OneWater/SmartWater: Creating A More Eco-friendly And Equitable World (Prompt #3)

By: Samragyee Dhakal

Historically, in the United States, drinking water, wastewater, stormwater, and water for the environment were managed separately. Due to this separation, different water sectors often had conflicting notions in terms of how water should be managed. The agricultural sector, for example, uses water to activate fertilizer, while the ecological sector prevents runoff caused by fertilizer. Additionally, the water infrastructure that runs throughout our neighborhoods is deteriorating due to concerns about changes in our climate, and larger infrastructure, such as dams is proving to be ecologically detrimental. In particular, traditional infrastructure overlooks the significance of the natural environment in cleaning and regulating water. Some areas of the world lack water infrastructure altogether. As a result, several communities are suffering from low amounts of water.

OneWater is an alternative approach to managing water systems that integrates all different sectors of water into a single management system. SmartWater, integral to OneWater, pioneers cyberinfrastructure to integrate technology and infrastructure, promoting sustainable water management in local communities.This approach aims to advance sustainable water management through research, community engagement, and fundraising. Similarly, SmartWater aims for sustainability by integrating technology into water infrastructure and emphasizing crowdsourced data. SmartWater's technological advancements, with OneWater's community-oriented management systems, synergize effectively in tackling global challenges like climate change and water equity.

Globally, traditional water systems are in a constant battle with the natural environment. Several dams, for example, have been built in Native American villages and destroyed fishing sites, their main source of food and income, because the dam forced the fish to change course. As a result of the dependency on reservoirs, several Native American tribes faced displacement. However, the

OneWater/SmartWater seeks to embrace the ecological landscape of local communities to promote the health and sustainability of the water and the ecosystem. OneWater seeks to diversify water sources to maintain the ecological balance of local communities and prevent the dismantling of local economies.

In contrast to current detrimental dam-reliant water management systems, OneWater seeks to diversify water sources to prevent excessive strain on a single natural resource. In the context of Native American villages, diversifying water sources can help move away from relying on dams and thus preserve the natural environment and tribal lands. Additionally, SmartWater aims to incorporate green infrastructure to reduce the carbon footprint and other negative ecological impacts of water management systems during processes such as water treatment, distribution, and wastewater management. Green infrastructure incorporates the natural environment into water management which can help promote community building. For example, instead of building dams, some communities incorporating the principles of OneWater, have built rain gardens to catch stormwater, thus using green infrastructure to diversify their water sources instead of relying on a singular reservoir.

Green infrastructure is a step in the right direction. However, several communities lack sufficient infrastructure in the first place, leading to the broader issue of water inequity. In many rural areas around the globe, people rely on rain barrels and bottled water to meet their needs. According to the United Nations, globally, 79% of people living in extreme poverty reside in rural areas. As an example, many Nepali women in my home country bear the burden of managing their household. With this expectation comes the responsibility of carrying water from low-land to the highlands where their homes are located. The lack of proper water infrastructure puts immense strain on the physical health of Nepali women. In particular, chronic back pain is the leading cause of disability among Nepali villagers, according to the National Institute of Health (NIH).

Before the concept of OneWater, water management systems did not consider socioeconomic conditions in their plans. However, water management and socioeconomic conditions are intertwined. OneWater actively seeks to garner community engagement, to approach water management holistically. Through alliances such as the One Water Council, people from several different sectors meet to collaborate and tackle the issue of water inequity with their expertise. Through this engagement, SmartWater can provide technological advancements such as smart water infrastructure, data-based decision-making, and artificial intelligence to determine safe drinking water.

A future where OneWater/SmartWater principles are widely adopted includes cross-sector management coupled with cyberinfrastructure to approach water management holistically. Previous water management systems that solely focused on providing water, efficiently failed to address the socioeconomic conditions of the communities they were serving, thus in the case of Native American villages, causing more harm than good. The revised principles of OneWater/SmartWater seek to incorporate a focus on socioeconomic needs, thus making water management more holistic and beneficial for local communities. Through green infrastructure and data-driven technology, OneWater/SmartWater can pioneer a new era of eco-friendly and equitable water, which ultimately leads to a happier and healthier planet.