

ORL-EB&C-01**Aqua Pond Gene Bank: An Effective Practice for Dynamic and Evolutionary Conservation of Aquatic Agricultural Biodiversity**

Bal Krishna Joshi*, Bikash Bushal, Md. Akbal Husen, Umita Sah, and Prem Timalisina

National Agriculture Genetic Resources Center (NAGRC)
 Nepal Agricultural Research Council
 Khumaltar, Nepal
 joshibalak@yahoo.com

The total aquatic agricultural genetic resources (AAGRs) are 267 species in Nepal. This includes 252 aquatic agricultural animal genetic resources (AAAGRs) and 17 aquatic agricultural plant genetic resources (AAPGRs), with 16 species of AAAGRs being exotic. The species and varietal richness of aquatic agro-microbes, aquatic agro-insects, zooplankton, and phytoplankton remain undocumented. This paper is based on surveys, focus group discussions, the authors' fieldwork, and observations. The authors have established an aqua pond genebank and developed guidelines for its operation. The average genetic erosion rate stands at 30%, driven by factors such as the introduction of exotic species, damp construction, land use changes, climate change, pond desiccation, poor utilization, and neglect. Nepal hosts many localized and site-specific species and varieties. Since 2016, the Nepal Genebank has initiated the establishment of an aqua pond genebank, employing strategies such as ex-situ, on-farm, in-situ conservation, and conservation breeding. The aqua pond genebank aims to conserve AAGRs in a dynamic system, enhancing evolutionary rates by growing compatible species together and allowing interaction with environmental factors to develop climate-resilient genotypes.

Guidelines have been formulated for the establishment and management of aqua pond gene banks. A passport format has been created for both AAAGRs and AAPGRs, along with a supporting app. All fisheries research stations and fisheries research units under the Nepal Agricultural Research Council (NARC) have aqua pond gene banks, totaling 15 such facilities that have conserved over 100 species including aquatic plankton and macrophytes. As part of an on-farm strategy, some communities have begun setting up community aqua pond gene banks to conserve the AAGRs found locally. The idea of a "community river," akin to community forestry, could also be effective for the conservation and sustainable use of AAGRs. Additionally, several aqua pond gene banks have been established in public domains as part of an in-situ conservation strategy. Further characterization and evaluation are necessary to expedite the utilization of these resources along with online portal of these resources. Continuous monitoring and exploration are imperative to preserve endangered species, and such conservation efforts should extend to protected areas, wetlands, and other public ponds, lakes, and rivers.



Figure 1. First aqua pond gene bank established in 2016 in Khajura, Banke, Nepal