INSTRUMENT NAME: 7.2 BONDS/GREEN BONDS

Pondscape-specific definition: Bonds are an instrument for raising finance through the debt capital market. It is effectively a loan from multiple parties. By issuing bonds, the bond issuer (the debtor) receives a fixed amount of funding (the principal) from multiple investors (creditors). In return, the debtor must repay the creditors the money they received (the principal) over an agreed time period plus interest (called "coupons"). Green bonds are bonds where the principal is used exclusively to finance or re-finance "green" projects i.e. those that generate an environmental benefit. What qualifies as a "green" project has commonly been defined by alignment with the voluntary Green Bond Principles (ICMA, 2021)[1], though the EU Commission has proposed its own voluntary EU Green Bond Standard (EU Commission, 2021).[2]

There are numerous sub-categories of green bonds including standard green use of proceeds bonds, green revenue bonds, green project bonds, and green securitised bonds, among others. Each has different specific structures and requirements. Here we focus on green bonds generally.

CATEGORY	Debt instruments			
ALSO-KNOWN-AS	Fixed income securities, green revenue bonds, green project bonds, and green securitised bonds			
RELATED INSTRUMENTS	Loans, green loans, revolving fund			
APPROPRIATE FOR: Who can use this type of financing instrument?	Pondscape developer	NGOs and non-profits	**Local/city/ regional govt. and agencies**	**National govt. and public agencies**
SOURCE OF FINANCE: Who provides the finance?	Private, public: Investors in bond markets (e.g. pension funds, mutual funds, corporates, governments)			
PAYMENT FORM: What form is the payment?	Cash (equal to the principal)			
IN RETURN FOR WHAT? What is the NBS project obliged to deliver in return?	- Principal repayment over time plus coupon payments (i.e. interest payments). - Different types of green bonds give different recourse to the creditor if the bond cannot be repaid. Some types of green bonds are only guaranteed by the assets and balance sheet of the project, others have recourse to revenue generated by the investment (e.g. taxes, fees), while others are guaranteed by the issuer as a whole or to pools of projects (Climate Bonds Initiative, 2021a).			
RECIPIENT REQUIREMENTS: What requirements must recipients meet to receive finance?	Green bonds are commonly issued by large institutional actors, such as local/regional/national/international governments and agencies (e.g. cities, regional water authorities, European Investment Bank), or by financial institutions (such as banks). This is linked to the complexity of bond issuances and the scale requirements of capital markets (green bond issuances are generally very large, while some recent issuances are as small as €85,000, multiple million and even billion-dollar issuances are more common (Climate Bonds Initiative, 2021b))			

[1] The ICMA Green Bond Principles require bond finances to be used for specific types of projects (including e.g. environmentally sustainable management of living natural resources and land use, terrestrial and aquatic biodiversity conservation), and requires debtors to transparently justify the project's green credentials, manage proceeds, and report on projects.

[2] The EU Green Bond Standard is also proposed to be a voluntary standard. Once adopted, it would require that finance is used exclusively for projects that are aligned with the EU Taxonomy, which classifies economic activities as sustainable/non-sustainable (based on their impact on six environmental objectives: climate change mitigation, adaptation, biodiversity, pollution, sustainable use and protection of water, and transition to a circular economy). It also requires transparent reporting and that projects are externally reviewed (with supervision from the European Securities Markets Authority) (EU Commission, 2021)

PROJECT REQUIREMENTS: What requirements must the pondscape project meet?	-Projects must be "green", i.e. the financing must be used only for projects that deliver environmental benefits (referred to as "Use of Proceeds"). Pondscape creation/restoration/management are likely to be considered green. - A common definition of what is considered "green" is given by the ICMA Green Bond Principles, which specify different eligible categories (such as renewable energy, environmentally sustainable management of living natural resources and land use, terrestrial and aquatic biodiversity conservation, climate change adaptation, among others). These principles also require transparent pre- and post-issuance reporting and management of proceeds. - The EU Green Bond Standard is an under-development voluntary standard that aims to establish a new baseline for green bonds. It would require proceeds to be used only for projects classified as sustainable by the EU Taxonomy, as well as additional external review and reporting requirements. - To attract creditors, projects may need to be able to demonstrate that the project will generate economic returns (that will enable repayment of the principal).			
OTHER REQUIREMENTS: What additional requirements are attached to the financing?	Transparent pre- and post-issuance reporting: Debtors commonly need to prepare detailed justifications for investors that outline how the project is eligible as a green bond (as well as evidence that they will be able to repay the bond). To maintain creditor trust (and support secondary market trades) they must also monitor and report on the project once the bond has been issued. This may need to be externally evaluated and approved. These additional requirements can generate transaction costs.			
SPEED: How quickly do recipients receive money?	Fast (<4months) – Medium(5-12months) – **Slow (12months+)**			
FUNDING TIMELINE: When does the recipient receive the funding?	One-off: the debtor receives the principal up front. They must then pay creditors regular coupon (i.e. interest) payments (e.g. annually), as well as repay the principal when the bond matures. Green bonds are commonly long-term, with maturity after 10-30 years.			
NBS TYPE: What types of NBS is the financing for?	**Pondscape creation**	**Pondscape restoration**	**Pondscape management**	
SCALES: What scale of financing?	Small (<€10k)	Medium (€10k-€99k)	**Large (€100k-€999k)**	**Very large (€1million+)**
COMPLEXITY: How complex is applying for the finance	Medium	Medium	**Complex**	
EXIST NOW IN EU?	**Yes**	No		
REFERENCES:	Climate Bonds Initiative (2021a) Explaining green bonds (webpage). Accessed 03.01.2021 .https://www.climatebonds.net/market/explaining-green-bonds Climate Bonds Initiative (2021b) Labelled Green Bonds Data: Latest 3 Months (webpage). Accessed 03.01.2021. https://www.climatebonds.net/cbi/pub/data/bonds EU Commission (2021) REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on European green bonds. 2021/0191(COD). https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021PC0391 ICMA (2021) Green Bond Principles: Voluntary Process Guidelines for Issuing Green Bonds. Accessed 03.01.2021 https://www.icmagroup.org/sustainable-finance/the-principles-guidelines-and-handbooks/green-bond-principles-gbp/			

Instrument: 7.2 Environmental Impact Bond

Example name: 7.2.1 DC Water Environmental Impact Bond

Example description: A number of green infrastructure measures were developed to reduce stormwater flow into the combined sewer system to reduce the frequency and volume of sewer overflow. The measures were financed by Goldman Sachs and Calvert Impact Capital through an Environmental Impact Bond of $25 million, issued by the utility company D.C. Water with a 30-year issues length. The environmental impact bond is a particular bond structure because the interest rate is linked to the measured environmental benefits from the use of the bond funding.

NBS DESCRIPTION			
LOCATION	Washington D.C., US		
NBS TYPE	**Creation**	Restoration	Management
ECOSYSTEM TYPE	Green infrastructure		
NBS BENEFITS	Reduction of stormwater flow into the combined sewer system to reduce frequency and volume of sewer overflow.		
NBS DESCRIPTION	As a part of the DC Clean River Project, rain gardens, permeable pavements, and two sewershed parks were created to absorb rainwater and reduce sewer overflow.		
SCALE (SIZE)	25 acres of raingardens; unreported scale of permeable pavement and sewershed parks		
NBS PERFORMANCE CRITERIA	Volume of stormwater reduction		
NBS PERFORMANCE	- The green infrastructure was assessed successful for achieving 20% reduction in stormwater inflow.		

FINANCING DESCRIPTION	
SOURCE OF FINANCING	Goldman Sachs; Calvert Impact Capital
RECIPIENT	D.C. Water (utility company)
SCALE (FINANCING)	$25 million
TIMELINE	30 years issue length
FINANCING REQUIREMENTS	This case was the first implemented Environmental Impact Bond used by D.C. Water, who had previously declared the following goals for which the structure of an environmental impact bond seemed appropriate: • "Ensure responsible stewardship of ratepayer funds by transferring a portion of performance risk associated with technologies that had never been implemented on a large scale in the district • Enhance future decision-making about how much and which types of green infrastructure to build • Create a model funding mechanism that other municipalities can leverage to advance the use of green infrastructure to address stormwater management in their communities • Establish a green jobs initiative targeting local workforce development and sustainable job creation, including training and certification opportunities for District residents • Improve transparency to local ratepayers by formally predicting, measuring, and publicly reporting the environmental impact of the green infrastructure."
FINANCING PERFORMANCE	• The principal is repaid through the costs saved by reducing sewer overflow. The core interest rate is at 3.43% for the expected environmental benefit, with a reduction clause for under-performing and an increase for over-performing.
TRANSACTION COSTS	The bond was developed by Quantified Ventures at costs that remained undisclosed.
REFERENCE	Brand M. W. et al. 2021. Environmental Impact Bonds: a common framework and looking ahead. Environmental Research: Infrastructure and Sustainability. 1: 023001 Mooring P. 2021. DC Water's pioneering Environmental Impact Bond a success (webpage). Accessed 26.04.2022. Available: https://dcwater.com/whats-going-on/news/dc-water%E2%80%99s-pioneering-environmental-impact-bond-success

Instrument: 7.2 Green Bond example

Example name: 7.2.2 The Conservation Fund's Green Bond

Example description: Forest in the US are at risk of land-use change and fragmentation due to new developments. To conserve productive forest at risk, The Conservation Fund (TCF) has issued a $150 million green bond, with the proceeds used to acquire, restore and permanently protect forests and their ecosystem services including wildlife habitats, carbon sequestration, recreational values, as well as their value for sustainable timber production.

NBS DESCRIPTION			
LOCATION	USA, different locations		
NBS TYPE	Creation	**Restoration**	**Management**
ECOSYSTEM TYPE	Productive forests (including other landscapes e.g. wetlands)		
NBS BENEFITS	Biodiversity; Carbon sequestration; Water filtration and purification; Production of timber; Recreation and wellbeing		
NBS DESCRIPTION	Targeted are productive forests that are threatened by fragmentation or land-use change, which are then permanently protected for the benefits they provide, including recreation, carbon sequestration, climate adaptation, water provisioning and purification, timber production, and other services.		
SCALE (SIZE)	500,000 acres of forest, with another 390,000 acres in the planning		
NBS PERFORMANCE CRITERIA	Area of forest conservation; carbon sequestration; rivers streams under protection; regional economic impact		
NBS PERFORMANCE	The Conservation Fund reports: - 890,790 acres impacted forest - 779,443,000$ annual economic impact - 213,957,000t CO2-equivalent sequestrated carbon - 1,613 miles of streams affected - 138,617 acres of wetlands affected		

FINANCING DESCRIPTION	
SOURCE OF FINANCING	Institutional investors; private investors on the bond market
RECIPIENT	The Conservation Fund (TCF)
SCALE (FINANCING)	$150 million
TIMELINE	10-year issue length, with financing paid by investors upfront, who then receive annual coupon (interest) payments and repayment at the end of the ten-year period.
FINANCING REQUIREMENTS	According to TCF the bond required: - a strong investment grading - a diversified and reliable revenue stream to repay principal and interests - a strong asset base (i.e. the forest and its resources) - possibilities of blended finance (grants for initial start-up phase)
FINANCING PERFORMANCE	The bond received a triple A rating from Moody's, was oversubscribed 2.5 times and priced at 3,47%. TCF report: - $1.87 million value of forests acquired per $1 million of bonds. - $131,602,987 out of $150,000,000 bond money invested (Dec. 2020) - $245,712,725 total value of projects utilizing proceeds
TRANSACTION COSTS	Transaction costs are not reported but include the costs of launching and marketing the bond, which encompasses Moody's credit rating service, Goldman Sachs' bond offering services, auditing and monitoring activities, among other things.

REFERENCE	Green Finance Institute (2020) The Conservation Fund Green Bonds [Accessed online 03.08.22]. Available here: https://www.greenfinanceinstitute.co.uk/gfihive/case-studies/conservation-fund-green-bonds/ Kart, J. (2021) Conservation Fund's Green Bonds Pay Off: Eight Forests And 220,000 Acres [Accessed online 03.08.22]. Available here: https://www.forbes.com/sites/jeffkart/2021/01/23/conservation-funds-green-bonds-pay-off-eight-forests-and-220000-acres/?sh=10d3c1933800 The Conservation Fund (2020) GREEN BOND IMPACT REPORT DECEMBER 31, 2020. Available here: https://www.conservationfund.org/images/The_Conservation_Fund_Green_Bond_Impact_Report.pdf