CONTENTS

9.1	BASIC POLICY	1
9.2	MONITORING SYSTEM FOR PHEWA LAKE AND ITS WATERSHED	2
9.3	MONITORING SYSTEM OF SOIL EROSION FOR WATERSHED	5
9.4	STRUCTURE FOR THE EXECUTION OF MONITORING WORKS	5
9.5	STRENGTHENING OF FRC LABORATORY	6
9.6	PRIORITY PROGRAM	9

CHAPTER 9

MONITORING PLAN COMPONENT(6)

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

CHAPTER 9
MONITORING PLAN COMPONENT (6)

9.1 BASIC POLICY

9.1.1 Objective

The objective of the Monitoring Plan Component is to regularly and periodically carryout monitoring of Lake water quality, river hydrology, soil erosion from rural watershed area and rate of sedimentation of the Lake. The objective is also to document the monitoring data for future analysis and dissemination. The objective of such regular monitoring will assist in making intervention plans if the quality of water starts to deteriorate or rate of sedimentation exceeds rapidly.

9.1.2 Basic Policy

The basic policies for the formulation of Master Plan for water quality, hydrological, and watershed monitoring are as follows:

- Monitoring should encompass the water level and water quality distribution in the Lake, the flow and load from main inflow rivers, and the discharge load from main pollution sources.
- Meteorological and hydrological conditions in the basin directly affect Lake and river water environment. In view of the significant annual and seasonal fluctuations, monitoring should be regularly and concurrently carried out as much as possible.
- The selection of the monitoring stations should consider water quality distribution characteristics, use of the water area, and load inflow points ascertained from the Study results.
- The monitoring of major point and nonpoint sources of pollution should target urban drain and natural stream inlets locations, which discharge significant amount of sewage/ wastewater and agricultural nutrients in the Lake.
- To emphasize on the continuity of data, existing monitoring stations of relevant agencies such as Fisheries Research Center should be used for future monitoring works.
- Budget should be allocated by relevant Ministries of HMGN, such of Department of Hydrology and Meteorology, Department of Soil Conservation, National Agriculture Research Council etc. to carry out monitoring activities at selected monitoring stations in regular basis.
- Current monitoring activities mainly carried out by the Fisheries Research Center at single cage fish culture area should be extended to urban area also for better coverage and comparison of water quality status.
- A monitoring section under proposed "Phewa Lake Environment Conservation Committee (PLECC)" should be established, which will coordinate with Phewa Lake Conservation Center and Fisheries Research Center of NARC at Begnas and Baidam for carrying out regular monitoring works
- A system for the dissemination of the monitoring data among relevant agencies should be promoted.

- To know trend of water quality improvement or deterioration, water quality data should be posted under "pollution watch" corner of the proposed "Phewa Lake Conservation Center" and should be disseminated for public utility as well as in stakeholder's meetings. This will support for check and balance mechanism.
- The sedimentation monitoring of Phewa Lake was carried out by Integrated Watershed Management Project, FINNIDA during 1992 to 1994. Sthapit and Balla did similar monitoring once in 1998. This type of rate of Lake sedimentation monitoring should be carried out routinely in yearly basis.
- FAO had carried out runoff plot monitoring for sediment flow/soil erosion analysis in 1977-1978, whereas, the monitoring of bed load, suspended load and sediment sampling at landslide areas of Lake watershed has never been done. Thus, these monitoring methods should be carried out regularly every year.

9.2 MONITORING SYSTEM FOR PHEWA LAKE AND ITS WATERSHED

9.2.1 Monitoring Items

Monitoring in the Phewa Lake should cover items such as water quality, aquatic flora/ fauna and organisms, as well as human disturbance level, meteorological and hydrological conditions etc. Database on monitored results should be prepared and disseminated through Phewa Homepage.

The monitoring items proposed for this Master Plan are as shown below.

(1) Water Quality

- In-situ Observation : Transparency, Water Color, Odor, Water Temperature, Conductivity, pH, Turbidity
- Items for Analysis of Water Samples:

  BOD, COD ($k_2Cr_2O_7$), DO, T-N, NO_2-N NH_4-N, NO_3-N, T-P, PO_4-P, Chl- a, Total Coliforms, Faecal Coliform, TSS, Agricultural Chemicals and Pesticides etc.

(2) Meteorological/ Hydrological Conditions at Shoreline Stations

- Meteorology : Temperature, Precipitation, Wind (velocity & direction), Amount of Insulation, Sunshine Hour etc.
- Hydrology : Inflow Load of Rivers/Streams, Discharge, Sediment Load etc.

(3) Soil Erosion and Landslide Monitoring

- Lake Sedimentation
- Surface Erosion in Different Slopes, Land Uses, Cropping Pattern and Cultural Practices
- Sediment Sampling of Major Landslides

(4) Aquatic Lives

- In-Situ Observation: Biotic Community e.g. Aquatic Macrophytes, Fish Species, Other Wild Flora and Fauna
- Items for Analysis of Water Samples : Phytoplankton/ Zooplankton
- Items for Analysis of Sediment Samples : Benthos, Micro Invertebrates

Table I-9.1: Prioritization of Monitoring Parameters

Priority	Monitoring Items	Parameters
A (High Priority)	Water Quality	Transparency, Color, Temperature, pH, BOD, COD, DO, T-N, NH_4-N, NO_2-N, NO_3-N, T-P, PO_4-P, Chl-a, Total Coliform, Faecal Coliform
	Meteorological and Hydrological Conditions	Temperature, Precipitation, Wind (velocity & direction), Water Level, Inflow Load, Discharge and Sediment Load of Rivers Flowing in to the Lake
	Soil Erosion and Land Slides	• Rate and Quantity of Sediment Flow/Soil Erosion. • Depth of Sedimentation Layer on Lake Bottom
B (Medium Priority)	Water Quality	Odor, Conductivity, Turbidity
	Water Quality	Agricultural Chemicals
	Aquatic Lives	Biotic Community, Phytoplanktons
C (Low Priority)	Social Indicators	Waste Management and Organic Farming Practices
	Aquatic Lives	Benthos, Micro Invertebrates
	Meteorological and Hydrological Conditions	

9.2.2 Monitoring Stations

(1) Phewa Lake Water Quality

The Water Quality monitoring stations selected in the Lake are presented in **Fig. I-9.1.** These stations are selected as some monitoring at these stations have been carried out in the past. Thus, these past data will also be relevant for future analysis. Similarly, the stations are also selected based on their potential pollution load as well as to represent the entire Lake area. These stations are:

Station 1 : Dam side/Downstream of Phirke

Station 2 : Lake Reservoir

Station 3 : Lake side

Station 4 : Fish Tail Lodge

Station 5 : Khapaundi

(2) River Monitoring Stations

- Confluence of Harpan and Andheri Khola
- Phirke Khola

(3) Sedimentation/Soil Erosion Monitoring Station

- Runoff Plots (depending on different slope categories, land use and cropping pattern)
- Major landslide areas
  - Chhipchhipe Pani Landslide –Kaskikot VDC
  - Toripani Landslide-Sarangkot VDC
  - Bhirmuni Landslide-Dhikur Pokhari VDC.

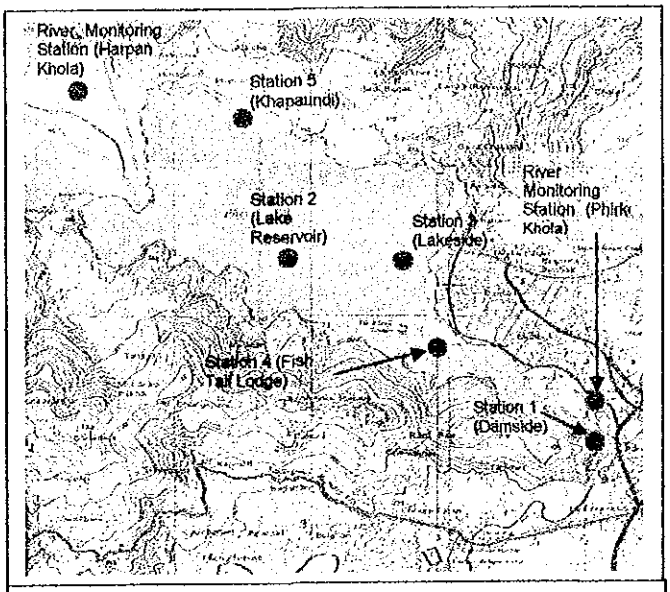


Fig. I-9.1: Sampling Stations at Phewa Lake

9.2.3 Monitoring Frequency

Meteorological and hydrological conditions affect the water quality of the Phewa Lake resulting in great seasonal and annual fluctuations. Due to these significant fluctuations, water quality monitoring should be carried out monthly. To understand annual fluctuations, long-term continuous monitoring should be carried out. The permanent gauge erected by the Study team at Harpan Khola and Phewa canal should be continued to be measured and documented. The monitoring frequency proposed for this Master Plan is as presented below.

(1) **Water Quality**

- **Monthly:** Transparency, Color, Temperature, pH, BOD, COD, DO,T-N, NH_4-N, NO_2-N, NO_3-N, T-P, PO_4-P, Chl-a, Coliform, Odor, Conductivity, Turbidity
- **Yearly:** Agricultural Chemicals and Pesticides eg. DDT

(2) **Meteorological and Hydrological Conditions**

- **Every Hour:** Temperature, Precipitation, Wind (velocity & direction), Amount of Insolation, Sunshine Hour.
- **Every Hour:** Water Level
- **Yearly:** Rivers Before Monsoon and During Monsoon

(3) **Sedimentation/Soil Erosion**

- **Yearly:** Pre-Monsoon and Monsoon Season for Runoff Plots
- **Yearly:** Pre-Monsoon and Monsoon Season for Landslide Erosion
- **Yearly:** Lake Sedimentation Once In Every Year During December (Winter)

(4) **Aquatic Lives**

- **Yearly (Once in Summer):** Biotic Community, Phytoplankton, Benthos etc.

Water Quality Test in progress at Phewa Lake with Van Dorn sampler (November 26, 2001)

Measuring velocity of the waterflow by Current Meter at the gauging site at Pame. (November 24, 2001)

9.2.4 Monitoring Method

It is proposed that entire monitoring of water quality tests and sedimentation tests should be carried out by Phewa Lake Conservation Center under PLECC in-coordination with Fishery Research Center (FRC) of NARC at Begnas and Baidam.

The analysis of the samples will be based on the "Standard Methods for the Examination of Water and Wastewater" (prepared and published jointly by the American Public Health Association, the American Waterworks Association and the Water Pollution Federation).

9.2.5 Monitoring Program

The program includes following:

1. Establish collaboration between PLECC/Phewa Lake Conservation Center and Fisheries Research Center, Pokhara & Begnas
2. Assess the present capacity and resources of Fishers Research Center at Pokhara and Begnas
3. Identify equipment needed to successfully carry out regular and periodic monitoring works at Phewa Lake and its source rivers
4. Procurement of equipment and re-strengthening of the laboratory
5. Human resource strengthening through on-site and other training

6. Carryout regular and periodic monitoring works, documentation and dissemination of data
7. Establish sustainable system by phasing out assistance program

9.3 MONITORING SYSTEM OF SOIL EROSION FOR WATERSHED

Monitoring of soil erosion for watershed would cover

- Runoff plots
- Suspended sediment and bed load sampling in conjunction with the measurement of water discharge
- Sediment sampling at landslide areas
- Lake sedimentation survey (Echo sounding)

9.3.1 Runoff Plots

These are rectangular plots with long axis oriented up slope to sample surface runoff and soil loss directly from major characteristic areas such as slope, soil type, plant cover and cultural practices.

They consists of a border, an element to concentrate runoff at the lower end of the plot and collector.

These should be set up at different slope categories (less than 30%, 30-60% and above 60%, land use types (forest, shrub, pasture, grazing land, cropland and different cropping pattern). Monitoring is to be carried out during pre-monsoon and monsoon season every year.

9.3.2 Bed Load and Suspended Load Monitoring

Bed load and suspended load sampling should be launched at least at three rivers (Harpan, Andheri, and Bentani Kholas) at early and later part of the floods during the pre-monsoon and monsoon period (June-September) every year.

9.3.3 Landslide Monitoring

Sediment sampling should be performed at three landslide areas (one in each VDC) before and after monsoon (July-September) every year. 'Sediment Sampler' positioned at foot of landslide zone is used for its monitoring.

9.3.4 Lake Sedimentation Monitoring

Lake sedimentation survey should be conducted once every year during winter (December) by Echo Sounding method.

9.4 STRUCTURE FOR THE EXECUTION OF MONITORING WORKS

Gaining the cooperation of PSMC, Phewa Trust Fund, FRC and relevant NGOs would be an effective means of instilling interest in participating in water quality improvement activities.

The proposed PLECC should be the principle institution responsible for carrying out routine and periodic monitoring works. The Phewa Lake Conservation Center will be coordinating the monitoring activities with FRC and other relevant HMGN Departments. The database thus prepared will be kept in Phewa Lake Homepage for dissemination.

Based on these aforementioned points of view, the proposed structure for monitoring works is presented in **Fig. I-9.2**.

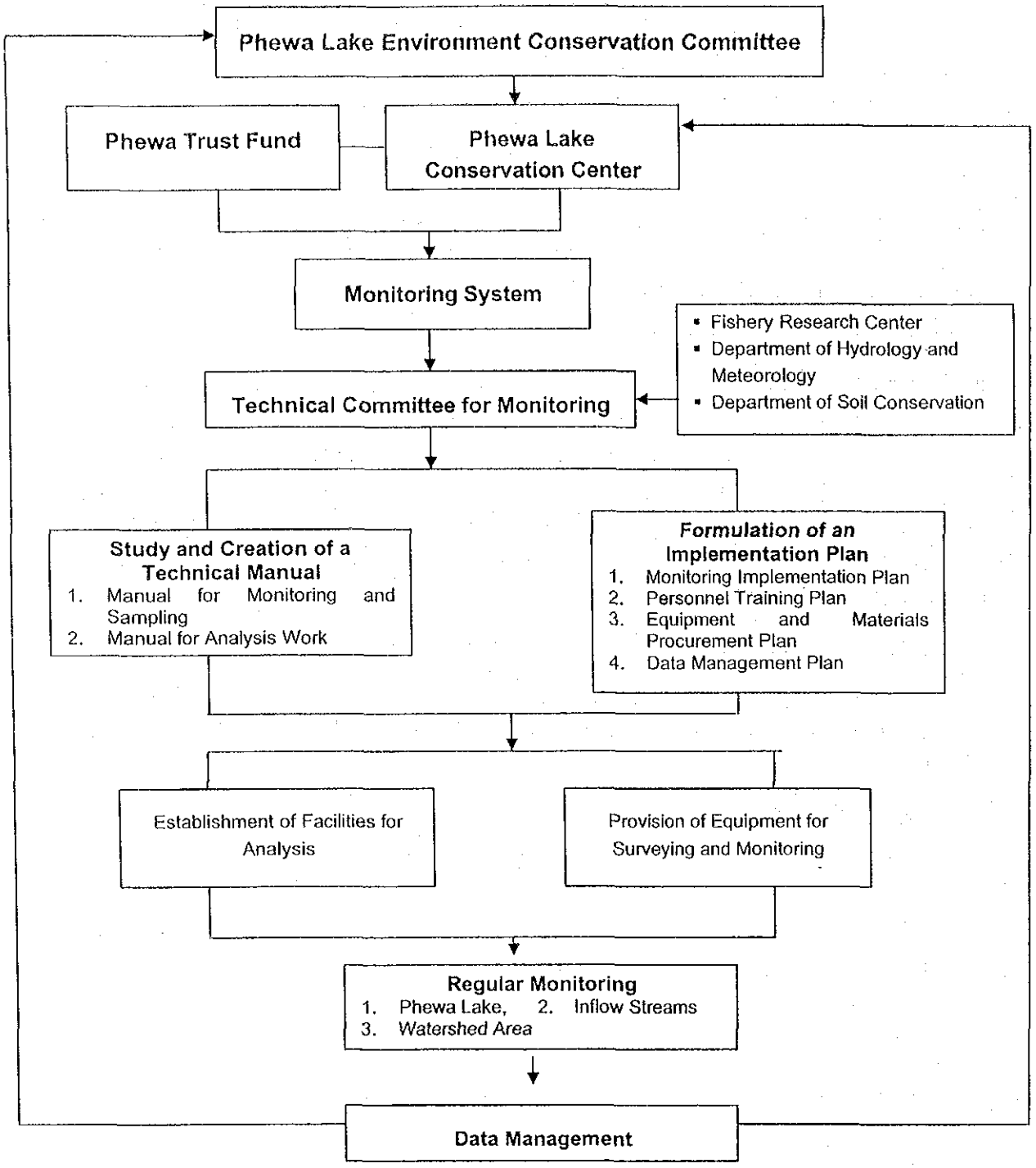


Fig. I-9.2: Implementation System for Monitoring Activities

9.5 STRENGTHENING OF FRC LABORATORY

The water quality testing laboratory of Fisheries Research Center at Begnas under NARC can be utilized for carrying out routine and periodic water quality monitoring of the Phewa Lake. To carryout such activities, the laboratory needs to be re-strengthened regarding its equipment, chemical and manpower

The following **Table II-9.2** presents the equipment available with Fishers Research Center Laboratory at Begnas. **Table II-9.3** presents the required Equipment, Glassware, Chemicals and Media to strengthen the FRC Laboratory. Also presented in the table is cost for procurement of these equipment and other related activities.

Table II.9-2: Available Equipments in Fisheries Research Center Laboratory at Begnas Lake

S. No.	Particulars
1.	Water Sampler
2.	Bottom Sampler
3.	Motor Boat
4.	Spectrophotometer
5.	Incubator
6.	Microscope
7.	Fluorescence Microscope
8.	Autoclave
9.	Dryer
10.	Filtration Unit

Table II-9.3: Required Equipments, Chemicals & Media to Strengthen FRC Laboratory

S. No	Particulars	Quantity	NRs. (,000)
1	Kemmerer water sampler	1 set	80.0
2	Van Dorn water sampler	1 set	80.0
3	pH meter with adaptor & sun charger	1set	64
4	Conductivity Meter	1set	64
5	Turbidity Meter	1 set	104
6	D.O. Meter with probe & detachable cable for depth wise record of temperature	1 set	72
7	Double Beam Atomic Absorption Spectrophotometer	1 set	2400
8	Hollow Cathode lamps: Hg, Pb, Se, Zn, As, Na, K, Mn	Each 1 set	848
9	UV/Visible Spectrophotometer	1 set	200
10	Analytical Electronic Balance	1 set	56
11	COD reflux condenser/R.B Flask & Heating Menthe	10 sets	
12	Kjeldahl condenser/R.B flask & digester	10 sets	104
13	BOD incubator	1 sets	160
14	Refrigerator	1 set	72
15	Distillator	1 set	80
16	Sterilizer (Laminar flow)	1 set	80
17	Membrane filtration portable kit with incubator (Delagua/Millipore)	Each 1 set	144
18*	Disposable Petridish, Absorbent Pad 47 mm Membrane Filter Paper of 0.45 micron, GPC Filter paper	Each 3000 pcs	1680
19*	MFC Rosol c. Acid Broth Ampules	2500 pcs	400
20*	M Endo Broth	8 kg	28
21*	MFC Broth	8 kg	28
22	90 mm Glass	200 pcs	40
23	Automatic Micropipette 20 µl, 100 ul 1000 µl with 5000 tips	Each 2 pcs	80

S. No	Particulars	Quantity	NRs. (,000)
24	*Transferring Pipette 9 & 10 ml*	Each 2 pcs	56
25	Voltage stabilizer	5 pcs	56
26	Stereoscopic Microscope	1 set	48
27	Sedgwick Rafter	100 sets	16
28	Autoclave	1 set	24
29	Hot Plate/Regulator	1 set	12
30	Plankton Net Material 20,30,60,80, 100,200,300 & 400 micron	10 m^2	40
31	30 cm diameter Plankton net	10 set	16
32	Inverted Microscope		48
33	5 cm long cuvette for Spectrophotometer		3
34	Glassware	Lump sum	400
35	Chemicals	Lump sum	400
36	Wooden Boat		96
37	Equipment for Hydrological and Soil Erosion Monitoring such as Installation of Permanent Hydrological Gauges, Echo Sounding Machine, Current Meter etc.	Lump sum	100
38	*Computer/Printer*	1 set	80
39	Stationery/Photo copy paper	Lump Sum	184
40	Remuneration for Sampling & Analysis		80
41	Miscellaneous		696
42	Man Power Training on Water analysis		80
Total			**9,299**

** Item Nos 18, 19, 20 & 21 should be procured on yearly consumption basis.*

Table II-9.4: Remuneration for Water Sampling & Testing: (At Least 7 Sampling Locations)

Personnel	Man Power	Sampling Frequency	Analysis Day Per Sampling	Remuneration Per Diem (NRs.)		Charges (NRs.)		Total Cost (NRs. ,000)
						Field work cost	Lab work	
1. Chemist cum Bacteriologist	1	12/year	15	2000.0	1200.0	24000.0	2,16000.0	240
2. Lab Tech. cum Sampler	1	12/year	15	960.0	640.0	1,1520.0	1,15200.0	127
3. Lab Boy	1	12/year	15	400.0	400.0	4800.0	72,000.0	77
4. Boat Man	1	12/year	15	960.0	-	11520.0	-	12
5. Hydrologist/ Watershed Expert								240
Total								696

Table II-9.5: Total Cost for Monitoring Project

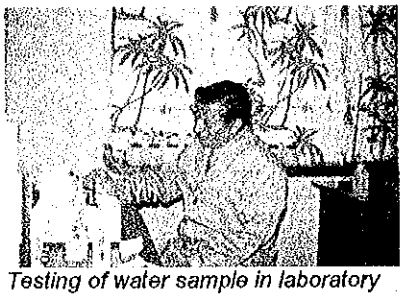
S.No	Particulars	NRs. (,000)
1	Equipment Cost	8,603
2	Remuneration and Testing Cost	696
Total		9,299

9.6 PRIORITY PROGRAM

The priority program for Monitoring Plan is presented below in Action Plan format

Title : **Monitoring for Water Quality Management in Phewa Lake**

Objectives : To regularly monitor water quality of Phewa Lake to assess if it meets the international standard of lake water quality for recreational use and for fishery production, so as to take necessary mitigative action in time, if required.


Testing of water sample in laboratory

Project Duration: 5 years

Phase : 1

Justifications : Phewa Lake is the touristically most important Lake of Nepal accounting about 0.1 million visitors every year. Hence maintenance of its bacterial water quality for recreational value is indispensable. Phewa Lake is a multipurpose Lake in terms of its use in fishery, recreation, irrigation and hydroelectricity generation. Maintenance of its dissolved oxygen level for fishery promotion is quite important. Sediment free transparent water hold high significance for irrigation and hydel plant.

At present, Phewa Lake is a dumping point of municipal drains and solid waste. This has resulted in its ecosystem health in general and water quality parameter in particular deteriorating day by day. If it is not improved from existing condition, this Lake will not be fit for tourism promotion and it will create problem of public hygiene in terms of water borne diseases. High fish mortality will also take place.

Programs: Regular monitoring of Phewa Lake water covering whole Lake area with representative sample sites at monthly , seasonal to yearly variation.

- Re-strengthening of FRC laboratory at Begnas.
- Coverage of water quality parameters may include important all physical, chemical and biological parameter including test on pesticides and heavy metals.
- Laboratory analysis of most parameter at Fishery Research Center at Begnas, Pokhara.
- Parameters like pH, Conductivity, Dissolved Oxygen, Transparency, TN, TP, BOD, COD, Chlorophyll "a", Chloride, Ammonia, etc. at monthly variation.
- Weekly sampling of DO at various depth (up to 20 m depth) during stratification (March-April)
- Monitoring of key water quality parameters of major inlets such as Harpan and Andheri Khola

Location: Phewa Lake whole area including its major inlet rivers and urban drains.

Implementing Agency: PLECC, Phewa Lake Conservation Center, Fisheries Research Center Laboratory- Begnas

Budget: **Total - NRs. 9,299,000**

CONTENTS

10.1	BASIC POLICY	1
10.2	BASIC CONCEPT OF TOURISM DEVELOPMENT	1
10.3	THE BASIC CONCEPT	6
10.4	TOURISM DEVELOPMENT PLAN AND EXPECTED OUTCOMES	7
10.5	MEASURES TO ATTAIN THE LONG-TERM TARGET	8
10.6	ESTIMATION FOR THE PROJECT	8
10.7	RECOMMENDATION FOR RECOVERY OF PROJECT COST	9
10.8	PRIORITIZED PROJECT RECOMMENDATION	9

CHAPTER 10

TOURISM DEVELOPMENT PLAN COMPONENT(7)

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

CHAPTER 10

TOURISM DEVELOPMENT PLAN COMPONENT (7)

10.1 BASIC POLICY

10.1.1 Objectives of the Basic Concept

Environmental degradation of Phewa Lake has become conspicuous since last three decades, because of the uncontrolled growth of Pokhara. Unplanned tourism growth, as a part of this urban expansion in the watershed area and specially along the Lakeside is partly blamed for this. 'Tourism', at the same time, will be the hardest hit sector among all other trades; in scale and impact by the degradation of the Lake environment. In spite of that, 'Tourism' is also the biggest sector that can create an effective forum (both political and social), and fund for contributing to the conservation initiatives. This Study has, therefore, formulated a concept for Tourism Development with the following objectives to:

- support the environmental conservation of Phewa Lake.
- increase the number of tourists and income there from.
- sustain, and expand tourism development around the Lake through introduction of new tourism products and better service standard.
- establish a base for information and promotion of the Lake.
- increase the quality of life of the Community through tourism.

10.1.2 Basic Policies within the Basic Concept

Following policies will be adopted to achieve the above objectives.

- Tourism development in Pokhara should continue with proper understanding of its relation with the environment of the Lake.
- It should take maximum benefit from the Lake, but in no case at the cost of the Lake itself.
- Local communities both from the urban and rural areas should be involved in the tourism development plan of their respective areas.
- The linkage between the urban and rural areas should be strengthened through income generating, tourism related activities.
- New tourism products should be introduced regularly.
- Information dissemination and promotional activities like establishment of information documentation and dissemination center, organizing Phewa festivals and international sports etc. should be initiated to sustain the effort of conservation and get support from both the tourists and local community alike.

10.2 BASIC CONCEPT OF TOURISM DEVELOPMENT

Phewa Lake in Pokhara has been the most attractive site after the Himalayas for the foreign tourists, and top tourist destination for the domestic tourists. Phewa Lake is therefore, a synonym to tourism in Pokhara.

Tourism development activities in Pokhara are concentrated to the west side of the airport and basically in the Lakeside and Pardi Damside area. These areas in 1974 had very few houses. With the advent of tourism, this once sleeping village turned into a vibrant and hub of tourism related activities. Construction of a new road from Prithivi Chowk to Hallan Chowk brought this area nearer to the town thereby, opening up additional land for further development.

Pokhara is visited by, in average, 22 per cent of the total tourist arrived in the country, thus maintaining itself as the second tourist destination in Nepal (see **Table I-10.1** and **Fig I-10.1)**

Table I-10.1: Tourist Arrival in Pokhara

Year	Total Number in Nepal	Pokhara	% Increase
1990	254,885	59,488 (23)	
1991	292,995	62,138 (21)	+5
1992	334,353	69,049 (21)	+11
1993	293,567	56,499 (19)	-18
1994	326,531	59,201 (18)	+5
1995	363,395	63,782 (18)	+8
1996	393,613	86,504 (22)	+36
1997	421,857	92,717 (22)	+7
1998	463,684	103,900 (22)	+12
1999	491,504	105,546 (21)	+1.6
2000	463,646	95,095 (21)	-11
2001	363,970*	93,731(22)	

Source: *Nepal Tourism Statistics, 2000; MoCTCA Tourism Office; MoCTCA*

*Note: - * figure for 2001 was extrapolated from the number of arrivals by air (NTB), for Pokhara - Tourism Office, Pokhara (Gorkhapatra Feb. 4, 2002)*

- number in the parenthesis is the percentage of total arrival in the country

The sudden drop of tourists in 1993 (-12.2% in the total tourist arrival and –18% in Pokhara) can be attributed among others, to the THAI and PIA (Pakistan International Airlines) air-crash near Kathmandu. Despite this drop in tourist arrival in the country, the percent of total tourists visiting Pokhara was maintained in general.

Although, the rise in the total tourist arrival in 1996 was not more than 8.3 percent, the sudden rise of the tourists arrival in Pokhara (+36%) is because of the increase in air seats provided by private airlines established sine 1992 and upgrading of the Pokhara airport. The airport was not fully operable from 1993 to 1995 because of the upgrading works, so the increase was also not high.

Factors including political unrest, continuous strikes in the country, bubonic plague epidemic in India, the Indian Airlines hijacking was unpleasant to the tourism industry, resulting in gradual decrease in growth of tourists arrival since 1999 (from +12% in 1998 to +1.6% in 1999 and –5.7% in 2000).The Royal carnage, the incident of September 11, 2001 in New York, increase in terrorist activities in the country, and the declaration of emergency rule brought disaster to this industry. The tourists' arrival in 2001 consequently became more alarming, which is estimated to be –21.5% of the previous year

(2000). Although, total tourists' arrival decreased in Pokhara in 2001, nevertheless, number of Japanese tourists during the same period increased from 11,006 by 32% to 14,542.

As it is a prioritized economical sector of HMGN, and the Nepal Tourism Board has aggressive promotional program, there is sufficient hope for its improvement, if the national and international situation improves or at least does not deteriorate further(**Table I-10.2**).

It is assumed that per annum growth of tourists will be in the range of 5% to 8%. Total tourist arrival in the country fell by 16% in 2001, due to various reasons mentioned above and the inflow of Indian tourists decreased by 30% during the same period (**Table I-10.2**).

Table I-10.2: Estimated Tourist Inflow in Pokhara

Year	Without Project			With Project		
	Total Tourists	Non-Indian	Indian	Total Tourists	Non-Indian	Indian
2001	93,731	77,853	15,878	93,731	77,853	15,878
2002	93,731	77,853	15,878	93,731	77,853	15,878
2003	95,606	79,410	16,196	95,606	79,410	16,196
2004	97,518	80,998	16,519	97,518	80,998	16,519
2005	99,468	82,618	16,850	99,468	82,618	16,850
2010	115,311	95,777	19,534	133,111	110,562	22,549
2015	133,677	111,032	22,645	178,132	147,957	30,176
2020	162,638	135,087	27,551	227,347	188,834	38,512
2025	197,874	164,354	33,520	290,159	241,006	49,153
2030	240,744	199,962	40,782	370,324	307,591	62,733

Note:

1. Total Tourists Visiting Pokhara

2001	*93731*
Indian	*15878*
Non-Indian	*77853*

	Without Project	*With Project*
2. Growth Rate (2003) per Annum	*2%*	*2%*
3. Growth Rate (2004-2005) per Annum	*2%*	*2%*
4. Growth Rate (2006-2015) per Annum	*3%*	*6%*
5. Growth Rate (2016-2030) per Annum	*4%*	*5%*
6. Entry Fee (Rs.) for Non-SAARC Tourists		*200*
7. Entry Fee (Rs.) for SAARC Tourists		*50*

The tourist arrival figures (**Table I-10.1**) do not include Indian and domestic tourists. Considering the fact that Indian tourists account to 30.2% of the total third countries tourists, the number of Indian tourists can be estimated as given below in **Table I-10.3**.

Table I-10.3: Indian Tourist Arrival in Pokhara

Year	Indian Tourists	Total Tourists (Excl. Domestic Tourist)
1999	29,698	135,244
2000	25,675	120,770
2001	15,875	93,731

***Source**: Tourism Office, Pokhara (Gorkhapatra, Feb. 4, 2002).*

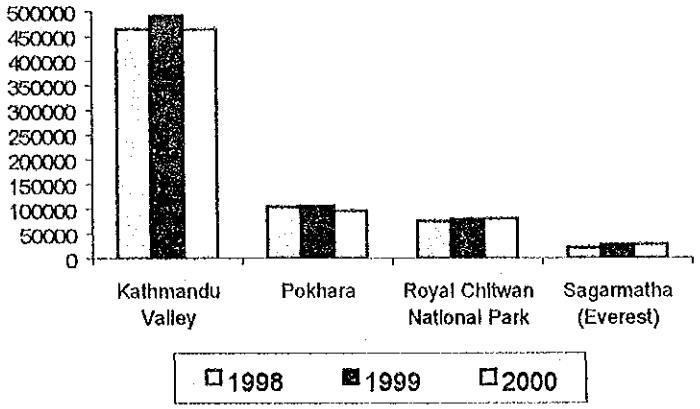
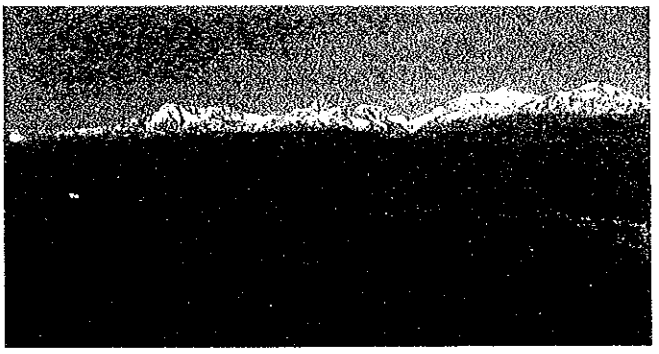


Fig. I-10.1: Comparison of Tourist Flow to Different Destination

The strong points for tourism development in Pokhara are:

- Beautiful view of the Himalayas,
- Beautiful landscape of the lower hills,
- Phewa Lake and its environ,
- Main route for trekking to the Annapurna Conservation Area,
- Presence of shorter trekking routes around Pokhara,
- Mixture of friendly people of different ethnicity,
- Good number of tourism related infrastructures (hotels, restaurants, travel and trekking agents, road and airport).



Phewa Lake with Fishtail Mountain at the backdrop.

There are 348 classified and tourist lodges providing 4403 rooms, whereas only 226 of them are registered. Numbers of Travel and Trekking Agency are 41 and 32 respectively. Employment in this sector is given in the following **Table I-10.4.**

Table I-10.4: Employment Scenario

Establishment	Number of Employees
Hotels, Lodges	2,301
Travel Agents	369
Trekking Agents	288
Total	2,958

(Source: Tourism Office, Pokhara)

The occupancy has fallen from 40% in 1995 to 26% in 2000. The average length of stay is only 2.5 days.

During the last few decades, undesirable developments have given rise to some weak aspects for tourism in Pokhara, which are listed below:

- Degradation of Lake side area and urbanscape as a whole, due to its uncontrolled growth,
- Pollution of Phewa Lake, both from urban and rural areas. It is now not safe for swimming and drinking purposes.
- The risk factor for the aesthetic and consumer value of the Lake is increasing,

- Condition of municipal infrastructures is not good and also is inadequate,
- Pokhara is now crowded and noisy,
- Lack of development for new additional tourism products,

Pokhara, A Valuable Asset of the Country

Pokhara valley by its location and natural beauty occupies a very important position among the settlements of the country. This a unique place because;

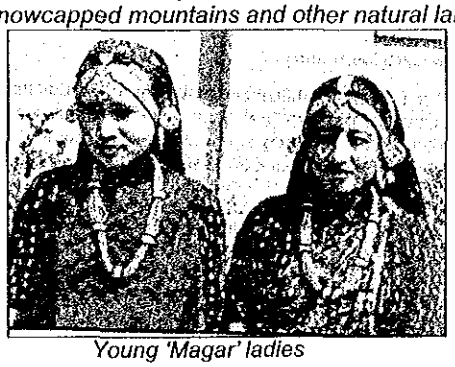
Natural

- *It has got one of the most magnificent views of high snow capped mountains in the world.*
- *This is the only place in the world from where one can enjoy three eight thousand meter high mountains. (Dhaulagiri, Annapurna, Manaslu)*
- *Phewa Lake in Pokhara is the second biggest lake of the country and the biggest in the valley.*
- *There are seven more lakes not far from Phewa Lake. Phewa Lake including these seven Lakes are the most easily accessible lakes in the country*
- *Phewa Lake is among those lakes, where one can witness the breath taking reflection of the snowcapped Himalayan mountains, in all seasons.*
- *Deep and narrow gorge made by the Seti River and its sudden and occasional widening is spectacular.*
- *Spectacular view of disappearance of Phewa river into the ground in David's Fall is a unique experience for all visitors*

David's Fall

Social and Cultural

- *This place has a unique mixture of people of different ethnicity*
- *Cultural and social capital of Pokhara is very much influenced by the beauty of Phewa Lake, the snowcapped mountains and other natural landscape of Pokhara*

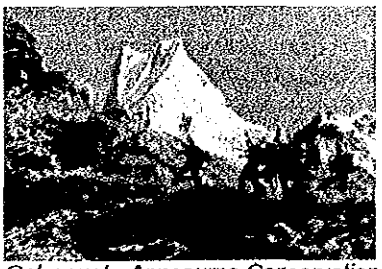


Young 'Magar' ladies

'Gurung' women

Political

- *Pokhara is the Regional Center of western development Region of the country*
- *Pokhara is the district headquarter of Kaski district*



Gateway to Annapurna Conservation Area trekking

Economic

- *Pokhara is the second tourist destination of the country after Kathmandu Valley and the gateway to Annapurna Conservation Area*
- *Pokhara is well connected by road and air to all parts of the country*
- *Pokhara has good telecommunication network with the rest of the country as well as the world.*

- Although, tourism accounts to 16% of the income of Pokhara, it does not have strong linkage with local economy, and more so, with the watershed area of the Lake within the Village Development Committees.

Phewa Lake and tourism are formidable intermingled economical forces in Pokhara. Tourism Development Concept therefore, will address the above mentioned strong and weak aspects, taking into consideration the future urban growth of Pokhara as a regional center.

10.3 THE BASIC CONCEPT

- Phewa Lake watershed area, both within the VDCs and Pokhara Sub-metropolis, is the integral part of tourism development of Pokhara.
- Tourism development in the watershed area of Phewa Lake will be based on the land use plan of Pokhara Sub-metropolis and zoning of the rural watershed area.
- Tourism development in Pokhara will increase the income of the people by maximum utilization of local resources but without depleting the natural environment or without decreasing its value for the use of future generation.
- Environmental and sanitation awareness program will be a part and parcel of tourism development.
- Tourism service standard will be introduced and maintained through appropriate regulation and training.
- Ecotourism/village tourism approach will be adopted for the tourism development in Pokhara and specially in the VDCs.
- Benefit and access to the Lake area will be based on the contribution to the conservation of the Lake.
- Maximum use of local products and manpower.

The basic concept of tourism development plan is presented in following **Fig. I-10.2.**

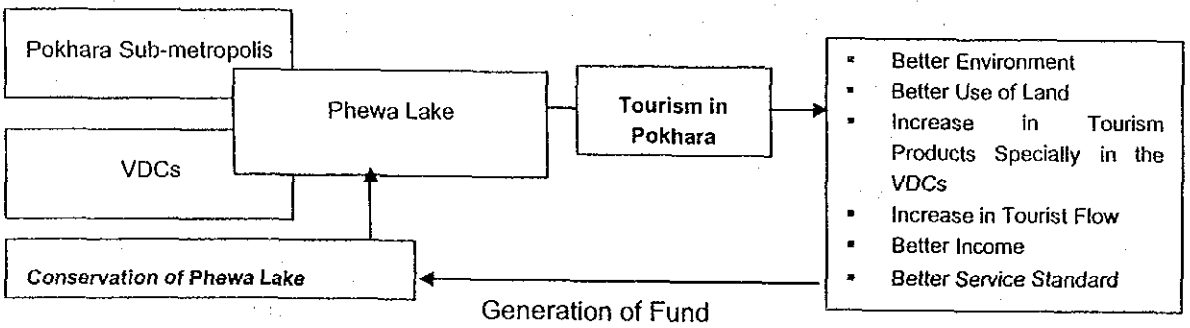


Fig. I-10.2: Basic Concept of Tourism Development Plan

Fig. I-10.2 and the experience (Refer **Chapter 12** of **Part I** of this Report) has proved that tourism can play the major role in contributing to the conservation of the Lake through creating appropriate forum and generating significant amount of fund for the purpose.

10.4 TOURISM DEVELOPMENT PLAN AND EXPECTED OUTCOMES

10.4.1 Tourism Development Plan

Following Fig I-10.3 presents the tourism development plan.

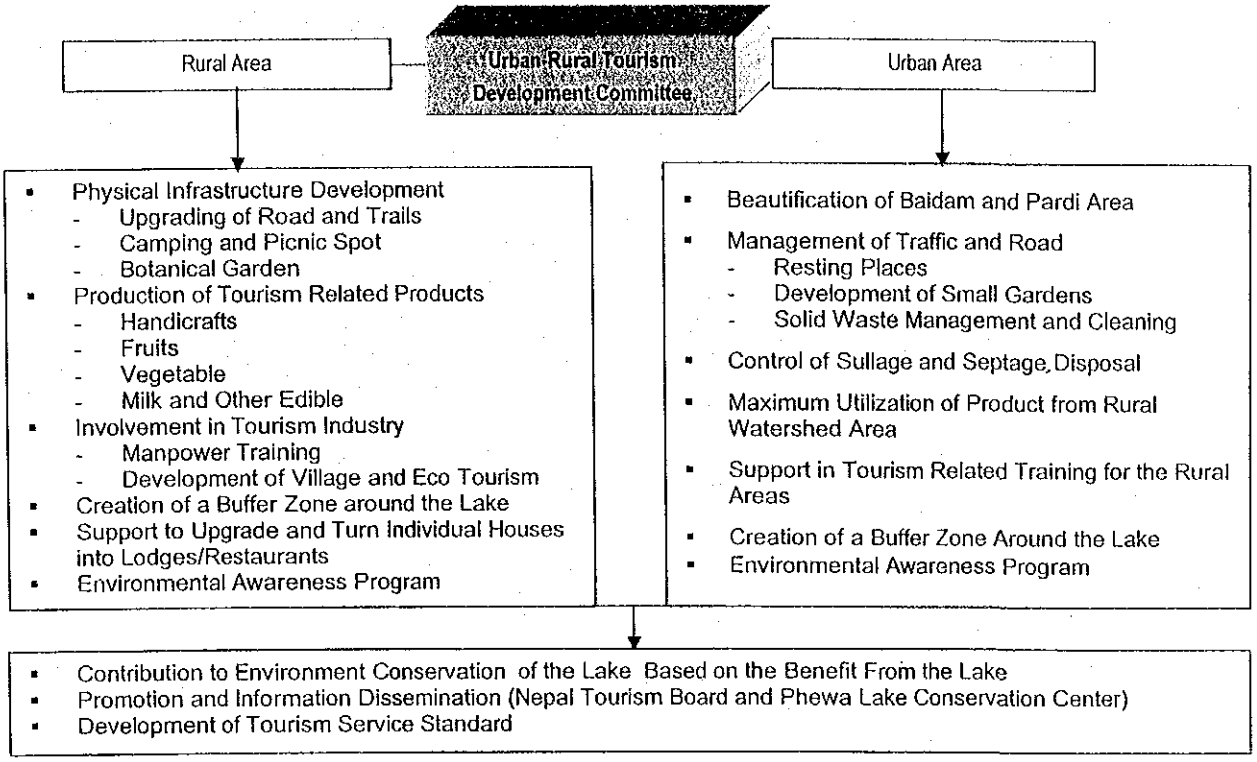


Fig I-10.3: Tourism Development Plan

10.4.2 Expected Outcomes

- Proposed Tourism Development Plan will in the first place contribute to the prevention of environmental degradation of the Lake and so will sustain the income from tourism.
- It will also help in distribution of tourism related income to the village level.
- It will help in the physical development of the watershed area (e.g., roads, trails, trekking routes around the Lake, landscaping in the Lakeside area, sewerage and sanitation system, camping sites, picnic spots and others) and create a conducive environment for sustainable tourism development as well as add clean and beautiful physical asset to the VDCs and the Pokhara Sub-metropolis.
- Tourists will stay longer in the vicinity of the Lake.
- It will help to increase the carrying capacity of the Lakeside area, therefore, add to the increase in visitors number.
- Create a base for further development through consultation among different stakeholders and promotion through information dissemination.

10.5 MEASURES TO ATTAIN THE LONG-TERM TARGET

The basic achievements through the implementation of the plan are (i) good lake environment, and (ii) increased income through tourism as stated in Sub-section10.4.2.

Increase in income from tourism, however, depends upon (i) good service standard (ii) increase in number of tourists, and (iii) longer stay of the tourists. This can be achieved, together with what has been explained in Sub-section 10.4.2 through the implementation of the following measures:

- A buffer zone will be created around the Lake. This zone will be a recreational area for the visitors and a step towards checking the encroachment of land adjacent to the Lake.
  - Lakeside area from Pardi to Gaira Chautara will be properly landscaped to maintain it as the tourism center of Pokhara.
  - Tourism activities will be expanded further from Gaira Chautara and Sarangkot to the rural areas to cater both the foreign and domestic tourists, through ecotourism approach.
  - Upgrading of the existing roads, trails to Sarangkot, construction of campsites, picnic spots, and other facilities will be provided.
  - Incentive (loan) for providing guest rooms with proper sanitary and kitchen facilities in the existing residential houses will be given.
- Nepal Tourism Board will support the tourism development and promotion of this watershed area.
- Provide information on watershed area of the Lake and Pokhara Valley
- Regular promotional activities like Phewa festival, boat racing and others.
- Establishment of botanical garden around the Lake.
- Formation of self-help and Community group in VDCs and municipality.

- Formation of Phewa Lake Tourism Committee comprising members both from VDCs and PSMC.
- Adherence to the existing Land Use Plan, Construction and Sanitation By-laws.
- Formulation of Tourism Service Standard and its implementation.

10.6 ESTIMATION FOR THE PROJECT

The estimation for the proposed project will be calculated at the later stage of Study.

S. No.	Item	Activity	Estimated Cost (NRs. '000)
1.	Buffer Zone Creation	Demarcation, land acquisition around the Lake	220,000
2.	Lakeside footpath in the buffer zone	Paved footpath from Basundhara park to Khapaundi with proper drainage	10,000
3.	Landscape in Lakeside area	Upgrade chautaras, gardens, benches, signposts & lamp-post, and underground wiring	8,000
4.	Phewa Lake Community Road upgrading	1).Upgrading of road (6 m wide) from Hallan Chowk to Thulakhet with proper drainage and (18 km) environmental care	90,000
		2).Lakeside road (2.5 km); Sarangkot to Naudanda (16	Lakeside road(2.5km) is being implemented

S. No.	Item	Activity	Estimated Cost (NRs. '000)
		km) upgrading with proper drainage and environmental care.	by PEIP. Sarangkot-Naudanda 100,000
5.	**Eco-tourism component** **a)** Tourists trail	Khapaundi-Sarangkot – 2 km Chankapur-Naudada – 3 km Chankhapur, Pame-Anadu-World Peace Monastery-Chorepatan-Raniban-Dams side (Total 25 km)	10,000
	b) Campsite and picnic spot	8 nos, equipped with toilet & kitchen	2,500
	c) Loan and other incentive for upgrading houses to lodges (village tourism)	Loan to upgrade toilets, kitchen bed room and other for 20 households	10,000
	d) Establishment of botanical garden	Establishment of such garden as recommended by IUCN	Further study necessary
	e) Establishment of Phewa Lake Tourism Development Committee	Formation with participants from VDCs also	-
6.	Promotion of Phewa Lake	Promotion through **Phewa festival** and support from NTB	-

10.7 RECOMMENDATION FOR RECOVERY OF PROJECT COST

The following options for the recovery of the project cost are suggested.

- Entry fee to the Lake be collected from the visitors.
- Environment conservation be charged to the tourism related enterprises and landowners in the lakeside area.
- Fee be collected for the use of camping sites and picnic spots.
- Vehicle entry fee be collected in the Lake side area for the promotion of tourism.
- As the Government, Nepal Tourism Board, and PSMC as well as DDC will benefit from the tourism development in Pokhara , these institutions will also contribute for the cost recovery of the Project.

10.8 PRIORITIZED PROJECT RECOMMENDATION

(1) Title: Eco-tourism/ Village tourism development in the rural area of the watershed (Fig I-10.3)

Aim: To expand tourism in the rural area of the watershed through ecotourism approach. It is anticipated that this will involve the rural community in tourism industry. This will help in increasing their income and generate direct interest and involvement in the conservation of the Lake.

Phase:

- 1st Phase - Community mobilization
- 2nd Phase - Start construction and involvement in other software activities

Project Duration:

- 1st Phase - 1.5 years
- 2nd Phase - 2 years

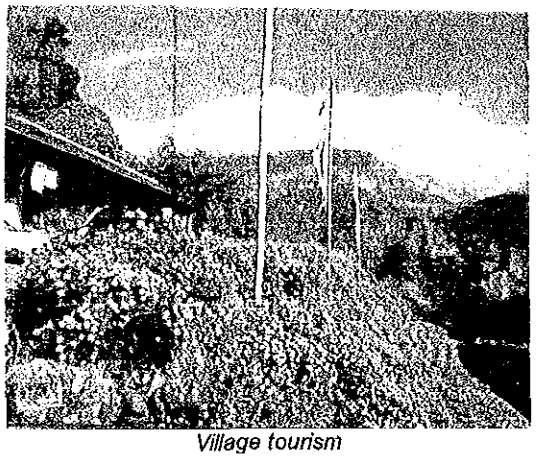
Justification:

Conservation of Phewa Lake is directly linked with tourism industry. Similarly, it is linked with the activity both in the rural and urban area. This linkage is strong and direct in the urban area but is not so for the rural area. Expansion of tourisms development without depleting the natural environment in the rural area will create visible and strong linkage between the economic uplift of the rural area and the Lake. This will also help in exposing the untapped resources of the rural area manifested in the socio-cultural as well as in its natural richness.

Scope:

It includes the following major actions

- Mobilization and Awareness of the local community
- Development of picnic spots and campsites with proper toilets, kitchen and garbage pits.
- Training for income generating activities and tourism trade
- Provide loan to upgrade and transfer the individual houses into lodges and restaurants. This will help in the development of village tourism in the long run.



Village tourism

Location : Watershed area of the Phewa Lake

Responsible Agencies: PLECC, VDC and local community

Budget : (NRs. ,000)

30,000,000

(2) Title : **Beautification and Lakeshore Planning (Fig. I-10.4, I- 10.5)**

Aims :

- Open the Lakeshore for all visitors to enjoy the beauty of the Lake
- Create an ambience of peace, beauty, recreation and relaxation
- Save the Lakeshore from encroachment and undesirable development
- Help in lengthening the visitors stay in the vicinity of the Lake and encourage them to visit beyond the municipality towards the rural areas.

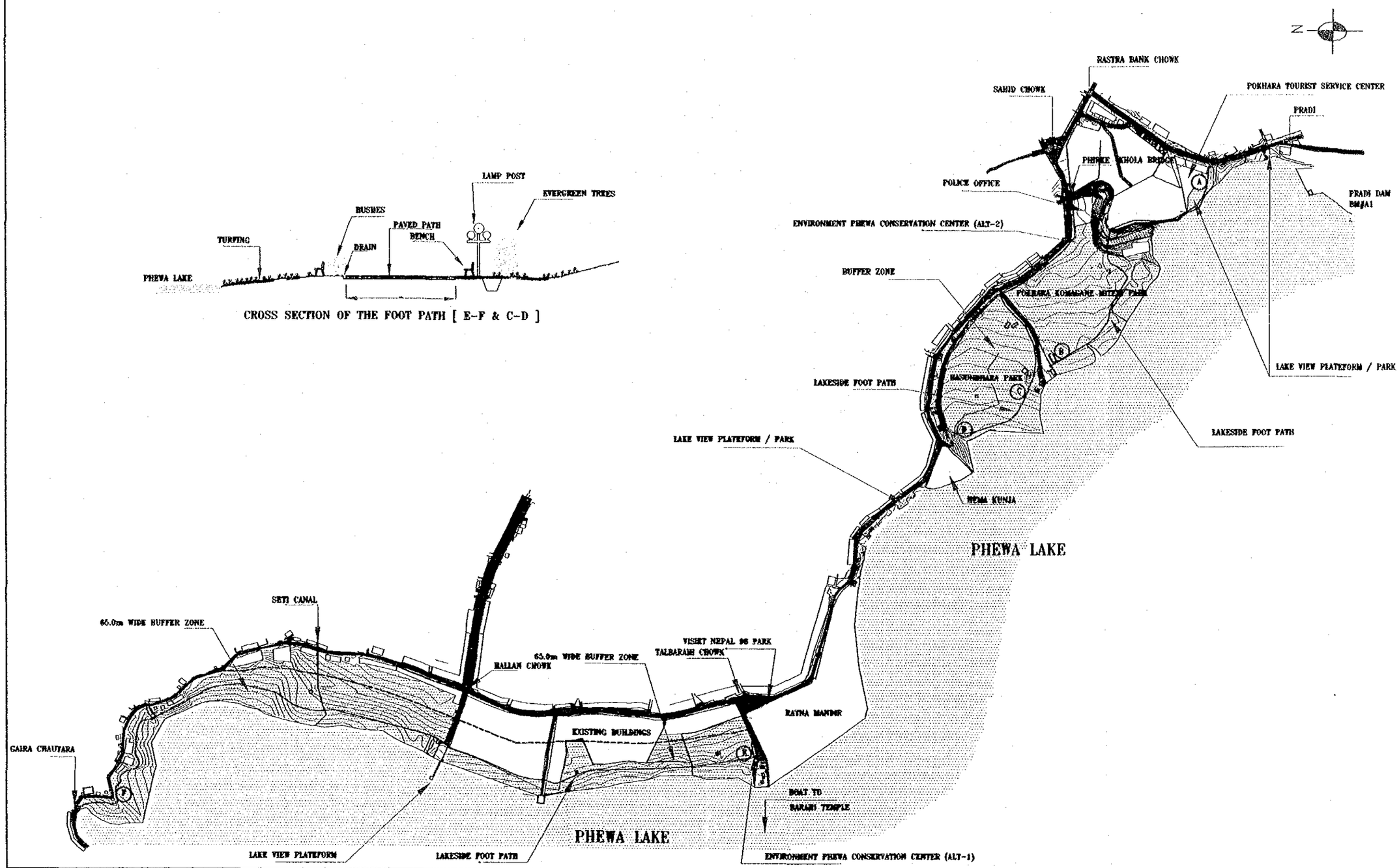
Phase :

- 1st Phase - Land acquisition around the Lake
- 2nd Phase - Lakeshore demarcation, beautification of Lakeside
- 3rd Phase - Physical construction and beautification

Duration:

- 1st and 2nd Phase- total two years
- 3rd Phase – one year

CROSS SECTION OF THE FOOT PATH [E-F & C-D]



JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	THE DEVELPOMENT STUDY ON THE ENVIRONMENTAL PRESERVATION OF PHEWA LAKE POKHARA NEPAL	DRAWING TITLE: LAKE SIDE BUFFER ZONE & FOOT PATH	PARTICULAR	DESIGN BY:	CHECKED BY:	APPROVED BY:	SCALE	SILT Consultants (P) Ltd. Baneswor,Kathmandu,Nepal P.O Box: 2724 Fax: 977-1-473573 Phone: 473573 , 470866 , 487598,495163 E-mail:silt@mos.com.np Web:www.silt.com.np	Fig. No. I-10.4
			NAME	Mr.	Mr.	Mr.			
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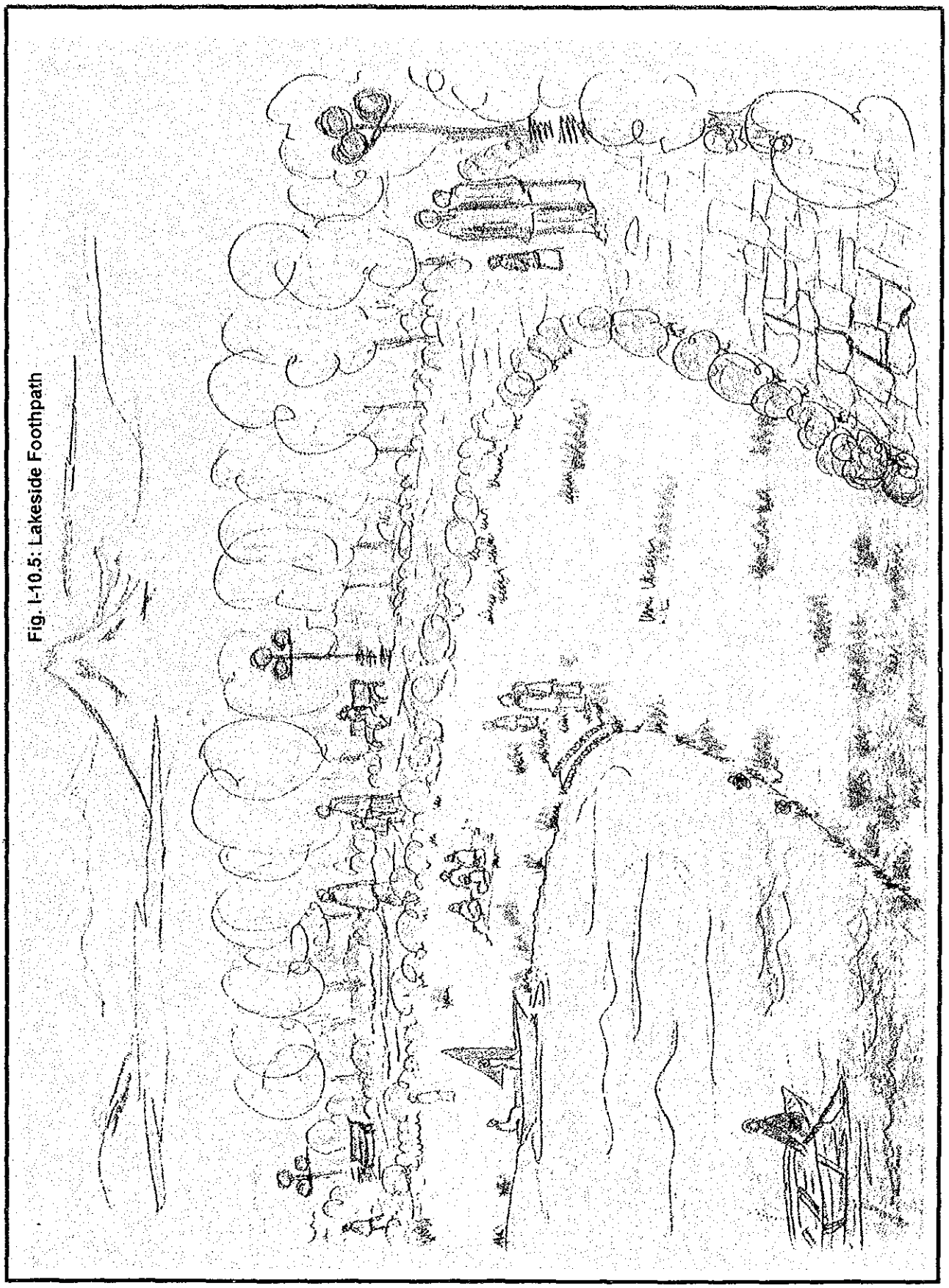


Fig. I-10.5: Lakeside Foothpath

Justification:

Uncontrolled growth along the Lakeside has virtually blocked the view of the Lake from the visitors. Encroachment of the Lakeside has destroyed the Lakeshore, increased its pollution (solid waste and drains from toilets) thereby endangering the aesthetic value of the Lake. If such development continues in future also, the Lake may not attract visitors giving a death blow to the thriving tourism industry and consequently to the income of the people. Buffer zone creation and beautification of the Lakeside area will help in creating better physical and recreational environment around the Lake. Visitors then will be attracted to stay longer.

Scope:

- Beautification of Pardi-Baidam Lakeside streets which will include:
  - traffic control and creation of recreative promenade
  - garden and resting places to enjoy the Lake
  - upgrading of chautaras, plantation of trees and flowers
  - street lighting(under ground wiring included) and sign post.
- Creation of buffer zone on the eastern side of the Lake. The width of the zone will be as decided by DDC and PSMC (65 m in urban and 30 m in rural area). Acquisition of the land and demarcation will precede its creation. Proper landscaping with flower gardens, paved foot path along the Lakeshore in the buffer zone with proper drains, and footpath lighting will also be done in this zone.

Location:

- Pardi-Baidam Road
- Eastern Lakeshore

Responsible Agencies: HMGN/CDO's Office, PLECC, DDC and PSMC

Budget:	(NRs. ,000)
▪ Land Acquisition and Demarcation –	220,000
▪ Landscaping and Beautification including Underground Wiring	18,000
TOTAL	**238,000**

(3) Title: Lakeside Community Road Upgrading

Aim :

Easy access to rural area and upgrade the linkage between urban and rural area

Phase :

1st – Gaira Chautara – Thulakhet (18 km)

2nd – Sarangkot-Naudada (16 km)

Project Period:

1st Phase – 2 years Total – 3 years (with overlapping)

2nd Phase – 2 years

Justification:

Rural area of the watershed is at present handicapped by lack of accessibility to the urban area. It is manifested in low economical and social interaction with the PSMC. The most distinguishable

symptom is absence of its linkage to the thriving tourism industry. Easy and comfortable access to these areas is one of the reason that has hindered the use of its potential as an effective tourism product and supplier of common goods to this industry. Upgrading of the existing road will help to attract the visitors in Pokhara to these areas giving significant impact to its economic uplift.

Scope:

Upgrading of existing roads with proper drainage and environment protection measures. Available local manual labor will be used to the possible extent.

- Gaira Chautara – Pame - Thulakhet 18 km.
- Sarangkot – Naudanda 16 km.

Responsible Agencies:

PLECC / VDC and HMGN, Department of Roads.

Budget:	(NRs. ,000)
▪ Gaira Chautara – Pame - Thulakhet	90,000
▪ Sarangkot – Naudanda	100,000
TOTAL	**190,000**

The Lake area zoning and activities around the Lake is presented in **Fig. I-10.6.**

CONTENTS

11.1	BASIC POLICY	1
11.2	OBJECTIVE	2
11.3	EXPECTED OUTPUT	2
11.4	ENVIRONMENTAL EDUCATION PROGRAM COMPONENTS	4
11.5	IMPLEMENTATION SCHEDULE	20

CHAPTER 11

ENVIRONMENTAL EDUCATION AND CAPACITY BUILDING PLAN COMPONENT (8)

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

CHAPTER 11
ENVIRONMENTAL EDUCATION AND CAPACITY BUILDING PLAN COMPONENT (8)

11.1 BASIC POLICY

There is realization that the environmental degradation in the Phewa Lake is posing risk to its existence, and that such trend must be stopped. The Study has identified that

- real issues of managing the Lake and its environment have not been practically and adequately addressed;
- environmental awareness and capacity at various levels from the communities and other stakeholders to the policy-level people are inadequate; and
- there is lack of proper mechanism, capacity, resources and systems of conserving its environment.

There is, therefore, demand that the awareness and capacity building program be integral initiatives of the environmental conservation and improvements. The management of the lake environment without the involvement of local people in terms of securing their understanding, cooperation and participation encounter conflicts and problems. The political interests are more on physical development and public interest on human development. The Study has identified that emphasis should be on the environmental education, helping the communities and stakeholders understand the situation, stimulate the participation and work out the measures for improving the situation.

The planning of the environmental education and capacity building has been basically done considering the following parameters:

- Existing environmental conditions and problems of the Phewa Lake and its watershed areas; and their causes and sources.
- Level of awareness, behavior and practice of the people causing environmental degradation.
- Existing and past programs and efforts of environmental education and improvements and capacity building.
- Experience gained from the field.
- Felt and experienced needs, types, and methods for the programs.

Based on these, the following basic policy has been adopted:

- Responsibility sharing-oriented approach will be used for educating and motivating the people and strengthening local capacity.
- The local authorities, related governmental agencies, NGOs, CBOs etc. who are undertaking some activities covering environmental issues will be strengthened, enabling them to undertake the result-oriented and action-oriented environmental education and capacity building activities.

- Some environment programs have been successfully conducted, from where the proposed plan will be built on by maintaining the continuity of past efforts.
- A lead institute will take-up the responsibility of mobilizing and integrating the scattered efforts of local NGOs and CBOs.
- The methods for environmental education and capacity will focus on actual learning experiences, commitment for action on whatever learned and applicable, and undertaking the commitment into real practice.
- Together with the awareness, the systems to adopt the awareness into real practice will be in place and accessible to the people.
- All possible sources including schools, NGOs, CBOs, women groups, government bodies and private-public sectors will be mobilized.
- Appropriate tools, materials and methods of rural urban linkages and mechanism of associating lake conservation with individual and community advantages will be used.
- The environmental education and capacity building program will have to differently approach to the people with lower level of exposure to environmental education, illiterate people and with exposure to environmental education but without behavioral adoption of learning.
- The basic educational and capacity building activities can provide an essential foundation upon which the community participation for local development activities could be effectively mobilized. Similar program has proved of being able to provide the multipurpose effect. The environmental education and capacity building program therefore will be the foundation activity of all types of conservation initiatives.

11.2 OBJECTIVE

The **primary objective of development study** on environmental education and capacity building includes the preparation of a comprehensive environmental education and capacity building plan for sustainable environmental conservation of Phewa Lake and its watershed areas helping to enhance the quality of the life of the people in these areas.

The **general objective of the environmental education and capacity building program** will be to contribute to the sustainable environmental conservation management of the Phewa Lake and its watershed areas through the promotion of action-oriented environmental awareness and capacity building.

11.3 EXPECTED OUTPUT

More specifically, the implementation of the environmental education and capacity building plan will achieve the outputs as presented in following **Fig. I-11.1**.

- The study has identified drawbacks and lacking in adopting government strategy and policy at field level. The program will therefore set the practical and appropriate examples of improving and adopting the government strategy/policy and developing practical support system.
- There are a lot of educational and extension materials developed by government and non-government agencies which are often not used practically and appropriately at field level and usually not available in the field at the time of needs. In other hand field workers are hardly efficient in handling and disseminating the messages and contents of the materials. The proposed program will therefore work in utilizing the supply of existing inputs practically at field level.

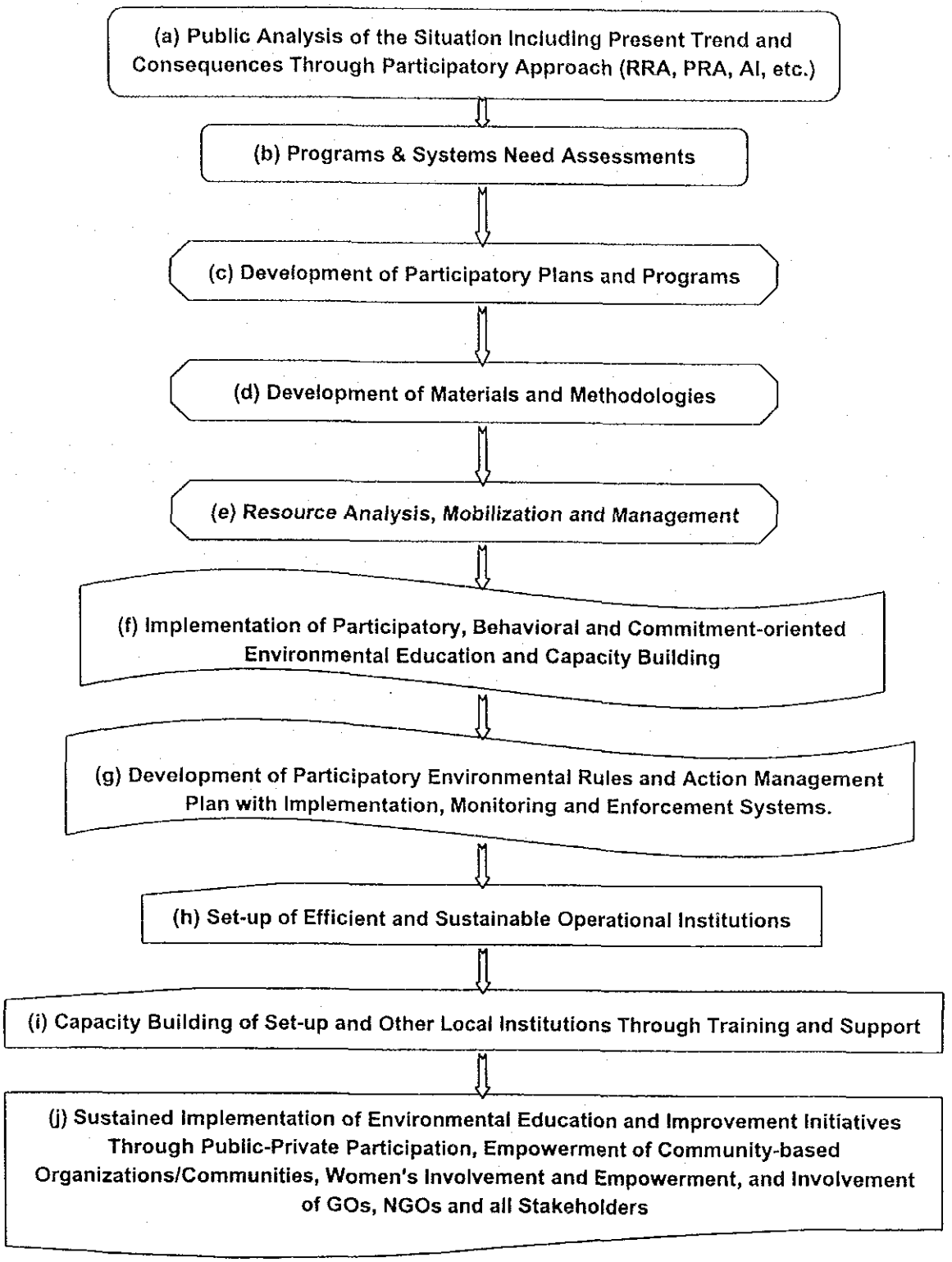


Fig. I-11.1: Flow Chart of Expected Output of Environmental Education Program

- Conservation education is the answer to many of the conservation problems confronting the local people. It is important that the conservation education be interlinked with the specific issues directly confronting the people rather than flying high to the global and generalized issues; providing practical motivation to the people for the application of the learning into the real life situation.
- Lack of communication, coordination and networking among environmental line agencies has been noted as one of the obstacles in coordinating and utilizing the extension services. Coordination, networking and linkages development at least at implementation level would greatly benefit the communities. They will therefore be undertaken at all levels.
- Rural people, during the Study, have raised the questions over why they should contribute more in relation to the urban people for the Phewa conservation, since they have been receiving relatively low direct benefits and advantages. The environmental education and capacity building program will incorporate the ways of promoting the rural-urban linkage, and motivate them for their contribution in the conservation initiatives.
- As part of motivation, the Lakeside Community Roads linking the rural areas of the watershed are needed to be developed, improved and upgraded with application of labor-based and environment-friendly road concepts. This will provide transportation between farm to market as well as for other social services in rural urban link areas. For this purpose, the existing district based road users' committees (DRUC) could mobilize the local road users' committees (LRUCS).
- Community-based approach of environmental education and capacity building has proved effective and therefore will be guiding policy.
- Schools have proved of having potential to function as change agents. This requires the use of appropriate and practical approach and methodologies, which include skill training on behavioral teaching, child-to-child, child-to-school neighborhood, child-to-home, and child-to-home neighborhood, children's environmental club, and other behavioral adoption of curricular and extra-curricular activities.
- Development of sound guidelines on project implementation by involving local leaders and other stakeholders will be a part of processes for avoiding undue political pressures.

11.4 ENVIRONMENTAL EDUCATION PROGRAM COMPONENTS

The program components identified the environmental education includes the followings:

11.4.1 NGOs, CBOs and Women Groups' Environmental Education Program

(1) Background

The task of improving conservation awareness and adopting the awareness into actual practice is complex and requires appropriate approach of intervention. In this regards, the programs through appropriate approach of interpersonal communications has proved effective in changing the behavior of the people and motivating the people to adopt the learning in the real life. Motivation of entire community and mass mobilization is required to work on huge and deep-rooted problems of conservation. Local communities including each and every household and individual should have a clear understanding of the needs of their roles and responsibilities, how it provides benefits and advantage to them and how they can contribute to the environmental conservation works. The communication networks, information, extension, education and training through the NGOs, CBOs and Women Groups have vital role in the process.

(2) Objectives

The objectives of the program will be to enable the NGOs, CBOs and Women Groups to undertake the environmental education and capacity building to:

- increase the level of people's awareness of environmental problems and opportunities and improve their attitude, skill and practices;
- help community groups and women help themselves in committing to undertake the conservation initiatives and widen their participation base in conservation activities through participatory formulation and implementation of the Participatory Environmental Rules and Action Management Plan (PERAMP);
- help communities adopt the conservation practices, learned and demonstrated during the educational programs in the real life situation;
- help communities formulate and function communities Self-help Conservation Committees in a sustainable way.

(3) Strategic Guidelines

The strategic guidelines for the program includes the following:

- People will relate Phewa Lake and environmental conservation to their real life situation.
- People will share and snowball their positive environmental knowledge, skill and experiences with their neighborhoods.
- Women will be participating, sharing and snowballing their learning experiences.
- People will participate in developing community-based conservation plan, commit its implementation and initiate the conservation activities.
- The program will continue on the achievements already acquired by the programs implemented by different organisations.
- As many people were found not adopting the awareness into practice, the program will work out the ways that the awareness be supported by the systems for its adoption into real practice.
- The development, establishment and implementation of the PERAMP by involving all households will function as an educational tool and also as an agreed system. The PERAMP will achieve the commitment of all householders and businesses to implement what has been agreed. Once the PERAMP will come into function, the system will be established. At this stage, no further major input of service agencies except monitoring and follow-up support will be required.
- In order to make the program cost-effective and mutually supportive, the Community Empowerment and Development Program will accompany the environment education and capacity building program.

(4) Program Process and Measures

The Environmental Education and Capacity Building Program is designed for implementation at four levels of programming:

(i) institutional arrangement; (ii) pilot test; (iii) evaluation; and (iv) full fledged implementation

(a) Institutional Arrangement

The institutionalisation of proposed Phewa Lake Environmental Conservation Committee (PLECC) will take time and process. It is therefore proposed that for the pilot testing of the program, the present Steering Committee will function as the responsible institution on ad-hoc basis until the establishment of the PLECC is accomplished.

It is proposed to select professional NGOs for the catalytic role in implementing the program. The number of NGOs and CBOs to be mobilized in urban and rural areas has been estimated as follows:

Table: I-11.1: Estimated Number of NGOs and Community Functionaries (CF) to be Mobilized in the Urban Area

Description	Urban	Rural Areas						
	Wtershed	Kaskikot	Sarangkot	Dhikurpokhari	Pumdi Bhumdi	Chapakot	Bhadaure Tamagi	Total
Estimated Nos. of CFs to be Trained (1CF for about 10 HHs)	1463	152	143	170	160	64	76	764
Estimated nos. of NGOs Required @ 1 NGO for 500 CFs	2	-	-	-	-	-	-	3

NGOs working in the Study Area were reviewed during the Study and found to have inadequate capacity in implementing the type of comprehensive plan as envisaged. It is therefore proposed that their capacity be strengthened during the pilot test phase.

(b) Pilot Test Program

(i) Introduction

Programs developed and launched without considering the ground realities and experiences have been reported of being failed in giving the desired impact, resulting in the wastage of time, efforts and investments. The programs without the priority felt-need of the target population have also caused difficulty to participatory implementation. It is therefore important that all aspects of program be pilot-tested in order to make the program appealing to the people, cost effective and sustainable. The practicability, efficiency, and effectiveness of the program will be tested during the pilot program.

(ii) Output

By the end of the pilot test program, the following major outputs and products will be available:

- Field-tested practical participatory models, procedures and methods
- Field-tested educational and training materials
- Trained field and managerial staff and community functionaries
- Models of local community-based institution building and strengthening
- Approach and methods of developing PERAMP by involving all households; and PERAMP agreement signed by all the households and the stakeholders
- PERAMP functioning as sustainable establishments of the system for environmental conservation
- Improvements in the environmental behavior and practice

- Monitoring and support system of program implementation
- Draft of strategic and implementation plan for full fledgedd program implementation

(iii) Proposed Sites

Proposed target sites and population for the pilot tests include the followings:

- Kaskikot VDC - Pame, Maula, Deurali
- Sarangkot VDC - Khapaundi, Bhakunde, Sedi
- Dhikurpokhari VDC - Bhakari Danda, Laxmi Deurali
- PSMC Phewa Watershed Wards - Lakeside, Dihiko Patan

The final selectors of the pilot test villages and sites will be stakeholders as to be defined by the criteria.

(iv) Approach

The better the approach will be used, the better will be the impact. The use of approach requires to really winning the heart of the people. This is called heartware approach as presented in following **Fig I - 11.2.**

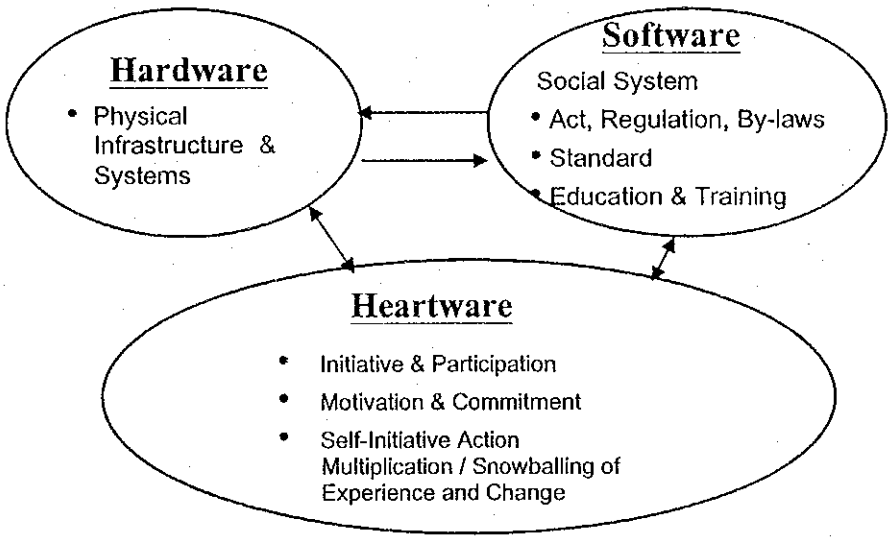


Fig. I-11.2: Heartware Approach for Environmental Education Program

(v) Plan Components

Pilot testing is worked out into the following plans.

- **Information Sharing Plan:** It will undertake the following the process activities:
  - **conceptualization and programming:** Pilot program concept and criteria of site selections will be developed. Alternative pilot sites will be studied and their profiles will be prepared. This will follow the municipal / VDC-level orientation programs of stakeholders. The programs will work out the objectives and details of the methods, process approach and schedule of plan and program. The participants will agree on specific roles and responsibilities of the stakeholder organisations.

- **pilot sites selection:** The participants will select the pilot sites from among the proposed alternative sites. Due to the extensive geographical size of the project area, the tole and village level boundary has been considered for the pilot area selection. The strategy of tole and village-based program provides less workload to the Community Functionaries.

- **information sharing mass orientation programs:** The mass orientation program will acquaint the participants with the pilot test program design, objectives, and process; achieve the interest and willingness of the community groups in implementing the program. The program will develop the community understanding on the designed programs and create the environment for implementing the pilot test. The program will identify community leaders, groups, and organisations willing to contribute and identify, and agree on each other's specific roles and responsibilities. Community-based environmental committee will be formed on ad-hoc basis for the proceeding of pilot program.

- **participatory situation assessment of pilot sites and preparation of community profile of pilot areas:** The participatory situation assessment will determine the specific nature and issues for the program; assess the facilities, knowledge, attitude, behaviour, practice and programs; establish a database to help design, plan, implement and evaluate the pilot intervention; help community self-understand the situation; establish the baseline data for monitoring and evaluation of the pilot area program; and help develop the community profile. The participatory approach and tools proposed include Participatory Rural and Urban Appraisal, Focus Group Discussion, and Appreciative Inquiry. Community profile of pilot area will be prepared by incorporating the data of the situation assessment. The profile will serve as a database to help design, plan, execute, monitor and evaluate the programs.

- **draft design of conservation plans, programs, and systems:** Community-based conservation plans and systems will be draft designed by using participatory tools working together with community groups and stakeholders.

- **compilation and development of information, education, communication and training materials:** Conservation education and extension tools and training materials already developed by other line agencies will be collected and compiled. Essential educational and training materials not available and not developed earlier will be developed.

- **re-orientation training program of community functionaries/volunteers:** Re-orientation training programs will be organized for community members, functionaries, groups, organizations / agencies including women willing to contribute to the environmental education activities. Community Functionaries (CFs) will be divided into pairs. Pilot areas will be divided into a numbers of hamlet areas. Each pair of CFs will select their hamlet for the intervention.

- **Environmental Consciousness Enlightening Plan:** The Information Sharing Plan will follow the Environmental Consciousness-Enlightening Plan consisting of the following plans, programs and systems.

  - **educational intervention:** The participant Community Functionaries (CFs) of reorientation training program will be grouped into pairs. The pilot area will be clustered into the numbers of clusters adequate for the numbers of pairs grouped. Each pair will undertake the educational intervention in the selected cluster community. They will organize and conduct the educational sessions in the clusters by visiting door-to-door or organizing the households into groups as felt comfortable and effective by them. In the meantime, educational intervention to and from

women groups will also take place. Children Education Programs will be implemented through Teachers' Training. The trained teachers will mobilize their students for community intervention.

- **women's involvement program:** The program will enhance women's involvement in the behavioural change process. Women groups will be identified. Identified women's groups will be intervened through training, workshop, meetings and interactions. The women will actively participate in awareness and education program and adopting the awareness into action. Together, the women groups will undertake the neighbourhood intervention.

- **participatory development and agreement of environmental improvement systems and participatory environmental rules and action management plan (PERAMP):** It is important that the informed and enlightened awareness be converted to the implementation plan and its actual implementation. The educational intervention will therefore be followed by the design of the environmental improvement systems and PERAMP by involving each and every household of the community. Each cluster of the community groups will develop their environmental improvement systems and PERAMP through community consultation process. The consultative process after being educated will produce a sense of enlightened ownership of the environmental improvement systems within the target groups and will have a significant effect on their delivery and acceptance.

  The issues of the PERAMP agreed by all the cluster communities will be compiled. The process of re-orientation will be carried out between/among the cluster communities on the non-agreed issues. All the cluster communities will be brought into the consensus on all the issues. The general assembly will approve it. The PERAMP will function as the charter agreed by all the households and residents for the implementation of the environmental conservation systems. All the PERAMP developed at tole and village levels will be compiled to formulate the Phewa Lake Protection PERAMP.

- **institutional development and strengthening:** Sustainable community-based institutionalization process, its structure, role and responsibility will be initiated during the community consultation process. The general assembly will form the conservation committees. A mobile system of participatory responsibility sharing in the committees will be developed. Training, technical support, and monitoring and evaluation of the activities will strengthen the institutional capacity of the committees.

- **implementation of agreed system and PERAMP:** All residents as agreed on the PERAMP will implement the systems on the conservation and environmental improvement plans, rules and legal provisions. All the residents and households will participate in the execution of works and management of the contribution according to the agreement signed.

- **monitoring of the implementation of agreed system, PERAMP and legal provisions:** Each element of the program implementation will be monitored in terms of its effectiveness in achieving stated goals. System of monitoring the implementation of the agreed PERAMP, environmental improvements and legal provisions will be developed. The provision of monitoring will also be made at different levels of responsibility. The objective of the monitoring will be to strengthen the systems by adjusting the program components depending upon the feedback on its effectiveness. A guideline will be prepared to guide all on-site activities for monitoring purpose. Given below are some of the more generally applicable proposed areas of variables for monitoring indicators.

Program Variables	Output Variables
• Adequate User Consultation in Local Planning and Design • Adequate Community Organization • Adequate Training of Community Functionaries • Active Involvement of Women in Environment Education and Improvement Initiatives • Locally-specific Program and system Established	• Sustained Increase in Environment Friendly Practices • Environmental Quality Sustained • Sustained and Proper Functioning of Environmental Facilities • Sustained Use and Maintenance of Environmental Facilities • Sustained Environmental Practices • Sustained Environmental Benefits and Cost Savings

(c) Evaluation

The evaluation study will

- assess the adequacy of the knowledge, skill and attitude imparted to the target population, and assess the behavior change in them in adopting the behaviors and practice with regards to environmental conservation.
- evaluate the quality of materials used with regards to coverage, ease of use, level of practicability and other particulars;
- ascertain the appropriateness and effectiveness of the strategies, materials and methodologies used, specially the practical experience and the mobilization of local resources and community participation; and
- determine the problems and constraints faced in implementing the activities and develop possible strategies for addressing them.

The program will apply process, output and impact evaluations.

- **Process Evaluation:** Process evaluation will measure the activities of the programs and whom they are reaching. It includes participant satisfaction, attendance, content, and suitability of materials, facilities, and performance.
- **Impact Evaluation:** Impact evaluation will measure the effects of the program on target participants on changes in behaviour and practice occurred in the short term. Impact evaluation will measure if the program had effect on factors contributing to the problem.
- **Output Evaluation:** Follow-up survey will provide evidence on the capability of the program to reach its desired objectives of change and improvements in knowledge, attitude, behaviour and practice. A self-evaluation system of the community group will be established.

(d) Full Fledged Implementation

(i) Strategic Implementation Plan for Full Fledged Implementation

The full fledged implementation will be built upon the pilot test results, experience, and feedback as well as the systems, methodologies, and materials developed and established by the pilot test as sustainable, effective and efficient. A series of input sessions and workshops after the pilot test with the key stakeholders will help gain their perspective on full fledged program. The strategic implementation plan will result from these activities.

(ii) Objective and Output of Full Fledged Implementation

The objective of the full fledged implementation will be to develop a sustainable system of improving the environmental conservation behaviour and practice of the people residing in the Phewa Lake watershed area resulting in the sustained improvement in conservation.

The full-fledged implementation will achieve the followings:

- Expanded and well-staffed and equipped service institutions established with the capacity to respond to the needs.
- Community groups organized in all toles, villages and wards to foster greater community participation, adopt the systems of environmental improvements and monitor problems affecting service delivery.
- Full fledged implementation with appropriate training and educational materials being implemented in all toles and wards with the collaboration of community groups / organizations, other concerned government agencies, non-governmental organizations (NGOs), and women groups.
- Several mass media campaigns developed and implemented.
- PERAMP functioning as sustainable tools of institutional functioning of community groups and that of improvements in environmental conservation subsequently leading to the environmental conservation of Phewa Lake.

Specifically, the full fledged implementation will secure public cooperation, participation and initiatives in

- conserving the natural resources and improving the conservation management;
- operation and maintenance of conservation systems and facilities;
- keeping Phewa Lake water and other natural quality in good condition;
- reporting Phewa Lake pollution sources and assuring that abuses of conservation facilities are reduced and eliminated;
- conservation facilities and systems are properly developed, standardized, used and maintained.

(iii) Program Area

The program will cover 9 urban wards and 6 rural VDCs of Phewa Lake watershed.

(iv) Technical Approach and Methodology

The full fledged project will use dual approaches: building on known successes of pilot test program and replicating them for full fledged implementation; and developing new activity, responsive to the trends of the knowledge, attitude, behavior and practice of the population at the mass scale.

The strategy will involve the mix of workshops, media campaigns, door-to-door contact, one-on-one NGO participation in individual communities, local demonstration and rigorous field inspections as follow-up measures.

(v) Process Sequence

The followings **Fig. I-11.3** presents the key and supportive process flow necessary to obtain the results specified.

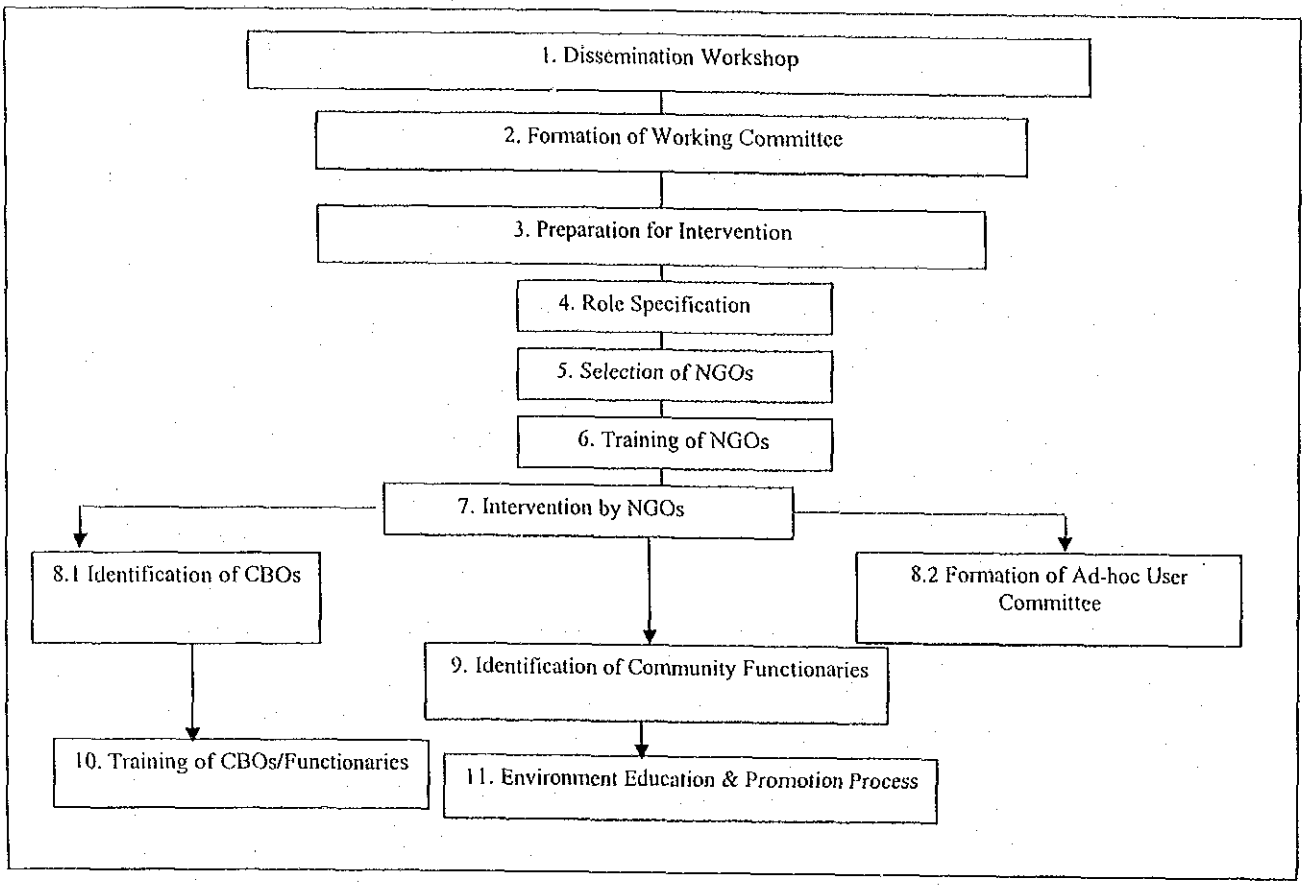


Fig. I-11.3: Process Flow-Chart of Full-fledged Implementation of EEP for Service Agencies Process I

(vi) *Full Fledged Implementation Program Components*

The work breakdown structure and description of full fledged implementation consists of the followings:

- **Dissemination and Kick-off Workshops:** Dissemination and kick-off workshops will be organized. The workshop will share the experience and evaluation results of the pilot test and design the strategy and implementation plan. Feedback of experiences (organization, working procedure, support system, materials, training, approach, etc.) will be available in the workshop for the full-fledged implementation. Detailed technical design and program methods including division of tasks at all levels will be defined and agreed. Stakeholder committees from the pilot test areas will be involved in information exchange; proposals for problem solving; and development of local problem solving activities. Adaptation and application of experiences gained in the pilot program will be worked out. An executive body for the full-fledged implementation of the project will be formed.
- **Preparation of Community Profile:** Community profile with baseline information required for the full fledgeds implementation will be prepared.
- **Assessment, Selection & Training of NGOs and Partner Agencies & Responsibility Management:** Roles and responsibilities of each participating agency will be specified and worked

out. As per identified roles of NGOs and criteria of selection, required number of NGOs will be assessed and selected. The selected NGOs and partner agencies will be trained. The project areas will be divided into cluster areas for NGOs. Ward is already divided into a number of toles in urban areas and villages in the rural areas. However, boundaries of the toles and villages are often confused. The boundaries will be therefore established in consultation with communities. Each NGO will take at least an assignment of a cluster area. Trained NGOs will intervene in the assigned areas by informing the community on the existing situation.

- **Identification and Mobilizations of CBOs:** CBOs in each tole and village area will be identified. NGOs will prepare CBOs at tole and village level for the Program. CBOs and community groups will be oriented and trained on undertaking and implementing the program. If CBOs would not already be existing, forming of ad-hoc user committee will be proceeded. People from the CBOs, NGOs, women groups, stakeholder committees and community willing to function as community functionaries to voluntarily contribute will be identified at each tole and village area. Depending on number of community functionaries, each tole boundary will be divided into the number of clusters for responsibility management.
- **Training of Community Functionaries & Responsibility Management:** Community functionaries will be prepared and trained. Wards will be divided into specific tole and village boundaries. Toles and villages will be divided into specific cluster communities. Each community functionary will select the responsibility for each cluster community and will prepare intervention workplan. Each pair CF will take up the responsibility of the intervention in the cluster community.
- **Educational Intervention:** The trained CBOs and community functionaries will undertake the environmental education, promotion and conservation activities. Each pair of trained community functionaries will undertake the intervention activities in the cluster community of their own selection either by visiting door-to-door or organizing small group sessions. Together with this, women groups will undertake interpersonal educational intervention to the community groups as a result of intervention carried out to them. Children in school will be intervened through trained teachers, as a result of which the children will undertake interpersonal intervention in their families and neighborhood communities. Environment-related teachers of all the schools will be trained on the community-oriented behavioral teaching methods and materials. Together with the educational interventions by CFs, the local CBOs, clubs, women groups and other local NGOs will organize community events and mass campaigns.
- **Community consultation and development of systems and PERAMP:** Each pair of CFs will organize cluster community meetings and draft the cluster-level PERAMP, taking the support and guidelines of the already drafted PERAMP. Each cluster community will draft the PERAMP during community consultation process. General agreement on PERAMP will take place among cluster communities of each tole and village. Community meetings participated by the representatives of the cluster communities will be organized to draft the tole and village level PERAMP. General assembly of tole and village communities participated by almost all households of the tole and villages will agree and approve the PERAMP by signing the agreement. The PERAMP will also function as tools for negotiating between the community and executing service agencies.
- **Forming and strengthening stakeholder organizations:** Stakeholder committee will be formally organized and its institutional structure will be agreed and approved in the general assembly. The committees will be trained and strengthened.

- **Implementation and monitoring of agreed system and PERAMP:** The PERAMP and environmental conservation systems agreed in the general assembly will be implemented and adopted by each household of the tole and village communities. PERAMP and systems implementation will be monitored, followed-up and facilitated by the stakeholder committee initially with the back support of the NGOs and later independently.
- **Sustained establishment of education and promotion system:** The system established by the PERAMP will come into sustainable function. No further major input of service agencies will be required, after the system being established. Only occasional follow-up and monitoring may be required.
- **Monitoring of implementation & strengthening of executing agency:** Simple and clear monitoring procedures will be developed, so that all persons associated with the program understand how it operates. The people associated with the program will be trained on the monitoring. Capacity building including training of the service agencies will be the central themes at this stage. Executing agencies will be strengthened where required and will participate in further training for sustainable organisations. The participatory process for full fledged implementation is presented in **Fig. I-11.4.**

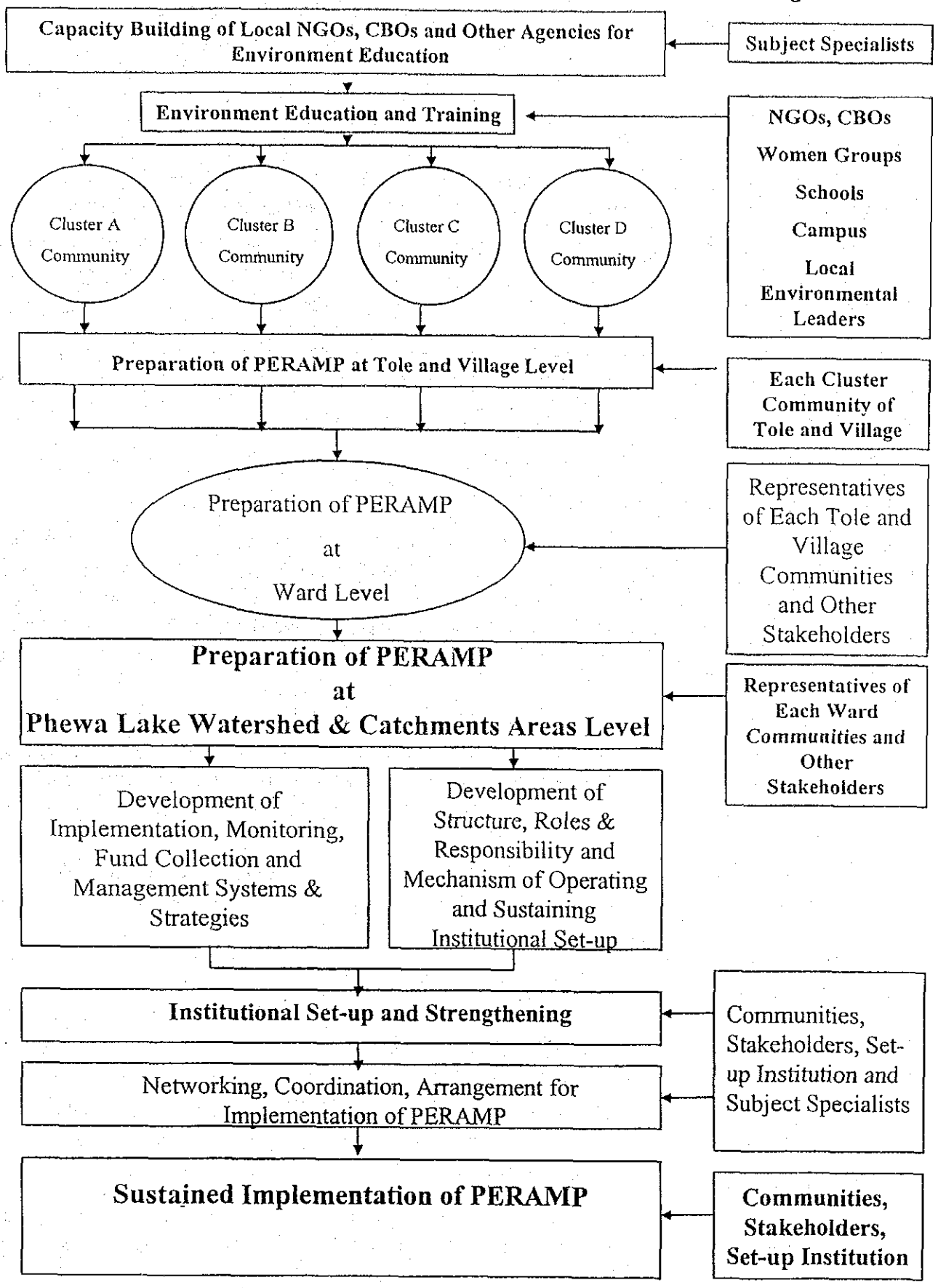
11.4.2 Communication Approach, Channels and Tools

Communication programs will be implemented at two levels:

- **Mass Media Communication:** Mass media strategies will be implemented to widely disseminate the message by organizing multi-media campaign over regional and local media channels.
- **Behavior Change Communication/Intervention:** CBOs will be trained and strengthened to implement an integrated communication portfolio consisting of one-to-one communication, peer education, and community events. Each trained community functionary will undertake the responsibility for one-to-one or small group communication in 5 - 10 households. This is not a difficult load and can be easily performed within a month until the PERAMP be developed. The peer education model will be implemented to attract new target members to the program and for the multiplication of experience-based and behavioral education. The behavior change communication will also develop twinning relationship with new neighborhood CBOs, functioning as the motivator.

Proposed behavioral change materials, methods and tools include (i) video; (ii) slides; (iii) posters; (iv) exhibitions including rural-urban linkage exhibition and festivals; (iv) flip charts; (iv) group discussions; (iv) cards/diagrams; (iv) models; (iv) brochures/ leaflet; (iv) role games; (iv) street drama; (iv) puppet and shadow plays; (iv) projects and case studies; (iv) house visit; (iv) demonstration; and (v) dialogue

Fig. 11.4. Participatory Process for Environment Education Program



The proposed participatory tools proved effective include the followings:

Tools	Materials
1. Investigative Tools	1.1 Community Map, 1.2 Flexiflans, 1.3 Unserialized Posters, 1.4 Healthy Home Game, 1.5 Pocket Chart, 1.6 Sex Identity, 1.7 Gender Identity, 1.8 Gender Work Distribution, 1.9 Seasonal Chart of Community
2. Analytical Tools	2.1 Three Pile Sorting, 2.2 Open-ended Poster Drama, 2.3 Sustainability Analysis, 2.4 Maxiflans, 2.5 Technical Options of Conservation, 2.7 Structural Design, 2.8 Reality Analysis / Classification
3. Informative Tools	3.1 Program Management Game, 3.2 Conservation Tools
4. Planning Tools	4.1 Planning Tools, 4.2 Software and Hardware, 4.3 Integration Planning, 4.4 Activities Planning
5. Conceptual Tools	5.1 Resistance to Change, 5.2 Broken Square, 5.3 Johari's Window, 5.4 Force Field Analysis, 5.5 Cup Exercise, 5.6 Photo Parade

11.4.3 Assessment of Local Capacity

(1) Input of Governmental Service Agencies:

There are operational difficulties in terms of institutional arrangement. The government has different agencies. They are working on the vague environmental issues mainly dealing with the mass communication and policy level input. They are found lacking in the capacity in the community-based approach, materials, methods and resources including manpower required for the specific input at the grassroots level. There was lacking in the adequate institutional arrangements, staffing and the adequate use of community-based approach.

- The Pokhara Sub-Metropolis is more concerned with the physical management of environment. They clearly lacked the know-how and resource capacity in adequate educational approach. ADB-funded Public Environment Education and Staff Training Program implemented by the Pokhara Sub-Metropolis is the only larger environmental education initiative at the municipality level.
- Ministry of Education is focused more on formal children education and lacks the capacity to deal with the specific needs of environmental education.
- The Ministry of Environmental has been active just recently and not yet been involved in the aspects of community-level program.
- The Ministry of Housing and Physical Planning is involved in hygiene issues through the Department of Water Supply and Sanitation and Central Human Resource Development Unit.

While going through the review of the local capacity of all the governmental agencies in implementing the environmental education, it has been realized by the governmental agencies themselves that they lack the adequate capacity of in-depth interventions at the grassroots level.

(2) Input of the Consultant

While reviewing the capacity of the consultants/ private agencies, it has been realized that they can not be considered for sustained involvement and adherence in environment education. But they are

professional in providing input and considered very useful and essential in developing the capacity of service agencies to sustainably, effectively and efficiently serve. They can also contribute in developing the capacity of community groups in sustainably, effectively and efficiently undertake in the environmental education activities and adoption of consequent system. The consultant input is to:

- organize dissemination workshop on the pilot test program and "kick-off" workshop for the full fledged implementation.
- prepare and help establish project organization, and formation of steering/working committee.
- detail the strategic and implementation plan of the project and prepare work-plan including logistics, arrangement and time frame for technical and activities, detail budget breakdown.
- help the Steering Committee specify the roles and responsibilities of each participating agency.
- help the Steering Committee assess, identify and select the NGOs.
- train and mobilize NGOs on the tasks to be carried out by the NGOs.
- supervise and monitor the intervention activities of NGOs.
- help the Ministry of Education train the school teachers on the community-oriented behavioral teaching methods and materials.
- develop monitoring procedures, guidelines and manuals and train and capacitate the service agencies and organizations on the sustainable monitoring system.

In order to carry out the activities and tasks as listed above, consultant's input based on the standard parameters are given in the following **Table I-11.2.**

Table I-11.2: Standard Consultants Input

S.No.	Staff	No.	Total Man-month
1.	Community Development Specialist	1	18
2.	Environmental Education and Training Specialist	1	12

(3) Input of NGOs

There is an impressive number of non-governmental organisations, which can make an important contribution. A list of major NGOs active in environment and community development in Kaski has been provided in Annex 7 to this Report. NGOs having in-depth experience in environmental education as expected by this program have not been found. Their capacity is not adequate for the sustained adherence in environmental education in the communities. But their capacity can be developed for the mediation, facilitating and catalytic roles. The input of NGO in the full fledged implementation is identified to be required to:

- intervene in the assigned areas by informing on the existing situation of the environmental conservation.
- identify community-based organizations and groups including tole level and village level committees, women groups, user groups and other indigenous community groups.

- facilitate the community groups form the stakeholder committee if there is no already existing community-based organizations.
- identify the community functionaries willing to voluntarily contribute in the activities.
- train CBOs and community functionaries on undertaking and implementing the neighborhood environmental activities.
- monitor and support the intervention activities undertaken by the community functionaries in the hamlet/cluster communities of the tole.
- monitor, follow-up and technically support the PERAMP implementation.

In order to carry out the activities and tasks as listed above, standard NGOs input based on the standard parameters are given in the following **Table I-11.3.**

Table I-11.3: Standard Staff Input Per NGO

S.No.	Staff	No.	Total Man-month
1.	Team Leader	1	18
2.	Field Coordinators	2	26

(4) Input of Community Groups/ Organization

Increased capacity of community-based organisation will enhance local ownership and sustainability of the program. CBOs have been identified to be the agency capable of sustained adherence to the environmental education and conservation. But, if the approach is not appropriately, systematically and adequately used, it is not easy to effectively and significantly mobilise the community groups mainly in the urban area. But once they could be adequately mobilised, they can become the most effective, efficient, significant and sustainable agency. The input of NGO in the full fledged implementation is identified to be required on the following tasks:

- Identify community functionaries for voluntary contribution.
- Plan, and implement the activities and undertake and adopt the environmental messages.
- Divide ward area into specified tole and village boundaries.
- Divide tole and village boundaries into a number of hamlets/ small clusters.
- Undertake the responsibility of intervention in the neighbourhood hamlet/ cluster communities of their own selection by sharing the responsibilities among each other.
- Organise the community events / campaigns.
- Organise and participate the cluster community meetings and draft the cluster-level PERAMP.
- Organise and participate the general meetings of the representatives of the cluster communities and come into the consensus on the PERAMP developed at the cluster-level.
- Organise and participate the general assembly of the tole and village community and agree on the PERAMP for the adoption and implementation.
- Negotiate with the concerned service agencies for taking support in the aspects of the implementation of the environmental education and conservation.

- Build the sustainable user institution and form ad-hoc and constitutional user committees and undertake the roles as defined by the PERAMP.
- Implement and adopt the PERAMP into day-to-day activities.
- Monitor and follow-up the PERAMP implementation.
- Disseminate and multiply the positive experience.

The strengthening of the community groups will eventually lead to the delivery and proper usage of environmental education and conservation. The cooperation of community members is essential to assure that the systems are not damaged once they are in place. Involvement of women groups and organizations will be important element of the process.

(5) Capacity of Collaborative Agencies and Implementation Arrangements

The appropriate office of service agency/ies will be required. The staff required will include specialists in environmental education and training, community development and women's involvement, public relations and mass media. The office will be required to be assisted by advisory and steering committees. Qualified experts will be required to assist the unit in designing, preparing and launching the programs including providing required training to staff and selected NGOs, and for other specialized tasks as may be needed.

The program's relationship with different level of agencies including government, non-government, private-public, municipalities and communities is critical to the success of the program. A collaborative intervention program is required. Experience indicates that the key to sustainability is developing strong partnerships among local organisations, stakeholders and the government.

- **Coordination Arrangements:** The program will need the cooperation and support of government agencies as well as NGOs, and most importantly community groups/leaders at the ward and tole and village levels. The main instrument for achieving coordination of action will be an Advisory Committee composed of representatives of all the above, which will participate actively in the planning, organization, supporting and evaluation of project activities.
- **Training Components**: Training is the most important component of the proposed project and the post critical to its success. The training activities proposed under this project comprise the following:
  - Training of executing agency by the project advisors and consultants.
  - Orientation programs and workshops for NGO personnel and other community leaders whose active cooperation will be needed in the organization of community groups and community level training programs.
  - Pilot program in selected communities for the purpose of testing the training materials and approaches and providing executing agency staff with field experience in organizing community program exercises.
  - Several pilot mass media campaigns for the same purposes.
- **Inputs:** Committee will provide the following inputs:
  - Suitable premises for accommodations of the project, together with the necessary furniture, office equipment, utilities, etc.

- Staff for the project office, which initially will consist of:

1 Project Manager	36 MM
1 Community Development Specialist	18 MM
1 Environment Education Specialist	18 MM
NGO Staffs	48 MM

Two consultants will be required.

Committee as Executing Agency will provide:

- Management and supervision of the project through review and approval of work plans to ensure appropriate co-ordination.
- Maintain close liaison with the implementing agency, which will assist in technical back-stopping and support including provision of all relevant documentation and training materials available through other relevant projects.
- Maintain close liaison with sector national and international agencies.

Committee will ensure that the counterpart staff and the appropriate accommodation to be provided as government inputs to the project are in place before the start of the project.

11.4.4 Cost Estimate

The cost for the implementation of 3 years period is estimated as follows:

		(NRs ,000)
(1)	Project Management Cost @ 25% of Project Cost	9,120
(2)	Consultants	
	- Remuneration	7,220
	- Out-of-Pocket Expenses	4,940
(3)	Project Cost for NGOs	17,632
(4)	Project Cost for about estimated 1,200 CBOs	2,052
(5)	Equipment & Furniture	1,672
(6)	Education and Training Materials	3,420
(7)	Package Programs	1,368
(8)	Transportation Cost	1,368
(9)	Stationary, Communication, Printing & Reproduction, Meetings, Contingency	1,140
	Total Cost of the Project	**49,932**

11.5 IMPLEMENTATION SCHEDULE

The implementation schedule is presented in **Fig. I-11.5** in following page.

Fig. I-11.5: Implementation Schedule

S.No.	Name	Year I/II				Year III/IV				Year V/VI			
		1	2	3	4	1	2	3	4	1	2	3	4
1	Pilot Test	■	■	■	■								
2	Full Fledged Implementation					■	■	■	■	■	■	■	■
2.1	Information Sharing					■							
2.2	Educational Intervention						■	■					
2.3	Implementation of Women's Involvement Program						■	■					
2.4	Community Consultation & Participatory Development of System							■	■				
2.5	Enlightened PERAMP Development							■	■	■			
2.6	Institutional Development								■				
2.7	Implementation & Monitoring of Agreed System and PERAMP									■	■	■	■
2.8	Formation and Strengthening of Community Conservation Committee									■	■	■	
2.9	Monitoring and Evaluation									■	■	■	■
2.1	Sustainability Arrangement												■

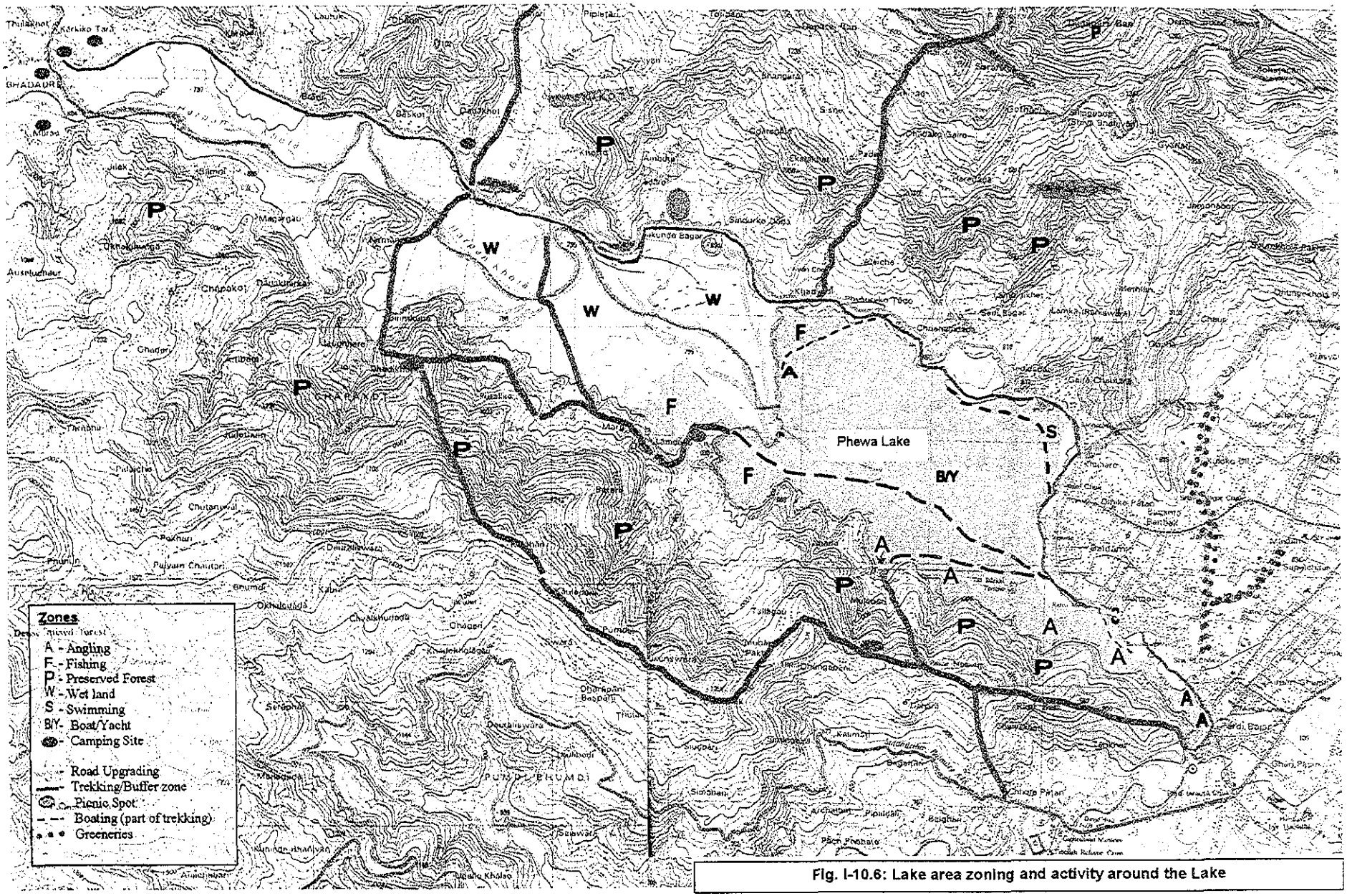


Fig. I-10.6: Lake area zoning and activity around the Lake