Hydrological Sensitivity of Commercial Fish Production Potentiality Around Bangladesh

Mohammed Mukteruzzaman

Center for Environmental and Geographic Information Services (CEGIS), F-14/E, Agargaon Administrative Area, Sher-E-Bangla Nagar, Dhaka-1207, Bangladesh

Moshiur Rahman Rimu

Center for Environmental and Geographic Information Services (CEGIS), F-14/E, Agargaon Administrative Area, Sher-E-Bangla Nagar, Dhaka-1207, Bangladesh

Md. Ashraful Alom

Center for Environmental and Geographic Information Services (CEGIS), F-14/E, Agargaon Administrative Area, Sher-E-Bangla Nagar, Dhaka-1207, Bangladesh

Md. Atikul Islam

Center for Environmental and Geographic Information Services (CEGIS), F-14/E, Agargaon Administrative Area, Sher-E-Bangla Nagar, Dhaka-1207, Bangladesh

Sharmin Akhter

Center for Environmental and Geographic Information Services (CEGIS), F-14/E, Agargaon Administrative Area, Sher-E-Bangla Nagar, Dhaka-1207, Bangladesh

Roland Nathan Mandal*

Center for Environmental and Geographic Information Services (CEGIS), F-14/E, Agargaon Administrative Area, Sher-E-Bangla Nagar, Dhaka-1207, Bangladesh

Abstract:

Under future hydro-climatic changes and modifications of river discharge and water depth are expected to result in potential production shifts of riverine organisms, including commercial fin fish. Bangladesh is one of the world's leading fish producing countries with a total production of 4.3 Million MT in FY 2017-18, in which river system contributes only about 7.5%. The fish production module underpins the estimation of riverine fish production of Bangladesh based on the discharge and water depth at different hydrological nodal points[1]. We project changes for the highly valued commercial fish, the Hilsa Shad (*Tenualosa ilisha*), by applying a bio-hydrological model based on the Bayesian theorem considering 248 bio-hydrological variables, among which 170 variables linked with discharge and 78 with water depth. The hilsa production potentiality changes projected from the recent past (1985–2017) to two futures (2030 and 2050) were calculated for riverine waters around Bangladesh under four scenarios based on the climate change and economic condition. Our model projected that some districts, such as Bhola, Noakhali, Cumilla, and Chandpur, would highly be sensitized with the hydrological shifts under four scenarios. These changes might drive significant changes in hilsa production in future.

Keywords:

Riverine Ecosystem, Fish Production Potentiality, Climate Change Scenarios, Bio-hydrological Modelling.

[1] Nodal Points: Hydrological network nodes