Financing Sustainable Water Infrastructure
This iBook showcases the full work of The Johnson Foundation at Wingspread around its report on sustainable infrastructure financing. Scroll through the pages to see videos about the report, testimony before Congress, links to other information, and of course, the report itself. We hope you enjoy this iBook - and don’t forget to share it with friends and colleagues!
Video: Introducing FSWI

Lynn Broaddus, Director of the Environment Program at The Johnson Foundation at Wingspread introduces us to the Financing Sustainable Infrastructure report and her testimony on Capitol Hill about the report.
Our nation’s freshwater infrastructure faces a critical juncture. Largely built on systems developed during the 19th and early 20th centuries, our water infrastructure is aging, our technology outdated and our governance systems ill equipped to handle rising demand and environmental challenges. Additional strain is being placed on these systems from a variety of sources, including pressures from urbanization and changing climate conditions, such as increases in both droughts and extreme one-day precipitation events.

While these challenges are significant, they are not insurmountable. In fact, they can be viewed as drivers of much-needed change in how we finance and develop our water systems to meet future demands. New financing models and pricing flexibility, which are necessary to pay for new infrastructure and to support legacy systems, provide enormous opportunity for positive transformation necessary to keep pace with the rapid changes being experienced by counties, municipalities and investor owned utilities.

“Progress towards more sustainable, resilient and cost-effective systems is attainable, particularly if a long-term view is taken.”
This report seeks to tackle these issues and deliver some suggestions on how to understand and confront the pressing need for more sustainable and integrated water infrastructure financing models. This report is the product of a meeting convened by The Johnson Foundation at Wingspread, in collaboration with American Rivers and Ceres, which brought together a group of experts to discuss ways to drive funding toward the infrastructure we need for the 21st century. Specifically, this group focused on the following questions:

- What new financing techniques can communities use to pay for integrated and sustainable infrastructure approaches?
- How can we direct private capital toward more sustainable water management projects?

The report finds that while options for more cost-effective, resilient and environmentally sustainable systems are available, they are not the norm. In fact, investment in inflexible and expensive “siloed” water systems is still pervasive, despite the fact that money available for financing water infrastructure is increasingly scarce.

Of equal concern is the inefficiency of the existing systems, which lose some 6 billion gallons of expensive, treated water each day due to leaky and aging pipes – some 14 percent of the nation’s daily water use. This point is underscored by the fact that the American Society of Civil Engineers gives the nation’s water systems a D-, the lowest grade of any infrastructure including roads and bridges.

The report also details the various financing mechanisms available to different water systems. While municipal bonds are the debt instrument of choice for utilities large enough to be able to attract capital from markets, the vast majority of water systems must rely on cash, state revolving loan funds, or other low-interest loan programs at the state and federal level. In fact, only about 1,500-2,000 of the roughly 52,000 water systems in the United States are large enough to issue their own bonds. Given these constraints, some systems are turning to private equity as a financing source.

There are, of course, numerous obstacles and challenges that stand in the way of transforming our water systems to ones that are more sustainable, resilient and cost-effective. One of the main impediments to change
is the very nature of the systems themselves, where potable water, waste water, storm water, grey water and rain water are not treated as part of an interconnected system, but rather as distinct, separately financed and regulated units.

In addition, the rate-paying public and locally elected officials must come to grips with the temporary nature of federal subsidies for infrastructure. Once these subsidies expire, ratepayers are left holding the bag for funding further maintenance, inspection and upkeep, which can be politically unpopular. Therefore, many jurisdictions are not able to fully recapture all relevant costs, leading to long-term financial shortfalls and suboptimal maintenance and upkeep of systems.

While these challenges and obstacles are formidable, the report makes clear that they are not insurmountable. Progress towards more sustainable, resilient and cost-effective systems is attainable, particularly if a long-term view is taken. While there is no silver bullet, the report outlines pathways that will improve chances of success. These include:

- Recognize that local pressures will drive local solutions. Our water systems are as diverse as the drivers of change that impact them. But solutions are emerging at the local level, including green infrastructure, closed loop systems and recycling. Financing models need to be developed that can support this type of local activity, which can then be scaled up.
- Consumers should be given choices and options. Today’s water systems typically provide one product at a single price – focusing on potable water. While that has served us well, it is also true that potable water is the most expensive kind of water and is widely used for non-drinking purposes such as watering lawns, flushing toilets and showering. Consumers should be given options that include differentiated rates for drinking water versus other types. Additionally, water systems should explore how to move be-
yond “minimum cost rates” in order to meet customer demands.

• The financial health of our water systems is directly linked to their long-term sustainability. Our nation’s water systems need to embrace various financing changes in order to ensure long-term sustainability. These include full-cost accounting of water services; incorporating value-added services into the revenue picture to better align customers’ perceived value with products delivered; improving the capture and dissemination of performance data to drive efficiency; and considering consolidation of certain systems to enhance efficiency.

• Innovative financing models should be pursued to increase efficiency, add value to customers and lower costs for providers. These models should include: mechanisms to expand the pool of water service funding to non-traditional partners; increasing incentives and markets for distributed water services that include “low impact development,” such as on-site treated wastewater for buildings; and other green infrastructure initiatives.

• Alternative market-based solutions should be explored and evaluated for scalability. These solutions could include: properly valuing and pricing ecosystems services, which provide enormous value yet are largely unaccounted for in the present system; developing securities to aggregate customer-financed projects such as greater “where it falls” water management; and creating private investment opportunities for efficiency gains from such things as retrofitting and closed-looped water systems in order to reduce system impacts and improve efficiency at both the building and neighborhood levels.

This summary provides an overview of the main sections and themes contained in the report, but is not a substitute for the full breadth of depth offered in the following pages.

For the full report: click here
The photos above were taken during convenings at The Johnson Foundation at Wingspread in Racine, Wisconsin during the summer of 2011.
The Path Forward on Financing Sustainable Water Infrastructure

January 26, 2012

Charting New Waters

American Rivers
Rivers Connect Us

Ceres

The Johnson Foundation
AT WINGSPREAD
On March 21st, The Johnson Foundation testified before the House Transportation and Infrastructure Subcommittee on Water Resources and Environment. Lynn Broaddus presented the findings of the FSWI report and provided perspectives on two pieces of legislation being considered by the Subcommittee. Ms. Broaddus’ testimony provided Committee members with numerous examples of how innovative financing models must be pursued in order to avoid a potential crisis in our water systems in the years to come. Following is her written testimony to the Subcommittee:
Introduction

Good morning Chairman Gibbs, Ranking Member Bishop and distinguished members of the Water Resources and Environment Subcommittee. Thank you for inviting me to testify today.

My name is Lynn Broaddus, and I direct the Environment Program at The Johnson Foundation at Wingspread in Racine, Wisconsin. The Johnson Foundation’s mission is to be a catalyst for positive and lasting change through leading-edge convening to create healthier environments and communities.

The Johnson Foundation is non-partisan and brings no preconceived ideas or fixed agendas to this or any issue on which we focus. We aim to have candid and authentic dialogue in an environment that fosters the trust and collaboration needed to identify innovative yet broadly supported solutions that have impact.

FSWI Report Background

I am here today to testify about a report released recently by The Johnson Foundation titled, appropriately enough, Financing Sus-
This report lays out a roadmap for innovative ways to finance our nation’s water infrastructure for the 21st century and beyond.

The report’s recommendations were created from deliberations among a unique group of experts. In fact, these experts are similar to those the subcommittee has invited to this two-part hearing: public and private water utility managers, investment managers, municipal bond raters and underwriters, non-governmental organizations, foundations and other stakeholders.

These meetings were convened as part of The Johnson Foundation’s ongoing initiative on U.S. freshwater issues known as Charting New Waters - a broad, collaborative effort dedicated to catalyzing new solutions to freshwater challenges we are facing in the United States. Charting New Waters represents more than three years of high-level engagement on freshwater issues. The initial phase of work led to the release of Charting New Waters: A Call to Action to Address U.S. Freshwater Challenges, a consensus report issued in September of 2010.

The latest report, Financing Sustainable Water Infrastructure, is a direct outcome of the Charting New Waters work. The Johnson Foundation, in collaboration with American Rivers and Ceres, convened a group of experts at Wingspread to discuss ways to drive funding toward the infrastructure we need for the 21st century. The Financing Sustainable Water Infrastructure report is a result of those meetings.

FSWI Report Findings

The report examines the operational, institutional, and market-related challenges that our water and wastewater utilities need to overcome if they are going to continue to support our people and industries into the next century.

I would also note in the report “sustainability” means multiple things. It means that the infrastructure itself includes sustainable elements such as natural infrastructure that can be used to provide low-cost protection of water supply and flood abatement. It also includes consideration of sustainable pricing and financing mechanisms and how to make sure that those mechanisms are structured in a way that actually incentivizes and supports water
infrastructure decisions that will be appropriate for the next 50 to 100 years.

I would like to highlight some of the report’s recommendations that are relevant to this hearing and your work on innovative water infrastructure financing legislation.

- The water utility business model is changing. Historically, water and wastewater utilities have functioned as monopolies without competition. Now technological advances are allowing more options for water efficiency, water re-use, and water harvest. For example, Forbes recently did an article about how Google is using recycled gray water to cool its vast network of data centers – eliminating the demand for millions of gallons of treated drinking water. This is but one example of the sort of disruptive shift in traditional business models that needs to be factored into current thinking and planning.

As the price of water services rises, the cost of new technology drops, and concern for securing a water supply increases, we are likely to see a rise in use of these “disruptive” technologies, which can undermine the monopolistic nature of the water utility.

This can be a very good thing for society as a whole, but it means that the financial tools and risk models that have served the industry for the past fifty years need to be re-examined.

- With this we are likely to see more consolidation of systems and a move toward “one water” management, where wastewater, water supply, stormwater, and flood management are managed as one system rather than siloed into disciplines working at cross-purposes to each other.

- These changes and our shifting water demands drive the need to consider a number of innovative financing strategies including expanding the pool of water service funding, accounting and paying for ecosystem services and implementing distributed water services.

*Expanding Pool of Water Service Funding:*

We need to recognize that water systems are more than pipes and treatment plants and that roads, green spaces, and build-
ings are all critical to effective water management. This more comprehensive definition of water systems expands the funding pool. Other ways to expand the funding pool include partnering with heavy-use industrial partners and recovering valuable nutrients and energy embedded in the water and wastewater.

Accounting and Paying for Ecosystem Services:
We need an accurate valuation of ecosystems that can provide clean drinking water at a fraction of the cost of built infrastructure. These services are often not reflected on utilities’ balance sheets, which could help expand debt capacity for other capital improvements. Linking payment for watershed services upstream can cost magnitudes less than treatment plants and new supply development.

Implementing Distributed Water Services:
It is often cheaper—and potentially profitable for private investment—to capture and manage water where it falls through low-impact development including on-site treated wastewater for use in toilets and irrigation, living roofs, and rain gardens.

WIFIA and H.R. 3145
Many of these recommendations are encapsulated in the bills put forward by both Chairman Gibbs, the discussion draft known as Water Infrastructure Finance and Innovation Act or WIFIA, and Ranking Member Bishop’s H.R. 3145, the Water Quality Protection and Job Creation Act of 2011.

While The Johnson Foundation cannot offer any specific perspectives about this legislation, I can tell you generally about how these proposals fit into our report’s recommendations.

WIFIA:
The WIFIA proposal covers many of the necessary recommendations discussed during our financing water infrastructure meetings and contained in the Financing Sustainable Water Infrastructure report. However, the report also emphasizes the importance of flexibility, recognition of new technology and the changing conditions in the water business in order to maximize the impact and effectiveness of new proposed financing mechanisms.
The water industry is on the verge of significant change even as we face our nation’s growing freshwater challenges. In order to handle these uncertain but fast-paced changes, we need to have the ability to finance smaller, more incremental projects, especially for smaller communities. This is perhaps even more important than finding financing for larger projects. If financing mechanisms are available only for “mega-projects,” then that is what we will get when a smaller solution might be a more cost-efficient answer.

Similarly we need to expand “prioritization” criteria and include more scenario planning as cities and communities have to consider a growing number of diverse factors depending on location including water supply security, energy impact, vulnerability to disruptive technologies, changing utility business structures, and changing weather patterns.

Finally, I will just note that this country is built on innovation, a successful balance of private and public funding and the private sector’s ability to find solutions. The same is true in the water business and participants contributing to the report noted it might prove counterproductive to assume that the way we do business will continue to hold the same risks and opportunities that they once did. We need to ensure that changing weather patterns, long-term projections of aquifer drawdown, and uncertainties about future energy costs are taken into consideration as projects are evaluated.

H.R. 3145:
I will just briefly touch on Ranking Member Bishop’s Federal Water Pollution Control Act, H.R. 3145.

First I think the two bills, while certainly different, do share a lot of common and important ground. H.R. 3145 also hits on a lot of the important themes from our report. H.R. 3145 does recognize the inherent benefits of smaller projects. Certainly developing smaller projects that are more tightly focused can avoid some of the problems we are currently seeing where communities can no longer afford to maintain larger projects because of population shifts, reductions in per capita water use, and other factors.
In addition, the legislation addresses new technologies and alternative infrastructure, as does the WIFIA legislation, which is a necessary and positive element to water systems planning.

Regarding the grant programs, our report found that long-term sustainable funding mechanisms produce the best possibility that projects will be sustained at the local level with local resources. The experts we convened expressed the strong sentiment that full-cost pricing is the most compatible with long-term, sustainable water management. Grant funding of water infrastructure can be at cross-purposes with this goal by hiding the true cost of water and wastewater services.

**The Big Picture**

While all of these efforts on innovative financing are necessary and important, I encourage this Subcommittee, my fellow panelists and stakeholders to include in your discussions an emphasis on the nature of the systems we want to fund, in addition to our consideration of how we finance these systems.

We can bring about a more cost efficient and effective system for the long term if we tackle not only how to maintain the existing system but how to improve it so that we can more effectively meet the needs of our shifting population and water resources relative to the environmental, social, and demographic changes we are expecting.

**In Summary**

So to summarize my main points I would say as we look for new ways to finance the necessary water infrastructure for this country:

- Remember that water infrastructure includes more than pipes and water treatment plants, as several witnesses and subcommittee members have referred to, and can be leveraged in helpful and cost cutting ways;
- The nature of the water industry is changing and great opportunities lie in private and public partnerships, especially in financing;
- While it is absolutely necessary to find new ways of financing our infrastructure, we must also ask ourselves what infrastruc-
ture best meets our needs and how that might be different from the infrastructure we already have; and,

- We need to be cautious about new water funding mechanisms that emphasize large projects that reduce a community’s ability to respond to change.

I’d also like to ask unanimous consent to enter the *Charting New Waters* report and the *Financing Sustainable Water Infrastructure* report into the record.

Thank you for your attention to these issues and I would be happy to take any questions.
These photos were taken during the House Transportation and Infrastructure Subcommittee on Water Resources and Environment hearing on March 21, 2012.
Report Taps into Innovative Financing to Secure Future for Sustainable Water Infrastructure

Policy and funding changes needed to support efficiency, reliability and environmental upgrades for U.S. freshwater systems

RACINE, Wis. (Jan. 26, 2012) – Innovative financing and pricing flexibility are key to preparing the nation’s aging freshwater systems to handle growing demand and environmental challenges, according to a Charting New Waters report released today by The Johnson Foundation at Wingspread, American Rivers and Ceres.

The Financing Sustainable Water Infrastructure report, is the product of a meeting convened by The Johnson Foundation, in collaboration with American Rivers and Ceres, which brought together a group of experts to discuss ways to drive funding toward the infrastructure needed for the 21st century.

Largely built on systems developed during the 19th and early 20th centuries, U.S. water infrastructure faces profound problems of aging components, outdated technology and inflexible governance systems ill-equipped to handle current consumption, environmental and economic problems.

Presently, about 6 billion gallons of expensive, treated water is being lost in the U.S. each day due to leaky and aging pipes — some 14 percent of the nation’s daily water use. This pervasive water waste is underscored by the fact the American Society of Civil Engineers gives the nation’s water systems a D-, the lowest grade of any infrastructure including roads and bridges.
The report concludes that rebuilding and operating our water systems as they are presently built would be enormously inefficient. One major problem is the very nature of the systems themselves – where drinking water, stormwater and wastewater are built, financed and operated as entirely distinct units rather than as more efficient, interconnected systems. Another major problem is myopic, inflexible water-pricing systems that fail to distinguish between various water uses and generally undervalue water.

In order to achieve more sustainable, resilient and cost-effective freshwater systems, the report recommends bold new approaches for financing and operating public water systems, including:

- Local water solutions that can improve efficiencies, including green infrastructure, closed-loop systems and water recycling;
- Flexible water pricing and revenue structures that distinguish between drinking water and various other types of water, such as lawn water and toilet water;
- System-wide, full-cost accounting of water services and financing mechanisms; and
- Less reliance on state and federal funding and more reliance on private, market-based financing mechanisms that can support local, customer-supported solutions.

“While the deteriorating state of the nation’s water infrastructure is not a secret, we have lacked workable strategies and policies to finance the changes needed,” said Lynn Broaddus, Director, Environment Programs at The Johnson Foundation. “This report addresses the critical linkage between financing and sustainability that was initially raised by the Charting New Waters consensus report in 2010. It’s not enough to pay for new water infrastructure: we need the financing to actually drive a new, sustainable water infrastructure that will take care of generations to come.”

Jeffrey Odefey, Director of Stormwater Programs at American Rivers, said, “Clean water and resilient ecosystems are absolutely vital to our health, our communities, and economy. This timely report lays out clear directions to ensure that our communities grow into the future with safe, reliable water supplies and healthy rivers and streams.”

Sharlene Leurig, Senior Manager of Water and Insurance Programs at Ceres, said, “This report makes clear that our nation’s water infrastructure system is broken and dramatic changes are needed. Rethinking how we finance and operate our vast water systems is not a choice, it’s a must. We have the engineering and land use tools we need to ensure our water systems can stand up to 21st century challenges. The key will be partnerships and cooperation between business, government and public interest groups to finance these new tools.”

The Johnson Foundation is releasing this report as part of its work with Charting New Waters, an effort it formally launched in 2010 dedicated to catalyzing new solutions to U.S. freshwater challenges. Charting New Waters is composed of a diverse group of leaders from business, agriculture, academia and environmental organizations that have publicly committed to improving U.S. freshwater resources by advancing the principles and recommendations of the group.

The initial phase of work led to the release of Charting New Waters: A Call to Action to Address U.S. Freshwater Challenges, a consensus report issued on Sept. 15, 2010. Download the report here.

As part of its ongoing Charting New Waters effort, The Johnson Foundation is also hosting a series of Regional Freshwater Forums that convene experts to examine freshwater challenges, successes, innovations and potential solutions that can bridge geographies and inform national policy. The first Forum took place in Denver, Colo., in October 2011.

Charting New Waters is actively engaging new organizations to join the effort. If you are interested in making a commitment please click here.

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The Johnson Foundation at Wingspread is dedicated to serving as a catalyst for change by bringing together leading thinkers and inspiring new solutions on major environmental and regional issues. For additional information about Charting New Waters, or to learn more about The Johnson Foundation at Wingspread, please visit www.johnsonfdn.org.

American Rivers is the leading organization working to protect and restore the nation’s rivers and streams. Rivers connect us to each other, nature, and future generations. Since 1973, American Rivers has fought to preserve these connections, helping protect and restore more than 150,000 miles of rivers through advocacy efforts, on-the-ground projects, and the annual release of America’s Most Endangered Rivers®.

Ceres is an advocate for sustainability leadership. It leads a national coalition of investors and public interest groups working with companies to address sustainability challenges such as global climate change and water scarcity. Ceres also directs the Investor Network on Climate Risk (INCR), a network of 100 institutional investors with collective assets totaling about $10 trillion. For more information, visit www.ceres.org.
Op-Ed

America’s Troubled Water Infrastructure

Americans received a splash of cold reality about their water bills last week.

The average household water bill could double or even triple in order to cover more than $1 trillion in infrastructure costs to repair and expand the existing drinking water system in the U.S., according to a new study by the American Water Works Association (AWWA).

Consider for a moment that much of our water infrastructure – the millions of miles of pipes, wastewater treatment plants, pump stations and drinking water treatment systems – dates to before the Roosevelt Administration and you start to get a picture of what we’re up against. (That’s Teddy Roosevelt, by the way.)

In fact, the American Society of Civil Engineers rated the nation’s water systems a D-, the lowest grades of any infrastructure including roads and bridges. Not surprising considering we lose some 6 billion gallons of treated water each day due to leaky and aging pipes, some 14 percent of the nation’s water use.

So why then are we talking about spending $1 trillion to repair one of our existing water systems when what we really need is a whole new approach? It would be like investing in room-sized, mainframe computers running on punch cards rather than moving to laptops, tablets and cloud storage.

The AWWA is correct to insist that the nation sit up and pay attention, and to let Americans know we can no longer afford to rely on the previous generations’ investments in water infrastructure. Leaders in Congress are listening. Notably the Senate and House both have held recent hearings to look into alterna-
tive financing solutions for water infrastructure replacement, including a possible direct loan or loan guarantee program.

But the AWWA’s focus on “where, when, and how much pipe replacement or expansion for growth required” is only the beginning of the conversation. We also need answers to the “what”. If we’re going to spend $1 trillion, let’s get it right. Rather than simply repair pipes, we need to turn to American ingenuity to help us re-imagine a new infrastructure, and a new way to pay for it.

Most of our existing water systems were designed and engineered at a time when water and energy resources seemed limitless. As numerous water experts have noted, today’s technology is 20th century at best. We need 21st and 22nd century technologies that can handle the challenges of water and energy shortages, systems that can harvest stormwater, recycle wastewater and capture nutrients embedded in the waste, all while using less or even no net energy.

Many leading thinkers believe that we need more flexible water systems, which may mean employing decentralized designs and options that better integrate with natural systems. We may also need to re-think the institutional design of our water utilities so that drinking water, stormwater and wastewater are built, financed and operated as one interconnected system.

Replacing decades old material without replacing the decades old thinking and strategy that are behind our water systems is not an efficient use of dollars. U.S. water infrastructure faces not only profound problems of aging components, but also outdated technology and inflexible governance systems ill-equipped to handle current consumption, environmental and economic problems.

In order to achieve more sustainable, resilient and cost-effective freshwater systems, we need bold new approaches to financing and operating U.S. water systems.

A report recently released by The Johnson Foundation at Wingspread, Ceres and American Rivers, Financing Sustainable Water Infrastructure, addresses many of these issues and concludes that rebuilding, operating, and financing our water systems as they are presently built would be a shortsighted mistake. In addition to technological innovations, the report also points out that we need financial systems that recognize the changing nature of our water and energy resources. Many of our current methods for utility financing rely too heavily on growth, government subsidies, and potentially risky assumptions about future water supplies.

Clean, safe water and sanitation are fundamental to our way of life and commerce. For the last half-century, most Americans have received water and sanitation at heavily subsidized rates, reinforcing the delusion that these services come cheap. Those days are over. But the good news is that we have an incredible opportunity to reboot our water infrastructure systems so that they’re resilient and sustainable for future generations to come.

Lynn Broaddus, Ph.D., M.B.A., is Director, Environment Programs for The Johnson Foundation at Wingspread.

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This Op-Ed was published in The Hill newspaper on March 12, 2012.