



GREEN INVESTMENTS IN WASTEWATER MANAGEMENT: DRIVING SUSTAINABLE BUSINESS AND CIRCULAR ECONOMY IN SERBIA

Milica Radojković^{1*}, (D)



Milena Rikalović²

¹PhD candidate. Singidunum University, Belgrade, Republic of Serbia

²Singidunum University, Belgrade, Republic of Serbia

Abstract:

Water management is a cornerstone of sustainable development, closely linked to climate change mitigation, natural resource protection, and public health. In Serbia, key challenges include water pollution, outdated infrastructure, and insufficient investment in wastewater treatment systems, underscoring the need for innovative financing solutions. Green investments, such as green bonds, dedicated funds, and public-private partnerships, provide effective mechanisms to support environmentally sustainable projects. By promoting circular economy practices, including water reuse, sludge treatment, and resource recovery, these investments enhance environmental protection, economic efficiency, and social well-being. This paper examines the current state of wastewater management in Serbia, analyses the potential of green financial instruments, and explores their role in strengthening sustainable business models. It also considers how companies can improve their Environmental, Social, and Governance (ESG) performance through water-related investments. The findings underline the strategic importance of integrating green finance and circular economy approaches to drive sustainable business and water sector resilience in Serbia.

Keywords:

green investments, wastewater management, sustainable business, ESG, circular economy, Serbia.

1. INTRODUCTION

1.1. IMPORTANCE OF WATER MANAGEMENT

Water is a fundamental resource, essential for human health, environmental balance, and economic prosperity. It plays a central role in agriculture, industry, and energy production, making its management a cornerstone of sustainable development. Globally, population growth, rapid urbanisation, and industrial expansion place increasing pressure on water resources. According to the World Health Organization (WHO), 2.2 billion people lack access to safely managed drinking water, while 4.2 billion have no access to safely managed sanitation, highlighting the urgent need for effective water governance and modern infrastructure (World Health Organization, 2019).

Climate change, along with pollution from agriculture, households, and industry, further threatens the availability of and quality of, biodiversity, and public health. Proper collection, treatment, and reuse of wastewater (WW) can prevent contamination, reduce greenhouse gas emissions, and enable the recovery of valuable resources such as nutrients and energy (Intergovernmental Panel on Climate Change, 2018).

Correspondence: Milica Radojković

e-mail: milica.radojkovic.24@singimail.rs





International frameworks also recognise the importance of integrated water management (WM) for sustainable development. The United Nations' Sustainable Development Goal (SDG) 6 seeks to "ensure availability and sustainable management of water and sanitation for all" by 2030, reflecting the interdependence between water security, poverty reduction, climate resilience, and economic growth. Investment in water resources and wastewater infrastructure is, therefore, both an environmental necessity and a driver of sustainable business models and resilient communities (United Nations, 2023).

1.2. CONNECTION WITH SUSTAINABLE BUSINESS AND CIRCULAR ECONOMY

Sustainable water management, including wastewater treatment and reuse, is increasingly tied to corporate responsibility and long-term business resilience. Companies that invest in water efficiency, advanced treatment technologies, and circular practices reduce their environmental impact while meeting regulatory and international sustainability standards. Such investments are vital for aligning with Environmental, Social, and Governance (ESG) criteria, now widely recognised as indicators of financial stability and ethical performance (Organisation for Economic Co-operation and Development, 2021).

Circular economy (CE) principles further enhance this link by turning wastewater into a resource. Reusing treated water in industry, agriculture, or urban applications eases pressure on freshwater reserves and lowers operational costs. Recovery of by-products, such as nutrients for fertilizer or biogas for energy, generates additional revenue streams while minimising waste. These practices support both ecological preservation and innovation in the green economy (European Environment Agency, 2020). CE strategies, such as nutrient recovery and water reuse, have been shown to enhance resource efficiency and sustainability in urban water management (Liu, X, 2020).

Strategically, companies that adopt circular approaches gain competitive advantages, demonstrate resilience to climate risks, and improve stakeholder trust. In Serbia, where water infrastructure remains underdeveloped, such practices are essential for bridging the gap with EU standards and ensuring long-term environmental and economic sustainability (European Environment Agency, 2020).

1.3. OVERVIEW OF GREEN INVESTMENTS

Green investments (GIs), including green bonds, environmental funds, and public–private partnerships (PPPs), are key tools for supporting sustainable water management. They enable the modernisation of treatment infrastructure, adoption of energy-efficient technologies, and implementation of innovative reuse strategies, serving as catalysts for circular economy (CE) practices and sustainable business models (European Investment Bank., 2021).

Across Europe and in Serbia, Gis have contributed to to improved wastewater treatment, reduced pollution, and promoted water efficiency. EU-funded programmes, such as the Instrument for Pre-Accession Assistance (IPA) and European Bank for Reconstruction and Development (EBRD) - backed initiatives, have supported plant upgrades, modern monitoring systems, and rehabilitation of distribution networks. Green bonds provide long-term capital for large-scale projects with environmental benefits (European Investment Bank., 2021). Empirical evidence suggests that green bonds effectively mobilise long-term capital for sustainable water infrastructure projects, providing measurable environmental benefits and supporting circular economy practices (Zhou, Y & Li, J., 2021).

PPPs encourage collaboration between municipalities, private investors, and international organisations, combining financial resources with technical expertise and project management skills. Green investments also incentivise renewable energy adoption in water facilities, such as solar pumping stations or biogas utilisation, enhancing energy efficiency and climate mitigation (European Investment Bank., 2021).

By financing projects that deliver measurable environmental benefits, GIs promote a sustainable water management ecosystem, supports circular economy practices, and strengthens resilience against climate risks, positioning them as crucial for Serbia's sustainable development (European Investment Bank., 2021).

This paper represents a review and synthesis study, aiming to examine the role of GI in WW management and its contribution to sustainable business practices and the circular economy in Serbia. The analysis draws on a diverse set of sources, including recent policy reports, case studies, strategic documents, and relevant academic literature. By integrating these perspectives, the paper provides a comprehensive overview of current practices, key challenges, and emerging opportunities, linking theoretical insights with practical developments in water management.



2. CURRENT STATUS AND CHALLENGES IN WATER MANAGEMENT IN SERBIA

2.1. STATISTICAL DATA ON WATER RESOURCES AND WASTEWATER

Serbia possesses abundant water resources, with an estimated annual river basin flow of approximately 90 billion m³. Major rivers, including the Danube, Sava, and Morava, are vital for domestic water supply, agriculture, energy, and industry. Despite this, only 50–60% of urban wastewater receives adequate treatment, and rural areas remain significantly underserved (United Nations Development Programme Serbia, 2020).

Agriculture accounts for nearly 40% of water use, while industrial demand continues to rise, especially in the food processing, mining, and chemical sectors. Seasonal droughts and floods further complicate water management, causing temporary shortages. Pollution from untreated wastewater, agricultural runoff, and industrial effluents also degrades surface and groundwater quality (United Nations Development Programme Serbia, 2020).

Outdated infrastructure and insufficient monitoring exacerbate these problems, resulting in inefficiencies and up to 30% water loss in some urban networks. Groundwater overexploitation in northern and central Serbia has lowered water tables, reducing availability for domestic and agricultural use. EU and international development projects aim to modernize wastewater treatment plants s, enhance monitoring, and promote more efficient water use (United Nations Development Programme Serbia, 2020).

2.2. CHALLENGES AND RISKS RELATED TO ENVIRONMENTAL ISSUES

Water pollution in Serbia stems from industrial effluents, agricultural runoff with fertilisers and pesticides, and untreated household sewage, all of which affect rivers and groundwater quality. For example, the Sava and Danube experience nutrient overloads, causing eutrophication, harmful algal blooms, and biodiversity loss (United Nations Development Programme, 2022).

Infrastructural deficiencies exacerbate these issues. Many wastewater treatment (WWT) plants date back to the 1970s–1980s and now require modernisation to meet current environmental standards. Aging pipelines, inefficient pumping stations, and limited treatment capacity result in leakages, overflows, and the release of untreated or partially treated wastewater (WW). Urban water loss can reach up to 30%, reducing supply efficiency and increasing operational costs (United Nations Development Programme, 2022).

Northern Serbia faces more frequent floods, overwhelming treatment plants, and spreading pollutants, while prolonged droughts in regions such as Vojvodina lower river flows and groundwater recharge, concentrating pollutants and threatening water availability. These extremes also stress hydropower, irrigation, and drinking water systems, highlighting the link between water management, infrastructure resilience, and climate adaptation (United Nations Development Programme, 2022). Addressing these challenges requires the modernization of wastewater infrastructure, improved monitoring systems, stricter enforcement of regulations on industrial and agricultural discharges, and the integration of climate adaptation measures into water management (WM) planning and optimization (United Nations Development Programme, 2022).

2.3. EXAMPLES OF LOCAL AND REGIONAL PROJECTS

Several initiatives illustrate ongoing efforts to improve wastewater management in Serbia. In Belgrade, the modernisation of the central WWT plant has enhanced treatment efficiency, reduced pollutant discharge, and introduced advanced sludge management, including upgrades to mechanical, biological, and chemical processes and real-time monitoring systems to meet EU standards (European Bank for Reconstruction and Development, 2021).

In Novi Sad, a pilot project demonstrated circular economy CE principles by reusing treated wastewater in industrial processes, reducing freshwater consumption and operational costs. Similarly, Niš has implemented water recycling schemes for municipal and industrial applications, including irrigation and cooling systems (European Bank for Reconstruction and Development, 2021).

Regional initiatives in smaller municipalities are addressing persistent gaps in rural wastewater management. For example, Senta received EU funding to construct a new treatment facility, improving sanitation and reducing nutrient loads, while Vojvodina has rehabilitated pipelines and integrated stormwater management to mitigate flooding and improve water quality (European Bank for Reconstruction and Development, 2021).



Many of these projects are financed through EU grants, such as the IPA and PPPs, which combine public funding with private-sector expertise. International institutions, including the European Bank for Reconstruction and Development (EBRD) and the World Bank (WB), have provided technical assistance and low-interest loans. These coordinated efforts demonstrate how investment, innovation, and policy alignment can enhance wastewater treatment, promote water reuse, and strengthen integral resource management at both local and regional levels (European Bank for Reconstruction and Development, 2021).

3. GREEN INVESTMENTS IN THE WATER SECTOR

3.1. FINANCIAL INSTRUMENTS AS A TOOL FOR SUSTAINABLE WASTEWATER MANAGEMENT

Green investments (GIs) provide structured financing for sustainable water infrastructure. Green bonds, earmarked for environmentally beneficial projects, offer long-term capital at competitive rates and have gained popularity across Europe and globally. In Serbia, they have funded the modernization of wastewater treatment (WWT) plants, energy-efficient pumping stations, and water recycling initiatives (European Bank for Reconstruction and Development, 2020).

Dedicated environmental funds pool resources from governments, international organisations, and private investors to address priority areas such as water quality, pollution reduction, and circular economy practices. By aggregating capital, these funds can support projects that may be too large or risky for a single investor, while also offering technical assistance and capacity building. Examples include EBRD-backed funds and regional development programmes (European Bank for Reconstruction and Development, 2020).

PPPs facilitate collaboration between authorities and private enterprises by sharing risks and leveraging expertise. In Serbia, PPPs have supported pipeline rehabilitation, new treatment facilities, and the adoption of smart water management technologies, enabling modern project management and sustainable operational practices (European Bank for Reconstruction and Development, 2020).

Together, these instruments provide capital, knowledge, and risk-sharing mechanisms that drive sustainable water management, promote innovation, encourage responsible resource use, and advance resilient, circular water systems. By aligning financial incentives with environmental objectives, green bonds, environmental funds, and PPPs are key to achieving Serbia's EU-aligned environmental targets and long-term sustainable development goals (European Bank for Reconstruction and Development, 2020).

3.2. EUROPEAN AND SERBIAN CASE STUDIES

Across Europe, green bonds have financed major upgrades to WWT plants in Germany, the Netherlands, and Sweden. In Germany, they supported the modernisation of facilities to reduce energy consumption, enhance nutrient removal, and implement water reuse for industry and agriculture. The Netherlands invested in membrane bioreactors, anaerobic digestion for biogas, and stormwater management to prevent flooding. These cases show how green investments combine environmental protection with efficiency and cost savings (European Bank for Reconstruction and Development, 2020).

In Serbia, pilot projects funded through EU grants and public–private partnerships are demonstrating similar potential. In Belgrade, modernisation of the central WWT plant improved pollutant removal and enabled nutrient recovery from sludge for agricultural use. In Novi Sad, treated wastewater is reused in industry, reducing freshwater demand and costs. Other projects in Niš and Senta integrated small-scale water recycling and pipeline rehabilitation to 0 improve water quality and system reliability (European Bank for Reconstruction and Development, 2020).

These examples highlight the key benefits of green investments: enabling innovative technologies, promoting circular economy practices such as nutrient recovery and water reuse, and addressing gaps in infrastructure, institutional capacity, and regulatory compliance. Both European and Serbian cases demonstrate the environmental and operational gains achievable through well-structured green investment strategies (European Bank for Reconstruction and Development, 2020).



3.3. ECONOMIC AND SOCIAL BENEFITS

Beyond environmental benefits, green investments deliver significant social and economic gains. Modernised wastewater treatment reduces exposure to waterborne pathogens, lowering the incidence of water-related diseases, while cleaner rivers and groundwater support recreation, fisheries, and local tourism. Economically, energy-efficient technologies, automated monitoring, and optimised treatment processes cut operational costs, while CE measures - such as biogas energy recovery, nutrient recycling, and treated wastewater reuse - create additional revenue streams and improve resource efficiency. These strategies also stabilise water supply and reduce vulnerability to droughts or climate-related disruptions (World Bank, 2019).

For businesses, green investments facilitate ESG compliance, enabling access to international financing and maintain competitiveness. Companies that adopt sustainable water practices demonstrate corporate responsibility, attract socially conscious investors, and mitigate risks linked to water scarcity or regulatory penalties (World Bank, 2019).

Furthermore, successful projects create a positive feedback loop: they attract additional funding, foster innovation, and build technical and managerial capacity within authorities and private enterprises. Over time, this strengthens resilience in the water sector, enhances community engagement, and supports national sustainable development goals. Green investments (GIs) therefore generate enduring environmental, social, and economic value, helping Serbia align with EU sustainability standards and global best practices in water management (World Bank, 2019).

4. CONNECTION WITH SUSTAINABLE BUSINESS AND ESG PRINCIPLES

4.1. IMPROVING ESG PERFORMANCE THROUGH WATER INVESTMENTS

Investing in sustainable water management contributes directly to a company's ESG performance. Environmentally, it reduces pollution, promotes efficient water use, and supports circular economy practices. Socially, it improves community health and ensures equitable access to safe water. From a governance perspective, transparent reporting on water-related projects and investments strengthens stakeholder confidence and aligns with global ESG standards. Companies that integrate GI in their operations often experience improved reputation and brand value, which can attract new customers and investors. For instance, the city of Novi Sad implemented a pilot project reusing treated wastewater, which improved water efficiency, reduced costs, and enhanced municipal ESG reporting (European Bank for Reconstruction and Development, 2021). Also, European corporations that funded WWT plant upgrades through green bonds have reported measurable reductions in water-related risks and operational costs, alongside enhanced ESG ratings (European Bank for Reconstruction and Development, 2020).

4.2. IMPACT ON REPUTATION, COSTS, AND LONG-TERM SUSTAINABILITY

Sustainable water management WM investments can lead to long-term financial savings by reducing water consumption, energy costs, and potential fines for environmental non-compliance. Additionally, they mitigate risks associated with water scarcity or contamination that could disrupt production. Over time, these practices contribute to the resilience of business operations, making them less vulnerable to climate change and regulatory pressures. Integration of ESG principles encourages a strategic approach to resource management, in which environmental stewardship aligns with business objectives (European Bank for Reconstruction and Development, 2020).



5. ROLE OF CIRCULAR ECONOMY IN WATER MANAGEMENT

5.1. REUSE OF TREATED WATER

CE principles focus on reducing waste and maximising resource efficiency. In the water sector, treated wastewater can be reused for industrial processes, agricultural irrigation, or the replenishment of natural water bodies This approach reduces freshwater demand, mitigates environmental impact, and supports ecological balance (European Environment Agency, 2021).

Industrial reuse is common in sectors such as food processing, textiles, and energy, where water quality requirements are lower than for drinking water. Treated WW can serve cooling systems, cleaning processes, or boiler feedwater, lowering operational costs and reducing reliance on municipal supply. In agriculture, irrigation with treated water conserves freshwater and provides nutrients that enhance soil fertility and crop yields (European Environment Agency, 2021).

Pilot projects in Serbia and Europe highlight the benefits of water reuse. In Novi Sad, municipal wastewater is reused in industry, reducing freshwater consumption, while agricultural cooperatives in Vojvodina employ treated water for irrigation during dry periods. Integrating water reuse into urban green spaces also promotes resilient cities and raises environmental awareness (European Environment Agency, 2021).

Reusing treated water is a key strategy for CE implementing in the water sector, delivering environmental, economic, and resource efficiency benefits that support long-term sustainability in both urban and rural areas (European Environment Agency, 2021).

5.2. WASTE AND SLUDGE MANAGEMENT AS RESOURCES

Sludge from wastewater treatment plants is increasingly recognized as a valuable resource rather than waste. Processes such as composting, anaerobic digestion, and nutrient recovery transform sludge into products that support both environmental sustainability and economic growth (European Environment Agency, 2022).

Composting produces organic fertilizers that enhance soil fertility and reduce reliance on synthetic alternatives. Anaerobic digestion generates biogas, supplying electricity and heat for treatment plants, with surplus energy potentially fed into the grid .Nutrient recovery extracts phosphorus and nitrogen for commercial fertilizers, closing nutrient loops and advancing circular economy goals (European Environment Agency, 2022).

European examples demonstrate these benefits. In Germany and the Netherlands, biogas production and nutrient recovery reduce emissions and create new revenue streams. In Serbia, pilot projects in Belgrade and Novi Sad use sludge for biogas and compost, supporting local agriculture and covering part of the treatment facility's energy needs (European Environment Agency, 2022).

By treating sludge as a renewable resource, WW management can reduce environmental impact, create economic value, and strengthen urban and rural water system resilience, aligning with circular economy principles and EU sustainability standards (European Environment Agency, 2022).

5.3. PRACTICAL EXAMPLES AND INNOVATIONS

Innovative projects in Serbia and Europe highlight the potential of circular WM. In Serbia, pilot schemes in Novi Sad and Belgrade focus on nutrient recovery from sludge, the reuse of treated wastewater in industry, and energy generation from biogas. These initiatives demonstrate how integrating circular economy approaches in WWT can reduce environmental impacts, lower operational costs, and create new revenue streams. For example, Belgrade's central WWT plant employs advanced monitoring systems to enable nutrient recovery and energy production, while treated water is reused for municipal irrigation and industrial purposes (European Commission, 2018).

Across Europe, several large-scale innovations provide models for Serbia. The Netherlands has developed *waste-water-to-energy* plants combining anaerobic digestion, biogas utilisation, nutrient extraction, and water recycling. Germany connects industrial parks to local WWT plants, enabling the reuse of treated water and recovered nutrients. Sweden has piloted smart water grids that integrate water reuse, energy production, and real-time monitoring to enhance efficiency and environmental performance (European Commission, 2018).



These examples demonstrate the importance of technology, regulatory frameworks, public–private collaboration, and targeted investment. In Serbia, expanding such initiatives could combine EU grants, green bonds, and PPPs, alongside policies that encourage water reuse and sludge valorization. By adapting European best practices locally, Serbia can develop resilient, efficient, and economically viable water management systems aligned with circular economy principles (European Commission, 2018).

6. CONCLUSION

Water management, particularly the wastewater segment, is not only an environmental and technical challenge but also a cornerstone of sustainable development, economic resilience, and public health. In Serbia, gaps in wastewater infrastructure, pollution control, and climate adaptation underscore the need for urgent action. Without substantial investment, these issues threaten both environmental quality and community well-being (European Bank for Reconstruction and Development, 2020).

GI provides a pathway to address these challenges by linking financial innovation with sustainability objectives. Tools such as green bonds, environmental funds, and PPPs can fund projects that modernise wastewater systems, enable water and resource reuse, and promote CE practices. Beyond ecological benefits, these investments create business opportunities, enhance corporate ESG performance, and strengthen the competitiveness of Serbian enterprises (European Bank for Reconstruction and Development, 2020).

Nevertheless, several challenges remain, including funding gaps, regulatory hurdles, and stakeholder resistance, which may slow the implementation of green investments (European Bank for Reconstruction and Development, 2020). For policymakers, integrating green finance into national water strategies is crucial. Regulatory incentives, transparent monitoring, and stronger collaboration among government, the private sector, and civil society are essential to unlock the full potential of green investment. Investors must also recognise the long-term value of financing sustainable water solutions, not only for financial returns but also for protecting resources and generating social benefits (European Bank for Reconstruction and Development, 2020).

Addressing these barriers requires clear regulatory frameworks, targeted financial incentives, and strengthened collaboration among government, private sector, and civil society (European Bank for Reconstruction and Development, 2020).- ovaj pasus ponavljašta je rečeno u prethodnom

Circular economy approaches further amplify these benefits by transforming wastewater from waste into a valuable resource. Innovations such as water reuse, sludge valorisation, and energy recovery enable Serbia to align with European sustainability standards and contribute to global climate goals (European Bank for Reconstruction and Development, 2020).

In conclusion, the transformation of Serbia's water sector depends on mobilising green investments, embedding ESG principles, and adopting circular economy practices. This integrated approach can drive sustainable business, generate long-term economic resilience, and ensure that water remains a shared resource for future generations (European Bank for Reconstruction and Development, 2020). Successfully scaling up and mobilising green investments therefore depends not only on adopting ESG and circular economy practices but also on overcoming financial, regulatory, and social challenges (European Bank for Reconstruction and Development, 2020). Despite their potential, barriers such as regulatory complexity, funding gaps, and stakeholder resistance remain significant obstacles to full implementation (Cui & Zhang, 2019). Addressing these barriers requires coordinated action from policymakers, investors, and local stakeholders. Regulatory simplification, financial incentives, and capacity-building programmes can help unlock the full potential of green investments. Furthermore, transparent monitoring and reporting of environmental outcomes can build trust and encourage broader participation. Successfully mobilising green investments therefore depends on combining technical solutions with effective governance and stakeholder engagement (Cui, L & Zhang, X., 2019).



LITERATURE

- Cui, L.& Zhang, X. (2019). Barriers to green investment in water management: A European perspective. *Water Policy*, 21(6), 1221–1235.
- European Environment Agency. (2022). Sludge management and resource recovery in wastewater treatment.
- European Bank for Reconstruction and Development. (2021). *Water sector projects in Serbia: Progress and best practices*. EBRD. Retrieved from https://www.ebrd.com/news/publications/institutional-reports/water-sector-serbia.html
- European Environment Agency. (2021). Water reuse in Europe relevant policies, practices and challenges. EEA.
- European Investment Bank. (2021). *Financing sustainable water management: Green investments and public-private partnerships*. Luxembourg: European Investment Bank.
- European Bank for Reconstruction and Development. (2020). *Green finance in the water sector: Opportunities and case studies in Europe and Serbia*. Retrieved from https://www.ebrd.com/what-we-do/sectors/water
- European Bank for Reconstruction and Development. (2020). Water and wastewater sector investment: Green finance and circular economy opportunities in Europe and Serbia. London: EBRD.
- European Environment Agency. (2020). *Circular economy in water management: Policies and practices for sustainable water use.* EEA Report No 12/2020. Retrieved from https://www.eea.europa.eu/publications/circular-economy-in-water
- European Commission. (2018). *Circular economy in the water sector: Opportunities for sustainable water management in Europe*. Brussels: European Commission.
- Intergovernmental Panel on Climate Change. (2018). *Global warming of 1.5°C: Summary for policymakers*. Retrieved from https://www.ipcc.ch/sr15/
- Liu, X. (2020). Journal of Cleaner Production, 244, 118805. doi:10.1016/j.jclepro.2019.118805
- Organisation for Economic Co-operation and Development. (2021). *Water governance and corporate responsibility: Integrating ESG principles.* Organisation for Economic Co-operation and Development. Retrieved from https://www.oecd.org/water
- United Nations. (2023). Sustainable Development Goal 6: Ensure availability and sustainable management of water and sanitation for all. Retrieved from https://sdgs.un.org/goals/goal6
- United Nations Development Programme. (2022). Water resources and management in Serbia: Challenges and opportunities. UNDP Serbia. Retrieved from https://www.rs.undp.org/content/serbia/en/home/library/environment_energy/water-resources-and-management.html
- United Nations Development Programme Serbia. (2020). *Water resources and wastewater management in Serbia: Challenges and opportunities.* Belgrade: United Nations Development Programme Serbia.
- World Bank. (2019). *Worsening Water Quality Reducing Economic Growth by a Third in Some Countries*. Retrieved from https://www.worldbank.org/en/news/press-release/2019/08/20/worsening-water-quality-reducing-economic-growth-by-a-third-in-some-countries
- World Health Organization. (2019). *Progress on household drinking water, sanitation and hygiene 2000–2017*. World Health Organization. Retrieved from https://www.who.int/water_sanitation_health/publications
- Zhou, Y& Li, J. (2021). Green bonds and sustainable water infrastructure investment: Evidence from Europe. *Environmental Science & Policy*, 112–121.