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CHAPTER 12

INSTITUTIONAL PLAN COMPONENT (9)

The Development Study on Environmental Conservation of Phewa Lake in Pokhara, Nepal

CHAPTER 12
INSTITUTIONAL PLAN COMPONENT (9)

12.1 INSTITUTIONAL SETUP FOR PHEWA LAKE ENVIRONMENT CONSERVATION

12.1.1 Objective

The objective of formation of an institutional setup for Phewa Lake is for its conservation in a more Lake focused and sustained way with participation of stakeholders so that the recreational and aesthetic value of the Lake will not be diminished, the life of the Lake will be prolonged and Phewa will remain as a source of tourist attraction for Pokhara in particular and Nepal in general. The objective is also to establish a fund with sustained source of income, which then can address the issues of conservation of the Lake in a holistic manner.

12.1.2 Basic Policy

The basic policy of establishing an institutional structure for formulation and implementation of Phewa Lake conservation works are:

- The conservation of Phewa Lake should be carried out by a semi-autonomous institution
- Such institution should have a legal mandate for conservation of Phewa Lake
- Jurisdiction of such institution should cover the entire watershed area within the VDCs and PSMC including the Lake
- All the conservation works should be conducted through direct participation of all the stakeholders including communities both from the VDCs and PSMC under the Lake watershed area
- DDC, VDCs and PSMC should be the integral part of such institution and these agencies should use all its rights under the Acts, Rules and Regulations of HMGN for the conservation of the Lake
- Such institution should be capable to charge conservation fee and use such fund for the betterment of the Lake's environment at both rural and urban watershed areas
- Such institution should ensure that the benefit from the Lake would be shared by the rural area also

12.1.3 Implementation System of Phewa Lake Conservation

(1) Existing Arrangements

With the realization of the importance of an institutional framework at the local level for the conservation of the Lake, different forms of committees have been formed in the past. Some NGOs have also been created by Local people out of their own initiative to conserve the Lake. Four major existing institutional arrangements have been reviewed and are presented hereunder.

a) Pokhara Valley Town Development Committee (PVTDC)

The Pokhara Valley Town Development Committee (PVTDC) is an autonomous HMGN institution that is responsible to formulate policies, By-laws and implement them as well as undertake various urban

development related activities in the Pokhara Valley towns. It has endeavored, though at a limited scale, various conservation activities in Phewa Lake. It has removed sediment from Lakeshore and Phirke Khola, constructed check dams and assisted in removal of water hyacinth from the Lake, etc.

b) *Municipality Supported Phewa Trust Fund (PTF)*

IUCN took the initiative to establish Phewa Trust Fund as a non-governmental agency with the participation of stakeholders to generate resources for the conservation of Phewa Lake. It is formed under the chairmanship of Pokhara Sub-metropolis. The composition of the Trust is as follows.

1. Pokhara Sub-metropolis (PSMC)
2. DDC, Kaski
3. Hotel Association of Nepal, Pokhara
4. Ratna Mandir (King's Palace), Lakeside, Pokhara
5. Hema Griha, Lakeside, Pokhara
6. IUCN, Nepal
7. Chamber of Commerce and Industry, Pokhara Chapter
8. Pokhara Valley Town Development Committee
9. Lake City Club
10. Boat Club
11. Ward No. 6 of PSMC

PSMC contributed Rs. 100,000 per annum, while other members contributed Rs. 50,000 each as seed money. At present the Trust is having Rs. 750,000 as fixed deposit in the bank. The interest earned from the deposit is used for cleaning Phewa Lake. The strength of Trust is, it is initiated by the concerned stakeholders group.

Despite its achievements, it could not institutionalize effectively due to:

- Non participation of the government in sharing of contribution
- It does not have a permanent office and is working as an NGO
- Inadequate legal base to work as an autonomous organization
- With the limited resources availability vis-a-vis the size of the requirements, it could not expand its activities
- It could not mobilize the line agencies of the government, which has the technical capability and financial resources
- Lack of long-term planning and programming

c) *HMGN Supported 'Phewa Lake Area Conservation Committee (PLACC)'*

Guidelines for Phewa Lake conservation, prepared by National Planning Commission, HMGN in collaboration with IUCN recommended to establish Phewa Lake Area Conservation Committee for undertaking conservation and development activities of the Phewa Lake area.

In this background, HMGN constituted Phewa Lake Area Conservation Committee. The composition of the Committee is as follows (**Table I-12.1**).

Table I-12.1: Composition of PLACC

S.N	Position	Designation	S.N	Position	Designation
1.	Chairman	Chairman, DDC, Kaski	8.	Member	Director, Western Regional Irrigation Directorate Kaski
2.	Member	Chief District Officer, District Administration	9.	Member	Representative, Dept. of Housing and Urban Dev.,

S.N	Position	Designation	S.N	Position	Designation
		Office, Kaski			Western Regional Directorate, Kaski
3.	Member	Mayor, PSMC	10.	Member	Representative, Hotel Association Nepal, Pokhara
4.	Member	LDO, DDC Secretariat, Kaski	11.	Member	Nominee form NGO, Pokhara
5.	Member-Secretary	Director, Department of Housing and Urban Development, Pokhara	12.	Member	Ward Chairman, Concerned Ward of the PSMC
6.	Member	Chief, Tourist Information Center, Kaski	13.	Member	Three persons nominated by HMGN from among the reputed experts in the related field (two years term)
7.	Member	Chief, District Forest Office, Kaski			

The Secretariat of PLACC is located in the office of the Department of Housing and Urban Development, Western Regional Directorate, Kaski.

Functions and Duties of the Committee

The duties of the Committee is to carry out the following activities for the conservation of Phewa Lake:

- To prepare a plan for the conservation of Phewa Lake and submit it to HMGN for approval
- Implementation of the approved plan
- To establish coordination amongst the relevant governmental and non-governmental institutions for the conservation and development of Phewa Lake area
- To collect essential data and information for conservation of the Phewa Lake area
- To carry other activities as specified by HMGN.

Removal of water hyacinth and solid waste from Lake should be coordinated and implemented as a routine activity to keep the Lake clean and healthy. To coordinate such activities, a Lake focused institution is necessary.

The Committee though includes various stakeholders; there is a heavy representation of the governmental agencies. Due to this, other stakeholders have not shown interest to actively participate in the Committee. The Committee is not active also because the government has not allocated budget. It is not having its full-fledged secretariat.

d) Non-Government Organizations (NGO)

There are few non-governmental organizations working for cleaning of Phewa Lake and its surrounding areas. Some of such NGOs, are 'Pokhara Tourism Promotion Committee', 'Phewa Lake Environment Conservation Committee - Bhattarai Group' etc.

The Pokhara Tourism Promotion Committee assists in removing water hyacinth mat from the Lake. The Phewa Lake Environment Conservation Committee-Bhattarai Group is having two numbers of 18 feet long boats to help the cleaning of hyacinth mat. Four persons are employed to clean the Lake.

The strength of such committee is that a concern in the conservation of Phewa Lake is demonstrated by private sector with their own limited resources, which can be an encouraging message to other residents, hoteliers and restaurant owners to initiate such work. However, the resources with such groups are limited and it has not institutionalized properly. The activities carried out at individual levels are not coordinated with each other and are carried out independently.

(2) Review of the Existing Arrangements

The existing institutional arrangements in the management of conservation activities in Phewa Lake area are presented in following **Table I-12.2.**

Table I-12.2: Review of Existing Institutional Arrangements on the Conservation of Phewa Lake

S. No.	Institutions / Item	Municipality Supported Phewa Trust Fund	Government Supported PLACC	NGO Supported Committees
1.	Chairman	Mayor of PSMC	Chairman, DDC Kaski	Private sector
2.	Promoting Agency	IUCN	HMGN	Private sector, community and family
3.	Composition	Public Representative-3, HMGN-3, Private-4, INGO-1 Total- 11	HMGN-7, Public representative-3, Private-1, NGO-1, Experts of the concerned field-3: Total-15	Family members and friends
4.	Financial Arrangements	Each participating organization contributed Rs. 50,000/- but PSMC contributed Rs. 100,000. Until now Rs. 750,000 is collected and deposited in bank	Budget allocation has not been made but arrangements have been made to operate from Department of Housing and Urban Development of HMGN	Operated from the family fund
5.	Objective	• Clean Phewa Lake • Removal of sediment from the Lake	• Present plan on the conservation of Phewa Lake to HMGN • Implement the plan approved by HMGN • Collection of information and data needed for the conservation of Phewa • Mobilization of government agencies	• Clean Phewa Lake • Generating awareness • Remove water hyacinth • Remove sediment
6.	Work Performed	• Cleaning of Hyacinth • Taking out silt from the Lake	Demarcation of Phewa Lake	• Cleaning of hyacinth • Excavating and removing sediment • Lake shore training
7.	Limit of Area of Action	Urban watershed area	Principally entire Lake watershed area	Around the Lake on specific sites
8.	Strengths	Started by the stakeholders	The governmental agencies mobilized	Started by the private sector. It can be an example for others.
9.	Weaknesses	• Small amount of budget • Lack of strong mandate to operate as autonomous organization • Cannot influence the rural area • Do not have specific plan and program.	• Over dependence on governmental agencies • Low representation of other stakeholders • Weak influence in the urban area	• Small amount of resources • Activities are also limited

S. No.	Institutions / Item	Municipality Supported Phewa Trust Fund	Government Supported PLACC	NGO Supported Committees
10.	Reason for Inadequacies	• PSMC has agreed to allocate budget every year, but was not implemented except the first year. • Lack of participation of the government	• Due to heavy representation of the government, other stakeholders are not interested • Lack of appropriate legal authority	• Not yet properly institutionalized • Activities in piece-meal approach
11.	Lessons Learned	• Long term planning needed • Need for the involvement of HMGN offices • Adequate budget must be allocated	• When there is heavy dependency on the government then other stakeholders will not be motivated • Appropriate legal authority necessary	If private sector is motivated, it will be encouraged to participate in the conservation works of Phewa Lake

Note: This review was also presented in the Public Hearing organized in Pokhara, December 25, 2001

* Two places- Ratna Mandir and Hema Griha are also included within it.

Interaction of the Study team with the Mayor of PSMC, President of Chamber of Commerce and Industry, representative of HAN, and other concerned stakeholder of Pokhara have revealed that there is a need to have a strong institutional mechanism to handle the conservation work.

(3) Need For a New Form of Institution

(a) Review

An analytic review of the existing institutions shows that only PLACC in principle can work in the entire watershed area. The other remaining institutions have limited their area of work only at Lakeside. Conservation works by excluding the watershed area will not be effective.

Heavy dependency of PLACC on Government agencies (which have their own mandate, plan and annual program) and insignificant participation of the local level beneficiaries, who are the most important partner in the conservation work diminishes its viability for the execution of the Master Plan. Moreover, in the absence of legal authority and reliable budgetary sources, PLACC has been handicapped in the conservation efforts. For continuation of PLACC as the institution to implement the Master Plan proposed under this Study, following changes are required.

- Give PLACC a legal authority for Phewa conservation work.
- Change the structure of PLACC with appropriate minimum representatives from HMGN and more from private sector and other local beneficiaries.
- Involve VDCs in the representation and decision making process.
- Allocate necessary annual budget.
- Establish a management system suitable to the conservation work.

Such changes will transfer the present PLACC into an altogether different type of organization. Introduction of such changes may invite many conflicts. However, re-strengthening and restructuring of the existing committee with sufficient legal authority and mandate devoid of the inherent weakness as in the existing institutions will be an appropriate method to setup the committee with new vigor and wider objective.

The interactions carried by the Study team with diverse groups of people related with Phewa Lake conservation activities also restructuring of the existing PLASCC in to a strong institution with adequate legal mandate for implementing the Master Plan.

(b) Organization Directly Related with Conservation of Phewa Lake

There exists active participation of four groups of organizations directly related to the Phewa Lake conservation activities. They are:

Stakeholder	Area of Action
(i) Government	
▪ Ministry of Water Resources	- use and maintenance of water bodies
▪ Ministry of Forest and Soil Conservation	- management of forest, control of flood and landslide
▪ Ministry of Agriculture	- fisheries, agro-extension, livestock
▪ Ministry of Population and Environment	- environment conservation
▪ Ministry of Physical Planning and Works	- urban planning
▪ Ministry of Culture, Tourism and Civil Aviation	- environment and tourism related infrastructures
(ii) Local Governing Authorities	
▪ DDC, Kaski management	- infrastructure development, watershed
▪ Pokhara Sub-metropolis and Ward No. 6 and 17	- infrastructure construction, cleaning the municipal area around the Lake.
▪ VDCs	- conservation of Phewa watershed
(iii) Private Sector	- investment in tourism business - construction of shopping complex - house construction for dwelling - promotion of Pokhara
(iv) NGOs/ INGOs/ CBOs/ Mothers Groups	- involved in social mobilization and cleaning of the Lake

(c) Alternatives for Management of Lake Conservation Committee

In order to assess the strength and weakness of the management of the committee by different agencies, the following alternatives have been explored.

(i) Government Managed Committee

Strengths	Weakness
• Adequate budget/resources. • Donors can provide assistance comparatively faster • Technical support can be made available. • Enforcement easier.	• Less or no participation of the local people. • Cost of administration will increase. • More dependency syndrome and the dilution of ownership of the stakeholders. • Slow decision and not productive • Bureaucratic and red tapism.

(ii) **DDC Managed Committee**

• More participation of the local people. • Easy to levy local tax. • Can build up partnership between the municipality and the VDCs.	• Less availability of resources. • Government may be less interested • Weak implementation capacity. • Political conflicts may be developed. • Less transparency

(iii) **Municipality Managed Committee**

• Participation of the local people. • Tax can be easily levied.	• Limited within the municipality. • Limited technical support. • Limited financial resources. • Less/no participation of the VDCs. • Government and DDC may be less interested. • Political conflict may arise

(iv) **Stakeholder Managed Committee**

• Coordination among the participants. • More judicious.	• Resources are limited. • Social conflicts may emerge. • Participation of local community cannot be assured. • Iimplementation of social services sector will be weak. • Less involvement of DDC, PSMC

(v) **Autonomous Committee**

▪ Better and open participation of the stakeholders ▪ Plan and program formulation at the local and grassroots level ▪ Directly responsible to the environment of the Lake and the community of the watershed area ▪ Less bureaucratic hassle, quick to respond ▪ Use of fund at its own discretion ▪ Less dependent on HMGN for implementation	▪ Occasional conflict with HMGN ▪ Risk in inability to raise fund ▪ Capacity building will take time

Thus, to set up an efficient, autonomous and Lake focused institution with legal mandate, it is recommended to restructure and revitalize the existing PLACC by incorporating all the necessary above discussed structural and legal modifications. The committee is recommended to be chaired by the Chairman of DDC, Kaski. The area of operation of the committee will not be only the Phewa Lake, but also includes its entire watershed area. Thus, it is also recommended to change the name from existing 'Phewa Lake *Area* Conservation Committee' to 'Phewa Lake *Environment* Conservation Committee'. The latter name also highlights the physical, biological, socio-economic and cultural environment of the Lake watershed on which the committee will focus its activities.

12.1.4 Phewa Lake Environment Conservation Committee (PLECC)

(1) Composition

The composition of the Committee therefore, needs a radical improvement to the existing organization (PLACC). The following restructuring of PLACC is proposed for forming PLECC.

- Chairman, DDC, Kaski	-	Chairman	1
- Mayor, PSMC	-	Vice-chairman	1
- Chief Executive Officer (Nominated by the Government, from Ministry of Population and Environment)	-	Member Secretary	1
- Chairman, Pokhara Valley Town Development Committee			1
- Chairman of six VDCs of the Lake watershed area			6
- Ward Chairman, Ward No 6 of PSMC			1
- President, Regional Hotel Association (HAN), Pokhara Chapter			1
- Representation (by rotation) from Travel Business Sector, Pokhara			1
- President, Chamber of Commerce and Industry, Pokhara			1
- Representation(by rotation) from concerned CBOs (*Fishermen/ Boaters*)			1
- Representation from NGOs working in the watershed area			1
- Representation from NGOs working in Pokhara Sub-metropolis			1
Total Members			17

(2) Organizational Structure

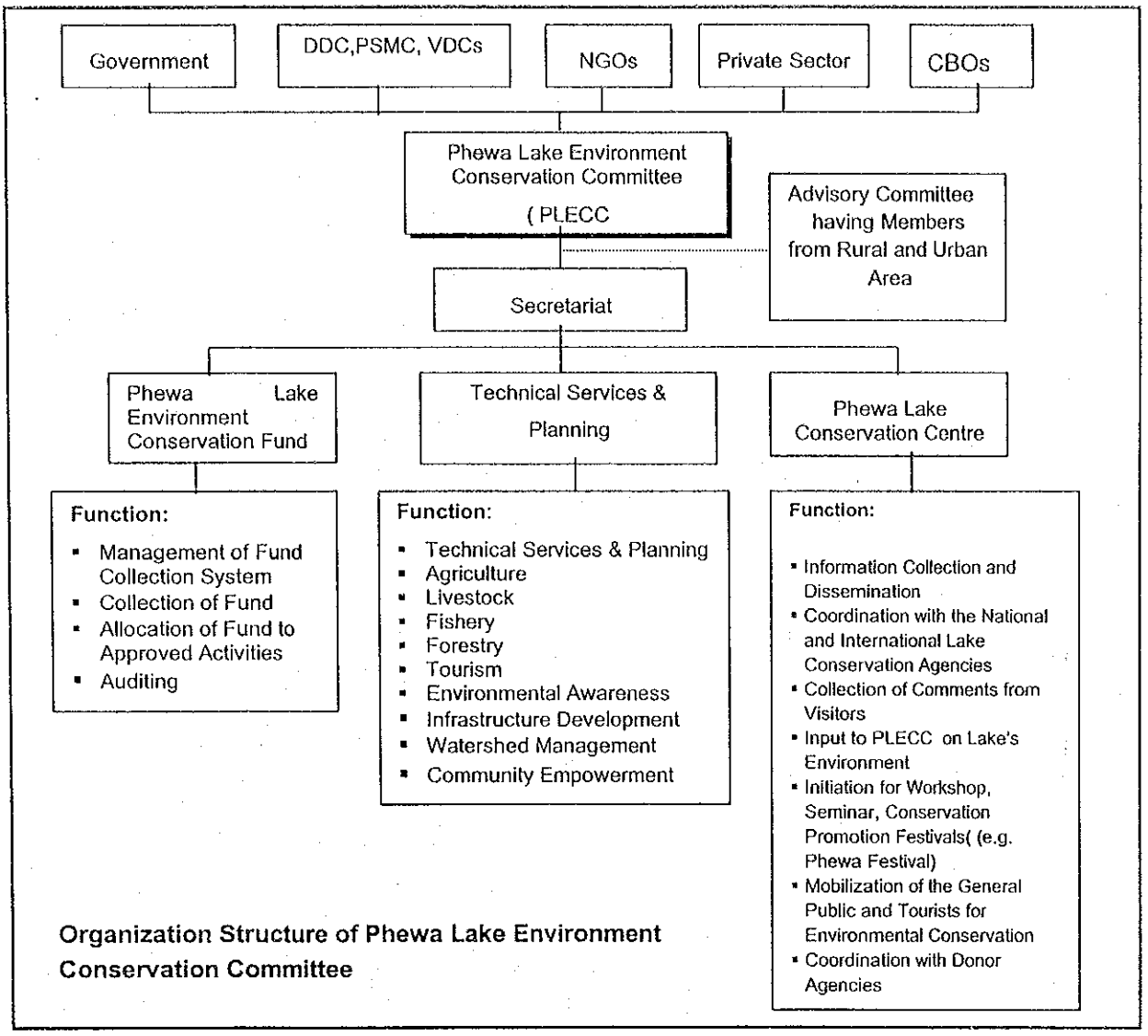
An Organization Structure envisaged for the PLECC is presented in the following page.

(3) Reasons for the Proposed Operational Mechanism

The reasons for the proposed operational mechanism are

- This system will build up cooperation among all the local agencies achieving better horizontal linkages .
- With the chairmanship of DDC, VDCs and PSMC can be brought together achieving better vertical linkages
- It will be easy to levy tax and entry fees by the local bodies than by the central governmental authority. The successful cases are in the municipalities of Kathmandu Valley.
- With the appointment of the Chief Executive Officer from among the senior officers of HMGN will make it easy to coordinate with international donor agencies, and will help to institutionalize the functioning of PLECC.

The district level line agencies of the government can be properly mobilized to provide technical backing and financial support to the Phewa watershed conservation works.



Organization Structure of Phewa Lake Environment Conservation Committee

(4) Process of Establishment

- An interactive meeting with the stakeholders was organized in Pokhara to review the proposed structure of PLECC. All have agreed to have this type of organization to manage the conservation activities.
- The government needs to allocate some seed money to PLECC for the operation and maintenance of its activities for five years. Within five years the process of phasing out of the governmental support is essential.
- The phase-wise action program is presented in **Sub-section 12.4** of this Chapter.

(5) Coordination Mechanism

Conservation work is multisectoral and multidimensional activity. It cannot work effectively unless good coordination is assured. The proposed PLECC has representatives both from the Government, political and private stakeholders. Coordination, therefore, is well built up in the proposed PLECC.

Central Level Coordination	Local Level Coordination
Coordination with different Sectoral Ministries and Departments as well as Donor Agencies by Ministry of Population and Environment (MoPE), HMGN	Coordination with different VDCs, Municipality, Private Sectors, NGOs, CBOs, Local Government Agencies, and information dissemination to Donor Agencies by PLECC.

12.2 PHEWA LAKE ENVIRONMENT CONSERVATION FUND (PLECF)

12.2.1 Objective

Basic objective of setting up Phewa Lake Environment Conservation Fund is to support the conservation activities of Phewa by mobilizing adequate amount of fund. Creation of such fund will give support, sustainability and confidence in the conservation activities. It will also give an independency in decision making process for the benefit of the conservation efforts. The existing Phewa Trust Fund, established in 1998, can be re-strengthened legally and structurally by converting it in Phewa Lake Conservation Fund.

12.2.2 Basic Policy

Creation of the Fund will be guided by the following policies,

- Access to the Lake is not free.
- Benefit from the Lake can be enjoyed by contributing to its conservation
- Polluters will be punished.
- Sustainable conservation efforts requires continuous and reliable source of Fund. A mechanism to create a Fund therefore will be established.
- The Fund will be utilized only for the conservation works of Phewa Lake and its watershed.

12.2.3 Establishment of Phewa Lake Conservation Fund

In order to collect fund for PLECF, various sources can be tapped. But in the beginning, for the sake of equity, taxing the foreign tourists at a minimal rate for entering in Phewa Lake area would be an important source for the Fund. Once the Fund is properly established, it can raise resources from other sources also, by sharing with DDC Kaski, Pokhara Sub-metropolis and VDCs, and by seeking support from the HMGN. External sources and donor agencies should be explored as another important source of fund for implementing various Lake conservation activities.

(1) Exploration of Possible Sources for Fund

(a) Tourists

(i) The Existing Situation

The annual number of tourists visiting Pokhara used to be about 100,000, out of which about 70% tourists are from non-SAARC countries and 30% from the SAARC countries. At present, the tourists do not have to pay any tax for the conservation and development of Phewa.

(ii) **Tourist Entry Fee Charged in Touristic Places of Nepal**

The assessment of the entry fee charged at different places of touristic interest, national parks and conservation area as presented in **Tables I-12.3** and **I-12.4** have shown that differential rates are charged for SAARC and Non-SAARC tourists. The rates for the non-SAARC tourists to visit historical and cultural areas varies from Rs. 25 to Rs. 750, while in case of national parks and conservation

areas it varies from Rs. 500 to Rs. 1000. For the SAARC visitors, the rate varies from Rs. 15 to Rs. 50 for the visit of historical places and Rs. 100 to Rs. 200 for the visit of national parks and conservation area. These facts have shown that the practice of charging entry fee to the tourists has been established in Nepal. The case of Bhaktapur has clearly shown that, with better conservation program the tourists are willing to pay even high entry fee.

The Bhaktpar Experience

In Bhaktapur, there are 172 temples, monasteries, and mosques. Likewise, Bhaktapur has 172 patis (public shelters), 27 sattals (public inns), 19 maths (priest houses), 152 wells, 34 ponds and 77 sunken stone waterspouts. Besides, it is Nepal's cultural capital in which diverse cultural events, festivals and tradition are found. Tourist visits Bhaktapur to enjoy this unique architecture and cultural events. The number of tourists visiting Bhaktapur ranges from 500 to 600 daily. Municipality's record also shows that as many as 1200 visitors had visited the city in a day during tourist peak season.

The urban heritage conservation of Bhaktapur includes not only the important monuments, but also the surroundings, courtyards & squares, lane & streets and its skyline & townscape. Average annual growth in tourist arrival is around 15 percent. Municipality spends almost half of the total fund generated from the tourists' services fees on keeping the city clean and in improvement of urban infrastructure. The remaining fund is being used for heritage conservation and management. Municipality also emphasizes in the improvement of the ecosystem by cleaning river, improving burning cemeteries and by greening public open spaces.

Bhaktapur realizes the widely accepted view that the benefits from tourism should be invested in the conservation and management of the heritage. Its plan, programs and actions of past decades clearly demonstrate that the conservation of old city is possible only with the cooperation from visitors, its citizen and investment in heritage conservation.

Remarks From A Tourist Visiting Bhaktapur

Today, we have been in Bhaktapur. Two days ago we heard that we have to pay 10 $ to see this place. First, we thought, that is high charge and we do not want to go there, but we read in our German Travel Book that it is a very nice place, peaceful and wonderful.

So we went there, paid 10 $, and now we think it is not at all high charge, because there are a lot of wonderful buildings, and it will take a lot of money to keep them. This place also belongs to happy people. We think tourists, who spend a lot of money for the entrance, may make it by do not spending more for souvenir & food. So it will be a good idea to give some, may be one of the 10 $ to the people who live in this place, to keep them happy.

Burkhard Boock
GroBdornberger 110
33619 Bielefeld

Germany (Extract from Bhaktapur : A Cultural City, Bhaktapur Municipality, Sept. 2001)

The figures presented in the **Table I-12.3** has shown that substantial amount of Fund is generated in Bhaktapur.

Table I-12.3: Income Earned from the Tourist in Bhaktapur (NRs. ,000)

Year	Non-SAARC	SAARC	Total Income
1997/'98	36,959	948	37,907
1998/'99	42,256	1,727	43,984
1999/'00	44,637	1,493	46,130
2000/'01	73,019	1,483	74,501

Source: Bhaktapur: A Cultural City, Bhaktapur Municipality, Sep. 2001

Table I-12.4 : Entrance Fees in other Touristic Areas of Kathmandu Valley

(in NRs)

SN	Destinations	Foreigners	SAARC Visitors	Nepalese	Nepalese Students	Camera	Video Camera (not for film shooting)
1	Swayambhunath, Kathmandu	50	30	Free	Free	Free	Free
2	Boudhanath, Kathmandu	50	15	Free	Free	Free	Free
3	Patan Durbar Square and City Entry, Lalitpur	200	25	-	-	-	-
4	Golden Temple, Lalitpur	25	25	-	-	-	-
5	Bhaktapur Durbar Square and City, Bhaktpur	NRs.750 or US$ 10	50	-	-	-	-
6	Kathmandu Durbar Square	200	25	-	-	-	-

Source : *Collected from concerned offices.*

Table I-12.5: Entrance Fees in National Parks and Conservation Area (NRs.)

SN	Destinations	Foreigners	SAARC Visitors	Nepalese	Film Shooting Foreigners US$	Film Shooting SAARC Visitors	Film Shooting Nepalese	Helicopter Landing
1	Royal Chitwan National Park	500	200	20	1,000	25,000	5,000	2,000
2	Royal Bardia National Park	500	200	20	1,000	25,000	5,000	2,000
3	Khapted National Park	1,000	100	free	1,000	25,000	5,000	2,000
4	Wildlife Reserves	500`	200	20	1,000	25,000	2,000	2,000
5	Conservation Areas (Annapurna and Manasulu)	1,000	100	10	1,500	200	7,500	2,000
6	Kanchanjunga Conservation Area	1,000	100	free	1,000	25,000	10,000	2,000
7	Himalayan National Park	1,000	100	free	1,000	25,000	5,000	2,000
8	Dhorpatan Hunting Reserve	500	200	20	1,000	25,000	5,000	2,000

Source : **Information Bulletin, Ministry of Tourism**

(iii) Willingness to Pay

The survey conducted in Pokhara in November 2001, has shown that 60% respondents supported the levying of entry fee to enter into the Lakeside area for the conservation of Phewa Lake. Almost all the respondents expressed that there is a need to support the conservation fund to conserve Phewa. Another rapid opinion poll of the tourists carried in December 2001 by the Study has shown that about 53% of the respondents expressed their willingness to pay US $ 1 to 3 as entry fee to enter into Phewa Lake Area.

During the Public Hearing conducted on December 25, 2001 in Pokhara, almost all of the stakeholders supported the idea of levying tourist entry fee.

(iv) Expected Size of the Income from Tourist Fee

Based on above, charging Rs. 200 as conservation fee to enter Phewa Lakeside for the Non-SAARC country tourists seems to be appropriate. While for the SAARC tourist, Rs. 50 would be appropriate.

The proposed rates of tariff and the estimates of the number of tourists visiting Pokhara, the estimated revenue that can be generated from conservation fee is presented in **Table I-12.7**.

Table I-12.6: Projected Income from Tourist in Pokhara

(NRs. ,000)

Year	Non-SAARC	SAARC	Total
2005	16,524	842	17,366
2010	22,112	1,127	23,240
2015	29,591	1,509	31,100
2020	37,767	1,926	39,692
2025	48,201	2,,458	50,659
2027	61,518	3,137	64,655

In conclusion, levying conservation fee on the tourists is a good and logical resource for establishing Fund. Moreover, it is expected that visitors will be more than happy for such contribution. The fund collected from this source will assist in sustainable conservation of Phewa Lake.

(b) The Other Sources

- **Supports from the DDC, Municipality and VDCs:** Contribution from the part of income from property, hotel and restaurant tax, sale of Lake water, road cess/ toll tax, users' tax and others.
- **Support from the Government:** The government has to allocate seed money and annual budget to initiate functioning of the Fund as HMGN will also benefit directly from the Tourism Development.
- **External Sources:** Technical assistance on the conservation of Lake and conservation promotion activities from external agencies.

(2) Setup and Use of the Fund

The fund should be established through the sources discussed in 12.1.7 and fee collected as well as operated by the proposed PLECC. This fund will be used only for the conservation of the Lake and through an approved program by PLECC.

12.2.4 Implementation System for PLECF

(1) Legal Arrangements for the Conservation Fund

There is a legal provision for the establishment of Conservation Fund. Section 13 of Environment Protection Act, 2053 has provision to establish fund from money received from HMGN, Foreign Countries or International Non-Government Organizations and money received from other sources.

(2) Legal Arrangements for Imposing Tax

The Local Self Governance Act, 2055 has provided basis for levying charges on the use of natural heritage, for the provision of services to the touristic places, for the provision of sanitation and sewerage facilities within the jurisdiction of the three local organizations- Village Development Committee, Municipality and District Development Committee.

- **Village Development Management**

The Local Governance Act, 2055 under the provision of Village Development Management, Chapter 4, Section 28, 'J' has provided rights to the VDC for undertaking conservation and development of touristic places and control of pollution. Furthermore, Chapter 7, Section 56 of the Act has provided rights to the VDC to levy entry fee on touristic places. Village Development Fund established under Section 60 of the same Act has provided rights to the VDC to levy tax on use of water of rivers, streams for private purpose.

The Section 55 of the same Act has also provided the rights to VDC to levy tax on natural resources if they are used for commercial purpose.

- **Municipality Management**

The Local Governance Act, 2055 under the provision of Municipality Management, Chapter 8, Section 145 on the 'Service Charge' has given right to the Municipality to levy charge on the services provided by the municipality in the touristic places and on the services provided for solid waste management, sanitation and sewerage facilities.

- **District Development Management**

The Local Development Act, 2055 under the provision of District Development Management, Chapter 4, Section 189 'O' has made a provision to preserve the natural resources, cultural and touristic places by DDC. The section 217 of the same Act has also provided the right to DDC, to levy tax and charge on natural resources if they are used for commercial purpose such as rafting, boating and for fishing.

The assessment of above mentioned Acts has revealed that there is sufficient legal provision for the establishment of conservation fund and for charging entry fee to the tourists in Phewa Lake area.

12.2.5 Collection System and Management of PLECF

(1) Formulation and Approval of Entry Fee Collection Regulation

Prior to the collection of the fund, a Fund Collection Rules and Regulations needs to be formulated and approved by PLECC. Guideline for the formulation of such regulation, based on the present practice in the country is given below:

- The visitors will be categorized on the regional basis and the entry fee will be fixed accordingly. The appropriate regional categorization will be as follows:
  - Nepalese Citizen
  - Nationals from other SAARC Countries
  - Visitors from countries other than SAARC region
- Fee structure may be changed or reviewed according to the market condition
- visitors after payment of the fee will be provided informative paper clearly indicating the duration of its use
- Entry fee will be based on per visit
- Entry for children below 6 years of age will be free
- Researchers and educational group will have a different subsidized rate
- commercial group, filmmakers, photographers will have to pay an extra charge. This will be applied for the use of fueled vehicles also
- For diplomats, foreigners residing for longer period of guests of HMGN, DDC Kaksi, PSMC and journalist with identity card will be provided a subsidized rate, and in special cases with free entry
- Group or individuals visitors or mission for conservation of the Phewa Lake will not be charged
- Payment of the fee will not be a permit for undesirable activities in and around the Lake, and such payer should abide by the conservation behavior prescribed by PLECC, as well as other prevalent HMGN rules and regulations
- It will be a moral obligation of PLECC to maintain transparency to maintain information on the collection of fee

(2) Collection System

As in other municipalities, the collection of fund at the entry points will be the appropriate mechanism. Bhaktapur Municipality is having its own staff to manage separately the income from tourist tax. It is having 57 staff to collect and manage the fund. A separate department or section for PLECF within the PLECC would be an appropriate mechanism for the collection and disbursement of the Fund (Fig. I-12.1).

(3) Management of the Fund

The allocation of the fund from PLECF needs to be made on the basis of the program designed earlier by PLECC and discussed with all the stakeholders. The bottom-up approach in the formation of developmental program of Phewa for funding will be appropriate. The disbursement of the Fund is to be made based on approved annual budget allocated to the agreed program in the meeting of PLECC.

(4) Monitoring and Audit

The fund allocated from the PLECF for some specific program should be used exclusively on specific activities. PLECF should reserve the rights to closely monitor the activities and develop accounting process for the project and audit the accounting documents through registered audit firm. All the financial dealings and process should comply with prevailing Financial Regulation of HMGN. In case the project in finance by donor agencies, the accounting system and process should also comply with provisions of the respective donor agencies.

12.3 PHEWA LAKE CONSERVATION CENTER

12.3.1 Objective

Conservation of the Phewa Lake consists of different activities covering many disciplines as have been discussed before. The implication of these activities on the community is many folds. Efforts to conserve the Lake will affect the daily life of the community, their habits and attitude as well as their income and also the sentiment of the population of the country in general. But during and after the implementation of the Project many questions from the community and tourists alike have to be answered, to get their support in the conservation work. 'What is the present condition of the Lake?', 'What is polluting the Lake?', ' What can help the Lake to achieve its pristine beauty?', ' What attempts are being made to make it healthier?', ' What is the role of the community?', and 'What is good and bad for the Lake', are some of the possible questions that people may ask in relation to the Lake. Unless this information is disseminated, support from the community cannot be expected to be effective.

Phewa Lake Conservation Center has been proposed by the Study to act as a center for such functions to attain the following objectives:

- creation of a bridge between the visitors, the people and the conservation efforts
- creation of a catalyst in the conservation of the Lake by mobilizing different community, groups. NGOs or individuals, both national and international
- promote Phewa Lake through information collection and dissemination, initiation of different festival type of activities (e.g. Phewa Festivals), organize international Lake Seminar and opinion collection from the visitors etc.

12.3.2 Basic Policy

- The Phewa Lake Conservation Center will be the center for documentation and dissemination of environmental information of Phewa Lake. The Center will collect such information from different related sources.
- The Center will be established within the proposed Phewa Lake Environment Conservation Committee.
- This Center will be the pushing force behind the continuation of information collection.
- In addition to the information collection and dissemination, it will have its own program to popularize the conservation effort and its promotion. Conference, seminar, workshop, campaign, Phewa Festival, relation with the donor agencies are the examples of such activities.
- The activity of this Center is expected to act as a catalyst in supporting and contributing to the tourism development, sanitation program, watershed management for the benefit of the Lake and the community (stakeholders).
- The Center will have its own building.
- In the long run, it has to be a self-sustaining Center.

12.3.3 Implementation of Master Plan

(1) Land for the Center

The Study team during their survey did identify few alternative locations for the Center. They are :

- Barahi Boat-ghat Plaza,
- Friendship Park,
- Camping Site,
- Tourist Service Center Building
- Fisheries Research Center Boat Yard

In view of the fact that Barahi Plaza is visited by most of the tourists, this area is recommended for the site for Phewa Lake Conservation Center. The Conservation Center at this location will attract the visitors more easily and therefore, its function of information dissemination will be more effective. The only problem with this site is the nearness to the Lakeshore, which may prevent its erection as per the building regulation.

The other alternate site is the Miteri (friendship) Park. This park is along the roadside to the Lake area and visitors have an easy access to it.

The building for this Center will be of modest size and will have an exhibition hall as well as a meeting room. It will be a single storied building and will give an impression of Nepalese architecture.

Its conceptual layout, plan and elevation are presented in **Fig I-12.1** and **Fig I-12.2** at the end of this Chapter.

(2) Establishment and Operation of Phewa Lake Conservation Center

The Center will be a part of the proposed Phewa Lake Environment Conservation Committee(PLECC) but will have its own building and administrative autonomy. It will have its own separate cadre of staffs. At the initial stage, it will be supported by PLECC, and gradually become self-sufficient through its different resource generating initiatives, and ultimately run by Local NGOs or CBOs.

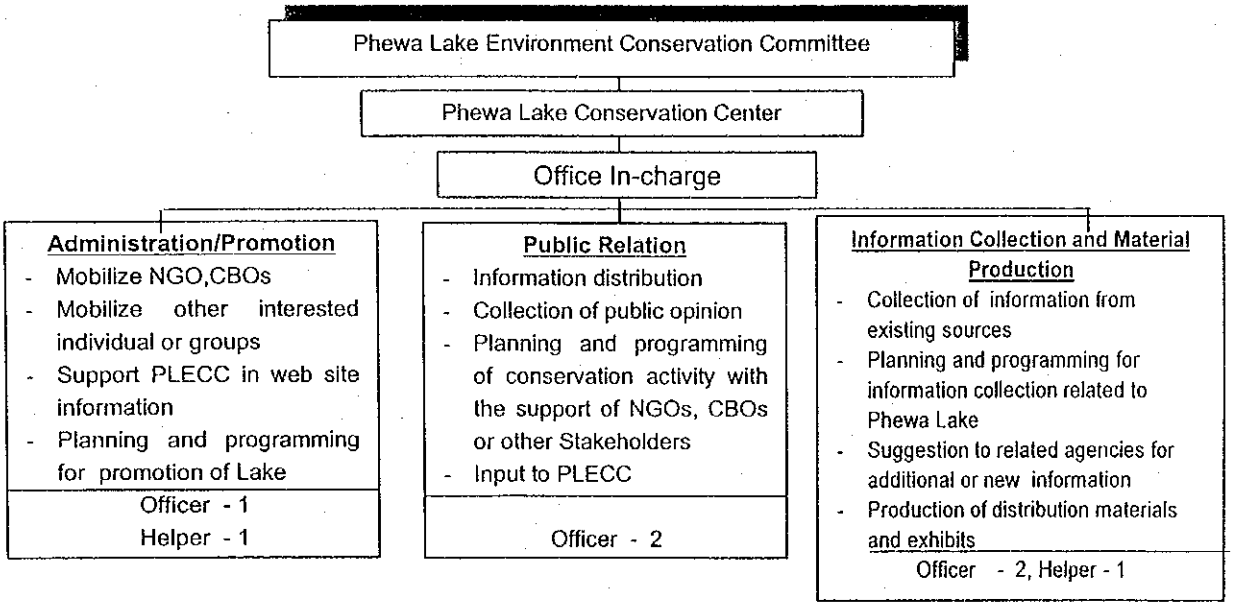
The specific function of this Center will be:

- collection of information related to the Lake from different sources. These sources may be any Government agencies, research institutions or groups and other national or international agencies.

- use of existing agencies for generation of most essential information related to the qualitative aspect of the Lake's environment. For example, it can use the existing scientific laboratory of NARC in Begnas Lake for regular monitoring and documentation of the information on water quality of Phewa Lake.
- information dissemination to the visitors, national or international institutions on the environmental condition of the Lake to generate interest on its conservation and get support for it.
- coordination with other lakes both within and outside the country for sharing and collection of experiences with the lake and conservation works.
- input to PLECC on the Lake's environment and needed priority conservation activities.
- initiation in organizing seminars, workshops, conservation promotion festivals(e.g., Phewa Festivals, marathon around the Lake, boat race in Lake and others).
- increase awareness on the importance of lake conservation and its benefit.
- publicize the conservation effort and mobilize different NGOs, CBOs, individuals, public sector or foreign agencies for their support.

In conclusion, it will act as a media to get support for the conservation of the Phewa Lake.

12.3.4 Organizational Structure of the Phewa Lake Conservation Center



12.3.5 Setup and Operation of Phewa Lake Conservation Center

Year	Action Required
1st	▪ Formation of Conservation Center wing in the Phewa Lake Environment Conservation Committee ▪ Recruitment of personnel. ▪ Prepare annual plan and program ▪ Approval of the plan and program from the PLECC ▪ Design & tendering and procurement of contractor ▪ Contact with agencies for information collection on Phewa Lake
2nd	▪ Building construction ▪ Procurement of goods, equipments and exhibition set up ▪ Contact with NGOs, CBOs and other interested groups and at least organize one event (Phewa Festival) per year. ▪ Distribution material production ▪ Campaign for support

Year	Action Required
3rd	▪ Continuation of above activity ▪ Information dissemination through brochure, exhibition ▪ start events like: - Phewa festival - marathon around the Lake - painting of the Lake by school children and others ▪ Conduct dialogue with NGOs, CBOs, other agencies like Municipality, FNCCI for operation of the Center and continue campaign for support from national and international organizations ▪ Plan and prepare the Center for self-sufficiency and alternating management option.
4th	▪ Create an independent fund for self sufficiency ▪ Hand over management to appropriate agencies (NGOs, CBOs or other groups)

12.4 PROGRAM FOR INSTITUTIONAL DEVELOPMENT

In order to implement the environment conservation activities in Phewa Lake area together with the development of related components and the improvements in the surrounding areas, the following programs are proposed to be implemented in two phases:

(1) Preparatory Phase 2001 to 2002

The Preparatory Phase will be devoted for the preparation of the project by the Government. During this period the Ministry of Population and Environment (MOPE) has to the take following steps:

- Approval of the proposed Environmental Conservation of Phewa Lake Master Plan by HMGN
- Initiation by MOPE for formation of PLECC
- Establish legal mandate for fund raising by PLECC
- Budgetary commitment of HMGN to provide seed money

(2) Establishment and Strengthening Phase- 2003 to 2005

In this phase, the three institutions will be established to perform the following activities as presented in **Table I-12.7**.

Table I-12.7: Activities to be Carried out by the Proposed Three Institutions

Description	Activities	Responsibility
1. Operation of PLECC	- Appointment of Chief Executive Officer - Establish PLECC Secretariat - Formation of PLECC Rules, Regulations and By-laws based on Local Development Act - Listing and Prioritization of Conservation Activities - Establish Phewa Lake Environment Conservations Fund and Phewa Lake Conservation Center - Demarcation of Lake Area - Initiation of Environmental Education and Community Empowerment - Preparation of Plan and Program and Budgeting for Implementation of Master Plan	DDC with HMGN/ MoPE HMGN/MoPE HMGN/ MoPE/PLECC
	- Preparation for Sewage System Treatment	PLECC
2. Formation of Phewa Lake Conservation Fund	- Preparation of Rules and Regulations of the Trust Fund - Appointment of the Staff - Initiate Collection of Conservation Fee from Tourist - Explore Donor Agencies for Supporting Phewa Lake Conservation	HMG/N PLECC, DDC, PSMC
3. Establishment of Phewa Lake Conservation	- Formation of Phewa Lake Conservation Center (PLCC) - Collection and Compilation of Information on the Lake and Its Dissemination - Construction of PLCC Building - Initiate and Organize Various Lake Related Activities such as Phewa	PLECC

Description	Activities	Responsibility
Center	Festival, International Water Sports, Seminar, Campaign and Other Promotional Works	

12.5 PRIORITIZED PROJECT RECOMMENDATION

Some of the priority projects are presented below in Action Plan Format.

(1) Title: Phewa Lake Conservation Center (Fig. I-12.1 and Fig. I-12.2)

Aims: Collection and dissemination of environment related information on Phewa Lake and act as a catalyst for promotion of environmental concern and mobilization of individuals, or organizations interested in Phewa Lake.

Phase : 2

Project Duration : (a) Establishment and operation - 3 years

(b) Handover to NGOs - 4th year onward

Justification: Despite the overwhelming concern on the environment of Phewa Lake, visitors as well as the general mass have little idea on the exact picture of the environmental degradation, attempts of different agencies for its improvement, and scope of possible participation for the benefit of the Lake. Unless such informations are not disseminated, support for its conservation will not be effective. Similarly, absence of such support will affect the sustainability of any conservation efforts. This center will therefore act as a bridge between the Lake and the people.

Scope : Construction and management of the centre with the following activities

- collection and dissemination of information related to Phewa Lake's environment
- expedite different organizations for production of information
- mobilize NGOs, CBOs, national and international organizations, individuals and establish a network
- initiate promotional activities like Phewa festival, boat race, cleaning campaign, international lake seminar etc. with the help of individuals , community, NGO and others.
- production of promotional materials.

Location: Barahi Ghat/Miteri Park

Responsible Agency: Phewa Lake Environmental Conservation Committee, Pokhara Sub-metropolis/VDC of the watershed area.

Budget:

Land	- Public Land
Construction	- Rs. 4,800,000
O&M	- Rs. 1,191,000/year

(2) Title: Phewa Festival

Aim: Promotion and popularization of the Lake and its conservation. Such promotional activities will help mobilize the community and sustain the conservation effort, and consequently the tourism development and income of the people.

Phase: To be continued regularly

Project Duration: To be continued regularly

Japanese folk dance

Nepali folk dance

Phewa festival

Justification: Conservation activities can not be sustained unless it is supported by the general mass. Promotion of conservation activities and hence the Lake is the corner stone to raise public interest and awareness. Such awareness and interest can generate resources, mobilize different types of community and in conclusion benefit the Lake and the local community.

Such activities will also raise interest among international agencies in the conservation of the Lake and tourism industry

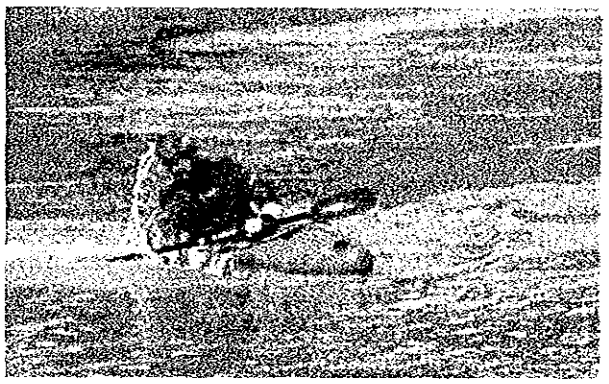
Through such festivals the general mass and the visitors will experience that conservation is enjoyable and recreational in character.

Scope: Organizing Phewa Festival. Such festivals can not be limited to any specific type of activities. It will be time and situation specific but the overall goal will be the promotion of the Lake and conservation in a festive atmosphere. Some examples of such festivals are listed below:

- Phewa-Biwa Festivals (Phewa, Nepal-Biwa, Japan Festival). It may include
  - Phewa Marathon by Different Nationalities
  - Phewa Boating Race
  - Dance and Music Festival
  - Food Festival
  - Phewa Cleaning Campaign
- Phewa-Biwa Essay Competition (Essay Competition on Phewa and Biwa Lakes)
- Phewa Painting at Site and Exhibition
- Phewa Photographs Exhibition
- Festival for School Children (Dance, Music, Painting and Others)
- Handicraft show
- Eight Lakes of Pokhara Valley Festival
- Phewa and International Lake Festivals
- Water Festival

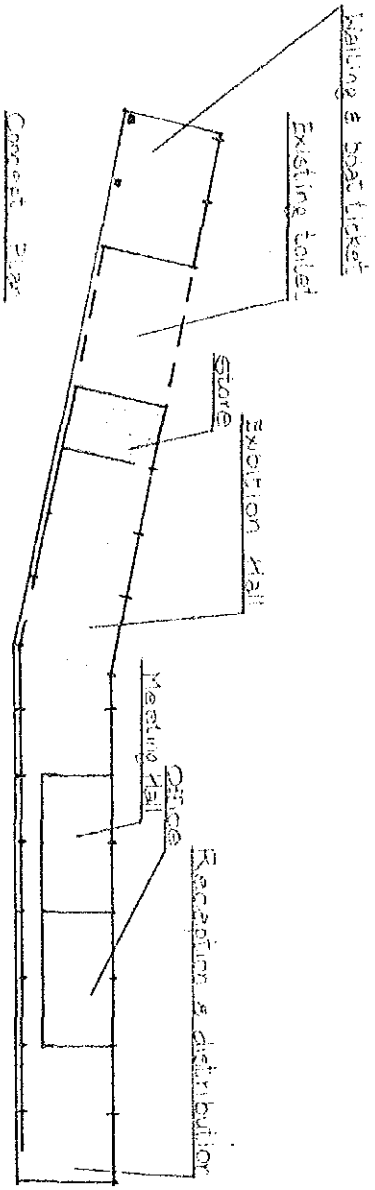
Responsible Agencies: PLECC and Phewa Lake Conservation Center (for initiation and mobilization), NGOs, CBOs, PSMC, DDC or Individuals

Budget:
- No fund from PLECC
- Expenses to be born by organizing group and will vary according to the type of program



Water sport

Traditional music fare



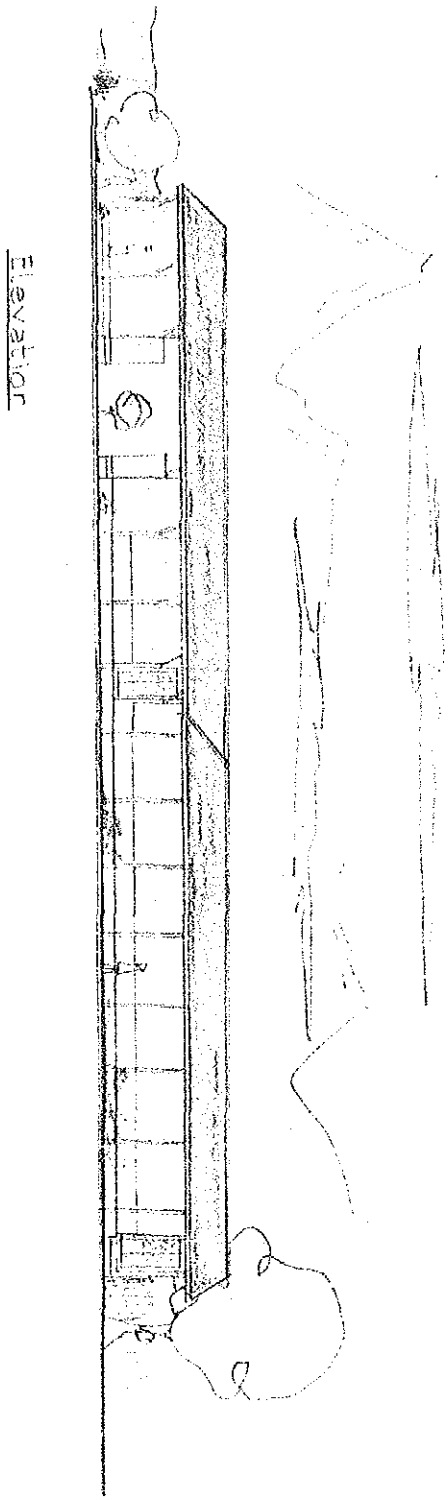


Fig. I-12.1: Plan and Elevation of Phewa Lake Conservation Center

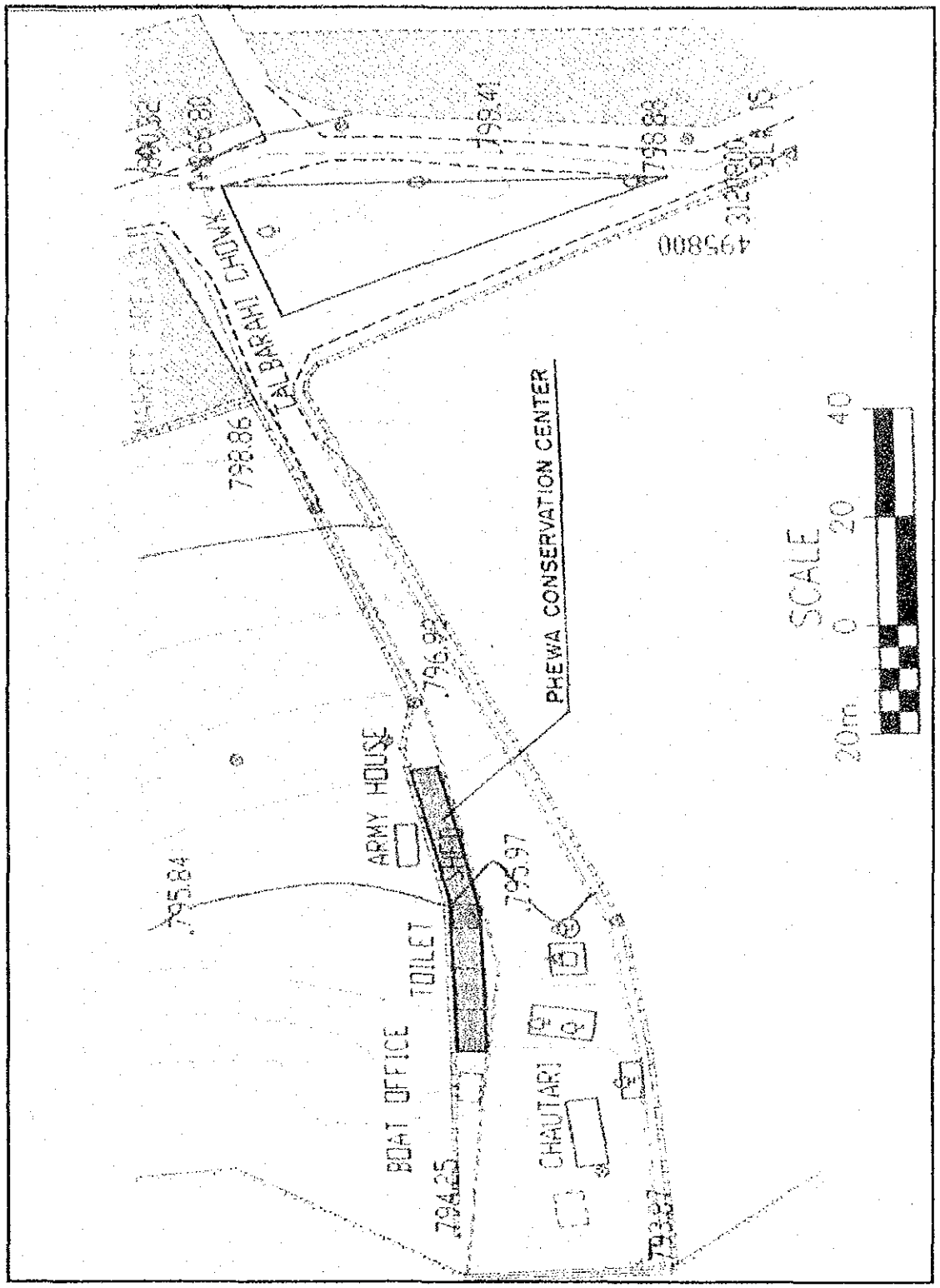


Fig. I-12.2: Location Map of Phewa Lake Conservation Center

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CHAPTER 13

PROJECT IMPLEMENTATION

The Development Study on Environmental Conservation of Phewa Lake in Pokhara, Nepal

CHAPTER 13
PROJECT IMPLEMENTATION

13.1 PROJECT IMPLEMENTATION

13.1.1 Prioritized Project and Cost

The following **Table I-13.1** presents the prioritized projects and their tentative cost, as envisaged in corresponding Master Plan.

Table I-13.1: Prioritized Project and Cost

SN	Component	Priority	Project Title	Cost (In million NRs.)	Remark	Total (NRs. million)
1	Water Quality and Sewage Management Plan	1	- Sewerage System Plan (with tunnel) - *Laundry Washing Spots*	486 5	Without Tunnel - 221 million NRs.	491
2	Environmental Education Plan	2	Environmental Education and Capacity Building	52		52
3	Watershed Management Plan	3	- Sustainable Agriculture Development - Soil Erosion and Sedimentation Reduction	38.5 40	Include Annual O&M Cost	78.5
4	Institutional Strengthening Plan	4	Phewa Lake Conservation Center	4.8	Does Not Include Operational Expenses	4.8
5	Ecosystem Conservation Plan	5	- Lakeshore Wise Use Project - Conservation and Sustainable Utilization of Bio-diversity - Fish Conservation and Fisheries Development - Constructed Wetland	1.1 3.4 8.5 0.9		13.9
6	Monitoring Plan	6	Monitoring of Lake Water Quality, Inflowing Rivers and Watershed Management	9.3	*Includes Re-strengthening of FRC Lab of NARC/HMGN in Begnas*	9.3

7	Tourism Development *Plan*	7	- Eco-tourism / Village Tourism
			- Lakeshore Planning and Beautification Project
			- Lake Side Community Road
			  - Gaira Chautara – Thulakhet Road
			  - Sarangkot – Naudanda Road
				30
				18
				
				90
				100
					Does Not Include Land Acquisition Cost	238

8	Solid Waste Management Plan	8	Solid Waste Management System	-	To Be Carried Out Under Public Private Partnership	-
TOTAL						**887.5**

13.2 IMPLEMENTATION SCHEDULE

The following **Table I-13.2** presents the implementation schedule for various prioritized project activities.

Table I-13.2: Implementation Schedule

S. No.	Master Plan Components	Priority Projects	Time Schedule				
			1st year	2nd Year	3rd year	4th Year	5th Year
1	Water Quality and Sewage Management Plan	- Sewerage System Plan (With Tunnel) - Laundry Washing Platforms					
2	Environmental Education Plan	Environmental Education and Capacity Building					
3	Watershed Management Plan	- Sustainable Agriculture Development - Soil Erosion and Sedimentation Reduction					
4	Institutional Plan	- Phewa Lake Environment Conservation Center - Phewa Lake Environment Conservation Fund - Phewa Lake Conservation Center					
5	Ecosystem Conservation Plan	- Lakeshore Wise Use Project - Conservation and Sustainable Utilization of Bio-diversity - Fish Conservation and Fisheries Development - Constructed Wetland					
3	Monitoring Plan	Monitoring of Lake Water Quality, Inflowing Rivers and Watershed Management					

7	Tourism Development Plan	- Eco-tourism / Village Tourism
		- Lakeshore Planning and Beautification Project
		- Lake Side Community Road
		  - Gaira Chautara – Thulakhet Road
		  - Sarangkot – Naudanda Road					

8	Solid Waste Management Plan	Solid Waste Management System					

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CHAPTER 14

PROJECT EVALUATION

The Development Study on Environmental Conservation of Phewa Lake in Pokhara, Nepal

CHAPTER 14
PROJECT EVALUATION

14.1 BASIC JUSTIFICATION OF STUDY

(1) General

The Development Study relating to Environmental Conservation of Phewa Lake has been conducted with the basic objectives of Environmental Management of Phewa Lake in terms of maintaining the water quality suitable for recreational, irrigation and hydro-power use as well as up keeping the Lake size (surface area and storage capacity) and aesthetic beauty. Basic justification includes coverage on essentialities like environmental conservation of Lake and improved local socio-economic condition. This is followed by an economic analysis considering the expected benefits accrued from the Lake conservation and estimated cost for the conservation activities. Apart from these, the proposed conservation works covering various components as identified during the course of this Study needs to be assessed from environmental perspective to ensure sustainable conservation and development. The identified priority projects under this study needs to undergo through Initial Environmental Examination (IEE) or Environmental Impact Assessment (EIA) in accordance with the prevailing Environmental Protection Regulation (EPR), 1997 of HMGN. EPR has categorically described the type and size of the development projects to be undertaken for IEE as well as EIA.

(2) *Necessity of the Phewa Conservation Work*

The current environmental situation of Phewa Lake is under serious threat with degradation of water quality as a result of algal bloom, growth of water hyacinth, generation of foul odor and evidences of skin and eye diseases upon swimming in the Lake. Deposition of over 123,000 cubic meters sediment into Lake per year has resulted decrease of it's area at almost 2 hectare per year. Combined effects of water quality degradation and shrinkage of Lake has affected the tourism related industries, which provides a considerable employment and contribute to local as well as national income. Such a gloomy environmental situation of the Lake has become essential to be improved through integrated projects covering all related domains as early as possible. The proposed projects therefore have two purposes viz. (i) improvement of basic environmental condition of Lake by maintaining water quality standards combined with retention of the Lake size, and (ii) improvement of socio-economic condition of people living within the project area with better environmental awareness.

The Master Plan prepared during this Study embodies assessment and basic justification of the current study. More specifically, the justification analysis has been made by reviewing and assessing the priority projects identified during the course of Study, whether they meet the requirement of Lake conservation or not. Similarly, the views expressed by the stakeholders during public hearing have also been taken into account for justification of the Projects.

(3) Results from the Master Plan Study

The findings of current Study indicate that major environmental problems of Phewa Lake includes water quality degradation and sedimentation. Lake Water quality degradation is attributed to point and nonpoint sources of pollution. In order to reduce the pollution loads from point sources, the sewerage

system project has been identified and studied in detail (feasibility level). Similarly, for the reduction of nonpoint source of pollution load from urban and rural areas, priority projects of solid waste management and environmental education plus watershed management with sustainable agriculture programme have been envisaged. For sediment reduction, long term option of tunnel with hydraulic sediment flushing project and medium/ term option by mechanical excavation and disposal have been envisaged. Micro-watershed management projects have been also envisaged for sediment reduction. Apart from these, several priority projects have been identified to conserve the Lake from pollution and sediment intrusion. The current Study has identified priority projects under 8 components and described in **Table I-14.1.**

Table I-14.1: Priority Components for Master Plan

S.No.	Plans/Components	Purpose	Coverage Area
1	Diversion Sewerage System and Treatment Facilities under Water Quality Management Plan	Reduction of pollution load from urban watershed into Lake through diversion sewerage	Urban watershed covering nine wards of Pokhara Sub-metropolis
2	Environmental Education, Community Empowerment and Capacity Building Plan	Enhancement of public environmental awareness and promotion of local capacity for better socio-economic condition	Rural and urban watershed.
3	Watershed Management Plan Covering Sustainable Agriculture	Reduction of sediment and nutrient load from rural watershed area into the Lake.	Six Village Development Committees in rural area
4	Organizational and Institutional Plan	Effective and sustainable management of programmes in implementation as well as in operation and maintenance. Rural - Urban linkage.	Rural and urban area.
5	Eco-system Conservation Plan	Improve biodiversity conservation and land use of Lake shoreline	Urban and rural area
6	Monitoring Plan	Improvement of Lake water quality, ecosystem conservation and watershed management	Urban and rural area
7	Tourism Development Plan	Enhancement of rural and urban income level through the generation of employment	Rural and urban watershed area
8	Solid Waste Management Plan	Reduction in pollution load from city area	Urban area

(4) Justification of the Study

The priority projects identified under 8 components are essential and indispensable for improving the environmental condition of Phewa Lake. These projects will contribute in attaining the targets as set in the Master Plans. Various target years for project implementation has been envisaged in Master Plans depending upon the nature of project. However, the long term sewerage system project will be under operation for up to 25 years i.e. 2027.

With the implementation of priority projects, the substantial improvement in the following area will be achieved:

- Improvement in Lake water quality with algal and water hyacinth growth, foul odor, etc,
- Reduction of sediment and nutrient load from rural watershed,
- Control in conservation of haphazard disposal of solid waste along the Lakeshore,
- Conservation of Lake/wetland eco-system
- Conservation and sustainable utilization of aquatic/wetland biodiversity

The Master Plan prepared under this Study is considered to be appropriate to address the basic problem of environmental degradation of Phewa Lake.

14.2 ECONOMIC EVALUATION

For the economic evaluation, the conventional economic analysis through proceedings of calculated project costs and benefits is performed on the basis of an environmental management project.

With the formation of a cash flow analysis for design life of 25 years after the completion of construction is considered.

14.2.1 Tools to Evaluate Returns

The main tools to evaluate returns are Benefit Cost Ratio (BCR) and Internal Rate of Returns (IRR). The discount rate for calculating B/C has been taken as 7% (normally adopted in Nepal).

14.2.2 Analysis Period and the Basis of Analysis

The economic life of long-term projects such as sewerage system is assumed as 25 years, excluding 3 years for construction and installation. The cost of construction of civil infrastructure, installation of mechanical equipment and subsequent O & M cost has been estimated for investment stream. Similarly, benefits accrued from the project has been accounted for 25 years of project life, beginning from 2006 (considering its commissioning year). Furthermore, benefits accounted include direct and indirect benefits, which are also termed as quantitative and qualitative.

In investment stream, it is assumed that in the beginning within three years from the initiation of project 100% investment will be made through external assistance. After the commissioning of the project, it should be phased out, and operation and maintenance responsibility is assumed to be taken over by local organization and stakeholder through internal resources. Based on these assumptions, the scope of economic benefits covered by the implementation of the two priority projects are elaborated as follows:

1. Sewerage System
2. Environmental Education and Community Empowerment Program

(a) Components of Cost:

- Construction cost, O&M cost including capital cost replacement, and cost for the implementation of various software programs (environmental education, income generation activities, etc.)

(b) Components of Possible Economic Benefits:

- Additional income from the tourists, benefits from new income generating activities, increase of freshwater resource income such as fish production, increased employment and other indirect benefits.

Main source of revenue and income of the Phewa Lake Environment Conservation Committee will be the conservation fee charged to the tourists. In addition, some other charges can also be levied in the future when the Phewa Lake Environment Conservation Committee (PLECC) and Phewa Lake Environment Conservation Fund (PLECF) will be firmly established. Other sources can be rental fee on building and lease charges on land, hotel tax, regular government grant, tariffs on utilities, miscellaneous income

14.2.3 Benefits and Indicators of the Selected Component for Economic Analysis

Expected direct and indirect benefits to be accrued from the investment in the three different activities presented in the form of a matrix are used for economic analysis. For assessing the benefits, quantitative and qualitative indicators have been identified.

Table I-14.2 Benefits and Indicators of the Selected Component

(a) Sewerage System

S.N	Benefits	Indicators		Remarks
		Direct (Quantitative)	Indirect (Qualitative)	
1	Minimizes pollution in the Lake environment and helps in increasing the number of visitors and recreational activities	√	-	It is estimated that Phewa shares about 40% of the time and expenses incurred by the tourist
2	Income from sewerage tax will sustain maintenance cost of sewer system	√	-	In average Rs.200 is paid by each household for drinking water connection and 50% of the water bill is charged as sewerage charge
3.	Local employment during construction period	No. of people employed	• Better life of the local people	
4	Reduction of annual expenses in health care	-	• Reduction in visual pollution • Reduction in skin diseases	
5	Improves the aquatic bio-diversity life of the Lake and fish culture production	Increase in fish catch		About 2 to 6% increases in the fish catch will be there when quality of water improves for cutan years and stabilizes after a period

(b) **Soil Conservation Program (SCP)**

S.N	Benefits	Indicators		Remarks
		Quantitative	Qualitative	
1	Checks decline in crop production due to top soil erosion of cultivated land	• Increase the area of farm conservation • Cultivation of improved variety of more leading to high yield	• Protection of farmland from soil erosion • Soil fertility is maintained	
2	Reduce silt load/agro-nutrients sedimentation and increase life span of Phewa Lake		• Better quality of water • Checks losses from flash flood • Increase the life of Phewa Lake	Area of open lake water body maintained

(c) Community Empowerment and Income Generating Program (CEIGP)

S.No	Benefits	Indicators		Remarks
		Direct (Quantitative)	Indirect (Qualitative)	
1	Environment education & technology provided to the beneficiaries		• Awareness generation for environment protection	Dissemination of environment friendly improvement approach measure of local economy
2	New income generating activities i. Goat Raising ii. Laundry Washing Platform	• Income earned • Control of pollution in Phewa Lake	• Concern on environment	
3	Better economic life of economically disadvantaged people living in the catchments of Phewa Lake	-	• Capacity to increase educational and health expenses • Capacity to participate in societal activities	

14.2.4 Budgetary Analysis of the Organizational and Institutional Arrangements

The project has proposed an autonomous institutional framework for the management of developmental and improvement activities in Phewa area. The funding arrangements of such activities have been made through the formation of Phewa Lake Environment Conservation Fund. For the dissemination of information on Phewa and its promotional activities, it is proposed to establish Phewa Lake Conservation Center. Thus the budgetary arrangements of both the institutions have been presented. The benefits to be accrued from these two institutions are presented in the following matrix.

Table I-4.3 (a): Phewa Lake Environment Conservation Center (PLECC)

S.N	Benefits	Indicators		Remarks
		Quantitative	(Qualitative)	
1	Number of visitors visiting Pokhara	√	-	
2	Visitors get information about problems and potentials of Phewa Lake	-	• Authentic information on conservation of Phewa • Support for charging tourist entry fee	Tourists/ students and local children will be better informed about issues & needs of Phewa Lake
3	Helps to mobilize resources to conservation activities	-	• International publicity of Phewa Lake • Helps to generate international support to conservation Phewa Lake	Website best e-commerce will increase in future days for tourism and will influence promotion and conservation activity

Table I-14.3 (b): Phewa Lake Environment Conservation Fund (PLECF)

S.N	Benefits	Indicators		Remarks
		Quantitative	Qualitative	
1	Mobilizes funds for conservation of Phewa Lake	√	-	Revenue earned from tourist entry fee
2	Self-sustaining system of finance	-	• Local participation • Increases the sense of ownership among stakeholders • Transparency in financial transaction • Tourist will also monitor the conservation work indirectly • Efficiency in financial management	Increases financial capacity of proposed Phewa Lake conservation committee to undertake more conservation and development related activities in Phewa Lake.
3	Implementation of urban rural partnership in Phewa Lake conservation	-	• Alternatives of environment friendly approach in rural area will reduce population pressure • Promote diversification of tourist destination • Creates better relation between the rural and urban dwellers • Reduction in rural urban conflict in sharing of the Lake resources • Increased supply of agro-production from rural area to urban centers	Sharing of conservation benefits among urban and rural populace enhance efficiency of conservation activities of tourism value

14.2.5 Valuation of Economic Benefits

In the valuation of economic benefits, only the direct benefits are taken into account for the calculation of numeric figures to be used in the economic analysis. The calculation of these subjective economic benefits is based on a set of assumptions of a projected recuperation level in the water quality of Phewa Lake to be achieved by the project and the actual and future conditions of income or expenses of the related items.

Table I-14.4: Summary of Economic Analysis of Sewerage System

Description	HH to be served	NPV (in '000 Rs.)	EIRR	B/C Ratio
Economic Analysis of Sewerage System (With Tunnel) Without Conversion	50%	(213,042)	3%	0.60
Economic Analysis of Sewerage System (With Tunnel), With Conversion Factors	50%	(186,565)	3.22%	0.62
Economic Analysis of Sewerage System (Gravity with Cut and Fill) Without Conversion	50%	(25,194)	6.43%	0.93
Economic Analysis of Sewerage System (Gravity with Cut and Fill), With Conversion	50%	(8,318)	6.8%	0.97

Description	HH to be served	NPV (in '000 Rs.)	EIRR	B/C Ratio
Factors				
Economic Analysis of Sewerage System (With Mechanical Treatment Facilities), Without Conversion Factor	50%	(522,581)	-	0.35
Economic Analysis of Sewerage System (With Mechanical Treatment Facilities), With Conversion Factors	50%	(484,925)	-	0.36

Table I-14.5: Analysis of the Sample Project of Software Component only with Project Cost

Description	HH to be served	NPV (in '000 Rs.)	IRR/ EIRR	B/C Ratio
On-Farm Conservation Project, Without Conversion	50%	700	13.12%	1.60
On-Farm Conservation Project, With Conversion	50%	665	13.12%	1.60
Goat Raising Project, Without Conversion	50%	4,843	18.12%	1.23
Goat Raising Project, With Conversion	50%	3,671	15.6%	1.18
Washing and Laundry Place, Without Conversion	50%	2,260	19.72%	1.48
Washing and Laundry Place, With Conversion	50%	2,163	19.94%	1.48
Integrated Analysis of the Software Components, Without Conversion	50%	7,803	17.66%	1.29
Integrated Analysis of the Software Components, With Conversion	50%	6,499	16.27%	1.25

Table I-14.4, and **Table I-14.5** have presented the summary of the IRR, B/C data and NPV of all the priority projects.

14.2.6 Sensitivity Analysis of the Project

The results of all the analysis provide inputs to the decision makers to invest in the project activities. Furthermore, the sensitivity analysis based on certain assumptions such as possible increase in the cost component or reduction in the expected revenue have also been done for Sewerage System Project with Tunnel to make the analysis more realistic.

From the annual disbursement of project costs and economic benefits mentioned above, the Basic Economic Internal Rate of Return (EIRR) was obtained at 3% along with the ratio of B/C of 0.60% and the NPV at Rs. (213,042) with the discount rate of 7%.

For the sensitivity analysis to cope with the risks that may happen when implementing the project, the three following typical cases are basically considered for the economic justification.

1. Case 1: An increase of 10% in costs
2. Case 2: A decrease of 10% in benefits
3. Case 3: A combination of an increase of 10% in costs and a decrease of 10% in benefits

In these three cases of sensitivity analysis of the proposed sewerage system, the results are presented in following **Table I-14.6 (a)** and **Table I-14.6 (b).**

Table I-14.6 (a): Sensitivity Analysis of Sewerage System
(With Tunnel, Without Conversion Factor)

Description	NPV (in '000 Rs.)	EIRR	B/C Ratio
Case 1: With 10% Increase in Cost	(266,872)	2.23%	0.55
Case 2: With 10% Decrease in Revenue	(245,568)	2.15%	0.54
Case 3: With 10% Increase in Cost and 10% Decrease in Revenue	(299,398)	1.37%	0.49

Table I-14.6 (b): Sensitivity Analysis of Sewerage System
(With Tunnel and Conversion Factor)

Description	NPV (in '000 Rs.)	EIRR	B/C Ratio
Case 1: With 10% Increase in Cost	(236,157)	2.45%	0.57
Case 2: With 10% Decrease in Revenue	(217,501)	2.37%	0.56
Case 3: With 10% Increase in Cost and 10% Decrease in Revenue	(267,093)	1.58%	0.51

The results based on sensitivity analysis have shown that the sewerage system with tunnel type will have a positive EIRR even if the expected cost of construction will increase by 10% and the expected revenue will decrease by 10%. Any other indirect benefits occurring from the project would be the additional benefits. Unless otherwise stated, the number of household to be served is 50% of the total household of the watershed area.

The analysis of the three sample software projects: on-farm conservation, goat raising, and laundry platform have shown results that these projects are viable because the EIRR of each project is positive. In case of income generating projects, it is more than 11% with the inclusion of the environmental education and management cost. The economic internal rate of return of each project is also relatively high (**Table I-14.7 (a)** and **Table I-14.7 (b)**).

Table I-14.7(a): Analysis of the Software Component Inclusive of Environmental Education and Management Cost (Without Conversion Factor)

Description	NPV (In '000 Rs.)	EIRR	B/C Ratio
Project 1: On-Farm Conservation Project	(378)	5.22%	0.83
Project 2: Goat Raising Project	3,777	13.48%	1.17
Project 3: Washing and Laundry Place	1,215	11.16%	1.21
Project 4: Integrated Analysis of the Software Components	4,570	11.08%	1.15

Table I-14.7(b): Analysis of the Software Component Inclusive of Environmental Education and Management Cost (With Conversion Factor)

Description	NPV (in '000 Rs.)	EIRR	B/C Ratio
Project 1: On-Farm Conservation Project	(382)	5.10%	0.82
Project 2: Goat Raising Project	2,647	11.72%	1.12
Project 3: Washing and Laundry Platform	1,139	11.08%	1.21
Project 4: Integrated Analysis of the Software Components	3,404	10.21%	1.12

From the above results of economic evaluation, the Master Plan of Phewa Lake, which covers the priority projects, have shown basically an economic viability for the implementation of the Master Plan.

14.3 TECHNICAL EVALUATION

The priority projects and programs described in the Master Plan and identified high priority projects with feasibility level study can be implemented successfully. The technology in terms of hardware and software including design and implementation are available in Nepal and similar projects have been successfully accomplished in recent past. Hence, no problems are expected to arise in terms of safety, reliability, and feasibility. For upgrading the water quality of Lake, diversion sewerage system has been identified as most technically and financially viable alternative with long term solution, together with 90% reduction of pollution load from point sources as per present feasibility level study and simulation projection. The technical evaluation based on the feasibility study also reveals that the sewerage system project can be technically viable in Nepal. No significant risks of safety and reliability is expected during construction as well as operation /maintenance phase of the project.

For sediment reduction plan, the long-term solution as hydraulic sediment flushing with delivery tunnel is most permanent solution. However, for short-term solution, excavation with machine is also technically feasible.

14.4 ENVIRONMENTAL EVALUATION

The projects identified under the Master Plans are aimed to restore and conserve the Lake in terms of water quality and sediment reduction. No serious environmental adverse impacts are expected due to the implementation of priority projects. However, for the construction of sewerage system, there are likely chances of adverse environmental impacts in terms of physical, biological, social and cultural aspects. An Environmental Examination has been conducted during the course of this Study. The result of examination indicates that there will be no likely significant adverse impacts due to the implementation of sewerage system during construction as well as operation/ maintenance phase. Whatever adverse impacts are identified can be solved through mitigation measures. The beneficial impacts of Sewerage System out weigh the adverse impacts.

During construction phase, there will be short term and temporary adverse impacts, such as inconvenience of traffic to local and tourists, dust emission, noise generation at Lakeside area for a period of about 2 to 3 months. To minimize such impacts, construction activities is planned to be carried out during tourist off-season.

Sediment reduction project with machine and tunnel option may also have some adverse impact but they can be mitigated through appropriate mitigation measures. Other projects, such as eco-system, tourism development project, environmental education will have nominal environmental adverse impacts if they are implemented.

Although the priority projects identified under the Master Plan are basically to enhance environmental condition of the area, and no significant adverse impacts are likely, these projects must under go through EIA process in accordance with EPR, 1997 of HMGN.

14.5 OVERALL EVALUATION

From the results of above-mentioned economic, technical and environmental evaluation, all the identified prioritized projects are important for the conservation of Phewa Lake. The implementation of the projects are to be done in accordance with the priority identified in **Chapter 3** of **Part I** of this Report.

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CHAPTER 15

RECOMMENDATION

The Development Study on Environmental Conservation of Phewa Lake in Pokhara, Nepal

CHAPTER 15
RECOMMENDATIONS

Recommendations and suggestion related to environmental conservation of Phewa Lake are presented below corresponding to the Master Plans proposed under this Development Study.

15.1 WATER QUALITY MANAGEMENT

- **Construction of Diversion Canal:** The Master Plan for Water Quality Management has been identified as most urgent plan to be implemented to enhance the water quality situation of the Lake. For water quality management, it has also identified that urban sewage management along the Lakeshore as the immediate intervention. Similarly, the feasibility study on appropriate system for sewage management has concluded that the gravity type diversion sewerage system with tunnel alternative along the eastern Lakeshore as the most feasible option. This option conveys and discharges the sewage beyond the Lake in Phushre khola, and is thus recommended for implementation.
- **Construction of Waste Treatment Plant:** A cascade type sewage treatment system through oxidation at the end of the sewer line, just before disposing the sewage in Phushre Khola is recommended. However, regular monitoring of water quality of Phusre Khola is recommended. If pollution load in Phusre khola increase due to discharge of sewage, suitable treatment facilities such as reed bed (constructed wetland) is recommended in future.
- **Environmental Impact Assessment:** A detailed Environmental Impact Assessment (EIA) is recommended to be carried out in accordance with the Environmental Protection Act, 1996 and Regulation, 1997 (first amendment 1999) to ensure environment friendly development activities for the proposed sewerage system. EIA study is recommended to be commenced prior to the detail design so that mitigation measures can be incorporated in detail design and cost estimation.
- **Provision of Alternative Laundry Site:** To ensure water quality of Lake, laundry activities around the Lakeshore should be prohibited through legal instruments as well as by providing alternatives. For this, numbers of laundry platform in eastern Lakeshore, as suggested in Master Plan, is recommended to be developed along with overhead tank and pumping of water from the Lake. These platforms, should be carefully designed so that outflow from these shall be completely diverted to the trunk sewer lines. The washing platforms will be operated by group of low income people, who will charge the beneficiaries for the services to run the system sustainably. This will provide income-generating opportunity to the low-income group of people.
- **Restriction on Undesirable Activities on Lake and Lakeshore**: Unpleasant scenes of buffalo wallowing and wandering of pigs, a symbol of dirtiness along Lakeshore of Phewa Lake pose drastic decline in aesthetic beauty and water quality of the Lake. To retain touristic appeal of the Lake and maintain water quality, such practices should be effectively controlled.

15.2 UPGRADE PUBLIC ENVIRONMENTAL AWARENESS AND COMMUNITY EMPOWERMENT

- **Emphasis on Environmental Awareness**: Public environmental awareness combined with information on prospect of conservation benefits is recommended to be given to the people, which

- can only positively result in effective environmental conservation. Target oriented skill training is recommended to be taken as an approach in tackling local environmental problems at both urban and rural areas.

- **Emphasis on Community Empowerment:** The local community, with an emphasis on the disadvantaged groups, women and children is recommended to be given due consideration in dissemination of information and for sharing of benefits so as to generate wider public confidence in environmental conservation activities.

- **Improve Local Socio-economy Through More Employment and Alternative Income Sources:** High emphasis is recommended to develop micro enterprises to increase employment and income to achieve social sustenance. This can be done thorough integrating tourism with local agricultural and cottage industry products.

15.3 ESTABLISH INSTITUTIONAL SETUP AND RESOURCE FUND

- **Institutionalization of a Legally and Economically Strong Phewa Lake Authority:** The proposed Phewa Lake Environment Conservation Center (PLECC) should be established (after restructuring of PLACC) as an authorized and accountable coordinating agency with necessary legal mandate, financial back-up and collaborative approach among stakeholders. This will improve project implementation in an institutionally sustainable way.

- **Enforce Existing Relevant Environmental Regulations:** The Aquatic Lives Protection Act, Pesticides Act, Soil and Watershed Conservation Act, Solid Waste Management Act, Local Governance Act are recommended to be effectively enforced in coordinated ways in checking environmental pollution of the Lake.

- **Establish Phewa Lake Environment Conservation Fund:** The existing Phewa Trust Fund should be re-strengthened as Phewa Lake Environment Conservation Fund (PLECF), or established as a separate entity. The PLECF will collect Lake conservation fee from the tourist in addition to other sources of fund raisin. With this resource, it will assist to develop more tourist friendly facilities and its management at urban and rural areas of the Lake and take various environmental conservation activities. Future conservation activities in Phewa Lake will largely depend upon successful mobilization of this fund.

- **Establish Phewa Lake Conservation Center** (PLCC): It is recommended to establish PLCC under PLECC, which will carryout various Lake conservation activities and disseminate information on pollution status, conservation activities as well as constraints and prospects on sustainable management of Phewa Lake. It will carryout regular monitoring on water quality and sedimentation of the Lake in collaboration with NARC/Fisheries Research Center laboratory located at Begnas, Pokhara.

- **Establish Phewa Lake Specimen Museum/Aquarium:** As a component of PLCC, an aquarium can be established at existing building facility (boat yard) of Phewa Lake Fisheries Research Centre, located at Lakeside, Baidam. It will disseminate information and generate financial support on conservation of aquatic bi7odiversity with an emphasis on threatened fish, wild rice, aquatic macrophyte and long distance migratory waterfowl species.

- **Promote Tourism:** Proposed PLECC will coordinate in organising. Phewa Festivals like food, fashion, boating, yatching, international lake seminars, essay/quiz competition and cultural exchange

programs to promote tourism and campaign Phewa Lake as a prime tourist destination in the international tourism circle.

15.4 WATERSHED MANAGEMENT PLAN

- **Sediment Reduction:** Sediment and nutrient load from watershed of Phewa Lake has been identified as crucial element for Lake degradation in terms of its size (volume and surface area) and water quality degradation. For the reduction of sediment load, long term measure by constructing a sediment tank with tunnel for hydraulic flushing of annually deposited sediment into Phusre Khola is recommended. Similarly, as a medium term measure, sediment tank for trapping annual sediment load, its excavation and disposal beyond the Lake by using mechanical excavator, front end loader, bulldozer and dump-trucks is recommended. As an immediate measure, excavation of delta and disposal of excavated material to safe location by mechanical means is recommended.
- **Community Based Integrated Watershed Conservation:** About 70% of pollution load into the Phewa Lake is from nonpoint sources, which directly relate with agricultural lands of its watershed. This emphasize vital need of conservation of its watershed and is recommended for rehabilitation of landslide prone areas, improve terrace agriculture, introduce organic farming and integration of watershed conservation activity with income generating activities from collaborative approach.
- **Micro Watershed Conservation:** Micro watershed conservation under watershed management plan at 5 locations of Harpan Khola watershed as pilot site is recommended which will contribute to reduce sediment and nutrient load in the Khola. The works under this includes plantation of soil erosion checking grasses like Vetiver, Napier, etc. at the agriculture terraces, riparian buffer strip and plantation at the bank of tributaries of Harpan Khola, and construction of pond at its inlet in the Khola to act as a sediment and nutrient trap. This pond can also be used for fish production and assist in income generation. Such arrangement will contribute for Peak-cut of runoff during heavy downpours. These activities are suggested to be implemented through active participation of farmers and should be linked with income generating activities.

15.5 ECOSYSTEM CONSERVATION

- **Adoption of Eco-zoning Based Land Use Planning:** Eco-zoning based land use planning enhances conservation of habitat and optimal utilization of ecologically and socio-economically important resources. Division of Lakeshore into development and conservation zones and buffer zoning is recommended. Along the Lakeshore of rural areas, ditch should be constructed in the beginning, which will demarcate the Lake, check encroachment and trap nutrient load. This will protect wetland areas of the Lake.
- **Conservation and Sustainable Utilization of Threatened Biodiversity:** Threatened fish and aquatic plant species along with their habitats should be conserved. Economically useful species should be sustainably utilized through periodic harvesting and bio-manipulation. Due consideration along with information on sustainable ways of fish production, harvesting, storage and marketing should be provided to fishermen families dependent on the Lake.

15.6 MONITORING SYSTEM

- **Institutionalization of an Effective Monitoring System:** An in-built system of monitoring will ensure better water quality control through reduction of imminent problems of watershed and Lake ecosystem. An effective system of monitoring is recommended to ensure the integration of

environmental consideration in projects in timely & cost effective way. The monitoring should be carried out for Lake water quality, hydrology and nutrient loads of inflowing streams, sedimentation of the Lake and erosion from watershed areas.

- **Enforce Regular Monitoring System:** There has been reported cases of skin rash and conjunctivitis of eye upon swimming in the Phewa Lake water as well as cases of mass mortality of fish and outbreak of waterborne disease like typhoid. To get rid of such situation and to improve tourism prospects, there should be not only diversion canal but also an effective regular water quality monitoring mechanism as a safe guard and sustainable preventive measure. For this, collaboration with laboratory of Fisheries Research Center at Begnas is recommended. The lab needs to be strengthened and is accordingly recommended in the Master Plan.

15.7 TOURISM DEVELOPMENT PLAN

- **Promote Ecotourism/Village Tourism:** The Lakeside urban area is recommended to be developed as tourist hub area with development of new tourist destination spots in surrounding areas so as to reduce tourist pressure at Lakeside area only, and in the process support to develop local rural economy through village tourism. This will also help in lengthening the duration of stay of tourists. To promote village tourism, it is recommended to upgrade infrastructure facilities such as easy access, clean lodges, pure water, hygienic organic food, safety, sanitary toilets etc. at touristically important villages.
- **Develop a Walking Trail:** Promenade or short walks/treks around Phewa Lake buffer strip require landscaping with parks, sitting arm chair, lighting, dust bin facility etc. This will enhance aesthetic beauty and Lakeshore stabilization of Phewa Lake.
- **Upgrade Urban-Rural Linkage Road:** There exist need to develop/upgrade Phewa Lakeside urban-rural linkage road such as Khahare- Thulakhet and Sarangkot- Naudana for strengthening rural urban linkage and develop village tourism potentials.

15.8 SOLID WASTE MANAGEMENT

- **Emphasis on Reuse/ Recycle of Solid Waste:** The long term sustainable management of solid wastes generated in urban area is recommended through collection of waste at it's point of generation, practice principle of "Reduce-Recycle-Reuse", and ban use of plastic bags. 'Public-Private Partnership' modality is recommended to carryout waste management system.