

WATER INNOVATION CHALLENGE

How can we harness innovative, cost effective, sustainable measures of channeling water in safe and scalable ways that address changing future global dynamics?

BACKGROUND

Access to clean drinking water and sanitation is the foundation for every part of life and forms the foundation for the achievement of all of the UN Sustainable Development Goals (SDG) with SDG goal #6 specifying that we need to:

“Ensure availability and sustainable management of water and sanitation for all.”

In the next ten years, the quality and quantity of water for human consumption and other uses will deteriorate. While much progress has been made on access to clean water in the Millennium Development Goals, there remain many challenges that inhibit access to clean and safe water. Quantity of future water resources is changing based on weather patterns which will shift hydrology. Rapid urbanization, growing populations and migration will place additional stress on existing infrastructure to deliver the new water demands. Current infrastructure was built for different purposes and has not adapted to new realities. In addition, there are often design and management flaws that do not consider the lifecycle implementation of water distribution. Water availability is further impacted by political trends towards privatization and selling of water rights.

Many of these challenges that inhibit access to clean and safe water specifically affect the world's poorest and most vulnerable communities. Access to clean water and sanitation is often unequal in the world, with the poor and being disproportionately under-represented in the achievement statistics.

CHALLENGE

How can we harness innovative, cost effective, sustainable measures of channeling water in safe and scalable ways that address changing future global dynamics?

World Vision Canada has identified 5 key challenges that will have a significant effect on the availability and sustainable management of water and sanitation systems for the world poorest and disadvantaged communities. Ideas submitted to the open platform should address one of these key issues:

- 1. Water Pollution:** There is an increasing concentration of antibiotic residues in the water environment due to untreated discharges from municipal wastewater treatment plants (STPs). Over time, these residues can cause antibiotic resistant genes (ARGs) to appear and bio-accumulate in the environment, resulting in increasing toxicity in the water environment for human and nonhuman life. What is lacking is the ability of developing nations to effectively treat these discharges and prevent them from reaching waterways and water bodies¹.
- 2. Infrastructure Design:** In developing countries there is a major deficiency in water infrastructure design, funding, and maintenance. Even recent increases in overseas development aid and assistance with water projects² have not been able to address this issue. One clear example of this is the water hand pump situation in Africa, where at any one point in time, one in three hand pumps are non-functioning.³ Many designs of water infrastructure projects, whether small point of use or large infrastructure projects also lack the flexibility in dealing with the changing hydrological context. As water patterns shift there is a need to utilize new innovative infrastructure design that can deliver point of use water in a cost effective way. There is a pressing need for water infrastructure projects to be planning properly, right from the start, so that every step of the project lifecycle is taken into consideration and implemented properly (changing water availability patterns, design, construction, maintenance, and either replacement or retirement).⁴
- 3. Water Efficiency:**
 - Low Water Efficiency in Agriculture:** Agriculture accounts for 70% of global water consumption, but water efficiency rates in this sector are a paltry 10-20%. This leaves much room for improvement in water consumption rates. This will become increasingly important as the world population is expected to grow to over 9 billion people by the year 2050⁵.
 - Untapped Wastewater Potential:** Currently, more than 80% of the world's wastewater flows untreated into the environment.⁶ This is not just harmful to water quality in the world's freshwater supplies, it also is a huge wasted and untapped opportunity to expand the world's supply of freshwater through water reuse / recycling technologies.



- 4. Water Data Availability:** In many developing countries there is a lack of water data available. Comprehensive national water assessments have not been undertaken and as such, key water data is lacking. Without quality data, planning decisions are ineffective at best, and counterproductive/ destructive at their worst to a nation's water resources. There is a pressing need for outside assistance with building the capacity of developing nations to conduct quality water assessments so that they can 'take into account national realities, capacities and levels of development as well as respecting nation policies and priorities' when they are developing water improvement strategies and programs. Without the building of assessment capabilities, developing nations will be unable to create sustainable societies and economies.⁷
- 5. Behavioural Challenges:** Open Defecation Rising In Urban Areas: There is an increasing rate of open defecation in cities and urban areas as populations move from rural to urban areas (Schulte, 2014). This is because as cities grow, there is a corresponding lack of growth in sanitation facilities / infrastructure to deal with the extra wastewater being created.⁸

Disregard for Others' well-being, Health, and Sanitation: Freshwater quality in cities is threatened by wealthier households discharging sewage from their homes into storm drains, waterways, or landfills, which pollutes poor residential areas.⁹

1 Ahmed, et al., 2015

2 Schuster-Wallace, Sandford, 2015: 17

3 Foster, 2013; Rural Water Supply Network, 2010

4 CAVST, 2016

5 Lall, et al., 2008: 9

6 World Water Council, 2016

7 Schuster-Wallace, Sandford, 2015: 9, 44

8 WHO, 2015b

9 WHO, 2015b

CRITERIA

1. Focus on the Poor:

World Vision Canada seeks to address some of the most significant challenges addressing the world's poorest communities. Ideas need to be focuses on implementation in South America, Africa and South and East Asia.

2. Market Based Approaches:

Traditional approaches in the development sector focus on extreme poverty and address immediate needs to reduce vulnerability to future shocks. Market-based approaches on the other hand are based on the premise that being poor does not eliminate trade and market processes. Market-led approaches therefore look at people as consumers, producers, entrepreneurs and seek solutions that make markets more efficient, competitive and inclusive.

3. Cost Effectiveness:

With so many people to reach, the ability to pay for services and an expectation for sustainability, cost effectiveness is important.

4. Sustainable Change:

Water and sanitation are needed every day and solutions need regular maintenance and investment. We're excited about solutions that prioritize the sustainability needed to make lasting change.

5. Consider Scale:

Despite population growth slowing in recent years, the global population is projected to reach 8 billion in 2025 and about 11 billion by the year 2100¹. Consequently, solutions that are able to reach scale will be the most impactful.

[1] Roser, 2016

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