

Status of Wetland Governance in Lake Cluster of Pokhara Valley: A case study of the Phewa, Begnas, and Rupa Lakes

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Abstract

This study examines the status of the governance of Phewa, Begnas, and Rupa Lakes of Pokhara valley in Gandaki province, Nepal. These lakes constitute the Ramsar designated lake cluster site. The assessment of wetland governance was done through a comprehensive literature review, focus group discussion and key informant interview of representatives from 13 governmental and non-governmental organizations. Using the Integrated Lake Basin Management framework of the International Lake Environment Committee, the study evaluates governance based on six pillars: Institution, Policy, Participation, Information, Technology, and Finance. A governance assessment matrix with 10 indicators was used to score these pillars on a scale from 1 (lowest) to 7 (best). The study findings indicate that governance in these lakes is generally weak (low), except for the Institution and Policy pillars, which scored higher but fell in average scale. Among the three lakes, Rupa Lake had the highest governance score, while Technology, Information, and Finance were the weakest pillars across all lakes. There is no designated strong agency responsible for Ramsar site management in provincial level, although the Ministry of Forest and Environment, Gandaki Province has authorized the Lake Conservation and Development Authority to address wetland issues. Community-led Lake Resources Cooperatives have contributed to environmental improvements and provisional services. However, wetland area and biodiversity loss remain a concern. Additionally, weak coordination among provincial and local government agencies hinders effective governance. Strengthening institutional coherence, better enforcement of rules and regulations and consolidating efforts across agencies and stakeholders are necessary to improve governance and ensure sustainable wetland management in the future.

Key words: *biodiversity, community, Integrated Lake basin management, Lake institution, Wetland management*

Introduction

Governance basically refers to the structures and processes through which a society makes collective decisions and shares power within the formal and informal institutions of the community. They are the horizontal and vertical linkages among organizations and social groups engaged in decision-making, negotiation, and managing trade-offs (Young, 1992; Moench et al., 2003; Cookey et al., 2016). Governance of lake or wetland resources is a socio-political and technical processes through which authority and power are applied in running lakes and advocating for the common

interests of people concerning development and conservation. In governance, it brings about a shift from a more centralized authority to a decentralized one wherein roles and responsibilities extend beyond the government hierarchy. It depicts not only state actions but all other actors such as communities and NGOs encouraging effect on resource management (Lemos & Agrawal, 2008; Juarez-Aguilar, 2010). The authority here usually relates to institutional legitimacy and capacity, where local governments and their agencies become the core actors (Brillo, 2023). Lake governance has contemporary dimensions and consists of the interplay of policies, laws, norms, institutions,

and processes in the making, implementation, and accountability of decisions impacting lakes and their users (Pokharel, 2020). The International Lake Environment Committee (ILEC, 2005) developed the Integrated Lake Basin Management (ILBM) approach. It provides a governance framework aimed at enhancing lake basin environments and conserving biodiversity for sustainable development. Nepal has been involved in ILBM activities from the first exposure of National Lake Conservation Development Committee (NLCDC), the lake management authority of the Government of Nepal at the 12th World Lake Conference held in Jaipur/Rajasthan, India in 2007 (Pokharel, 2009).

The ILBM is a management framework that promotes lake management approaches based on the proper understanding of the biophysical characteristics of lake ecosystems and interactions between lake ecosystems and humanity (Muhandiki et al., 2014). ILBM emphasizes on six pillars of governance such as Institutions, Policies, Participations, Information, Technologies and Finance (ILEC, 2005; ILEC, 2007; Pokharel, 2020). These six pillars are necessary components for any management response to be effective. The government of Nepal has been adopting this prescription to improve lake basin governance since 2006, and ever after federal restructuring through National Lake Conservation Development Committee (MoFE, 2018).

ILBM applications became visible in Nepal only after the country accepted the ILBM approach and documented it in National Ramsar Strategy and Action Plan (2018-2024). In Kaski district, the Gandaki Province and local governments are engaged in managing Lake Cluster of Pokhara Valley, the Ramsar site, and other wetlands by consolidating the basin-level governance following ILBM

The LCPV and ILBM approaches are aligned with the core principles that establish management and governance framework of wetland sites designated as Ramsar sites. The Ramsar Convention is an inter-governmental treaty adopted in 1971, and its initial focus is on the conservation of waterfowl habitats (www.ramsar.org). Over the years,

recognizing wetland ecosystems for biodiversity conservation and improving human health and wealth, the convention broadened its scope into conservation and wise use of wetlands, listing wetlands of international importance (the Ramsar list) and broadening international cooperation. Also recognizing wetlands integral element of environment and sustainable development (Poudel, 2009), the Convention came into enforcement in Nepal in 17 April 1988. Nepal has 10 Ramsar sites including lake cluster of Pokhara valley (<https://www.researchgate.net>). Such multilateral international environmental agreements also guide national policies and laws in other wetland related areas. Numerous sectoral agencies claimed authority over its governance but failed to deliver effective results (Joshi & Bhandari, 2016). This study focuses on the following key governance principles of the Ramsar Convention: a. Integrated management; Stakeholder involvement; c. Policy and legal frameworks, d. Incentives for conservation and e. addressing conflicts.

Materials and Methods

Study Area

Pokhara Valley lies in the lesser Himalaya of Nepal with an average elevation of 822 m and is the capital city of Gandaki province. The nine-lake cluster in Pokhara Valley, including Phewa, Begnas and Rupa was listed as Ramsar sites of Nepal in 2016 which has a total area of 261 km² including their riparian areas (Ghimire and Regmi, 2024). The LCPV lies on a top of a gigantic debris fan from a cataclysmic flashflood that, according to geologists, was caused by the Seti River bursting through a landslide or avalanche dam in its headwaters below Annapurna IV about 800 years ago (RIS 2016). The lake areas consist of layered clastic deposits with gravel, silt, and clay from the Quaternary age, brought from the Annapurna range by series of catastrophic debris flow (Yamanaka et al., 1982). Morphologically, LCPV is made of five major land units, including alluvial plains and fans, alluvial plains, ancient river terraces (tars), and moderate to steep mountain slopes. Agriculture is concentrated in alluvial plains and river terraces (GoN 2014).

This study focuses on Phewa, Begnas and Rupa Lakes, which are the major lakes under the LCPV, Nepal (Fig. 1). Phewa is the largest lake in cluster and second largest lake in Nepal by area with a surface area of ~4 km² in 2018 (Watson et al., 2018). The Phewa Lake is the main attraction for tourism in Pokhara. Begnas is the second biggest lake in LCPV at an elevation of 650 masl covering an area of ~2.98 km² in 2019 (Thakuri et al., 2021). The lake lies at the foothills of Himalayan Mountain at an elevation of 782 masl, symbolizing a lake with the intense anthropogenic burden from various pollutants and contaminants. It bears an external area of 4.35 Km² and extreme depth of 22.5 m (Sharma et al., 2015). Likewise, Rupa is the third largest lake at an elevation of 600 masl with an area of 1.35 km² (MoFE, 2018).

The climate of Pokhara is controlled by Indian monsoon in summer seasons and westerly wind

systems in winter seasons (Khadka et al., 2023). The LCPV region receives maximum total annual rainfall of around 3500 to 4,000 mm compared to eastern (~1600 mm) and western (~1500 mm) parts of Nepal and has a humid subtropical climate (Sharma et al., 2020; Sigdel et al., 2022). The lake regions have been experiencing changes in temperature (0.3°C increase per decade) and rainfall (insignificant increase). Similarly, there is a notable 11.39% decline in the surface area of Phewa Lake since 1989, while the surface areas of Begnas and Rupa have remained relatively stable. Changes in LULC show an increase in forest cover (+47 to 64%) and decrease in croplands (-36 to 59%) across all watersheds (Sigdel et al., 2025).

The vegetation in the area is a mosaic of sub-tropical and temperate broad-leaved forests, including Sal (*Shorea robusta*) in the south, riparian forests along the banks of the Seti River and its tributaries,

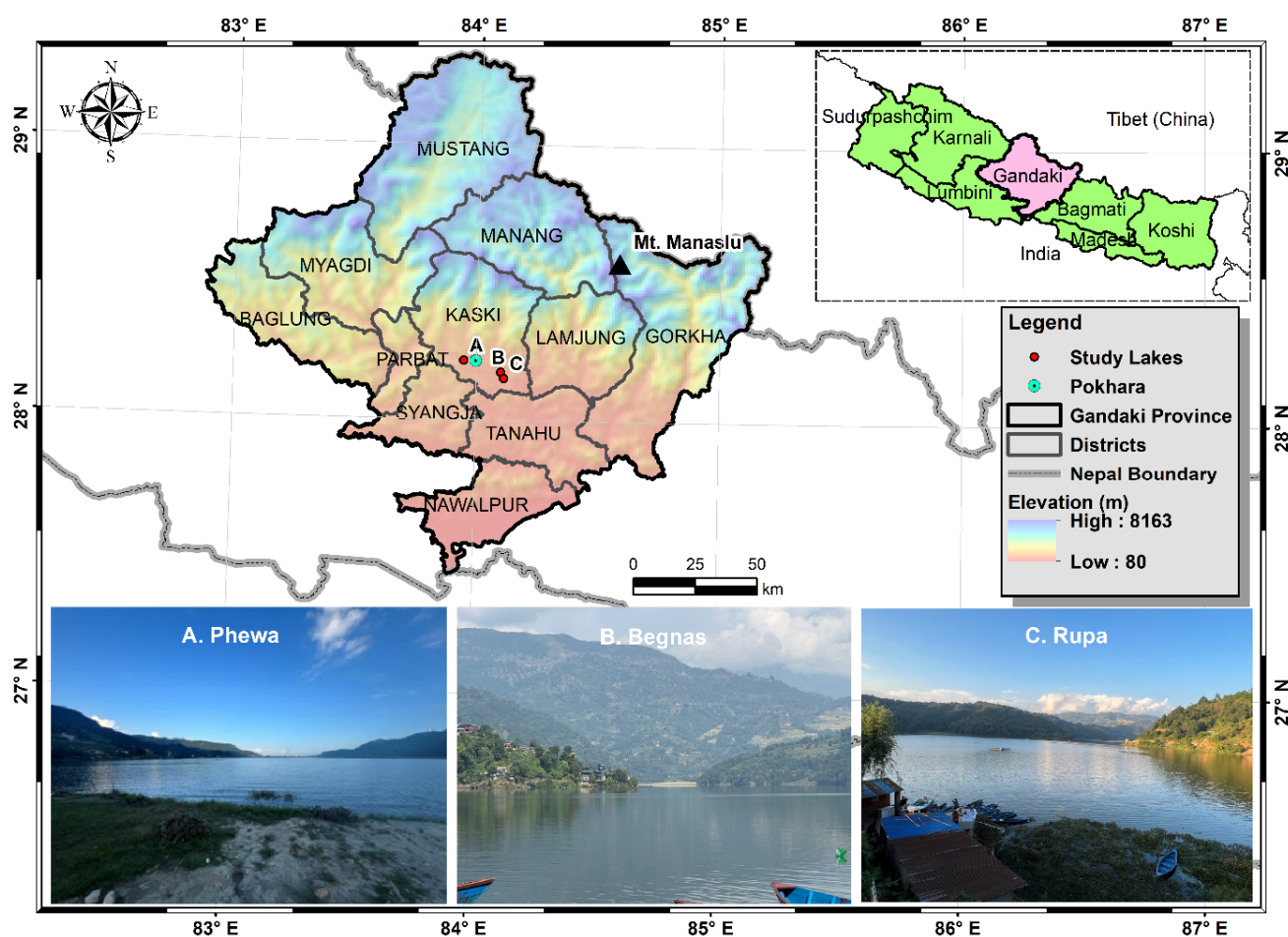


Figure 1: Overview of the study area and three lakes. The inset displays Gandaki Province in Nepal, while the zoomed-in panel offers a detailed view of the specific locations of the three lakes in Gandaki province. The lakes pictures in lower panel are captured by first author, which are the primary focus of this research.

and Schima-Castanopsis forests in the north and west (MoFE, 2018). In the Phewa lake basin, the subtropical forests dominant on the southern and western sides. A significant portion of the Panchase Forest Protected Area, located within the Harpan sub-watershed of Phewa, includes the historic Hill-top (Lek) called 'Panchase', which is rich in endemic orchids. The basin of Begnas and Rupa lakes are mainly covered by sub-tropical vegetation, including hill Sal forests and Chilaune-Katus forests (MoFE, 2018).

Methodology

This involved meticulously examining a wide range of sources, including scientific articles, institutional and government reports, and relevant news articles that focus on lake management and governance. By synthesizing information from these diverse materials, we aimed to ensure a thorough and accurate understanding of the current state of lake basin management practices. Qualitative tools for the study included desk research, observation key informant interviews (KII). Open-ended and pretested questionnaires for key-informant interviews, focused group discussion (FGD), observations were used for data collection. The study sites (Phewa, Begnas and Rupa Lakes) were visited for two times in 2024 representing two different seasons during monsoon (June-August) and autumn (September-November) seasons.

Key Informants' Interview (KII)

For evaluating lake basin governance, 13 wetland related institutions personal were selected as Key Informant Interview (KII) as institutions involved in managing targeted lakes of LCPV. Assessment matrix was designed to assess the status of governance to evaluate the strength of Institution, Policy, Participation, Information, Technology and Finance pillars of ILBM following the Governance Diagnosis System (GDS) (Juarez-Aguilar, 2010) after its modification by Pokharel (2020).

Focus Group Discussion

Focus group discussion was aimed to draw out information on environmental degradation and conservation efforts for the wetland management

and wetland governance. A total of three Focus Group Discussions (FGDs) were organized with lake conservation and management committees of Phewa, Rupa, Begnas lakes. During focus group discussion, Community Forest User Groups, Lake Conservation Committee, Boater's Association, Fishing Cooperatives, Mother Groups, Local Youth Club and others, elder persons living at the nearby locations of the lake clusters Water User Group, Informal Irrigation User Group, Fishermen Group, Lake Dependent Communities (Jalahari) were involved. Checklists were used as a tool for FGD.

For analysis, assessment matrix was devised in MS Excel 2016, which uses 10 indicators for each of the six governance pillars. The amplitude of governance improvement has been ranked using a scale from '1' to '7', where '1' is ranked as the weakest value (lowest) and '7' as the strongest (best) governance value. All the indicators are expressed in diagnostic question to be responded by concerned agencies reciprocating their engagement in targeted lakes. Each question needs to be answered with a score (from 1 to 7) that fits best in the case of individual wetlands. The average scores for each governance pillar were calculated and plotted for analysis. An overall summary of each governance pillar's perceived importance was also completed by analyzing mean scores. A radar diagram for lake depicting each pillar was developed to determine the strength of ILBM pillars.

Results and Discussions

Status of governance pillars in Phewa, Begnas and Rupa lakes

Institution

There are multiple interrelated layers of institutions that overlap in their jurisdiction in managing the resources of these lakes. The Ministry of Forest and Environment (MoFE) at the federal level is the governmental institution playing the role of the lead agency for administrating Ramsar implementation, through its departments such as Department of National Parks and Wildlife Conservation (DNPWC) and Department of Forests and Soil Conservation (DoFSC) (Pokharel,

2009; 2022). Basin Management Center (BMC) based in Gandaki province, is a federal-level institution that works under the DoFSC, focuses on watershed management. At Province, the Ministry of Forests and Environment (MoFE), leads lake management activities. Lake Conservation and Development Authority (LCDA) and Division Forest Office, Kaski, work under the Ministry of Environment, Gandaki provincial government Pokhara Metropolitan City (PMC), Rupa Rural Municipality and Annapurna Rural Municipality have also dedicated roles as institutions for managing lakes. All these entities from federal to province and local levels, they do coordinate, allocate budget and implement ILBM plan of LCPV. Each local-level government has environment sector for lake conservation. Conservation partners, Non-Government Organization (NGO), academia, research institutions and private sector act in parallel as advocates and supporters in managing the lake basin watersheds (Figure 2).

In stakeholder respondent analysis, the institutional pillars of all three lakes were ranked good, since they all scored more than the 3.5 in an average in the governance radar diagram (Figs. 3, 4, 5 and 6). This means that institutions exist in this lake basin area and are functioning well. Institutions are at the pillars of lake basin management since they implement the measures for management. For example, they administer laws, provide a forum for involving stakeholders, gather and store knowledge, sometimes establish policies, etc. (ILEC, 2005). In addition, other institutions are also associated with lake management. In these lakes, mainly three levels of institutions are functioning. At Federal level, the MoFE through the Department of National Parks and Wildlife Conservation (DNPWC), Department of Forests and Soil Conservation (DoFSC), Forest Research and Training Center (FRTC) and Department of Plant Resources (DPR) implements policies, programmes and projects. Basin Management Center (BMC),

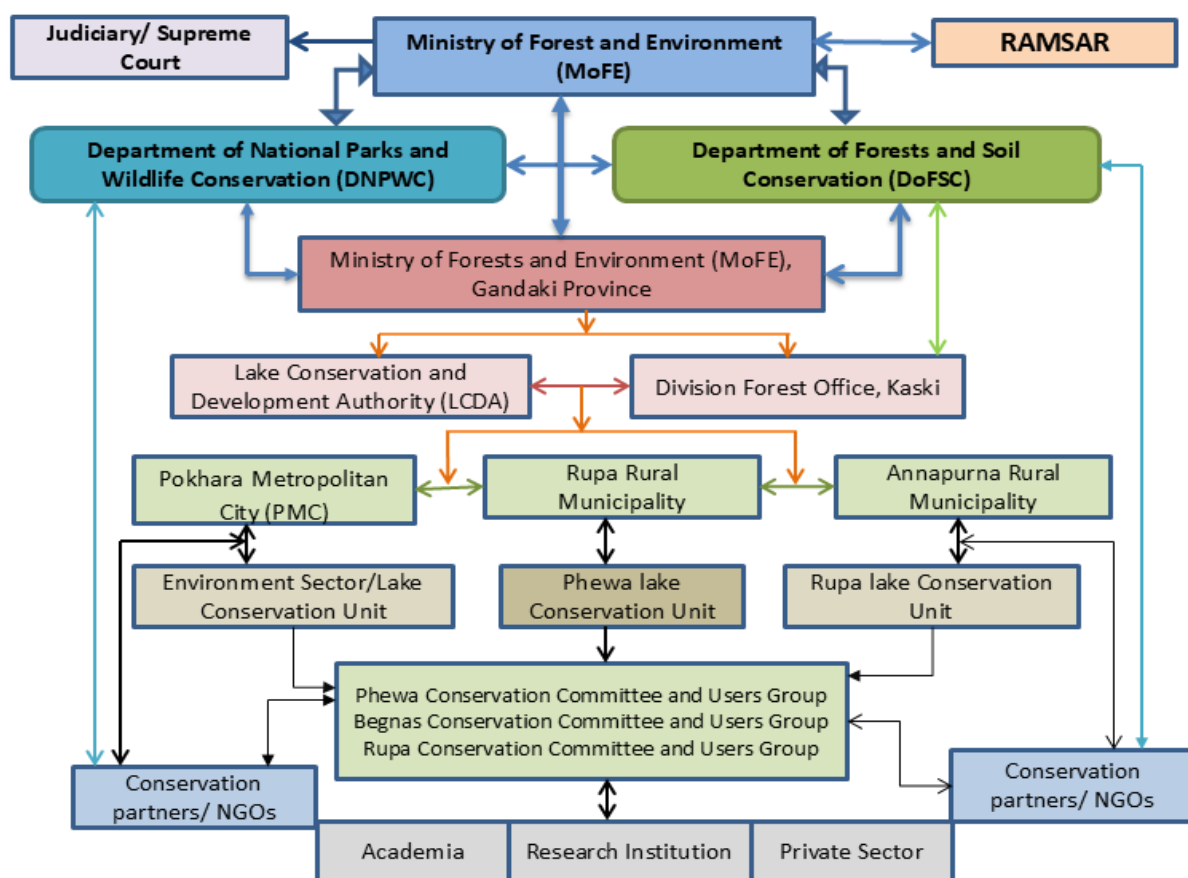


Figure 2: Institutional arrangement of Phewa, Begnas and Rupa Lakes

Gandaki is a federal-level institution that works under the DoFSC. Wetlands management involves collaboration with various ministries, including the Ministry of Agriculture and Livestock Development (MoALD); Ministry of Land Management and Cooperatives (MoLMC); Ministry of Education, Science and Technology (MoEST); Ministry of Energy, Water Resources and Irrigation (MoEWRI); Ministry of Industry, Commerce and Supplies (MoICS); Ministry of Federal Affairs and General Administration (MoFAGA.); Ministry of Culture, Tourism and Civil Aviation (MoCTCA); National Planning Commission (NPC); and Water and Energy Commission Secretariat (WECS). The National Wetland Coordination Committee (NWCC) under MoFE coordinates efforts across these ministries. In Phewa Lake, the Nepal Electricity Authority (NEA) utilizes the Lake water to generate electricity. The Nepal Tourism Board promotes the Lake as a major tourist attraction and recreation area. The Federal Ministry of Finance is also a stakeholder since it collects tax generated through revenue from various goods and services catered to the tourists in the Lakeside area.

At provincial level, all three lakes lie in Gandaki Province. The Ministry of Environment (MoFE), Gandaki province has established Lake Conservation and Development Authorities (LCDA) to promote the sustainable conservation and wise use of all lakes in the provincial level of Gandaki Province (LCDA, 2024). The other relevant sectorial agencies for implementation include the Forest Directorate, Division Forest Office, Forest Research and Training Center, Soil and Watershed Management Office, Water Resource and Irrigation Development Division Office, Underground Water Resource and Irrigation Office Pokhara, Infrastructure Development Office, Urban Development and Building Office, Transportation Management Office, Panchase Protected Forest Office, and Vocational and Skill Development Training Centre. Additional federal agencies operating in Pokhara include the Basin Management Center, Rupa Taal Conservation Integrated Irrigation Project, Pokhara Tourism Board, and Fishery Research Station, Begnas.

Key urban management initiatives include the Pokhara Valley Lake Restoration Program and various sustainability policies led by the Gandaki Province Government and Pokhara Metropolitan Office. These efforts aim to improve infrastructure, manage solid waste, and balance urban growth with environmental conservation (Department of Urban Development and Building Construction [DUDBC], 2022; Pokhara Valley Lake Restoration Program, 2021). Likewise, Annapurna Rural Municipality and Rupa Municipality play significant roles in Conserving Phewa and Rupa lakes.

At community level, LI-BIRD is a leading NGO engaged in agriculture biodiversity research and development at the local level. The Pragya Cooperative Implements Non-timber forest products (NTFP) related activities and has a nursery in the Begnas Lake basin. The Machhapuchre Development Organization (MDO) is engaged in biodiversity-based livelihoods, including orchid conservation in the Panchase area. The Boat Associations in Phewa and Begnas lakes provide recreational boating services in their respective lakes. Rupa Lake Restoration and Fishery Cooperative is a key local institution that supports the sustainable functioning of Rupa Lake. In addition, numerous conservation partners are active in the lake area. Key international partners include International Union for Conservation of Nature (IUCN) Nepal, World Wide Fund for Nature (WWF) Nepal, and International Centre for Integrated Mountain Development (ICIMOD), Zoological Society of London (ZSL), International Water Management Institute (IWRMI) Nepal, and Conservation and Development Fund (CODEFUND). Notable NGOs working in the region are the Society for Wildlife Research and Conservation, Bats Friend Pokhara, Bird Conservation Nepal (BCN), Forest for Transformation Nepal, Union for Nature Conservation, and Forest Alliance Nepal.

Policy and Legal Framework:

The Constitution of Nepal has divided the sovereign powers and nation capabilities amongst three ranges of governments i.e. federal, nation and nearby level (Article 56) envisioning a cooperative, coexistent

and coordinative device of federal governance (Article 232). For clarity, the Constitution has divided jurisdictions of the nation capabilities categorically where 'wetland conservation' is below federal jurisdiction. But wetland capabilities and offerings like electricity, irrigation, consuming water, navigation, and tourism are frequently unfold over all of the ranges (Schedules five to nine). In addition to that, it has said that the rights now no longer certain withinside the schedules fall below the prerogative rights of the federation (Article 58).

Our stakeholder respondent analysis also reflects the policy pillar of all three lakes, where scores are more than the average score of 3.5 in Governance radar diagram by respondents (Fig. 6). According to individual scores, Rupa lake (4.20) has higher scores as compared to Phewa (3.87) and Begnas lake (3.54) (Figs. 3, 4 and 5). There are policies, and they all function to govern the lakes. Policies act as principles to guide decisions in the sector and are implemented as procedures (ILEC, 2005). As Phewa, Begnas and Rupa Lake are included in the Ramsar sites, they are subjected to follow the Ramsar guidelines. The Convention on Biological Diversity (CBD) and International Trade in Endangered Species (CITES) function alongside Ramsar Convention. These are Nepal's international commitments in the protection of environment. In addition, the Constitution of Nepal has divided the sovereign powers and state functions among three tiers of government, i.e., federal, provincial and local levels, envisioning a cooperative, coexistent and coordinative federal governance system.

Whatever the Constitution provides, the water sector is cross-cutting under the many prevailing strategies and policies. The Water Resources Strategy (2002) and National Water Plan (2005) have the concept of Integrated Water Resources Management (IWRM). At the setting of these strategies/policies, over two dozen of Acts prevail, and the most relevant to wetlands among these are Aquatic Protection Act (2017), National Parks and Wildlife Conservation Act (1973), Soil and Watershed Conservation Act (1982), Water Resources Act (1992) and Water Resources Policy (2020), Solid Waste Management Act (2011) and Irrigation Policy (2013). Besides

many Acts, a few environmental standards and guidelines related to wetlands/ponds also prevail. Nepal's wetlands follow the guidelines of Nepal, especially the 4th Ramsar Strategic Plan (2016-2021), the Communication Education Participation and Awareness (CEPA) Strategy of Ramsar (2011-2015) and Nepal's National Wetlands Policy (2012). Local Government Operation Act (2017) also provides the rights for local government to directly engage in wetlands activities and Public-Private Partnership Policy (2072) and Public Private Partnership and Investment Act, (2019) also engage private sector in wetlands. Policy provision is not a gap, but many policies require mainstreaming, harmonization and implementation for their effectiveness (GoN, 2012; 2013; 2020).

Based on above legal footprint, and provisions set by way of means of the Constitution of Nepal 2015, the Gandaki province of Nepal has been very proactive to respond with coverage and legal framework for the basin level sustenance of lentic-lotic water system. The province has formulated the Forests and Watershed Policy of the Gandaki province-2018, that's the center coverage framework to cope with all of the problems of forests, vegetation and wildlife, biodiversity, watershed, wetlands, and grasslands of the country. This coverage strongly spelled out for the weather resilient and sustainable management of wetlands ecosystem (Bullet 2 under 'Ka'), incorporated control of lakes, wetlands, rivers and glaciers of the country (Bullet five under 'Ka')¹⁰, and for the environment management of the country ('Kha'). Next however very terrific one, the enactment of Lake Conservation and Development Authority Act-2018 which objectives to conserve, restore and manage lakes and their basins for the biodiversity and surroundings conservation for sustainable development and prosperity withinside the country.

Participation:

In respondent analysis, the participation pillar in wetland governance is high in the case of Rupa Lake that is 4.3, compared to Phewa Lake (2.8) and Begnas Lake (2.2) (Figs. 3, 4 & 5). Participation in Rupa Lake is satisfactory compared to the other two lakes. The three lake basins have a wide range of

stakeholders due to the broad range of ecosystem services offered by these three lakes. Ecosystem-based adaptation (EbA) and Payment for ecosystem services (PES), these two mechanisms are to be adopted in three lakes, which may support to local people to remain engaged in lake activities. EbA Project in the Panchase area of Phewa piloted a PES mechanism that linked upstream and downstream communities, offering technical and financial support to reduce sedimentation in Phewa and improve livelihoods upstream (WWF Nepal, 2019). There is already a cooperative model in Begnas Lake and Rupa Lake consisting of the fishermen group and the Community Forestry User Group (CFUG) paying a certain amount of revenue to CFUG for conservation works in upstream of the lake. Rupa Lake Restoration and Fishery Cooperative directly involve the local people in fishery management and lake conservation. The PES mechanism in Phewa has been updated in 2024 and Pokhara Metropolitan and Annapurna Municipality acting the process of implementation of PES mechanism for the sustainable management of Phewa Lake and its watershed areas. PES mechanism of Rupa Lake is already functioning. Participation in Rupa Lake appears strong because the EbA, PES and Cooperative model operate and function in the lake basin area.

Technology:

In our stakeholder respondent analysis, technology pillar score is low in ranking. Phewa (2.5), Begnas (2.3) and Rupa (2.9) were ranked weak in utilizing technology around the lake basin area (Figs. 3, 4 & 5). In this century and high-time, the role of technology is very important. Technology helps to conserve lake basin area in proper manner. These three wetlands at grass-root are being managed conventionally using indigenous technology and tools. In the past, Japan International Cooperation Agency (JICA) and Asian Development Bank (ADB) made efforts to improve the environment and sanitation of Pokhara City including the sewage management of Phewa Lake, but these mega projects terminated before completion and full implementation.

Information:

In stakeholder respondent analysis, scores in the information pillar in the radar diagram seem low in the Technology pillar. However, the information pillar of Rupa (3.3) scored more than the other Phewa (2.7) and Begnas lake (2.5) (Figs. 3, 4 & 5). Meaningful actions and decision-making are needed for reliable information (ILEC, 2005). Formulation of different strategies and policies are intended to produce various products and tools to generate conservation education and public awareness. Academic centers like Tribhuvan University, Institute of Forestry Pokhara and Kathmandu University have curriculum-based graduate programs for research-based information generation. Kathmandu University has also established a research laboratory in the Rupa Lake area to research Hydrology and Meteorology around the Rupa Lake basin area. The Resource Himalaya, an NGO, annually conducts a Graduate Symposium with a wetland's component. IUCN-Nepal, WWF-Nepal and ICIMOD along with universities are knowledge-generating institutions that publish and disseminate research-based knowledge. In addition, some non-governmental organizations like the Conservation Development Foundation (CODEFUND), Bird Conservation Nepal (BCN), Pokhara Bird Society (PBS), Local Initiatives for Biodiversity, Research and Development (Li-Bird), Green Governance, and so on also conduct field-based research and organize symposia in Phewa, Begnas and Rupa lake basin area.

Finance:

In our stakeholder respondent analysis, the finance pillar of three lakes scores lower than other pillars (Fig. 6). Rupa (3.4) scores higher in the governance pillar than in two other lakes. Stable finance is necessary to manage lake basins (ILEC, 2005). The government funding for the conservation and management of lakes comes from several key federal, provincial, and local sources. Ministry of Finance (MoF) allocates the national budget for the implementation of Ramsar provisions in Nepal, including the regular budget for Phewa, Begnas, and Rupa Lake. Under this budget, various ministries,

including the Ministry of Forest and Environment (MoFE) and the Ministry of Culture, Tourism and Civil Aviation are provided with financial resources for initiatives related to natural resource management, including wetlands like the Phewa, Begnas and Rupa Lake.

Gandaki Provincial Government provides funding for lake management through Lake Conservation and Development Authority (LCDA) and other regional agencies. Local governments, particularly

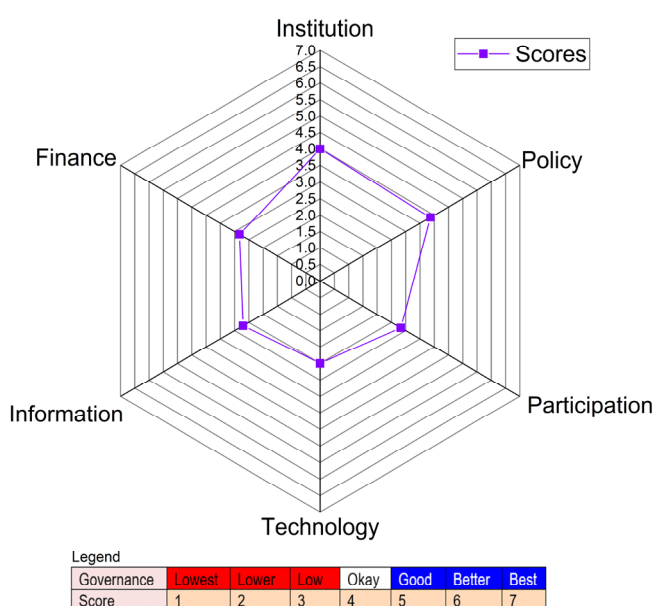


Figure 3: Wetland Governance Diagnosis Radar Diagram of Phewa lake. Note: The legend is same for all radar diagrams in figures 4,5 and 6.

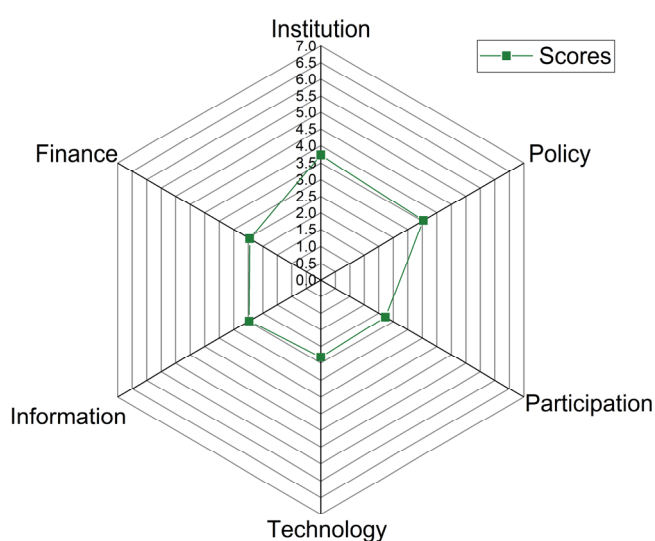


Figure 4: Wetland Governance Diagnosis Radar Diagram for Begnas lake.

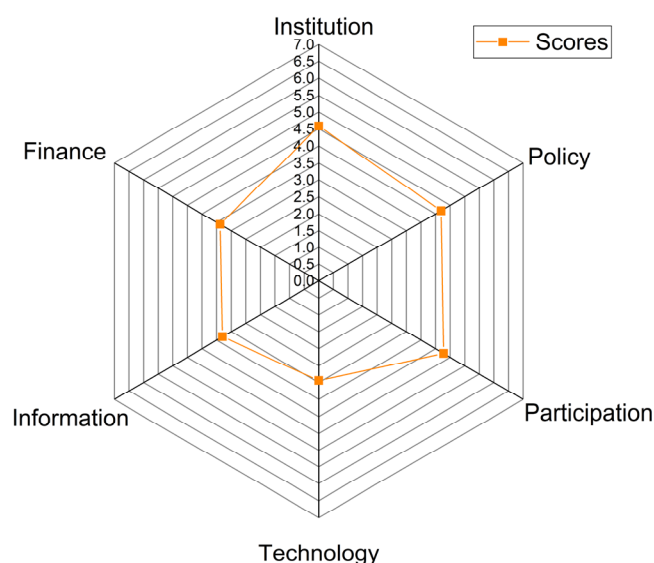


Figure 5: Wetland Governance Diagnosis Radar Diagram for Rupa Lake.

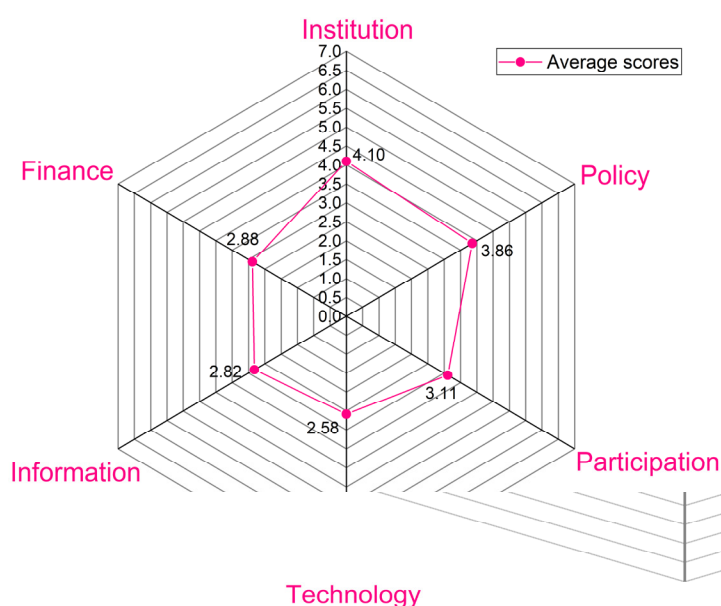


Figure 6: Overall Wetland Governance Diagnosis Radar Diagram obtained by average scores for Rupa, Begnas and Rupa Lakes governance.

Pokhara Metropolitan City and, Annapurna Rural Municipality and Rupa Municipality, play a crucial role in financing Phewa, Begnas and Rupa Lake conservation efforts. The Local Government Operation Act of 2017 empowers local governments to allocate budgets specifically for environmental management, encompassing the conservation of wetlands and lakes.

Conclusion

Community based as well as other non-government organizations are supporting governments and communities to strengthen six pillars of ILBM in Nepal in policies documentation, stakeholder engagement and communities' preparation. The Phewa, Begnas and Rupa lakes are three bigger lakes in the LCPV, where ILBM approach has been applied. Hence, this study aims to examine the extent of ILBM in these lakes. The significance of this study lies not only in its potential to enhance our knowledge of ILBM practices but also in its ability to inform and strengthen governance frameworks and management strategies for these vital water bodies. Effective governance is essential for balancing the diverse interests of stakeholders, including local communities, tourism operators, and environmental conservationists.

Based on the study findings, this study concludes that the six pillars - Institution, Policy, Participation, Technology, Information, and Finance- of Integrated Lake Basin Management (ILBM) for wetland governance are interconnected and interact with one another constantly. Overall, pillars in wetland governance in Phewa, Begnas and Rupa lakes have below-average scores except for institution (4.10) and policy pillars (3.86) with neutral score. None of the pillars were ranked good or above-good governance. Technology, Information, and Finance pillars are weak among others in this lake cluster. The study found an exemplary case of institutional arrangement in Phewa lake which scored higher compared those of Begnas and Rupa lakes. According to our results, Begnas and Rupa Lake's governance activities are not particularly focused on lakes but the overall watershed. The governance responsibility for Ramsar sites is not clearly assigned to either federal government (Ministry of Forests and Environment) or Division Forest Office (provincial government), or local governments such as Pokhara Metropolitan City and Rupa and Annapurna rural municipalities. There are policies and strategies related to lakes and wetlands, including dozens of acts backed by regulations and environmental standards. Conservation and management of lakes and wetlands in Nepal

fall under different governmental organizations institutions with overlapping mandates. However, integrated wetland management actions are urgently needed to enhance Lake Basin governance.

There exists so many lakes and wetlands related policies and strategies including dozens of acts backed by regulations and environmental standards. Conservation and management of lakes and wetlands falls under several institutions, with overlapping mandates. The government of Nepal implemented National Ramsar Strategy and Action Plan (national policy framework to guide the implementation of Ramsar) in 2018. Next implementation plan is needed to prepare and such documents will be useful in the context of improving weak lake basin governance by the province, metropolitan and rural municipality. Payment for ecosystem services (PES) mechanism of Phewa lake has also been prepared and has to be implemented soon. Therefore, strengthening basin governance in LCPV is the next immediate priority to implement a drive of the Lake City of Nepal making Pokhara a combined key of tourism and biodiversity destination in Nepal. Phewa, Begnas and Rupa Lakes are major lakes of LCPV, other lakes are significant wetland resources of Nepal.

Conflicts of Interest

The authors declare no conflict of interest.

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