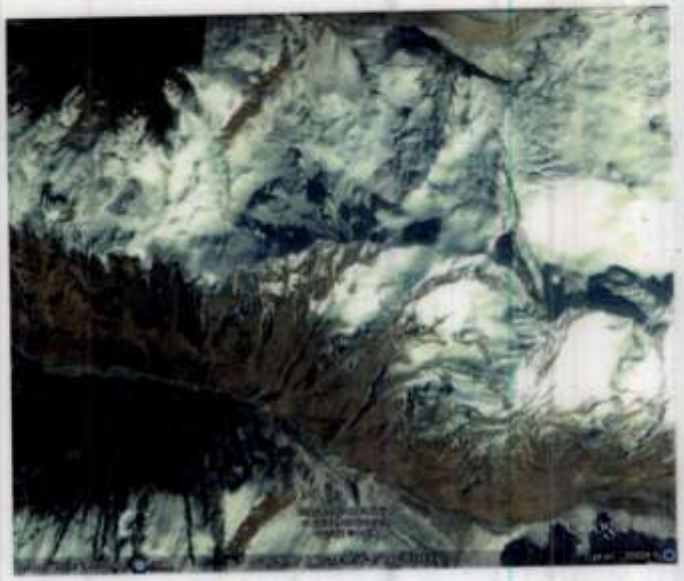
CATCHMENT AREA TREATMENT PLAN

FOR

Wanger Homte Hydro Electric Power Project (24.6MW)

Village–Kafnoo, Tehsil - Nichar, Distt. - Kinnaur (H.P.)



Divisional Forest Officer
Wildlife Division, Sarahan BSR
Distt. Shimla (H.P.)

PROMOTER:

M/s Panchhor Hydro Power Private Limited

TABLE OF CONTENTS

UNDERTAKING

I, M.V. Rahul authorized signatory of M/S Panchhor Hydro Power Private Limited having its registered office at Plot No.226, Road No-78, Phase-III, Jubilee Hills, Hyderabad here by confirm that CAT Plan of Wanger Homte HEP (24.6MW) at Kafnoo village in Kinnaur Distt. with an outlay of Rs.4.1 crore has been prepared on the basis of the Total Project Cost Rs. 164 crore as per TEV (Techno Economical Viability) dated 23rd April 2011 and as per the Implementation Agreement with GOHP dated 20th April 2011. I hereby also confirm that in case the Project cost is increased then the CAT Plan outlay shall be enhanced accordingly through revision of the CAT Plan and differential amount of the CAT Plan outlay will be paid by us.

M/s. Panchhor Hydro Power (P) Ltd.,

M V Rahul.

Authorized Signatory

(Director)

DIRECTORATE OF ENERGY
GOVERNMENT OF HIMACHAL PRADESH
OFFICE ORDER

Directorate of Energy(DOE), Govt. of Himachal Pradesh, is pleased to accord Techno Economic Clearance(TEC) to Wanger-Homte SHP(24.60 MW) on Bhaba khad a tributary of Satluj river in Satluj basin, Distt. kinnaur, Himachal Pradesh, allotted to "M/S Panchhor Hydro Power Pvt Ltd, Plot No 226, Road No:-78, Phase-III, Jubilee Hills, Hyderabad-500033(AP)" at an estimated cost of Rs. 164.00 crore (Rupees one hundred sixty four crore) only including Interest During Construction(IDC), Escalation, Financial Charges(FC) and LADC @ 1.5% of total project cost with the following stipulations :

1.i) The completion cost shall not exceed the above cost except on account of the following:
   a) Interest During Construction(IDC) and Financial Charges(FC) shall be as per actuals but not exceeding the amount as indicated at Annex-I, unless revised by DOE, GoHP while according concurrence under Section-8 of Indian Electricity Act 2003 after review of the financial package.
   b) Change in rates of Indian taxes and duties such as Excise Duty, Sales Tax/ VAT, Custom Duty and levy of any other taxes/duties subsequent to issue of Techno Economic Clearance.
   c) Change in Indian law resulting in change in the cost.

ii) The abstract of the Estimated Cost approved by DOE/GoHP is furnished at Annex-I, summary of the Financial Package as considered by DOE/GoHP is at Annex-II and the Salient Features of the scheme are at Annex-III.

2. The Techno-Economic Clearance(TEC) is subject to the fulfillment of the following conditions:

i) Completed cost/Techno-Economic Clearance(TEC) shall not be re-opened due to the following:
   a) Non acquisition of land.
   b) Non- finalization of Power Purchase Agreement (PPA)
   c) Delay in financial closure.

ii) The final financial arrangement shall not be inferior to the financing arrangement projected in the Detailed Project Report (DPR) for TEC.

iii) The cost of the project cleared by the DOE/ GoHP is indicative and shall have no binding on the regulator while fixing the tariff. The tariff of the project shall be regulated by the appropriate Electricity Regulatory Commission.

iv) The public issue expenses, if any, shall be reconsidered at the time of approval of completion cost based on documentary proof and in accordance with Security Exchange Board of India (SEBI) guidelines regarding regulation of public issue expenses.

v) Fulfillment of conditions stipulated in Central Electricity Authority(CEA)/Central Water Commission(CWC) guidelines in respect of civil works at the stage of detailed designs/execution.

vi) Any increase in the cost estimate due to design modifications and geological surprises would be absorbed by the Independent Power Producer (IPP) i.e. "M/S Panchhor Hydro Power Pvt. Ltd, Hyderabad-500033(AP)".

vii) No additional cost shall be allowed due to Resettlement & Rehabilitation (R & R) Plan.

viii) Normal operation life of the hydro power plant shall be as per provisions of CWC/CEA guidelines or CERC/HPERC regulations.

ix) The Techno Economic Clearance(TEC) is subject to clearance of the project and transmission line by MOEF from environmental and forests angle. The statutory and administrative clearances as per Annex-IV shall be obtained before execution/ implementation of the project.

x) The interconnection point with State grid and interconnection facilities at the interconnection point shall be provided, operated and maintained at the cost of the IPP.

xi) The cost of providing and/or strengthening/additions etc. of the system at and beyond the

1/1

Interconnecting Sub-station which may also include the cost of replacement of switchgear/ protection and provision of shunt capacitors, strengthening of bus bars, apart from other works required at injection voltage level and other one or more successively higher voltages, civil works relocation of existing bays etc. shall be recovered by HPSEBL/HPPTCL, as per the regulations of HPERC read with the clarifications/decisions by HPERC and/or any other competent authority as may be finally applicable. The share of IPP on this account shall be paid by the IPP to HPSEBL/HPPTCL as per the final decision of the competent authority.

xii) Whereas the HPSEBL/HPPTCL shall endeavor to provide the evacuation system at the earliest, the scheduled date for providing evacuation arrangements shall be spelt out in the PPAs on case to case basis inter-alia, keeping in view the time lines indicated in the relevant plan and approved by HPERC.

xiii) The powerhouse generating equipment as well as other electrical equipment to be provided by the developer shall be compatible for parallel operation with State grid after interfacing. The IPP shall be responsible for any loss of generation on this account.

xiv) O&M charges for maintenance of inter connection facilities at the interconnection sub-station shall be paid by the IPP to HPPTCL/HPSEBL, throughout the period, the IPP runs the project and the same shall be reviewed at the beginning of every financial year.

xv) For evacuation of power the IPP shall interface his project at the proposed 66/220 kV pooling sub-station of HPPTCL at Sherpa colony by constructing 66 kV D/C line in joint mode with Silti Masrang HEP(24 MW) subject to the condition that another project Himani Chamunda(10MW) shall also evacuate its power through 66kV joint dedicated line from Wanger Homte to Sherpa colony.

xvi) The project line shall be provided, operated and maintained by the IPP at his cost as per normal conditions after obtaining approval of HP Govt. under Section 68(1) of Electricity Act, 2003.

xvii) The above mentioned evacuation arrangements shall be subject to the feasibility of interconnection at the interfacing point and further HPERC approval of "Comprehensive area wise plan for augmenting and establishing of transmission/sub-transmission system for evacuation of power from small HEPs" which has already been submitted to HPERC. The Transmission/Distribution Licensee may however also evolve alternate system(s) depending on the site conditions and subsequent developments with the approval of HPERC.

xviii) The IPP shall develop operate and maintain the Project including the dedicated transmission system subject to compliance with the following:

a) Grid code and standards of grid connectivity.
b) Technical as well as Mechanical standards for construction of Electrical lines.
c) Norms of System Operation of the concerned State Load Dispatch Center(SLDC) or Regional Load Dispatch Center (RLDC).
d) Directions of the concerned SLDC or RLDC regarding operation of dedicated transmission line.
e) The IPP shall only be allowed to inject power in HP system with the undertaking that necessary action to provide tele-metering to SLDC shall be provided by them and specifications required to be got approved from the office of SE, SLDC, HPSEB Ltd, Totu, Shimla from compatibility point of view with existing SCADA system.

xix) The conditions on these lines shall have to be suitably included by the developer in the PPA etc. apart from other standard conditions.

xx) 15% release of water immediately downstream of diversion structure shall be ensured all the times including lean season as per Power Policy of HP Govt., 2006 and subsequent amendments thereof. The necessary monitoring equipment as prescribed by pollution Control Board for the same shall be installed by the IPP during execution of the project.

xxi) LADC/LADF amount and activities shall be implemented as per Power policy of HP Govt., 2006 and subsequent amendments thereof.

xxii) The additional 1%(one percent) free power from the project shall be provided and earmarked for a Local Area Development Fund(LADF) as per HP Govt. Notification No. MPP-F(1)-2/2005-V dated 30.11.2009.

1/2

xxiii) The IPP shall carry out the detailed Geological explorations as per CWC/CEA guidelines and as suggested by Geologist (Annex-V) before taking up project construction and submit the report to the HP Govt./DOE.

xxiv) The TEC is based on the reports and data furnished by the IPP in the DPR and it is presumed that information furnished is correct and has been collected reliably after carrying out detailed field investigations and surveys under the supervision of competent personnel. The scrutiny does not cover the examination of the detailed designs & working drawings of project components in regard to their structural, hydraulic and mechanical performance & safety which shall be ensured by the project authority/IPP.

xxv) The observations of HPSEB/DOE and replies thereof shall form an integral part of the DPR. The IPP shall submit the updated DPR incorporating all modifications agreed during the appraisal process to DOE/GoHP within one month of issuance of TEC.

3. The project shall be completed within 48 months from the date of start of the construction works.
4. The completion cost of the scheme shall be submitted to DOE/GoHP for approval within 3 months from the Commercial Operation Date (COD) of the plant.
5. The Project Promoters/Project Authorities shall give free accessibility to the officers and staff of DOE/GoHP to have on the spot assessment of various aspects of the project.
6. The firm financial package and tie-up of balance inputs/clearances shall be completed within the period as stipulated in the HP Govt. power Policy, 2006 and subsequent amendments thereof /Implementation Agreement.
7. In case the time gap between the Techno-Economic Clearance of the scheme and actual start of work on the project is three years or more, a fresh Techno-Economic Clearance shall be obtained from DOE/GoHP before start of actual work.
8. Monthly Progress Report of the project shall be submitted to the DOE/GoHP. Three(3) copies of the semi-annual physical progress report of the scheme and expenditure actually incurred, duly certified by statutory auditors shall be submitted to the DOE/GoHP till the Commercial Operation of the plant.
9. The DOE/GoHP reserve the right to revoke the concurrence if the conditions stipulated above are not complied with to the satisfaction of the DOE/GoHP.

BY ORDER OF THE GoHP

Director(Energy),
Directorate of Energy, GoHP,
Khalini, Shimla-171002.

No. DOE/CE(Energy)/TEC-Wanger Homte /2011- 462-70 **Dated:** 23-04-2011

Copy for information and necessary action to the:

1. Principal Secretary (MPP & Power) to H.P. Govt., Shimla-171002
2. Principal Secretary (NES) to H.P. Govt., Shimla-171002
3. Secretary, Ministry of Non-Conventional Energy Sources (MNES), Block No.14,CGO Complex, Lodhi Road, New Delhi-110003.
4. Director, Environmental & Scientific Technologies, Narayan Villa, Near Wood Villa Palace, Shimla-171002.
5. General Manager, HPPTCL, Borowalia House, Khalini ,Shimla-171002
6. Chief Engineer (SP), HPSEB Ltd. Vidyut Bhawan, Shimla-171004.
7. Chief Engineer(Commercial), HPSEB Ltd. Vidyut Bhawan, Shimla –171004.
8. Chief Executive Officer, Himurja, 8A-SDA Complex, Kasumpti, Shimla-171009.
9. M/S Panchhor Hydro Power Pvt Ltd, Plot No 226, Road No:-78, Phase-III, Jubillee Hills, Hyderbad-500033(AP).

Director(Energy),
Directorate of Energy, GoHP,
Khalini, Shimla-171002.

173

ANNEXURE-I

Wanger-Homte SHP(24.60MW) in District Kinnaur, Himachal Pradesh of "M/S Panchhor Hydro Power Pvt Ltd, Plot No 226, Road No:-78, Phase-III, Jubilee Hills, Hyderabad-500033(AP)".

ABSTRACT OF THE ESTIMATED COST

Sr. No.	Description of works	Amount (Rs in lac)	
(a)			
1.	Civil works i/c other Misc. Expenses	9547.72	Price Level Dec., 2010
2.	Electro Mechanical works	3801.17	
3.	Transmission works	621.00	
	Sub Total (a)	**13969.89**	
(b)			
1.	Escalation	Nil	
2.	Interest During Construction(IDC)	2089.35	
3.	Financial Charges (FC)	118.04	
	Sub Total (b)	**2207.39**	
	Total (a+b)	**16177.28**	
(c)	LADC @1.5% of (a+b)	242.66	
	Grand Total (a+b+c)	**16419.94**	

Say Rs 164.00 crore

(Rupees one hundred sixty four crore only)

Director(Energy),
Directorate of Energy, GoHP,
Khalini, Shimla-171002.

1/4

ANNEXURE-II

Wanger-Homte SHP(24.60MW) in District Kinnaur, Himachal Pradesh of "M/S Panchhor Hydro Power Pvt Ltd. Plot No 226, Road No:-78, Phase-III, Jubilee Hills, Hyderabad-500033(AP)".

I. Tentative Financial Package

Debt : Equity = 70 : 30

Sr. No.	Description	Amount (Rs. in crore)
A	Equity by Promoter.	49.00
B	Debt from Indian Financial Institutions	115.00
	Total (Debit + Equity)	164.00

II. Terms of Loan

Sr. No	Item	Package
1.	Source of Debt	Financial Institutions
2.	Loan Amount (Rs. in crore)	112.70
3.	Interest rate	11 %
4.	Repayment period	10 years
5.	Moratorium Period	3 years

Director(Energy),
Directorate of Energy, GoHP,
Khalini, Shimla-171002

1/5

Executive Summary

The CAT plan for Wanger Homte HEP has been prepared on the basis of field survey in active association of the officers/staff of the Forest Department and keeping in view the general requirement of the catchment area to stabilize the area and to reduce the silt load. The areas to be treated have been selected as advised by them.

However, detailed site specific planning/micro planning is required before actual execution of the works in consultation with local people/committees to ensure mutually agreed type of work and its scheduling.

Moreover, Master Catchment Area Treatment Plan of Satluj river is under preparation by the H.P. Forest Department with the help of experts/consultant. The prescription of CAT plans of this area will have to be revised to fit in the prescription of the Master CAT Plan. For the revision/site specific micro planning, a provision of Rs 10 lac has been kept.

Changes in this CAT Plan (inter component or across the plan) can be made with approval of PCCF, H.P. within over all ceiling of the amount, for which this CAT Plan has been prepared.

Total Catchment area of Bhaba Khud above intake point of Wanger Homte is 248.83 sq km. But on the same khud another HEP i.e. Selti Masrang is coming up at a distance of about 2 ½ km, the catchment area of which is 245.49 km^2. Hence the effective catchment area of Wanger Homte is limited to 3.34 sq km (248.83 minus 245.49) only. 45 % of catchment of Wanger Homte falls in PA-Rupi-Bhaba Wild Life Sanctuary and balance 55 % falls in proposed community

Reserve. The whole catchment falls within the jurisdiction of Wild Life Division Sarahan.

It is also important to add here that out of total catchment area of 3.34 sq km, 15 % is under permanent snow and another 25 % area is totally barren and rocky, which can not sustain any vegetative growth. Another 15 % is pasture land. Thus, leaving a balance of 45 % area, where treatment can be done. This comes to about 1.5 sq km. i.e. 150 ha. Hence, the scope of treatment is very limited. Depending on the area that can be treated, prescription has been provided amounting to Rs 2.00 crore only. However, the Project proponent will pay the total amount of Rs 4.1 crore in consonance with the provisions of 2.5 % of the total project cost. H.P Forest Department shall be at liberty to spend the balance amount as per their plan to implement the Master CAT Plan of Satluj Basin or in any other manner as decided by HP Forest Department

CHAPTER – 1

General Description of the Tract and Project

1.1 INTRODUCTION:

In Himachal Pradesh many small, medium and large hydroelectric projects have been taken up to tap the hydroelectric potential of the State. It also provides excellent opportunities for power generation to bridge the gap between demand and supply of power in the State. The electric power being a vital and essential infrastructure has a significant role to play in economic development and upliftment of people. The State has 21000MW identified hydroelectric potential, out of which 6370MW potential had been harnessed so far. During the 10th five year plan, 2241MW potential was harnessed and 5744MW would be added during the 11th five year Plan.

Himachal Pradesh has five river basins, which provide an ample scope for development of Hydro power potential. Out of these five basins, Sutlej basin has the highest potential of about 9,227MW of electricity. The life of a hydro electric project primarily depends on the rate of soil erosion in the catchment area of the project, its transportation and deposition down stream. Soil erosion occurs due to number of abiotic and biotic factor like, topography of the catchment, soil characteristics, meteorological conditions such as precipitation and its intensity in the form of rainfall and snowfall and the extent of vegetation cover and its types. It is therefore imperative to

control one or more of the most crucial contributes of the factors triggering soil erosion, which will enhance the life of the reservoir.

The area is rich in bio diversity and around 45% of the catchment area above the diversion site falls in the Rupi-Bhaba wild life sanctuary. Therefore, while making the CAT plan for the area special attention is required to be paid towards improvement of habitat and protection of Wild Life. A well-designed Catchment Area Treatment (CAT) Plan is essential to ameliorate the biotic pressure, adverse process of soil erosion and maintenance of ecological balance including atmospheric equilibrium, which is vital for sustenance of all life forms- humans, animal and plants in and outside the protected area. Proper soil and moisture conservation treatment, bio-engineering works, habitat improvement for management of Wild Life Sanctuary is of utmost importance.

1.2 HYDRO-POWER POTENTIAL OF HIMACHAL PRADESH

Himachal Pradesh is situated in the northern part of the country and lies between latitudes 30° 22' to 33° 12' N and longitudes 75° 47' to 79° 04' E. It shares its boundary with Uttaranchal on the eastern side, Jammu and Kashmir in the north-western side, China on the north-east side and Punjab and Haryana in the southern side. The State has a geographical area of 55,673 sq. km. and population of 60,77,248 as per 2001 census records. The State has a population density of about 109 persons per sq. km.

The State is blessed with significant hydropower potential. The total power potential of various river basins in the State is estimated as 20131.75 MW, which is available in five river basins. Details of basin wise hydropower potential are given in the following Table.

Hydro-power potential in various river basins of Himachal Pradesh

S. No.	Basin	Identified potential (MW)
1.	Satluj	9396.75
2.	Beas	4,293
3.	Ravi	2,181
4.	Chenab	3,301
5.	Yamuna	960

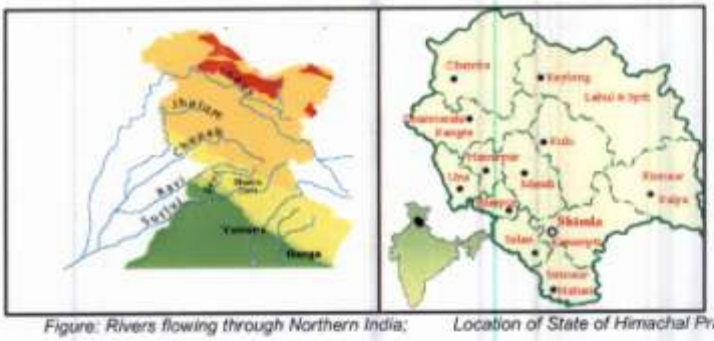


Figure: Rivers flowing through Northern India; Location of State of Himachal Pradesh

The present installed capacity of Himachal Pradesh in medium and major hydro projects is 6344 MW (Source: HPSEB). With rising hydro power generation and improving efficiencies in distribution of electricity, Himachal Pradesh can offer energy at stable prices for eco-friendly industrial development. Thus, there is an urgent need to develop its huge untapped hydro power potential capacity with the purpose of harnessing hydro-power resources in the State for economic well being and growth of the people in the whole region.

1.3 NEED OF THE PROJECT

Our country is facing severe power crisis, which will aggravate further, even after considering the contribution of various projects in different

stages of commissioning. Thus, it is imperative to harness the untapped power potential of various river basins.

Due to paucity of resources and the increasing gap between supply and demand of power, Govt. of India has sought participation of private sector in power generation. The Electricity Act 1910 and Electricity (Supply) Act 1948 have been amended to facilitate entry of the private sector in power generation. Various incentives have been offered to attract private investors, both domestic and overseas to enter in the field of power generation.

In line with the policy guidelines of the Govt of India, the Himachal Pradesh Govt has decided to allow development of selected hydro-electric power projects in the State by the private sector. Wanger Homte (24.6 MW) located in Kinnaur district has been allocated by Himachal Pradesh Govt to M/S Panchhor Hydro Power Pvt Ltd.

An Implementation Agreement (IA) has been signed between Ramesh Hydro Power Pvt Ltd. and Government of Himachal Pradesh for implementation of the project.

1.4 Project detail

Proposed Wanger Homte Hydroelectric Project (24.6 MW) is a run of the river type project on Bhaba khud, a tributary of Satluj river in Distt Kinnaur, Himachal Pradesh. The scheme envisages diversion of Bhaba

khad inflows by constructing a raised crested diversion weir at El 2633 m. The diverted inflow will be carried through conveyance channel to a surface desilting tank, which will be designed to exclude all silt particles down to 0.20 mm size. The silt free water will be carried through power tunnel up to an underground foreway. The inflows will be led to surface power house through a surface penstock to feed 3 no Francis type turbine driven generating units of 8.2 MW capacity each.

Salient features of Wanger Homte Project:

Proposal	Weir site on Bhaba Khad at El 2633 m and powerhouse on right bank at El 2440 m near village Kafnu
Geographical co ordinates	31^0 37' 07" N, 78^0 01' 16"E
SOI Topo sheet	53E/14
Design discharge	16.25 cumecs
Percentage availability of design discharge	38.07 cumecs
Design flood	785 cumecs
Penstock	Circular, surface steel, 590 m long, 2.25 m dia
Gross head	186.77 m
Net head	182.49 m
Tail race	RCC Box section, dia-3.4mx3.4m, 45 m long
Installed capacity	24.6 MW


CAT Plan-Wanger-Homte 24.6 MW
Map-1 from DPR
Panchhor Hydro Power Pvt Ltd
PROJECT AREA
LOCATION MAP
JAMMU
KASHMIR
HIMACHAL PRADESH
CHINA
KINNAUR
HOMTE-WANGER
SHEP (24.60 MW.)
HARYANA
UTTAR PRADESH
VICINITY MAP
LEGENDS
REFERENCE
SYMBOL
STATE BOUNDARY
RIVER AND NAAD
ROAD EXISTING
RAILWAY LINE BROAD GAUGE
RAILWAY LINE METRE GAUGE
POWAI
KACHA ROAD

CAT Plan-Warger-Homte 24.6 MW

Panchhor Hydro Power Pvt Ltd

Map-2 from DPR

1.5 Topography and Drainage:

The catchment area is generally rocky and mountainous, which may be classified under moderate to steep with precipitous slopes (35^0 to 85^0). The catchment area drains into Bhaba khud (Wanger Khud), which ultimately joins the Sutlej River on the right Bank above Wangtu town.

Photo: Bhaba Khud and catchment.

1.6 Geology:

The known geological formations in the tract are followings:

1.	Pre Cambrian	Schist's, gneisses, granites, quartzite's (Vaikrita system)
2.	Lat Pre Cambrian	Haimanta System-phyllites, quartzite conglomerates, shale's and slates.
3.	Silurian	Coral limestone, Quartzite's
4.	Carboniferous	Quartzites and limestones
5.	Triassic Rhaestic	Limestone, Shales, dolomites etc
6.	Recent sub-recent	Soils

The important rock formation in the forest areas are gneisses, schist, phyllites, granites and quartzites; metamorphosed schists occurring principally in the western portion of the Sutlej valley. In the Wanger (Bhaba) khad there is an outcrop of greenish quartzite which rapidly assumes a gneissic structure. Extensive outcrop of "Granitod gneiss" are seen beyond Wangtu along the Hindustan Tibet Road. To this rock type the name "Wangtu gneiss" is given. This parent rocky structure has given rise to clayey-loam and sandy-loam soils, which are shallow on the rocky outcrops and moderately deep to very deep at sheltered places and valleys. In many places the soil are prone to fast erosion due to rains and glacial activity. The different soil types and varied terrain have resulted in endowing the area with very rich bio-diversity- both flora and fauna.

Schists and soft-Banded gneiss, which decompose more rapidly, tend to produce deeper soils than the hard fine-grained gneiss and quartzite. The soils produced by the former vary from clay to clay-loam and

are often heavy and retentive of moisture to a considerable degree, edaphic conditions favoured by Kail and silver Fir. Fine-grained gneiss produce well drained sandy loam when decomposition is slow, but coarse gritty sand when decomposition is rapid. The former is particularly preferred by finest Deodar growth.

Depth and fertility of soil are both dependent on the presence of sufficient humus. Under a Fir or broadleaved canopy, the quantity of humus produced is greater than that under a Deodar. Spruce canopy is sufficient to produce a fertile loam. The soil profiles are generally well developed in higher locations under dense forest, but lower down they suffer from erosion and offer less scope for developing. Soils in most of the areas are formed in situ and are more or less loamy to clay-loam.

Photo: Rock type of the area

Generally speaking, the soil is shallow on ridges, spurs, and precipitous slopes. On the other hand, it is moderately deep on the cooler aspects and gentle slopes. On steep slopes, the soil is rapidly eroded by precipitation particularly where it lies just above sheet rock, unless it is adequately protected by woody vegetative growth. Owing to the very steep inclination of the terrain, soils are generally shallow. With steeply inclined rock strata and unstable surface soils, it is not uncommon to find boulder beds and detritus deposits at the base of the ridges in the catchment area. The chemical constitution of soils does not appear to have so important bearing on the quality of tree growth as do their physical properties. Preservation of tree growth on hot aspects and steep slopes is strongly recommended as a means of preserving soil fertility and a guard against soil erosion in the area where natural forces often become calamitous

1.7 Climate & Rainfall:

The climate is predominantly temperate with a more subtropical environment along the lower reaches. Part of the northern parts of the catchment, are under perpetual snow with tundra-like climate.

There are four clearly defined seasons that mark the region's local climate: spring, summer or monsoon, autumn, and winter. The spring extends from mid March to mid June and is characterized by a sunny weather in the forenoon and moderate to heavy showers in the afternoons. The summer season, from mid June to mid September, is the hottest period

when both day temperature and relative humidity are highest. Intense heat is generally experienced along the main Sutlej Valley because of large bare rocky mountains that overlook the river Bank. Interior valleys however are relatively cooler in summer owing to dense moist temperate vegetation on slopes. By the end of June, south west monsoon breaks bringing in copious rainfall along the outer Himalayas, but less so in the interior valleys. The autumn season that immediately follows the monsoon between mid September and mid November is probably the driest period when there is very little rain or snow and diurnal range of temperature is quite marked. Areas above 2000 m altitude experience frost during this period. The winter lasts from mid-December up to mid-March and even till April in alpine localities in the north. It is characterized by heavy frost in the lower areas and fairly heavy snowfall at higher elevations. Snow may descend down to Sutlej valley (1500m) during severe spells, but does not usually stay longer below 2000 m. Similarly, the accumulation of snow is often high in the forest belt but quickly melts away on south-facing slopes. By the end of April, all but high-lying forests and deep interior valleys on the northern aspects are clear of snow.

1.8 Temperature:

Specific data in respect of temperature & humidity of the Catchment is not available as there is no temperature recording station in the area. However, the temperature varies from (-) 5^0 to 25^0

The temperature varies according to the elevation. Temperature begins to rise rapidly from April onwards till June, which is the warmest month. It remains more or less high between June and September after which it starts to drop. Then the temperature becomes very low with the onset of winter, and January is the coldest month. In association with the passage of western disturbances in the cold season, the area experiences severe cold spells when the temperature often goes down below the freezing point. Frost is also very common between October and May.

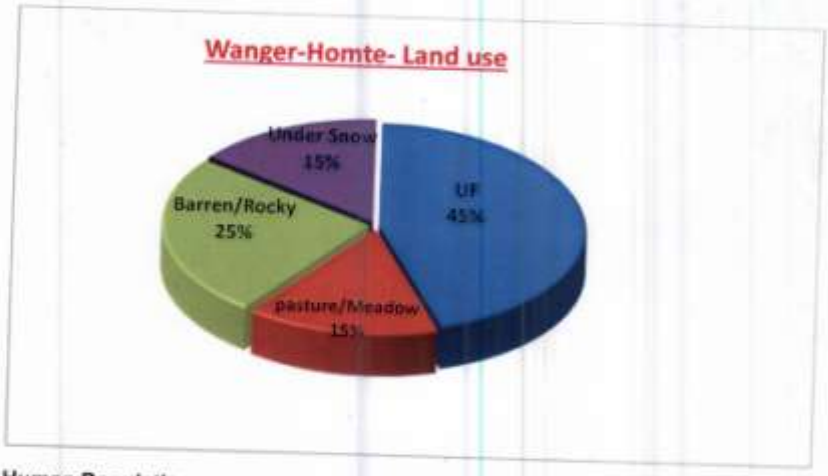
Rainfall in the area is in the range of 700-750 mm.

1.9 Land Use Pattern:

The land use pattern of the catchment area is summarized in Table below.

S.No.	Category	Area in ha
1	UF	150
2	Pasture land	50
3	Rocky/barren land	84
4	Area under permanent snow	50
	Total	**334**

Source: Revenue Department & Forest Department



1.10 Human Population:

There is no village inside the catchment area. However, human population of nearby villages, which have biotic influence/pressure on the catchment area, is given under:

Tehsil	Panchayat	Village	No. of House Hold	Human Population
Nichar at Bhaba Nagar	Kafnooo	Kafnooo	145	738
		Homtey	29	162
	Yangpaa	Yangpaa-I	170	1195
		Yangpaa-II	148	828
		Huri	32	164
		Kasrim	22	214
	Katgoan	Katgoan	134	609
		Bai	31	187
		Shango	110	533
		Dutarang	25	124
		Kangrang	12	63
		Surchoo	16	97
		Karaba	50	287
		Total	**924**	**5,201**

The local communities are by and large agrarian and a few young generation members are currently working outside either in Government services or in unorganized sector. Though cultivation of wheat, rice, and potato is the traditional practice, local people have started to grow apple, walnut, pear, and other commercially viable crops. Animal husbandry (esp. rearing of sheep and goats) has been practiced by the local communities as a source of supplementary income

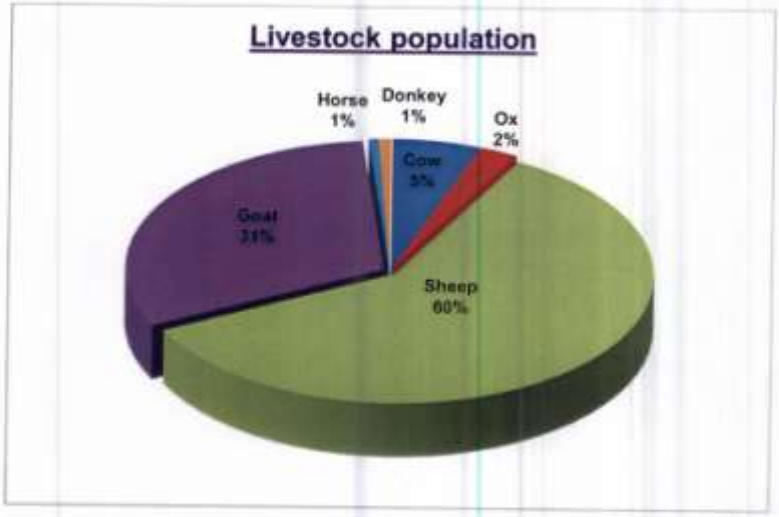
1.11 Cattle population:

Population of live stock in the villages which are outside the catchment area but exert biotic pressure in the catchment area is given below.

Panchayat	Village	Cow	Ox	Sheep	Goat	Horse	Donkey	Total
Kafnooo	Kafnooo	150	75	1020	600	15	21	1881
	Homtey	49	23	910	320	35	20	1357
Yangpaa	Yangpaa-I	410	130	4950	2300	45	29	7864
	Yangpaa-II	190	70	640	590	13	15	1518
	Huri	30	15	170	155	6	9	385
	Kasrim	15	10	420	110	5	6	566
Katgoan	Katgoan	124	49	620	310	0	7	1110
	Bai	39	18	940	475	5	8	1485
	Shango	15	45	520	220	0	12	812
	Dutarang	27	12	520	215	0	3	777
	Kangrang	15	10	370	290	0	12	697
	Surchoo	15	10	675	360	0	7	1067
	Karaba	40	32	545	465	0	8	1090
Total		1,119	499	12,300	6,410	124	157	20,609

Source: Revenue Department.

The above table shows that number of milch cattle is only 1,119 i.e. 5.4 %. Sheep and Goat constitute 91 % of the total cattle population, which have very adverse impact on regeneration of forests.



1.12 Flora:

The catchment area comprises parts of only 2 UFs- UF-29 and UF-30 and is endowed with rich flora of temperate species. The major species of the area include Fir, Spruce Deodar, Kail, Betula utilis, Bird Cherry, Mapple, Juglans regia, Pyrus species, wild popular, Salix, Alnus nitida, Corylus, Horse Chest nut etc., The under growth is Vibernum, Deutzia corymbosa, Skimmia laueola, Lonicera angustifolia, Spiraea spp, Indigofera spp, Salvia glutinosa Cotoneaster bacillaris, Desmodium tiliaefolium. and herbs like Salvia glutinosa, Thalicturm spp, Saussurea lappa, Jurinea macrocephella, Fragaria vesca, Gentiana kuroo, Fragaria vesca etc. are also found in the catchment.

1.13 Animals (Fauna) in the area

Mammals

Rupi-Bhaba Sanctuary, in which part of catchment area falls is home to about 65 species of mammals including some Himalayan charismatic species like Snow Leopard, Himalayan Tahr, Brown Bear, and Himalayan Weasel. However, mammal populations are generally low in density, barring a few species like Serow and Common Leopard. Heavy disturbance owing to movement of nomadic shepherds and mushroom collectors, habitat degradation due to overgrazing by livestock, and poaching (which was rampant till recently) are the primary causes.

Mammal found in the area are:

Mammal Taxa	Notable speices
Insectivores	Himalyan Water Shrew, Horsefield's shrew
Bats	Greater Horse shoe Bat, Hutton's Tube nosed Bat
Primates	Rhesus Macaque, Common Langur
Viverrids	Large Indian Civet, Himalyan Palm Civet.
Mustelids	Yellow throated Marten, Stone Marten, Himalyan Weasel, Yellow-bellied Wiesel.
Canids	Red Fox
Bears	Asiatic Black Bear, Himlayan Brown Bear.
Ungulates	Himalyan Musk Deer, Goral, Serow, Himalyan Tahr, Asiatic Ibex

Avian diversity found in the area is as follows:

Avian Taxa	Notable species
Pheasants	Himalyan Snowcock, Western Tragopan, Koklas, Cheer, Kalij
Snipes	Eurasian Woodcock, Himalyan Griffon, Vulture,
Owls	Montain Scops Owl, Himalyan Wood Owl.
Woodpeckers	Speckled Piculet, Himalyan pied Woodpecker
Wagtails & Pipits	Grey Wagtail, Rosy Pipit

1.14 Rights of the people:

i) Grazing:

In forests of catchment area, rights for grazing exist. It is estimated that 70% requirements of the fodder are met from the forest area. The settlement provides for free grazing to all animals of the right holders and no ceiling has been fixed on the number of cattle that might be grazed. A large number of cattle grazing in these forests lead to great damage to the vegetation as well as to the plantations. The right of grazing also comes in the way of taking up more closure for raising plants of different species as the consent of local people is to be obtained before the plantation work is to be undertaken and requires closure notification under the Indian Forest Act, 1927.

In Bhaba Valley, a large number of livestock enter the area each year in summer and monsoon months. A large number of these

are from the 13 villages of the Bhaba valley itself, but a considerable number are also from other villages/areas. The livestock from the Bhaba valley villages primarily graze in the Mulling alpine pastures en-route to Spiti, while other alpine pastures are used by herders from areas other than the Bhaba valley. Fodder is extracted both from within the forests and from the apple orchards (because the land beneath apple trees is fallow and yields considerable amounts of palatable grasses and herbs). With no major broadleaf forests in the Bhaba valley, the lopping of trees for fodder is not prevalent around villages but some fodder yielding tree species close to the tree-line are lopped in the autumn to provide winter forage.

ii) **Collection of fuel wood:**

People have the right to collect dry and fallen wood for their domestic use as per Forest Settlement Report, 1921. People entirely depend upon Fuel wood for their day to day use. Annual consumption of fuel wood per house hold has been assessed to be 6.0 tonnes. Mainly this requirement is fulfilled by Broadleaved species found near the adjoining forest and river banks.

iii) Timber:

People have the right to get timber at nominal rates for construction/repair/maintenance of their houses. The concessional rates were fixed at the time of forest settlement. No limit on the nos. of trees to be sanctioned was placed. However, now new TD rules have been framed by the Forest Department.

iv) **Cutting of Grass and Lopping of trees:**

People have right to cut grass and lop trees for fodder purpose. Cutting of grasses is being done in the forests without paying any fees to the Department of Forests.

v) **Minor Forest Produce:**

The local people have rights to collect Medicinal plants, Herbs, roots, shrubs and other forest produce for bonafide domestic use and for sale to the traders as enshrined in the Bushahr Satluj valley Forest settlement report, 1921 by H.M. Glover. The system of issuance of permit has been made easier by delegating power on the Pradhan Gram Panchayat concerned. Local communities are dependent on the Sanctuary for a variety of forestry resources. Collection of medicinal herbs, particularly Dhup (Jurinea macrocephalla), karu (Gentiana kurroo), mohra or patish (Aconitum heterophyllum), and kuth (Saussurea lappa) is a major activity. Besides, Gucchi (Morchella esculenta, a commercially valuable fungus grown on forest floor during rainy season) is much sought after by locals.

The main non-timber forest products include medicinal plants, guchchi mushroom, and other minor products like honey and animal by-products. A majority of these medicinal and aromatic plants occur in alpine meadows and pastures above the tree line in the sanctuary; among them Jungli jeera (Carum corvi), Bankakri Podophyllum hexandrum), Tallish patra (Rhododendron anthopogon), Karu

(Picrorhiza kurrooa), Dhoop (Jurinea macrocephala), Hath-panja (Dactylorhiza hatagirea), Chukhli (Rheum australe), Patish (Aconitum heterophyllum), and Saussurea obvallata, are the most sought-after plants by the locals. In particular, Dhoop is also being exported in large quantities. The Guchchi mushroom which emerges in damp moist forest floor during monsoon is reportedly delicious and a highly priced product that may fetch Rs. 8,000-10,000 per kg in retail markets. In particular, dense forests in deep interior valleys of Lankapuri and Phupal Gad Valleys are the major source for Guchchi mushroom, and hundreds of people throng these areas every monsoon in search of the mushroom.

1.15 Period of CAT Plan:

The Cat plan has been formulated for a period of eleven years. For the First two years of the plan not much of works have been prescribed and establishment of nurseries has been emphasized. However, from the second year onwards works will be done in full swing and will gradually taper off from the 6th year onwards and completed during the plan period.

1.16 Cost of the Plan:

The prescription of this CAT plan is to the tune of Rs. 2.02 crore only including Contingencies, Eco-Tourism, Monitoring & Evaluation, and Payment for Environmental Services, etc. However, the project proponent shall deposit total amount of Rs 4.1 crore (2.5 % of the HEP cost.).

CHAPTER-2

Problem analysis and Objectives

The study area taken for the catchment area treatment forms a part of only one sub catchment that is sub catchment 9 and falls in priority-4 classification. It is covered with snow in upper reaches and by forests in middle and lower reaches. Bhaba khud originates at an elevation of 5315 and joins Satluj river on its right bank at an elevation of 1495 m just upstream of Wangtu town. Total effective catchment area for Wanger Homte is 3.34 sq km only. Survey of India Topo sheets No- 53E/14 (1:50,000 scale) cover the catchment area.

2.1 Soil Erosion:

Soil erosion may be defined as the removal of soil from its origin and deposition in a new area. Water is the major agent responsible for this erosion. The intensity of rain/snow melt, steepness of hill sides, nature of top soil, vegetation, human interference, grazing and many such factors combine to erode the surface soil and carry it away in the form of silt load. In this catchment area glaciers are the major source for soil erosion. In the catchment area of a hilly area like one being considered for the project, land slips/glaciers, water erosion is a common phenomenon and the same has been studied as a part of the Catchments Area Treatment (CAT) Plan.

Photo: Glacier in catchment area

The catchment area comprises mainly of gneisses, which are by and large quite compact and do not pose problem of possible potential slides in general. The catchment in the upper reaches are not approachable. However, some of the areas are susceptible to incidence of landslides, slips/glaciers and water erosion. Bulk of soil erosion takes place due to scouring action of water running off the surface during melting of snow. The geology of the catchment area is such that major land slides or high soil erosion intensity locations are in the upper portion, but the lower portion is not susceptible to much soil erosion.

The sediment load in Bhaba (Wanger Khud) is very low even in rainy season as compared to the silt load in Satluj river. During winter season the water is quite and almost free from any kind of sediment/silt.

Photo: Bhaba khud joins Satluj river near Wangtu

Photo: Bhaba meets Satluj

Photo: Bhaba Khud- Clear water in July 2011

Photo: Satluj river- High silt load in July 2011

Map showing Prioritization of Micro Watersheds

MWS Prioritization Legend

- 1 Highest Priority
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10 Lowest Priority

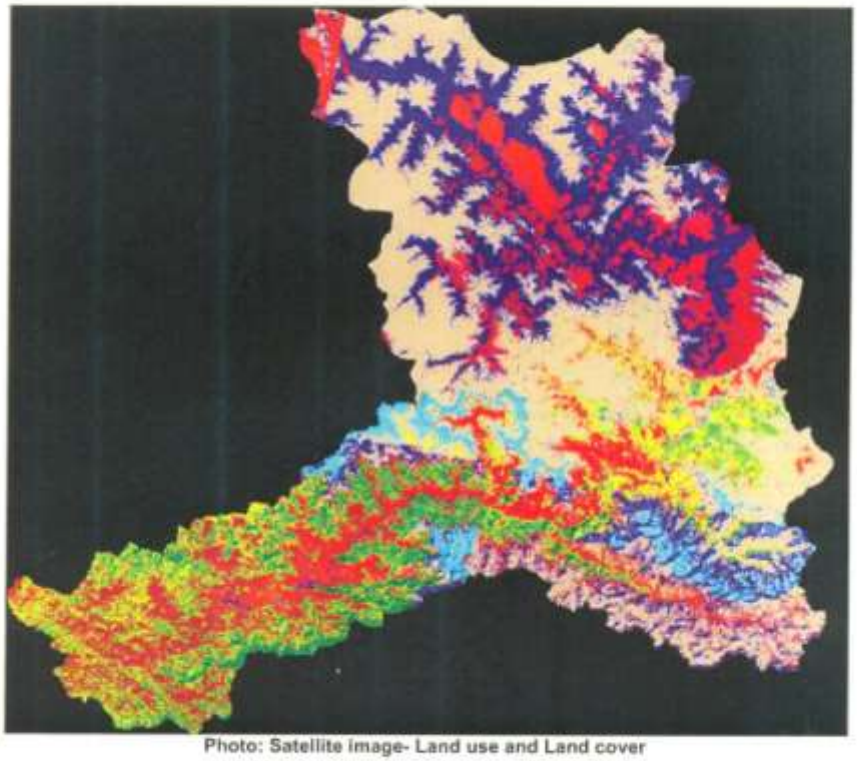
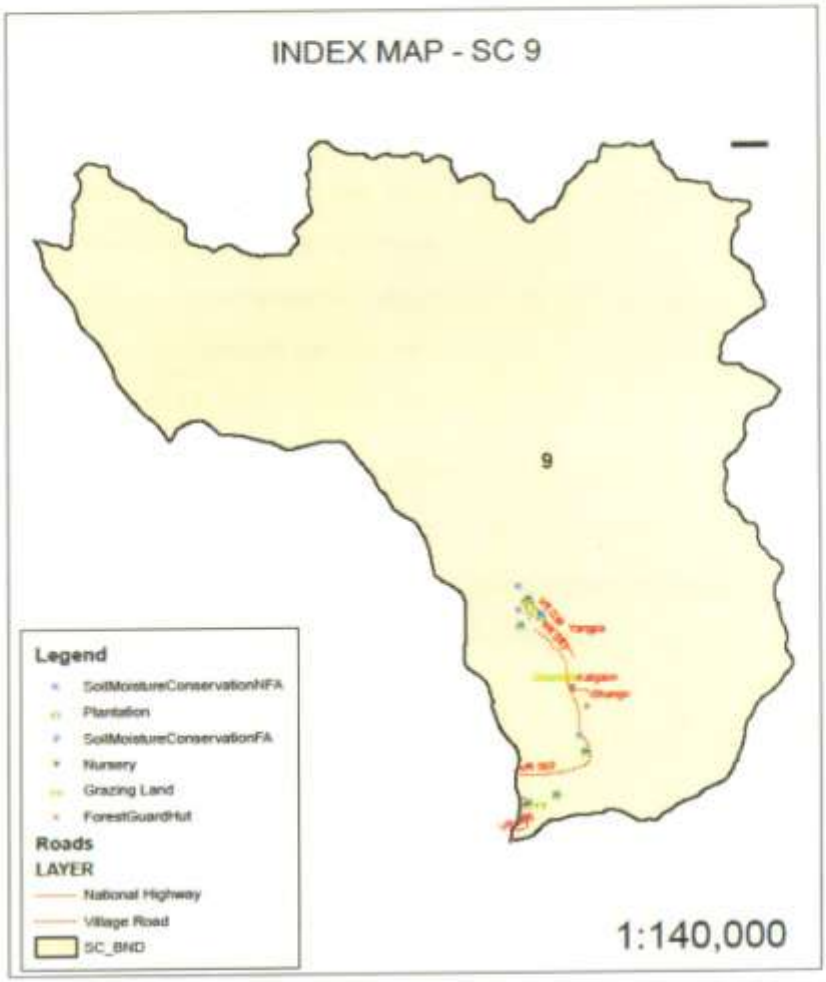


Photo: Satellite Image- Land use and Land cover

	Dense Forests
	Moderate Dense Forests
	Open Forests
	Scrubs
	Private Land
	Barren Land
	Water Body
	Snow Cover



Area of sub catchment-9 is 405 km^2, out of which the effective catchment of Wanger-Homte is only 3.34 km^2. Total catchment area of Wanger Homte falls only in sub watershed-9.

Soil Erosion Leads to:

i) Loss in production in agriculture land due to removal of top soil.

ii) Reduction in infiltration rates due to soil removal.

iii) Reduction in water holding capacity.

iv) Loss of nutrients available to plants and trees.

v) Increase in tillage operation costs.

vi) Reduction in water availability due to heavy runoff

2.2 Information Collection & Compilation:

Ground maps, contour information, and problematic areas were collected/selected and studied to know the specific areas which require intervention. The strata are generally stable and rocky.

2.3 Water Shed Management:

Watershed management is the optimal use of soil and water resources within a given geographical area so as to enable sustainable production. It implies changes in land use, vegetative cover, and other structural and non-structural action that are taken in a watershed to achieve specific watershed management objectives.

The overall objectives of watershed management programme are to:

- Increase infiltration into soil.
- Control excessive runoff.

- Manage and utilize runoff for useful purposes.

The watershed management measures have been classified under the following categories;

a) Biological measures

b) Bio-Engineering Measures

a. **Biological Measures**

The various measures covered in this category are:

- Nursery Development.
- Afforestation.
- Enrichment planting.
- Energy Plantation.
- NTFP/Medicinal Plants Plantation.

b. **Bio-engineering Measures**

- Stabilization of landslides/slips
- Nullah stabilization

2.4 Pressure on Forest Resources:

2.4.1 Grazing:

Afforestation cannot be successful if it is damaged soon. Grazing is the most destructive factor for the failure of plantation. Grazing includes eating of any kind of standing vegetation by domestic livestock or wild animals. Young seedlings/saplings can hardly coexist with thousands of sheep, goats, and cattle left freely in the plantations and regeneration areas causing irreparable losses to

the soil and vegetation cover. Nevertheless, role of livestock in the economy of local people is appreciable, But free and uncontrolled grazing causes tremendous losses to the forests.

The extent of pressure can be gauzed by the fact that the livestock population of the nearby villages is 4 times the human population

Effects of grazing on forests:

1. Grazing destroys tender seedlings of desirable species which are eaten away along with grass.
2. Seedlings of the desirable species get either trampled or damaged by the heavy hooves of the animals; roots get exposure and finally plants die out.
3. Grazing makes the soil compact, reduces its porosity and breaks down the soil aggregates. Heavily grazed lands are therefore, poorly-aerated, with poor percolation, increased run-off and evaporation whereby germination of seeds is reduced.
4. Soil particles are dislodged and destruction of protective cover leads to erosion.
5. Due to grazing, highly nutritive palatable grasses and plants get replaced by less nutritive, unpalatable and coarse grasses leading to dwindling of grazing resources. Change of composition of crop also takes place with inferior species.
6. Mechanical damage to seedlings and saplings by the passage of animals.

2.4.2 Fodder and Fuel wood:

Livestock population in the nearby villages is 20,609, out of which Sheep is 12,300 and Goat is 6,410. These animals put great pressure on the forests as most of them graze in the forests. 82 % of household is dependent on forest to meet the fodder requirement. 27 % of fuel wood requirement is met from their own farms and to cover the gap 80 % families depend on forests.

2.5 Man-Wildlife conflict:

Man-wild life conflict is the result of gradual degradation of natural resources and the most sufferers are poor, marginalized communities living in and around the forests of the Catchment area. The problems of animal damage in area, whether it is crop depredation, live stock depredation or human causalities, are not as alarming as it is in some other parts of the State or elsewhere in the country. However, the problem of livestock predation and killing by Leopard and Black Bear is gradually increasing. In particular, cattle lifting by Common Leopard and human attacks by Black Bear seem to be a burning issue in this part. The problem of encounters with Black Bear seems to be particularly high during winters and monsoons. The villagers also complain about extensive damage to potato fields by porcupines, both the freshly-sown and harvest-stage crops. Livestock owners and shepherds complain that their animals are routinely preyed on by Common Leopards, Snow Leopards, and more occasionally by Brown Bears, in alpine pastures during summer. Common Leopards occasionally attack livestock within villages as well, but no loss of human life was reported. Himalayan Black Bears frequent the surrounds of the villages of

the Bhaba valley, lured by the abundance of fruit and other crops in the fields. Interestingly, villages most affected by Bears typically have orchards along the upper fringes of agricultural land; areas that are usually the most distant from homes and most proximate to forests. Villages that are lower down in the valley, or surrounded by other villages face less damage from Bears.

In the past, poaching of wildlife was apparently common, as hunting was a prime pastime of the locals. In particular, Musk Deer was poached extensively for the commercially valuable musk-pod (an abdominal gland in male animals), which would then be sold in markets of Rampur Bushahr, Shimla, Amritsar, and Ambala. Barking Deer was heavily killed for its meat and even today the Barking Deer populations in the Sanctuary is very low. Himalayan Tahr and Goral were other animals which were hunted in a large scale for meat. Himalayan Monals were trapped and killed for their crest feathers which the villagers used to wear on their caps as a status symbol. Fortunately, poaching became much reduced since the enactment of the Wild Life (Protection) Act, 1972 and the re-notification of the Sanctuary status in 2001. Moreover, establishment of several hydel projects along Sutlej and its tributaries in recent years has opened up employment opportunities among the locals and this has, to a certain extent, weaned away the locals from poaching practices.

Appropriate compensation is needed and also environmental awareness programmes for glaziers need to be created. Concerted efforts,

education, awareness, research, monitoring, habitat restoration and development is essentially needed to tackle the complex issue of man animal conflict

2.6 Inadequate Scientific Information:

Complete inventory of the flora and fauna of the catchment is yet to be prepared. The status of important habitat types and that of the threatened flora and fauna is not known. No information is available in this regard about the carrying capacity of the forests and alpine meadows in and around the Catchment area. Therefore, in the absence of reliable primary data on various aspects only general type of strategy and approach can be made as management and improvement of the catchment area by carrying out detailed survey of the catchment area.

2.7 Employment and Income generation Activities:

In general, people in Bhaba valley are relatively well off as a result of recent commercialization of the valley in response to establishment of hydel projects which were followed by huge infrastructural development like roads, buildings, electricity, telecommunication, and residential colonies. This has provided ample opportunity for employment and income generation. Apple orchards are also owned by the villagers nearby the catchment area. However, people are interested in Khadi, Fishery, Poultry, Bee keeping etc.

2.8 Eco-Tourism Potential:

The area is very interior and picturesque. The Bhaba Valley is having a good potential of Eco-Tourism but is still not fully explored for this purpose. There is overall deficiency of proper infrastructure for the growth of tourism in the area and basic facilities like FRH, I/Hut, Hospitals, boarding & lodging, proper paths, well developed camping sites & public utility services etc. which further affects eco-tourism in the area. The local people are not aware of the vast potential of eco-tourism. They need basic training about eco-tourism vis-à-vis wildlife conservation. It can become one of the most important alternative income generation activities.

Rupi Bhaba Wildlife Sanctuary has a large number of trekking routes and mountain trails, most of which are quite challenging and the high mountain-passes connect the Sanctuary to neighbouring parts of Great Himalayan National Park and Pin Valley National Park.

2.9 Demarcation of Boundaries and Construction of boundary Pillars:

The boundaries of Rupi-Bhaba Sanctuary has finally been notified under Section 26A of the Wildlife (P) Act, 1972 by the H.P. Government Notification dated 07.09.2001. However, these boundaries are yet to be marked on the ground for the better management and to protect their boundaries from the encroachments.

Construction of the B/Pillars and chak pillars will not only prevent illegal activities in the Sanctuary but also benefit the local people to know the boundaries of their cultivated land in PA.

2.10 Buildings, Paths, Bridges and Communication network:

The existing buildings are inadequate and the I/Paths and B/Paths/Foot bridges are in bad condition, which require immediate repair and some new buildings are also required. To manage the forest resources and to implement the CAT Plan, better infrastructure is necessary for the front line field staff. The paths and bridges are also required to be maintained for the local people and the staff for patrolling.

2.11 Need of latest technology and training for the staff/officers:

The front line staff and officers should regularly be trained to have latest technique and methodology of professional management techniques. In order to equip the staff with latest technology and new scientific knowledge in addition to their long gained experience, training needs to be arranged in wildlife management, soil conservation etc.

2.12 Lack of concern about conservation by the local people:

The local people are not much concerned about the forest wealth due to various reasons. They are more concerned about their livelihood opportunities. Proper understanding, co-operation and awareness is required to have better results.

2.13 Monitoring and Evaluation:

Monitoring is an important and integral component of effective conservation and management as it provides ways to track the status of various components of biological diversity and forest eco system over time. The regular feed back through monitoring and evaluation allows better understanding, midway corrections and adoption of appropriate strategies.

CHAPTER-3

Objective and Project Proposal

3.1 Project Objectives:

Catchment area treatment basically involves:

i. Understanding erosion characteristics and
ii. Suggesting remedial measures to reduce the erosion rate/silt load

The objectives of the CAT Plan are summarized as under:

- To achieve sustainable management of Forests, Bio-Diversity Conservation and also ecological rehabilitation in the area leading to an all round eco-development activities on sustainable basis.
- To initiate measure to rehabilitate the degraded habitat through afforestation of native species.
- To reduce soil erosion and land degradation through soil conservation measures to ensure longevity of Wanger Homte Hydel Project.
- To increase the potential/production of the bio-mass in the area and to ensure longevity of Wanger Homte Hydel Project.
- To improve the infrastructure facilities in the area.
- To reduce burden on forests through Energy Saving Devices and other measures.
- To provide employment to the local people by engaging them in afforestation, anti poaching, rural infrastructure and other works.
- To upgrade the skills and build capacity of the PA's staff in Wildlife management skills by providing training to meet the challenges.

- To plant wild fruit bearing species suitable for wild life and create water resources for wild life.
- To strengthen the extension activities for forestry development and wild life protection.
- To conduct research studies relevant for management of flora and fauna.
- To seek people's participation in planning, implementation and monitoring.

In the present plan thrust has been given for sustainable development of the catchment area as well as to protect and conserve the local environment with the active involvement of local people. In the CAT Plan equal emphasis has been given to the economic needs of the local people, greening of the region and strengthening the local wildlife management and integrate these activities with a view to finally avoid soil erosion.

Various mechanical and biological measures have been suggested to treat the catchment area to meet the objectives of the CAT Plan.

3.2 Project Period:

The Project period would be for 11 years.

3.3 Project Components:

This CAT Plan has been designed keeping in view the ecological as well as social conditions prevailing in both the project as well as catchments area. The treatment measures emphasize on conservation of catchment through afforestation in blank/ degraded areas, and bio engineering works in soil eroded areas including Nullahs. It also envisages an active participation

of local community as it will ensure better success of the works and provide them employment to add to their economy. Apart from this, management as per the needs of the wildlife along with habitat improvement, anti poaching, coupled with bio engineering works will be undertaken in the catchments area. The important activities in this regard to be undertaken during the project period have been described.

a. A map depicting the administrative boundaries, Beats, Block, Range, Road network, drainage of the catchment etc. has been prepared.

b. The map also shows the forest infrastructure present like buildings etc. Few works have been proposed to be treated outside of the catchment area in the interest of overall requireent.

c. The prescriptions of the CAT Plan have been made based on the analysis of the current situation of the catchment after extensive field reconnaissance.

d. The prescription in the CAT Plan is based on the actual extent of the work to be done in the catchment. A provision to offset the cost escalation in the CAT Plan has also been made. As the Hydel project implementation cost increases, the outlay of the CAT Plan will be revised proportionately after review to be done every two years.

e. The basis for calculating the financial outlay for the all the activities mentioned in the CAT Plan is the prevailing schedule of rates of H.P. Forest Department.

f. The locations of the proposed activities are based on GPS Coordinates which will subsequently form the basis of monitoring.

g. The activities proposed in the CAT Plan have been spread over 11 years and annual phasing of the works has also been kept as per guiding principles.

3.4 Biological Measures—Improvement of tree cover

(a) Nursery development-Development of New Nursery.

(b) Afforestation.

(c) Enrichment plantation.

(d) Energy Plantation.

(e) N.T.F.P/Medicinal plants Plantation

3.5 Soil Conservation Works- Engineering and Bio-Engineering measures:

- Stabilization of land slides/slips.
- Stabilization of Nullahs

3.6 Payment of Environmental Services (PES)

This is a new concept and and detailed modalities are yet to be worked out.

3.7 **Research, Training, studies and Capacity Build up**

Different research/studies have been proposed in the CAT Plan along with training of Forest officers/ front line staff to enhance their capacity for wild life management.

3.8 Forest Infrastructure Development, Operational Support &Forest Protection

3.9 Buildings and paths

- ✓ Repair of forest path/bridle Paths/foot bridges.
- ✓ Maintenance of existing buildings.
- ✓ Construction of new building.

(b) Energy saving devices.

- ➢ Distribution of LPG Cylinders.
- ➢ Distribution of Solar lights.
- ➢ Construction of crematoria and store for fuel wood.
- ➢ Distribution of induction heaters/cookers/Energy efficient chulhas.

(c) Construction and repair of existing boundary pillars.

Although the boundaries of sanctuary have been notified, boundary pillars are yet to be fixed.

(d) Sign and slogan boards

Sign and slogan board will help in educating/ sensitizing local people as well as visitors about the Wild Life.

3.10 Management of Wildlife in and outside the protected area

Rupi Bhaba Sanctuary, being located in the Great Himalaya, is characterized by a steep, precipitous terain with harsh weather and poor access to deep interior valleys.

This Sanctuary is among those mountain protected areas in the state,where lot of studies can be made and monitoring mechanism can be improved to understand the responses shown by the wildlife. The key problems that plague the Sanctuary are as follows

- The staff lacks latest and sufficient equipments and education materials relevant for wildlife management.
- Dependency of local communities on the area is substantial similar to many other mountain protected areas. With improvement in the road network leading to increased agriculture/horticulture opportunities, conflicts also increase due to crop depredation and killing of livestock by wild animals.
- Managing livestock grazing is a challenging task, and in the absence of any credible information on the livestock-habitat interaction, it is difficult to gauge the consequences of livestock grazing or non-grazing here.
- Information on biodiversity components is grossly lacking, and that the management objectives are constrained by this lack of knowledge. Research has not found a place in the Sanctuary, except for some short surveys, and therefore, there is no targeted activity. Monitoring is adhoc, and there is a clear need for scientifically sound monitoring protocol.
- Unique Wildlife Habitats: The area seems to have a lot of Unique wildlife habitats such as gorgers and hidden valleys which are home to many such

species which may be new to the science (such as amphibians like salamanders, etc). There is a need to identify such unique habitats and protect them from blasting, degradation, etc. Same is true for nesting sites of vultures (cliffs, ledges, etc), galliforms, etc. The mapping of such critical and unique area needs to be done.

Opportunity for ecotourism is unbounded and this would not only create revenue for Sanctuary management, but would simultaneously harness popular support for the welfare of the area. Research and monitoring, if undertaken on the target groups/activities suggested in this plan, would put the management on right course similar to already established mountain PAs in the state.

3.11.1 Management Prescriptions

- The frontline staff of the sanctuary should be regularly given hands-on training on the field on different aspects of wildlife management including survey methods for large mammals and pheasants, reading and interpretation of signs and evidences of wildlife, assessment of the state of wildlife habitats, and evaluation of wildlife health.
- A good network of intelligence is essential to the sanctuary management, and as such, the frontline staff should be encouraged to liaison with the local people and gather crucial opinions and information.
- Capacity-building workshops and training sessions should be regularly conducted in the field for the lower and middle level staff in various aspects of wildlife management and conservation. Professional organizations like

Wildlife Institute of India, Forest Survey of India, and Institute of Himalayan Bioresource Technology (Palampur), can be approached for imparting these trainings.

- The sanctuary management, in general, should now adopt new-age spatial tools and techniques like use of GIS and remote sensing for mapping the sanctuary, resource mapping, distribution of wildlife populations, fire-incidence, etc. A dedicated GIS lab should be commissioned at the head-quarters along with a team of trained personnel and required tools and software.

3.11.2 Eco-tourism Initiatives

Though Rupi Bhaba Sanctuary has enormous potential for wildlife and adventure tourism on account of it being the stronghold of some of the spectacular wildlife species of western Himalaya like Western Tragopan, Serow, and Himalayan Tahr, and being a mountain landscape with precipitous hills and deep narrow gorges, there are hardly any signs of such activities in the sanctuary barring a few recent initiatives by private tourism firms in Bhaba Valley.

Photo: scenic view of the area

In particular, the spectacular diversity of birds like the nine species of pheasants, three species of rare snipes that occur only in high-altitude bogs of montane forests, and ten species of leaf-warblers would make Rupi Bhaba Sanctuary a birding hotspot. This would also attract the foreign birders and wildlife enthusiasts who throng GHNP and Pin Valley in great numbers every year to Rupi Bhaba. Eco-tourism, while it can generate opportunities to raise income for local communities and sanctuary management, can also be a bane if not regulated. We provide here some possible outlines for taking up responsible eco-tourism initiatives in the sanctuary.

3.11.3 Income Generation Opportunities and Mechanisms

It is imperative to wean away the local communities from forest-based livelihood for effective conservation of wildlife populations and their habitats. It can be done only by creating new genre of employment and income-generating opportunities, equitably across all strata of the society. This is evident from Rupi Bhaba Sanctuary, where pressure on forests is perceptibly low in Bhaba Valley in comparison to the Rupi Range. The establishment of hydel projects and subsequent infrastructure developmental works created new employment opportunities in Bhaba Valley, and recent shift in their cropping pattern to more lucrative apple orchards has generated a lot of agricultural income. These two factors have contributed to the growing clout of non-forest economy in Bhaba valley. Opening up of Bhaba Valley for mountain and adventure tourism has again created a new avenue of income generation for the local people. On the contrary, people in Rupi and Shorang Valley continue to be wholly dependent on forestry resources for their sustenance, exerting huge pressure on forests and wildlife populations in the core of the sanctuary. With agriculture largely confined to sustenance farming and lack of opportunities for raising non-forest income, villages in Rupi Valley are dependent on forests for their livelihood and their use and extraction of forestry resources are often well beyond sustainable limits.

Though Mahila Mandals (women's self-help organizations) are actively present in nearly every village of the buffer zone, they are currently not sufficiently innovative to find revenue-creating opportunities from non-forestry

sector. Lack of counsel and leadership, traditional absence of social entrepreneurship in these communities, and a misplaced perception of forests as limitless resources of income are some of the factors why these Mahila Mandals are not very successful vehicles of local level economic change.

3.12 Mitigation of Human-Wildlife Conflict

(i) Compensation against wildlife damages.

(II) Publicity and awareness.

3.13 Extension of Sarahan Peasantry at Gopalpur

4. A brief description of each component is as under:

1. Biological Measures-Improvement of tree cover:

a. Nursery Development:

To raise successful plantation it is necessary to have good & adequate planting stock. It is proposed to establish Nursery in UF-29 since there is no existing nursery in the vicinity. The nursery shall be raised in the 1st year of the project period and will be further maintained till the completion of planting activities. Modern facilities like poly house, improvised irrigation system etc will be provided. The plants raised will be Fir/Spruce and broad leaved species and NTFP species.

Name of Nursery	Amount-Rs	Latitude	Longitude

Establishment of New Nursery in UF-29	4,50,000	31°38'30"	78°01'35"

b. Afforestation.

The aim of this CAT Plan is to conserve in-situ flora and fauna along with the full range of eco-system. Under this scheme blank areas devoid of tree growth and degraded forests shall be undertaken for plantations. while the choice of species will be mainly governed by the site/location, effort will be made to raise a mixture of conifers, broad leaved species and fruit bearing species etc. The plant life provides congenial home to wildlife and bio diversity therefore the habitat of wildlife is to be improved by supplementing with Bamboo/shrubs and fruit bearing species. The Nirgal/shrubs in the under story is very important for pheasant in the catchments area. The main species to be raised under this scheme are Fir/Spruce, Nirgal, Maple, Ban, Oak, Aesculus indica, Prunus persica, Prunus cornuta, Prunus pashia, chestnut, Juglans regia, Pyrus spp and other fruit bearing spp etc. Plantation must use local and indigenous species since exotic species have long term negative impacts on the forest eco-system. The preference of local communities as the regards the choice of species will be ascertained and given due weight age as per the requirement of site.

Plantation will be maintained for subsequent three/five years. A total of 20 hac. has been identified for planting under this scheme. The detail of the areas identified to be planted is given below:

Sr.N.	Name of Area/Forest	Area in Ha	Longitude	Latitude	Remarks
1	UF-29	10	31°39'	78°6'	During course of execution of works there may be minor changes in longitude and latitude
2	UF-30	10	31°38'	78°6'	
	Total	**20**			

The afforestation norms have been worked out as per norms of HP Forest Department for tribal areas for the year 2011-12. Looking at the high incidence of grazing during summer, all the plantation areas will be fenced with B/Wire in 3-4 strands.

S.N.	Component	Amount-Rs
1	Fencing cost-wages	6971.64
2	Planting cost-wages	14014.13
3	**Sub total wages**	**20,985.77**
4	Barbed wire cost	3,500.00
5	Other material cost	1,100.00
6	**Sub total material cost**	**4,600.00**
7	Cost of plants Rs4.35x1100	4,785.00
8	**Total**	**30,370.77**
9	**Norm**	**Rs 30,400 per ha**

Sr.No	Expenditure Detail	Amount-Rs.
1	Afforestation cost with conifers/Broad Leaved over 20 ha. @ 30,400	6,08,000
2	Maintenance cost of 3 years	
a	1st Year Maintenance cost for 20 ha. @ 5,040	1,00,800
b	2nd Year Maintenance cost for 20 ha. @ 3,120	62,400,
c	3rd Year Maintenance cost for 20 ha. @ 1,740	34,800
	Total (New + Maintenance)	**8,06,000**

c. Enrichment Plantation:

There are some forests in the catchments area where in patch density of crop is poor and devoid of overhead shade where planting could be done. In such areas planting of 800 seedlings per hectare is expected to result in full density forests. Extent to such areas is estimated to be 55 ha. Thus, it is imperative that such forest areas are planted by artificial means to increase their stocking to the required level. The detail of the areas identified is as under:

Sr.No	Name of Area/Forest	Area in Ha	Longitude	Latitude	Remarks
1	UF-29	20	78°6'	31°39'	During course of execution of works there may be minor changes in longitude and latitude
	Total	20			

Per Ha Cost Norms for Enrichment Plantation (800 plants per ha) Works has been calculated on the Prevailing Schedule of rates applicable in H.P. Forest Department for the year 2011-12.

S.N.	Component	Amount-Rs
1	Fencing cost-wages	6971.64

2	Planting cost-wages	10,985.02
3	**Sub total wages**	**17,956.66**
4	Barbed wire cost	3,500.00
5	Other material cost	800.00
6	**Sub total material cost**	**4,300.00**
7	Cost of plants Rs4.35x800	3,480
8	**Total**	**25,736.66**
9	**Norm**	**Rs 25,700 per ha**

Sr. No	Expenditure Detail	Amount-Rs.
1	Afforestation cost over 20 ha. @ 25,700	5,14,000
2	Maintenance cost of 3 years	
a	1st Year Maintenance cost for 20 ha. @ 3,996	79,920
b	2nd Year Maintenance cost for 20 ha. @ 2,424	48,480
c	3rd Year Maintenance cost for 20 ha. @ 1218	24,360
	Total (New + Maintenance)	**6,66,760**

d. Energy plantation

Nearer to habitations in small patches, energy plantation/ high density plantation is proposed, in which Five Strands barbed wire fencing of 3 strand and 2 cross wise; with creosoted wooden fence posts & two layers of live-hedge to reinforce fencing will be done and , 5000 tall plants per ha (spacing 2mx 1m) of fuel and fodder value will be planted to provide quick availability of fodder and fuel wood.

No maintenance will be done. Total 10 hac area has been identified for this treatment under this component as per detail is given below:

S. N.	Name of Area	Longitude	Latitude	Area - ha.	Remarks
1.	UF 29	78° 02' 18"	31° 38' 15"	10.	During course of execution of works there may be minor changes in longitude and latitude
	Total			**10 hac.**	

The cost estimate for raising of Energy plantation over one hac is as under:

Per Ha Cost Norms for Energy Plantation:

A. Energy Plantation

S.N.	Component	Rs
1	Fencing cost	10,000
	Planting cost	37,500
2	Sub-Total Wages	47,500
3	Material cost	9200
	Cost of plants raised (Rs.4.35/Plant x5000)	21,750
4	Total	78,450
5	**Norms per ha**	**Rs. 78,500**

Expenditure Detail	Amount

Energy plantation over 10 ha. @ 78,500	**7,85,000**

e. N.T.F.P/Medicinal Plants Plantation:

A number of valuable medicinal plants have become endangered due to over exploitation and unscientific extraction and collection from their natural habitat without adequate replacement by way of artificial regeneration. Local people have a right to collect/extraction of Minor Forest Produce in and around the forest and Sanctuary area under provision of Forest Settlement Report, 1921 for domestic use and their livelihood, there by threatening the very existence of rare and endangered species of medicinal herbs. Therefore, it is essential to address the livelihood issue by encouraging forest based enterprises for development of NTFPs on sustainable basis as it provides alternative income generation activities. Under this scheme medicinal herbs like Dhoop, Karu, Kuth, Salam Panja (Hat Panja), Ban kakri, Chora, Patish and Discorea deltoidea etc. will be raised. Up to 4,400 shrubs and perennial herbs shall be planted in 1 ha. area depending upon the site.

The plantation areas will be fenced with B/wire fence in four strands on wooden fence posts. 10 hac. area has been identified for planting under this component. The details of the area identified are as under:

Sr.N.	Name of Area/Forest	Area in Ha.	Latitude	Longitude	Remarks
1	UF-30	10	31° 37' 10"	78° 07' 30"	During course of execution of works there may be minor changes in longitude and latitude
	Total	**10**			

Expenditure Detail:

The cost model for raising of NTFPs plantation over 10 hac is given as under:

Sr. No.	Expenditure Detail	Amount
1.	Afforestation cost with medicinal plants/herbs over 10 ha. @ 37500	3,75,000
2.	Maintenance cost for 3 years	
a	1st year maintenance cost for 10 ha. @ 6350	63,500
b	2nd year maintenance cost for 10 ha. @ 4300	43,000
c	3rd year maintenance cost for 10 ha. @ 2250	22,500
	Total (New + Maintenance)	**5,04,000**

2. Soil Conservation works-Engineering and Bio-Engineering measures:

Soil bio-engineering stabilizes or protects eroded soils and reduces further soil erosion. The plant and plant parts (roots, stems) act as the main structural components to reinforce the soil and to provide protection. Soil bio-engineering technique must be a cost-effective solution using locally available material and executable through unskilled or semi-skilled labor. The approach must allow the involvement of the local population in the management and maintenance aspects. Traditional methods of controlling stream flow and erosion rely on structural practices like rip rap, retaining walls and sheet piles and are often expensive, ineffective or socially unacceptable. Bio-engineering uses live plants alone or in combination with dead or inorganic material, to

produce living, functioning systems to prevent erosion, control sediment and provide habitat. Both structural practices and live vegetation are used to provide erosion protection for hill slopes and stream banks. The techniques outlined in this manual use woody plants that root mostly from dormant cuttings.

The species selected for bio-engineering should be available locally suitable for that zone. Cuttings and rooted plants are only to be used during the winter months (dormant season) and sodding techniques be used during the (summer season) vegetation season. Various methods are available for hillside and slope stabilization. Methods of seeding are dry-seeding and hydro-seeding. On exposed areas the seed is to be protected with straw in combination with meshes of jute and wire. After seeding, the stabilization can be increased through transplanting of stump sprouting deciduous shrubs or tree species.

With different type of brush layering, loose rock slopes can be stabilized. If the plants are rooted, they are called hedge layer. If they are un-rooted, they are called brush layer. There are numerous different hillside and slope stabilization methods which utilize plants in combination with wood layering, stone and wire combinations, such as planted pole walls, live slope grids, live wooden crib-walls, vegetated stone walls and vegetated gabions.

The budget for soil and water conservation needs to be utilized as under:

- 50% For Small Engineering works.

- 50% For Bioengineering afforestation works.
  - 50% for raising nursery plants.
  - 50% for actual afforestation.

Application depends upon the suitability of soil bioengineering plants and structural techniques. Bio-engineering species can be raised in p-bags and through cuttings (easily sprouting types). Plants raised in nursery need to be acclimatized to the outdoor environment before planting. Seeding and mulching are not appropriate in areas of flooding, high water flow or rapid changes in water depth, as the mulch and seed will be washed away. Proper seedbed preparation, fertilization and irrigation may be needed to assure seedling survival. Different techniques used are:

- Grass planting and seeding
- Brush layering, fascines and palisades construction
- Tree and shrub Planting and seeding
- Live vegetative check dams and stone pitching
- Large bamboo planting
- Jute netting and mulching

The following criteria will be used for choosing the species:

- Local natural plant species
- Easy availability
- Easy propagation
- High tolerance for refractory soil conditions

- Non palatable or less grazed/browsed by animals
- Bush to medium sized species

i) **Land Slide Stabilizations:**

Land slides are caused by the down hills measurements of weathered rock mass, boulders, soil etc.

There are various factors natural and manmade, which contribute directly or indirectly in producing land slide.

The identified areas in the CAT Plan area are to be stabilized through various controlled measures would depend upon the size, extent and location of the slip of the area. However in general the following measure shall be applied depending upon the situation in the site/field:

a) Construction of check wall/protection/retaining wall with crate wire to control land slips and toe cutting with brushwood check dams.

b) A mixture of soil conservation work with biological measures is required depending upon the site.

The various land slips/land slides stabilization proposed for treatment is given below:

S. N.	Name of the Location/Area	Ha	Area benefitted-ha	Longitude	Latitude	Remarks
1	Masrang Slip	3	30	$31^0 37'$	$78^0 03'$	During course of execution of works there may be minor changes in longitude and latitude
2	Thingri Slip	1	10	$31^0 35'$	$78^0 01'$	
3	Selti Slip	2	20	$30^0 39'$	$78^0 00'$	
	Total	**6**	**60**			

The Expenditure of Land slide/slips stabilization:

Sr.No	Name of Work	Amount-Rs
1	Land slip Stabilization over 6 ha	16,75,000

The actual extent of treatment and expenses will vary as per the site condition and requirement at the time of execution.

ii) Nullah Stabilization:

4 Nullahs with a length of about 5 Km. are required to be treated in the catchment area.

Photo: Thingri Nullah

Photo: Masrang Nullah

These will be done through various measures which will depend upon the site, extent and location of the points. Some of the activities suggested are:

a) Construction of check dams with gabion wall, protection wall with crate wire to regulate and check/reduce the speed of flow.

b) The eroded and effected Nullah will be channelized and protected by the crate wire of check wall and check dams.

c) Live hedge vegetative spurs along the nullah and land slips shall be put up after one or two years, when the nullah will be filled by the silt. Local species which are good soil binders like Salix, Alnus nitida, Alianthus, Agave, Nirgal, Kashmal,

Bhekhal, Seabuckthorn, Rosa spp. & Rubas spp. etc. will be planted.

The details of Nullahs with length in Km are given below:

S.N.	Name of the Nullah	Length -Km	Area benefitted-ha	Longitude	Latitude	Remarks
1	Homtey Nullah	1	20	31°38'23"	78°01'13"	During course of execution of works there may be minor changes in longitude and latitude
2	Palasnuch Nullah	1	20	31°38'30"	78°01'15"	
3	Sorgunch Nullah	1	20	31°38'14"	78°00'20"	
4	Masrang Nullah	2	40	31°38'16"	78°02'30"	
	Total	**5**	**100**			

Financial Implications:

Sr. No.	Name of Work	Amount-Rs
1	Nullah Stabilization over 5 Kms	20,90,000

3. **Payment for Environmental Services (PES):**

It is a new concept as a reward for good conservation behaviour by the community living around the catchments area of the project having bearing on the catchment area. The PES will be based on the result of monitoring of the following aspects and effectiveness of conservation measures between communities:

- Silt load (total, seasonal and average assessment).
- Survival % of plantation.
- Freezing land use.

- Better Agriculture, Horticulture and Animal Husbandry practices in and around the catchments area reducing pressure on forest.

Procedure for implementing PES is yet to be evolved. However, 8 % of the CAT Plan outlay has been kept for PES.

Village support activities/Eco development activities:

In order to reduce the pressure from forests of Sanctuary, it is essential to develop village support activities, which should be undertaken under PES.

Following works are suggested under this component:

- Distribution of Fruit plants.
- Value addition facilities for the local raw materials.
- Span for carriage of /commodity/local produce.
- Maintenance/improvement of village paths.
- Maintenance/improvement of Bawries.
- Incentivisation for rotational grazing in pastures.
- Establishment of Go Sadan.

Eco tourism activities:

The area is also known for its scenic beauty. The area has a very high potential for development of Eco-Tourism but poor infrastructure, low publicity, trained manpower and inadequate financial resources have been the main constraints in the proper development of eco-tourism. There is priority need to promote and

develop eco-tourism, wilderness travel and adventure travel in the landscape. The eco-tourism society and they need training and awareness/importance of the conservation of wildlife along with eco-tourism. Sign and Slogan boards to encourage all interested persons, both domestic and foreign tourist with a view to acquaint them and create awareness of this unique eco-system.

The activities which can be undertaken under this component have been identified as under:

- Development of camping sites and public utility services.
- Training of local youths for Eco-Tourism activities.
- Maintenance/repair of path/trekking routes.
- Purchase of camping equipments.

Details and mechanism as well as year wise phasing of these activities has not been prescribed because this will depend on the degree of support provided by the local people in implementation of CAT plan and providing environmental support. As the CAT Plan progresses, these activities may be decided/changed/amended and there after executed.

Catchment specific study will be made to identify proposals and activities to be undertaken under PES and once these activities are

approved by the Forest Department, these will be implemented with the amount kept under PES.

Income Generation Activities.

One of the major factors impacting on the effective bio-diversity conservation is the dependence of tribal people on the natural resources of the Sanctuary for their livelihood. Local people have a right to collect/extraction of NTFP in and around the Sanctuary area under the provision of Forest Settlement Report, 1921. Although, a four year feeling cycle has been prescribed by the H.P. Forest Department and the Apex Court Order dated 14.02.2000, prohibited the removal of dead decreased, dying and fallen trees, drift wood and grasses from National Park and Sanctuary but they extracted NTFP for the their livelihood there by threatening a very existing of the rare and endangered species of medicinal herbs.

Therefore, there is need to address the livelihood issue by encouraging forest based enterprises for development of NTFP along with bee keeping, vermin composting and organic farming are required to sustainable basis as it provides alternative income generation activities. Agriculture and Horticulture are the main occupation of the people in the project area. The productivity of such land is mostly poor and traditional. It is thus imperative that appropriate technological interventions are made in Agriculture, horticulture and vegetative Farming sector to have a

harmonious effect on the environment. The development must take into account the ecological and social conditions of mountain environments. As such, there is need of using and improving the indigenous methods of agriculture. Use of toxic chemicals such as pesticides/weedicides must be highly restricted or not done at all. This will help in maintaining quality of Bio-diversity, water, soil and atmosphere as a whole. Mitigative works should be carried out with the consent of the public through District Administration i.e. line Department subject to the approval of A.P.O.

The components are given below:

- Vermi compost & organic farming
- Apiculture (bee keeping)
- Animal husbandry support and dairy development
- Agriculture and Horticulture support

4. Research, studies, Capacity building and Publicity:

The area is unique and rich in Bio-diversity due to diverse physiographic and climatic condition. Whereas the prominent indigenous woody component includes Deodar, Kail, Fir, Spruce Betula utilis, the grasslands are mainly composed of a large variety of grass and herbaceous

plants which have immense medicinal values. However, not much is known about the floral diversity, ecological and environmental impact of the area, as no comprehensive work on the subject has been conducted and published as yet. It is important that a base line information about the floral diversity, ecological studies and composition is generated to guide future conservation action. Priority will be given to undertake research studies on the following subject:

(a) Study on distribution, relative abundance and habitats of the Himalayan Tahr and Leopard.

(b) Ornithological Survey.

(c) Socio-Economic Studies of the villages dependent on the Rupi Bhaba Wildlife Sanctuary

For **capacity building**, following activities are proposed:

a. **Training and workshops for frontline staff and officers.**

To provide latest technology and to upgrade their skills study tours in India shall be arranged for forest officials/officers who are implementing the plan. The objective of this training component would be to provide the people and the staff working in the project area to augments their existing skill, professional knowledge, and capacity building with latest technology in the field.

b. **Training of Eco guides.**

Local guides should be enlisted as official tour and trek guides and income generated can be disbursed through co-operative venture. These co-operatives should be managed by the local communities themselves

Year wise and Division wise allocation shown in the schedule is only indicative and funds may be used as per actual requirement of research activities proposal/plan decided by the Department.

5. Infrastructure Build up & Forest Protection:

A. Infrastructure:

For the optimum management of Forest resources of the tract, it is essential that the field infrastructure of the Forest Department is adequately developed. The forest path/bridal path and buildings in the region are the important lines of communication in these difficult terrains and to keep them in serviceable condition is highly desirable but due to paucity of funds many of them are in a State of neglect.

Maintenance of following buildings is proposed with outlays shown against each:

S.N	Name of Building	Amount
1	Maint of R.O. Office cum Residence, Katgaon	2,50,000
2	Maint of B.O. Quarters at Katgaon-2	4,00,000
	Total	6,50,000

In addition, following new infrastructures are proposed to be built:

a. **Nature Interpretation Centre at Katgaon**

A new Nature interpretation centre is proposed to be constructed at Katgaon with an estimated cost of Rs 9 lac. This will focus on high-altitude alpine eco system and climate change. This will also act as centre for Environmental education for students, public, tourists and other visitors.

Following link roads is proposed to be repaired:

S.N	Name of link road	Amount
1	Maint of Katgaon link road to Range Office	50,000
	Total	50,000

A provision has been made in the CAT Plan to provide support to the implementing agency in the form of establishment charges, office expenses, vehicle, Computers and equipments etc. for better implementation of CAT Plan

S. N.	Description of items	Qty.	Amount-Rs
1	Establishment Cost (Reimbursement of Salary & Contractual amount to Contractual Staff)	L/s	2,50,000
3	(a) Computer with accessories (b) Photo copier (c) GPS	1 1 4	2,25,000
4	O.E.	L/S	1,00,000
5.	Maintenance of Motor Vehicle	L/S	50,000
6.	Amenities to staff & labour	L/S	50,000
	Total		**6,75,0,00**

B. Forest Protection:

Following activities are proposed under Forest Protection:

(i) **Energy Saving Devices:**

In order to reduce the pressure on forest resources in and around the catchments of the project area, it is proposed to provide alternative sources like LPG cylinders on subsidized rate (50% cost to be borne by the beneficiaries) to poor local people, construction of crematoria along with fuel wood store and distribution of solar lights etc. in each village. The component wise detail is given below:

(a) Distribution of LPG cylinders (on 50% cost sharing basis) 80 No

(b) Distribution of Solar lights 5 Nos.

(c) Construction of Crematoria 1 No

(d) Distribution of Induction heaters/cookers/Energy efficient chulhas- 60 No

This has to be done in consultation with the JFMCs.

(ii) **Construction/Repair of existing boundary pillars/chak pillars:**

For protection of protected areas from encroachments near the cultivations, the existing boundary pillars are to be repaired and new

intermediate pillar/chak pillars are to be constructed along the boundary of cultivated land and jurisdiction of the protected forest areas.

(iii) Sign and Slogan Boards

It is recommended that the sign and slogan boards must be put up at selected sites. All these sign and slogan boards must be in Hindi and English Languages in the form of an appeal to the local people, aware them the importance of Wildlife conservation under the provision of Wildlife (Protection) Act, 1972, Indian Forest Act, 1927 & Forest Conservation Act, 1980 etc. All such development works which are taking place in the project area must be properly displayed at the site of execution e.g. plantation work, nursery, pasture development, soil conservation works etc.

6. Management of Wild Life

a. Improvement and Development of Wild Life:

i. Anti Poaching/patrolling activities:

The sanctuary area as well as area outside the Sanctuary is required to be guarded against poaching throughout the year.

In order to curb nefarious activities poachers, anti poaching measures like construction of check post/chokiest and joint patrolling is to be organized by engaging ex-serviceman and local un-employed youth. Local youth are to be trained and engaged them to give assistance to field staff and clues regarding poaching in a Sanctuary area. A forest guard will have two wild life watchers while going on

patrolling in the forests. These wild life watchers are to be engaged seasonally and for a short duration so that they will not claim regularization of their services. These wild life watchers will also act as local informers.

ii. Wild Life awareness and vaccination of domestic cattle

The local people have grazing rights in and around the Sanctuary area. It is therefore, necessary to immunize the domestic cattle against contagious disease like foot and mount etc. It will prevent disease from spreading from domestic cattle to Wild animals and vice-versa.

iii. Field equipments for staff/officers and Office support

Conflict between Wildlife and local communities is a major factor that leads to antagonism among the people and discourage the forest official to appropriately enforce the existing laws.

The sanctuary is surrounded by private land or other man-modified habitats where the presence of several wild animals, particularly predators i.e. Leopard and Black Beer is intolerable. These species venture into human settlements and cultivated areas in search of food and cause loss or injuries, livestock predation or extensive damage to the Horticulture/Agriculture crops and other private properties. The human-wild life conflict is an outcome of

shrinkage, fragmentation and degradation of habitats. Special field training/workshop on wildlife damage control with emphasis on use and handling animal repellants, deterrents, snares, traps, capture devices nets and accessories and fencing etc. need to be organized. Besides above staff should be well equipped with all necessary capture traps and squeeze cages and immobilizing equipments required for capture and handling of problem of Leopard. The equipment will help in capturing of such animals and release them in their natural habitat or zoo under the provision of Wildlife (P) Act, 1972.

In addition to that it is necessary to purchase a medicine also for management of Wildlife-because in the past it has been frequently responded to call from a different Sanctuary to deal with human-Wildlife conflict.

1) Physical capture cages, traps, immobilizing gun, darts, drugs.
2) Animal rescue, translocation/transportation.
3) Capture devices net and accessories etc.
4) Field measurement-, altimeter, pedometer, Compass, Handy cam, Tape Recorder, Census equipments.
5) Binoculars and spotting scope etc.
6) Medicines
7) Protection Guns.

8) Other equipments.

iv. **Habitat improvement**

Following activities are proposed under Habitat improvement:

a. Plantation of herbs/shrubs for creation of refuge sites for wild life.
b. Development of hiding sites for animals.
c. Pheasant's habitat development activities.
d. Improvement of forest cover and under storey cover along nullahs.

v. **Support to Gopalpur Pheasantry (Sarahan):**

The idea of establishing the alternate site of breeding western Tragopan was put forward by the chief wildlife warden, HP during the year 2008. Then a budget was provided under NJPC CAT plan to create Security Fencing around 6.033a (Approx.) area. The area was fenced at the cost of 28Lac during the year 2009-10. Then the matter was taken up to Central Zoo Authority for its site approval and for preparation of management plan. In order to make funds for this purpose, a sum of Rs. 14Lakh has been earmarked for its conservation breeding.

This pheasantry will serve an alternate breeding centre for Western Tragopan. This was created mainly for the following reasons.

- To save birds in case of any epidemic/disease in Sarahan Pleasantry.

- To try its success of breading in two different locations.
- To increase its population stock
- To release in its natural habitat after its sufficient population in Captive Breeding.
- To save this rare Spp from Extinction.

(b) Mitigation of Human-Wild Life conflict

(i) Publicity for awareness through Kala Jatha (Nukkar Natak).

A provision for formation of a street theatre of the local community may be very effective for the protection of wildlife and forests. Several bands of ten to twelve village youth each may go performing about wildlife and forest conservation (with local nature based songs and natti) from village to village. The wages for one of such performances (including travelling and boarding, lodging) will be about Rs. 4000 per performance. In a day two performances may be given by one band. A dress, musical instruments and workshops for their training, etc will also be part of this arrangement. In addition adequate signage will be put up, which will help in creating awareness. For this, an amount of Rs 50,000 has been provided.

(ii) Compensation against Wildlife damages.

Wildlife depredation on cattle is a major cause of alienation of local communities from wildlife conservation. Timely payment of

compensation against the depredation of wildlife goes a long way in eliciting local support.

7. Monitoring and evaluation

In addition to 3rd party monitoring, regular in house quarterly monitoring will be done. The Monitoring Committee would be constituted as below:

1. Conservator of Forests Wild Life, Shimla-Chairman.
2. A.C.F. Wild Life Div, Sarahan- Member
3. Representative of PRI- Member
4. Representative of user agency- Member
5. Range Officer Katgaon- Member
6. D.F.O. Wild Life, Sarahan- Member Secretary

The committee would need to ensure the implementation and monitoring of the catchment area works and review progress from time to time. The implementing agency upon its approval will provide a copy of the approved APO giving details such as list of areas along with the works to be taken up and their costs to each member of the committee. The committee shall strive to make the monitoring process transparent. Meeting of this committee shall be convened at least thrice in a year or as and when required in emergency with due approval from members and higher competent authorities. All non official members shall be entitled to TA/DA as per rates approved by D.C. Shimla. All the expenditure incurred on these

meetings shall be met from the head of Monitoring and Evaluation. 5% of the cost of CAT Plan has been kept reserved for this purpose. Therefore an outlay of Rs. 10,00,000 is proposed to be incurred under the scheme during the plan period.

8 Site specific / Micro Planning:

In the proposed CAT Plan, activities are given component wise and area specific. Further Micro Planning will be required at the time of execution of CAT Plan with the consultation of JFMCs especially in afforestation and Soil Conservation activities. Moreover, if certain new techniques/ innovative idea come in due course of time, these can be taken up as per requirement of site and particular location. Therefore, an outlay Rs. 10,00,000 is proposed for this purpose during the plan period.

9 Contingencies:

Outlay in the CAT Plan for various components has been worked out as per H.P. Forest Department schedule rate for the year 2011-12. Lump sum provision has been made in the plan for engineering works & for soil and moisture conservation works. These works are to be undertaken after preparation of detail estimates and as per actual works depending upon the sites/location required to be worked. The model/ design prescribed in the proposed plan is only suggestive although efforts have been made to

restrict the expenditure but excess and deficit may occur as per the allocation of funds and escalation of wage rate and cost of material etc. since the CAT Plan is to be implemented over a period of seven years, there may be some un foreseen activities to be undertaken. For this, 5 % of the CAT Plan outlay has been kept under contingency.

CHAPTER- 4

Organization structure and Implementation

This CAT Plan will be implemented by the H.P. Forest Department through DFO Wild Life Sarahan, Conservator of Forests wildlife, (South), Shimla/Society meant for implementation of CAT Plan. At the field level the actual implementation will be done by D.F.O wildlife Sarahan having territorial jurisdiction over the areas covered under this Plan. The DFO wildlife Sarahan will be assisted by the regular staff posted under them and may also hire local consultants on short term basis for implementation of the CAT Plan.

4.1 Implementation Staff:

The existing staff of wildlife Division Sarahan will implement the CAT Plan works in addition to their own duties, DFO will be authorized to engage staff on contract basis with the approval of Society/Project Director-cum-C.F (Wildlife) Shimla as and when required.

4.2 Cost Escalation:

The present cost projections are based on the wage rates of 2011-12. The outlay of the CAT Plan is based on the HEP cost as mentioned in the TEC. As the project cost increases, CAT Plan outlay will proportionately be revised and the Project proponent will pay the differential amount. It will be reviewed every 2 years.

CHAPTER- 5

Cost Estimate

5.1 Total Project Cost:

Cost of the various component have been worked out on schedule rate for the year 2011-12 of H.P. Forest Department.. Total project cost for 11 years will be as under:

Year	Amount- Rs lakh
Zero Year	4.00
First Year	20.34
2nd Year	34.36
Third Year	35.20
Fourth Year	30.84
Fifth Year	22.58
Sixth Year	12.53
Seventh Year	11.91
Eighth Year	11.40
Ninth Year	8.90
Tenth Year	8.65
Total	**200.71**

5.2 Annual Phasing:

Annual phasing of works to be carried out in Wanger Homte HEP is given as Annexures-I to XII.

Annexure-II

S. No.	Name of Component			Zero Year	
				Phy-ha/ Km/ No	Fin- Rs
1	**Bio-logical Measures-Improvement of tree cover**				
	(a)	**Nursery Development**			
		(i)	New Nursery-UF-29	1	100000
	(b)	**Afforestation**			
		New -UF 29, UF-30		0	0
		Maintenance			
			1st year maintenance	0	0
			2nd year maintenance	0	0
			3rd year maintenance	0	0
	©	Enrichment planting			
		New -UF 29		0	0
		Maintenance			
			1st year maintenance	0	0
			2nd year maintenance	0	0
			3rd year maintenance	0	0
	(d)	**Energy Plantaion-UF-29**			
		New		0	0
	(e)	**NTFP/Medicinal Plants Plantation-UF-30**			
		New		0	0
		Maintenance			
			1st year maintenance	0	0
			2nd year maintenance	0	0
			3rd year maintenance	0	0
	Total (1)			**0**	**100000**
2	**Soil Conservation works-Engineering and Bio-Engineering measures**				
	(i)	Stabilization of land slides/Slips			
	(ii)	Stabilization of Nalla			
	Total (2)			**0**	**0**
3	**Payment of Eco-Services**				
4	**Research, Capacity building, Publicity**				
5	**Infrastructure Build up & Forest Protection:**				
A	(i)	Maintenance of R.O. Office cum Res, Katgaon		0	0
	(ii)	Maintenance of B.O. Qtr. at Katgaon-2		0	0
	(iii)	Nature interpretation centre, katgaon		0	0
	(iv)	Maint of link road to Range Office, Katgaon			0
	(v)	Establishment Cost (Reimbursement of Salary & Contractual amount to Contractual Staff)		0	0
	(vi)	Mobility for protection-vehicle		0	0
	(vii)	Office Equipments (Computer- 1 with accessories,Photocopier-2, GPS –4		0	0
	(viii)	O.E.		0	0

	(ix)	Maintenance of Motor Vehicle			0
	(x)	Amenities to staff & labour			
	Total 5A			**0**	**0**
B	**Protection of Forests**				
	a	**Energy Saving devices**			
		(i) Distribution of LPG Cylinders		0	0
		(ii) Distribution of Solar lights		0	0
		(iii) Distribution of Induction Heater/ Cooker/Energy efficient Chulhas		0	0
		(iv) Construction of crematorium		0	0
	b	(i) Construction and repair of existing boundary pillars/chak pillars		0	0
	c	(ii) Sign & Slogan Boards		0	0
	Total 5 B			**0**	**0**
	Total 5 (A+B)			**0**	**0**
6	**Management of Wildlife in and outside the Protected**				
	(a)	**Improvement and Development of wildlife**			
		(i)	Anti-Poaching/patrolling activities	L/s	10000
		(ii)	Vaccination of domestic cattle	L/s	10000
		(iii)	Field equipments for staff and officers and office support	0	0
		(iv)	Habitat improvement	0	0
		(v)	Signage	0	0
		(vi)	Support to Western Tragopan pheasantry at Gopalpur (Sarahan)	0	0
	(b)	**Mitigation of Human Wildlife Conflict**			
		(i)	Compensation against wildlife damages	0	0
		(ii)	Publicity & awareness through Kala Jatha (Nukar Natak).	L/s	30000
		Total (6)			**50000**
	G. Total (1 to 6)			**0**	**150000**
7	**Monitoring & Evalution**				0
8	**Site Specific Plan/ estimate**				**200000**
9	**Contingencies**				**50000**
	Total Cost of CAT Plan			**0**	**400000**

Range Forest Officer,
Wild Life Range Katgaon

Divisional Forest Officer,
Sarahan Wildlife Division,
Distt. Shimla (H. P.)

Annexure-III

S. No.	Name of Component			1st Year	
				Phy-ha/ Km/ No	Fin- Rs
1	**Bio-logical Measures-Improvement of tree cover**				
	(a)	**Nursery Development**			
		(i)	New Nursery-UF-29		100000
	(b)	**Afforestation**			
		New -UF 29, UF-30		0	0
		Maintenance			
			1st year maintenance	0	0
			2nd year maintenance	0	0
			3rd year maintenance	0	0
	©	Enrichment planting			
		New -UF 29		0	0
		Maintenance			
			1st year maintenance	0	0
			2nd year maintenance	0	
			3rd year maintenance	0	0
	(d)	**Energy Plantaion-UF-29**			
		New		0	0
	(e)	**NTFP/Medicinal Plants Plantation-UF-30**			
		New		0	0
		Maintenance			
			1st year maintenance		0
			2nd year maintenance		0
			3rd year maintenance		0
	Total (1)			**0**	**100000**
2	**Soil Conservation works-Engineering and Bio-Engineering measures**				
	(i)	Stabilization of land slides/Slips			200000
	(ii)	Stabilization of Nalla			200000
	Total (2)			**0**	**400000**
3	**Payment of Eco-Services**				**100000**
4	**Research, Capacity building, Publicity**				**250000**
5	**Infrastructure Build up & Forest Protection:**				
A	(i)	Maintenance of R.O. Office cum Res, Katgaon		0	0
	(ii)	Maintenance of B.O. Qtr. at Katgaon-2			
	(iii)	Nature interpretation centre, katgaon		0	100000
	(iv)	Maint of link road to Range Office, Katgaon			0
	(v)	Establishment Cost (Reimbursement of Salary & Contractual amount to Contractual Staff)		0	25000
	(vi)	Mobility for protection-vehicle		0	0
	(vii)	Office Equipments (Computer- 1 with accessories,Photocopier-2, GPS –4			50000
	(viii)	O.E.		0	15000

	(ix)	Maintenance of Motor Vehicle			5000
	(x)	Amenities to staff & labour			5000
	Total 5A			**0**	**200000**
B	**Protection of Forests**				
	a	**Energy Saving devices**			
		(i) Distribution of LPG Cylinders		10	20000
		(ii) Distribution of Solar lights		1	10000
		(iii) Distribution of Induction Heater/ Cooker/Energy efficient Chulhas		10	20000
		(iv) Construction of crematorium		0	0
	b	(i) Construction and repair of existing boundary pillars/chak pillars		0	5000
	c	(ii) Sign & Slogan Boards			2000
	Total 5 B			**21**	**57000**
	Total 5 (A+B)			**21**	**257000**
6	**Management of Wildlife in and outside the Protected**				
	(a)	**Improvement and Development of wildlife**			
		(i)	Anti-Poaching/patrolling activities	L/s	10000
		(ii)	Vaccination of domestic cattle	L/s	10000
		(iii)	Field equipments for staff and officers and office support	L/s	200000
		(iv)	Habitat improvement	L/s	200000
		(v)	Signage	L/s	2000
		(vi)	Support to Western Tragopan	L/s	200000
	(b)	**Mitigation of Human Wildlife Conflict**			
		(i)	Compensation against wildlife damages	L/s	25000
		(ii)	Publicity & awareness through Kala Jatha (Nukar Natak).	L/s	30000
		Total (6)			**677000**
	G. Total (1 to 6)			**21**	**1784000**
7	**Monitoring & Evalution**				**0**
8	**Site Specific Plan/ estimate**				**200000**
9	**Contingencies**				**50000**
	Total Cost of CAT Plan			**21**	**2034000**

Range Forest Officer,
Wild Life Range Kotgarh

Divisional Forest Officer,
Sarahan Wildlife Division,
Distt. Shimla (H. P.)

Annexure-IV

S. No.	Name of Component			2nd Year	
				Phy-ha/ Km/ No	Fin- Rs
1	**Bio-logical Measures-Improvement of tree cover**				
	(a)	**Nursery Development**			
		(i)	New Nursery-UF-29		80000
	(b)	**Afforestation**			
		New -UF 29, UF-30			0
		Maintenance			
			1st year maintenance	0	0
			2nd year maintenance	0	0
			3rd year maintenance	0	0
	©	Enrichment planting			
		New -UF 29		0	0
		Maintenance			
			1st year maintenance,	0	
			2nd year maintenance	0	0
			3rd year maintenance	0	0
	(d)	**Energy Plantaion-UF-29**			
		New		5	392500
	(e)	**NTFP/Medicinal Plants Plantation-UF-30**			
		New		0	0
		Maintenance			
			1st year maintenance		0
			2nd year maintenance		0
			3rd year maintenance		0
	Total (1)			5	**472500**
2	**Soil Conservation works-Engineering and Bio-Engineering measures**				
	(i)	Stabilization of land slides/Slips			300000
	(ii)	Stabilization of Nalla			300000
	Total (2)			0	**600000**
3	**Payment of Eco-Services**				**100000**
4	**Research, Capacity building, Publicity**				**200000**
5	**Infrastructure Build up & Forest Protection:**				
A	(i)	Maintenance of R.O. Office cum Res, Katgaon		1	150000
	(ii)	Maintenance of B.O. Qtr. at Katgaon-2			200000
	(iii)	Nature interpretation centre, katgaon			200000
	(iv)	Maint of link road to Range Office, Katgaon			0
	(v)	Establishment Cost (Reimbursement of Salary & Contractual amount to Contractual Staff)			25000
	(vi)	Mobility for protection-vehicle		1	0
	(vii)	Office Equipments (Computer- 1 with accessories,Photocopier-2, GPS –4			50000
	(viii)	O.E.			15000

	(ix)	Maintenance of Motor Vehicle			5000
	(x)	Amenities to staff & labour			5000
	Total 5A			**2**	**650000**
B	**Protection of Forests**				
	a	**Energy Saving devices**			
		(i) Distribution of LPG Cylinders		10	20000
		(ii) Distribution of Solar lights		1	10000
		(iii) Distribution of Induction Heater/ Cooker/Energy efficient Chulhas		0	0
		(iv) Construction of crematorium		1	300000
	b	(i) Construction and repair of existing boundary pillars/chak pillars			5000
	c	(ii) Sign & Slogan Boards			2000
	Total 5 B			**12**	**337000**
	Total 5 (A+B)			**14**	**987000**
6	**Management of Wildlife in and outside the Protected**				
	(a)	**Improvement and Development of wildlife**			
		(i)	Anti-Poaching/patrolling activities	L/s	10000
		(ii)	Vaccination of domestic cattle	L/s	10000
		(iii)	Field equipments for staff and officers and office support	L/s	300000
		(iv)	Habitat improvement	L/s	200000
		(v)	Signage	L/s	2000
		(vi)	Support to Western Tragopan pheasantry at Gopalpur (Sarahan)	L/s	200000
	(b)	**Mitigation of Human Wildlife Conflict**			
		(i)	Compensation against wildlife damages	L/s	25000
		(ii)	Publicity & awareness through Kala Jatha (Nukar Natak).	L/s	30000
		Total (6)		**0**	**777000**
	G. Total (1 to 6)			**19**	**3136500**
7	**Monitoring & Evalution**				0
8	**Site Specific Plan/ estimate**				**200000**
9	**Contingencies**				**100000**
	Total Cost of CAT Plan			**19**	**3436500**

Range Forest Officer,
Wild Life Range Kalpaa

Divisional Forest Officer,
Sarahan Wildlife Division,
Distt. Shimla (H.P.)

Annexure-V

S. No.	Name of Component			3rd Year	
				Phy-ha/ Km/ No	Fin- Rs
1	**Bio-logical Measures-Improvement of tree cover**				
	(a)	**Nursery Development**			
		(i) New Nursery-UF-29			50000
	(b)	**Afforestation**			
		New -UF 29, UF-30		10	304000
		Maintenance			
			1st year maintenance	0	0
			2nd year maintenance	0	0
			3rd year maintenance	0	0
	©	Enrichment planting			
		New -UF 29		10	257000
		Maintenance			
			1st year maintenance	0	0
			2nd year maintenance	0	0
			3rd year maintenance	0	0
	(d)	**Energy Plantaion-UF-29**			
		New		5	392500
	(e)	**NTFP/Medicinal Plants Plantation-UF-30**			
		New		5	187500
		Maintenance			
			1st year maintenance	0	0
			2nd year maintenance	0	0
			3rd year maintenance	0	0
	Total (1)			**30**	**1191000**
2	**Soil Conservation works-Engineering and Bio-**				
	(i)	Stabilization of land slides/Slips			300000
	(ii)	Stabilization of Nalla			300000
	Total (2)			**0**	**600000**
3	**Payment of Eco-Services**				**150000**
4	**Research, Capacity building, Publicity**				**250000**
5	**Infrastructure Build up & Forest Protection:**				
A	(i)	Maintenance of R.O. Office cum Res, Katgaon			100000
	(ii)	Maintenance of B.O. Qtr. at Katgaon-2			200000
	(iii)	Nature interpretation centre, katgaon			200000
	(iv)	Maint of link road to Range Office, Katgaon			0
	(v)	Establishment Cost (Reimbursement of Salary & Contractual amount to Contractual Staff)			25000
	(vi)	Mobility for protection-vehicle		0	0
	(vii)	Office Equipments (Computer- 1 with accessories,Photocopier-2, GPS –4			50000
	(viii)	O.E.			10000

	(ix)	Maintenance of Motor Vehicle			5000
	(x)	Amenities to staff & labour			5000
	Total 5A			**0**	**595000**
B	**Protection of Forests**				
	a	**Energy Saving devices**			
		(i) Distribution of LPG Cylinders		10	20000
		(ii) Distribution of Solar lights		1	10000
		(iii) Distribution of Induction Heater/ Cooker/Energy efficient Chulhas		10	20000
		(iv) Construction of crematorium		0	0
	b	(i) Construction and repair of existing boundary pillars/chak pillars			5000
	c	(ii) Sign & Slogan Boards			2000
	Total 5 B			**21**	**57000**
	Total 5 (A+B)			**21**	**652000**
6	**Management of Wildlife in and outside the Protected**				
	(a)	**Improvement and Development of wildlife**			
		(i)	Anti-Poaching/patrolling activities	L/s	10000
		(ii)	Vaccination of domestic cattle	L/s	10000
		(iii)	Field equipments for staff and		0
		(iv)	Habitat improvement	L/s	200000
		(v)	Signage	L/s	2000
		(vi)	Support to Western Tragopan	L/s	200000
	(b)	**Mitigation of Human Wildlife Conflict**			
		(i)	Compensation against wildlife damages	L/s	25000
		(ii)	Publicity & awareness through Kala Jatha (Nukar Natak).	L/s	30000
		Total (6)		**0**	**477000**
	G. Total (1 to 6)			**51**	**3320000**
7	**Monitoring & Evalution**				0
8	**Site Specific Plan/ estimate**				**200000**
9	**Contingencies**				**100000**
	Total Cost of CAT Plan			**51**	**3620000**

Range Forest Officer,
Wild Life Range Ketgaon

Divisional Forest Officer,
Sarahan Wildlife Division,
Distt. Shimla (H.P.)

Annexure-VI

S. No.	Name of Component			4th Year	
				Phy-ha/ Km/ No	Fin- Rs
1	**Bio-logical Measures-Improvement of tree cover**				
	(a)	**Nursery Development**			
		(i) New Nursery-UF-29			40000
	(b)	**Afforestation**			
		New -UF 29, UF-30		10	304000
		Maintenance			
			1st year maintenance	10	50400
			2nd year maintenance	0	0
			3rd year maintenance	0	0
	©	Enrichment planting			
		New -UF 29		10	257000
		Maintenance			
			1st year maintenance	10	39960
			2nd year maintenance	0	0
			3rd year maintenance	0	0
	(d)	**Energy Plantaion-UF-29**			
		New		0	0
	(e)	**NTFP/Medicinal Plants Plantation-UF-30**			
		New		5	187500
		Maintenance			
			1st year maintenance	5	31750
			2nd year maintenance	0	0
			3rd year maintenance	0	0
	Total (1)			**50**	**910610**
2	**Soil Conservation works-Engineering and Bio-**				
	(i)	Stabilization of land slides/Slips			300000
	(ii)	Stabilization of Nalla			340000
	Total (2)			**0**	**640000**
3	**Payment of Eco-Services**				**150000**
4	**Research, Capacity building, Publicity**				**300000**
5	**Infrastructure Build up & Forest Protection:**				
A	(i)	Maintenance of R.O. Office cum Res, Katgaon		0	0
	(ii)	Maintenance of B.O. Qtr. at Katgaon-2			0
	(iii)	Nature interpretation centre, katgaon			200000
	(iv)	Maint of link road to Range Office, Katgaon			50000
	(v)	Establishment Cost (Reimbursement of Salary & Contractual amount to Contractual Staff)			25000
	(vi)	Mobility for protection-vehicle		0	0
	(vii)	Office Equipments (Computer- 1 with accessories,Photocopier-2, GPS –4			75000
	(viii)	O.E.			10000

	(ix)	Maintenance of Motor Vehicle			5000
	(x)	Amenities to staff & labour			5000
	Total 5A			**0**	**370000**
B	**Protection of Forests**				
	a	**Energy Saving devices**			
		(i) Distribution of LPG Cylinders		10	20000
		(ii) Distribution of Solar lights		1	10000
		(iii) Distribution of Induction Heater/ Cooker/Energy efficient Chulhas		0	0
		(iv) Construction of crematorium		0	0
	b	(i) Construction and repair of existing boundary pillars/chak pillars			5000
	c	(ii) Sign & Slogan Boards			2000
	Total 5 B			11	37000
	Total 5 (A+B)			**11**	**407000**
6	**Management of Wildlife in and outside the Protected**				
	(a)	**Improvement and Development of wildlife**			
		(i)	Anti-Poaching/patrolling activities	L/s	10000
		(ii)	Vaccination of domestic cattle	L/s	10000
		(iii)	Field equipments for staff and officers		0
		(iv)	Habitat improvement	L/s	200000
		(v)	Signage	L/s	2000
		(vi)	Support to Western Tragopan	L/s	200000
	(b)	**Mitigation of Human Wildlife Conflict**			
		(i)	Compensation against wildlife damages	L/s	25000
		(ii)	Publicity & awareness through Kala Jatha (Nukar Natak).	L/s	30000
		Total (6)		**0**	**477000**
	G. Total (1 to 6)			**61**	**2884610**
7	**Monitoring & Evalution**				0
8	**Site Specific Plan/ estimate**				**100000**
9	**Contingencies**				**100000**
	Total Cost of CAT Plan			**61**	**3084610**

Range Forest Officer,
Wild Life Range Katgaon

Divisional Forest Officer,
Sarahan Wildlife Division,
Distt. Shimla (H. P.)

Annexure-VII

S. No.	Name of Component			5th Year	
				Phy-ha/ Km/ No	Fin- Rs
1	**Bio-logical Measures-Improvement of tree cover**				
	(a)	**Nursery Development**			
		(i)	New Nursery-UF-29		30000
	(b)	**Afforestation**			
		New -UF 29, UF-30			0
		Maintenance			
			1st year maintenance	10	50400
			2nd year maintenance	10	31200
			3rd year maintenance	0	0
	©	Enrichment planting			
		New -UF 29		0	0
		Maintenance			
			1st year maintenance	10	39960
			2nd year maintenance	10	24240
			3rd year maintenance	0	0
	(d)	**Energy Plantaion-UF-29**			
		New		0	0
	(e)	**NTFP/Medicinal Plants Plantation-UF-30**			
		New		0	0
		Maintenance			
			1st year maintenance	5	31750
			2nd year maintenance	5	21500
			3rd year maintenance	0	0
	Total (1)			**50**	**229050**
2	**Soil Conservation works-Engineering and Bio-**				
	(i)	Stabilization of land slides/Slips			300000
	(ii)	Stabilization of Nalla			350000
	Total (2)			**0**	**650000**
3	**Payment of Eco-Services**				**200000**
4	**Research, Capacity building, Publicity**				**200000**
5	**Infrastructure Build up & Forest Protection:**				
A	(i)	Maintenance of R.O. Office cum Res, Katgaon		0	0
	(ii)	Maintenance of B.O. Qtr. at Katgaon-2			0
	(iii)	Nature interpretation centre, katgaon			200000
	(iv)	Maint of link road to Range Office, Katgaon			0
	(v)	Establishment Cost (Reimbursement of Salary & Contractual amount to Contractual			25000
	(vi)	Mobility for protection-vehicle		0	0
	(vii)	Office Equipments (Computer- 1 with accessories,Photocopier-2, GPS –4			0
	(viii)	O.E.			10000

	(ix)	Maintenance of Motor Vehicle				5000
	(x)	Amenities to staff & labour				5000
	Total 5A				**0**	**245000**
B	**Protection of Forests**					
	a	**Energy Saving devices**				
		(i) Distribution of LPG Cylinders			10	20000
		(ii) Distribution of Solar lights			1	10000
		(iii) Distribution of Induction Heater/ Cooker/Energy efficient Chulhas			10	20000
		(iv) Construction of crematorium			0	0
	b	(i) Construction and repair of existing boundary pillars/chak pillars				5000
	c	(ii) Sign & Slogan Boards				2000
	Total 5 B				21	57000
	Total 5 (A+B)				**21**	**302000**
6	**Management of Wildlife in and outside the**					
	(a)	**Improvement and Development of**				
		(i)	Anti-Poaching/patrolling activities		L/s	10000
		(ii)	Vaccination of domestic cattle		L/s	10000
		(iii)	Field equipments for staff and officers and office support			0
		(iv)	Habitat improvement		L/s	200000
		(v)	Signage		L/s	2000
		(vi)	Support to Western Tragopan pheasantry at Gopalpur (Sarahan)		L/s	200000
	(b)	**Mitigation of Human Wildlife Conflict**				
		(i)	Compensation against wildlife damages		L/s	25000
		(ii)	Publicity & awareness through Kala Jatha (Nukar Natak).		L/s	30000
		Total (6)			**0**	**477000**
	G. Total (1 to 6)				**71**	**2058050**
7	**Monitoring & Evalution**					0
8	**Site Specific Plan/ estimate**					**100000**
9	**Contingencies**					**100000**
	Total Cost of CAT Plan				**71**	**2258050**

Range Forest Officer,
Wild Life Range Katgaon

Divisional Forest Officer,
Sarahan Wildlife Division,
Distt. Shimla (H. P.)

Annexure-VIII

S. No.	Name of Component				6th Year	
					Phy-ha/ Km/ No	Fin- Rs
1	**Bio-logical Measures-Improvement of tree cover**					
	(a)	**Nursery Development**				
		(i)	New Nursery-UF-29			30000
	(b)	**Afforestation**				
		New -UF 29, UF-30				0
		Maintenance				
			1st year maintenance		0	0
			2nd year maintenance		10	31200
			3rd year maintenance		10	17400
	©	Enrichment planting				
		New -UF 29			0	0
		Maintenance				0
			1st year maintenance		0	0
			2nd year maintenance		10	24240
			3rd year maintenance		10	12180
	(d)	**Energy Plantaion-UF-29**				
		New				0
	(e)	**NTFP/Medicinal Plants Plantation-UF-30**				
		New			0	0
		Maintenance				
			1st year maintenance		0	0
			2nd year maintenance		5	21500
			3rd year maintenance		5	11250
	Total (1)				50	147770
2	**Soil Conservation works-Engineering and Bio-**					
	(i)	Stabilization of land slides/Slips			0	0
	(ii)	Stabilization of Nalla			0	0
	Total (2)				0	0
3	**Payment of Eco-Services**					
4	**Research, Capacity building, Publicity**					
5	**Infrastructure Build up & Forest Protection:**					
A	(i)	Maintenance of R.O. Office cum Res, Katgaon			0	0
	(ii)	Maintenance of B.O. Qtr. at Katgaon-2				0
	(iii)	Nature interpretation centre, katgaon				0
	(iv)	Maint of link road to Range Office, Katgaon				0
	(v)	Establishment Cost (Reimbursement of				25000
	(vi)	Mobility for protection-vehicle			0	0
	(vii)	Office Equipments (Computer- 1 with accessories,Photocopier-2, GPS –4				0
	(viii)	O.E.				

	(ix)	Maintenance of Motor Vehicle			5000
	(x)	Amenities to staff & labour			5000
	Total 5A			**0**	**35000**
B	**Protection of Forests**				
	a	**Energy Saving devices**			
		(i) Distribution of LPG Cylinders		10	20000
		(ii) Distribution of Solar lights			0
		(iii) Distribution of Induction Heater/ Cooker/Energy efficient Chulhas		0	0
		(iv) Construction of crematorium		0	0
	b	(i) Construction and repair of existing boundary pillars/chak pillars		0	0
	c	(ii) Sign & Slogan Boards		0	0
	Total 5 B			10	**20000**
	Total 5 (A+B)			10	**55000**
6	**Management of Wildlife in and outside the**				
	(a)	**Improvement and Development of**			
		(i)	Anti-Poaching/patrolling activities		0
		(ii)	Vaccination of domestic cattle		0
		(iii)	Field equipments for staff and		0
		(iv)	Habitat improvement		0
		(v)	Signage		0
		(vi)	Support to Western Tragopan pheasantry at Gopalpur		0
	(b)	**Mitigation of Human Wildlife Conflict**			
		(i)	Compensation against wildlife damages		0
		(ii)	Publicity & awareness through Kala Jatha (Nukar Natak).		0
		Total (6)		**0**	**0**
	G. Total (1 to 6)			**60**	**202770**
7	**Monitoring & Evalution**				**1000000**
8	**Site Specific Plan/ estimate**				**50000**
9	**Contingencies**				**0**
	Total Cost of CAT Plan			60	**1252770**

Range Forest Officer,
Wild Life Range Kalgaon

Divisional Forest Officer,
Sarahan Wildlife Division,
Distt. Shimla (H. P.)

Anexure-IX

S. No.	Name of Component			7th Year	
				Phy-ha/ Km/ No	Fin- Rs
1	**Bio-logical Measures-Improvement of tree cover**				
	(a)	**Nursery Development**			
		(i)	New Nursery-UF-29		20000
	(b)	**Afforestation**			
		New -UF 29, UF-30			0
		Maintenance			
			1st year maintenance		0
			2nd year maintenance	0	0
			3rd year maintenance	10	17400
	©	Enrichment planting			
		New -UF 29		0	0
		Maintenance		0	0
			1st year maintenance		0
			2nd year maintenance	0	0
			3rd year maintenance	10	12180
	(d)	**Energy Plantaion-UF-29**			
		New		0	0
	(e)	**NTFP/Medicinal Plants Plantation-UF-30**			
		New		0	0
		Maintenance			
			1st year maintenance	0	0
			2nd year maintenance	0	0
			3rd year maintenance	5	11250
	Total (1)			**25**	**60830**
2	**Soil Conservation works-Engineering and Bio-**				
	(i)	Stabilization of land slides/Slips			100000
	(ii)	Stabilization of Nalla			200000
	Total (2)			**0**	**300000**
3	**Payment of Eco-Services**				**250000**
4	**Research, Capacity building, Publicity**				
5	**Infrastructure Build up & Forest Protection:**				
A	(i)	Maintenance of R.O. Office cum Res, Katgaon		0	0
	(ii)	Maintenance of B.O. Qtr. at Katgaon-2			0
	(iii)	Nature interpretation centre, katgaon			0
	(iv)	Maint of link road to Range Office, Katgaon			0
	(v)	Establishment Cost (Reimbursement of Salary & Contractual amount to Contractual Staff)			25000
	(vi)	Mobility for protection-vehicle			0
	(vii)	Office Equipments (Computer- 1 with accessories,Photocopier-2, GPS –4			0
	(viii)	O.E.			10000

	(ix)	Maintenance of Motor Vehicle			5000
	(x)	Amenities to staff & labour			5000
	Total 5A			**0**	**45000**
B	**Protection of Forests**				
	a	**Energy Saving devices**			
		(i) Distribution of LPG Cylinders		10	20000
		(ii) Distribution of Solar lights			0
		(iii) Distribution of Induction Heater/ Cooker/Energy efficient Chulhas		10	20000
		(iv) Construction of crematorium			0
	b	(i) Construction and repair of existing boundary pillars/chak pillars			0
	c	(ii) Sign & Slogan Boards			0
	Total 5 B			**20**	**40000**
	Total 5 (A+B)			**20**	**85000**
6	**Management of Wildlife in and outside the Protected**				
	(a)	**Improvement and Development of wildlife**			
		(i)	Anti-Poaching/patrolling activities	L/s	10000
		(ii)	Vaccination of domestic cattle	L/s	10000
		(iii)	Field equipments for staff and officers and office support	L/s	60000
		(iv)	Habitat improvement	L/s	100000
		(v)	Signage	L/s	10000
		(vi)	Support to Western Tragopan pheasantry at Gopalpur (Sarahan)	L/s	100000
	(b)	**Mitigation of Human Wildlife Conflict**			
		(i)	Compensation against wildlife damages	L/s	25000
		(ii)	Publicity & awareness through Kala Jatha (Nukar Natak).	L/s	30000
		Total (6)		**0**	**345000**
	G. Total (1 to 6)			**45**	**1040830**
7	**Monitoring & Evalution**				0
8	**Site Specific Plan/ estimate**				**50000**
9	**Contingencies**				**100000**
	Total Cost of CAT Plan			**45**	**1190830**

Range Forest Officer,
Wild Life Range Kalpaa

Divisional Forest Officer,
Sarahan Wildlife Division,
Distt. Shimla (H.P.)

Annexure-X

S. No.	Name of Component			8th Year	
				Phy-ha/ Km/ No	Fin- Rs
1	**Bio-logical Measures-Improvement of tree cover**				
	(a)	**Nursery Development**			
		(i)	New Nursery-UF-29		0
	(b)	**Afforestation**			
		New -UF 29, UF-30			0
		Maintenance			
			1st year maintenance		0
			2nd year maintenance	0	0
			3rd year maintenance	0	0
	©	Enrichment planting			
		New -UF 29		0	0
		Maintenance		0	0
			1st year maintenance	0	0
			2nd year maintenance	0	0
			3rd year maintenance		0
	(d)	**Energy Plantaion-UF-29**			
		New		0	0
	(e)	**NTFP/Medicinal Plants Plantation-UF-30**			
		New		0	0
		Maintenance			0
			1st year maintenance	0	0
			2nd year maintenance	0	0
			3rd year maintenance	0	
	Total (1)			**0**	**0**
2	**Soil Conservation works-Engineering and Bio-**				
	(i)	Stabilization of land slides/Slips			100000
	(ii)	Stabilization of Nalla			200000
	Total (2)			**0**	**300000**
3	**Payment of Eco-Services**				**250000**
4	**Research, Capacity building, Publicity**				
5	**Infrastructure Build up & Forest Protection:**				
A	(i)	Maintenance of R.O. Office cum Res, Katgaon			0
	(ii)	Maintenance of B.O. Qtr. at Katgaon-2			0
	(iii)	Nature interpretation centre, katgaon			0
	(iv)	Maint of link road to Range Office, Katgaon			0
	(v)	Establishment Cost (Reimbursement of Salary & Contractual amount to Contractual Staff)			25000
	(vi)	Mobility for protection-vehicle		0	0
	(vii)	Office Equipments (Computer- 1 with accessories,Photocopier-2, GPS –4		0	0
	(viii)	O.E.			10000

	(ix)	Maintenance of Motor Vehicle			5000
	(x)	Amenities to staff & labour			5000
	Total 5A			**0**	**45000**
B	**Protection of Forests**				
	a	**Energy Saving devices**			
		(i) Distribution of LPG Cylinders		10	20000
		(ii) Distribution of Solar lights			0
		(iii) Distribution of Induction Heater/ Cooker/Energy efficient Chulhas		0	0
		(iv) Construction of crematorium		0	0
	b	(i) Construction and repair of existing boundary pillars/chak pillars		0	0
	c	(ii) Sign & Slogan Boards		0	0
	Total 5 B			**10**	**20000**
	Total 5 (A+B)			**10**	**65000**
E	**Management of Wildlife in and outside the Protected**				
	(a)	**Improvement and Development of wildlife**			
		(i)	Anti-Poaching/patrolling activities	L/s	10000
		(ii)	Vaccination of domestic cattle	L/s	10000
		(iii)	Field equipments for staff and officers and office support	L/s	50000
		(iv)	Habitat improvement	L/s	100000
		(v)	Signage	L/s	10000
		(vi)	Support to Western Tragopan pheasantry at Gopalpur (Sarahan)	L/s	100000
	(b)	**Mitigation of Human Wildlife Conflict**			
		(i)	Compensation against wildlife damages	L/s	15000
		(ii)	Publicity & awareness through Kala Jatha (Nukar Natak).	L/s	30000
		Total (6)		**0**	**325000**
	G. Total (1 to 6)			**10**	**940000**
7	**Monitoring & Evalution**				0
8	**Site Specific Plan/ estimate**				**0**
9	Contingencies				200000
	Total Cost of CAT Plan			**10**	**1140000**

Range Forest Officer,
Wild Life Range Kalpaa

Divisional Forest Officer,
Sarahan Wildlife Division,
Distt. Shimla (H.P.)

Annexure-XI

S. No.	Name of Component			9th Year	
				Phy-ha/ Km/ No	Fin- Rs
1	**Bio-logical Measures-Improvement of tree cover**				
	(a)	**Nursery Development**			
		(i) New Nursery-UF-29			0
	(b)	**Afforestation**			
		New -UF 29, UF-30			0
		Maintenance			
			1st year maintenance		0
			2nd year maintenance	0	0
			3rd year maintenance	0	0
	©	Enrichment planting			
		New -UF 29		0	0
		Maintenance		0	0
			1st year maintenance	0	0
			2nd year maintenance	0	0
			3rd year maintenance	0	
	(d)	**Energy Plantaion-UF-29**			
		New		0	0
	(e)	**NTFP/Medicinal Plants Plantation-UF-30**			
		New		0	0
		Maintenance		0	0
			1st year maintenance	0	0
			2nd year maintenance	0	0
			3rd year maintenance	0	
	Total (1)			**0**	**0**
2	**Soil Conservation works-Engineering and Bio-**				
	(i)	Stabilization of land slides/Slips			50000
	(ii)	Stabilization of Nalla			100000
	Total (2)			**0**	**150000**
3	**Payment of Eco-Services**				250000
4	**Research, Capacity building, Publicity**				
5	**Infrastructure Build up & Forest Protection:**				
A	(i)	Maintenance of R.O. Office cum Res, Katgaon			0
	(ii)	Maintenance of B.O. Qtr. at Katgaon-2			0
	(iii)	Nature interpretation centre, katgaon			0
	(iv)	Maint of link road to Range Office, Katgaon			0
	(v)	Establishment Cost (Reimbursement of Salary & Contractual amount to Contractual Staff)			25000
	(vi)	Mobility for protection-vehicle		0	0
	(vii)	Office Equipments (Computer- 1 with accessories,Photocopier-2, GPS –4		0	0
	(viii)	O.E.			10000

	(ix)	Maintenance of Motor Vehicle			5000
	(x)	Amenities to staff & labour			5000
	Total 5A			**0**	**45000**
B	**Protection of Forests**				
	a	**Energy Saving devices**			
		(i) Distribution of LPG Cylinders		0	0
		(ii) Distribution of Solar lights			0
		(iii) Distribution of Induction Heater/ Cooker/Energy efficient Chulhas		10	20000
		(iv) Construction of crematorium		0	0
	b	(i) Construction and repair of existing boundary pillars/chak pillars			0
	c	(ii) Sign & Slogan Boards			0
	Total 5 B			**10**	**20000**
	Total 5 (A+B)			**10**	**65000**
6	**Management of Wildlife in and outside the Protected**				
	(a)	**Improvement and Development of wildlife**			
		(i)	Anti-Poaching/patrolling activities	L/s	10000
		(ii)	Vaccination of domestic cattle	L/s	10000
		(iii)	Field equipments for staff and officers and office support	L/s	50000
		(iv)	Habitat improvement	L/s	100000
		(v)	Signage	L/s	10000
		(vi)	Support to Western Tragopan pheasantry at Gopalpur (Sarahan)	L/s	100000
	(b)	**Mitigation of Human Wildlife Conflict**			
		(i)	Compensation against wildlife damages	L/s	15000
		(ii)	Publicity & awareness through Kala Jatha (Nukar Natak).	L/s	30000
		Total (6)		**0**	**325000**
	G. Total (1 to 6)			**10**	**790000**
7	**Monitoring & Evalution**				0
8	**Site Specific Plan/ esumate**				0
9	**Contingencies**				**100000**
	Total Cost of CAT Plan			**10**	**890000**

Range Forest Officer,
Wild Life Range Kotgarh

Divisional Forest Officer,
Sarahan Wildlife Division,
Distt. Shimla (H. P.)

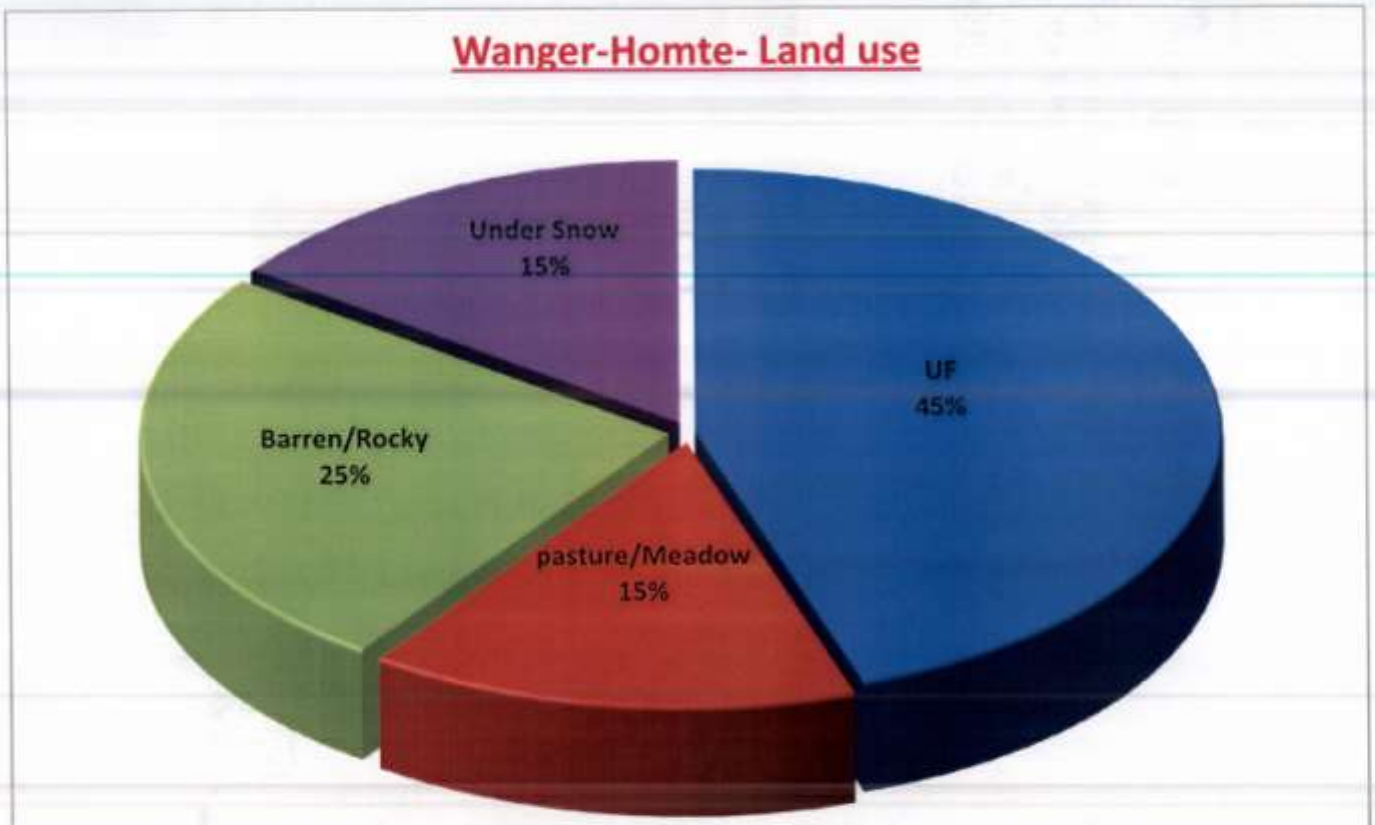
Anexure-XII

S. No.	Name of Component			10th Year	
				Phy-ha/ Km/ No	Fin- Rs
1	**Bio-logical Measures-Improvement of tree cover**				
	(a)	**Nursery Development**			
		(i)	New Nursery-UF-29		0
	(b)	**Afforestation**			
		New -UF 29, UF-30			0
		Maintenance			
			1st year maintenance		0
			2nd year maintenance	0	0
			3rd year maintenance	0	0
	©	Enrichment planting			
		New -UF 29		0	0
		Maintenance		0	0
			1st year maintenance	0	0
			2nd year maintenance	0	0
			3rd year maintenance	0	
	(d)	**Energy Plantaion-UF-29**			
		New		0	0
	(e)	**NTFP/Medicinal Plants Plantation-UF-30**			
		New		0	0
		Maintenance		0	0
			1st year maintenance	0	0
			2nd year maintenance	0	0
			3rd year maintenance		
	Total (1)			**0**	**0**
2	**Soil Conservation works-Engineering and Bio-**				
	(i)	Stabilization of land slides/Slips			25000
	(ii)	Stabilization of Nalla			100000
	Total (2)			**0**	**125000**
3	**Payment of Eco-Services**				**250000**
4	**Research, Capacity building, Publicity**				
5	**Infrastructure Build up & Forest Protection:**				
A	(i)	Maintenance of R.O. Office cum Res, Katgaon			0
	(ii)	Maintenance of B.O. Qtr. at Katgaon-2			0
	(iii)	Nature interpretation centre, katgaon			0
	(iv)	Maint of link road to Range Office, Katgaon			0
	(v)	Establishment Cost (Reimbursement of Salary & Contractual amount to Contractual Staff)			25000
	(vi)	Mobility for protection-vehicle		0	0
	(vii)	Office Equipments (Computer- 1 with accessories,Photocopier-2, GPS –4		0	0
	(viii)	O.E.			10000

	(ix)	Maintenance of Motor Vehicle			5000
	(x)	Amenities to staff & labour			5000
	Total 5A			**0**	**45000**
B	**Protection of Forests**				
	a	**Energy Saving devices**			
		(i) Distribution of LPG Cylinders		0	0
		(ii) Distribution of Solar lights			0
		(iii) Distribution of Induction Heater/ Cooker/Energy efficient Chulhas		10	20000
		(iv) Construction of crematorium		0	0
	b	(i) Construction and repair of existing boundary pillars/chak pillars		0	0
	c	(ii) Sign & Slogan Boards		0	0
	Total 5 B			**10**	**20000**
	Total 5 (A+B)			**10**	**65000**
6	**Management of Wildlife in and outside the Protected**				
	(a)	**Improvement and Development of wildlife**			
		(i)	Anti-Poaching/patrolling activities	L/s	10000
		(ii)	Vaccination of domestic cattle	L/s	10000
		(iii)	Field equipments for staff and officers and office support	L/s	50000
		(iv)	Habitat improvement	L/s	100000
		(v)	Signage	L/s	10000
		(vi)	Support to Western Tragopan pheasantry at Gopalpur (Sarahan)	L/s	100000
	(b)	**Mitigation of Human Wildlife Conflict**			
		(i)	Compensation against wildlife damages	L/s	15000
		(ii)	Publicity & awareness through Kala Jatha (Nukar Natak).	L/s	30000
	Total (6)			**0**	**325000**
	G. Total (1 to 6)			**10**	**765000**
7	**Monitoring & Evalution**				0
8	**Site specific Plan/ estimate**				**0**
9	**Contingencies**				**150000**
	Total Cost of CAT Plan			**10**	**915000**

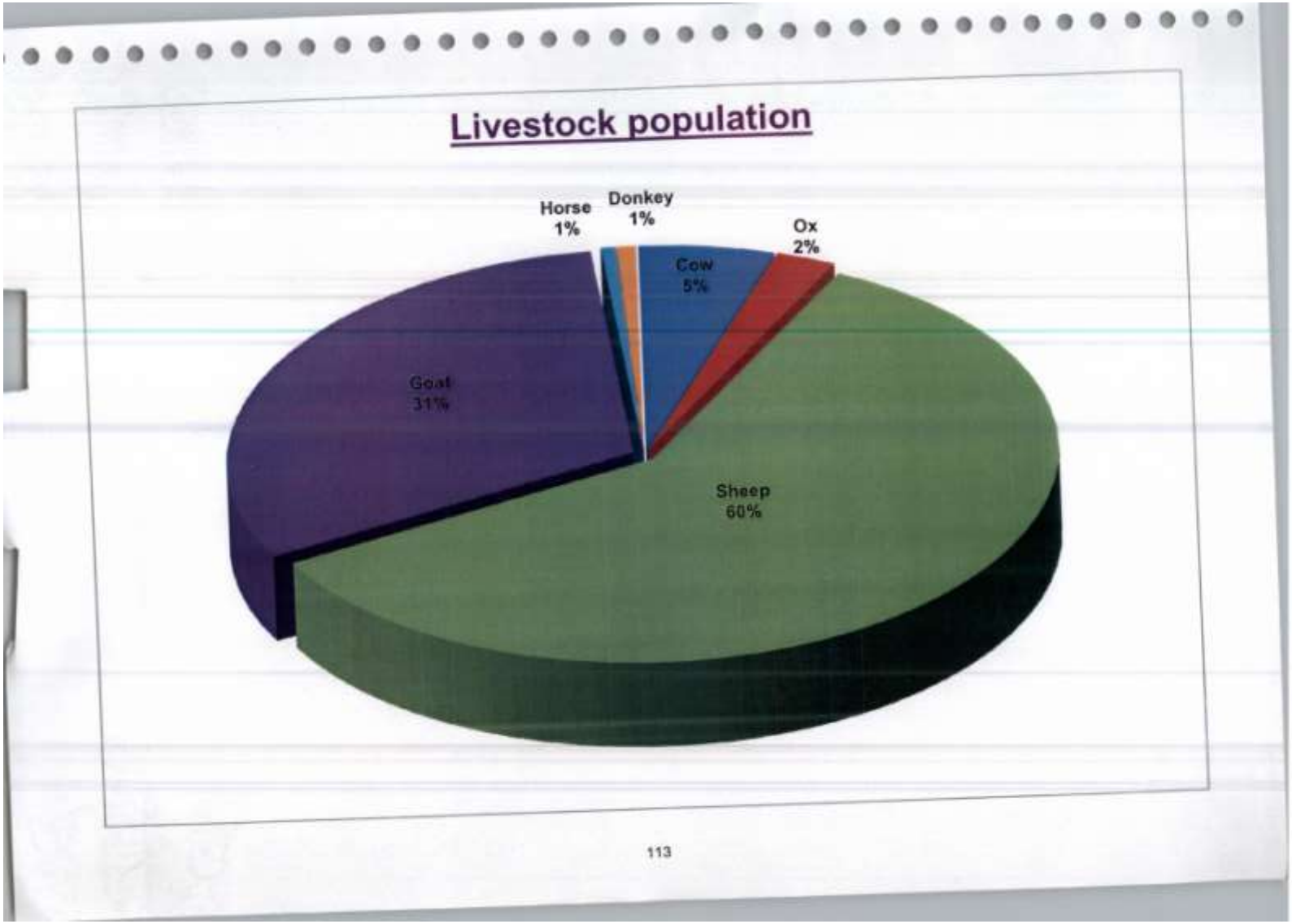
Range Forest Officer,
Wild Life Range Ketgaon

Divisional Forest Officer,
Sarahan Wildlife Division,
Distt. Shimla (H. P.)


Wanger-Homte- Land use
Under Snow
15%
UF
45%
Barren/Rocky
25%
pasture/Meadow
15%

Wanger Homte- Land Use-ha

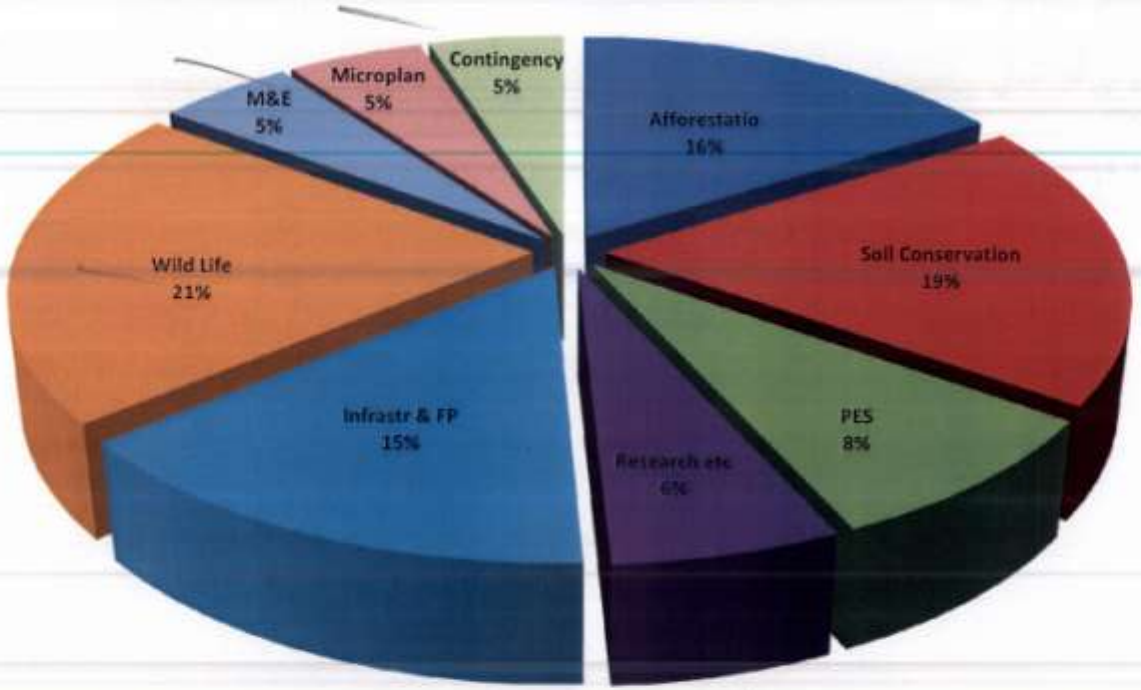
UF	150
pasture/Meadow	50
Barren/Rocky	84
Under Snow	50
Total	334


Livestock population
Horse 1%
Donkey 1%
Ox 2%
Cow 5%
Goat 31%
Sheep 60%

Livestock population

Cow	1,119
Ox	499
Sheep	12,300
Goat	6,410
Horse	124
Donkey	157
Total	20,609

Component wise % allocation



Component wise allocation		%
Afforestatio	3211760	16.00
Soil Conservation	3765000	18.76
PES	1700000	8.47
Research etc	1200000	5.98
Infrastr & FP	2940000	14.65
Wild Life	4255000	21.20
M&E	1000000	4.98
Microplan	1000000	4.98
Contingency	1000000	4.98
Total	20071760	100.00


Year wise phasing- Wanger-Homte-Rs lac
4.0
20.3
34.4
35.2
30.8
22.6
12.5
11.9
11.4
8.9
8.7
Zero Year
First Year
2nd Year
Third Year
Fourth Year
Fifth Year
Sixth Year
Seventh Year
Eighth Year
Ninth Year
Tenth Year

Year wise phasing of expenditure

Year	Amount- Rs lac
Zero Year	4.0
First Year	20.3
2nd Year	34.4
Third Year	35.2
Fourth Year	30.8
Fifth Year	22.6
Sixth Year	12.5
Seventh Year	11.9
Eighth Year	11.4
Ninth Year	8.9
Tenth Year	8.7
Total	**200.72**