Revised Action Plan for Rejuvenation of Nandhor/Kailash River Stretches

Priority –IV

1. INTRODUCTION

River Nandhor/ Kailash originate from Pangoot, Nainital Forest and flows downward along the EldecoSidcul Industrial Park (ESIPL) Sitarganj and further Sitarganj town of Uttarakhand. River Nandhor is known as river Kailash. Within the catchment of river, about 96 operating industries are located in the ESIPL Sitarganj, which contributes its wastewater to CETP for treatment and disposal. CETP receives about 2.4-2.5 MLD wastewater against the installed capacity of 4.0 MLD. Though the treated wastewater is being disposed through land disposal (Karnal technology) and overflow goes to Baigul canal. The google image of Sitarganj town along with river Nandhor/ Kailash is annexed at Annexure – 01.

2. WATER QUALITY GOALS:

It is an important aspect for maintain wholesomeness of river Nandhor/Kailash in context of meeting water quality criteria for bathing. In order to meet the water quality criteria for bathing, it is imperative to keep close observation on industrial units /CETP and drain flowing towards river Nandhor/Kailash.

Water Quality Monitoring of River Nandhor/Kailash:

River quality monitoring is being carried out by the Uttarakhand Pollution Control Board. Water quality characteristics data is as follows:

River Nandhor/Kailash at upstream of Nandhor/Kailash (US Nagar) (2018)

Month	pH	BOD (mg/L)	DO (mg/L)
Jan-18	River Dry		
Feb-18			
Mar-18			
Apr-18			
May-18			
Jun-18			
Jul-18	7.6	4.2	6.4
Aug-18	7.3	2	7.4
Sep-18	7.4	3.2	7.2
Oct-18	7.2	6	6.8
Nov-18	7.6	4	6.8
Dec-18	River Dry		

River Nandhor/Kailash at Downstream of (US Nagar) (2018)

Month	pH	BOD (mg/L)	DO (mg/L)
Jan-18	7.6	4	8
Feb-18	8.1	8	7.6
Mar-18	7.7	2	7.2
Apr-18	7.38	7	6
May-18	7.46	8.2	6.2
Jun-18	River Dry		
Jul-18	7.8	8.2	6
Aug-18	7.1	6	6.8
Sep-18	7.3	8	6.2

Oct-18	7.89	10	5.8
Nov-18	7.9	10	5.6
Dec-18	7.6	8	5.2

River Nandhor/Kailash at upstream of Nandhor/Kailash (US Nagar) (2019)

Month	pH	BOD (mg/L)	DO (mg/L)
Jan-19	River Dry		
Feb-19			
Mar-19			
Apr-19			
May-19			
Jun-19			
Jul-19			
Aug-19	7.4	12	4
Sep-19	7.3	4	5
Oct-19	7.5	3.8	6.2
Nov-19	8.2	7	6
Dec-19	7.2	3.8	6

River Nandhor/Kailash at Downstream of (US Nagar) (2019)

Month	pH	BOD (mg/L)	DO (mg/L)
Jan-19	7.7	8	4.8
Feb-19	7.5	8	5
Mar-19	7.3	6.2	5.6
Apr-19	7.5	4.8	5.2
May-19	7.3	4.2	5.6
Jun-19	7.6	4	6
Jul-19	7.3	4	5.6
Aug-19	7.3	5	3.6
Sep-19	7.7	4	4.4
Oct-19	7.99	8	6.4
Nov-19	7.7	15	5
Dec-19	7.8	12	6.4

River Nandhor/Kailash at upstream of Nandhor/Kailash (US Nagar) (2020)

Month 2020	pH	BOD (mg/L)	DO (mg/L)	Total Coliforms MPN/100ml
May-20	No Discharge of water			
Jun-20	No Discharge of water			
Jul-20	8	5.4	3.0	210
Aug-20	7.01	5.0	6.9	240

River Nandhor/Kailash at Down stream of Nandhor/Kailash (US Nagar).

Month 2020	pH	B.O.D. (mg/L)	D.O. (mg/L)	Total coliforms MPN/100ml
May-20	7.9	8.0	5.4	--
Jun-20	8.2	8.6	2.6	-
Jul-20	8.4	6.0	2.9	430

Aug-20	7.7	5.6	6.3	900

The drainage map of river Nandhor is annexed at Annexure - 02

Basis of Proposed Action Plan for rejuvenation of river Nandhor/Kailash:

River Nandhor/Kailash is a spring fed river and as such no direct source of industrial wastewater have been reported in river (before ESIPL), therefore other sources including drains from town and hamlets will be identified.

3. IDENTIFICATION OF SOURCE OF POLLUTION:

The proposed action plan for rejuvenation of river Nandhor/Kailash consisting following components:

3.1 Source Control:

Source control includes industrial pollution control and treatment and disposal of domestic sewage as detailed below:

(a) Industrial Pollution control:

i. Identification of pollution potential industries.
ii. Sector specific categorization of industries.
iii. Assessment of Water consumption and wastewater discharge and gap in treatment of industrial effluent.

(b) Sewage Management:

i. Estimation of quantity of sewage generated and requirement of treatment capacity.
ii. Gap analysis in terms of sewage generation, existing installed treatment capacity and required treatment capacity.
iii. Identification of municipal drains & their discharge in the catchment of river Bhela.
iv. Interception and diversion of municipal drains to STP.

(c) Solid Waste Management:

i. Implementation of Door-to-Door collection.
ii. Source segregation as biodegradable and non-biodegradable wastes.
iii. Identification of suitable site for setting up common waste processing and secure landfill facility.
iv. Restriction illegal disposal of solid waste along the river bank and flood plain zones.
v. Prohibition on burning of solid wastes.
vi. Implementation of Construction and Demolition Wastes Management Rules.

(d) Ground Water Quality:

i. Periodic groundwater quality assessment at strategic locations.

3.3 Flood Plain Zone.

i. Flood plain zoning.

3.4 Ecological/Environmental Flow (E-Flow)

i. Maintaining E-flow.

3.5 Catchment area treatment

i. Activity wise River Rejuvenation plan.

4. RIVER NANDHOR REJUVENATION PLAN:

Following are the action plan for rejuvenation of river Nandhor/Kailash as detailed below:

4.1 Industrial Effluent Management:

The UKPCB is vigilant on operation of Common Effluent Treatment Plant and other grossly polluting industries (GPIs) and other categories of water polluting industries. There are 96 Nos. of industries operational in the EldecoSiidcul Industrial Estate (ESIPL),

SN	Industry Name	Water Consumption (KLD)	Waste Water Generation (KLD)	Existing treatment facility
1	Gujarat Ambuja Exports Ltd. ESIPL, Sitarganj	3613	1647	Comply
2	Balaji Action Buildwell Ltd., Phase-III ESIPL, Sitarganj	1710	650	Comply

Wastewater so generated is contributing to CETP after treatment in order to meet CETP inlet parameters. GPIs are being monitored in every quarter apart from other surprise inspection. Online effluent monitoring systems have also been provided at effluent outlet and real time data are being transmitted to Central Pollution Control Board and UKPCB.

Category wise number of industries operating in the area are as follows: All the unit have valid CCA and complying the norms .

S.N.	Number of Unit			Total	Compliance status
	Red	Orange	Green		
1	16	51	29	96	All unit are connected to CETP.

Operation of CETP:

Regular monitoring of CETP outlet is carried out in order to comply outlet discharge standards as specified under Environment (Protection) Rules, 1986 as amended.

Environmental Surveillance Squad (ESS) also formed at Head Office level in order to make surprise inspection. Strengthening of ESS will be carried out for effective surveillance.

4.2 Industrial hazardous waste management:

Recyclable hazardous wastes, mainly used oil /contaminated barrels are being recycled through registered recyclers, while Incinerable and landfillable waste is being disposed thorough M/S Bharat Oil and Waste Management Pvt. Ltd. located at Laksar, Distt. Haridwar with an installed capacity of 667 MT/month landfill. Incinerable hazardous waste

is disposed through common incinerator of 1000MT/Month capacity at TSDF or through co-processing in cement kilns.

4.3 Sewage Management:

It is estimated that about 4.25 MLD sewerage is generated from Sitarganj town. At present there is no sewerage treatment facility in the town and individual septic tanks have been made by households for disposal of sewage TharuBhanori joins river Kailash in downstream of Sitarganj town. Detail of tharubhanori drain are:

General Parameters:

S.N.	Drain	Flow MLD	pH	BOD (mg/l)	DO (mg/l)	Facealcolifrom (MPN/100)	FacealSteptoCocci
1	TharuBhagori drain	2.0	7.42	8.5	6.8	150	70

Heavy Metals

S.N.	Drain	Cd (mg/l)	Cr (mg/l)	Ni (mg/l)	Zn (mg/l)	Fe (mg/l)	As (mg/l)
1	TharuBhagori drain	0.001	0.03	0.012	0.14	1.58	0.01

The action plan for sewage management is as follows:

S.N.	Name of ULB	Total Sewage generation MLD		Available treatment facility	Action Plan
		Existing	Expected for 2032		
1	Nagar PalikaSitarganj	3.4	4.25	No	DPR for Rs 13.44 Lac for Bio-remediation sent to NMCG for approval. DPR of Rs 27.35 Crs for STP and interception & diversion sent to NMCG for approval .

The state Govt. has promulgated septase the management protocol and also contributed local authority wise committee for implementation of protocol.

4.4 Solid Waste Treatment:

Nagar PalikaParisad, Sitarganj is statuary body responsible for management of solid wastes as per provisions of Solid Waste Management Rules, 2016 as amended. The population of Sitarganjr town is 31185 as per census of 2011. Nagar PalikaParisad is divided into 13 wards. the action plan for solid waste management is as follows.

S.N.	Name of ULB	No. of Wards	Quantity of Waste MTD	D-to-D collection	Source segregation	Action plan
1	Nagar Palika, Sitarganj	13	19	100%	100%	DPR for Rs 4.02 Crs for common disposal facility approved

4.5 C& D Waste Management

The Uttarakhand Urban Development Department has issued necessary directions to all local body for identification of site for disposal of C& D Waste. The copy of the same is annexed at Annexure – 02.

Ground Water Quality:

So far contamination of groundwater is not reported in the area, however groundwater quality monitoring is being carried out by UKPCB. It is proposed at least twice in the year, the monitoring of ground water will be carried out. The analysis report of ground water is as follows:

General Parameter

Sampling Locations	Parameter					
	pH	EC µs/cm	TDS mg/l	COD mg/l	Fluoride mg/l	Total Hardness mg/l
Upstream of river Nandhor	7.18	899	449	6.4	0.62	360
Downstream of river Nandhor	7.29	387	194	6.9	0.22	216

Heavy Metals

Sampling Locations	Parameter mg/l					
	Cd	Cr	Ni	Zn	Fe	As
Upstream of river Nandhor	0.001	0.01	0.01	0.08	1.01	0.01
Down stream of river Nandhor	0.001	0.02	0.01	0.22	1.32	0.01

4.6 Flood Plan Zone (FPZ):

River Nandhor/Kailash is non-perennial water body discharge is found only during monsoon season therefore flood plain zoning is not required for river Nandhor/Kailash as reported by irrigation department.

4.7 Environmental Flow (E-Flow):

River Nandhor.Kailash carrying no natural water during non-monsoon period. The irrigation department has proposed measurement of E-flow of river from October 2020.

4.9 Monitoring of Action Plan:

The proposed Action Plan will be monitored by the River Rejuvenation Committee (RRC) constituted by Government of Uttarakhand vide Office order dated 05.12.2018, under the overall supervision and co-ordination of Principal Secretary, Forest & Environment, Govt. of Uttarakhand.

4.10 Activities wise Gap Analysis details

Municipal Solid waste

S.no.	Name of ULB	Total Solid Waste Generation (MTD)	Available facility	Gaps
1	Nagar PalikaParishad, Sitarganj	19	No Treatment and disposal facility available	100 %

Municipal Sewage Management

S.no.	Name of ULB	Total Waste Water Generation (MlD)	Available Treatment facility	Gaps
1	Nagar PalikaParishad, Sitarganj	4.25	No Treatment facility available	100 %

Industrial Waste Water Management

S.no.	Name of ULB	No. of Unit				Available Treatment facility	Gaps
		Red	Orange	Green	Total		
1	Nagar PalikaParishad, Sitarganj	16	51	29	96	All the units are connected to CETP and complying the norms	Nil

Bio-Medical Waste Management

S.no.	Name of ULB	Total No. of HCF	Total BMW Generation (KG/Day)	Available Treatment facility	Gaps
1	Nagar PalikaParishad, Sitarganj	46	63	Common BWM Treatment Facility Gadarpur	Nil

5.ACTION PLAN:

Identified activities and concerned authorities for compliance of action plan:

SN	Action plan for rejuvenation of river Nandhor/Kailash	Agency Responsible for Execution of the Action Plan	Budgetary Requiremet (Rs. In Lacs)	Time Target
1. Industrial Effluent Management:				
a)	Routine /surprise inspection GPIs and Red category of industries for	Special Environmental Surveillance Task Force /	Nil	Continuous activity.

	ensuring compliance of effluent discharge standards as prescribed under E (P) Rules, 1986, as amended.	UKPCB		
b)	Strengthening of Environment Surveillance Squad (ESS) of UEPPCB	UKPCB	Nil	Continuous activity.
c)	Monitoring of drains carrying industrial wastewater and CETP outlet.	UKPCB	Nil	Continuous activity.
2. Sewage Management:				
a)	Interception and diversion of Ukrauli drain.	UttarakhandPeyjalJal Nigam	**DPR of Rs. 2735.72 lac sent to NMCG for approval**	Proposed activities will be completed in two years from sanction and release of funds.
b)	Installation of 1- STPc of 2 MLD capacity.			
c)	Operation and Maintenance of of STP of 2MLD capacity for 15 years; Operation and Maintenance of drain. I&D Works for 15 years; Land acquisition etc. expenses.			
3. Solid Waste Management:				
a)	Door to door collection of solid waste in all 40 wards of town.	Nagar PalikaParisad, Sitarganj.	DPR of Rs. 402.00 approved.	Proposed activities will be completed in two years from sanction and release of funds.
b)	Source segregation of wastes in all 40 wards of town.			
c)	Setting up solid waste processing facilities.			
4.Groundwater Quality:				
a)	Groundwater quality monitoring at during summer (May-June) and winter (December-January).	UKPCB	-	UKPCB is conducting monitoringTwice in a year
5. Flood Plain Zone:				
a)	River Nandhor/Kailash is non perennial river and, therefore flood plain zoning is not required as reported by Irrigation department.			
6. Environmental Flow:				
a)	River Nandhor/Kailash is non-perennial river. The irrigation department has initiated the measurement of flow from October 2020.			
7. Catchment are treatment:				
a)	The catchment are treatment of the river is proposed to be carried out through CAMPA, the work will be initiated from January 2021.			

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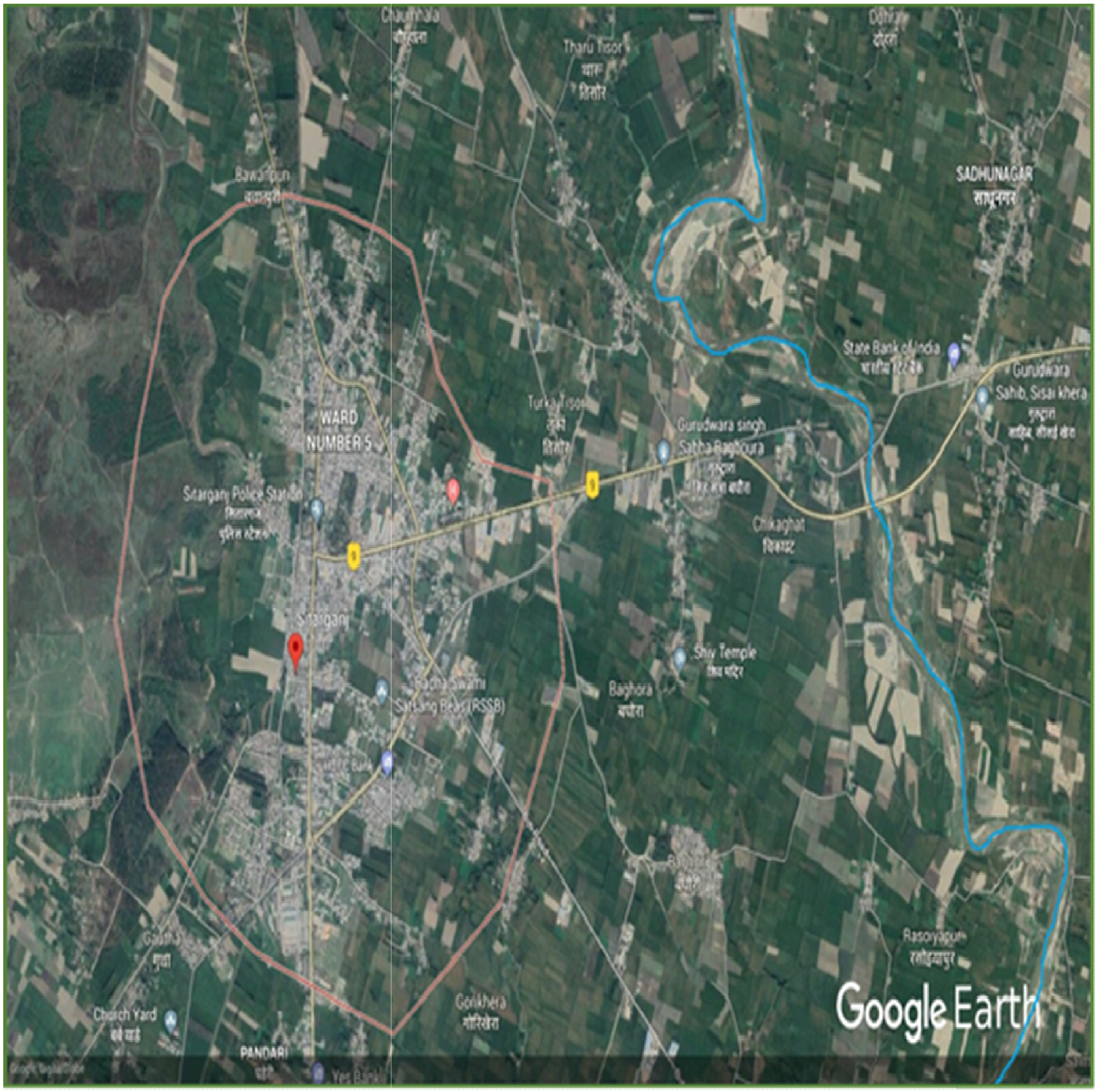
Annexure-1


Tharu Tisor
थारू तिसौर
SADHUNAGAR
साधुनगर
WARD NUMBER 5
Sitarganj Police Station
State Bank of India
भारतीय स्टेट बैंक
Gurudwara Sahib, Sisai khera
Gurudwara singh Sabha Baghoura
Chikaghat
चिकाघाट
Sitarganj
Shiv Temple
शिव मंदिर
Baghora
बघौरा
Radha Swami Satsang Beas (RSSB)
Rasoiyapur
रसोइयापुर
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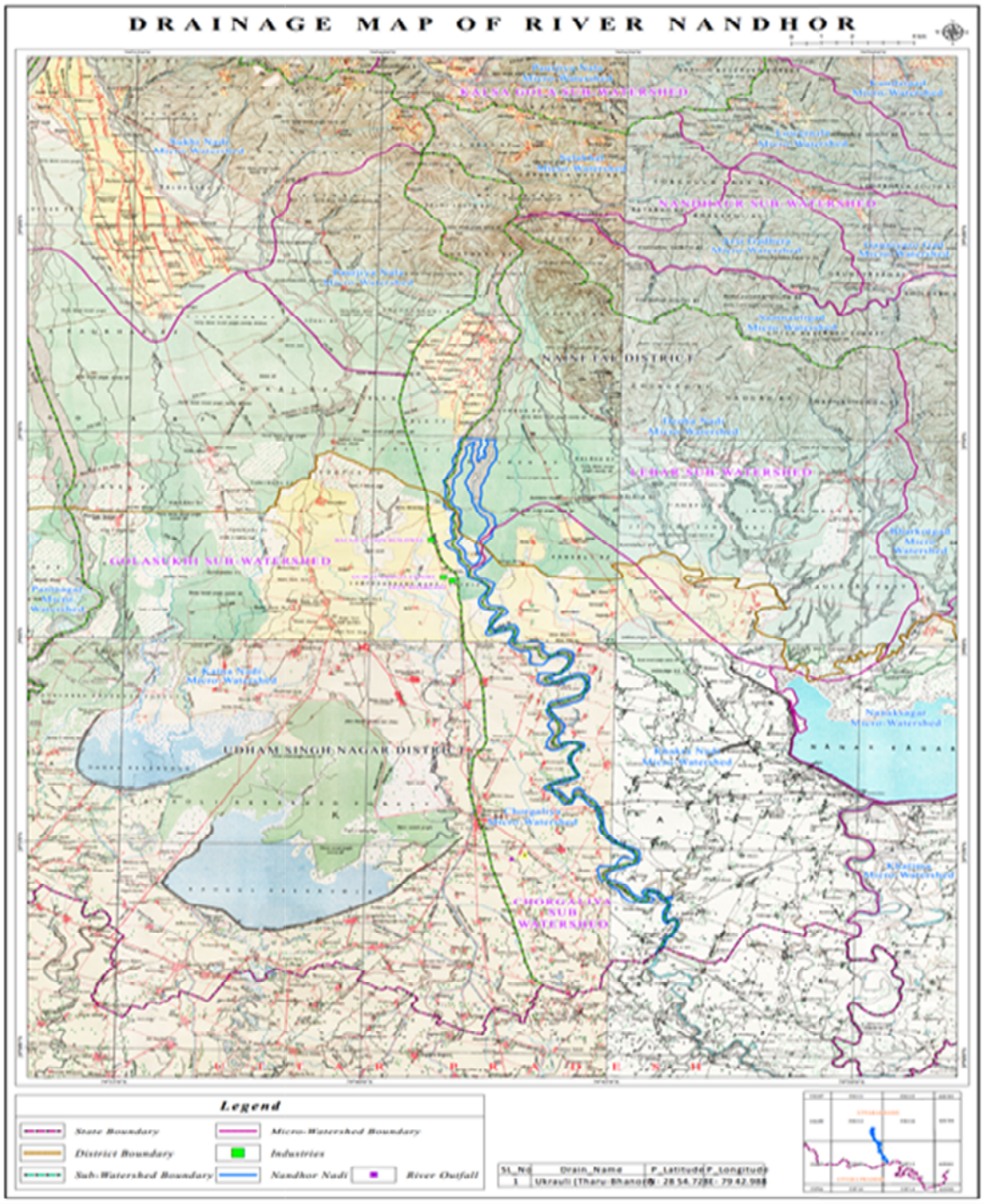
Gorikhera
गोरीखेरा
PANDARI
Yes Bank
Google Earth

Annexure - 02


DRAINAGE MAP OF RIVER NANDHOR
NANDHOR SUB-WATERSHED
GOLANAKHI SUB-WATERSHED
UDHAM SINGH NAGAR DISTRICT
Legend
State Boundary
District Boundary
Sub-Watershed Boundary
Micro-Watershed Boundary
Industries
Nandhor Nadi
River Outfall

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