

Island Voices: Sustainability, the new science

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In the Nicola Valley, the B.C. government has a pilot project on water sustainability underway with Indigenous governments.

Zero Water Day. This ominous day was when the water supply for more than two million residents of Cape Town, South Africa, was forecast to run out. The date was set for April 1. However, Zero Water Day has been postponed indefinitely because of the unprecedented reduction in per-capita water use.

This experience indicates that populations can adapt under a crisis and mitigate the effects of a severe drought. A United Nations-sponsored report suggests that there are at least 11 other major cities that could also run out of water by 2040 as a result of climate change, loss of natural storage capacity and population growth.

The era we live in has been termed the “Anthropocene” — or the age of dominant mankind — where human activity is having an overwhelming impact on the natural workings of the planet Earth. To begin addressing the looming consequences of human impact, the UN Climate Agreement signed in Paris in December 2015 set a goal that the globe should become carbon-neutral by about 2075, and thereby limit the increase in the average global temperature to less than two degrees Celsius (which has been deemed by scientists as a critical tipping point).

This commitment requires human-based carbon emissions to be almost eradicated and the capacity of Earth’s ecosystems to store carbon to be greatly increased.

A recent analysis by independent auditors general across Canada concluded that neither the federal government nor most of the provinces have viable plans to meet their stated carbon-reduction targets. Consequently, much more attention must be placed on adapting to the rapidly changing climate, as demonstrated by the citizens of Cape Town, in addition to reducing the carbon footprint.

The Cape Town situation is not resolved, as it will take years of water austerity before the reservoirs refill, if they ever do, carrying huge implications for social justice and the collective nature of future water use in the region. All of these aspects are at the heart of sustainability science.

The impact of humanity on our planet is often cast in a negative light. However, it can also be a force for good. Humans are endowed with immense intellectual capacity to understand and to foresee. The hard work of hope centres on the ability of humans faced with a crisis to exercise extraordinary creative solutions to safeguard all species over all coming generations.

Rivers and lakes are the foundation of our society, and are the arteries of the landscape. The changing climate will have an enormous impact on the global water cycle. With warmer average temperature, the atmosphere holds greater amounts of water.

Watersheds large and small can expect more frequent and intense floods and droughts. This means more holistic approaches to watershed governance are required that start by integrating land and water management with ecologies, economies and cultures.

Over the past decade, the B.C. provincial government (along with many governments globally) has started on a path that favours more sustainable water management. The province has introduced regulations to control large-scale groundwater use, thus initiating a more holistic approach to the water cycle; it has required decision-makers to protect environmental water flows to support healthy aquatic ecosystems; and it has enabled water sustainability planning with the first pilot underway in the Nicola watershed in an innovative co-governance model with Indigenous governments in the Nicola Valley.

The entry of the Anthropocene and the daunting goal of carbon neutrality forces a radical new vision for all of humanity, and has very specific and significant implications for science, research and education. "Sustainability science" requires a new approach to gaining knowledge and education — one that integrates the ecosystem sciences (carbon storage) with the physical and engineering sciences (carbon reduction). But it also has to engage the public, including Indigenous cultures, to create a common willingness to alter course so we collectively achieve carbon neutrality, as well as overall planetary continuance.

Sustainability science also offers insights into how to build more resilience in watersheds by restoring and maintaining healthy ecosystems to buffer streams from flood and drought conditions. Healthy watersheds store more carbon and protect key habitats for wildlife and fisheries, and greater reuse of natural resources cuts avoidable carbon emissions. Science and technology can also drive water reuse and conservation.

But these steps are only a start. Much scientific work will be required to fully implement the framework set out in B.C.'s Water Sustainability Act and reduce carbon emissions as set out in B.C.'s new climate-action plan. If we are to avoid more Zero Water Days, we have to integrate carbon reduction and adaptation using the creative energy derived from the belief in the collective good of the human race as a steward of its home.

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