

Water Abuse and Climate Change

It is widely acknowledged that greenhouse gas emission-fuelled climate change is having a profound and negative impact on fresh water systems around the world. Warmer weather causes more rapid evaporation of lakes and rivers, reduced snow and ice cover on open water systems, and melting glaciers. What is less understood is that our collective abuse and displacement of fresh water is also a serious cause of climate change and global warming. If we are to successfully address climate change, it is time to include an analysis of how our abuse of water is an additional factor in the creation of global warming as well as solutions that protect water and watersheds.

There are two major factors. The first is the actual displacement of water from where it is sustaining a healthy ecosystem as well as healthy hydrologic cycles. Because humanity has polluted so much surface water of the planet, we are now mining the groundwater far faster than it can be replaced by nature. *New Scientist* reports of a “little-heralded crisis” all over Asia as a result of the exponential drilling of groundwater. Water is moved from where nature has put it (and where we can access it) in watersheds and aquifers, either for flood irrigation for food production - where much of it lost to evaporation - or to supply the voracious thirst of mega cities, where it is usually dumped as waste into the ocean.

Water is also lost to ecosystems in the form of virtual trade – water used in the in the production of crops or manufactured goods that are then exported. Over 20% of daily water used for human purpose is exported out of watersheds in this way. Water is also piped across long distances for industry leaving behind parched landscapes.

The second factor is the removal of the vegetation needed for a healthy hydrologic cycle. Urbanization, deforestation and wetland destruction greatly destroy water-retentive landscapes and lead to the loss of precipitation over the affected area. Quite simply, if there is nothing green to receive the rain, cloud vapours will blow away, creating desert where there was a living ecosystem.

Slovakian scientist Michal Kravcik and his colleagues explain that the living world influences the climate mainly by regulating the water cycle and the huge energy flows linked to it. Transpiring plants, especially forests, work as a kind of biotic pump, causing humid air to be sucked out of the ocean and transferred to dry land. If the vegetation is removed from the land, this natural system of biosphere regulation is interrupted. Soil erodes, reducing the content of organic material in the ground, thus reducing its ability to hold water. Dry soil from lost vegetation traps solar heat, sharply increasing the local temperature and causing a reduction in precipitation over the affected area. This process also destroys the natural sequestration of carbon in the soil, leading to carbon loss.

Of course, these two factors are deeply related. Just as removing vegetation from an ecosystem will dry up the soil, so too will removing water from an ecosystem mean reduced or non-existent vegetation. As Kravcik explains, the yellow of the sun combined with the blue of water creates the green of our living world. Remove either the blue or the green from the earth and the heat of the sun will change everything.

Taken together, these two factors are hastening the desertification of the planet, and intensifying global warming. *Kravcik says that even if we successfully address and reverse greenhouse gas emissions and our dependence on fossil fuels, if we do not deal with the impact of our abuse of water on the planet, we will not be able to stop climate change.* Unless we collectively address the crisis of fresh water and our cavalier treatment of the world's water systems, we will not restore the climate to health.

Restoration of Watersheds

The solution to the water half of this crisis is the massive restoration of watersheds. Bring water back into parched landscapes. Return water that has disappeared by retaining as much rainwater as possible within the ecosystem so that water can permeate the soil, replenish groundwater systems, and return to the atmosphere to regulate temperatures and renew the hydrologic cycle. All human, industrial and agricultural activity must conform to this imperative, a project that could also employ millions and alleviate poverty in the global South. Our cities must be ringed with green conservation zones and we must restore forests and wetlands – the lungs and kidneys of fresh water. For this to be successful, three basic laws of nature must be addressed.

First, it is necessary to create the conditions that allow rainwater to remain in local watersheds. This means restoring the natural spaces where rainwater can fall and where water can flow. Water retention can be carried out at all levels: roof gardens in family homes and office buildings; urban planning that allows rain and storm water to be captured and returned to the earth; water harvesting in food production; capturing daily water discharge and returning it clean to the land, not to the rising oceans.

Second, we cannot continue to mine groundwater supplies at a rate greater than natural recharge. If we do, there will not be enough water for the next generation. Extractions cannot exceed recharge just as a bank account cannot be drawn down without new deposits. Governments everywhere must undertake intensive research into their groundwater supplies and regulate groundwater takings before their underground reservoirs are gone. This may mean a shift in policy from export to domestic and local production.

Third, we must stop polluting our surface and groundwater sources and we must back up this intention with strict legislation. Water abuse in oil and methane gas production and mining must stop. We must wean ourselves of industrial and chemical-based agricultural practices and listen to the many voices sounding the alarm around the rush toward water-guzzling bio fuel farming. We need to promote “subsidiarity,” whereby nation-state policies and international trade rules could support local food production in order to protect the environment and promote local sustainable agriculture. Such policies would also discourage the virtual trade in water and countries could ban or limit the mass movement of water by pipeline. Government investment in water and wastewater infrastructure would save huge volumes of water lost every day in old or non-existent systems. Domestic laws could enforce water-harvesting practices at every level.

Toward a Water Secure World

Clearly, for this rescue plan to be successful, governments around the world must acknowledge the water crisis before them and the part that water abuse plays in the drying of the planet. This in turn means that a nation’s water resources must be considered in every government policy at all levels. Nations must undertake intensive studies to ascertain the health of watersheds and placement and size of groundwater reserves. All activities that will impact water must conform to a new ethic – backed by law - that

protects water sources from pollution and over-pumping. This will likely mean a strong challenge to government policies that favour unlimited global economic growth.

Nearly two billion people live in water-stressed regions of the earth. Until now, the UN has addressed this terrible reality with a program to hook them into groundwater sources. But current levels of groundwater takings are unsustainable. To truly realize the universal right to water, and to protect water for nature as well, means a revolution in the way we treat the world's finite water resources. There is no time to lose.

Maude Barlow, January 2010