementation for the [Northwest Resiliency Park](#) (C2ES Center for Climate and Energy Solutions, n.d.).

Early-stage project champions should avoid the temptation to focus on funding sources rather than drivers and large beneficiaries (potential project initiators and leaders). It can be tempting to think that available funding should in and of itself be sufficient motivation to pursue new ideas; however, this is rarely the case.

Project developers of both conventional and greener infrastructure solutions know that putting together public funding and financing applications is often onerous—even for the most straightforward projects and fund types. Specialty finance solutions, such as EIBs and certified green bonds, require even more detail and documentation. Starting by seeking the most innovative form of capital is unlikely to produce the scale of resources required for large-scale project implementation. Building strong and implementation-oriented partnerships around specific projects is a far more likely path to success.



4.0 Recommendations for Funders and Green Investors

Public, private, and philanthropic funders can also play a catalytic role in accelerating the development, implementation, and scale-up of large natural infrastructure projects. The most important thing is for all three types of funders to recognize that simply creating a new fund or source of capital is unlikely to help early-stage project champions address the critical project initiation and predevelopment gaps outlined above. Four main things funders and green investors can do immediately to increase investment in and use of natural infrastructure solutions are:

1. **Fund targeted research to fill data gaps and develop trusted metrics on natural infrastructure performance.** Even grey infrastructure technology innovators struggle to demonstrate the performance benefits of new technologies, such as porous pavement materials or leak detection monitors in water systems. The uncertainties and attribution challenges associated with large ecosystem interventions and their benefits are an even greater barrier to natural infrastructure project design, permitting, and investment.

Demonstrating that a mangrove or reef offers comparable protection to a seawall is a non-trivial data, modelling, and analytical challenge. Funders can help bridge this gap by: (1) supporting pilot projects with monitoring components; (2) adding monitoring and metrics development to ongoing or planned projects that lack sufficient support for long-term evaluation; and (3) funding new data collection, research, and targeted workshops that bring together scientists and financial modellers to create quantitative performance metrics for different categories of projects (e.g., constructed wetlands, detention systems, floodplain management). Together, these types of efforts can lay the groundwork for improved performance-based contracting for natural infrastructure and reduce investment uncertainty for private sector partners and investors over time.

2. **Convene and align key groups of potential natural infrastructure beneficiaries.** Where project champions have identified valuable natural infrastructure investment opportunities that benefit a large number of diffuse beneficiaries, funders can help convene these stakeholders to develop cooperative solutions that align incentives and to take collective action. For example, funding a roundtable for municipalities and utilities around upstream flood risk reduction solutions for shared downstream risk can open the door to creating a public risk pool or other cooperative agreement. This type of convening support is especially important in rural areas in Canada to overcome the problem of capturing value in areas of low population density and/or highly diffuse ecosystem benefits.



3. **Support efforts to achieve scale.** Scaling up natural infrastructure projects is a chicken and egg problem. Most green and natural infrastructure projects completed to date have been smaller than USD 1 million (Green, 2011). In contrast, larger funds with set-asides for green and natural infrastructure projects often have much higher capital and borrowing thresholds for projects. For example, in a report titled *Combatting Canada's Rising Flood Costs: Natural Infrastructure Is an Underutilized Option*, the authors note that,

In its 2017 budget, Canada announced \$2 billion for a Disaster Mitigation and Adaptation Fund, and stated that natural infrastructure was eligible. Unfortunately, the \$20 million minimum project cost and funding-matching criteria will likely exclude applications for programs that feature natural infrastructure, as they are usually not that expensive to implement. (Moudrak et al., 2018, p. 13)

Funders can play an important role in catalyzing larger-scale natural infrastructure projects by setting up separate and progressive thresholds for natural infrastructure applications and creating processes to help aggregate projects from different applicants or regions to reach investment scale.

4. **Provide dedicated predevelopment support.** Project predevelopment has been an emphasis of this entire report. There are few sources of funding for early-stage natural infrastructure champions to develop the kinds of compelling proposals required to motivate action and investment. Nearly all of the case examples above benefited from some form of early-stage philanthropic support. Foundations with strong program-related investment and impact investing interests should explore options for creating new cost-recovery mechanisms for funding these critical early project design, planning, analysis, and stakeholder engagement activities in collaboration with government agencies that provide later-stage project funding.



5.0 Conclusion

In recent years, a wide range of government agencies, philanthropies, and impact investors have come together to call for or create new infrastructure funds that prioritize natural infrastructure projects. The value of natural infrastructure is increasingly widely recognized. There is growing community and investor interest in sustainable solutions. Yet the barriers to project finance outlined in this report are real. While the creation of new funds sends an important signal about the interest in supporting and scaling up natural infrastructure investment, these funding vehicles rarely cover the costs of the most essential predevelopment efforts to mobilize project capital.

It is essential for project champions and funders alike to recognize that large-scale natural infrastructure projects are unlikely to emerge on their own. Rather, experts in these solutions will need to be able to approach potential project beneficiaries and implementers with clear ideas and investment pitches and seek incrementally larger resources to develop solutions together at each phase of project design and implementation.

Developing these types of innovative partnerships and pragmatic project designs takes significant up-front time and resources. In the absence of support for these types of predevelopment activities, the solutions that emerge will more often be small and opportunistic rather than transformational landscape-scale investments.

There are growing numbers of examples of urban green infrastructure solutions but far fewer large-scale natural infrastructure projects. As a natural resource-rich nation, Canada has an opportunity to be both a market leader in mobilizing capital for landscape-scale, nature-based infrastructure projects that serve specific industries or sectors—for example, timber/forestry, agriculture, tourism, and mining—and a model for other resource-rich regions of the world seeking win-win solutions to meet sustainable development and conservation goals.



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