Potential for Aquaculture Integration with Wastewater Treatment Wetlands in Southern Iraq

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The city of Basra, Iraq, was once the thriving economic center of a vast marsh-dwelling community in the TigriséEuphrates river delta, a region that has sustained civilization for 6,000 years. Over the last several decades, damming and draining have decimated those wetlands and the communities that depended on the ecosystem services they provided. The most significant ecosystem service lost was natural water remediation and filtration that the marshes provided. “MaRSHiI” (Maintaining and Restoring Sustainable Hydrology in Iraq), a collaborative project under the Memorandum of Cooperation between University of South Carolina and the University of Basra (UB), studies the sustainability impacts of wetlands collapse and the possibility for wetland restoration. Work is ongoing to establish constructed wetlands for wastewater treatment throughout the Basra Governorate, beginning at UB. The long-term goal is to create integrated wastewater treatment-aquaponics wetland systems that would both remediate wastewater and support carp and reed farming, which would create economic incentives to construct wetlands. However, questions remain about how bioproductive this system could be, how long it would take to be economically viable, whether fish raised in farms using treated water would comply with health standards, and how regulation will influence the development of wastewater aquaculture. This thesis project addresses those questions through discussing the collapse and present state of recovery of the southern Iraqi marshes, reviewing wetland restoration and management around the world with a focus on wetlands for wastewater treatment, investigating the potential for creating an integrated wastewater treatment-aquaponics system in Basra, and describing remaining questions and next steps for building an integrated wastewater treatment marsh and aquaponics system at the University of Basrah. This research serves as a reference for that process, providing context, an overview of the available literature and data, and necessary tests and additional data. The thesis document will be distributed to MaRSHiI participants, regional collaborators, implementing institutions throughout Iraq, and potential funders for the establishment of wastewater treatment marshes and aquaponics in Iraq.