



Community input to quantification of lake restoration benefits: a pilot study of coastal Karnataka Lake, India

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Abstract

Lake restoration is one of the regional initiatives aimed at increasing natural resource-based livelihoods. Typically, data on lake inflows/outflows or benefits are not available. Under the circumstances, the best way to collect data is through a questionnaire survey and interviews with residents of the area. The study aims to determine the present condition of the lake and quantify the advantages of the lake on crop productivity after and before the construction of the bund. A reconnaissance investigation of the area found that the lake might have an impact within a 5 km radius. As a result, a survey was carried out within a 5 km radius. The total amount of lake water used for agriculture is 33264 mm³. The incorrect management of the lake's water has resulted in a water deficit in the study region. Consequently, residents who benefit from the lake are increasingly dependent on alternative water sources, such as wells and small ponds. As a result, the yield decreased by 20.45%. After the bund construction was built across the outflow of lake water, the profit increased by 37.88%, making more water available throughout the year. According to the study, appropriate conservation efforts require community input. Instead of focusing on high-cost technology in coastal Karnataka, this study suggests that water resource managers should restore surface water bodies, providing more water benefits for the public.

Keywords Lake restoration · Agricultural productivity · Community participation · Questionnaire survey · Bund

Introduction

Lake restoration aims to restore deteriorated or polluted lakes. Water pollution severely threatens human health and the environment; lake restoration is essential to resolving this issue. Protecting coastal lake water is critical since the unlimited consumption of freshwater aquifers directly causes groundwater quality issues. Because of the possibility

of seawater intrusion, coastal groundwater systems are vulnerable to reduced recharge, contamination from natural and anthropogenic sources, and overexploitation (Barik et al. 2021). The lake collects rainfall runoff and improves water seepage to aquifers. Furthermore, such storage structures work as sponges, reducing local flooding possibilities. Water is more frequently available in coastal places, and water in open wells is saline; considerable pumping extraction results in massive groundwater depletion.

According to Lathashri and Mahesha (2015)'s research in coastal Karnataka, heavy pumping diminishes the seaward freshwater gradient, which can even be reversed in some situations. This produces severe saltwater intrusion from the sea, seriously damaging internal freshwater aquifers, and restoration could take years. Because of the terrain and porous lateritic soil composition, large dams are not preferred in coastal Karnataka. Residents of the study area depend on surface water in this scenario, such as open wells or small ponds. However, the main challenge in coastal Karnataka is seawater intrusion, which is especially vulnerable during the monsoon season (January to June) (Sylus and Ramesh 2015). The water in open wells dried up after the

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