Urban sustainability by restoring axolotl habitat

Abstract:
Restoration in urban areas must be approached based on socio-ecosystem dynamics and should include different disciplines to achieve a successful long-term program. These dynamics may generate positive feedback loops that contribute to ecosystem resilience. Understanding the feedback loops is necessary to increase the opportunities for restoration practices to push the system toward stable states where local people benefit from the restoration programs. To highlight the significance of a multi-disciplinary approach, we present the progression of a long-term restoration project in an urban wetland: Xochimilco, a highly perturbed system at the south of Mexico City that still provides several ecosystem services. It hosts a high biodiversity of plants and animals, including Ambystoma mexicanum (the Axolotl), a neotenic salamander strongly tied to Mexican culture and a species used in many physiological and genetic research studies. We described an ecosystem depletion feedback loop, starting from the polluted water that lowers crops quality, eventually leading to agricultural abandonment. This opens the area to urban settlements which further pollute the water through sewage. To disrupt this negative feedback loop, we developed the "Chinampa-Refuge" project centered on agriculture production within the wetland and using the axolotl as a flagship species. The restoration process relies upon the establishment of aquatic refuges to increase water quality, a change which benefits native species as well as the crops. This benefit to farmers should make the creation of the refuges more attractive. That, in turn, should increase the number of refuges, and the water quality of the system.