

## Designing a Participatory Policy Framework for the Conservation of Lakes in the Sikkim Himalaya

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### ABSTRACT

Sikkim is a small mountain state located in the Eastern Himalaya and is home to more than 315 lakes. These lakes are holy as they are considered to have been blessed by Guru Padmasambhava, the renowned Buddhist sage of the 7<sup>th</sup> century A.D. Some of these lakes which are approachable by road have recently become mass tourist destinations resulting in increased incomes to the rapidly expanding tourism industry and added threats to this fragile aquatic ecosystem.

The land tenure or status of these lakes being reserve forest, the onus of preparing a conservation framework was on the forest department. Remote location, high altitude, adverse climate and tight security due to proximity to international borders had resulted in only limited interventions so far. To overcome these challenges it was imperative to adopt a decentralized approach of empowering the local community living adjacent to these lakes. Jointly with the support of NGOs and experts a participatory policy for lake conservation in Sikkim was framed through a consultative process during 2006. This policy derives its legal backing from the existing forest and wildlife legislation at national and state level. It envisages the formation of *Pokhri Sanrakshan Samitis* (PSS) or Lake Conservation Committees and lays down the composition, functions, duties, powers, ecotourism benefits and restrictive measures pertaining to them. Institutionally the PSS is closely linked to the Panchayati Raj Institution (PRI) which is the only constitutional body at the village level and decision making is decentralized to the *gram sabha*. The innovative components include lake conservation fees, annual lake conservation plan, code of conduct, capacity building of PSS, state level federation of PSS, linkage with PRIs, social audit and accountability to the *gram sabha*.

In 2006 five important wetlands of the state were included under the National Wetland Conservation Programme of the Ministry of Environment and Forests. Pilot implementation of this policy is being planned in Tsomgo lake (3660 m), Khecheopalri lake (1700 m) and Gurudongmar lake (5176 m) during 2007 and it is hoped that based on the experiences gained this policy will be further refined.

*Keywords: wetland, glacier, co-management, tourism, guidelines, sustainable, Sikkim*

### INTRODUCTION

Sikkim is a small north-eastern Indian state with a geographical extent of just 7,096 km<sup>2</sup> and is a part of the eastern Himalayan region. This region is also included as a part of the 34 global biodiversity hotspots of the world (Myers *et al.* 2000; Mittermeier *et al.* 2004). It is also the least populous of the Indian states with a population of 540,493 (Census of India 2001). Nearly 60% of its geographical area lies above 3,000 m and it harbours ten peaks that rise above 7,000 m. There are altogether 285 glaciers covering an area of about 576 km<sup>2</sup> with an ice reserve of 65 km<sup>3</sup> with the longest being the 26 km long Zemu glacier (Mool & Bajracharya 2003). This unique geomorphology has resulted in more than 315 glacial lakes located at an average altitude of 4,700 ( $\pm 500$ ) m (Fig. 1, 2). While only 2 lakes lie below 3000 m, most of them (94%) are located above 4000

m (Fig. 3). Locally known as *Tsho* or *Pokhri* their average size is 7( $\pm 6$ ) ha and they cover a total area of nearly 22 km<sup>2</sup>. The largest number of lakes numbering more than 65 is in the Chombo chu watershed in the Sikkim trans-himalaya (CISMHE 2005). With an extent of 164 ha the Khangchung cho is the largest lake while the Gyamtshona is saline. While four lakes exceed 100 ha in size and five 50 ha, most of the lakes (82.6%) are less than 10 ha in extent (Fig. 4). These lakes fed by melting glaciers and precipitation in their catchment, form the source of most of the rivers. Majority of the lakes in Sikkim have low turbidity (107 in post-monsoon and 60 in pre-monsoon) since they are located in the alpine zone and are of glacial origin (Space Application Centre, ISRO 1998). Though the area of the state is very small compared to other mountain states, but there are 14 potentially dangerous glacial lakes clustered in the trans-Himalayan plateau region

(Mool & Bajracharya 2003). Over the past 25 years, glacial lake outburst flood (GLOF) event of Pagla pokhri, Teen kune pokhri and Tembawa tsho have been recorded (Tambe *et. al* 2003; Lang 2003).

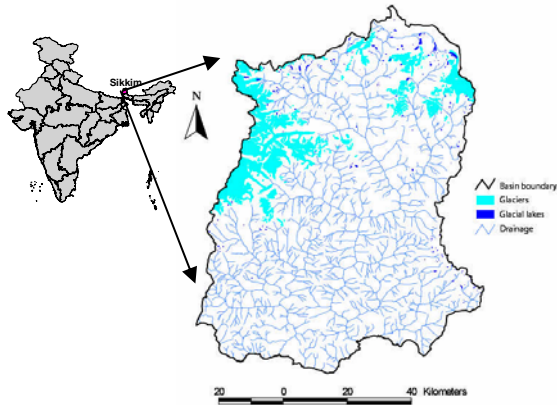


Figure 1: Distribution of glacial lakes in Sikkim (Source: Adapted from Mool & Bajracharya 2003)



Figure 2: Dawathong glacial lake in North Sikkim

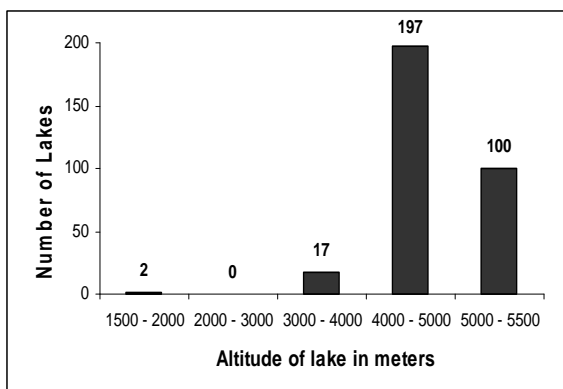


Figure 3: Altitudinal profile of the lakes (Source: Adapted from CISMHE 2005)

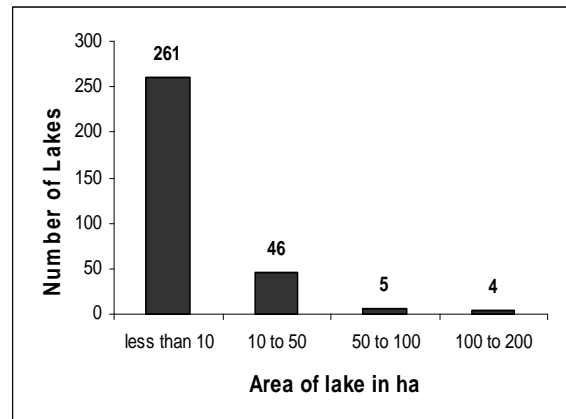


Figure 4: Profile of the size of the lakes (Source: Adapted from CISMHE 2005)

The vegetation in the catchment of these lakes in the lower alpine zone (4000 – 4500 m) comprises of alpine scrub, in the middle alpine zone (4500 – 5000 m) of sedge meadows and in the subnival zone (5000 – 5500 m) mostly scree, sparse herbs and graminoids. The faunal assemblage of six ungulate species (blue sheep, Himalayan musk deer, Himalayan tahr, Tibetan gazelle, Tibetan argali and southern kiang), seven carnivores (yellow-throated marten, wild dog, red fox, Tibetan fox, Tibetan wolf, lynx, snow leopard) and three pheasants (Himalayan monal, blood pheasant and satyr tragopan) share this alpine landscape. More than thirty species of wetland birds are reported from Sikkim. These include two threatened species; an old record of pallas fishing eagle and the recent record of black-necked crane breeding at Thepley tso a high altitude lake and also sighted at Khecheopalri lake (Ganguli-Lachungpa 1998; Peter Lobo *pers. comm.*).

Guru Padmasambhava the revered Buddhist sage of the 7<sup>th</sup> century A.D. eulogized as the second Buddha is considered to have blessed and sanctified Sikkim. Consequently these lakes are considered holy and eleven of them including Tsho Lhamo, Khecheopalri and Gurudongmar are also notified as sacred lakes and boating and fishing in these lakes is not permitted (Ramkrishnan 1996; Home Department 2001). High altitude, remoteness, adverse climate and high security international border zone make most of these lakes inaccessible. Before the growth of vehicular mass tourism, the prevalent landuse in the catchment of these lakes was mostly yak rearing, manning by the armed forces, limited seasonal pilgrimage and alpine trekking.

#### THE NEED

In 2005 about 251,700 domestic and 16,500 overseas tourists, nearly half of the size of the state's population visited Sikkim. The seven months of April to June and September to December are the

peak tourist season, creating the prospect of managing large volume of visitors in short time spans. The tourist volumes are also showing a rapid upward trend and increasing at an annual rate of nearly 20%. Sikkim shares its international borders with Nepal in the west, Bhutan in the south east and Tibetan Autonomous Region (TAR), China in the north. Historically trans-border trade through the silk route was conducted over alpine passes between these countries. But increasing security concerns during the latter half of the 20<sup>th</sup> century resulted in a closure of this transboundary exchange and led to the establishment of a road network. However the past decade has seen a growing warmth in international relations. The presence of this road network allows day visits to these high altitude lakes in vehicles from the comfort of towns. As a result, the lakes approachable by road are fast becoming mass tourist destinations. About 200,000 annual visitors to Tsomgo (Changu), 100,000 to Khecheopalri, and 20,000 to Gurudongmar were estimated in 2006. The wetlands of Sikkim have been relatively less studied and in-depth hydro-ecological information is available only on the Khecheopalri lake (Jain *et al.* 2000).

## CHALLENGES

Surprisingly the increasing incomes to the tourism industry from lake tourism did not automatically translate to better conservation status of the lakes or better services for the visitors. Management of solid waste, absence of proper sanitary facilities, water supply, parking of vehicles and mushrooming of shops were the main challenges faced in these destinations.

Decentralization initiatives are often plagued by the tendency to underestimate the capacity of the local community, reluctance to let go of powers or overcautious approaches. Often this results in lop-sided decentralization, with the local community having to bear the responsibilities without any real decision making authority or access to funds. While designing the decentralization framework, deliberations was done to address the following issues which if successfully addressed would go a long way in sustaining this initiative.

- At the local level should a new institution be created or an existing one designated and if so then which one and who decides?
- How to generate funds for this local institution?
- How to provide scientific and technical support to this institution?
- How to ensure that the lake and its environment actually benefits?
- How to provide an advocacy role also to this local institution?

## POLICY FRAMEWORK

These lakes along with their catchment are notified as forest land and classified as reserve forests under the jurisdiction of the Forest, Environment and Wildlife Management Department. Concerns were raised about the status of the lakes during the World Wetland Day celebrations in 2006. Accordingly a participatory framework for lake conservation in the state was designed. Subsequently it was shared with experts from the voluntary, government and private sector and their suggestions included. This framework was approved by the Government of Sikkim vide notification no: 355/F dated 31<sup>st</sup> July, 2006 titled "Guidelines for lake conservation in partnership with *gram panchayats* and *pokhri sanrakshan samiti's* in Sikkim". The full text of these guidelines is available at the forest department website at [http://www.sikenvvis.nic.in/Land\\_water.htm](http://www.sikenvvis.nic.in/Land_water.htm).

These guidelines decentralize the management aspects of the lake to the local community (*gram sabha*). The territorial jurisdiction is the "lake conservation area" that covers not only the lake but also its catchment and the accompanying biodiversity. The institutional arrangement at the village level has been left open and the local community has the flexibility to designate an existing institution or elect a new institution as the lake conservation committee. This provides the option to build on existing village based institutions like the gram panchayat, joint forest management committee, local CBO/NGO, local religious body etc for conservation of these lakes. A state level federation of these lake conservation committees is also envisaged to assist in advocacy in policy related matters. Decision making power vests with the local community, who have the authority to form the PSS, conduct the social audit, approve the lake conservation plan and also recommend dissolution of the PSS if its performance is found unsatisfactory.

The lake conservation committee has been provided with the authority to legislate and enforce a local "code of conduct" in the lake conservation area. They are also empowered to collect lake conservation fees at the rate of USD 0.125 (Rs. 5) per tourist. These funds accrued shall be used to pay honorarium to the *Pokhri Rakshaks* (lake guardians), setting up of an effective solid waste management system, preparing and publishing the annual lake conservation plan, capacity building, conservation of wild animals and their habitats, restoration of the lake conservation area, financial audit, administrative expenses and for community development works as detailed in the annual lake conservation plan.

The scientific components include a baseline survey and annual conservation planning. In order to monitor the health of the lake conservation area a lake conservation plan including the following components needs to be prepared:

- A map in 1:25,000 scale of the lake along with its immediate catchment area which shall constitute the lake conservation area.
- A baseline quantification of the quality of water of the lake in a quarterly manner.
- A baseline quantification of the threats and impacts on the lake like solid waste disposal, sanitation and sewerage, catchment degradation, siltation, eutrophication unplanned tourism infrastructure etc.
- A baseline quantification of the distribution, population and status of key wildlife species like water fowl, mammals, and invertebrate aquatic fauna and their habitat.
- A baseline quantification of the numbers and seasonality of the tourist arrivals, attitude of the tourists for preservation of culture and biodiversity of the lake concerned and the benefits accrued from ecotourism.
- A conservation action plan which shall lay down the activities to be carried out in the forthcoming year with detailed physical and financial targets, process to be followed as well as a timeframe.

This baseline survey followed by regular annual monitoring will ensure that the health of the lake environs can be ascertained scientifically. Since many of the above components require scientific studies and laboratory support, the Forest department, WWF-India and others will be providing technical support to the PSS.

#### SUSTAINABILITY AND REPLICABILITY

In the first phase by end of 2008 the target is to implement this policy in the three sacred lakes impacted by mass tourism namely Tsomgo (23 ha, 3740 m), Gurudongmar (109 ha, 5165 m) and Khecheopalri (14 ha, 1820 m). It is hoped that this will help to not only conserve the lakes but also provide a better experience to more than 200,000 visitors annually. A local fund of USD 25,000 (Rs. 10 lakhs) at the state level is hoped to be generated annually from the collection of lake conservation fees. The ability to collect and transparently use these funds will determine the sustainability of this initiative. Building the institutional capacity of the local community to take up this new responsibility is essential as well as providing scientific and technical support.

Alpine areas, which are above the tree line, have received only limited attention from the forest departments in the country. In spite of stringent national forest and wildlife laws the Himalaya continue to be plagued by unregulated grazing, unplanned tourism and weak monitoring. In this decentralized model the government plays a role of providing a co-management policy framework,

scientific and technical support is provided by NGOs and the local community is the lead agency. This model of decentralized natural resource governance can be replicated in other lakes in remote locations impacted by mass tourism. Decentralized approaches where the community takes the lead are needed to be piloted and showcased to bring about positive changes in this landscape.

#### EMERGING TRENDS

This lake co-management policy is amongst the first of its kind in the country and the emerging trends are very positive. The local community of Tsomgo (Changu lake) took the initiative to organize the first public meeting in May 2007 to constitute the lake conservation committee. This policy framework has also been well received by NGOs based in Sikkim like WWF-India and The Mountain Institute and they are already working towards building the capacity of the lake conservation committee. In the India Development Marketplace 2007 organized by World Bank – India, this idea was selected amongst the 20 innovative concepts from over 2,500 proposals received from all over the country. The Ministry of Environment and Forests, Government of India too has for the first time included five important lakes of the state under the National Wetland Conservation Programme. A state level steering committee has also been formed to guide this process. It is hoped that based on the implementation experience gained over the next few years this policy will be further improved.

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