

Strategies for Drought Adpatation and Mitigation via Wastewater Management

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Abstract : The unsustainable and injudicious use of natural renewable resources beyond the self-replenishment limits of our planet has proved catastrophic. Most of the Earth's resources, including land, water, minerals, and biodiversity, have been overexploited. Owing to this, there is a steep rise in the global events of natural calamities of contrasting nature, such as torrential rains, storms, heat waves, rising sea levels, and megadroughts. These are all interconnected through common elements, namely oceanic currents and land's the green cover. The deforestation fueled by the 'economic elites' or the global players have already cleared massive forests and ecological biomes in every region of the globe, including the Amazon. These were the natural carbon sinks prevailing and performing CO₂ sequestration for millions of years. The forest biomes have been turned into mono cultivation farms to produce feedstock crops such as soybean, maize, and sugarcane; which are one of the biggest green house gas emitters. Such unsustainable agriculture practices only provide feedstock for livestock and food processing industries with huge carbon and water footprints. These are two main factors that have 'cause and effect' relationships in the context of climate change. In contrast to organic and sustainable farming, the mono-cultivation practices to produce food, fuel, and feedstock using chemicals devoid of the soil of its fertility, abstract surface, and ground waters beyond the limits of replenishment, emit green house gases, and destroy biodiversity. There are numerous cases across the planet where due to overuse; the levels of surface water reservoir such as the Lake Mead in Southwestern USA and ground water such as in Punjab, India, have deeply shrunk. Unlike the rain fed food production system on which the poor communities of the world relies; the blue water (surface and ground water) dependent mono-cropping for industrial and processed food create water deficit which put the burden on the domestic users. Excessive abstraction of both surface and ground waters for high water demanding feedstock (soybean, maize, sugarcane), cereal crops (wheat, rice), and cash crops (cotton) have a dual and synergistic impact on the global green house gas emissions and prevalence of megadroughts. Both these factors have elevated global temperatures, which caused cascading events such as soil water deficits, flash fires, and unprecedented burning of the woods, creating megafires in multiple continents, namely USA, South America, Europe, and Australia. Therefore, it is imperative to reduce the green and blue water footprints of agriculture and industrial sectors through recycling of black and gray waters. This paper explores various opportunities for successful implementation of wastewater management for drought preparedness in high risk communities.

Keywords : wastewater, drought, biodiversity, water footprint, nutrient recovery, algae

Conference Title : ICDCC 2022 : International Conference on Drought and Climate Change

Conference Location : Dubai, United Arab Emirates

Conference Dates : December 20-21, 2022