

ENVIRONMENTAL SAFEGUARDS IMPLEMENTED AT THE PROJECT

CHAPTER

5.1 Catchment Area Treatment

Catchment area is an important factor, which governs the functioning and longevity of hydroelectric projects by defining the disposition of incoming precipitation, runoff and sedimentation. River runoff and sediment transport are the crucial factors for project operation and to devise mitigative measures to arrest soil erosion.

At the time when CAT plan was prepared, misuse of land and its resources for a long time had done a great damage to the catchment of the project. The area was highly vulnerable to erosion. Biotic interference in the forest lands, encroachment, and heavy grazing pressures coupled with weak geological formations and rugged topography had aggravated the soil erosion problems in the area. This resulted in deep gully formation, landslides, loss of top soil cover with consequent high yield of sedimentation. Therefore intensive soil conservation measures to provide maximum possible cover to the land surface and intensive land development and torrent control measures in the catchment were proposed under the CAT plan.

Detailed catchment area treatment plan was got prepared by NHPC from the Jammu & Kashmir State Forest Department in the year 1994. The plan was prepared for approximately 5000 ha. of degraded area identified in the free draining catchment spreading over an area of 13180 ha. covering 9 micro-watersheds (Plate 3). The details of these micro-watersheds are given in Table 5.1.

The CAT plan was prepared, based on Remote Sensing studies, with the following aims in mind:

- Restoration of soil and vegetation cover and rehabilitation of degraded site conditions through effective closure and exclusion of biotic interference.
- Planting fast growing plant species for the purpose of habitat building.
- Development of natural pastures for fodder development to prevent indiscriminate grazing in the project area.
- To control and regulate loss of soil & water and check the damages caused by the extremes of nature.

श्री. प्रबंधक (प्रमुख) (E)
उड़ी पावर स्टेशन Uri Power Station
एन. एच.पी. सी. लि. गिंगल NHPC Ltd Gingle
बaramulla (ज. क. क.) Baramulla (J&K) 193122

Table 5.1 Micro-watershed Details

S.No.	Name of microwatershed	Code no.	Area (ha.)
1.	Limber	IEJIS	4337
2.	Katha	IEJ2C5	1343
3.	Pahlipura	IEJ2C6	1716
4.	Gabbewar	IE2D1	1144
5.	Manjigiran	IEJ2D2	485
6.	Gantamula	IEJ1B10	712
7.	Buniyar	IEJ1C1	435
8.	Naushara	IEJ1B11	880
9.	Sank	IEJIB6	2128
		Total	13180

Treatment Measures Proposed & Implemented Under CAT

- a) **Contour Bunding:** In the project area, the rainfall is quite heavy and cause considerable soil loss in run-off. Therefore the agriculture lands under 6% slope were proposed to be brought under contour bunds so that the surplus run of can flow gently off the arable land at non-erosive velocity. About 470 ha. of land was proposed to be treated through contour bunding.
- b) **Bench Terracing:** The area of 190 ha. under moderate to steep slopes, was proposed to be bench terraced.
- c) **Gully Control:** The gullies in the cropland were proposed to be treated with engineering and vegetative methods. Check dams were also proposed to promote growth of vegetation & consequent stabilization of the area. Following types of checkdams were recommended:

Model I : DRSM checkdams with stone available at site.

Model II : Combination of DRSM and crate works.

Model III : Combination of DRSM checkdams, DRSM check walls & Crate work in area with eroding hill slopes.

Gully control measures were proposed to be implemented over 1186 ha. of land.

- d) **Landslide control:** Following landslide control works were proposed over 151 ha. of land:
- Check walls/retaining walls
 - Gabions
 - Fascine works

जरी. प्रबंधक (जि. व. क.) नरेंद्र (IE)

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- e) **Stream Bank Protection:** Measures such as Wire crates and Vegetative Spurs/structures were proposed near the banks of streams/Nullah to protect erosion along the banks from high velocity water specially during rains.
- f) **Plantation/Pasture Development:** Considering the area available for grazing, the cattle population in the area is very high. The domestic, poor bred, diseased and malnourished animals are kept in large numbers. An average fodder requirement per cattle per day is 4.5 kg. Seeing large need for pasture land, it was proposed that about 100 ha. land will be developed as pasture land. In addition to this about 240 ha. of land was proposed to be afforested under CAT. The species proposed to be planted included *Robinia*, *Aesculus*, *Ulmus*, *Prunus*, *Celtis*, *Alnus*, etc.
- g) **Inspection path:** For inspections and tending work inspection path of 22 km length were proposed to be constructed.
- h) **Nurseries:** Nursery network was proposed to be developed to raise seedlings to be used for Afforestation.

Progress of Catchment Area Treatment Plan

Catchment Area Treatment Plan was proposed to be implemented for a period of 5 years i.e from the year 1994-95 to 1998-99. Details of year wise physical target and achievement of various treatment measures implemented at the project is given at Table 5.2.

5.1.1 Augmentation of CAT Plan

After the successful implementation of CAT plan, a need was felt to augment the soil conservation measures implemented under CAT plan. Hence an Augmentation CAT plan was prepared for the year 1998, 1999 & 2000. Activities like fencing, plantation and grass & fodder sowing were undertaken under the plan. Year wise details of achievement against targets are as under:

COMPONENT	YEAR					
	1998		1999		2000	
	Target	Achievement	Target	Achievement	Target	Achievement
Fencing (R ft.)	81000	81000 (184 ha.)	45000	45000 (50 ha.)	—	—
Plantation (Nos.)	2,25,000	2,21,000	1,30,000	77,500	20,000	20,000
Grass and Fodder Sowing (ha.)	45	45	50	50	75 (Dibbling of Nuts)	75 (Dibbling of Nuts)

5.1.2 Maintenance of CAT works

The need for the maintenance of CAT units was emphasized to ensure proper nursing of plantations and sustenance of other units (fencing, plantation and other structures) raised under soil conservation and forestry measures. Maintenance of these units (watch and ward) was done through local labourers (especially the educated unemployed youth) and included routine repairs/renovation of fence, nursing of saplings, weeding and hoeing, pruning, watering etc.

Maintenance of the units under soil conservation measures like DRSM and wire crates etc. was also undertaken on the large scale simultaneously with the mass afforestation programme including silvi-pasture development.

5.2 Restoration of Dumping Sites & Landscaping

The Uri CAT project of the Department of Forests, J&K Government was created in 1994 for a period of 5 years i.e. upto March, 1999. The project funded by the National Hydroelectric Power Corporation Ltd. catered the environment development activities of the identified catchments of the Uri-I Hydroelectric Project of the NHPC, Ministry of Power, G.O.I.

It was only during the period 1997-99 that a separate integrated development scheme under the name of "Restoration Plan" (1997-99) was developed by NHPC & NEERI Nagpur & implemented in the field by the Uri CAT Project with effect from May, 1997. The plan envisaged the use of biotechnology. The said plan was aimed to re-vegetate an estimated 55 lac cubic meters of compact rock material excavated during the construction of the various places between Sheeri village & Bandi (Uri), thus, forming ugly scars in the form of dumping sites (Spoil tip areas).

The landscape of the Project area, after completion, was affected due to the excavation works done for various open as well as underground structures, viz. Barrage complex, Head race tunnel (10.7 km long), Tail race tunnel (2.06 km long), Power house complex (completely underground) etc. Total quantity of the muck excavated was approx. 55 lac cubic meters, covering more than 95 ha of land mass. This excavated material was dumped at ten designated locations (Plate 4 A - 4D) between village Sheeri and Bandi on National Highway NH-1A. These black-spots formed by the dumping of the excavated material were named as "Spoil Tip Areas of the Uri-I HEP".

The quarry site selected for excavation of concrete construction material was the river bed of river Jhelum, at Sheeri. The river bed is reclaimed by natural deposition hence no extra treatment was required. However, the dumping near Sheeri and crushing plant were included in the natural landscaping plantation. The waste material dumped at the

Dr. Prabhu (P) Sr. Manager (E)
Uri Power Station
NHPC Ltd. G
Jammu & Kashmir

Figures in ha.

Dr. Prateek Singh, Sparkfinger (E)
Jesit Nagar, Indirapuram Power Station
(E). Phone: 011-2196-51100 / 110, Gurgaon
India. E-mail: a@sparkfinger.com, a@sparkfinger.in

