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Recycling of wastewater through sewage-fed aquaculture in the peri-urban Kolkata of West Bengal, India

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Water scarcity and water pollution are crucial issues in today's world. One of the ways to reduce the impact of water scarcity and pollution is to expand water and wastewater reuse. The use of aquaculture for the purpose of wastewater treatment to improve the quality of sewage effluent prior to its release to the land and or any aquatic body has been practiced for a relatively short time. Since household wastewater often intermixes with effluents from industries and agricultural runoff, multidimensional approaches have been made towards maximizing protein production through rational exploitation of available resources. Sewage-fed aquaculture is a unique system and has manifold advantages in developing tropical countries acting as a major source of nutrients for crop farming and aquaculture, economical for sustainable production and helps to combat environmental pollution. The current study is on East Calcutta Wetland (ECW) which is a model for multi-use resource recovery system with activities like aquaculture and agriculture. The entire city's soluble waste is disposed into the raw sewage canals which finally drains into the shallow, flat bottom fish ponds called Bheri. These sewage fed fisheries act simultaneously for the purification process like removal of heavy metals, coliform reduction as well as fish production at a commercial scale. Mainly three types of commonly consumed fishes were chosen for the study namely *Labeo rohita, Catla catla* and *Cirrhinus mrigala*. Little scientific and technical attention may help to improve the water quality and in the same time use of economic benefit and uplift the socio-economic status.

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The impact of split flow on atmospheric extinction coefficient: A case study

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Visibility impairment is an indicator of air pollution in industrial cities. In this paper, the effect of the split of jet stream flows in the upper troposphere on the increase of atmospheric extinction coefficient is investigated. The extinction coefficient used is that derived from the radiative transfer equation. The split jet is composed of the following components: the subtropical jet, the polar front jet and the gap between these two. The split flow index is derived from the mean relative vorticity of each component on 300 hPa level. The negative and positive values correspond to, respectively, the split flow and non-split flow states. The impact of split flow on atmospheric extinction coefficient is presented for the period of 29th to 31st December 2009, a period of marked visual impairment in Tehran, Isfahan, Zanjan, Kermanshah and Ahwaz. The NCEP/NCAR reanalysis is used to calculate the split flow index and horizontal visibility from synoptic station data in the above cities are used to calculate extinction coefficient. Results show that the change of sign in split flow index from positive to negative may provide an explanation for the corresponding increase of atmospheric extinction coefficient on the same day or the day after.

Biography

S Sabetghadam, PhD, is an Assistant Professor of Space Physics at the University of Tehran, Iran, since February 2014. She completed her PhD in June 2013 and she is a visual air quality specialist. She has published 4 research papers in journals such as Atmospheric Environment, Aerosol Sciences etc.

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