

A photograph showing several children gathered around a public water pump. One child is filling a yellow jerrycan, while others are holding containers or looking on. The pump is a simple structure with a hand-operated lever and a spout.

Achieving the Water & Sanitation SDG: Role of the Global Water Pathogen Project

Sustainable Development Goal (SDG) 6:

Ensure Availability and Sustainable Management of Water and Sanitation for All

TARGET 6.1

By 2030, achieve universal and equitable access to safe and affordable drinking water for all

Safe drinking water is achieved when risk levels are equal to or less than a 1 in 10,000 (10^{-4}) annual probability of infection or 1 in a million (10^{-6}) Disability-Adjusted Life Year. Wastewater treatment must achieve a 99.9% reduction of viruses if sources of raw water contain 1% sewage.

The GWPP is evaluating available wastewater treatment and sanitation technologies to achieve the needed removal of pathogens to protect public health.

TARGET 6.2

By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations

There is not a “one size fits all” approach to building sanitation infrastructure that meets the needs of all and that are efficient, easily cleaned, and safe.

The GWPP is providing information on small and large systems (dry and wet systems) for excreta and wastewater treatment.

TARGET 6.3

By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally

Improving and restoring water quality will require prioritization on where and how to fix the sewage discharge problems and to move toward resource recovery facilities. Meeting a goal of water quality suited for purpose will enhance safe reuse.

The GWPP is providing maps showing pathogen emissions to surface water from untreated and treated wastewater to support decision making.

TARGET 6.5

By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate

Ultimately, embracing the ONE WATER concept will promote frameworks and innovation to support the management of transboundary waters. Assessment tools and knowledge will aid the implementation of such strategies.

The GWPP is providing information on water quality diagnostics (source tracking markers) that can be used to formulate Water Quality Agreements.

TARGET 6 a and b

By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies

Support and strengthen the participation of local communities in improving water and sanitation management

Developing and engaging an international network of scientists and engineers with policy makers, community organizations, and water management groups will enhance global to local cooperation.

The GWPP has over 140 authors in 40 countries. Future efforts will provide lectures, courses, and programmes for capacity building and water science and technology education.

Other SDGs

SDG 2 Zero Hunger: 2.2 By 2030 end all forms of malnutrition, including achieving by 2025 the internationally agreed targets on stunting and wasting in children under five years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women, and older persons

SDG 3 Good Health and Well-Being: 3.2 by 2030 end preventable deaths of newborns and under-five children

According to the World Health Organization, diarrhea is the second leading cause of death for children under five. Access to clean water and sanitation prevent “environmental enteropathy” which can lead to malnutrition. Even if children and vulnerable populations (pregnant women and elderly) have access to proper nutrition, their bodies cannot absorb nutrients if they are infected with pathogens.

The GWPP provides information about how to prevent exposure to pathogens that cause diarrhea.



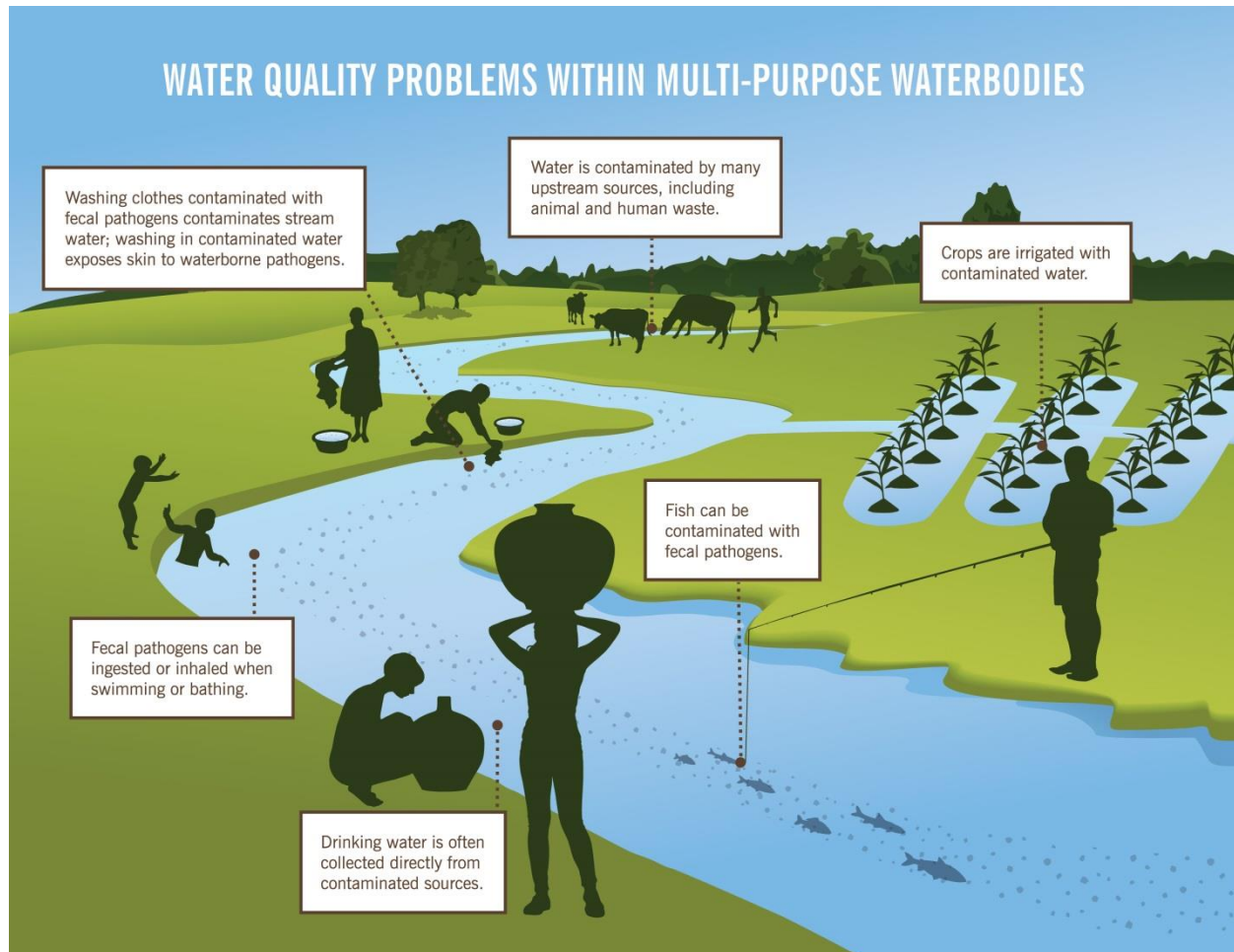
Learn more about the GWPP at
www.waterpathogens.org



GWPP
Global Water Pathogen Project

The Global Water Pathogen Project: Helping to Meet the UN Post-2015 Sustainable Development Goals

By Joan B. Rose, PhD



As nations work to meet the 17 post-2015 United Nations Sustainable Development Goals¹ (SDGs), there is a significant new resource that will help “ensure the availability and sustainable management of water and sanitation for all,” the focus of SDG #6². That resource is the Global Water Pathogen Project³ (GWPP), the largest single coordinated effort of scientists to contribute to the 2030 UN agenda.

Led by the United Nations Educational, Scientific and Cultural Organization (UNESCO) and Michigan State University, the GWPP organizes over 100 scientists from around the globe into 9 expert teams to address key fecal pathogen groups and the measures necessary to control those pathogens. The project features an online “open access integration platform” that will be updated regularly by the experts.

¹ <https://sustainabledevelopment.un.org/sdgs>

² <https://sustainabledevelopment.un.org/sdg6>

³ <http://www.waterpathogens.org/>

With access to the Internet, engineers and scientists working anywhere in the world will be empowered to tap into the best available science for controlling human exposure to waterborne pathogens. This ambitious project is funded by the Gates Foundation and the Midland Research Institute for Value Chain Creation. It has also received generous support from the Proctor & Gamble Company and the American Chemistry Council.

The Problems with Multi-purpose Waterbodies

In many communities around the world, the nearest body of water is an important multi-purpose resource, as the diagram above illustrates.⁴ That “multi-purpose waterbody” is a source of exposure to fecal pathogens from humans and animals. Unfortunately, in these communities, fecally-contaminated water is used routinely for drinking, bathing, washing, and crop irrigation. These uses expose the community to health risks through ingestion or even inhalation of, and skin contact with, contaminated water. The GWPP online platform will help water professionals characterize and optimize treatment methods for the specific pathogens of concern at a given location.

Far-reaching Implications

In addition to directly impacting the water and sanitation SDG, the GWPP will help achieve several other SDGs indirectly. For example, public health and the avoidance of waterborne disease are linked to a community’s economic stability. By identifying the tools needed to provide safe water, the GWPP also will play a role in: ensuring healthy lives and promoting well-being (SDG #3⁵), ending poverty (SDG #1⁶), and promoting full and productive employment (SDG #8⁷).

The organizers and contributors to the GWPP are excited to offer this “evergreen,” online tool for addressing fecal pollution anywhere in the world. We are especially gratified that the tool can be applied within the context of the post-2015 UN SDGs to help address some of the world’s most pressing problems.

The GWPP open access integration platform can be found at: www.waterpathogens.org.

Joan Rose, PhD, is the Homer Nowlin Chair in Water Research at Michigan State University and a member of the Water Quality and Health Council.

⁴ The diagram illustrates many, but not all, of the potential sources of fecal pathogen contamination to a surface waterbody.

⁵ <https://sustainabledevelopment.un.org/sdg3>

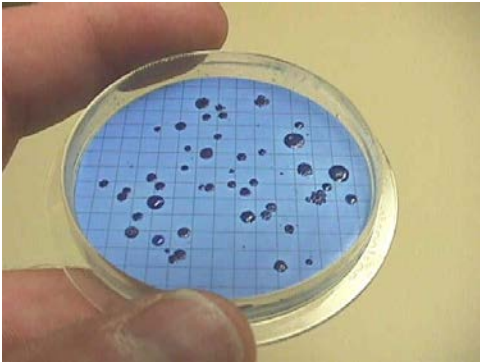
⁶ <https://sustainabledevelopment.un.org/sdg1>

⁷ <https://sustainabledevelopment.un.org/sdg8>

Waterborne Pathogens



1.5 million people, mostly young children, die annually from waterborne disease. That's like losing a city the size of Harare, Zimbabwe or Phoenix, USA every year.



There are many different types of waterborne pathogens that cause disease. These pathogens include bacteria, viruses, protozoan parasites, and helminths (worms). Many of these pathogens cause the same symptoms—diarrhea—so it can be difficult to determine the specific pathogen when people become sick. It is now recognized that these pathogens also cause heart, liver, and kidney infections, ulcers, meningitis, and neurological and respiratory problems.



The most common route of infection with a waterborne pathogen is the “fecal-oral” route. This means people are infected when they are exposed to water or food contaminated with untreated human or animal feces or improperly treated sewage.



If you reduce the concentration of pathogens, you reduce the health risk. Providing adequate treatment significantly reduces waterborne disease. According to the World Health Organization, every \$1 USD spent on sanitation produces a \$5.50 return by keeping people healthy.



GWPP
Global Water Pathogen Project

The Global Water Pathogen Project will provide access to state of the art policies and practices designed to reduce waterborne disease. For more information, visit the GWPP website at waterpathogens.org.

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For more information, visit the GWPP website at waterpathogens.org.



Image credits

Header pathogen images: Centers for Disease Control and Prevention, www.cdc.gov

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