

# Environmental Impact Investing: An Overview

Rosella Car è (Corresponding author)

Department of Economics and Business, University of Cagliari

17 Viale S. Ignazio, Cagliari 09123, Italy

Tel: 39-070-675-3319 E-mail: [rosella.care@unica.it](mailto:rosella.care@unica.it)

Riccardo De Lisa

Department of Economics and Business, University of Cagliari

17 Viale S. Ignazio, Cagliari 09123, Italy

Tel: 39-070-675-3319

Received: July 8, 2019

Accepted: August 5, 2019

Published: August 13, 2019

doi:10.5296/ijافر.v9i3.15045

URL: <https://doi.org/10.5296/ijافر.v9i3.15045>

## Abstract

In recent years, environmental and sustainability issues have experienced great interest. Addressing climate change requires the implementation of initiatives that require meaningful upfront capital investment and the development of alternative financing models for projects or initiatives with an environmental objective. In this sense, impact investments are currently used to fund projects and activities that tackle environmental problems. This work discusses new and emerging approaches towards sustainable development by providing a brief overview of the environmental impact investment movement and by focusing on an analysis of the first environmental impact bond (EIB).

**Keywords:** SDGs, Impact investing, Environmental impact bond

## 1. Introduction

Climate change is among the most debated challenges facing the world. The United Nations Sustainable Development Goals (UN SDGs) underlined the need to find long-term solutions towards critical priorities by avoiding the use of assets that deplete natural capital, while the United Nations Environment Programme (UNEP) clarified that a sustainable financial system can be defined as one that creates, values, and transacts financial assets in ways able to serve

the needs of an inclusive, environmentally sustainable economy in the long-term (UNEP, 2015: xi).

The Paris Agreement fully recognizes that public funds will not be enough to tackle climate change and that public-private-partnerships and private initiatives are envisaged to play a key role.

The United Nations estimates that the annual funding required to achieve the SDGs is USD 3.9 trillion, but current levels of investment towards the SDGs will leave an annual funding gap of USD 2.5 trillion. To help close the funding gap, additional sources of capital, including from the private sector, are required (Campiglio, 2016).

Academics, professionals, NGOs, and international authorities are aware that funding for environmental and climate efforts is scarce. Financial capital is considered to be the most important aspect in supporting sustainable development, and sustainable investment practices have recently experienced exceptional growth, being considered as the bridge between "an unsustainable present and a sustainable future" (Krosinsky and Robins, 2012).

Impact investments are currently used to fund a broad range of activities that tackle environmental problems. The World Economic Forum (2013) describes impact investing as a new and emerging investment approach that intentionally tries to make both positive social/environmental impacts and financial returns. Under this investment approach, impact investors aim to channel finance capital towards activities that produce positive social and environmental impacts but that can also offer some minimum financial returns (Bugg-Levine and Emerson, 2011; Geobey et al., 2012).

In the broad range of impact investing opportunities, Environmental Impact Bonds (EIBs) can be included within a growing trend of outcomes-based or pay-for-success financing models for sustainable development (Balboa, 2016).

Moving from these considerations, this study presents new and emerging approaches towards sustainable development by providing a brief overview of the environmental impact investment movement and by focusing on the analysis of the first environmental impact bond (EIB).

## **2. Emerging Trends: Environmental Impact Investing**

Impact investing corresponds to investments made with the intention of generating positive and measurable social and environmental impacts combined with a financial return (Canadian Task Force on Social Finance, 2010).

From a terminological point of view, the term "impact investing" does not provide clarification about the content of what such a "positive impact" is supposed to be. Therefore, the use of the terms "social impact investing" or "environmental impact investing" has been suggested in order to put attention not only on the financial return but also on the type of positive effects that the investment may have (Salamon, 2014). At the same time, previous works highlighted that impact investing is often confused with other forms of investments, including double and triple bottom line, mission related investing, program-related investing,

blended-value, or economically targeted investing (Rizzello et al., 2016; Carè and Wendt, 2018).

Several authors have highlighted that impact investing is an investment approach and not a stand-alone asset class because in the wide range of impact investing opportunities, financial instruments span from equity to bonds (Brandstatter and Lehner, 2015; Carè and Wendt, 2018). Impact investing differs from socially responsible investing (SRI) because the latter screens investments by seeking to minimize negative impacts ranging from environmental, social, and government factors (the well-known ESG factors), while impact investments seek to make positive and measurable impacts beyond financial returns (Geobey et al., 2012). Impact investors aim to channel financial capital towards activities that are designed to produce socially and environmentally positive impacts but that can also offer some minimum financial returns (Geobey et al., 2012). By bridging the gap between patient capital and venture capital, impact investments can be transformative in scaling up sustainable energy investments, especially through climate change mitigation projects and land restoration projects.

In the wide range of impact investing instruments, governments can develop specific and innovative investment architectures, such as Social Impact Bonds (SIBs), and promote public-private-partnerships to address specific social needs (Chiappini, 2017). SIBs can be considered as a specific way of conducting social policies and spending public money, and a radicalization of the wider phenomenon of (social) impact investing (Chiappello, 2015, p. 26). By using these innovative instruments, governments can identify potential areas of investment, define a favorable regulatory environment, and set up proper incentives, like tax incentives (Bugg-Levin and Emerson, 2011; Chiappini 2017).

SIBs involve different parties (Carè and Ferraro, 2019), are arranged around the logic of “payment-by-results” or “pay-for-success”, and can be considered both a financial product and a template for social policy interventions, promising to save government expenditures and to increase the quality of social service provision with the help of private organizations and financial markets (Berndt and Wirth, 2018).

### **3. Environmental Impact Bonds: The Case of D.C. Water**

Environmental Impact Bonds (EIBs) belong to the family of Social Impact Bonds (SIBs) with the difference being that while the latter focus on funding welfare projects, the former are devoted to the implementation of green or climate-related projects.

Unlike traditional bonds and green bonds, the EIB payment structure is related to the achievement of the pre-fixed outcome and thus it removes (success/failure) risk from the bond issuer by placing it on the investors (Balboa, 2016). EIBs are not bonds in a strict sense but pay-for-success contracts, in which the risk of success/failure is borne by the investor, and financial savings, pegged to the intervention outcome, are prioritized (Balboa, 2016).

The first EIB was announced in September 2016 by the Washington D.C. Water and Sewer Authority, in collaboration with the Calvert foundation and Goldman Sachs (D.C. Water, 2016).

The initiative will fund the construction of a green infrastructure project in the Rock Creek sewer shed to manage storm water runoff and improve the District's water quality (D.C. Water, 2016; Spiess-Knafl and Scheck, 2017; Christophers, 2018).

The performance risk of the infrastructure will be shared amongst government and private investors, while construction costs will be paid by the public administration, and payments may vary based upon the success of the environmental intervention (Spiess-Knafl and Scheck, 2017). Table 1 provides an overview of the main features of the EIB.

Table 1. Main features of D.C. Water's environmental impact bond (EIB)

<b>Target population</b>	Residents of Washington D.C. and the Anacostia and Potomac River watersheds
<b>Intervention</b>	To construct green infrastructure designed to simulate natural processes of absorbing and slowing surges of storm water by reducing the overall incidence and volume of combined sewer overflows (CSOs)
<b>Duration</b>	36 Months
<b>Capital raised</b>	\$25 M (of which \$2 M purchased by the Calvert Foundation and \$23 M purchased by Goldman Sachs Urban Investment Group)
<b>Max Payment</b>	<b>Outcome</b> \$28.3 M
<b>Bond Structure</b>	Multimodal variable rate bonds, initially issued at a fixed rate through a mandatory tender date (April 2021)
<b>Financial terms</b>	The \$25 million bond has a maturity of 30 years and an initial term rate of 3.43%.
<b>Investors</b>	Goldman Sachs, Calvert Foundation
<b>Financial Advisor</b>	Public Financial Management, Inc.
<b>Technical Advisor</b>	Harvard Kennedy School Government Performance Lab
<b>Intermediary</b>	Quantified Ventures
<b>Service Provider</b>	Sewer Authority and D.C. Water

<b>Outcome funders</b>	Sewer Authority and D.C. Water
<b>Metrics and Programme evaluation</b>	The program will be evaluated on the basis of the percentage reduction of storm water runoff

Source: D.C. Water (2016)

The EIB was structured as a 30-year municipal bond (tax exempt) with a mandatory tender in year five and was sold in a private placement to the Goldman Sachs Urban Investment Group and the Calvert Foundation, while Quantified Ventures served as the transaction coordinator (Appel et al., 2017; US EPA, 2017).

The bonds were issued at an initial interest coupon of 3.43%, payable semiannually, for the first five years and at a face value of \$25 million. The mandatory tender date is April 1, 2021, while the stated maturity date is October 1, 2046 (US EPA, 2017). Based on the relative success or failure of the project, the contract provides at the five-year mandatory tender a provision for a \$3.3 million payment for the Investors by D.C. Water or to D.C. Water by the Investors (Appel et al., 2017).

Depending on the success rate of the program, a first contingent payment may be due on April 2021. Table 2 provides an overview of the main outcomes' ranges, performance tiers, and contingent payments schedule.

Table 2. Outcomes ranges, performance tiers, and scheduled payments

<b>Performance Tier</b>	<b>Outcome</b>	<b>Payment</b>
1	The program will reduce runoff by more than 41.3%	\$3.3 million to investors
2	The program will reduce runoff by less than 41.3%, but by more 18.6%	No outcome payment will be made
3	The program will reduce runoff by less than 18.6%	Investors will make a risk-share payment of \$3.3 million to D.C. Water

Source: D.C. Water (2016)

#### 4. Risk Sharing and Institutional Impact Investors

The classical model of an SIB-from which this EIB is derived-involves a contractual agreement for the provision of public services by a private sector consortium, an 'optimal' risk-sharing between the public sector and the private sector, and an innovative design and

delivery of public services by the private sector (Carè 2018).

From a portfolio perspective, the types of risk that arise for impact investments are often the same risks that could potentially arise for a traditional investment (Saltuk, 2012).

On the other hand, from a contractual point of view, Carè (2018) and Rizzello et al. (2018) highlight some important risk factors that should be considered in the development of an SIB project or, in this case, of an EIB project. In particular, the authors made evident the following categories of risk factors: partnership risk, evaluation risk, operational risk, programmatic risk, policy risk, and regulatory risk.

Table 3 provides a breakdown of the types of risks and risk allocations among the parties in the case of the D.C. Water EIB.

Table 3. Risks inventory and risk sharing in the D.C. Water EIB

RISKS	PARTIES		
	D.C. Water and Sewer Authority	Calvert Foundation	Goldman Sachs Urban Investment Group
Operational, construction, implementation, and impact risk	✓		
Financing risk	✓		
Counterparty risk		✓	✓
Reputational risk	✓	✓	✓
Regulatory risk	✓		

Source: our elaboration

In the case in which the success rate of the program will require the \$3.3 million risk share payment to be made by the Investors, D.C. Water will withhold that amount from the principal and interest it would otherwise be obligated to pay to the Investors on the mandatory tender date. In this way, D.C. Water eliminates Investor counterparty risk by establishing a prior legal claim to these revenues, as the source of the potential Risk Share Payment, because this would reduce the interest and/or the principal payable from system revenues to Investors on the mandatory tender date by \$3.3 million (US EPA, 2017).

Regarding the operational risk, it occurs when the program does not work or when the established ranges make it difficult to obtain adequate financial savings (Carè 2018). This risk is held by D.C. Water, which has the responsibility for arranging, designing, constructing, and maintaining the assets. The operational risk was avoided by the decision of Goldman

Sachs and the Calvert Foundation to neither make nor receive any outcome or risk share payments until the project is completed and by using its expertise to review the plan before agreeing to invest (US EPA, 2017). As noted by Giantris and Pinakiewicz (2013), from the public commissioner side, the reputational risk refers to both the provision and testing services under a new approach, and there are also risks related to the introduction of new policies and practices. Thus, the ability to balance these risks is a key element of accessing private capital without any kind of costs for the government until the achievement of outcomes (Giantris and Pinakiewicz, 2013). Additionally, the failure to achieve target environmental outcomes will likely affect investors' decisions about funding these initiatives in the future. Similarly, if the commissioner fails to repay investors despite the achievement of agreed-upon targets, this too can cause damage to its reputation and its credit rating. The reputational risk relating to the success of the interventions is obviously shared with the institutional investors due to the fact that their involvement in the programme is not only a business strategy but also CSR and Sustainability strategies.

## 5. Conclusions

The financial crisis of 2007/2008, the emerging pressure towards a sustainable financial system, and the need to close the funding gap for climate actions seem to have fueled a new investor awareness that is more focused on the impact that financial decisions may have.

Impact investments are growing, and new financial opportunities are available. Sustainable infrastructure investing, real assets impact investing strategies, and EIBs represent new ways to raise financial resources for funding green projects and initiatives.

Even though the literature on impact investment tends to focus more on the financing of social initiatives, it seems that there is growing interest from investors in creating positive environmental impacts (GIIN, 2016) through investments in a wide range of sectors, including clean tech, green construction, land remediation, sustainable forestry, and biodiversity conservation (EC, 2016).

This work reviewed the main characteristics of the first EIB issued by the Washington D.C. Water and Sewer Authority in collaboration with Goldman Sachs and the Calvert Foundation. Compared to the most used SIBs, EIBs show the presence of two main institutional investors (Goldman Sachs and the Calvert Foundation) and a high level of financial sophistication. In particular, the EIB has been structured as a 30-year tax exempt municipal bond sold in a private placement to the Goldman Sachs Urban Investment Group and the Calvert Foundation with a provision for a \$3.3 million payment, either payable to the Investors by D.C. Water or to D.C. Water by the Investors, depending on the relative success or failure of the project. The construction cost will be paid by the public administration, but the performance risk of the infrastructure will be shared amongst government and private investors, while payments on the bond may vary based upon the success of the environmental intervention.

As highlighted in the previous sections, the contractual provisions of the EIB provide the sharing of risk among the involved parties. It is interesting to note that the presence of two major institutional investors represents the opportunity to raise capital but also to use the

financial and technical expertise of these two partners in arranging the scheme and in negotiating aspects such as the performance tiers and the evaluation process. Considering that local communities are on the front line of climate action, the implementation of the EIB represents the first attempt to use the scheme of pay-for-performance in the environmental sphere and to involve private investors.

As an explorative study, this work highlights some innovative aspects but also some open questions that need to be addressed in further research. First, the EIB analyzed in this paper represents the first and currently only case of an application of the conceptual scheme of Impact Investing, and especially of Social Impact Bonds, to green projects. This aspect represents, at the same time, the main limitation of our study but also a preliminary assessment of the potential that the use of this kind of innovative financial instruments could mean in terms of sustainable development.

Finally, unlike classical SIB schemes, this first EIB is strongly characterized by the presence of an investment bank that played a key role in both the underwriting and in the placement of investors. The possibility of using a contractual scheme like those of municipal bonds likely represents the main innovation of EIBs with respect to SIBs by transforming SIBs, which traditionally are mainly funded by philanthropic entities, into “market-friendly” financial instruments.

### **Acknowledgement**

This work is the result of collaboration between authors. In particular, Dr. Rosella Carè contributed to Sections 2, 3, and 4 while Prof. Riccardo De Lisa contributed to Sections 1 and 5.

### **References**

- Appel, T., Bezak, B., & Lisle, J. (2017). DC Water Green Infrastructure Financing: Pay for Success Can Help Water Utilities Pursue Innovative Solutions. *Journal-American Water Works Association*, 109(10), 26-31.
- Balboa, C. M. (2016). Accountability of environmental impact bonds: The future of global environmental governance?. *Global Environmental Politics*, 16(2), 33-41.
- Berndt, C., & Wirth, M. (2018). Market, metrics, morals: The Social Impact Bond as an emerging social policy instrument. *Geoforum*, 90, 27-35.
- Brandstetter, L., & Lehner, O. M. (2015). Opening the market for impact investments: The need for adapted portfolio tools. *Entrepreneurship Research Journal*, 5(2), 87-107.
- Bugg-Levine, A., & Emerson, J. (2011). Impact investing: Transforming how we make money while making a difference. *Innovations*, 6(3), 9-18.
- Campiglio, E. (2016). Beyond carbon pricing: The role of banking and monetary policy in financing the transition to a low-carbon economy. *Ecological Economics*, 121, 220-230.
- Canadian Task Force on Social Finance. (2010). Mobilizing private capital for public good.

Retrieved from  
<https://www.marsdd.com/wp-content/uploads/2011/02/MaRSReport-socialfinance-taskforce.pdf>

Carè R. (2018). Social Impact Bond: beyond financial innovation. In Wendt K. (Ed.), *Sustainable Financial Innovation*. Verlag: Taylor & Francis.

Carè R., & Ferraro, G. (2019). Funding Innovative Healthcare Programs Through Social Impact Bonds: Issues and Challenges. *China-USA Business Review*, 18(1), 1-15.

Carè R., & Wendt, K. (2018). Investing with Impact: an Integrated Analysis between Academics and Practitioners. In La Torre, M., & Calderini, M. (Eds.), *Social Impact Investing beyond the SIB*. Springer.

Chiapello, E. (2015). Financialisation of valuation. *Human Studies*, 38(1), 13-35.

Chiappini, H. (2017). *Social Impact Funds: Definition, Assessment and Performance*. Springer.

Christophers, B. (2018). Risk capital: Urban political ecology and entanglements of financial and environmental risk in Washington, DC. *Environment and Planning E: Nature and Space*, 1(1-2), 144-164.

D.C. Water. (2016). *Factsheet: DC water environmental impact bond*. Retrieved from <http://www.goldmansachs.com/media-relations/press-releases/current/dc-water-environmental-impact-bond-fact-sheet.pdf>

Geobey, S., Westley, F. R., & Weber, O. (2012). Enabling social innovation through developmental social finance. *Journal of Social Entrepreneurship*, 3(2), 151-165.

Giantris, K., & Pinakiewicz, B. (2013). Pay for success-understanding risk trade-offs. *Community Development Investment Review*, 9(1), 35-39.

Krosinsky, C., & Robins, N. (Eds.). (2012). *Sustainable investing: The art of long-term performance*. Routledge.

Rizzello, A., Caridà R., Trotta, A., Ferraro, G., & Carè R. (2018). The use of payment by results in healthcare: a review and a proposal for Italy. In La Torre, M., & Calderini, M. (Eds.), *Social impact investing beyond SIB: Evidence from the market*. Palgrave.

Rizzello, A., Caré R., Migliazza, M., C., & Trotta, A. (2016). Social Impact Investing: A Model and Research Agenda. In Lehner O. (Ed.), *Routledge Handbook of Social and Sustainable Finance*. Routledge.

Salamon, L., M. (2014). *New frontiers of philanthropy: A guide to the new tools and new actors that are reshaping global philanthropy and social investing*. Oxford University Press, USA.

Saltuk, Y., Bouri, A., Mudaliar, A., & Pease, M. (2013). Perspectives on Progress: The Impact Investor Survey. *Global Social Finance, JP Morgan and the Global Impact Investing*

Network, London.

Spieß-Knafl, W., & Scheck, B. (2017). The Impact Investing Market. In *Impact Investing* (pp. 75-110). Palgrave Macmillan, Cham.

U.S. EPA Water Infrastructure and Resiliency Finance Center. (2017). *DC Water's Environmental Impact Bond: A First of its Kind*. Retrieved from [https://www.epa.gov/sites/production/files/2017-04/documents/dc\\_waters\\_environmental\\_impact\\_bond\\_a\\_first\\_of\\_its\\_kind\\_final2.pdf](https://www.epa.gov/sites/production/files/2017-04/documents/dc_waters_environmental_impact_bond_a_first_of_its_kind_final2.pdf)

United Nations Environment Programme (UNEP). (2015). *The Financial System We Need: Aligning the Financial System with Sustainable Development*. Retrieved from [http://unepinquiry.org/wp-content/uploads/2015/11/The\\_Financial\\_System\\_We\\_Need\\_EN.pdf](http://unepinquiry.org/wp-content/uploads/2015/11/The_Financial_System_We_Need_EN.pdf)

World Economic Forum. (2013). From Ideas to Practice, Pilots to Strategy - Practical Solutions and Actionable Insights on How to Do Impact Investing. Retrieved from [http://www3.weforum.org/docs/WEF\\_II\\_SolutionsInsights\\_ImpactInvesting\\_Report\\_2013.pdf](http://www3.weforum.org/docs/WEF_II_SolutionsInsights_ImpactInvesting_Report_2013.pdf)

### **Copyright Disclaimer**

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>)