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Welcome to the 2nd edition of MISSION: Water, a magazine featuring the organizations and researchers tackling the world's most challenging water issues. I'd like to give a special thanks to all the participants in our inaugural edition who helped make the magazine's launch such a success – and another thank you to the contributors telling their story in this issue.

I'm excited to see MISSION: Water feature stories from around the globe, with topics ranging from climate change in the arctic to grassroots monitoring coalitions in the Himalayas. This edition also puts a spotlight on the work of environmental professionals confronting the lingering effects from some of the world's worst environmental disasters, including the Deepwater Horizon spill and the Gold King Mine incident in Colorado.

We hope you enjoy the magazine, and let us know if you're interested in joining us for the next issue!

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WATERKEEPERS® at the Third Pole

Co-written by
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WATERKEEPER® ALLIANCE

Panoramic view of confluence of the Zanskar river from left and Indus rivers from right - Leh, Ladakh, Jammu and Kashmir, India.
Photo: Candy Halls

THE HIMALAYAN GLACIERS, which stretch east from northern Afghanistan, Pakistan, and India, through Nepal and Bhutan, and into the neighboring Tibetan Plateau and China, are the source of fresh water for nearly four billion people in Asia.

The melting of snow in the Arctic and Antarctic due to global climate change is reported frequently, but the melting of the Himalayas' glaciers has gone largely unreported, even though far more people are affected. The glaciers of the Himalayas are, in fact, the "Third Pole." They feed the giant rivers of Asia that support half of the world's population.

Three major rivers – the Indus, the Ganges and the Brahmaputra – arise in the Himalayas and flow directly into Pakistan, India and Bangladesh. The Yellow, Yangtze, Mekong, Irrawaddy and Salween Rivers arise from the Tibetan Plateau and flow directly into China before continuing into Myanmar, Laos, Thailand, Cambodia, and Vietnam.

These rivers are the source of water for drinking, washing, irrigation, fishing and industry, and have also been the source of many local and international disputes about their quality and flow from one community into another, within and across borders. But 65 Waterkeepers and Affiliates in these communities do not recognize borders when they apply their passion and commitment to the health of river ecosystems.

In January 2016, Waterkeeper Alliance launched an initiative to protect the Himalayan waters and its growing network in India, Nepal, and Bhutan, and work with Waterkeepers throughout the region – and across the globe – to protect the "Third Pole."

Water monitoring equipment training on the Zanskar River.
Credit: Waterkeeper Alliance

"Do not dirty the sacred rooftop of the world."

His Holiness the Gyalwang Drukpa

Pangong Lake, an endorheic lake in the Himalayas situated at a height of about 4,350 m (14,270 ft).

Ladakh, India

High up on "the sacred rooftop of the world," on the Indus River in the Ladakh region of India, Himalayan Glacier Waterkeeper was founded in 2013 by His Holiness the 12th Gyalwang Drukpa, head of the Drukpa lineage of Buddhism, who has over 27 million followers around the world. He is an award-winning humanitarian and environmentalist who advocates respect for nature as one of the steps on the path to enlightenment. He was the recipient of the 2010 United Nations Millennium Development Goals Award for his cross-border humanitarian work and India's 2010 Green Hero Award for his work in sustainable development.

The Indus and its tributaries, fed by glacial-melt waters, sustain communities throughout Jammu and Kashmir, a single state that contains Ladakh and that is a locus of dispute involving India, Pakistan and China. The headwaters of the Indus originate in the plateaus of Tibet and run through India and Pakistan to the Arabian Sea near the port city of Karachi. Along its way, its river-systems support temperate forests, plains, arid countryside and countless communities.

The natural habitat and the way of life of Himalayans are seriously affected by the forces of modernization and climate-change. In Ladakh, although increased tourism and new roads have facilitated distribution of goods, there is virtually no awareness of the dangers of plastic litter in the wild.

There are no means of disposing of this waste, which is migrating into the region's rivers, its primary source of drinking-water. In addition, the rapid melting of glaciers caused by warmer weather is contributing to the drying up of springs and rivers used for drinking-water.

Ladakh, at an altitude of 9,800 feet, also has been facing extreme-weather, including rare and catastrophic flash floods, made worse by rapid deforestation that has removed nature's flood-defense mechanisms. In August 2010, flash floods in Ladakh damaged over 71 towns and villages, and claimed 225 lives. Floods in September 2014 killed more than 550 people in the Kashmir region and devastated the lives and livelihoods of survivors. These incidences, which are expected to become more common, have been termed "Himalayan tsunamis."

Less disturbing but also very significant is the threat of such events to Ladakh's spiritual and cultural heritage. Its nearly 1,000-year-old Hemis Monastery of the Drukpa Lineage houses its largest collection of Buddhist relics, rare murals and texts, many of which define the sacred and sophisticated administration of traditional water rights.

Stewards without borders, the **WATERKEEPER®** ALLIANCE work beyond political lines to solve water issues. Credit: Rinchen Wacher

In July 2016 the Waterkeeper Alliance held their first training exercise in the former Buddhist kingdom of Ladakh, India, where Himalayan Glacier Waterkeeper has been leading communities, and especially young people, to protect the region's water resources. Himalayan Glacier Waterkeeper currently includes 20 Waterkeeper Affiliates based at Drukpa monasteries in streamside villages throughout Ladakh.

At the Druk Padma Karpo School our experts trained the Himalayan Glacier Waterkeeper team and its 20 Affiliates on the use of water-quality monitoring field equipment. Drukpa nuns and students from the school were also trained on how to test water quality using monitoring kits. With these tools, Himalayan Glacier Waterkeeper's community is able to monitor the baseline physical and chemical water-quality conditions of their local waterways and advocate for the protection of clean water.

By the end of our tour, we had tested water quality at 10 sites northwest and southeast of Leh.

To launch the Himalayan Glacier Waterkeepers' water-quality monitoring program, we chose equipment from YSI to measure dissolved oxygen (DO), conductivity, and pH and supplemented these instruments with other tools to measure for nutrients, turbidity and E. coli.

Credit: Rinchen Wacher

Initial testing found the water quality of glacial streams to be generally good (dissolved oxygen at levels supportive of aquatic life, slightly alkaline, low conductivity, high clarity, no excessive nutrients). For the Indus and the Zanskar Rivers, both larger river systems, the main difference was low clarity and highly turbid water resulting from excessive suspended sediments in the water. Ongoing water-quality testing will help to establish baseline characteristics of these waterways and allow Waterkeepers to assess and address any changes that may occur from pollution or climate change.

WATERKEEPER® ALLIANCE engages monks and citizens at the top of the world to make positive impacts. Credit: Waterkeeper Alliance

Nedup Tshering

A charismatic authority who inspires citizens and leaders across the country, is the founder and executive director of Clean Bhutan, an NGO with a mission to achieve a "zero-waste Bhutan" by 2030. It was established in February 2014 in celebration of the 60th birthday of the previous king, who conceived the "Gross National Happiness Index," by which welfare is measured by good health, environmental preservation, clean air, clean water and other factors. Clean Bhutan advocates behavioral change and awareness of its programs. In September 2015, Clean Bhutan welcomed Thim Chu Waterkeeper to Thimphu.

Bhutan

Bhutan is a small Himalayan kingdom east of Nepal, north of India and southwest of China. It contains the least impacted rivers in the Himalayan region. It is roughly 75 percent forested, and its constitution requires that it remain at least 60 percent so. These conditions have allowed the country to be one of the few in the world that acts as a carbon sink that beneficially absorbs more carbon than it releases.

Prime Minister Tshering Tobgay promises that Bhutan will remain carbon neutral – while it is in fact, carbon negative. Bhutans strong conservation ethic was established by King Jigme Singye Wangchuck, who reigned until 2006, and has been carried forward by his son, King Jigme Khesar Namgyel Wangchuck, the prime minister and the Buddhist leadership. “Where we live,” the current king has declared, “must be clean, safe, organized and beautiful, for national integrity, national pride, and for our bright future. This too is nation-building.”

Bhutan’s main economic generator is hydroelectricity, 75 percent of which is exported to India. But as climate-change advances, more caution is required in dam building. A 2012 UN report on glacial-lake outburst-floods noted that the country’s 677 glaciers and 2,794 glacial lakes had experienced more than 21 glacial lake outburst floods in the last forty years. It also identified another 25 glacial lakes as potentially dangerous – ticking time bombs whose outbursts could have devastating impacts on dams downstream.

Bhutan, long closed to the outside world, opened its doors to tourism in 1974, and is now rapidly modernizing. As imports of packaged foods and other commodities have increased, so have littering and unsustainable practices such as dumping and burning of waste, this includes the burning of plastics, which releases toxic fumes. Waterways are becoming polluted, especially in the capital city, Thimphu.

A recent letter to the editor of Kuensel, the national newspaper, lamented the lack of proper controls of erosion and sediment on road-construction projects. And, though automobiles remain fairly scarce in Bhutan, their growing number has brought more repair-shops, which discharge waste-oil and other pollutants directly into the city’s Olarongchu River, tributary of the Thim Chu.

Several acts and plans have been established to address waste-management in Bhutan, including the National Environmental Protection Act and the National Strategy and Action Plan: Integrated Solid Waste Management in 2007, the 2009 Waste Prevention and Management Act, and the 2014 National Integrated Solid Waste Management Strategy. Unfortunately, implementation of these plans does not appear to have reached beyond Thimphu yet.

The Ministry of Health, which administers parts of the 2011 Water Act, has begun to focus more on water quality. It oversees a modest hospital-based aquatic laboratory, but it severely lacks equipment and training for monitoring and analyzing all the pollutants that are caused by rapid development.

Punakha Dzong "the palace of great happiness" is the administrative centre of Punakha District in Punakha, Bhutan.
Photo: MC Noppadol

Credit:
Waterkeeper Alliance

Last November, Waterkeeper Alliance staff traveled to Bhutan with a team of scientists from Stroud Water Research Center of Avondale, Pennsylvania to conduct physical, chemical and biological assessments of water quality in three Bhutanese rivers, the Thim Chu, Paro Chu, and Punakha Chu, and various streams. Working alongside Thim Chu Waterkeeper and partners from the National Environment Commission and the HydroMet Division of the Ministry of Economic Affairs, they installed the country's first three real-time water-quality monitoring sensors.

Conclusion

Protecting the Himalayan glaciers and rivers and the countless communities that depend on them is a colossal challenge, but the Waterkeepers in the Himalayas are optimistic. They are dedicated to strengthening community efforts to monitor the quality of their waterways and inform themselves to advocate for the abundance and purity of freshwater that sustains billions of people.

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About WATERKEEPER® ALLIANCE

Waterkeeper Alliance strengthens and grows a global network of grassroots leaders protecting everyone's right to clean water.

We're the largest and fastest growing nonprofit solely focused on clean water. We preserve and protect water by connecting local Waterkeeper organizations worldwide. Our goal is drinkable, fishable and swimmable water everywhere.

Waterkeeper Alliance is a global movement uniting more than 300 Waterkeeper Organizations and Affiliates on six continents and focusing citizen advocacy on issues that affect our waterways, from pollution to climate change. Waterkeepers patrol and protect more than 2.4 million square miles of rivers, streams and coastlines in the Americas, Europe, Australia, Asia and Africa.

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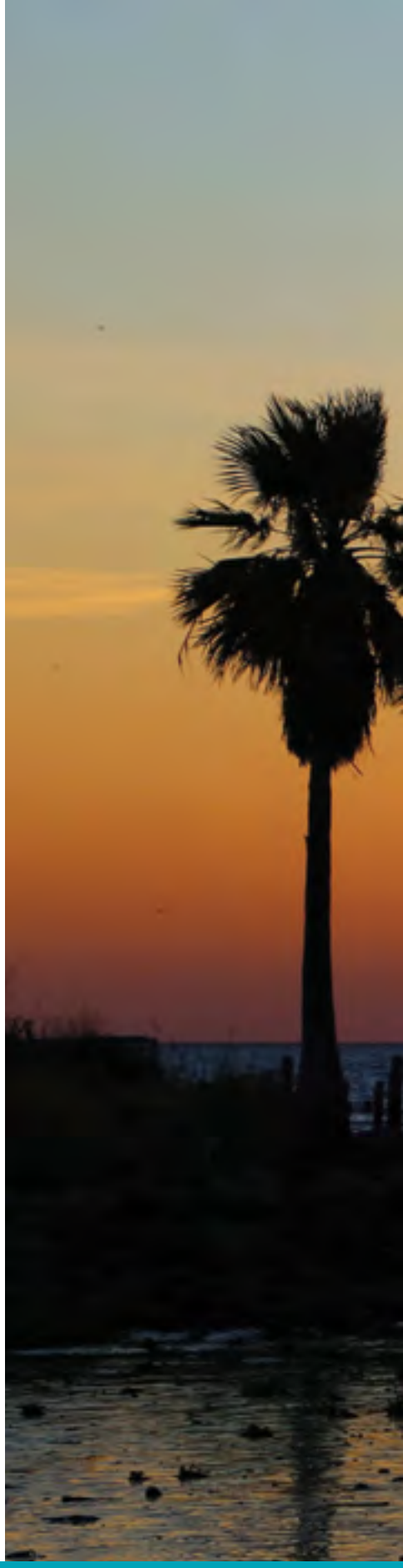

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