Office Address
Srinagar Office : Forest Complex, Shiekh Bagh, Phone: 0194-2483937
Lal Chowk, Sgr-190001
Jammu Office : Forest Resource Mgmt. Centre, Phone: 0191-3511909
Narwal Jammu-180006

URL Address: www.jkforest.gov.in
E-mail: pccfjkforest@gmail.com

Jammu & Kashmir Forest Department
Office of the Pr. Chief Conservator of Forests & HoFF
Government of Jammu & Kashmir

Addl. Pr. Chief Conservator of Forests,
Kashmir

No. PCCF/FCA/3386/ 6431-34 **Dated** 11 **-09-2023**

Sub: Catchment Area Treatment Plan of Uri I Stage II HE Project- approval thereof.

Ref: Your office communication No. 421/CCF(K)/Plg/2023-24/871-72 dated 19-07-2023.

Sir,

Please refer to your above quoted letter on the subject. In this regard, I am directed to convey the approval (in-principle) of the Pr. Chief Conservator of Forests (HoFF) to the CAT Plan of Uri I Stage II HE Project.

Yours faithfully

(S.Senthil Kumar) IFS
Addl. Pr. Chief Conservator of Forests
Nodal Officer (FCA)

Copy to:
1. Conservator of Forests, North Circle
2. Divisional Forest Officer, J.V. Forest Division
3. PS to Pr.CCF (HoFF) J&K for kind information of the Pr. Chief Conservator of Forests (HoFF) J&K

Office Address
Srinagar Office : Forest Complex, Shiekh Bagh, Lal Chowk, Sgr-190001 | Phone: 0194-2483937
Jammu Office : Forest Resource Mgmt. Centre, Narwal Jammu-180006 | Phone: 0191-3511909
URL Address: www.jkforest.gov.in
E-mail: pccfjkforest@gmail.com

सत्यमेव जयते

Jammu & Kashmir Forest Department
Office of the Pr. Chief Conservator of Forests &HoFF
Government of Jammu & Kashmir

Sub: Catchment Area Treatment Plan of URI I stage II HE Project-Approval thereof.

Ref: Your proposal No.FP/JK/HYD/144277/2021.

Sir,

This is with reference to the above proposal on CAT Plan. In this regard, you are requested to give a power Point presentation to the CAT Plan to undersigned on 12.08.2023 at 3.00 PM. either in person or online

(S. Senthil Kumar), IFS
APCCF/Nodal Officer (FCA)
09/08/23

To,
General Manager
NHPC URI-I Stage-II

No. PCCF/FCA/3386/4574
Dated 09-08-2023

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Sheikhbagh Forest Complex, Lal Chowk, Srinagar – 190001
Ph 0194-2455114 Fax 0194-2455366 email ccfkashmir@gmail.com

GOVERNMENT OF JAMMU & KASHMIR
OFFICE OF THE CHIEF CONSERVATOR OF FORESTS, KASHMIR

Addl. Pr, Chief Conservator of Forests/Nodal Officer,
FCA, Jammu & Kashmir Government,
Kashmir.

No.: 421/CCF(K)/Plg/2023-24/871-72 Dated: 19 - 07 - 2023

Subject: Catchment Area Treatment Plan of Uri I Stage II HE Project- Approval thereof.

Ref: Conservator of Forests,North Circle's letter No:. FD/CFN2023 24/FCA/320-22 dated: 19-05-2023.

Sir,

Kindly refer the CAT plan of Uri I Phase-II HE Project submitted by the project proponent recommended by Conservator of Forest, North Circle, vide the above reference, a copy of which is endorsed to you as well (copy enclosed).

The project report has been prepared as per the forest schedule of rates 2017. The CAT plan needs revision on account of the following:

1. The PWD schedule of rates have also been revised in 2022 and hence the fencing work and civil work would involve enhancement of rates also.
2. The minimum wages of the labours have considerably increased during the time and is likely to increase during the period of implementation of the plan as well.
3. The fencing given in the CAT Plan is using PCC posts, however in Kashmir, angle iron fence posts are used for creating fencing of plantation sites._

In light of the above, it is proposed to revise the cost estimation given in para 10.2.6 as per extant schedule of rates and minimum wages. The cost of planting component is proposed to be enhanced by a factor of 1.36 considering the CPI (IW) of 2017 and 2023. The revised cost estimates now works out to be Rs. 12.97 Crores (details enclosed).

The plan could be revised at the time of the implementation of CAT Plan by PCCF (HOFF) J&K. Approval may be accorded to the CAT Plan so that the case may be processed on PARVISH under CAT for diversion of forest land for non-forestry purpose.

Yours faithfully,

Encl: 4 leaves

APCCF/Chief Conservator of Forests
Kashmir

19.7.23.

Copy to:

1. Conservator of Forests, North Circle for information. This is with reference to letter No. cited above. He is requested to work out a detailed works programme with the extant rate norms.
2. File.

soplanning888@gmail.com

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Annexre II of CAT Plan .....Revised

S.No		Unit	Unit Cost (Rs)	Qty	Total Cost (Rs)
1	ADVANCE WORK				
	a) Fencing with Angle Iron Posts	Rft	**250**	300	75000
2	CREATION				
	A. PLANTATION				
	a) Pit Plantation (PB)	No.	40.081374	330	13226.85342
	a) Pit Plantation (NR)	No.	31.652537	770	24372.45349
	B. SOWING				
	a). Patching Sowing	No.	9.549039	370	3533.14443
	b). Dibbling	No.	9.808598	370	3629.18126
3	SMC WORKS*	Cum	**2744.35**	5	13721.75
	Sub Total I				**133483**
	Or Say				**133480**
4	MAINTENANCE				
	(BUS) 1st year @ 25% of last year plantation				
	a) PB Plantation	No.	40.081374	83	3326.754042
	b) NR plantation	No.	31.652537	193	6108.939641
	(BUS) 2nd year @ 15% of last year plantation				
	a) PB Plantation	No.	40.081374	50	2004.0687
	b) NR plantation	No.	31.652537	116	3671.694292
	(BUS) 3rd year @ 5% of last year plantation				
	a) PB Plantation	No.	40.081374	17	681.383358
	b) NR plantation	No.	31.652537	39	1234.448943
	Sub Total II				**17027**
	Or Say				**17030**
	Grand Total (Sub Total I+II)				150511
	OR SAY				**150510**
	* Rate as per PWD Schedule of Rates 2022, Code 7.3 (Page 111)				

2. Per Hectare Norm for Enrichment

S.No		Unit	Unit Cost (Rs)	Qty	Total Cost (Rs)
1	ADVANCE WORK				
	a) Fencing with Angle Iron Posts	RFt	**250**	300	75000
2	CREATION				
	A. PLANTATION				
	a) Pit Plantation (PB)	No.	40.081374	240	9619.52976
	a) Pit Plantation (NR)	No.	31.652537	560	17725.42072
	B. SOWING				
	a). Patching Sowing	No.	9.549039	270	2578.24053
	b). Dibbling	No.	9.808598	270	2648.32146
3	SMC WORKS*	Cum	**2744.35**	5	13721.75
	Sub Total I				**121293**
	Or Say				**121300**
4	MAINTENANCE				
	(BUS) 1st year @ 25% of last year plantation				
	a) PB Plantation	No.	40.081374	60	2404.88244
	b) NR plantation	No.	31.652537	140	4431.35518

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	) 2nd year @ 15% of last year plantation				
	PB Plantation	No.	40.081374	36	1442.929464
	o) NR plantation	No.	31.652537	84	2658.813108
	(BUS) 3rd year @ 5% of last year plantation				
	a) PB Plantation	No.	40.081374	12	480.976488
	b) NR plantation	No.	31.652537	28	886.271036
	Sub Total II				**12305.23**
	Or Say				**12300**
	Grand Total (Sub Total I+II)				133598
	OR SAY				**133600**
	* Rate as per PWD Schedule of Rates 2022, Code 7.3 (Page 111)				

3. Per Hectare Norm for Pasture Development

S.No		Unit	Unit Cost (Rs)	Qty	Total Cost (Rs)
1	ADVANCE WORK				
	a) Fencing with Angle Iron Posts	RFt	**250**	300	75000
2	CREATION				
	A. PLANTATION				
	a) Pit Plantation (PB)	No.	40.081374	330	13226.85342
	a) Pit Plantation (NR)	No.	31.652537	770	24372.45349
	B. SOWING				
	a). Patching Sowing	No.	9.549039	370	3533.14443
	b). Dibbling	No.	9.808598	370	3629.18126
3	SMC WORKS*	Cum	**2744.35**	5	13721.75
	Sub Total I				**133483.38**
	Or Say				**133480**
4	MAINTENANCE				
	(BUS) 1st year @ 25% of last year plantation				
	a) PB Plantation	No.	40.081374	83	3326.754042
	b) NR plantation	No.	31.652537	193	6108.939641
	(BUS) 2nd year @ 15% of last year plantation				
	a) PB Plantation	No.	40.081374	50	2004.0687
	b) NR plantation	No.	31.652537	116	3671.694292
	(BUS) 3rd year @ 5% of last year plantation				
	a) PB Plantation	No.	40.081374	17	681.383358
	b) NR plantation	No.	31.652537	39	1234.448943
	Sub Total II				**17027.29**
	Or Say				**17030**
	Grand Total (Sub Total I+II)				150510.67
	OR SAY				**150510**
	* Rate as per PWD Schedule of Rates 2022, Code 7.3 (Page 111)				

4. Per Hectare Norm for Assisted Natural Regeneration

S.No		Unit	Unit Cost (Rs)	Qty	Total Cost (Rs)
1	ADVANCE WORK				
	a) Fencing with Angle Iron Posts	RFt	**250**	300	75000
2	CREATION				
	A. PLANTATION				
	a) Pit Plantation (PB)	No.	40.081374	120	4809.76488

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	Plantation (NR)	No.	31.652537	280	8862.71036
	SOWING				
	a). Patching Sowing	No.	9.549039	135	1289.120265
	b). Dibbling	No.	9.808598	135	1324.16073
3	SMC WORKS*	Cum	**2744.35**	5	13721.75
	Sub Total I				**105007.51**
	Or Say				**105010**
4	MAINTENANCE				
	(BUS) 1st year @ 25% of last year plantation				
	a) PB Plantation	No.	40.081374	30	1202.44122
	b) NR plantation	No.	31.652537	70	2215.67759
	(BUS) 2nd year @ 15% of last year plantation				
	a) PB Plantation	No.	40.081374	18	721.464732
	b) NR plantation	No.	31.652537	42	1329.406554
	(BUS) 3rd year @ 5% of last year plantation				
	a) PB Plantation	No.	40.081374	6	240.488244
	b) NR plantation	No.	31.652537	14	443.135518
	Sub Total II				**6152.61**
	Or Say				**6150**
	Grand Total (Sub Total I+II)				111160.12
	OR SAY				**111160**
	* Rate as per PWD Schedule of Rates 2022, Code 7.3 (Page 111)				

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10.13: Cost Estimate for Catchment Area Treatment of Uri-I Phase-II HEP.....Revised

S.No.	Item	Rate (Rs)	Unit	Target	
				Physical	Financial (Rs in Lakh)
A	**Biological Measures**				
1	Normal Afforestation including maintenance	125346.51	Ha	119.00	149.16
2	Enrichment Plantations including maintenance	104588.62	Ha	40.00	41.84
3	Pasture Development including maintenance	80053.46	Ha	84.00	67.24
4	Asssisted Natural Renegeneration maintenance	77375.90	Ha	59.00	45.65
5	Plant Production				
a	Formation of New Permanent Nursery	413305.36	Ha	1	4.13
b	Raising of sapling of PB of size (9" x 6")				
c	Raising of sapling of NR sapling	10.97	/plant	73200	8.03
6	Maintenance of PB raised conifer saplings in nurseries of size (9" x 6")	10.16	/plant	170800	17.36
a	During 1st year of raising of plants	3.63	/plant	18300	0.66
b	During 2nd year of raising of plants	3.63	/plant	10980	0.40
c	During 3rd year of raising of plants	5.23	/plant	36600	1.91
d	During 4th year of raising of plants	5.23	/plant	36600	1.91
e	During 5th year of raising of plants	5.23	/plant	36600	1.91
f	During 6th year of raising of plants	5.23	/plant	36600	1.91
g	During 7th year of raising of plants	5.23	/plant	36600	1.91
h	During 8th year of raising of plants	5.23	/plant	36600	1.91
i	During 9th year of raising of plants	5.23	/plant	36600	1.91
j	During 10th year of raising of plants	5.23	/plant	36600	1.91
7	Maintenance of NR saplings				
a	During 1st year of raising of plants	3.39	/plant	42700	1.45
8	Engagement of Labours as Watch and Ward				
a	During Planting Year	330	/day	3	3.61
b	During 1st year of raising of plants	355	/day	3	3.89
c	During 2nd year of raising of plants	385	/day	3	4.22
d	During 3rd year of raising of plants	415	/day	3	4.54
e	During 4th year of raising of plants	450	/day	3	4.93
f	During 5th year of raising of plants	485	/day	3	5.31
g	During 6th year of raising of plants	525	/day	3	5.75
h	During 7th year of raising of plants	565	/day	3	6.19
i	During 8th year of raising of plants	610	/day	3	6.68
j	During 9th year of raising of plants	660	/day	3	7.23
k	During 10th year of raising of plants	710	/day	3	7.77
	Sub Total A				**411.36**
B	**Engineering Measures**				
9	DRSM Structures	**2744.35**	Cum.	7800.00	214.06
a	Maintenance cost @ 25%				53.51
10	Gabion Structures	**4716.85**	Cum.	2030.00	95.75
a	Maintenance cost @ 25%				23.94
11	Silt Observation Points		No.s	2	130.51

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एनएचपीसी लिमिटेड
NHPC Limited
(A Govt. of India Enterprise)

Uri I Power Station,
Gingle, Baramulla (J&K)
Phone: 01956-253211
CIN No.: L4010HR1975GOI032564

Undertaking for the Catchment Area Treatment Plan of Uri I Stage II HE Project;

The proposed project Uri I stage II HE project will utilise the already completed structures of existing Uri Power Station including Barrage, cut and Cover, Culvert desilting basin, open power channel, Adits. As such the project does not involve construction of Dam/intake Further, the Reservoir level will be the remain same as that of current FRL (at 1491.0m), hence, no new land will be submerged due to the proposed construction of the project.

It is to mention here that the CAT works of Uri Power Station has already carried out. A signed copy of the CAT works undertaken is enclosed.

Also, as per the approved TOR dated 10.06.2021 issued by MoEF &CC, a copy of the Catchment area Treatment Plan amounting to Rs 8.74 crore has been worked out by the consultant based on the various circulars/rates approved by Department of Forests Government of J&K and is enclosed. The same has been submitted by this office vide letter dated 02.03.2023 for approval. Any updation in the CAT plan shall be incorporated at the appropriate time.

It is also to undertake that any updation/modification in the final/approved CAT plan shall be incorporated accordingly.

Signature

Name: Naseer Shafi Bhat
Uri I Stage II HE Project
Gingle Baramulla

Manager (E)
Uri Power Station
NHPC Ltd Gingle
Baramulla (J&K)193122

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.

परि. प्रबंधक Manager (E)
उरी पावर स्टेशन Uri Power Station
एन. एच.पी. सी. लि. NHPC Ltd Qingle
बारामुला (ज. क.) Baramulla (J&K)193

Table 5.1 Micro-watershed Details

S.No.	Name of microwatershed	Code no.	Area (ha.)
1.	Limber	IEJ1S	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:

i) Check walls/retaining walls
ii) Gabions
iii) Fascine works

Manager (E)
उरी पावर स्टेशन Uri Power Station
एन. एच.पी.सी. लि. लिमिटेड NHPC Ltd Limited
बारामुला (ज. व क.) Baramulla (J&K)193122

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	Achieve-ment	Target	Achieve-ment	Target	Achieve-ment
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 o the excavation works done for various open as well as underground tructures, viz. Barrage complex, Head race tunnel (10.7 km long), Tail race nnel (2.06 km long), Power house complex (completely underground) tc. Total quantity of the muck excavated was approx. 55 lac cubic meters, overing more than 95 ha of land mass. This excavated material was dumped ten designated locations (Plate 4 A – 4D) between village Sheeri and ndi on National Highway NH-1A. These black-spots formed by the mping of the excavated material were named as "Spoil Tip Areas of the i HEP".

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

Manager (E) Uri Power Station

Table 5.2 Catchment Area Treatment (1994-1998)

Figures in ha.

Item of Work	Year									
	1994-95		1995-96		1996-97		1997-98		1998-99	
	Target	Achieve-ment	Target	Achieve-ment	Target	Achieve-ment	Target	Achieve-ment	Target	Achieve-ment
I Soil Conservation										
(i) Contour Bunding	100	102	130	106	125	102 steps (2781 cu m)	105	106.2	10	7
(ii) Bench Terracing	48	18	58	50	45	572 steps (15396 cu m)	37	36.08	2	2
(iii) Gully Control										
Model-I	182	190	299	291	98	—	—	—	—	—
Model-II	97	110	150	177	58	—	—	—	—	—
Model-III	102	110	96	78	38	—	—	—	—	—
Total Model-I,II,III	381	410	545	546	194	595 steps (5387 cu m)	50	52.56	16	16
(iv) Land slide control	36	41	41	39	30	114 steps (2144 cu m)	24	21.05	20	20
(v) Stream Bank Protection										
a. Wire crate	300	280	340	332	—	282 steps (5015 cu m)	—	96.5	—	3562.82 cu m
b. Veg./Structure	90	119	75	116	—	990 steps (5940 mawa) + 19800 Brushwood CD.	—	600 mawa	—	—
(II) Afforestation										
(i) Planting	65	76	70	100	60	1.72 lacs	45	44.4	—	—
(ii) Fencing	230	250	175	182	140	0.524 rfts	45	95	—	—
(iii) Pasture	25	25	30	30	25	4.10 lac patches	20	20	—	—
(III) General										
(i) Inspection Path	11km	11km	11km	12km	—	—	—	—	—	—
(ii) Nursery	✓	✓	✓	✓	—	—	—	—	—	—

Manager (E)
Uri Power Station
Baramulla (J&K)193122

ANNEX.-I

DETAILS OF FINANCIAL ALLOCATION AND EXPENDITURE INCURRED TILL SEPTEMBER,2002 FOR ENVIRONMENTAL MANAGEMENT PLANS, URI.H.E.PROJECT, GINGAL.

S. NO.	ITEM	FINANCIAL PROVISION	EXEPENDI-TURE TILL March, 2002	REMARKS
1	Catchment Area Treatment	Rs 382.05 lakhs	Rs382.05 lakhs	Completed
2	Compensatory afforestation	Rs12.55 lakhs	Rs12.55 lakhs	Completed
	Restoration plan	Rs 95.45 lakhs	Rs 95.45 lakhs	Restoration work stands completed. Maintenance work is continuing.
4	Rehablitation& Ressetlement plan	Rs 300.00 lakhs	Rs 295.00 lakhs	Completed
5.	Augmentation & Maintenance of CAT & Restoration units	Rs 83.38 lakhs	Rs 83.38 lakhs	Completed
	Augmentation & Maintenance of CAT & Restoration units	Rs 26.00 lakhs	Rs 26.00 lakhs	Work under progress.
6.	Casualties under Restoration plan	Rs 17.625 lakhs	17.625 lakhS	Completed
	Total	917.055 Lakhs	912.055 Lakhs	-

Sr. Manager (E)
Uri Power Station

एनएचपीसी लिमिटेड
NHPC Limited
(A Govt. of India Enterprise)

Uri I Power Station,
Gingle, Baramulla (J&K)
Phone: 01956-253211
CIN No.: L4010HR1975GOI032564

NH/UPS/GM – 61/2022-23/ 310 **Dated: 02.03.2023**

Divisional Forest Officer,
Jhelum Valley Division,
Baramulla.

Sub: Catchment Area Treatment Plan of Uri I Stage II HE Project — Approval thereof.
Ref: J-12011/08/2021-IA-I (R) dated 10.06.2021

Sir,

Based on the approved Terms of References issued by MoEF &CC dated 10.06.2022, EIA/EMP report of Uri I Stage II HE project is being prepared by consultant M/s RS Environlink Technologies Pvt Limited Gurugram, Haryana. The consultant is a NABL accredited agency. A copy of the registration certificate is enclosed herewith for reference please. It is to mention here that Uri I Stage II does not involve construction of Dam/intake as the said structure is already established for existing Uri Power Station and the same shall be used for Uri I Stage II HE project. Further, the Reservoir level will be the remain same as that of current FRL (at 1491.0m), hence, no new land will be submerged due to the proposed construction of the project. However, as a part of the process of preparation of EIA/EMP report in respect of Uri I Stage II HE project, Catchment area Treatment Plan amounting to Rs 8.74 crore has been worked out by the consultant based on the various circulars/rates approved by Department of Forests Government of J&K.

In view of the above, kindly find enclosed herewith the Catchment area treatment plan of Uri I Stage II HE project for accord of approval from Competent Authority, so that necessary action in this regard may be initiated by the project accordingly.

Thanking you,

Received Same in original alongwith CAT Plan.
03/3/23

Encl: As Above

Yours Sincerely,

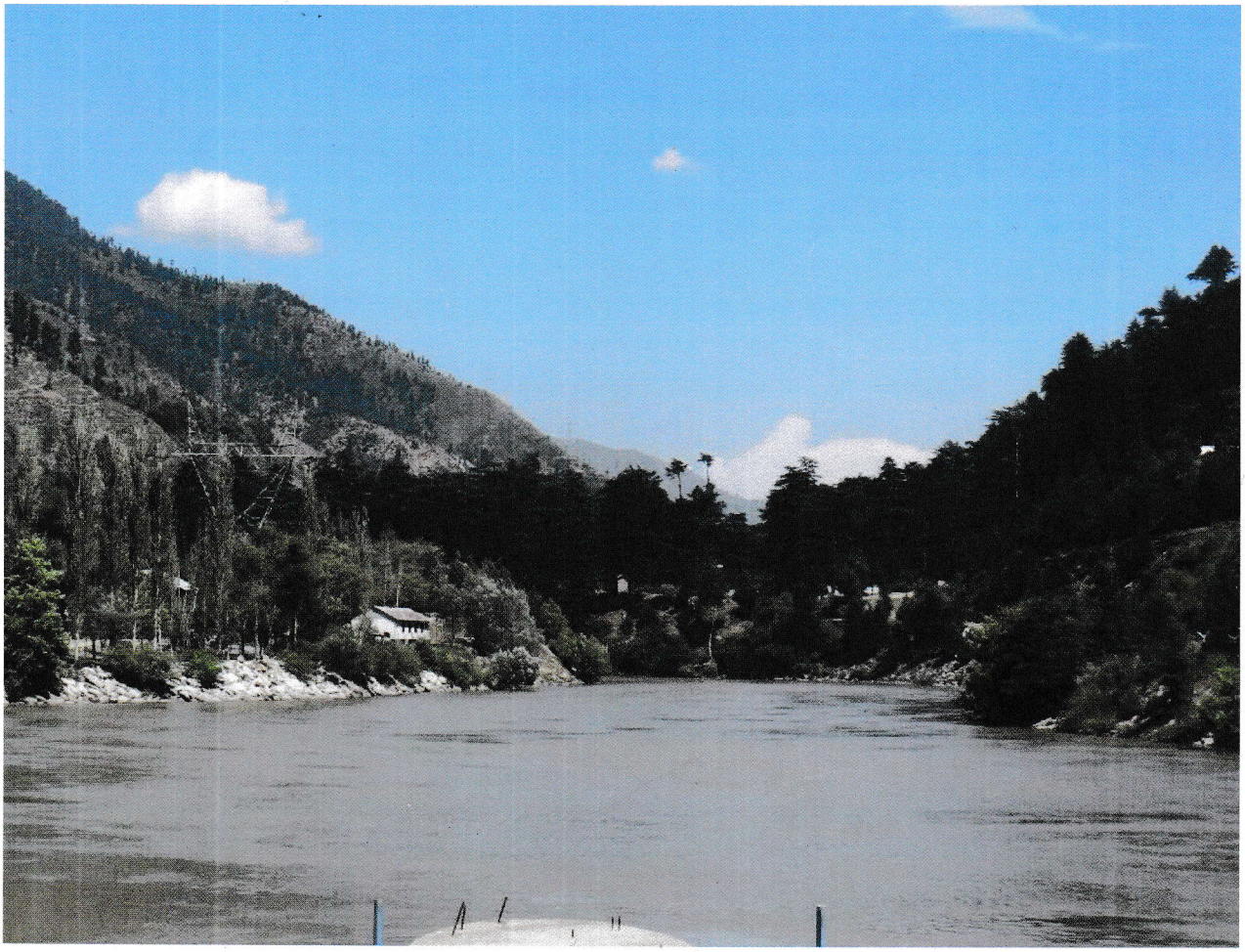
02/03/2023

(Ashok Kumar)
Gr. Sr Manager (E)
Uri I Stage II HE Project.

CATCHMENT AREA TREATMENT PLAN

FOR

URI-I PHASE-II HE PROJECT (240 MW)
DISTRICT BARAMULLA, UT OF J & K



Prepared for:

NHPC LTD
Jammu, J&K

Prepared by:

R S Envirolink Technologies Pvt. Ltd.
Gurugram, Haryana

QCI/NABET/ENV/ACO/23/2669 February 6, 2023

To,

RS Envirolink Technologies Pvt. Ltd.
403, Bestech Chamber Commercial Plaza,
B Block, Sushant Lok I
Gurgaon, Haryana-122009
(**Kind Attention**: Sh. Ravinder PS Bhatia)

Sub.: Extension of Validity of Accreditation till May 5, 2023– regarding
Ref.: 1. Certificate no. NABET/EIA/1922/SA 0144
2. Request e-mail dated February 6, 2023

Dear Sir,

This has reference to the Accreditation of your organization under the QCI-NABET EIA Scheme and a request email dated February 6, 2023, for validity extension. It is to inform your good self that the validity of **RS Envirolink Technologies Pvt. Ltd.** is hereby extended till **May 5, 2023,** or the completion of the accreditation process, whichever is earlier.

2. The above extension is subject to the submission of required documents/information concerning your existing application, timely submission/closure of NC/Obs (if any), and applicable fee (pending if any) during the application process.

3. You are requested not to use this letter after the expiry of the above-stated date.

With best regards.

(A K Jha)
Senior Director
QCI-NABET

Quality Council of India

National Accreditation Board for Education & Training

Certificate of Accreditation

R S Envirolink Technologies Pvt. Ltd

403, Bestech Chamber Commercial Plaza, B Block, Sushant Lok – I, Gurgaon- 122009, Haryana

*The organization is accredited as **Category-A** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3: for preparing EIA-EMP reports in the following Sectors –*

Sl.No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals- opencast only	1	1 (a) (i)	A
2	River Valley projects	3	1 (c)	A
3	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	27	6 (a)	A
4	Jetties only	33	7 (e)	A
5	Highways	34	7 (f)	A

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in SA AC minutes dated July 27, 2021 posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/21/2143 dated November 22, 2021.The accreditation needs to be renewed before the expiry date by R S Envirolink Technologies Pvt. Ltd., Gurgaon following due process of assessment.

Sr. Director, NABET
Dated: November 22, 2021

Certificate No.
NABET/EIA/1922/SA 0144

Valid up to
14.08.2022

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.

Section 10.2 CATCHMENT AREA TREATMENT PLAN

10.2 CATCHMENT AREA TREATMENT PLAN

It is a well-established fact that reservoirs formed by dams on rivers are subjected to sedimentation. The process of sedimentation embodies the sequential processes of erosion, entrainment, transportation, deposition and compaction of sediment. The study of erosion and sediment yield from catchments is of utmost importance as the deposition of sediment in reservoir reduces its capacity, and thus affects the water availability for the designated use. The eroded sediment from catchment when deposited on streambeds and banks causes braiding of river reach. The removal of top fertile soil from catchment adversely affects the agricultural production. Thus, a well-designed Catchment Area Treatment (CAT) Plan is essential to ameliorate the above-mentioned adverse process of soil erosion.

Soil erosion may be defined as the detachment, transportation and deposition of soil particles from one place to other by means of transporting agents like water, air, winds etc. Soil erosion is mainly affected by rainfall intensity, slope gradient, length, soil erodibility and vegetation cover. Therefore, study of erosion and sediment yield from catchment are of great importance. Soil erosion leads to:

- loss in production potential
- reduction in infiltration rates
- reduction in water-holding capacity
- loss of nutrients
- increase in tillage operation costs
- reduction in water supply

The Catchment Area Treatment (CAT) plan highlights the management techniques to control erosion in the catchment area of a water resource project. The life span of a reservoir is greatly reduced due to erosion in the catchment area. Adequate preventive measures are thus needed for the treatment of catchment for its stabilization against future erosion.

In the present study, Catchment Area Treatment Plan has been formulated for the free draining catchment i.e. from the diversion site of upstream Lower Jhelum HEP till the proposed diversion site of Uri-I Phase-II HEP. The total area of the free draining catchment is 135.91 sq km.

The catchment area treatment involves

- Understanding of the erosion characteristics of the terrain and,
- Suggesting remedial measures to reduce the erosion rate.

10.2.1 Steps Involved in CAT Plan Preparation

CAT Plan essentially consist of following steps-

i. Identification of highly erodible areas within catchment by calculation of Silt Yield Index (SYI) and sediment load for sub water sheds using GIS.

ii. Prioritizing the areas for treatment.
iii. Planning of suitable erosion control measures.
iv. Cost of CAT Plan.

10.2.2 River System & Catchment Area

River Jhelum, a major tributary out of five major tributaries viz. Satluj, Beas, Ravi, Chenab and Jhelum which are ultimately merging with river Indus in Pakistan is the west flowing river. The Jhelum is the main waterway of the Kashmir valley. Jhelum river originates from a magnificent spring called “Chashma Verinag”.

The total geographical area of Jhelum basin upto Indo-Pakistan border is about 34,775 sq. km. with a total length of 402 km. But the length of Jhelum in India upto existing ceasefire line is about 165 km. With a catchment area of about 17,622 sq. km. and lies 32°58'42“ to 35°08'02” north latitude and 73°23'32“ to 75°35'57” east longitude and is mainly confined within the Kashmir Valley in India. The river Jhelum runs in the Valley is surrounded by mountain ranges which rises to a height of 5487 m on the north east. Peaks of these mountainous range is mostly covered by snow cover from the month of October to May. The valley is perched at an average elevation of 1829 m above sea level and is approximately 135 km. in length and 32 to 40 km. in breadth. The Kuti and Brahmasakal are the highest peaks at 4675 m. in elevation in the basin.

The topography of this alluvial valley is typical. The river banks as is usual with river running in alluvial plains are higher than the land behind them. The scenario of the valley of Jhelum basin looking downward shows that the main streams and its tributaries flow between high definite banks except small reach where the banks are low, ill-defined and swampy, which causes the floods and loss of property.

The river Jhelum forms by the water of a spring viz. Cheshma Verinag situated at the foot hills accommodating Banihal pass in the south eastern corner of the Kashmir Valley and flows towards west through the Kashmir Valley. In the course upto Anantnag town, 3 major tributaries viz. Sandran river, Bringi river and Arapath joins on its right flank. Lidder, a biggest river of all the effluents that forms the head waters of river Jhelum and is fed by a number of glaciers from the high ranges, joins on its right flank at 2 km. downstream of Khannabal town. River Vishow and Rambiara drains their water on its left flank at 4.82 km. upstream from Sangam town. Between Sangam and Srinagar, Jhelum river receives two small streams viz. Watlara and Arapal on the right flank, and three small streams viz. Rambiara, Sasara, Romuhi on the left flank. Romushi river ordinarily in significant swells up considerably when it is joined by spill from Rambiara river. From Khanabal to Srinagar river Jhelum flows along the right side of the valley abutting close to the hills, in a zig zag manner. As already mentioned the levels of the banks higher than the land on its left, lowest of these forms swamps and are surrounded by cultivable land, when the river is in spate and overtops its banks thus damaging the crops in the cultivable land and causes a drastic damage to crops and property. Just before the river enters the main city of Srinagar which is situated on its banks it is joined near Shergari by a stream which drains from Dal Lake. For the flood protection of main city, there is a supplementary channel with a capacity of 500 cusecs just above Srinagar (near Kursu Padshahi Bagh) which functions only when the river discharge rises above the danger mark.

Below the Srinagar city, the flow of Dudh-ganga combines with the river and down below nallah Sindh merges with it at Shadipora on the right bank. At Banyari 20 km. downstream the river joins with the water of Wullar Lakes and takes off from the lake at its south west corner and flows to the west south west direction through the alluvial plain for a length of 21 km. upto the bridge at Baramulla. At Baramulla the river enters a gorge in the hills. After flowing through this gorge for about 5 km. the fall out channel takes off a sharp bend towards the left. The end of the gorge at Khadanyar is marked by huge rock projecting into the river from the left side. Below Khadanyar river takes a sharp turn rushing over rapids from Wullar Lake to Khadanyar in a stretch of 26 km. number of streams viz. Wingle, Pohru, Vij meet the river. Map showing the drainage network and hydro power projects in the Jhelum basin within Indian Territory is given at **Figure 10.1**.

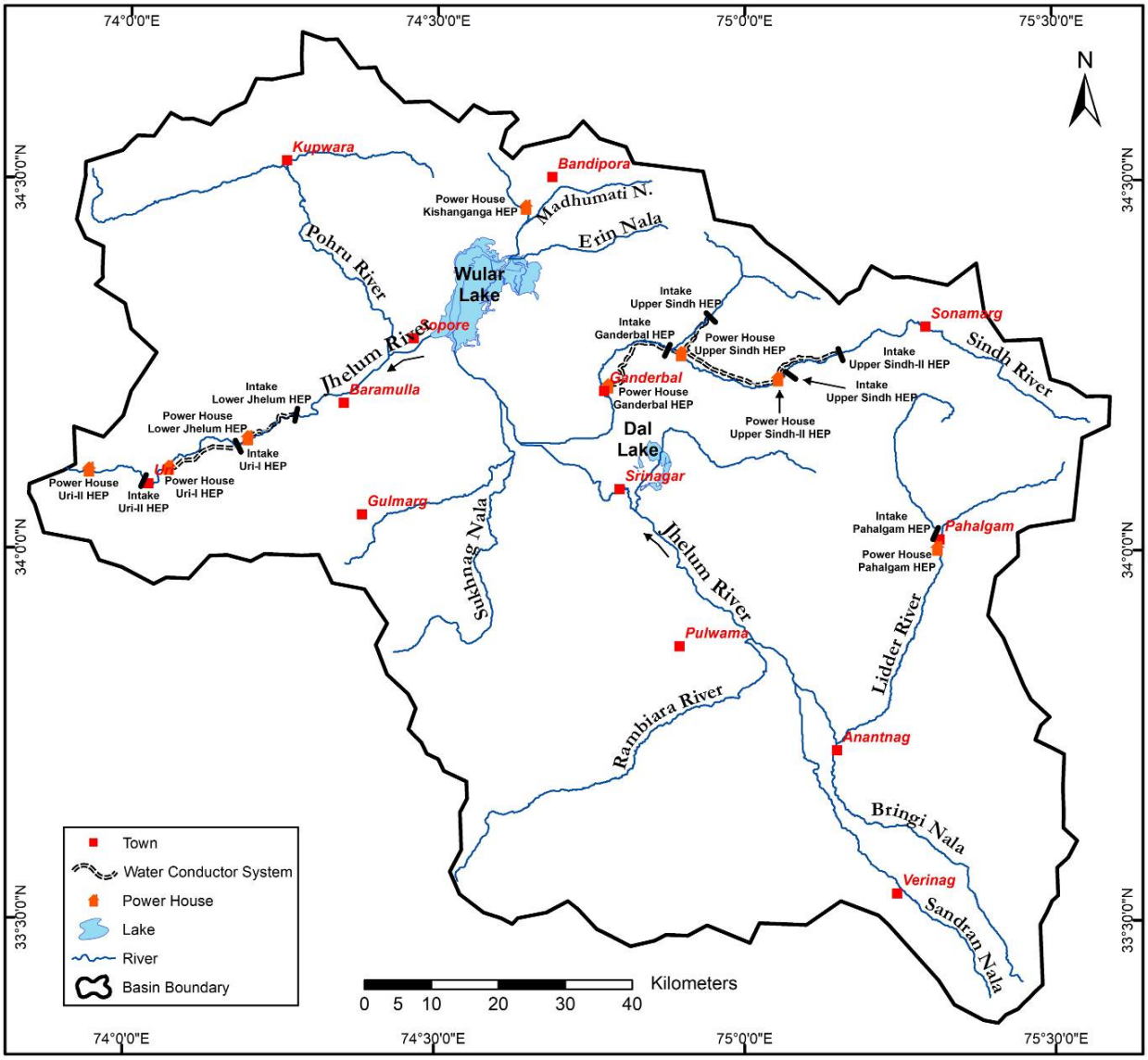


Figure 10.1: Catchment Area Map of Jhelum River within India

10.2.2.1 Free Draining Catchment

Free draining catchment has been delineated as intercepting catchment area falling between diversion site of upstream Lower Jhelum HE Project and diversion site of proposed Uri-I Phase-II HE Project on Jhelum river. Area of the free draining catchment thus delineated is

135.91 sq km. Total length of the Jhelum River in the free draining catchment is about 11 km. Major right bank tributaries of the Jhelum River in the free draining catchment are Brijh Nala, Gori Nala, Katha Nala and Limbar Nala. Major left bank tributary of the Jhelum River in the free draining catchment is Sank Nala. The drainage system of free draining catchment of Uri-I Phase-II HEP is given in **Figure 10.2.**

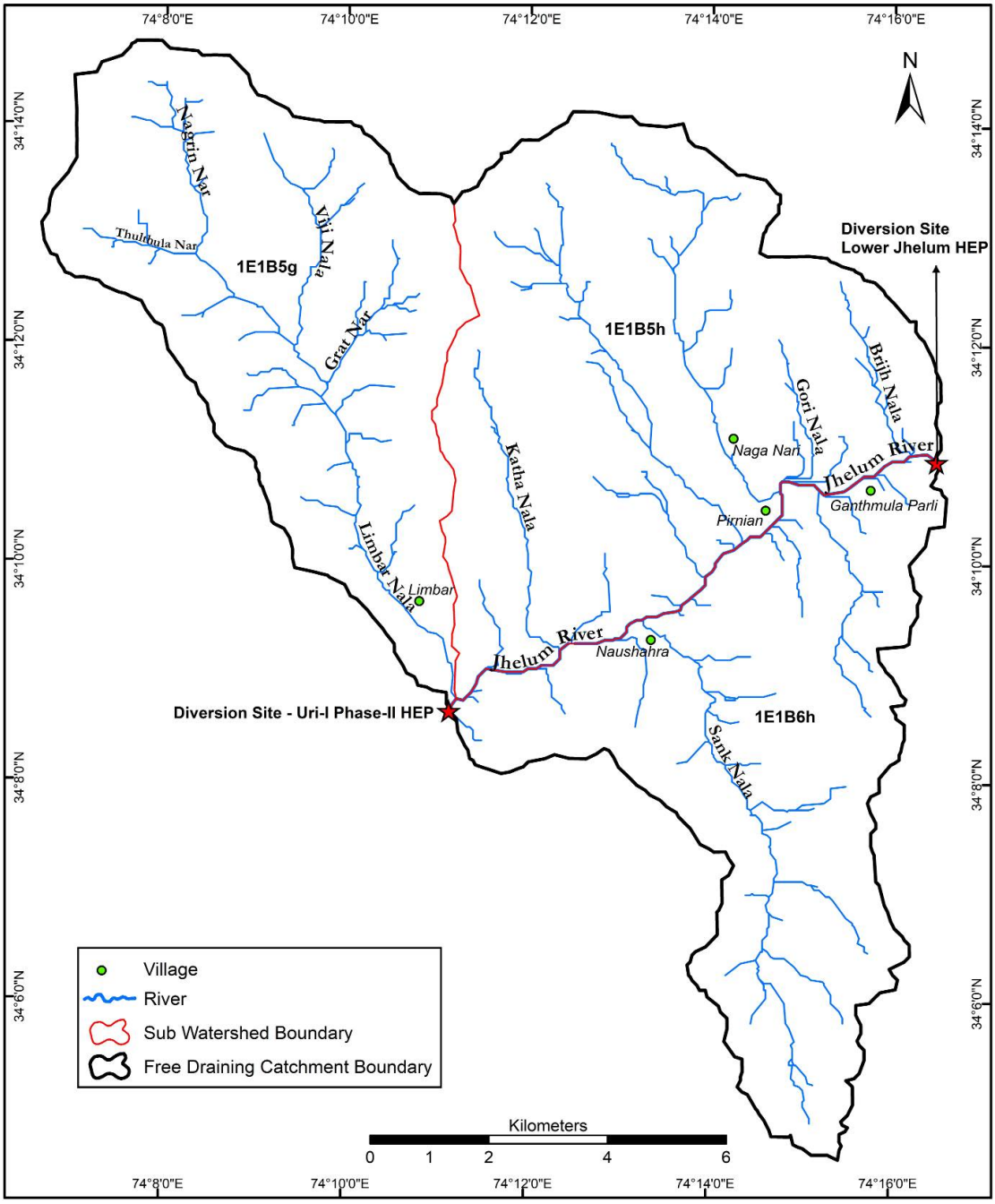


Figure 10.2: Sub-Watershed Map of Uri-I Phase-II HEP Free Draining Catchment Area

10.2.2.2 Delineation of Sub-Watersheds

In order to plan watershed management and to formulate action plans it requires sub-watershed delineation, therefore, free draining catchment area was further delineated into sub-watersheds. For the delineation of sub-watershed, Watershed Atlas of India prepared by Soil and Land Use Survey of India (SLUSI) has been referred.

Soil and Land Use Survey of India (SLUSI) has Watershed Atlas of India under digital environment using GIS and produced a Digital Watershed Atlas (DWA) where the delineation and codification of watersheds in the country has been undertaken in GIS environment. The delineation for DWS has been done in seven stages starting with Water Resource Regions and their subsequent division and subdivisions into Basins, Catchments, Sub-catchments, Watershed, Sub-watershed and Micro-watersheds in decreasing size of the delineated hydrologic unit.

As per Watershed Atlas of India, the free draining catchment area falls in 3 Sub-Watersheds. The nomenclature of Sub-Watersheds has been assigned as follows: Indus Region (coded as 1); Jhelum Basin (coded as 1E); Lower Jhelum Catchment (coded as 1E1); Sub-Catchment (coded as 1E1B); Limbar and Sank Watersheds (coded as 1E1B5 and 1E1B6 respectively) and 3 Sub-Watersheds (coded as 1E1B5g, 1E1B5h and 1E1B6h). The detail of Sub-Watersheds delineated for the free draining catchment area is given below (**Figure 10.2 and Table 10.1**).

Table 10.2: Names and Codes of Sub-watersheds Delineated in the Free Draining Catchment of Uri-I Phase-II HEP

S. No.	Water Resource Region	Basin	Catchment	Sub-Catchment	Watershed	Sub-Watershed	Sub-Watershed Area (sq km)
1.	Indus (1)	Jhelum (1E)	Lower Jhelum (1E1)	1E1B	1E1B5 (Limbar)	1E1B5g	41.83
2.						1E1B5h	52.92
3.					1E1B6 (Sank)	1E1B6h	41.16
TOTAL							**135.91**

10.2.3 Approach for the Study

A detailed database on natural resources, terrain conditions, soil type of the catchment area, socio-economic status, etc. is a pre-requisite to prepare treatment plan keeping in view the concept of sustainable development. Various thematic maps have been used in preparation of the CAT plan. Geographic Information System (GIS) is a computerized resource data base system, which is used to store, analyze and display various spatial data. GIS has a capacity to perform numerous functions and operations on the various spatial data because of its special hardware and software characteristics. In order to ensure that latest and accurate data is used for the analysis, satellite data has been used for deriving land use data. Ground truth studies, too, have been conducted. The various steps, covered in the study, are as follows:

- Definition of the problem
- Definition of data requirement
- Data acquisition and preparation
- Modeling
- Output presentation

The above mentioned steps are briefly described in the following paragraphs:

10.2.3.1 Definition of the Problem

The requirements of the study were defined, and the expected outputs were finalized. The

various data layers of the catchment area to be used for the study are as follows:

- Study Area Map.
- Slope Map.
- Soil Map.
- Land use Classification Map.
- Rainfall Intensity.

10.2.3.2 Data Acquisition and Preparation

The data available from various sources has been collected. The ground maps, contour information, etc. were scanned, digitized and registered as per the requirement. Data was prepared depending on the level of accuracy required and any corrections required were made. All the layers were geo-referenced and brought to a common scale (real co-ordinates), so that overlay could be performed. A computer program using standard modeling techniques was used to estimate the soil loss. The formats of outputs from each layer were formed to match the formats of inputs in the program. Ground truthing and data collection was also included in the procedure.

10.2.3.3 Land Use/ Land Cover

For the preparation of land use/ land cover map of the study area, land use/land cover map derived from Sentinel-2 imagery at 10m resolution and produced by Impact Observatory, Microsoft, and Esri have been used. The data was procured in geo-referenced digital format and was processed in GIS environment to extract the mask for the study area. The data was further refined using information from False Colour Composite (FCC) generated using bands 8, 4 and 3 of Sentinel-2 digital satellite data of Tile T43SDT dated 24th June 2022; land use/ land cover map prepared by National Remote Sensing Centre (NRSC), Indian Space Research Organisation (ISRO) of Dept. of Space, Govt. of India with Ecology, Environment & Remote Sensing, Govt. of J&K as partner under Natural Resource Census (NRC) project of National Natural Resource Repository (NRR) programme; ground truth collected during field surveys and latest imagery of the study area on Google Earth Pro. The classified land use map of the free draining catchment area, considered for the study, is shown as **Figure 10.3**. The land use pattern of the free draining catchment area as well as of sub-watersheds is summarized in **Table 10.3**. The land use/ land cover map of the free draining catchment of Uri-I Phase-II HE Project was classified into six classes. Out of these six classes, area under tree cover is the highest, while area under barren land is least.

A brief description of the land use/ land cover classes is as below:

Tree Cover: Any significant clustering of tall (~15 feet or higher) dense vegetation, typically with a closed or dense canopy; examples: wooded vegetation, clusters of dense tall vegetation within savannas, plantations, swamp or mangroves (dense/tall vegetation with ephemeral water or canopy too thick to detect water underneath).

Rangeland: Open areas covered in homogenous grasses with little to no taller vegetation; wild cereals and grasses with no obvious human plotting (i.e., not a plotted field); examples: natural meadows and fields with sparse to no tree cover, open savanna with few to no trees, parks/golf courses/lawns, pastures. Mix of small clusters of plants or single plants dispersed

on a landscape that shows exposed soil or rock; scrub-filled clearings within dense forests that are clearly not taller than trees; examples: moderate to sparse cover of bushes, shrubs and tufts of grass, savannas with very sparse grasses, trees or other plants.

Barren Land: Areas of rock or soil with very sparse to no vegetation for the entire year; large areas of sand and deserts with no to little vegetation; examples: exposed rock or soil, desert and sand dunes, dry salt flats/pans, dried lake beds, mines.

Builtup Area/ Crop Land: Human made structures; major road and rail networks; large homogenous impervious surfaces including parking structures, office buildings and residential housing; examples: houses, dense villages / towns / cities, paved roads, asphalt. Human planted/plotted cereals, grasses, and crops not at tree height; examples: corn, wheat, soy, fallow plots of structured land.

Snow Cover: Large homogenous areas of permanent snow or ice, typically only in mountain areas or highest latitudes; examples: glaciers, permanent snowpack, snow fields.

Waterbody: Areas where water was predominantly present throughout the year; may not cover areas with sporadic or ephemeral water; contains little to no sparse vegetation, no rock outcrop nor built up features like docks; examples: rivers, ponds, lakes, oceans, flooded salt plains.

Table 10.3: Land Use/ Land Cover Classification for Uri-I Phase-II HEP Free Draining Catchment Area

Landuse/ Landcover Class	Sub-Watersheds						Total	
	1E1B5g		1E1B5h		1E1B6h			
	Area (sq km)	Area (%)	Area (sq km)	Area (%)	Area (sq km)	Area (%)	Area (sq km)	Area (%)
Tree Cover	26.57	63.53	23.80	44.97	34.09	82.83	**84.47**	**62.15**
Range Land	11.88	28.41	21.78	41.15	3.08	7.49	**36.74**	**27.03**
Barren Land	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.00**
Builtup Area/ Crop Land	0.45	1.07	6.41	12.10	3.23	7.86	**10.09**	**7.42**
Snow Cover	2.91	6.96	0.02	0.04	0.00	0.00	**2.94**	**2.16**
Waterbody	0.01	0.02	0.92	1.74	0.75	1.81	**1.67**	**1.23**
Total	**41.83**	**100**	**52.93**	**100**	**41.16**	**100**	**135.91**	**100**

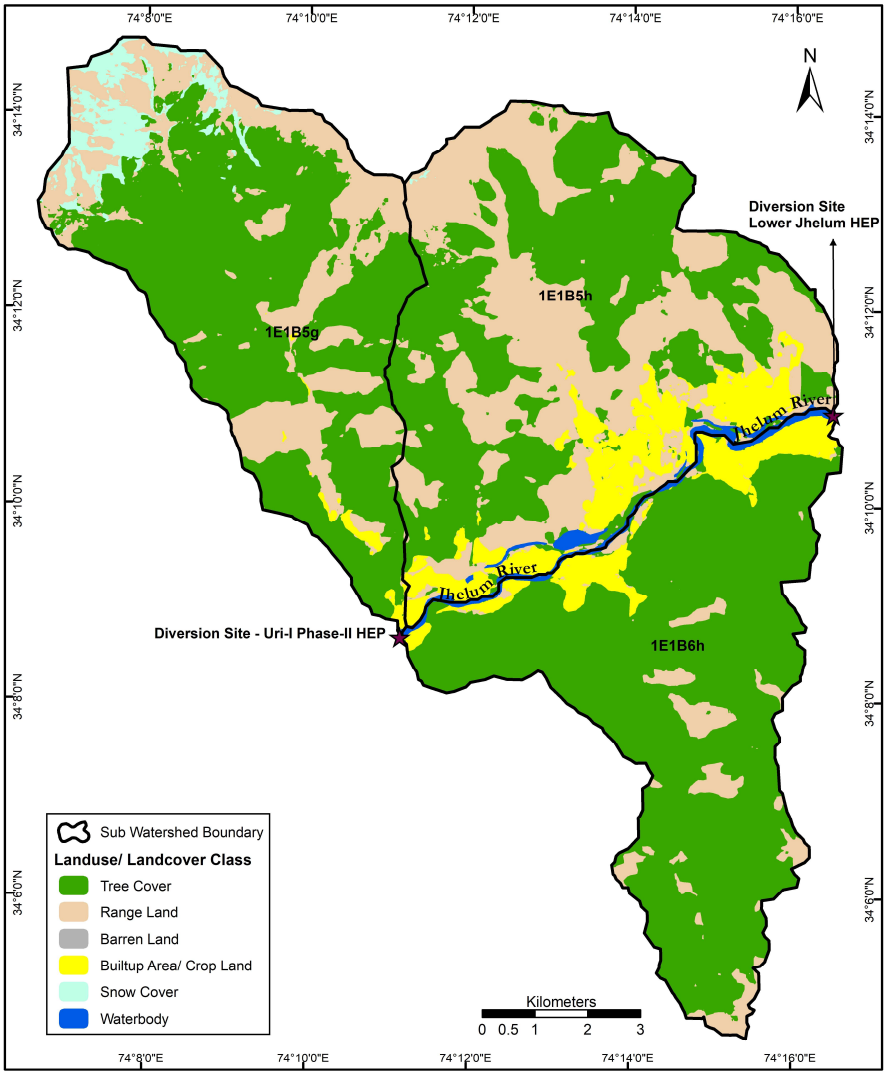


Figure 10.3: Land Use/ Land Cover Map of Uri-I Phase-II HEP Free Draining Catchment Area

10.2.3.4 Slope

Shuttle Radar Topography Mission (SRTM) 3 Arc-Second Global Digital Terrain Elevation Data (DTED) data was used for preparation of slope map. The data was downloaded in GeoTIFF format and using ArcGIS software a slope (in degrees) map was prepared. The degree slope was divided into different slope classes as per SLUSI. The areas falling under various slope categories in the Uri-I Phase-II HEP free draining catchment and Sub-Watersheds have been tabulated below in **Table 10.4**. The slope map is shown as **Figure 10.4**. As seen from the table (**highlighted cells**) and map majority of the area falls under two slope categories i.e. Moderately Steep and Steep.

Table 10.4: Areas Falling Under Different Slope Categories

Slope Categories (Slope in Degrees)	Sub-Watersheds						Total	
	1E1B5g		1E1B5h		1E1B6h			
	Area (sq km)	Area (%)	Area (sq km)	Area (%)	Area (sq km)	Area (%)	Area (sq km)	Area (%)
Gently Sloping (Up to 2°)	0.06	0.13	0.62	1.17	0.55	1.34	**1.22**	**0.90**
Moderately Sloping (2°- 8°)	0.50	1.20	4.37	8.25	2.27	5.52	**7.14**	**5.25**
Strongly Sloping (8°- 15°)	1.44	3.45	7.37	13.92	4.03	9.80	**12.84**	**9.45**
Moderately Steep (15°- 30°)	12.41	29.66	19.17	36.21	17.27	41.96	**48.84**	**35.93**

Slope Categories (Slope in Degrees)	Sub-Watersheds						Total	
	1E1B5g		1E1B5h		1E1B6h			
	Area (sq km)	Area (%)	Area (sq km)	Area (%)	Area (sq km)	Area (%)	Area (sq km)	Area (%)
Steep (30°- 45°)	23.54	56.28	18.84	35.60	15.12	36.74	**57.50**	**42.31**
Very Steep (45°- 60°)	3.84	9.18	2.51	4.74	1.89	4.58	**8.23**	**6.06**
Extremely Steep (60°- 70°)	0.04	0.09	0.06	0.11	0.03	0.06	**0.13**	**0.09**
Escarpments (Above 70°)	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.00**
Total	**41.83**	**100**	**52.93**	**100**	**41.16**	**100**	**135.91**	**100**

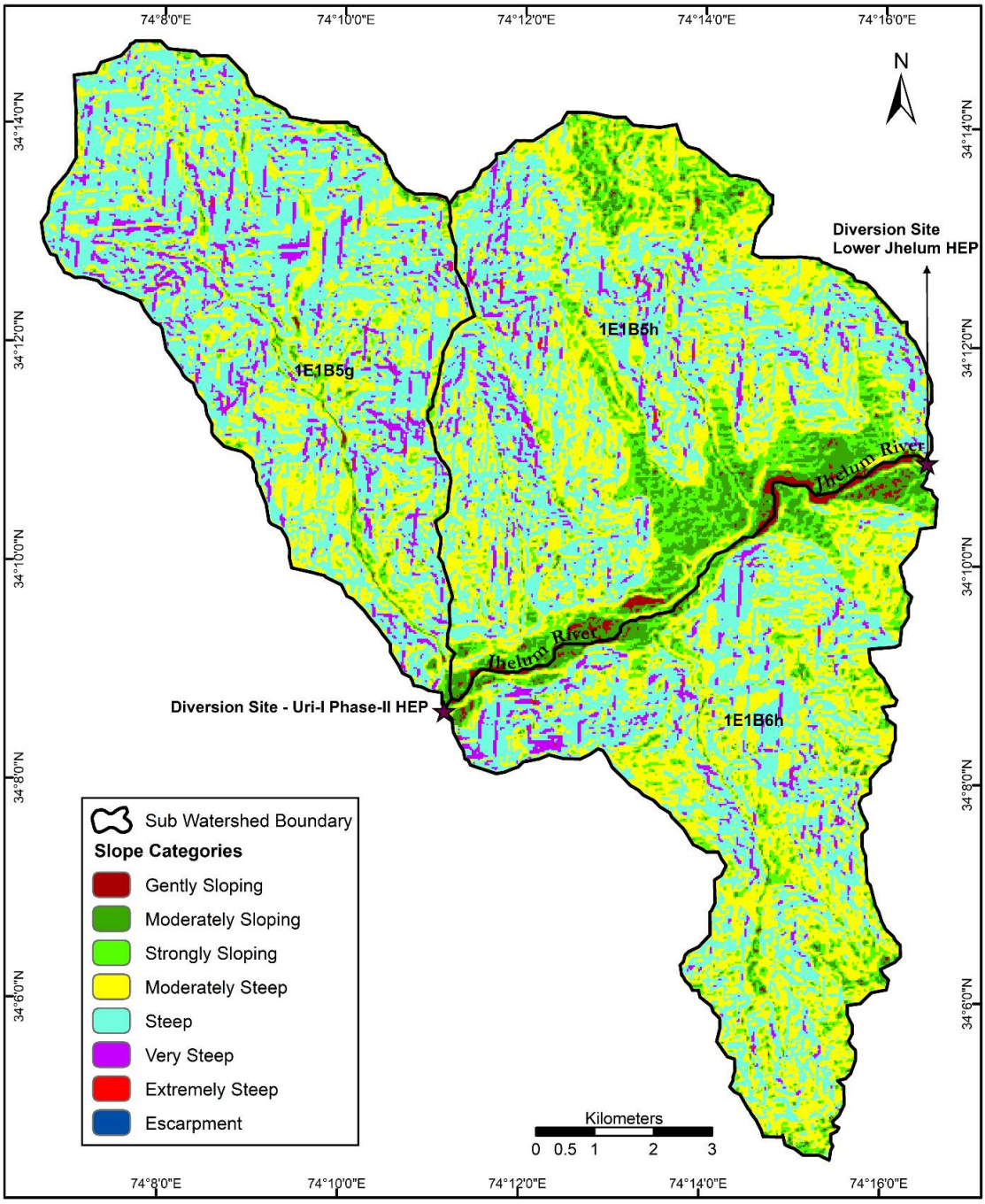


Figure 10.4: Slope Map of Uri-I Phase-II HEP Free Draining Catchment Area

10.2.3.5 Soil

Soil map has been digitized and produced using soil maps collected from National Bureau of Soil Survey & Land Use Planning, Regional Centre, New Delhi. Various layers, thus prepared, were used for modeling. Soil map has been shown in **Figure 10.5.** The legend for soil classes has been given in **Table 10.5.** As can be seen from the soil map and area under different soil units, maximum percentage area is covered soil unit 37. Majority of the soil type of the free draining catchment area is Shallow, somewhat excessively drained, mesic, loamy-skeletal soils on steep slopes with loamy surface, severe erosion and strong stoniness.

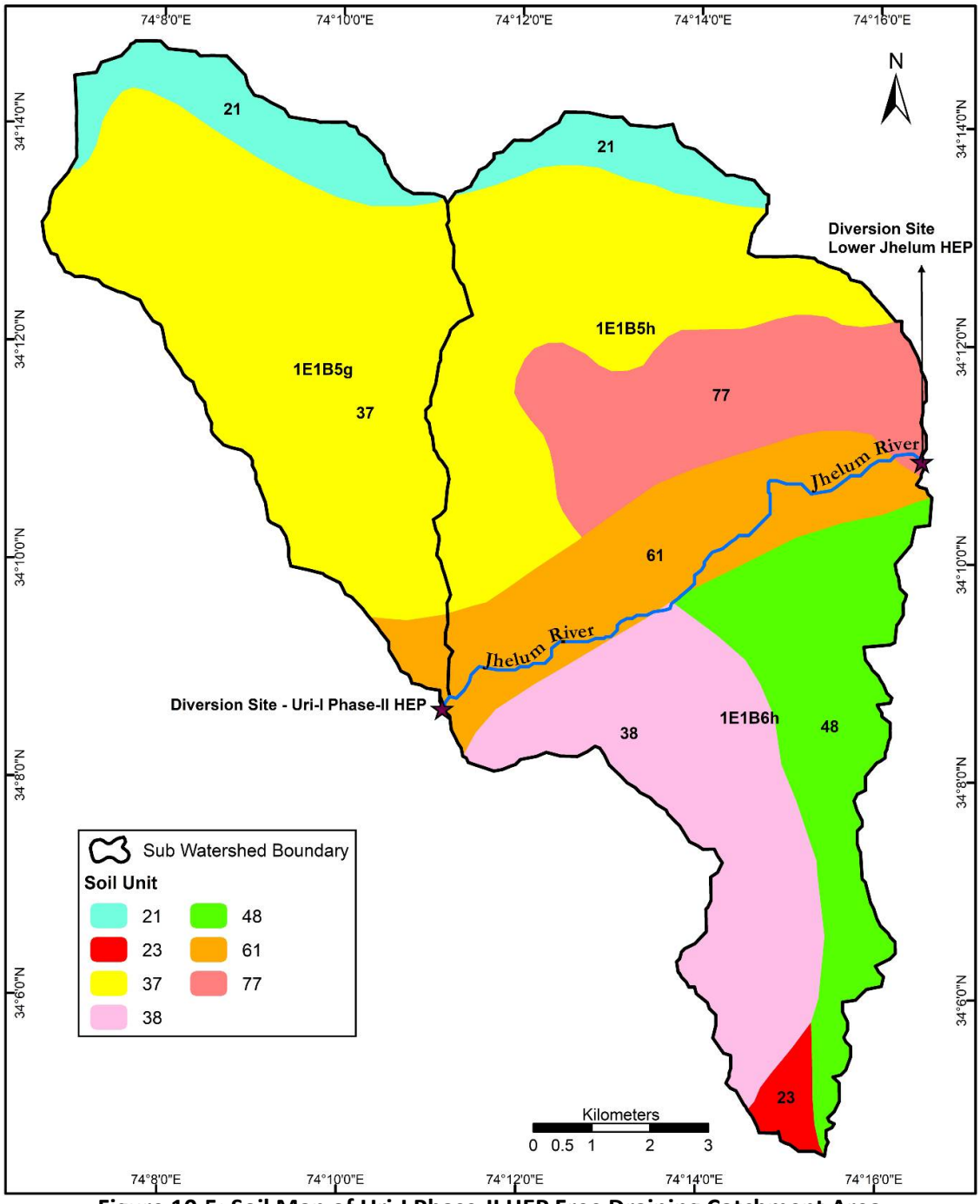


Figure 10.5: Soil Map of Uri-I Phase-II HEP Free Draining Catchment Area (For details of Soil Unit legend refer Table 4)

Table 10.5: Soil Classes of Uri-I Phase-II HEP Free Draining Catchment Area

Soil Unit	Soil Type		Area (sq km)	Area (%)
21	Dominantly rock landscape; *associated with*: Very shallow, excessively drained, fragmental soils on very steep slopes with loamy surface, very sever erosion and strong stoniness.	Lithic Cryorthents	9.67	7.11
23	Dominantly very shallow, excessively drained, fragmental soils occurring on very steep slopes with loamy surface, very severe erosion and strong stoniness; *associated with*: Rocky outcrops	Lithic Cryorthents	1.45	1.07
37	Shallow, somewhat excessively drained, mesic, loamy-skeletal soils on steep slopes with loamy surface, severe erosion and strong stoniness; *associated with:* Medium deep, somewhat excessively drained, mesic, loamy-skeletal soils on moderately steep soils with loamy-surface, severe erosion and strong stoniness.	Lithic Udorthents Typic Udorthents	58.33	42.91
38	Shallow, somewhat excessively drained, mesic, loamy-skeletal soils on moderately steep slopes with loamy surface, severe erosion and moderate stoniness; *associated with:* Medium deep, well drained, mesic, loamy-skeletal soils on moderately steep slopes with loamy surface, severe erosion and slight stoniness.	Lithic Udorthents Typic Udorthents	19.95	14.68
48	Medium deep, moderately well drained, mesic, fine-loamy soils on steep slopes with loamy surface and severe erosion; *associated with:* Deep, somewhat excessively drained, fine soils on steep slopes with loamy surface, severe erosion and slight stoniness.	Fluventic Eutrochrepts Dystric Eutrochrepts	15.52	11.42
61	Medium deep, well drained, loamy-skeletal soils on moderate slopes with loamy surface, severe erosion and strong stoniness; *associated with*: Medium deep, well drained, fine-loamy soils with loamy surface, moderate erosion and moderate stoniness.	Typic Udorthents Dystric Eutrochrepts	15.96	11.74
77	Deep, moderately well drained, fine-loamy soils on very gentle slopes with loamy surface and slight erosion; *associated with*: Medium deep, moderately well drained, calcareous, fine-loamy soils on moderate slopes with loamy surface and moderate erosion.	Dystric Eutrochrepts Typic Eutrochrepts	15.05	11.07
	TOTAL		**135.91**	**100**

10.2.3.6 Modeling

Soil loss has been calculated through RUSLE (Revised Universal Soil Loss Equation) model which is computed by the following equation:

Soil Loss (A) = R*K*LS*C*P

Wherein;

A = Soil loss (Tons/ha/year)

R is Rainfall & Runoff Erosivity Factor (MJ mm/ha-1/h-1/year-1), which depends upon the annual average rainfall in mm. Data required for R factor is rainfall intensity.

K is Soil Erodibility Factor (Tons/ha/h/ha-1/MJ-1/mm-1), which depends on the organic matter, texture permeability and profile structure of the soil. Also, it is a constant value for each soil type. Data required for K factor is soil type.

LS is Topographic Factor (dimensionless) which depends upon flow accumulation and steepness and length of slope in the area. Data required for LS factor is slope length and slope gradient.

C = Vegetation Cover and Crop Management Factor (dimensionless), which is the ratio of bare soil to vegetation and non- photosynthetic material. It is a constant value for each land use category. Data required for C factor is land use/ land cover.

P is Conservation Supporting Practice Factor (dimensionless), which takes into account specific erosion control practices like contour bunding, bench terracing etc.

10.2.3.7 Soil Erosion Intensity

A thematic map for soil loss of the free draining catchment area has been prepared using RUSLE model mentioned in the above section. The free draining catchment area was then demarcated into different soil erosion intensity mapping units or classes based upon the extent of soil loss (see **Table 10.6 & Figure 10.6**). The free draining catchment area under different Erosion Intensity categories is given in **Table 10.6.** As can be seen from the figure and table, around 30% of the free draining catchment is prone to less than 1 tons/ha/annum soil erosion, i.e. under negligible erosion intensity category. 9.32% of its area is prone to Severe and Very Severe soil erosion.

Table 10.6: Sub-Watershed Wise Area Under Each Soil Erosion Category

S. No.	Erosion Intensity Category (Soil Loss in tons/hectare/annum)	Sub-Watersheds						Total	
		1E1B5g		1E1B5h		1E1B6h			
		Area (ha)	Area (%)	Area (ha)	Area (%)	Area (ha)	Area (%)	Area (ha)	Area (%)
1	Negligible (<1)	1241.12	29.67	1611.21	30.44	1202.23	29.21	4054.56	29.83
2	Slight (1-5)	114.71	2.74	779.89	14.73	334.63	8.13	1229.23	9.04
3	Very Low (5-10)	543.86	13.00	786.11	14.85	891.22	21.65	2221.18	16.34
4	Low (10-20)	1003.97	24.00	945.14	17.86	1001.89	24.34	2951.00	21.71
5	Moderate (20-40)	728.93	17.43	673.71	12.73	465.61	11.31	1868.25	13.75
6	Severe (40-80)	385.27	9.21	348.25	6.58	162.53	3.95	896.05	6.59
7	Very Severe (>80)	164.93	3.94	148.55	2.81	57.70	1.40	371.19	2.73
	Total	**4182.79**	**100**	**5292.86**	**100**	**4115.82**	**100**	**13591.46**	**100**

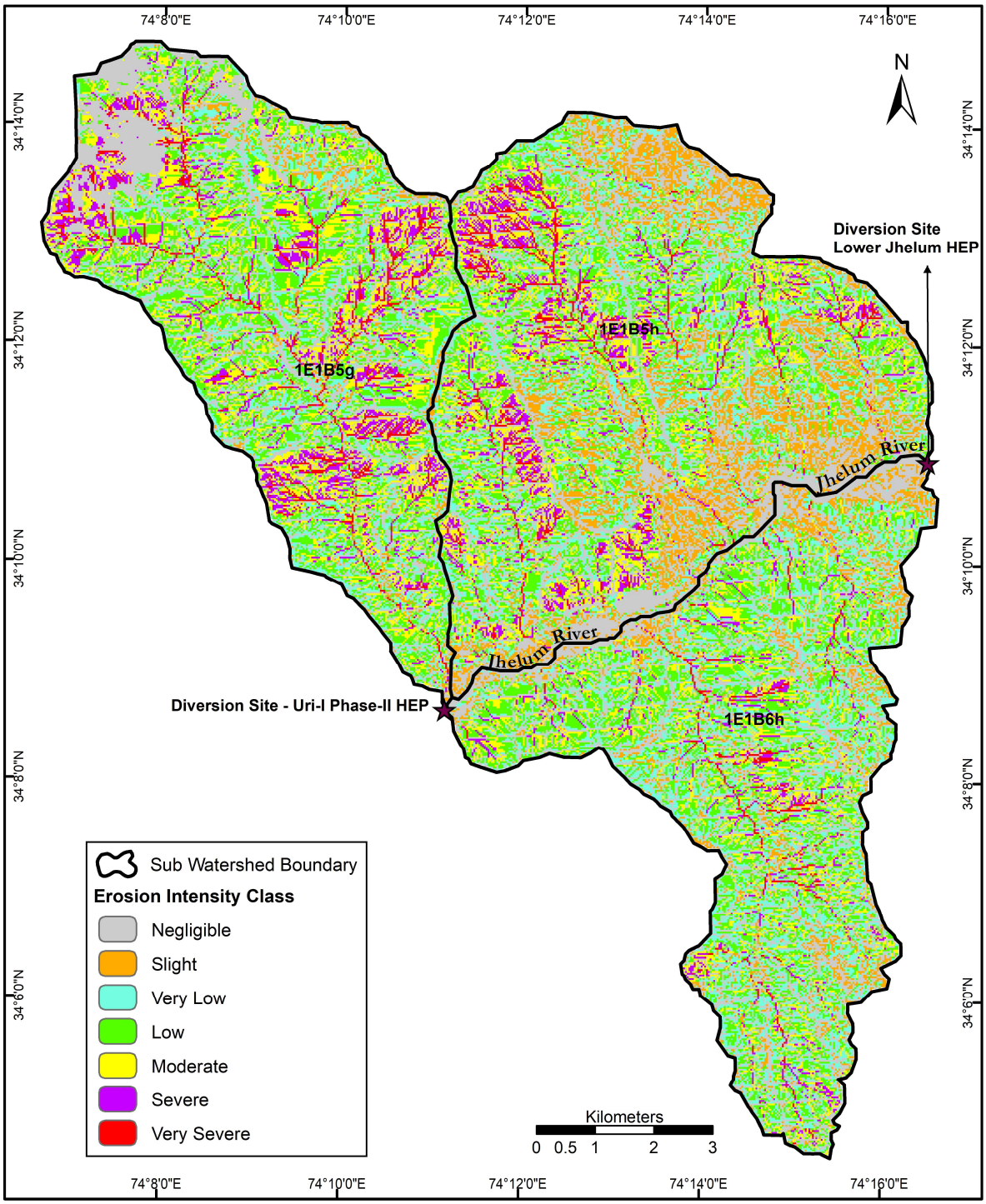


Figure 10.6: Soil Erosion Intensity Map of Uri-I Phase-II HEP Free Draining Catchment Area

10.2.4 PRIORTISATION OF SUB-WATERSHEDS USING SILT YIELD INDEX (SYI) METHOD

`Silt Yield Index' (SYI), method has been used for prioritization of sub-watersheds in the catchment for treatment. The Silt Yield Index Model (SYI) considers sedimentation as product of erosivity, morphometry and delivery ratio of a particular sub-watershed and was conceptualized by Soil and Land Use Survey of India (SLUSI) as early as 1969 and has been operational since then to meet the requirements of prioritization of smaller hydrologic units within river valley project catchment areas.

Different Erosion Intensity classes are demarcated and defined as per the soil erosion intensity maps prepared above. Various categories, such as Very Severe, Severe, Moderate, Slight, Negligible and Nil were then used to calculate sub-watershed-wise SYI.

The Silt Yield Index (SYI) is defined as the Yield per unit area and SYI value for hydrologic unit is obtained by taking the weighted arithmetic mean over the entire area of the hydrologic unit by using suitable empirical equation.

The prioritization of smaller hydrologic units within the vast catchments is based on the Silt Yield Indices (SYI) of the smaller units. The boundary values or range of SYI values for different priority categories are arrived at by studying the frequency distribution of SYI values and locating the suitable breaking points. The watersheds/ sub-watersheds are subsequently rated into various categories corresponding to their respective SYI values.

The application of SYI model for prioritization of sub-watersheds in the catchment areas involves the evaluation of:

a) Climatic factors comprising total precipitation, its frequency and intensity,
b) Geo-morphic factors comprising land forms, physiography, slope and drainage characteristics,
c) Surface cover factors governing the flow hydraulics and
d) Management factors.

The data on climatic factors can be obtained for different locations in the catchment area from the meteorological stations whereas the field investigations are required for estimating the other attributes.

The various steps involved in the application of model are:

- Preparation of a framework of sub-watersheds through systematic delineation
- Rapid reconnaissance surveys on 1:50,000 scale leading to the generation of a map indicating erosion-intensity mapping units.
- Assignment of weightage values to various mapping units based on relative silt-yield potential.
- Computing Silt Yield Index for individual watersheds/sub-watersheds.
- Grading of watersheds/sub-watersheds into very high, high, medium, low and very low priority categories.

The area of each of the mapping units is computed and silt yield indices of individual sub-watersheds are calculated using the equations mentioned above.

10.2.4.1 Silt Yield Index

To calculate silt yield index, the methodology developed by Soil & Land Use Survey (Department of Agriculture, Govt. of India) has been followed, where each erosion intensity unit is assigned a weightage value. When considered collectively, the weightage value represents approximately the comparative erosion intensity. A basic factor of K = 10 was used in determining the weightage values. The value of 10 indicates a static condition of

equilibrium between erosion and deposition. Any addition to the factor K (10+X) is suggestive of erosion in ascending order whereas subtraction, i.e. (10-X) is indicative of deposition possibilities.

Delivery ratios were adjusted for each of the erosion intensity unit. The delivery ratio suggests the percentage of eroded material that finally finds entry into reservoir or river/ stream. Area of each composite unit in each sub-watershed was then estimated. Silt yield index (SYI) was calculated using following empirical formula:

$$SYI = \frac{\sum (Ai * Wi) * Di * 100}{Aw}; \quad \text{where } i = 1 \text{ to } n$$

where,

Ai = Area of i^{th} unit (EIMU)
Wi = Weightage value of i^{th} mapping unit
n = No. of mapping units
Aw = Total area of sub-watershed.
Di = Delivery ratio

Delivery ratios are assigned to all erosion intensity units depending upon their distance from the nearest stream. The criteria adopted for assigning the delivery ratio are as follows:

Nearest Stream	Delivery ratio
0 - 0.9 km	1.00
1.0 - 2.0 km	0.95
2.1 - 5.0 km	0.90
5.1 - 15.0 km	0.80
15.1 - 30.0 km	0.70

Weightage values are assigned to the erosion intensity unit depending upon the soil erosion intensity and delivery ratio in a sub-watershed. Higher the soil erosion intensity and delivery ratio in the sub-watershed higher is the weightage value assigned to the erosion mapping unit. The weightage value assigned to erosion mapping unit in a sub-watershed ranges from 11-20. The SYI values for classification of various categories of priority are given in **Table 10.7**.

Table 10.7: Criteria for Priority Categories

Priority categories	SYI Values
Very high	> 1300
High	1200-1299
Medium	1100-1199
Low	1000-1099
Very Low	<1000

The objective of the SYI method is to prioritize sub-watershed in a catchment area for treatment. The sub-watersheds with very high and high priority category in the catchment are required to be treated on priority basis; however, the area under severe and very severe soil erosion category in all the sub-watersheds would be taken up for treatment measures. Thus, the prioritization will help in understanding which sub-watershed to be taken for priority during the 14 years CAT plan comprising of 2 years of implementation and 10 years of maintenance.

Hence, under the present CAT plan implementation, the sub-watersheds would be treated as per the priority defined in **Table 10.8** i.e. the sub-watershed falling in the high priority category would be taken up in the second year and sub-watershed falling in the medium priority category would be taken up in the third year (**Figure 10.7**).

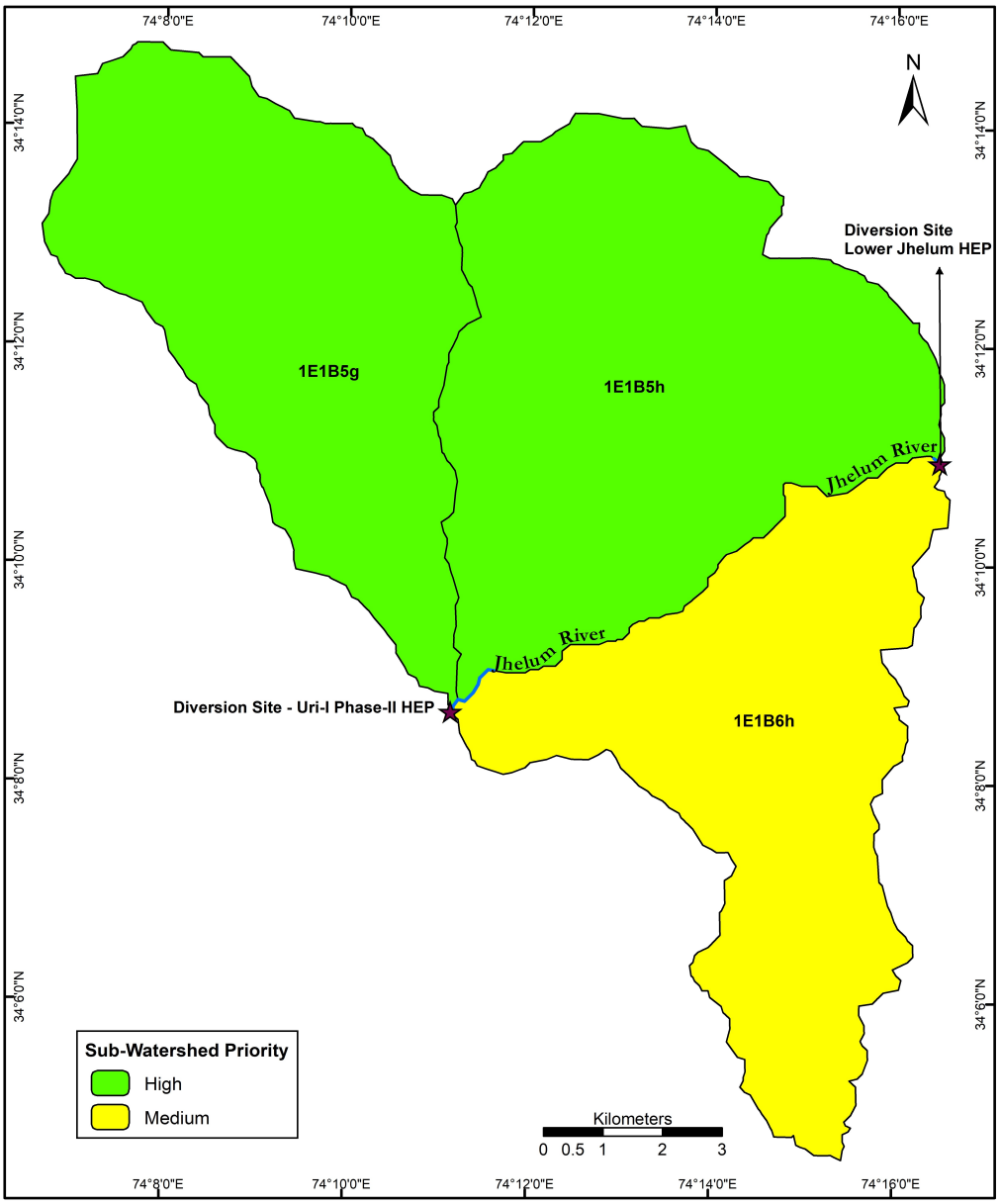


Figure 10.7: Sub-Watershed Prioritization of Uri-I Phase-II HEP Free Draining Catchment Area

Table 10.8: Prioritization of Sub-Watershed Falling in Free Draining Catchment Area of Uri-I Phase-II HEP

Sub-Watershed	EIMU Area (ha)	SYI	Priority Number
High Priority (1200-1299)			
1E1B5g	4182.79	1264	1
1E1B5h	5292.86	1214	1
Medium Priority (1100-1199)			
1E1B6h	4115.82	1196	2

10.2.4.2 Treatable Area

The sub-watershed wise treatable area was calculated in three steps, viz. i) assessment of area under severe and very severe erosion categories **(Table 10.9)**; ii) assessment of area under severe and very severe erosion categories falling in the different land use/ land cover classes **(Table 10.10)**; and iii) finally, area under severe and very severe erosion categories which falls under tree cover, range land and barren land is considered as area available for treatment (**highlighted cells in Table 10.10**). Therefore, under the Catchment Area Treatment plan an area of 1242.40 ha will be taken up for treatment.

Table 10.9: Sub-watershed wise area under Severe and Very Severe Erosion Category

S. No.	Sub-Watershed	Severe (ha)	Very Severe (ha)	Total (ha)
1	1E1B5g	385.27	164.93	**550.20**
2	1E1B5h	348.25	148.55	**496.80**
3	1E1B6h	162.53	57.70	**220.23**
	Total	**896.05**	**371.18**	**1267.24**

Table 10.10: Sub-watershed wise area under Severe and Very Severe Erosion Category under different Land use/ Land cover Categories

Land use/ Land cover Class	Sub-Watershed Wise Area under Severe and Very Severe Erosion Category			
	1E1B5g	1E1B5h	1E1B6h	Total
	Area (ha)	Area (ha)	Area (ha)	Area (ha)
Tree Cover	164.59	93.88	150.73	409.20
Range Land	376.19	395.02	61.93	833.15
Barren Land	0.00	0.00	0.06	0.06
Builtup Area/ Crop Land	2.85	7.74	7.43	18.01
Snow Cover	6.58	0.00	0.00	6.58
Waterbody	0.00	0.16	0.08	0.24
Total	**550.20**	**496.80**	**220.23**	**1267.24**

10.2.5 WATERSHED MANAGEMENT – AVAILABLE TECHNIQUES

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 & utilize runoff for useful purpose.

Following Engineering and Biological measures shall be suggested for the catchment area treatment depending upon the requirement and suitability:

10.2.5.1 Biological Measures

The biological measures will be undertaken under four different schemes as detailed below to make them specific to the needs of the areas being treated. The estimate for each of the four schemes has been prepared based on the Forest Schedule of Rates notified by Circular No. 06 of 2022 dated 18.05.2022 issued by the Office of the Pr. Chief Conservator of Forests & HoFF, Govt. of J&K, refer (**Annexure IV**).

- Normal Afforestation
- Enrichment
- Pasture development
- Assisted Natural Regeneration
-

Supplemented by

- Plant Production
- Maintenance of PB raised conifer saplings in nurseries
- Maintenance of NR saplings in nurseries
- Engagement of Labours as Watch and Ward

a. Normal Afforestation

A well-stocked forest plays a very important in control of soil erosion. Thus, it is proposed to increase the vegetal cover in the area. For this purpose, barren areas, devoid of tree growth have been recommended to be brought under afforestation. This will include raising of multi-tier mixed vegetation of suitable local species on steep and sensitive catchment areas of rivers/streams with the objective of keeping such areas under permanent vegetative cover. 1100 plants per ha are proposed to be planted under this scheme. 4 strands barbed wire square PCC fence post have been proposed to safeguard the plantation sites. The cost for afforestation excluding plant production cost and including Rs. 22,265/- for maintenance for a period of 10 years has been taken as Rs. 91,755/- per ha. Detailed estimate prepared for the scheme is given as **Annexure V**. The area to be brought under afforestation programme in different sub-watersheds is given at **Table 10.11**.

b. Enrichment

In areas where natural trees exist but are depleted due to excessive pressure of local population for timber, fuelwood and fodder are to be undertaken under enrichment. 800 plants per ha are proposed to be planted under this scheme. 4 strands barbed wire square PCC fence post have been proposed to safeguard the plantation sites. The cost for enrichment excluding plant production cost and including Rs. 16,000/- for maintenance for a period of 10 years has been taken as Rs. 76,560/- per ha. Detailed estimate prepared for the scheme is given as **Annexure V**. The area to be brought under enrichment in different sub-watersheds is given at **Table 10.11**.

c. Pasture Development

As there are degraded patches of pasture in the area, this measure will be adopted to encourage development of new and healthy pastures for use of cattle of the area. Barren land with greater slopes has been recommended to be treated by developing pastures over them. Under this treatment, suitable species of grasses and leguminous plant species be planted in

the land area earmarked for the purpose. 200 plants and 1000 grass slips in patches @ per ha are proposed to be planted under this scheme. 4 strands barbed wire square PCC fence post have been proposed to safeguard the plantation sites. The cost for pasture development excluding plant production cost and including Rs. 9,100/- for maintenance for a period of 10 years has been taken as Rs. 58,600/- per. Detailed estimate prepared for the scheme is given as **Annexure V**. The area to be brought under pasture development in different sub-watersheds is given at **Table 10.11**.

d. Assisted Natural Regeneration

It is important to enhance the establishment of secondary forest from degraded grassland and shrub vegetation by protecting and nurturing the mother trees and their wildlings inherently present in the area. Assisted natural regeneration is proposed to accelerate, rather than replace, natural successional processes by removing or reducing barriers to natural forest regeneration such as soil degradation, competition with weedy species, and recurring disturbances (e.g., fire, grazing, and wood harvesting). 400 plants per ha are proposed to be planted under this scheme. 4 strands barbed wire square PCC fence post have been proposed to safeguard the plantation sites. Cost for Assisted natural regeneration excluding plant production cost and including **Rs. 8,000/-** for maintenance for a period of 10 years has been taken as **Rs. 56,640/- per ha**. Detailed estimate prepared for the scheme is given as **Annexure V**. The area to be brought under assisted natural regeneration in different sub-watersheds is given at **Table 10.11**.

Table 10.11: Sub-watershed wise Biological Treatment Measures

S. No.	Biological Treatment Measures	Sub-Watershed			Total
		1E1B5g	1E1B5h	1E1B6h	
1	Afforestation (ha)	54	56	9	**119**
2	Enrichment (ha)	16	9	15	**40**
3	Pasture Development (ha)	38	40	6	**84**
4	Assisted Natural Regeneration (ha)	24	13	22	**59**

e. Plant Production

Having sufficient stock of plants is a pre requisite for undertaking all the biological measures suggested above. Therefore, in order to ensure sufficient stock of plant following measures are proposed to be undertaken:

- Formation of new permanent nursery
- Raising of sapling in poly bag of size (9” x 6”)
- Raising of naked root sapling

i. Formation of New Permanent Nursery

Nursery is defined as an area where plants are raised for eventual planting out in the forest area or elsewhere selected for plantation in field. In order to cater to the needs of biological treatment measures, one new nursery of 1 ha is proposed to be developed. The cost for the formation of nursery is Rs. 3,02,544/-. The cost for the formation of new nursery has been taken as given at Sr. No. a under Plant Production of Forest Rate Schedule Tariff for Forestry, Soil Conservation and related works notified by Circular No. 06 of 2022 dated 18.05.2022 issued by the Office of the Pr. Chief Conservator of Forests & HoFF, Govt. of J&K (refer **Annexure IV**).

ii. Raising of Sapling in Poly Bag

The total plants raised in poly bags to be planted in pits under different biological measures schemes are 6,990 (@ 330 plants/ ha for normal afforestation, 240 plants/ ha for enrichment, 60 plants/ ha for pasture development and 120 plants / ha for assisted natural regeneration). Before planting on sites, these plants will be raised as saplings in poly bag in the newly formed nurseries as mentioned above. Considering that all the saplings may not survive, 20% more saplings will be raised, which comes out to be 73,188, which further rounded off to 73,200. Therefore, total 73,200 saplings are proposed to be raised in poly bag of size (9" x 6"). The unit cost considered for raising sapling in poly bag is Rs. 8.03/ plant. The unit cost considered is as given at Sr. No. b under Plant Production of Forest Rate Schedule Tariff for Forestry, Soil Conservation and related works notified by Circular No. 06 of 2022 dated 18.05.2022 issued by the Office of the Pr. Chief Conservator of Forests & HoFF, Govt. of J&K (refer **Annexure V**).

iii. Raising of Naked Root Saplings

Similarly, total naked root plants to be planted in pits under different biological measures schemes are 1,42,310 (@ 770 plants/ ha for normal afforestation, 560 plants/ ha for enrichment, 140 plants/ ha for pasture development and 280 plants / ha for assisted natural regeneration). Before planting on sites, these plants will be raised as saplings in the newly formed nurseries. Considering that all the sapling may not survive, 20% more saplings will be raised, which comes out to be 1,70,772, which further rounded off to 1,70,800. Therefore, total 1,70,800 saplings are proposed to be raised as naked root. The unit cost considered for raising naked root sapling is Rs. 7.44/ plant. The unit cost considered is as given at Sr. No. d under Plant Production of Forest Rate Schedule Tariff for Forestry, Soil Conservation and related works notified by Circular No. 06 of 2022 dated 18.05.2022 issued by the Office of the Pr. Chief Conservator of Forests & HoFF, Govt. of J&K (refer **Annexure IV**).

A. Maintenance of PB raised Saplings in Nurseries

As 10 years maintenance has been proposed for all the plantation sites, therefore, it is necessary to ensure continuous supply of saplings raised in poly bags during this maintenance period. The total poly bag raised saplings proposed for maintenance in nurseries are 58,560. Out of which, 18,300 saplings (@25% of total 73,200 saplings raised in newly formed nursery) will be maintained during 1st year of planting. 10,980 saplings (@15% of total 73,200 saplings raised in newly formed nursery) will be maintained during 2nd year of planting. 3,660 saplings (@5% of total 73,200 saplings raised in newly formed nursery) will be maintained per year from 3rd year to 10th year of planting. The unit cost considered is as given at Sr. No. e under Plant Production of Forest Rate Schedule Tariff for Forestry, Soil Conservation and related works notified by Circular No. 06 of 2022 dated 18.05.2022 issued by the Office of the Pr. Chief Conservator of Forests & HoFF, Govt. of J&K (refer **Annexure IV**).

B. Maintenance of NR raised Saplings in Nursery

Since naked root (NR) saplings are being maintained for 1 year, therefore it is proposed to maintain 42,700 NR saplings (@25% of total 1,70,800 saplings raised in newly formed nurser4). The unit cost considered for maintenance of NR sapling is Rs. 2.48/ plant.

C. Engagement of Labours as Watch and Ward

It is proposed to engage local people of labours to assist regular staff for the protection of the plantation sites. It is proposed to engage 3 labours i.e. 1 labour per sub watershed. The total period for the engagement shall be 11 years i.e. planting year and subsequent 10 maintenance years. The rate for engagement of the labour is Rs. 330 per day for the current year. Considering per year revision in the wage rate, an enhancement @ 7.76% per year on the previous year has been applied for calculating the wage rate enhancement. The base wage rate has been taken as per Plant Production of Forest Rate Schedule Tariff for Forestry, Soil Conservation and related works notified by Circular No. 06 of 2022 dated 18.05.2022 issued by the Office of the Pr. Chief Conservator of Forests & HoFF, Govt. of J&K (refer **Annexure IV**).

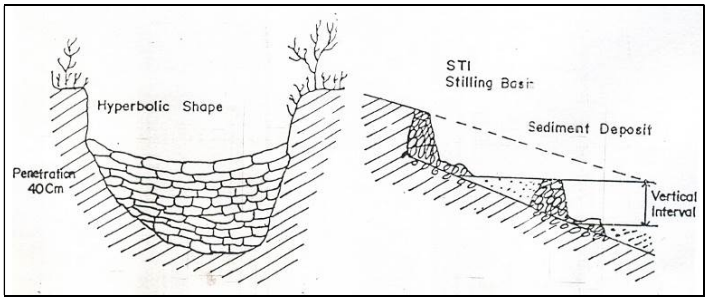
10.2.5.2 Engineering Measures

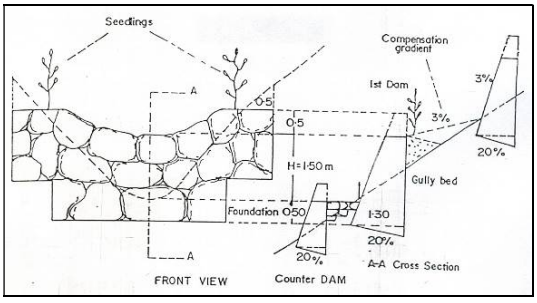
Engineering measures are more effective in conserving soil and water when they are supplemented by vegetative methods. But in certain situations, only engineering measures can be proposed. Various engineering measures have been suggested for landslides/ landslips, treatment of nalas and soil and water conservation in private/ irrigated land in the catchment area. The engineering structures suggested are as follows:

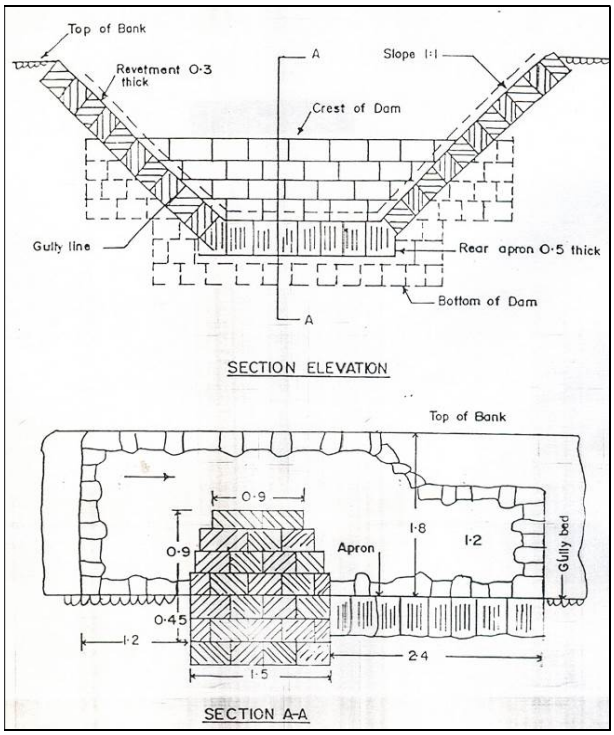
- Dry Stone Masonry Check walls and Check dams
- Gabion Check walls and Check dams
- Silt Observation Points

a. Dry Stone Masonry Structures

Dry stone masonry structures can be made of boulders piled up across the gulley if they are locally available. Structures for damming a gulley or a stream to refine the flow velocity are called check dams. In order to maintain the structures, 25% of the total cost has been kept as maintenance cost after 5 years of implementation of the structures. The unit cost of construction of such structure is Rs. 1099/- per cum (refer Sr. No. i under Engineering Works of Forest Rate Schedule Tariff for Forestry, Soil Conservation and related works notified by Circular No. 06 of 2022 dated 18.05.2022 issued by the Office of the Pr. Chief Conservator of Forests & HoFF, Govt. of J&K, given as **Annexure IV**). The total quantity of DRSM structures suggested for each sub-watershed is given at **Table 10.11**.



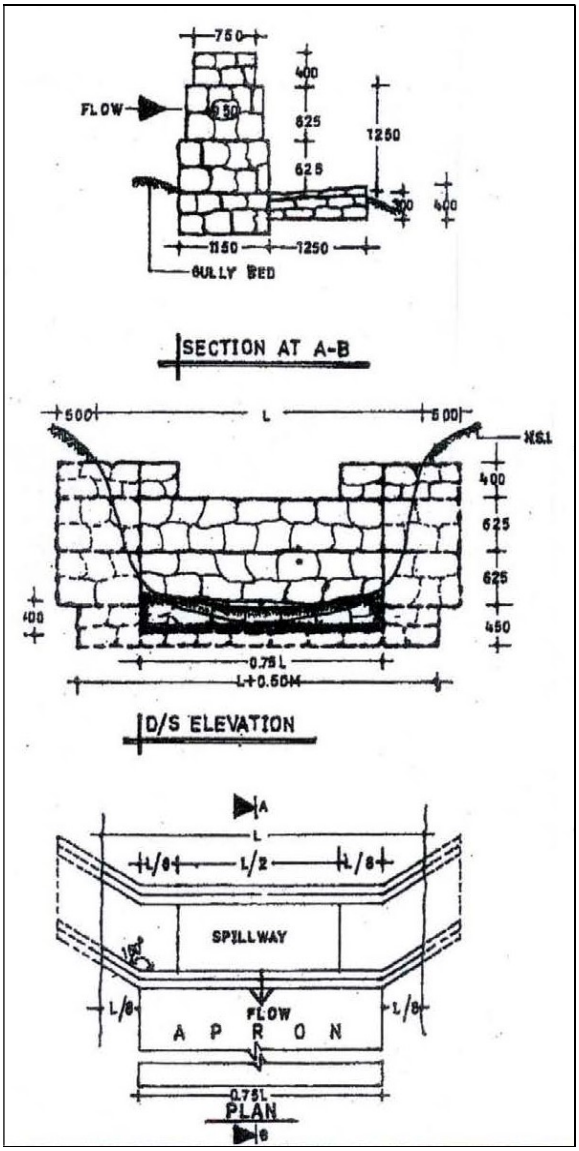




Layout of Dry Stone Check Dam

b. Gabion Structures

If loose boulders are considered not to be stable in a particular reach of the stream, Gabion structures can be installed. These structures are not that easy to get erected as compared to DRSM structures because the terrain is stiff and the wire used for making gabion boxes has to be carried by human labour. Carrying the wire will be tedious and time consuming. Therefore, with proper judgment about the site conditions, these structures may be installed. In order to maintain the structures, 25% of the total cost has been kept as maintenance cost after 5 years of implementation of the structures. Since rate of gabion structures are not included in the Forest Rate Schedule Tariff for Forestry, Soil Conservation and related works, therefore, rate given at Code No. 16.98 of Jammu & Kashmir Schedule of Rates, issued by the Public Works (R&B) Department, Govt. of J&K vide Govt. Order No. 192-PW(R&B) of 2020 dated 07.07.2020 has been considered. The unit cost of these structures has been taken as Rs. 3071.50/- per cum. The total quantity of gabion structures suggested for each sub-watershed is given at **Table 10.12**.



Typical Layout of Gabion Structure

Table 10.12: Sub-watershed wise Engineering Treatment Measures

S. No.	Engineering Treatment Measures	Sub-Watershed			Total
		1E1B5g	1E1B5h	1E1B6h	
1	DRSM Structures (Cum)	3000	2600	2200	**7800**
2	Gabion Structure (Cum)	1200	260	570	**2030**

c. Silt Observation Points

Two silt observation locations for regular monitoring of silt load coming in tributaries have been suggested which should be established in consultation with state forest department. This would ensure monitoring efficacy of implementation various treatments measures suggested as in CAT plan. Monitoring would be undertaken for a period of 13 years. Cost towards this should be kept in project estimates and could be taken as below:

Cost of one laboratory = Rs. 10.00 lakh
One hut at each site (@ Rs. 200,000/- lakh) = Rs. 4.00 lakh
Cost for hiring services of persons (@ two persons per site) = Rs. 103.51 lakh*

Consumables for the measurement Rs. 1.00 lakh per year for 13 years = 13.00 lakh
Total cost = Rs. 130.51 lakh

**The rate for engagement of the labour is Rs. 330 per day for the current year. Considering per year revision in the wage rate, an enhancement @ 7.76% per year on the previous year has been applied for the next 12 years for calculating the wage rate enhancement.*

10.2.5.3 Other Components

Apart from the biological and engineering treatment measures in the catchment area there are other aspects of the CAT Plan to be addressed and their cost included in the overall cost estimate of the plan. The other components forming the integral ingredients which have to be considered and included while formulating the CAT plans are:

- Socio-economic
- Administrative Expenditure
- Micro Planning
- Wildlife Protection and Management
- Monitoring & Evaluation
- Contingencies

d. Socio-economic

The following measures would help in rejuvenating the ecosystem and in reducing the soil erosion in the region. It shall be carried out for local villages in free draining catchment area of Uri I Phase II Project.

i. Plan for plantation in the village area.
ii. Avenue plantation using fuel wood trees with suitable fencing in the villages.
iii. Technical & Financial support for using alternate energy sources.
iv. Maintenance of hygiene in the villages.
v. Establishment of training, awareness programmes for water and soil conservation in the village areas
vi. Establishing a rural technology support program
vii. Awareness program for conservation of wildlife and natural resource.

A budgetary provision of **Rs. 18.68 lakh** has been kept under this component.

e. Administrative Expenditure

For an efficient management of forest resources, it is essential that operational support to the implementing agency is adequately developed. Similarly, in remote localities of the area there are no places for shelter for the staff, people and trekkers. Therefore, a budget provision of **Rs. 62.27 lakh** has been kept under this component.

f. Provision for Micro Plans

Based on the ground truth reality in each of the sub-watershed comprehensive micro plan for execution of the work has to be prepared as per norms. For this purpose, a provision of **Rs. 15.00 lakh** is being made.

g. Wildlife Protection and Management

Since majority of the area at the right bank of the Jhelum River in the free draining catchment area falls under Limber and Kazinag Wildlife Sanctuary therefore a provision of **Rs. 62.27 lakh** is being made for the wildlife protection and management in the wildlife sanctuary areas.

h. Monitoring & Evaluation

Monitoring and evaluation will be developed as in-built part of the project management. Thus, a process of self-evaluation at specified intervals of time will ensure the field worthiness and efficacy of the CAT Plan. The emphasis would be on Monitoring and impact studies of the works done under the plan. A sum of **Rs. 31.14** lakh has been provided for monitoring and evaluation.

i. Contingencies

A provision of **Rs. 62.27 lakh** has been kept under this component for some leeway to adjust any unforeseen expenditure.

10.2.6 COST ESTIMATE

The cost estimated for Catchment Area Treatment is **Rs. 874.39 lakh**. The details are given in **Tables 10.13**. The year wise physical and financial targets are given in **Table 10.14.** Sub-Watershed wise yearly physical and financial targets of proposed biological as well as engineering treatment measures are given in from **Table 10.15 to Table 10.20**.

Table 10.13: Cost Estimate for Catchment Area Treatment of Uri-I Phase-II HEP

S. No.	Item	Rate (Rs)	Unit	Target	
				Physical	Financial (Rs in lakh)
A	**Biological Measures**				
1	Normal Afforestation including maintenance	91,755	ha	119.00	109.19
2	Enrichment Plantations including maintenance	76,560	ha	40.00	30.62
3	Pasture Development including maintenance	58,600	ha	84.00	49.22
4	Assisted Natural Regeneration including maintenance	56,640	ha	59.00	33.42
5	Plant Production				
a	Formation of New Permanent Nursery	3,02,544	ha	1	3.03
b	Raising of sapling in PB of size (9" x 6")	8.03	/plant	73200	5.88
c	Raising of NR sapling	7.44	/plant	170800	12.71
6	Maintenance of PB raised conifer saplings in nurseries of size (9" x 6")				
a	During 1st Year of raising of plants	2.66	/plant	18300	0.49
b	During 2nd Year of raising of plants	2.66	/plant	10980	0.29
c	During 3rd Year of raising of plants	3.83	/plant	3660	0.14
d	During 4th year of raising of plants	3.83	/plant	3660	0.14
e	During 5th year of raising of plants	3.83	/plant	3660	0.14
f	During 6th year of raising of plants	3.83	/plant	3660	0.14
g	During 7th year of raising of plants	3.83	/plant	3660	0.14
h	During 8th year of raising of plants	3.83	/plant	3660	0.14
i	During 9th year of raising of plants	3.83	/plant	3660	0.14
j	During 10th year of raising of plants	3.83	/plant	3660	0.14
7	Maintenance of NR sapling				

S. No.	Item	Rate (Rs)	Unit	Target	
				Physical	Financial (Rs in lakh)
a	During 1st year of raising of plants	2.48	/plant	42700	1.06
8	Engagement of Labours as Watch and Ward				
a	During Planting Year	330	/day	3	3.61
b	During 1st Year of maintenance	355	/day	3	3.89
c	During 2nd Year of maintenance	385	/day	3	4.22
d	During 3rd Year of maintenance	415	/day	3	4.54
e	During 4th year of maintenance	450	/day	3	4.93
f	During 5th year of maintenance	485	/day	3	5.31
g	During 6th year of maintenance	525	/day	3	5.75
h	During 7th year of maintenance	565	/day	3	6.19
i	During 8th year of maintenance	610	/day	3	6.68
j	During 9th year of maintenance	660	/day	3	7.23
k	During 10th year of maintenance	710	/day	3	7.77
	Sub Total A				**307.14**
B	**Engineering Measures**				
9	DRSM Structures	1,099.00	Cum.	7800.00	85.72
a	Maintenance cost @ 25%				21.43
10	Gabion Structures	3,071.50	Cum.	2030.00	62.35
a	Maintenance cost @ 25%				15.59
11	Silt Observation Points		Nos.	2	130.51
	Sub Total B				**315.61**
I	**Total A and B**				**622.75**
II	**Other Components**				
12	Socio-economic Cost @3% of Total I				18.68
13	Administrative Expenditure Cost @ 10% of Total I				62.27
14	Micro Planning Cost				15.00
15	Wildlife Protection and Management @ 10% of Total I				62.27
16	Monitoring & Evaluation @ 5% of Total I				31.14
17	Contingency Cost @ 10% of Total I				62.27
	Total II				**251.64**
	Grand Total				**874.39**

Table 10.14: Year Wise Targets (Physical and Financial) for Catchment Area Treatment Plan

S. No.	Measures	Year I		Year II		Year III		Year IV		Year V		Year VI		Year VII		Year VIII		Year IX		Year X		Year XI		Year XII		Year XIII		Year XIV		Total	
		Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
A	**Biological Measures**																														
1	Afforestation (ha)			110	76.44	9	6.25																							**119**	**82.69**
	1st Year maintenance					110	7.60	9	0.62																					**119**	**8.22**
	2nd Year maintenance							110	4.57	9	0.37																			**119**	**4.94**
	3rd Year maintenance									110	1.54	9	0.13																	**119**	**1.67**
	4th Year maintenance											110	1.54	9	0.13															**119**	**1.67**
	5th Year maintenance													110	1.54	9	0.13													**119**	**1.67**
	6th Year maintenance															110	1.54	9	0.13											**119**	**1.67**
	7th Year maintenance																	110	1.54	9	0.13									**119**	**1.67**
	8th Year maintenance																			110	1.54	9	0.13							**119**	**1.67**
	9th Year maintenance																					110	1.54	9	0.13					**119**	**1.67**
	10th Year maintenance																							110	1.54	9	0.13			**119**	**1.67**
2	Enrichment Plantations (ha)			25	15.14	15	9.08																							**40**	**24.22**
	1st Year maintenance					25	1.25	15	0.75																					**40**	**2.00**
	2nd Year maintenance							25	0.75	15	0.45																			**40**	**1.20**
	3rd Year maintenance									25	0.25	15	0.15																	**40**	**0.40**
	4th Year maintenance											25	0.25	15	0.15															**40**	**0.40**
	5th Year maintenance													25	0.25	15	0.15													**40**	**0.40**
	6th Year maintenance															25	0.25	15	0.15											**40**	**0.40**
	7th Year maintenance																	25	0.25	15	0.15									**40**	**0.40**
	8th Year maintenance																			25	0.25	15	0.15							**40**	**0.40**
	9th Year maintenance																					25	0.25	15	0.15					**40**	**0.40**
	10th Year maintenance																							25	0.25	15	0.15			**40**	**0.40**
3	Pasture development (ha)			78	38.61	6	2.97																							**84**	**41.58**
	1st Year maintenance					78	2.22	6	0.17																					**84**	**2.39**
	2nd Year maintenance							78	1.33	6	0.10																			**84**	**1.43**
	3rd Year maintenance									78	0.44	6	0.03																	**84**	**0.48**
	4th Year maintenance											78	0.44	6	0.03															**84**	**0.48**
	5th Year maintenance													78	0.44	6	0.03													**84**	**0.48**
	6th Year maintenance															78	0.44	6	0.03											**84**	**0.48**
	7th Year maintenance																	78	0.44	6	0.03									**84**	**0.48**
	8th Year maintenance																			78	0.44	6	0.03							**84**	**0.48**
	9th Year maintenance																					78	0.44	6	0.03					**84**	**0.48**
	10th Year maintenance																							78	0.44	6	0.03			**84**	**0.48**
4	Assisted Natural Regeneration (ha)			37	18.00	22	10.70																							**59**	**28.70**
	1st Year maintenance					37	0.93	22	0.55																					**59**	**1.48**
	2nd Year maintenance							37	0.56	22	0.33																			**59**	**0.89**
	3rd Year maintenance									37	0.19	22	0.11																	**59**	**0.30**
	4th Year maintenance											37	0.19	22	0.11															**59**	**0.30**
	5th Year maintenance													37	0.19	22	0.11													**59**	**0.30**
	6th Year maintenance															37	0.19	22	0.11											**59**	**0.30**
	7th Year maintenance																	37	0.19	22	0.11									**59**	**0.30**
	8th Year maintenance																			37	0.19	22	0.11							**59**	**0.30**
	9th Year maintenance																					37	0.19	22	0.11					**59**	**0.30**
	10th Year maintenance																							37	0.19	22	0.11			**59**	**0.30**
5	Plant Production																														
	Formation of New Permanent Nursery	1	3.03																											**1**	**3.03**
	Raising of sapling in PB of size (9" x 6")	61700	4.95	11500	0.92																									**73200**	**5.88**
	Raising of NR sapling	144000	10.71	26800	1.99																									**170800**	**12.71**
6	Maintenance of PB raised conifer saplings in nurseries of size (9" x 6")																														
	During 1st year of raising of plants			15425	0.41	2875	0.08																							**18300**	**0.49**
	During 2nd year of raising of plants					9255	0.25	1725	0.05																					**10980**	**0.29**
	During 3rd year of raising of plants							3085	0.12	575	0.02																			**3660**	**0.14**
	During 4th year of raising of plants									3085	0.12	575	0.02																	**3660**	**0.14**
	During 5th year of raising of plants											3085	0.12	575	0.02															**3660**	**0.14**

S. No.	Measures	Year I		Year II		Year III		Year IV		Year V		Year VI		Year VII		Year VIII		Year IX		Year X		Year XI		Year XII		Year XIII		Year XIV		Total	
		Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
	During 6th year of raising of plants													3085	0.12	575	0.02													**3660**	**0.14**
	During 7th year of raising of plants															3085	0.12	575	0.02											**3660**	**0.14**
	During 8th year of raising of plants																	3085	0.12	575	0.02									**3660**	**0.14**
	During 9th year of raising of plants																			3085	0.12	575	0.02							**3660**	**0.14**
	During 10th year of raising of plants																					3085	0.12	575	0.02					**3660**	**0.14**
7	Maintenance of NR sapling																														
	During 1st year of raising of plants			36000	0.89	6700	0.17																							**42700**	**1.06**
8	Engagement of Labours as Watch and Ward																														
	During Planting Year			2	2.41	1	1.20																							**3**	**3.61**
	During 1st year of maintenance					2	2.59	1	1.30																					**3**	**3.89**
	During 2nd year of maintenance							2	2.81	1	1.41																			**3**	**4.22**
	During 3rd year of maintenance									2	3.03	1	1.51																	**3**	**4.54**
	During 4th year of maintenance											2	3.29	1	1.64															**3**	**4.93**
	During 5th year of maintenance													2	3.54	1	1.77													**3**	**5.31**
	During 6th year of maintenance															2	3.83	1	1.92											**3**	**5.75**
	During 7th year of maintenance																	2	4.12	1	2.06									**3**	**6.19**
	During 8th year of maintenance																			2	4.45	1	2.23							**3**	**6.68**
	During 9th year of maintenance																					2	4.82	1	2.41					**3**	**7.23**
	During 10th year of maintenance																							2	5.18	1	2.59			**3**	**7.77**
	Sub Total A		**18.69**		**154.82**		**45.28**		**13.56**		**8.25**		**7.78**		**8.16**		**8.58**		**9.02**		**9.50**		**10.02**		**10.45**		**3.01**				**307.14**
B	**Engineering measures**																														
9	DRSM Structures (cum)			3000	32.97	4800	52.75																							**7800**	**85.72**
a	Maintenance cost @ 25%																8.24		13.19												**21.43**
10	Gabion Structures (cum)			1200	36.86	830	25.49																							**2030**	**62.35**
a	Maintenance cost @ 25%																9.21		6.37												**15.59**
11	Silt Observation Points (no.)	2	19.82		6.18		6.62		7.06		7.57		8.08		8.67		9.25		9.91		10.64		11.37		12.24		13.12			**2**	**130.51**
	Sub Total B		**19.82**		**76.01**		**84.87**		**7.06**		**7.57**		**8.08**		**8.67**		**26.71**		**29.47**		**10.64**		**11.37**		**12.24**		**13.12**				**315.61**
I	**Total A and B**		**38.51**		**230.83**		**130.15**		**20.62**		**15.82**		**15.86**		**16.83**		**35.29**		**38.49**		**20.13**		**21.39**		**22.70**		**16.13**				**622.75**
II	**Other Components**																														
12	Socio-economic Cost @3% of Total I		6.23		6.23		6.23																								**18.68**
13	Administrative Expenditure Cost @ 10% of Total I		3.85		23.08		13.02		2.06		1.58		1.59		1.68		3.53		3.85		2.01		2.14		2.27		1.61				**62.27**
14	Micro Planning Cost		15.00																												**15.00**
15	Wildlife Protection and Management @ 10% of Total I		3.85		23.08		13.02		2.06		1.58		1.59		1.68		3.53		3.85		2.01		2.14		2.27		1.61				**62.27**
16	Monitoring & Evaluation @ 5% of Total I				1.93		11.54		6.51		1.03		0.79		0.79		0.84		1.76		1.92		1.01		1.07		1.13		0.81		**31.14**
17	Contingency Cost @ 10% of Total I		3.85		23.08		13.02		2.06		1.58		1.59		1.68		3.53		3.85		2.01		2.14		2.27		1.61				**62.27**
	Total II		**32.78**		**77.40**		**56.81**		**12.69**		**5.78**		**5.55**		**5.84**		**11.43**		**13.31**		**7.96**		**7.42**		**7.88**		**5.97**		**0.81**		**251.64**
	Grand Total (I and II)		**71.29**		**308.23**		**186.97**		**33.32**		**21.60**		**21.41**		**22.67**		**46.72**		**51.80**		**28.10**		**28.81**		**30.57**		**22.10**		**0.81**		**874.39**

Note: Amount is in lakh

Table 10.15: Year-Wise Physical and Financial Targets of Afforestation to be Undertaken in Sub-Watersheds

S. No.	Sub-Watershed	Year II		Year III		Year IV		Year V		Year VI		Year VII		Year VIII		Year IX		Year X		Year XI		Year XII		Year XIII		Total	
		Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
1	1E1B5g	54	37.52	54	3.73	54	2.24	54	0.76	54	0.76	54	0.76	54	0.76	54	0.76	54	0.76	54	0.76	54	0.76			**594**	**49.55**
2	1E1B5h	56	38.91	56	3.87	56	2.33	56	0.78	56	0.78	56	0.78	56	0.78	56	0.78	56	0.78	56	0.78	56	0.78			**616**	**51.38**
3	1E1B6h			9	6.25	9	0.62	9	0.37	9	0.13	9	0.13	9	0.13	9	0.13	9	0.13	9	0.13	9	0.13	9	0.13	**99**	**8.26**
	Total	**110**	**76.44**	**119**	**13.86**	**119**	**5.19**	**119**	**1.91**	**119**	**1.67**	**119**	**1.67**	**119**	**1.67**	**119**	**1.67**	**119**	**1.67**	**119**	**1.67**	**119**	**1.67**	**9**	**0.13**	**1309**	**109.19**

Note: Amount is in lakh

Table 10.16: Year-Wise Physical and Financial Targets of Enrichment to be Undertaken in Sub-Watersheds

S. No.	Sub-Watershed	Year II		Year III		Year IV		Year V		Year VI		Year VII		Year VIII		Year IX		Year X		Year XI		Year XII		Year XIII		Total	
		Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
1	1E1B5g	16	9.69	16	0.80	16	0.48	16	0.16	16	0.16	16	0.16	16	0.16	16	0.16	16	0.16	16	0.16	16	0.16			**176**	**12.25**
2	1E1B5h	9	5.45	9	0.45	9	0.27	9	0.09	9	0.09	9	0.09	9	0.09	9	0.09	9	0.09	9	0.09	9	0.09			**99**	**6.89**
3	1E1B6h			15	9.08	15	0.75	15	0.45	15	0.15	15	0.15	15	0.15	15	0.15	15	0.15	15	0.15	15	0.15	15	0.15	**165**	**11.48**
	Total	**25**	**15.14**	**40**	**10.33**	**40**	**1.50**	**40**	**0.7**	**40**	**0.40**	**40**	**0.40**	**40**	**0.40**	**40**	**0.40**	**40**	**0.40**	**40**	**0.40**	**40**	**0.40**	**15**	**0.15**	**440**	**30.62**

Note: Amount is in lakh

Table 10.17: Year-Wise Physical and Financial Targets of Pasture Development to be Undertaken in Sub-Watersheds

S. No.	Sub-Watershed	Year II		Year III		Year IV		Year V		Year VI		Year VII		Year VIII		Year IX		Year X		Year XI		Year XII		Year XIII		Total	
		Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
1	1E1B5g	38	18.81	38	1.08	38	0.65	38	0.22	38	0.22	38	0.22	38	0.22	38	0.22	38	0.22	38	0.22	38	0.22			**418**	**22.27**
2	1E1B5h	40	19.80	40	1.14	40	0.68	40	0.23	40	0.23	40	0.23	40	0.23	40	0.23	40	0.23	40	0.23	40	0.23			**440**	**23.44**
3	1E1B6h			6	2.97	6	0.17	6	0.10	6	0.03	6	0.03	6	0.03	6	0.03	6	0.03	6	0.03	6	0.03	6	0.03	**66**	**3.52**
	Total	**78**	**38.61**	**84**	**5.19**	**84**	**1.50**	**84**	**0.55**	**84**	**0.48**	**84**	**0.48**	**84**	**0.48**	**84**	**0.48**	**84**	**0.48**	**84**	**0.48**	**84**	**0.48**	**6**	**0.03**	**924**	**49.22**

Note: Amount is in lakh

Table 10.18: Year-Wise Physical and Financial Targets of Assisted Natural Regeneration to be Undertaken in Sub-Watersheds

S. No.	Sub-Watershed	Year II		Year III		Year IV		Year V		Year VI		Year VII		Year VIII		Year IX		Year X		Year XI		Year XII		Year XIII		Total	
		Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
1	1E1B5g	24	11.67	24	0.60	24	0.36	24	0.12	24	0.12	24	0.12	24	0.12	24	0.12	24	0.12	24	0.12	24	0.12			**264**	**13.59**
2	1E1B5h	13	6.32	13	0.33	13	0.20	13	0.07	13	0.07	13	0.07	13	0.07	13	0.07	13	0.07	13	0.07	13	0.07			**143**	**7.36**
3	1E1B6h			22	10.70	22	0.55	22	0.33	22	0.11	22	0.11	22	0.11	22	0.11	22	0.11	22	0.11	22	0.11	22	0.11	**242**	**12.46**
	Total	**37**	**18.00**	**59**	**11.63**	**59**	**1.11**	**59**	**0.52**	**59**	**0.30**	**59**	**0.30**	**59**	**0.30**	**59**	**0.30**	**59**	**0.30**	**59**	**0.30**	**59**	**0.30**	**22**	**0.11**	**649**	**33.42**

Note: Amount is in lakh

Table 10.19: Year-Wise Physical and Financial Targets of DRSM Structures to be Undertaken in Sub-Watersheds

S. No.	Sub-Watershed	Year II		Year III		Year VIII		Year IX		Total	
		Phy. (Cum)	Fin. (Rs in lakh)	Phy. (Cum)	Fin. (Rs in lakh)	Phy. (Cum)	Fin. (Rs in lakh)	Phy. (Cum)	Fin. (Rs in lakh)	Phy. (Cum)	Fin. (Rs in lakh)
1	1E1B5g	3000	32.97				8.24			**3000**	**41.21**
2	1E1B5h	2600	28.57				7.14			**2600**	**35.72**
3	1E1B6h			2200	24.18				6.04	**2200**	**30.22**
	Total	**5600**	**61.54**	**2200**	**24.18**		**15.39**		**6.04**	**7800**	**107.15**

Table 10.20: Year-Wise Physical and Financial Targets of Gabion Structures to be Undertaken in Sub-Watersheds

S. No.	Sub-Watershed	Year II		Year III		Year VIII		Year IX		Total	
		Phy. (Cum)	Fin. (Rs in lakh)	Phy. (Cum)	Fin. (Rs in lakh)	Phy. (Cum)	Fin. (Rs in lakh)	Phy. (Cum)	Fin. (Rs in lakh)	Phy. (Cum)	Fin. (Rs in lakh)
1	1E1B5g	1200	36.86				9.21			**1200**	**46.07**
2	1E1B5h	260	7.99				2.00			**260**	**9.98**
3	1E1B6h			570	17.51				4.38	**570**	**21.88**
	Total	**1460**	**44.84**	**570**	**17.51**		**11.21**		**4.38**	**2030**	**77.94**

Annexure-I

Office Address

Srinagar Office : Forest Complex, Shiekh Bagh, Lal Chowk, Sgr-190001 | *Phone: 0194-2483937, Fax: 0194-2455027*

Jammu Office : Van Bhawan, Below Gumat, Jammu-180001 | *Phone: 0191-2560585, Fax: 0191-2547276*

URL Address:www.jkforest.gov.in

E-mail:pccfjkforest@gmail.com

सत्यमेव जयते

Jammu & Kashmir Forest Department
Office of the Pr. Chief Conservator of Forests & HoFF
Government of Jammu & Kashmir

Circular No. 06 of 2022
D A T E D: 18 .05.2022

The estimates for forestry works are to be prepared based on Forest Schedule of Rates notified from time to time. The estimates for components of forestry works not specified in Forest Schedule of Rates shall be prepared based on the PWD Schedule of Rates.

These circular instructions are in continuation to the conditions as laid down in the Forest Order No. 114 of 2017 dated: 11.03.2017 issued for Forest Rate Schedule Tariff for forestry, Soil Conservation and related works.

Mohit Gera 18/5/2022

(Dr. Mohit Gera) IFS
Pr. Chief Conservator of Forests (HoFF),
Jammu & Kashmir

No. PCCF/Coord/Circular file/ Misc-213/1051-1101 **Dated:** 18 **.05.2022**

Copy for information to the:

1. Addl. Pr. Chief Conservator of Forests/ CEO CAMPA
2. Addl. Pr. Chief Conservator of Forests Jammu
3. Addl. Pr. Chief Conservator of Forests Kashmir
4. Addl. Pr. Chief Conservator of Forests (WPR&T)
5. Chief Conservator of Forests (S&D)
6. Chief Conservator of Forests (P&P)
7. All Conservator of Forests
8. All Divisional Forest Officers
9. I/c website for uploading it on the website of J&K Forest Department
10. Circular File

GOVERNMENT OF JAMMU AND KASHMIR
OFFICE OF THE PR.CHIEF CONSERVATOR OF FORESTS

Subject : Revision of FOREST RATE SCHEDULE TARRIF for Forestry, Soil Conservation and related works for the year 2016-17----reg.

Forest Order No. 114 of 2017
D a t e d : 11- 03 - 2017

1. Whereas, the forest rate schedule for the Forestry, Soil Conservation and related works for Jammu and Kashmir region were revised and sanctioned in the year 2004-05 vide FO No. 91 of 2005 dated 26-09-2005 and issued vide endstt. No. PCCF/Plg/98/72/1044-49 dated 26-09-2005 and subsequently the rates were revised in the year 2013-14 based on built in factor as per 2004-05 rates and annexure-A to the said order.
2. Whereas, the PCCF vide Order No: **PCCF/Coord/Meeting/554-58** dated:**21-12-2016** had constituted a Committee for the upward revision of the Forest Schedule Rates. The Committee comprising of :
   a. Regional Director, Social Forestry Deptt., Jammu (Chairman)
   b. Regional Wildlife Warden, Jammu (Member)
   c. Conservator of Forests, South Circle, Kashmir (Member)
   d. Divisional Forest Officer, Urban Forestry Division, Jammu (Member)
3. Whereas, the committee after series of discussion furnished the report vide office letter No. 2710/RD/SFD-J dated 03-02-2017, indicating the basis for the revision of the rates alongwith the rate schedule/tarrif for various Forestry, Soil Conservation and related works for the year 2016-17 as follows :
   i. The minimum wage rate was applied for the calculation of labour rate in Forest Schedule earlier and it had become very difficult for the field staff to execute the works departmentally due to the fact that the market rate of labour have become quite high as compared to minimum wage rate applied to the Schedule Rate. Keeping in view the above said facts the labour rate applicable as per PWD schedule rate of **2012-13** i.e. **Rs. 300/-** has been taken as a base wage rate for calculating revised schedule rates along with change in material cost as per present available rate obtained from **SICOP** for the current year. The market labour rate is actually around **Rs. 350 –400/-** for **unskilled** labour and **Rs. 500/- – 600/-** for **skilled** labour. Hence, there is a need for escalation of labour rate of **20%**. However, only **10%** enhancement in labour rate has been incorporated in the preparation of present revised Forest Schedule Rate.
   ii. Further, for execution of works within the municipal limits of Jammu and Srinagar cities and expensive localities, further escalation on proposed rates may be given by the competent authority.
   iii. For the works which are deep inside the forest or any inaccessible areas the carriage charges both mechanical and head load / manual in nature as per **PWD schedule rates 2012-13** may be followed.
   iv. The proposal for raising of seedlings and their maintenance in poly bags have been taken from SFRI as submitted by Research Advisory Committee vide No: SFRI/CFR/F-102/2016-17/2038-39 dated: 21-01-2017.

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In view of the above, the following revised rate of schedule is hereby issued for undertaking forestry, Soil Conservation and related works in the respective regions.

Item of work	Rate (in Rupees) per unit of work item for the year 2016-17				Remarks
	Jammu	Kashmir	Leh	Kargil	
i. Fencing – using Square PCC Fence Posts conforming to product code PCFP-3 at spacing of 8' and 4 strands of black annealed Barbed Wire conforming to the product code BA-BW. At least every 10th fence post along the straight fence line and every fence posts at the corner be fixed in the cement concrete block of size 1'6"x1'x1'. This type of fencing be preferred on sites which are likely to experience excessive heavy pressure of grazing by the domestic animals.	80.71/ rft	98.69/ rft	--	--	The rate includes the cost and carriage charges of material upto the work site digging of 1'6"x1'6" pit, fixing of fence posts firmly in the ground upto basal height of 1'6" stretching and fixing of BABW in the hooks, painting numbering of fence posts and display of plantation boards etc.
ii. Fencing – using Square Fence conforming to product code PCFP-3 at spacing of 10' and 4 strands of black annealed Barbed Wire conforming to the product code BA-BW. At least every 8th fence along the straight line and every fence posts at the corner be fixed in the cement concrete block of size 1'6"x1'x1'. This type of fencing be preferred on sites which are likely to experience moderate to light pressure of grazing by the domestic animals.	72.78/ rft.	89.01/ rft	--	--	The rate includes the cost and carriage charges of material upto the work site digging of 1'6"x1'6" pit, fixing of fence posts firmly in the ground upto basal height of 1'6" stretching and fixing of BABW in the hooks, painting numbering of fence posts and display of plantation boards etc.
iii. Fencing – using triangular Fence Posts conforming to product code PCFP-4 at spacing of 8' and 4 strands of black annealed Barbed Wire conforming to the product code BA-BW. At least every 6th fence along the straight fence line and every fence posts at the corner be fixed in the cement concrete block of size 1'6"x9"x9". This type of fencing be preferred on sites which are likely to experience light pressure of grazing by the domestic animals.	70.90 / rft	77.24/ rft	--	--	The rate includes the cost and carriage charges of material upto the work site digging of 1'6" x 9" x6" pit, fixing of fence posts firmly into the ground upto basal height of 1'6" stretching and fixing of BABW in the hooks, painting numbering of fence posts and display of plantation boards etc.

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iv **Fencing – using Wooden Fence posts** of length = 1.85 meter, minimum mid girth of more than 8" to be fixed 1'6" to 2' deep in the ground at a spacing of 8' and 4 strands of Black Annealed Barbed Wire conforming to product code BA-BW. This type of fencing be preferred on sites situated far away in the interior area/remote localities.	68.32/ rft	68.77/ rft	85.57/rft	80.91/rft	The rate includes the cost of BABW, cost of extraction of wooden fence posts to be salvaged only from the dry and dead fallen trees easily available at site, U-nails, paint, Tarcoal and carriage of material upto the work site, tarring and charring, fixing of fence posts, painting and numbering, stretching and fixing of BABW with U-nails and display of plantation boards.
Fencing Repair and Renovation a. Fencing Repair	16.74/ rft	16.74/ rft	19.95/rft	19.08/rft	The rates will be applicable subject to the approval ofCCF/CF only for the fencing which is more than 5 years old and where there is/ are no daily wager(s) for the watch and ward of the unit. Normally the repairs of fencing should be done by the watch and ward staff including daily wagers.
b. Fencing Renovation	26.32/ rft	27.33/ rft	32.39/rft	30.70/rft	The rates including the cost of material upto Rs. 3.30 per rft., Rs. 4.20 per rft in Jammu and Kashmir regions respectively and labour charges. The renovation of fencing will be permissible only in case of damages by natural calamities like land slides, fire occurrence and theft etc. Subject to the approval of the CCF concerned

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Plating **(i) Pit Planting** (a) Planting of poly raised saplings in staggered pits 45cm x 45cm x 45cm along the contours as well as on the flat surface	29.34/ plant	29.34/ plant	34.51/ plant	33.08/ plant	The rates includes the cost of digging of pits, refilling with clean surface soil, carriage of plants and raising of water harvesting structure etc.
(b) Planting of naked root saplings in staggered pits 45x45x45 cms along the contours as well as on the flat surface.	23.17/ plant	23.17/ plant	27.44/ plant	26.28/ plant	The naked planting should be preferred in flat terrine of temperate zone.
(ii) Trench Planting **(a)** Planting of poly raised saplings in staggered trenches of size 90cm x 45cm x 45cm with on plant in each trench	46.42/ plant.	46.42/ plant	55.01/ plant	52.72/ plant	The rate includes the cost of digging of trenches, refilling with clean surface soil, carriage of plant, planting and raising of water harvesting structures etc.
(b) Planting of naked root saplings in staggered trenches of size 90cm x 45cm x45cm with one plant in each trench	42.70/ plant.	42.70/ plant	50.42/ plant	48.32/ plant	The naked planting should be preferred in hilly terrine of temperate zone.
iii. Mawa Planting **(a)** Extraction of Mawa	6.99/ plant	6.99/ plant	8.49/ plant	8.09/ plant	The rate includes extraction charges for standard size Mawa (10" long with minimum mid girth 4") obtainable from forest plantations.
(b) Jumper Planting of Mawa	12.82/ plant.	12.82/ plant.	14.93/	14.36/ plant	The rate includes the cost and carriage of Mawas upto the plantation site and planting of the Mawa by Jumper planting method. The basal end of Mawas should be embedded inside the soil upto a depth of 1'6" to 2'.
iv. Dibbling of H.C. Nuts	7.18/ dibble	7.18/ dibble	8.83/ dibble	8.38/ dibble	The rate includes cost of healthy seeds and its carriage upto working site. At least two seeds should be dibbled per patch.
v Patch Sowing in 45cm x 45cm x 15 cm patches	6.99/ patch	6.99/ patch	8.50/ patch	8.09/ patch	The rate includes the cost of seeds and labour charges

vi. Grass slips in patches	6.35/ slip	6.35/ slip	6.35/ slip	6.35/ slip	The rates includes the cost of grass slips, carriage charges upto site and planting charges
vii. Cutting, grubbing and removal of Lantana	22904/ ha	--	--	--	The rate includes cutting, grubbing and removal of Lantana in a year during the active growth period of the weed. This activity should not be resorted to unless the area is simultaneously being planted. Simple removal of weeds without providing thick cover by artificial plantation will not serve the purpose. 50% of amount may be charged for the second cutting if required in same place in the same year.
viii. Pruning and training of existing root stocks. (Tending operation)	6.35/ plant	6.35/ plant	7.35/ plant	7.06/ plant	The rate includes the cost of pruning and training tools and the labour charges.
3. Plant production a. Formation of New Permanent Nursery	302544/ ha	302544/ ha	358034.6/ Ha	342914/ ha	The rate includes the cost of levelling tractorization, complete soil working upto a depth of 1'6" to 2' formation of beds, raising of bunds, water channels and paths etc.
b. Raising of saplings in polythene bags of size (9" x 6") conforming to product code No. PB-60/90 with artificial source of irrigation in the nursery	8.03/ plant	8.03/ plant	8.03/ plant	8.03/ plant	The rate will includes cost of all components including the cost of Poly Bags, seed, pesticide and well rotten FYM to be used with good earth in the ratio of 2:3 and the cost of running of 5diesel pump, but does not includes cost of pump, its accessories and maintenance of plant.

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c. Raising of saplings in polythene bags of size (18"x14") conforming to product code No. PB-60/90 with artificial source of irrigation in the nursery	42.88/ plant	42.88/ plant	42.88/ plant	42.88/ plant	The rate will includes cost of all components including the cost of Poly Bags, seed, pesticide and well rotten FYM to be used with good earth in the ratio of 2:3 and the cost of running of 6diesel pump, but does not includes cost of pump, its accessories and maintenance of plant.
d. Raising of Naked Root saplings	7.44/ plant	7.44/ plant	9.30/ plant	8.79/ plant	The rate includes the cost of all components including the cost of seed well rotten FYM weeding, hoeing and maintenance for one year.
e. Maintenance of Poly raised conifer saplings in nurseries of 9" x 6"					
i. During 1st year of raising of plants	2.66/ plant	2.66/ plant	2.66/ plant	2.66/ plant	The rate includes the maintenance cost of plants during the 1st year.
ii. During 2nd year of raising of plants	2.66/ plant	2.66/ plant	2.66/ plant	2.66/ plant	The rate includes the maintenance cost of plants during the 2nd year.
iii. During the 3rd year of raising of plants	3.83/ plant.	3.83/ plant.	3.83/ plant.	3.83/ plant.	The rate includes the 6maintenance cost and replacement of the old rotten Poly Bags by the new ones in the 3rd year.
f. Maintenance of Poly raised conifer saplings in nurseries of 18" x 14"					
i. During 1st year of raising of plants	13.20/ plant	13.20/ plant	13.20/ plant	13.20/ plant	The rate includes the maintenance cost of plants during the 1st year.
ii. During 2nd year of raising of plants	13.20/ plant	13.20/ plant	13.20/ plant	13.20/ plant	The rate includes the maintenance cost of plants during the 2nd year.
iii. During the 3rd year of raising of plants	19.00/ plant.	19.00/ plant	19.00/ plant.	19.00/ plant	The rate includes the 6maintenance cost and replacement of the old rotten Poly Bags by the new ones in the 3rd year.

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4. Marking and Enumeration of trees:- **a.** Enumeration of trees.	5.40/ tree	5.40/ tree	5.40/ tree	5.40/ tree	The rate includes the labour charges for marking and numbering etc including bush clearance, cost of material / equipment.
b. Marking of trees	9.75/ tree	9.75/ tree	9.75/ tree	9.75/ tree	The rate includes labour charges and other expenses for making of trees (both standing and fallen) including bush clearance, cost of material / equipment.
Working Plan and Resources Survey : **a. Layout of boundaries**	1673.21 Per sq. Km	1673.21 Per sq. Km	1986.71 Per sq Km	1673.21 Per sq. Km	The rate includes the wages of one skilled and three unskilled labourers to be engaged in the layout of the boundaries, including making and tarring of dry layout rings and making and fixing of various types of demarcation boards of standard sizes. This includes cost of material and tools required for the purpose.
b. Point Sampling	2261.05 Per sample point	2261.05 Per sample point	2679.05 Per sample point	2261.05 Per sample point	The rate includes the wages of two skilled and four unskilled labourers to be engaged in locating the primary and secondary reference point. Location layout and survey of sample point selected at random and collection of the data.
c. Survey of sample plot (Bamboo Survey)	2921.05 Per plot of size 0.1 ha	2921.05 Per plot of size 0.1 ha	3460.05 Per plot of size 0.1 ha	2921.05 Per plot of size 0.1 ha	The rate includes the wages of two skilled and six unskilled labourers to be engaged in locating, layout and survey of six sample plot of size 0.1 hectare selected randomly and collection of data

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d. **Plantation (Plot) Survey**	799.26 Plot of size (10M x 10M)	799.26 Plot of size (10M x 10M)	947.76 Plot of size (10M x 10M)	799.26 Plot of size (10M x 10M)	The rate includes the wages of one skilled and one unskilled labourer required to be engaged in locating, layout and survey of a sample plot of size 0.01 hectare (10 M x 10M) selected at random in plantation area and collection of Data.
e. **Resin channel survey**	799.26 Plot of size 0.1 hectare	-	-	-	The rate includes the wages of one skilled and one unskilled labourer required to be engaged in locating, layout and survey of a circular sample plot of size 1 hectare selected at random and collection of Data. The circular sample plot be normally laid out around the sample point to be surveyed in the Chir area.
f. **Regeneration Survey/ Fixed plot survey**	2921.05 Per plot of size 0.1 hectare	2921.05 Per plot of size 0.1 hectare	3460.05 Per plot of size 0.1 hectare	2921.05 Per plot of size 0.1 hectare	The rate includes the wages of two skilled and six unskilled labourer required to be engaged in locating, layout and survey of a fixed plot of size 0.1 hectare selected at random and collection of Data.
Engineering Works **i.** Laying of wire crates for plugging gullies and Nallahs.					The prevailing state PWD schedule may be applied. It should be preferred to DRSM in the interest of sustenance of the work for longer period duration.
ii. Stone Wall Fencing					The prevailing State PWD schedule may be applied.

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iii. Construction of Bridges, Culverts and Roads					The prevailing State PWD schedule may be applied.
i. DRSM works	1099/ cu.mt.	1099/ cu.mt.	1300/- cu.mt	1245/- cu.mt.	The rate includes the cost of collection, carriage of stone to the work site, fashioning of stones to be used along the exposed faces, in the construction of DRSM. It should be preferred only in sites which experience low to moderate rainfall and are free from flash floods.
ii. Inspection Path **a.** Construction of inspection path 1.5 Meter wide with standard specification	45221/ km	45221/ km	52349/ km	46849/km	The rate includes the cost and carriage of the material and labour charges
b. Construction of inspection path 1.0 Meter wide with standard specification	36971/ km	36971/ km	43736/ km	41536/km	The rate includes the cost and carriage of the material and labour charges.
iii. Fire line: i. Construction of permanent Fire line 10 mtr.. in width with standard specification	29250/- km.	29250/- km.	-	-	The rate includes the cutting/ burning/ disposal of bushes / slash/ debris/ dry leafs/ humus, fallen branches and other inflammable material and labour charges. The permanent fire line shall constructed in highly venerable areas. The rate is based on the PWD schedule of rates for bush clearance @ 5.85/ sq. mt. assuming 50% of the fire line area covered with bushes.
ii. Maintenance of permanent Fire line 10 mtr.. in width with standard specification	14625/- km	14625/- km	-	-	The rate includes the burning of slash, debris, dry leafs, fallen branches and other inflammable material and labour charges.

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Demarcation Works Fixing of RCC Boundary Pillar of size 6' x 1' 6" x 6"	-	-			The prevailing state PWD schedule rates may be applied. The escalation on said PWD rates shall be based on the site and terrain conditions and further subject to approval from competent authority.

The present revised rates are however, subject to the following conditions:

a. The revised schedule rates of works are for the areas which are within 1 km from approach road.
b. The revised schedule rate in respect to all the above said works shall be raised suitably in order to cover the extra expenditure involved in carriage of fencing material, planting stock and RCC boundary pillars, manually/ mechanically to cover longer distance in the far flung and in the interior Forest areas as per the carriage schedule chart of PWD schedule of rates of 2012.
c. For pit planting in 100% hard rock, 80% hard rock plus 20% ordinary soil and back filling of soil typical estimate based on prevailing PWD schedule rate may be followed.
d. For any specific location or any specific terrain the rate may be calculated based on terrain condition and be referred to the competent authority for approval.
e. Any deviation in the fencing viz chain link fencing with toe-wall, fixing of every square PCC fencing posts in cement concrete block, using mesh wire on PCC fence post, tree guards etc, for which estimates in this regard be prepared as per the prevailing PWD schedule rates and approval may be obtained from Competent Authority.
f. With regard to Leh and Kargil Districts the Labour rates may be applied as approved by the District Development Commissioners.
g. The built in factor which was approved in the Forest Order No. 91 of 2005 dated : 26-09-2005 has been adopted and is being annexed to this order as Annexure-A.

(A. K. SINGH) IFS
Pr. Chief Conservator of Forests (HoFF)

No PccF/Ply/2016-17/1673-87 Dated 11-03-2017

Copy for information and necessary action to the:

1. Commissioner/Secretary to Government, Forest Department, Civil Secretariat, Jammu. This also takes in reference to your letter No FST/Plan-28/2016-17 Dated: 08.03.2017 on the subject.
2. Chief Conservator of Forests, Jammu/Kashmir.
3. All other Head of Department (J&K Forest Department).
4. Conservator of Forests, Central Circle, Jammu.
5. Conservator of Forests, Working Plan, Jammu.
6. Senior Agrostologist, Forest Department.

Annexure-II

1. Per ha Cost Norm for Normal Afforestation

S. No.	Operation	Unit	Unit Cost (Rs)	Qty	Total Cost (Rs)
1	ADVANCE WORK				
	a) Fencing with PCC Posts	Rft.	89.01	300	26703
2	CREATION				
	A. PLANTATION				
	a) Pit Plantation (PB)	No.	29.34	330	9682
	b) Pit Plantation (NR)	No.	23.17	770	17841
	B. SOWING				
	a) Patch Sowing	No.	6.99	370	2586
	b) Dibbling	No.	7.18	370	2657
3	SMC WORKS	Cum.	1099.00	5	5495
	Sub Total I				**64964**
	Or Say				**64965**
4	MAINTENANCE				
	(BUS) 1st year @ 25% of last year plantation				
	a) PB plantation	No.	29.34	83	2435
	b) NR plantation	No.	23.17	193	4472
	(BUS) 2nd year @ 15% of last year plantation				
	a) PB plantation	No.	29.34	50	1467
	b) NR plantation	No.	23.17	116	2688
	(BUS) 3rd year @ 5% of last year plantation				
	a) PB plantation	No.	29.34	17	499
	b) NR plantation	No.	23.17	39	904
	Sub Total II				**12464**
	Or Say				**12465**
	Grand Total (Sub Total I + II)				**77428**
	OR SAY				**77430**

2. Per ha Cost Norm for Enrichment

S. No.	Operation	Unit	Unit Cost (Rs)	Qty	Total Cost (Rs)
1	ADVANCE WORK				
	a) Fencing with PCC Posts	Rft.	68.77	300	20631
2	CREATION				
	A. PLANTATION				
	a) Pit Plantation (PB)	No.	29.34	240	7042
	b) Pit Plantation (NR)	No.	23.17	560	12975
	B. SOWING				
	a) Patch Sowing	No.	6.99	270	1887
	b) Dibbling	No.	7.18	270	1939
3	SMC WORKS	Cum.	1099.00	5	5495
	Sub Total I				**49969**
	Or Say				**49970**
4	MAINTENANCE				
	(BUS) 1st year @ 25% of last year plantation				
	a) PB plantation	No.	29.34	60	1760

S. No.	Operation	Unit	Unit Cost (Rs)	Qty	Total Cost (Rs)
	b) NR plantation	No.	23.17	140	3244
	(BUS) 2nd year @ 15% of last year plantation	No.			
	a) PB plantation		29.34	36	1056
	b) NR plantation	No.	23.17	84	1946
	(BUS) 3rd year @ 5% of last year plantation	No.			
	a) PB plantation		29.34	12	352
	b) NR plantation	No.	23.17	28	649
	Sub Total II	No.			**9008**
	Or Say				**9000**
	Grand Total (Sub Total I + II)				**58976**
	OR SAY				**58970**

3. Per ha Cost Norm for Pasture Development

S. No.	Operation	Unit	Unit Cost (Rs)	Qty	Total Cost (Rs)
1	ADVANCE WORK				
	a) Fencing with PCC Posts	Rft.	68.77	300	20631
2	CREATION				
	A. PLANTATION				
	a) Pit Plantation (PB)	No.	29.34	330	9682
	b) Pit Plantation (NR)	No.	23.17	770	17841
	B. SOWING				
	a) Patch Sowing	No.	6.99	370	2586
	b) Dibbling	No.	7.18	370	2657
3	SMC WORKS	Cum.	1099.00	5	5495
	Sub Total I				**58892**
	Or Say				**58890**
4	MAINTENANCE				
	(BUS) 1st year @ 25% of last year plantation				
	a) PB plantation	No.	29.34	83	2435
	b) NR plantation	No.	23.17	193	4472
	(BUS) 2nd year @ 15% of last year plantation				
	a) PB plantation	No.	29.34	50	1467
	b) NR plantation	No.	23.17	116	2688
	(BUS) 3rd year @ 5% of last year plantation				
	a) PB plantation	No.	29.34	17	499
	b) NR plantation	No.	23.17	39	904
	Sub Total II				**12464**
	Or Say				**12465**
	Grand Total (Sub Total I + II)				**71356**
	OR SAY				**71355**

4. Per ha Cost Norm for Assisted Natural Regeneration

S. No.	Operation	Unit	Unit Cost (Rs)	Qty	Total Cost (Rs)
2	ADVANCE WORK				
	a) Fencing with PCC Posts	Rft.	89.01	300	26703
3	CREATION				
	A. PLANTATION				
	a) Pit Plantation (PB)	No.	29.34	120	3521
	b) Pit Plantation (NR)	No.	23.17	280	6488
	B. SOWING				
	a) Patch Sowing	No.	6.99	135	944
	b) Dibbling	No.	7.18	135	969
4	SMC WORKS	Cum.	1099.00	5	5495
	Sub Total I				**44119**
	Or Say				**44120**
5	MAINTENANCE				
	(BUS) 1st year @ 25% of last year plantation				
	a) PB plantation	No.	29.34	30	880
	b) NR plantation	No.	23.17	70	1622
	(BUS) 2nd year @ 15% of last year plantation				
	a) PB plantation	No.	29.34	18	528
	b) NR plantation	No.	23.17	42	973
	(BUS) 3rd year @ 5% of last year plantation				
	a) PB plantation	No.	29.34	6	176
	b) NR plantation	No.	23.17	14	324
	Sub Total II				**4504**
	Or Say				**4500**
	Grand Total (Sub Total I + II)				**48623**
	OR SAY				**48620**