

**A success story of the application of an indigenous, low-cost, and sustainable floating treatment wetlands technology in Pakistan**

Muhammad Afzal\*

*National Institute for Biotechnology and Genetic Engineering College, Pakistan  
Institute of Engineering and Applied Sciences (NIBGE-C, PIEAS), Faisalabad,  
Punjab, 38000, Pakistan*

*\*Email: afzal@nibge.org*

In Pakistan, due to very high capital and operational costs of conventional technologies, > 99% wastewater is discharged in water bodies untreated. This wastewater contaminates the water, soil and food. The use this contaminated water and food causes a significant number of diseases and deaths. To address this issue of high cost of wastewater treatment, a very low-cost floating treatment wetlands (FTWs) technology has been developed using locally designed and developed floating mat and available indigenous plants and microbes. FTWs is a low cost, sustainable, and environment friendly technology for wastewater treatment and reuse. Moreover, it is an innovative roots filter technology in Pakistan for the cost-effective treatment of wastewater without relying on energy or chemicals. It requires ~100 times lower capital investment than conventional technologies, without any operational cost. Until now 500,000 sq.ft FTWs have been applied at more than 100 sites in Pakistan and it improves the quality of about 500 billion cubic meter wastewater annually, and sequesters 300 tons of carbon per year. It removes (up to 90%) both organic and inorganic pollutants from the wastewater, and treated water is being safely discharge in the environment or reuse in agriculture and horticulture.

**Keywords:** wetland; microbes; Pakistan; treated