

# Applying Circular Economy to Rural Water and Sanitation: Opportunities for Vietnam

## Policy brief

### Key messages

- Vietnam has developed a supportive policy environment for circular economy implementation across diverse sectors. Opportunities to integrate circular approaches in **water and sanitation** services should now be articulated and prioritised in the national approach.
- There is particular opportunity for **rural development initiatives** to comprehensively integrate greater circularity, and water and sanitation are promising entry points for this application.
- Cross-sectoral collaboration is critical, as is developing affordable, appropriate technical solutions and management approaches aligned with genuine circular principles.
- A national workshop on circular water and sanitation held in Hanoi in November 2024 demonstrated strong interest in building circular rural communities, and current momentum must be leveraged.

**Current situation:** Vietnam has developed a supportive policy environment for circular economy implementation across diverse sectors. Opportunities to integrate circular approaches in water and sanitation services should now be articulated and prioritised in the national approach.

Vietnam has set a firm national direction towards circularity. Ideas of circular economy are being taken up at the highest level of government, evidenced by its inclusion in key national policy documents since 2016 such as the *Renewable Energy Development Strategy 2016 - 2030*, the *National Action Plan on Sustainable Production and Consumption for 2021-2030*, the *Socio-Economic Development Strategy 2021-2030*, and *Vietnam's National Climate Change Strategy to 2050*. In addition, many newly issued resolutions and strategies on economic restructuring and industrial development have referred to the application of circular economy.

A supportive policy environment for circular economy ideas was consolidated by the Prime Minister's Decision on circular economy declared in 2022 (*Decision No. 687/QĐ-TTg*). The directive has already sparked a series of institutional efforts including:

- A revised Law on Environmental Protection 2020 in 2022 (*Decree No. 08/2022/ND-CP*), which broadly emphasizes the obligation of ministries and local authorities to incorporate the principles of the circular economy into their planning strategies and development plans
- The National Action Plan on Circular Economy Implementation, formalised in January 2025 (*Decision 222/QĐ-TTg*), which aims to achieve land, water and

mineral resource efficiency on par with leading ASEAN countries and position the Vietnam as a “leading hub for innovation” (Vietnam Law Magazine, 2025).

Circular economy ideas will also be complementary to Resolution no 57/NQ-TW, declared by Politburo in December, 2024, which provides robust support to the nation’s development in science and technology, innovation, and digital transformation, and supports transformation to green and low carbon economies.

**The National Action Plan on Circular Economy Implementation (January 2025) sets ambition for land, water and mineral resource efficiency on par with leading ASEAN countries, positioning Vietnam as a leading hub for innovation.**

There is opportunity to bring water and sanitation more firmly into the national approach to circular economy in Vietnam, given the current political momentum. There are already sector-specific policies and practices that align with circular economy principles in water and sanitation, even if they are not yet formally articulated as connected to ‘circular economy’. For example, the 2023 revised Law on Water Resources foregrounds circular ideas of water use efficiency, reuse and the recycling of water and wastewater. Moreover, in sanitation, Circular No. 04/2015/TT-BXD (under Decree No. 80/2014/ND-CP on drainage and wastewater treatment) details procedures for reuse of treated faecal sludge. Additionally, the most recent National Target Program (NTP) for New Rural Development (NRD) (2021-2025) is also progressing water and sanitation service improvements, along with solid waste management, with a focus on reuse and recycling. Finally, the National Action Plan on Circular Economy currently includes **wastewater** (with regards to reducing non-revenue water), but with limited scope. Beyond wastewater reuse, circular economy approaches are related to diverse aspects of water and sanitation and can bring efficiency and sustainability benefits to multiple sector domains from household to national scales.

**8Rs for circular water and sanitation:** a practical framework to guide thinking on integrating circular economy ideas to water and sanitation service systems to achieve optimal outcomes

Circular economy principles can strengthen water and sanitation service systems, when applied appropriately. Circular economy ideas drive a focus on efficient resource use, the recovery of valuable substances and the regeneration of nature. Aligning ongoing efficiency, reuse and recovery efforts in water and sanitation with Vietnam’s circular economy momentum can drive innovation and achieve multiple sustainable development outcomes.

Research by the Vietnam Academy of Water Resources with University of Technology Sydney has identified directions for integrating circularity into water and

sanitation in rural Vietnam. The research team developed a framework (Figure 1) to guide innovative thinking on how to apply circularity to water and sanitation to achieve optimal outcomes. The framework, **‘the 8Rs for Circular Water and Sanitation’**, is founded on principles relating to circular economy, safely managed water and sanitation, social inclusion and climate resilience (see Annex A).

The framework provides a theory-based ‘thinking tool’ accessible to anyone (e.g., policymakers, planners, service providers) who is seeking locally led, context-specific applications of circular economy strategies. It is intended to be used as a tool for ideation and design, as well as a guide for planning implementation of circular opportunities and evaluation (Figure 2).

The framework includes 8 ‘R’ strategies for progressing water and sanitation. There are **three central practical Rs** that directly reflect the three core principles of circular economy. Alongside the three practical Rs, the framework includes **five Rs related to purpose and process**.

The framework is designed to support those involved in water and sanitation to align their work with the core purpose of circular economy: **systems change** towards greater sustainability.

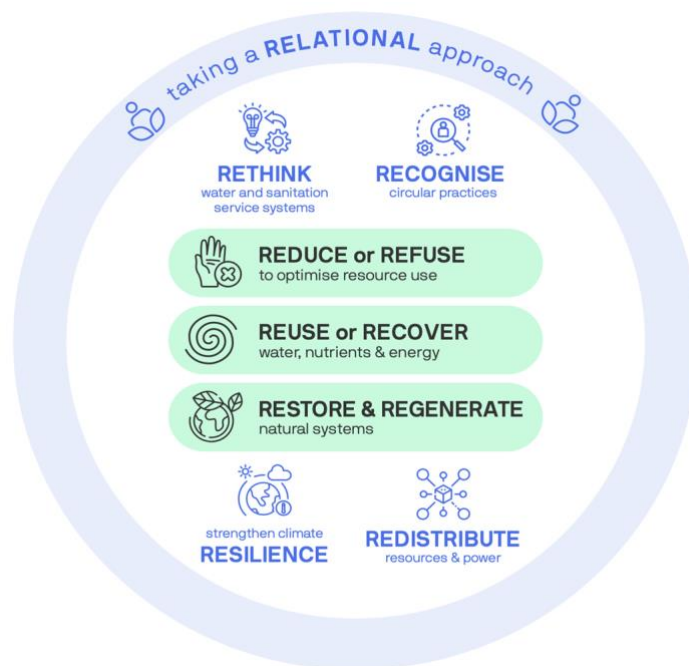


Figure 1. The 8Rs Framework for Circular Water and Sanitation (Carrard et al., 2024a)

R strategy	Prompt questions	Examples
<b>REDUCE OR REFUSE</b> to optimise resource use	How can we optimise use of resources in water and sanitation systems? Are there alternatives to water and energy use (refuse)? How can we improve efficiency (reduce)?	Reducing water losses and water demand. Designing low-energy wastewater treatment systems. Waterless toilets. Reusable menstrual health products.
<b>REUSE &amp; RECOVER</b> water, nutrients & energy	How can we close loops in water and sanitation systems? Are there opportunities to reuse water (treated or for lower quality purposes)? Can nutrients or energy be recovered from waste?	Household storage and reuse of water for different uses. Faecal sludge reuse to improve soil condition, nutrient capture and use to benefit food production, wastewater reuse at various scales, use of sludge in biogas systems. Natural reuse systems e.g. irrigation system recharges groundwater where it is naturally treated before reuse.
<b>RESTORE &amp; REGENERATE</b> natural systems	How can water and sanitation systems connect to natural systems? How can they contribute to the regeneration of nature?	Nature based solutions e.g. source water protection, aquifer recharge, wetland restoration or construction as a component of wastewater treatment.
<b>RETHINK</b> service systems	How could water and sanitation systems be different? What ideas come to mind if we think about changing typical approaches and questioning the assumptions that underlie current systems and models?	Changing thinking from 'wastewater' to 'resource-water'. Sanitation as a public service with shared government, service provider and household responsibilities.
<b>RECOGNISE</b> circular practices	What is already circular? This could include traditional practices and coping or adaptation strategies. How can we value existing circular practices and ensure they are safe?	Saving and reusing water in a household, e.g. bathing water for garden. Use of dried faecal sludge as soil conditioner. Use of human urine as fertilizer.
strengthen climate <b>RESILIENCE</b>	What climate change impacts do we need to consider when planning circular water and sanitation systems? How can circular options strengthen resilience? Resilience includes social, institutional, technical and natural dimensions.	Regeneration and reuse activities such as capturing, treating and reusing water supports resilience during times of drought. Soil conditioners from faecal waste (a reuse strategy) can increase water storage capacity of soil.
<b>REDISTRIBUTE</b> resources and power	How can we ensure everyone has equal access to water and sanitation services? How can we include diverse voices when planning circular approaches? How can the benefits of circular approaches be fairly shared?	Sustainable cost recovery approaches that balance what users pay with public investment to ensure affordability. Representation from diverse social groups when planning and implementing circular opportunities.
taking a <b>RELATIONAL</b> approach	Which groups and institutions are implicated in potential circular water and sanitation systems? How can collaboration and trust building be made central to the process? How do the people involved relate to the natural world, and how can circular opportunities strengthen (and not undermine) human-nature connections?	Bringing diverse perspectives together for conversations about circular economy water and sanitation systems. Creating space for connections to emerge and to shape actions. Building new connections and trust to enable new pathways. Re-imagining human–nature connectedness to shift unsustainable patterns.

Figure 2. Putting the 8Rs framework into practice: prompt questions and examples for each of the 8Rs (Carrard et al., 2024a); Carrard et al., 2024b).

## Four opportunities for rural Vietnam

### 1. There is opportunity for rural development initiatives to comprehensively integrate greater circularity

It is powerful to consider rural areas as ripe spaces for integration, collaboration and innovation – the scale of rural communities, and the connectedness between sectors (e.g. water, waste, agriculture, aquaculture) means they are well-placed to be sites of circular innovation. Rural areas often already demonstrate aspects of circular economy that can be built on (**recognise**), yet to date the application of circular economy policy has emphasised urban areas more than rural.

The National Target Program (NTP) for New Rural Development (NRD) (2021-2025) presents an opportunity for rural areas to trailblaze green transformation, and new scientific and technological innovations. Solid waste management, such as organic waste composting and plastics recycling, is one area where circular economy principles are already being applied.

The opportunity for rural development to comprehensively integrate circularity requires a **rethink** of rural communities as a microcosm of interconnected human and natural systems in which people and natural resources thrive.

### 2. Water and sanitation sectors are promising entry points to applying circular economy in rural areas and can support the regeneration of ecosystems

Water and sanitation are promising entry points for integrating circularity into rural development. We need to be regenerating ecosystems, and circularity is a path for this. This is a unique aspect of circular economy that differs from other approaches. A circular economy approach can enhance the ways in which water and sanitation services contribute to climate mitigation by, for example, increasing energy efficiency (**reduce**) and producing renewable energy from waste (**reuse**). Circular economy approaches can also strengthen adaptation and resilience, with efforts to **regenerate** nature (e.g. as part of nature-based solutions) offering co-benefits in the form of treatment, storage, buffer, and recreation.

### 3. Cross-sectoral collaboration is critical

In defining circular opportunities, it is imperative to engage people from different departments and sectors. Collaboration is critical to make circular solutions work and requires taking a **relational** approach in which household members, mass organisations, and multiple government departments (including health, environment, agriculture) meaningfully participate in decision making. Involving health, environment and water technicians is essential to ensure safety while optimising the agricultural benefits of reuse, for example. Prioritising social inclusion and equality (**redistribute**) is foundational for achieving development goals, which requires focusing on how circular opportunities are developed (ensuring a diversity of

perspectives and using inclusive approaches), as well as who the opportunities serve (reaching all and leaving no one behind).

#### 4. Develop affordable, appropriate technical solutions and management approaches aligned with genuine circular principles

Technological innovation aligned with genuine circular principles is necessary. A case study of household greywater treatment systems in Ha Tinh demonstrated both the potential for a **reuse**-oriented treatment system support safe sanitation and improve water quality (**regenerate**), as well as the importance of designing solutions that are appropriate for end-users and provide the necessary functionality in water treatment<sup>1</sup>. Challenges with operation and maintenance of these systems indicates a need for more accessible technical design that meets the quality standards of treated greywater reuse, the needs of elderly and young household members (in line with **redistribute** aims), establishment of local maintenance and repair networks, and monitoring by authorities to assess water quality outcomes.

#### Circular Water and Sanitation: Building on National Workshop Outcomes

A national workshop on applying circularity to rural development in Vietnam (November 2024) revealed strong interest from government officials at all levels (local, provincial, national) and researchers. Participants emphasised that circular approaches align with national values and development goals. The workshop highlighted the importance of building knowledge and respect for resources, including natural and social infrastructure.

Vietnam has committed to implementing circular economy principles. In water and sanitation, stakeholders value the 8Rs framework as a guide. Workshop participants endorsed the five 'purpose and process' Rs (rethink, recognise, redistribute, resilience, relational) as particularly powerful approach to ensure socio-economic and climate change dimensions are considered as part of efforts to 'reduce, reuse and regenerate' in rural areas.

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<sup>1</sup> Dao et al. (forthcoming) Optimising a circular economy approach to greywater management for safety, resilience and inclusion: A case study of household-scale systems in rural Vietnam.



Figure 3. National workshop on applying circularity to rural development in Vietnam held in Hanoi in November 2024.

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## Annex A Principles underpinning the 8Rs framework: circular economy, safe management, social inclusion, climate resilience

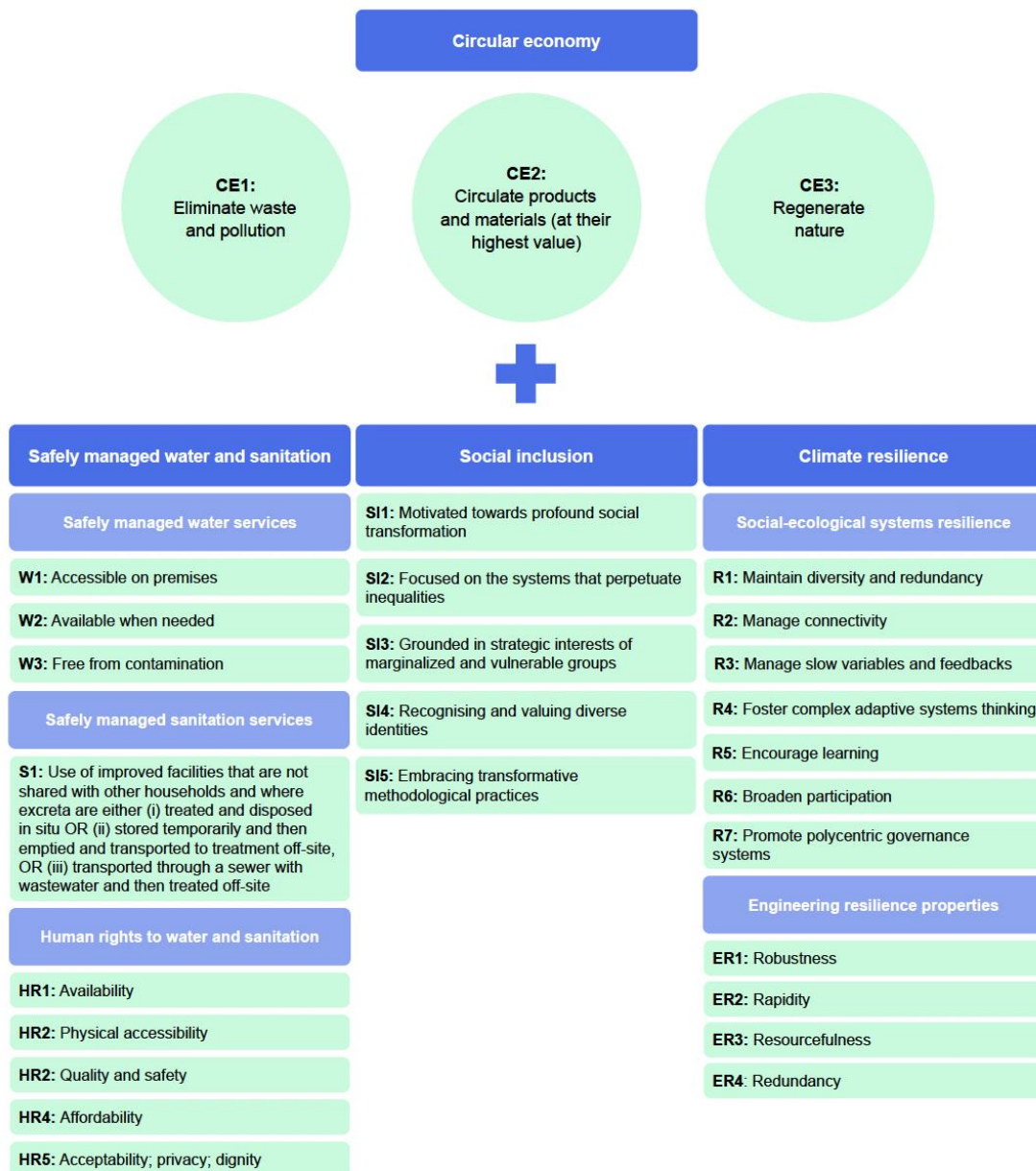


Figure 1 Leveraging circular economy to drive inclusive climate resilient WASH (and wider sustainable development) requires focusing on four sets of principles. A principles-based approach enables us to navigate potential tensions and achieve our multiple interconnected sustainable development objectives.

Sources: circular economy principles drawn from the work of Ellen MacArthur Foundation<sup>15</sup>, safely managed water and safely managed sanitation defined by WHO/UNICEF Joint Monitoring Programme (JMP), human rights to water and sanitation criteria from United Nations Office of the High Commissioner for Human Rights (OHCHR), social inclusion principles adapted from MacArthur et al. (2002)<sup>2</sup>, social-ecological systems resilience from Liggs et al. (2015)<sup>16</sup> and engineering resilience properties from Bruneau et al. (2003)<sup>17</sup>.



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