

CARRYING CAPACITY ASSESSMENT AND RECOMMENDATIONS

Introduction

The carrying capacity assessment will follow the methodology briefly outlined in the first part and discussed in more detail in Banskota and Sharma (1995a) and will be analysed in terms of environmental, economic, and social aspects. Although it is difficult to provide quantitative information related to these aspects of carrying capacity, the discussions already made provide an ample basis for assessing the major dimensions of carrying capacity.

Carrying Capacity Assessment

Environment

Environmental carrying capacity concerns itself with the status of HER or the maintenance of natural assets – renewable natural resources – in the context of multiple uses. For environmental sustainability, it is important that (Daly):

- growth of natural capital must be encouraged by reducing the current level of exploitation;

- pressure on natural capital should be reduced by expanding cultivated (more) natural capital; and
- the end-use efficiency of products should be increased and the lifecycle, durability, and recyclability of products should be extended to improve overall efficiency.

The 'tragedy of the commons' is fairly obvious in the study area and has already been discussed at length. Growing urbanisation has adversely affected the amenities in the urban area as well as tourism inflow by causing pollution, narrowing the pathways, and the lack of control over the discharge of sewage, all induced by human and development activities.

The increase in hotel construction and other development activities in the southwestern corner of the lake has contributed to environmental pollution and threatens biodiversity (aquatic, flora, and fauna). Settlements have sprung up at random with no apparent regulations or control. Pressure has greatly increased along the lake bank towards Baidam up to Khahare and the Gaira Chautara area. The area along the Phirke *Khola* has been used extensively for building construction. The lack of well-defined ownership rights and failure to demarcate the lake have intensified the problem. There are too many institutions empowered to carry out different and often times conflicting activities in the lake area (IUCN1995a).

Soil erosion and siltation are also becoming serious problems, owing to both natural processes and man-induced activities. The rate of soil erosion was estimated to be 17.37 cubic metres per hectare during 1993/94 (Department of Soil Conservation and Watershed Management HMG 1994). During the same period, silt deposits in the lake were estimated to be from 175,000 to 225,000 cubic metres per year. At this rate, it is estimated the lake will be completely covered in about 100 to 175 years.

These factors suggest that the natural capital (lake environment), the prime tourist asset, is depleting at an increasing rate directly due to tourism-related activities. The conservation efforts necessary to improve the natural capital have been unforthcoming. This problem is compounded by the many users, who compete among themselves. Upstream activities, such as deforestation, are also destroying the lake. Overall, the scale of human activities appears to have exceeded the regenerative and assimilative capacity of the lake environment. The economic growth that is occurring in the lake area, the poorly-managed urban development, deforestation, and agricultural activities (mostly upstream) have all contributed to the deterioration of Phewa Lake's environment. The current status of indicators and their perceived impacts on the environment can be seen in Table 4 which is based on field observations.

Economic

Economic sustainability can be defined as the maintenance of capital, i.e., 'the amount one can consume during a period and still be as well off at the end of the period' (Daly). In the present context, the income generated by the natural capital – the environment

Table 4: Environment Indicators: Current Status and Impact on Environmental Carrying Capacity

Broad Areas	Indicators	Current Status of Indicators	Perceived Impact			Remark
			Minor	Mod.	High	
Forestry Private tree plantation	Forest cover around the lake	Sparsely	✓			Regenerative capacity is low. Space for community plantation is limited. Biogas reduces firewood demand. Overgrazing is visible. Plantation of fodder trees to be encouraged.
	Number per household	Low	✓			
General landscape	Attractive	Deteriorating		✓		High natural value but negative impact due to human activities.
Littering and garbage Wildlife habitat Unique fauna Unique flora Aquatic life/fish Lake water	Visibility	High			✓	Poor management by authority.
	Quality	Fair	✓			Conservation plan urgently needed. Fish population being affected by lake water pollution.
	Density	Fair	✓			
	Density	Fair	Fair	✓		
	Density	Deteriorating	Deteriorating	✓		
Amenity/aesthetic and recreational values	Sewage connection to lake	few		✓		Loose enforcement of rules and regulations by concerned institutions. Institutional authority and responsibilities poorly defined and executed. Too many owners around lake area. Upstream problems affecting lake size and quality. Building codes and norm are poorly enforced. Vehicular emission standards and zoning are lacking completely.
	Laundry activities	Highly visible			✓	
	Domesticated animals	Highly visible			✓	
	Solid waste disposal	Visible	✓			
	Sedimentation rate	High			✓	
	Haphazard building construction	High rate			✓	
	Recreational and parking space	Limited		✓		
Overload of public infrastructure	High			✓		
Air and noise pollution	High		✓			

Note: The current status of indicators shows the status and the perceived impacts show the influence, positive or negative, on the carrying capacity.

of Phewa Lake – becomes important as it provides the driving force for economic growth in the area. In other words, the economic carrying capacity of a prime tourist area very much depends on the employment and income it has been able to create directly (locally) and indirectly (nationally), through forward and backward linkage without any negative impacts on either environmental or social sustainability.

The common property nature of the natural resource in question, which provides the basis for economic growth, is being overused. Private firms, in their pursuit of profits appear to have overinvested in buildings (a problem associated with common property resources as discussed above). Lack of regulatory controls and standards and failure to enforce them has made the situation even worse, as the entry of new firms into the industry is totally uncontrolled. Residential buildings and unauthorised firms have entered the industry creating a 'glut' (see Social Carrying Capacity below) to such an extent that the prices of tourism goods and services are rapidly falling. Because of the cut-throat competition among the hotels, lodges, and tourist industries, tourists reap a large part of the consumer surplus. As such the earnings from tourism are very low and declining. Local people have begun to realise that the decline in incomes generated from tourism is the result of degrading amenity and recreational values caused by increasing levels of pollution and environmental degradation in and around the lake. Without significantly improving the infrastructure and the management capabilities, the economic carrying capacity will be in serious trouble.

The economic carrying capacity suffers a double blow. In the first place, it suffers because visitor satisfaction is eroding, and hence their willingness to pay is also diminishing. In the second place, it appears that there is already overinvestment in physical capital by the private sector and underinvestment in physical capital by the public sector (drainage, water system, etc). The overinvestment of capital has thus created a surplus of accommodation and transport, and hence the price-cutting behaviour. The possibility of capturing consumer surplus is seriously constrained in such a situation. Estimates indicate that tourism contributes 16 per cent of Pokhara's total income (IUCN 1995a) and this is perhaps falling.

According to the local people, professionalism is lacking in this sector in terms of providing better services to tourists. The number of well-qualified guides is few and insufficient in relation to the tourist demand. Trained manpower in the tourism sector is low overall and of poor quality.

Economic sustainability is further weakened by the fact that the tourism industry in Pokhara is not linked to local development. Most of the food and non-food items that can be produced locally in the hinterlands are currently being imported from outside the country, especially from India. Most of the food items, such as fruit, eggs, and vegetables, are being imported from outside Pokhara. According to a local estimate, thirty to forty per cent of the earnings from tourism are retained in Pokhara (based on discussions with wholesalers). Local people are also becoming aware of the high leakages

of tourism income due to weak linkages between tourism and the local economy. Therefore, the economic carrying capacity is also weakening. Table 5 provides the current status of some economic indicators based on field observations.

Social

An important requirement for social sustainability is the development of social capital, i.e., new relationships between individuals to facilitate collective action and mutual trust, which is essential when common property resources are involved, as in the present case. Furthermore, social capital seeks to improve the ability of a community to make decisions and enlarge their choices and capabilities. The development of participatory institutions plays an important role in social capital formation.

At the heart of the Phewa Lake problem is the 'tragedy of the commons', which implies a poor state of social capital formation. Because the different stakeholders (*Stakeholders*) that have to share the common property resources have not been able to forge partnerships among themselves, establish participatory rules and regulations, and so on, the 'Phewa Lake environment is everybody's property and nobody's property'. Different studies, i.e., Master Plan (1972), PATA (1975), Pokhara Physical Development Plan (1973), and Department of Housing and Urban Development (1990) have recommended that the lakeside area be declared as and developed into a tourism resort requiring a strong institutional set-up, no effective action has taken place to date.

In the past, various government and non-government agencies have tried to address the problems. For example, Pokhara Valley Town Development Committee established codes and standards for development and expansion of the town. The government also acquired some private land for protection of Phewa Lake. Likewise, the Phewa watershed management programme aimed to reduce the soil erosion and siltation originating from upstream. All these efforts have not been effective and the problems continue to grow. The government agency, i.e., Department of Tourism, has been ineffective in monitoring and enforcing the rules and regulations; and, as a result, illegal tourism activities continue to flourish. Ironically, the local tourist office monitors only the registered agents and the unauthorised agents thus function normally. Without an institutional set-up, the chances of social sustainability are dim, which is clearly demonstrated in the case of Phewa Lake.

Promoting sustainable tourism in Pokhara first requires a conservation action plan for the Phewa Lake, and one has recently been prepared by IUCN (1995a). This Plan addresses the carrying capacity of tourism by addressing factors such as *accessibility, accommodation, facilities and services, and tourist products*.

The volume of passengers that the existing transport system can handle was analysed. At present, there are more than 10 tourist buses (each with a capacity of 40 passengers)

Table 5: Economic Indicators: Current Status and Impacts on Economic Carrying Capacity

Broad areas	Indicators	Current Status of Indicators	Perceived Impacts			Remarks
			Minor	Moderate	High	
Agricultural diversification	Cultivated land	Scarce			✓	No scope to expand agricultural land. Productivity gains have to be made through use of improved technology. There is enormous scope to link the agricultural and tourism sectors to benefit a wider farming community.
	Agricultural productivity	Declining		✓		
	Irrigation facility	Limited	✓			
	Commercial farming	Poor		✓		
Migration to Pokhara Employment, income opportunities and community and tourism linkage.	Percentage of households	Fairly high		✓		High, mostly among the poor. High dependency on imports and poor tourism diversification and relatively low occupancy do not provide many opportunities for employment and income. High imports also suggest high leakages and low linkages with the community. Within the sector, unhealthy competition exists and, due to the declining quality of tourism services and the Phewa Lake environment, incomes and visitor expenditure are believed to be declining. HRD needs to be improved thorough training and skills.
	Tourism induced-employment	Low	✓			
	Off farm induced-employment	Fairly high	✓			
	Tourism induced-income	Low	✓			
	Off farm -income	Moderate		✓		
	Visitor expenditure	Low		✓		
Knowledge and technology	Business income	Moderate		✓		
	Human resource development New technology	Poor Slow progress	✓		✓	

See notes in Table 4

that operate daily between Kathmandu and Pokhara. Many tourists use the regular buses as well. In fact, more than 400 tourists come to Pokhara and another 100 travel by tourist coach daily. In addition, the regular air flights between Kathmandu and Pokhara also increased after the construction of the tarmac runway in Pokhara under the TIDP. Considering both air and road transport, about 700 tourists per day or about 252,000 tourist per year can be handled by the existing transport system. Given, the number of visitors to Pokhara, carrying capacity is large enough to transport a much larger volume of tourists.

While assessing the accommodation carrying capacity (availability of beds in relation to the number of tourists), it was found that a total of 4,350 guests per night can be accommodated with the existing facilities (IUCN 1995a). Generally group tourists stay for two to three nights and FITs stay a little longer (5 to 6 nights). These rates give an occupancy rate of about 40 per cent. Clearly, the supply of accommodation is already in excess of the demand.

In any case, the accommodation capacity is not enough to satisfy visitors. The quality of the facilities and services is an essential part of tourism development and has implications on the overall carrying capacity. Visitor satisfaction is a complex phenomenon and depends on a host of factors that go beyond the number of beds and the availability of transport services.

In the first place, tourists visit Pokhara to enjoy the view of the Annapurna Himalayas, Machhapuchhre, and the Lake. The enjoyment of the view which, although non-consumptive in nature, i.e., its supply does not diminish, can be affected negatively by different factors such as crowding (people and buildings), smells and garbage, dirty roads, pollution, and so on.

The analysis of the present situation reveals that, unless an effective institution with appropriate representation of all stakeholders is in place, the social carrying capacity of the lake area will continue to deteriorate. Unless such an institution is in place, both the environmental and economic carrying capacities will also deteriorate. Hence, an institutional set-up appears to be the prime factor in improving the overall carrying capacity of the Phewa Lake environment. Table 6 gives an assessment of the social carrying capacity based on some indicators perceived during field observations.

Review of the IUCN Action Plan and Recommendations

The study carried out by IUCN (1995a) for the conservation of Phewa Lake has identified various policy strategies and actions to address the environmental problems of the lake. The purpose of this section is to highlight the major problems and assess, in brief, the recommended plan of action prepared by IUCN for the Phewa Lake area (also see Chart below).

Table 6: Sociocultural Indicators: Current Status and Impact on Social Carrying Capacity

Broad area	Indicators	Current Status of Indicators	Perceived Impacts			Remarks
			Minor	Moderate	High	
Host's perception of tourism	Well off people	favourable	✓	✓		Although benefits are not equitably distributed, both groups continue to have positive attitudes towards tourism.
	Poorer sections	favourable				
Cultural indicators	Religious monuments	good	✓			Cultural assets are not linked with tourism, with the exception of traditional dances and music in some hotels. Negative impacts of tourism are not visible in this area.
	Religious values	fair	✓			
	Dance, music, festivals	good	✓			
	Crafts	fairly good		✓		
Social indicators	Crime and theft	fairly high			✓	Discussions indicate crime and thefts are on the rise. Literacy and tourism are not linked and hence qualified people in the tourism industry are not adequate. Women's participation is low. There are currently no standards effectively enforced. Amenity values are decreasing. Management of hotels and lodges needs to be improved. Information and services provided to visitors also need to be improved. Transportation facilities and quality need to be improved. Lake area needs to be urgently improved to increase visitor satisfaction, which will most likely also increase their willingness to pay.
	Overall literacy	fair	✓			
	Female literacy	low		✓		
	Women's participation	low	✓			
	Cleanliness	poor		✓		
Visitor's perception (Quality of Experience) with regard to the Lake Area	Hospitality	good		✓		There are currently no standards effectively enforced. Amenity values are decreasing. Management of hotels and lodges needs to be improved. Information and services provided to visitors also need to be improved. Transportation facilities and quality need to be improved. Lake area needs to be urgently improved to increase visitor satisfaction, which will most likely also increase their willingness to pay.
	Information -visitor centre	fairly good		✓		
	Quality of services	poor		✓		
	Quality of tourism asset	poor		✓		
	Conservation effort	fairly good	✓			
	Hotel management	fair	✓			
	Communication media	fair			✓	
	Congestion, Noise	increasing		✓		
Institutions - their effectiveness and capacity	Planning	poor			✓	Currently, there does not appear to be well-defined roles and responsibilities of the various institutions (both public and private) involved in the tourism industry. As such coordination is very poor.
	Implementation	poor			✓	
	Monitoring and Enforcement	poor			✓	
	Coordination	poor			✓	

See notes in Table 4

Chart 1
Action Plan: Salient Features

Problems and Issues	Actions
<i>Lake Ownership & Management Responsibility Not Defined</i>	<ul style="list-style-type: none"> Fix the boundary of the lake and prepare a map based on <ul style="list-style-type: none"> - 1971 aerial photograph - 2032 cadastral map * PVTDC's decision on lake demarcation * Establish a committee for boundary demarcation * Pokhara Municipality be given the responsibility to manage the lake
<i>Inconsistence and overlapping of legal provisions</i>	Review existing legal provisions, including relevant acts, rules, regulations, standards, and guidelines
<i>Land-use inconsistency in urban area around the lake</i>	<ul style="list-style-type: none"> - Review the ownership provisions for the lake - Carry out a detailed study of existing land-use trends and environmental problems in Pokhara Valley - Revise and update the physical environmental development strategy of the valley - Prepare land-use and environmental protection strategy for the lake
<i>Inadequate and incompatible infrastructural development</i>	<ul style="list-style-type: none"> - Review ADB-assisted TIDP project and storm drainage - Carry out a detailed study and design to construct embankment and checkdam - Carry out detailed realignment of Pame Road
<u>Uncontrolled pollution</u> <i>Lake water pollution</i> <i>Solid waste disposal</i>	<ul style="list-style-type: none"> - Identify an appropriate location for washing facilities - one at Sahedi <i>phant</i> another in Bulaudi-using water from the Seti canal and another in Berauta <i>phant</i> increasing the space for washing. - Identify and acquire dumping sites - Establish a routine lake-water quality monitoring unit - Strict enforcement of septic tank and soak pit provisions and regular monitoring by municipality - Expand the present municipality and HAN arrangements to collect solid waste by increasing the contribution from lakeside bassoonist people and residents.
<i>Absence of lakeside landscaping and beautification programme</i>	<ul style="list-style-type: none"> - Develop Sehadi hill as a picnic spot - Develop floricultural activities in appropriate places. - Acquire necessary land at Chhahadi and develop it into a park and picnic spot - Construct a lake fountain in the strategic spot west of Barahi Temple - Acquire and develop the hillock at the end of Lal <i>dada</i> near the lake - Beach development
<u>Absence of a lakeside tourism development strategy with regard to trekking</u> <ul style="list-style-type: none"> - <i>Trekking and pleasure walks</i> - <i>Hotels and restaurants</i> - <i>Recreation spots</i> - <i>Promotional policies</i> 	<ul style="list-style-type: none"> - Develop and promote trekking in the watershed area with an emphasis on nature and recreation - Undertake a detailed study of Panchase and the forest around it to develop it as a wilderness reserve - Prepare and enforce ethics and code of conduct for those involved in the tourism trade and for visitors. - Undertake a detailed study of recreational and sports' facilities along the lake shore and into the lake itself and execute them

Chart 1
Action Plan: Salient Features

Problems and Issues	Actions
<ul style="list-style-type: none"> - <i>Ethics and code of conduct</i> <p><i>Insufficient attention given to biodiversity conservation</i></p>	<ul style="list-style-type: none"> - Develop norms for hotels - Development on the lake to be based on the resort complex concept with emphasis on openness and vernacular - Establish zoo in natural setting - Establish botanical garden - Orchid garden and peasant farming and deer. Encourage agoforestry - Encourage floriculture in such areas - Encourage agoforestry - Encourage conservation awareness programme - Encourage forest plantations
<ul style="list-style-type: none"> - Inadequate emphasis paid to increase in agricultural productivity - Increase in productivity and dairy farming including - <i>Development of the aquaculture</i> 	<ul style="list-style-type: none"> - Introduce farmers to new ideas of multi-layered farming - Introduce different varieties of plants and horticulture - Introduce high-yielding milch buffaloes and cattle - Pisciculture in the wetlands created by the sedimentation process in the lake - Developing a beach in such areas
<p><i>Soil erosion control still not effective</i></p>	<ul style="list-style-type: none"> - Undertake watershed management activities including drainage plantation and checkdam - Improve the Harpin <i>Khola</i> course by providing an embankment - Make a checkdam in the upper reaches of the Harpin <i>Khola</i> to reduce the flow of sedimentation - Fish farming - Review the previous work and recommend future conservation actions in identified location

Problem Lake Area Not Delineated and Lake Ownership and Management Not Defined

Action Define Lake Area and Its Management Responsibility

- Define Phewa Lake area and demarcate its boundary based on the 1971 aerial photograph
- Establish lake ownership and set up an institution responsible for its management
- Declare Phewa Lake Watershed Area a Protected Area

Problem Inconsistent and Overlapping Legal Provisions

Action Prepare Legal Framework for Lake Watershed Management

- Review, update, and make an ordinance relating to the Lake's conservation and management

- Study policies, functions, and roles of institutions and their impacts for effective performance for conservation and management of the lake
- In consultation with relevant ministries/departments and other institutions (stakeholders), prepare a national policy for lake management and conservation

Problem Land-use Inconsistency in Urban Areas and around the Lake

Action Review and Revise Existing Land-use Plan for Pokhara

- Review the Physical Development Plan for Pokhara (1973) and revise the physical and environmental strategies of the valley
- Prepare land-use and environmental protection strategies for the lakeside area

Problem Inadequate and Incompatible Infrastructural Development

Action Review the Municipal Infrastructure and Realign Pame Road where Necessary

- Review the Tourism Infrastructural Development Project (TIDP), especially with regard to the storm drainage
- Build a checkdam in Phirke *Khola* to control the sedimentation load and reduce the direct transfer of polluting debris into the lake
- Also build TIDP's second phase, i.e., drain construction and road pavement
- Involve Pokhara Municipality in the implementation of infrastructural development under the TIDP project

Problem Uncontrolled Pollution

Action Control Lake Pollution, Develop an Effective Waste Collection and Disposal System

Despite efforts that have been made (construction of storm-water drains, urban waste collection, cleaning activities, and awareness generation) by the municipality and different NGOs, they are not implemented as a package programme and are not coordinated due to lack of information on the environmental problem, lack of effluent standards, and lack of trained manpower, etc. Specific actions recommended with regard to this are given below.

- Formulation of a lake conservation policy and environmental plan
- Introduction of pollution control measures for waste water treatment and solid waste.
 - Develop appropriate facilities for washing clothes in Sehadi Phant, Bulandi, and Beraunta Phant at the end of Phewa Lake, using water from Seti canal

- Identify and acquire a dumping site and establish an effective solid waste collection system
- Establish routine monitoring of the lake water
- Regularly monitor and enforce construction of septic tanks
- Air and noise pollution control through zoning and emission standards and their enforcement
- Prohibition of pollution-prone industries
- Strengthening of local-level institutions to integrate environmental aspects into local plans and programmes through:
 - establishment of an environment unit in the municipality,
 - increasing the capability of existing manpower through training,
 - upgrading physical facilities,
 - developing environmental guidelines and a data bank,
 - strengthening the existing local NGOs and other social organizations, and
 - generating environmental awareness among local participants.

Prioritised actions recommended by IUCN to mitigate environmental problems are grouped into three categories.

High priority

- Policy formulation
- Environmental plan formulation and implementation
- Control of water pollution arising from sewage and disposal of solid waste into the lake
- Solid waste management
- Institutional strengthening
- Awareness programme

Moderate priority

- Air pollution control
- Landscape development

Low priority

- Noise pollution control

Problem Absence of Lakeside Landscaping and Beautification Programme
Action Landscaping and Beautification Scheme at Strategic Locations around Phewa Lake

The three strategic locations identified for beautification and landscaping around Phewa Lake are Sehadi hillock, Chhouhadi hillock, and a small hillock across the lake at the end of Lamidada which provides a panoramic view of the mountains and the lake. Partnership between the municipality and PVTDC has been suggested for their development.

Problem Absence of Lakeside Tourism Development Strategy
Action Formulation and Execution of Tourism Development Strategies for the Lakeside and Watershed Area

The existing violation of building regulations, haphazard construction, and hence overcrowding of the lakeside have severely affected the tourism industry. Given the lack of standards and their ineffective enforcement, there is cut-throat competition and, as such, the potential income from tourism in Pokhara remains largely unrealised. For the promotion of sustainable tourism in Pokhara, the following strategic actions have been identified by IUCN.

- Establish a branch office of HMTTC in Pokhara to educate, raise awareness, and train the local entrepreneurs and personnel engaged in the tourism industry
- Arrange for mobile training by HMTTC immediately until the HMTTC branch is established
- Prepare a code of conduct for hotels, lodges, and restaurants as well as other shops and agencies engaged in tourism
- Develop the lakeshore area
- Develop or improve the scenic view locations and camping sites in the watershed area of the lake
- Provide proper lighting arrangements for tourists along the lake shoreline from Pardi to Khahare
- Develop the Panchase area as a tourist resort and conserve forests, wildlife, and birds

Problem Insufficient Attention Given to Biodiversity Conservation
Action Encourage Conservation of Biodiversity on the Lakeside

- Develop orchid farming
- Establish medicinal and aromatic plant farming
- Establishment of the zoo

Problem Inadequate Emphasis Paid to Increasing Agricultural Productivity and Dairy Farming (Including Development of Aquaculture)

Action Encourage Horticulture, Silviculture, Aquaculture, and Improved Animal Husbandry

The mismanaged agricultural fields, increasing use of agro-chemicals, and increasing settlement on the lakeshore have further compounded soil erosion and water pollution. In order to reduce pollution caused by agricultural activities, the following measures have been suggested.

- Encourage horticultural and silvicultural activities in the denuded *bari* (unirrigated upland) area near the lake
- Introduce high milk-yielding buffaloes and encourage stall-feeding practices in the farming community within the lake watershed
- Institutionalise a system of agricultural extension and environmental education
- Encourage aquaculture in the land mass appearing due to siltation
- Introduce paddy-cum pisciculture along the lake's shoreline in the rice fields
- Introduce an integrated lake shoreline management system through community participation.

Problem Soil Erosion Control Still Not Effective

Action Encourage Watershed Management to Reduce Soil Erosion and Lake Sedimentation

Harpin *Khola* is called the sorrow of Phewa Lake because it deposits large amounts of sediment in it (20,000 tons per year). In order to minimise this siltation problem, IUCN has proposed the following.

- To undertake watershed management activities in the catchment area of the Harpin *Khola* through a government grant to VDCs and local participation
- To carry out a detailed study of Harpin *Khola* (by the Irrigation Department) to identify the most sensitive areas for immediate improvement of embankments and construction of checkdams
- To investigate soil erosion causes and identify options for community participation in controlling erosion.

Assessment of the IUCN Action Plan and Further Recommendations

While the IUCN action plan is comprehensive and addresses most of the major problems facing Phewa Lake, it has not addressed the necessary institutional arrangements for the management of the lakeside by the different stakeholders in order to operationalise the plan. The IUCN action plan has created some confusion and problems because the TDC implemented the IUCN action plan/recommendations without approval from HMG. While the TDC regulation of 1974 permits building construction beyond 200 feet from the shoreline of the lake, the IUCN standard in the upper part of the Baidam area stating that construction can take place 20m from the shoreline has already been

implemented. According to TPIO (Town Planning and Information Office) officials, the IUCN action plan has ignored land-use planning in the most critical area along the eastern corner of the Phewa Lake. Without systematic land-use planning and zoning regulations in this most critical area, long-term solutions to the environmental problems in around Phewa Lake will not be resolved.

This section addresses issues related to institutional development and codes in the tourism sector to complement the IUCN Action Plan. Although the analysis presented above is based on a small area around Phewa Lakeside, the problems discussed are fairly representative of greater Phewa Lake and possibly of similar lake areas in other parts of the country where tourism is practised. The recommendations made below focus on policies that are needed at the national level, without which area-based policies may not be effective even if implemented efficiently.

Identify Assets and Develop a Long-term Code for Sustainable Management

It is necessary for the government to declare what the tourist assets around the Phewa Lake are and develop a long-term code for their sustainable management. Such assets will have to be classified in different ways to reflect their local, national, and global values. A strict code of conduct with respect to the use of different assets must be clearly defined and penalties for violation need to be unambiguously formulated.

Depending on the prime value of the asset, broad guidelines for land use have to be made, since the Phewa Lake area has local, national, and global significance. A detailed land-use plan has to be made so that the assets are conserved. Therefore, strict development guidelines have to be provided in detail, monitored, and enforced. If the Phewa Lake area is considered to be a prime tourist destination, it must be declared so and development must be planned accordingly. For example, there is little disagreement on the fact that the Phewa Lake area is extremely important for tourism, but, as we have stated, there are many activities that do not promote tourism value. For example, buffaloes wallowing, cattle grazing, and pigs running around the lakeshore, washing clothes, unauthorised building construction, and so on are activities that deter tourism and reduce the willingness to pay on the part of the visitors. Such activities, which are important for the local people, need to be relocated. There is little doubt that other activities are unlikely to generate the benefits that tourism generates. The question is how to provide impetus to tourism growth and conserve the environment. Also, since local people have a stake in the lake, alternatives need to be developed through revenue generated by tourism and benefits also provided to local people.

Demarcate the Lake Boundary

What constitutes the Lake area needs to be resolved first. IUCN has already carried out adequate research and made recommendations. The Lake area then needs to be appropriately demarcated. It is worth noting that there are many lakes in Nepal, some

of which are better known than others. For example, the Rara Lake in Jumla and Shey Phoksindo in Dolpo are fairly well known. However, there are many other lakes in the mountains, as well as in the *Terai* region, which are not well known. The status of these lakes and their importance needs to be established, before they are submerged by human activities and development. In this context, it is recommended that HMG constitute a task force to study the lakes of Nepal and develop a conservation plan for them. Once approved the conservation plan has to be made effective through an appropriate participatory institutional framework.

Establishment of a Legal Basis and Institutional Arrangements

A legal basis for enforcement of rules and regulations should be established. Since Phewa Lake is a prime tourist destination in the nation, it is imperative to see that present laws do not hinder enforcement of the necessary rules and regulations. This step is necessary to protect the Phewa Lake as well as other assets in other parts of the country as well, if tourism is to be sustainable in Nepal. It may be useful to consider other lakes in the nation that have tourism development potentials when establishing the legal basis. In the case of Phewa Lake, there is an additional and urgent need to establish a participatory institution of all the major stakeholders to decide on and implement an action plan (IUCN). The lack of a sound institution is the major cause of problems confronting the Phewa Lake area. Some urgent steps that need to be taken with regard to this are listed below.

- Develop criteria to classify different natural, cultural, religious, historical, and other assets as tourism assets
- Categorise tourism destinations or sites on the basis of the different values (local, national, global)
- Develop broad guidelines for land-use plans, develop strict codes for their use and management
- Establish a legal basis for enforcing the codes
- HMG should constitute a task force to study the lakes of Nepal and to develop a long-term conservation plan, using Phewa Lake as an example.

Social sustainability has to improve, and this means that new relationships and solidarity between the different stakeholders have to be established for collective action to become possible. The Phewa Lake environment is deteriorating due to its 'common property ownership'. The problem facing the lake is such that all parties are likely to suffer from the myopic individual actions that are currently being practised. The first and foremost question that comes up in this regard is the need for specification not only of property rights but also of the roles and responsibilities of different partners/institutions. The institutional arrangements have to evolve in a participatory manner through establishing a partnership among the stakeholders. This partnership can be forged by developing a high-level steering committee constituted of representatives from among the stakeholder organizations.

- Form a steering committee constituted of representatives from all the stakeholder organizations.
- Develop a participatory Tourism Development Board – Pokhara Chapter – under the National Tourism Development Board.

Even before appropriate institutions can be created, the local people and other stakeholders should be made aware of the different problems and the possible actions they as stakeholders can take to reverse the process of unsustainability. They should also be made aware that individual actions, although they may appear rational, do not necessarily result in social benefits. There is, therefore, an urgent necessity to develop training programmes that will help generate awareness and impart skills to the different stakeholders at the policy, programme, and local levels, so that there is space for action plans to be implemented.