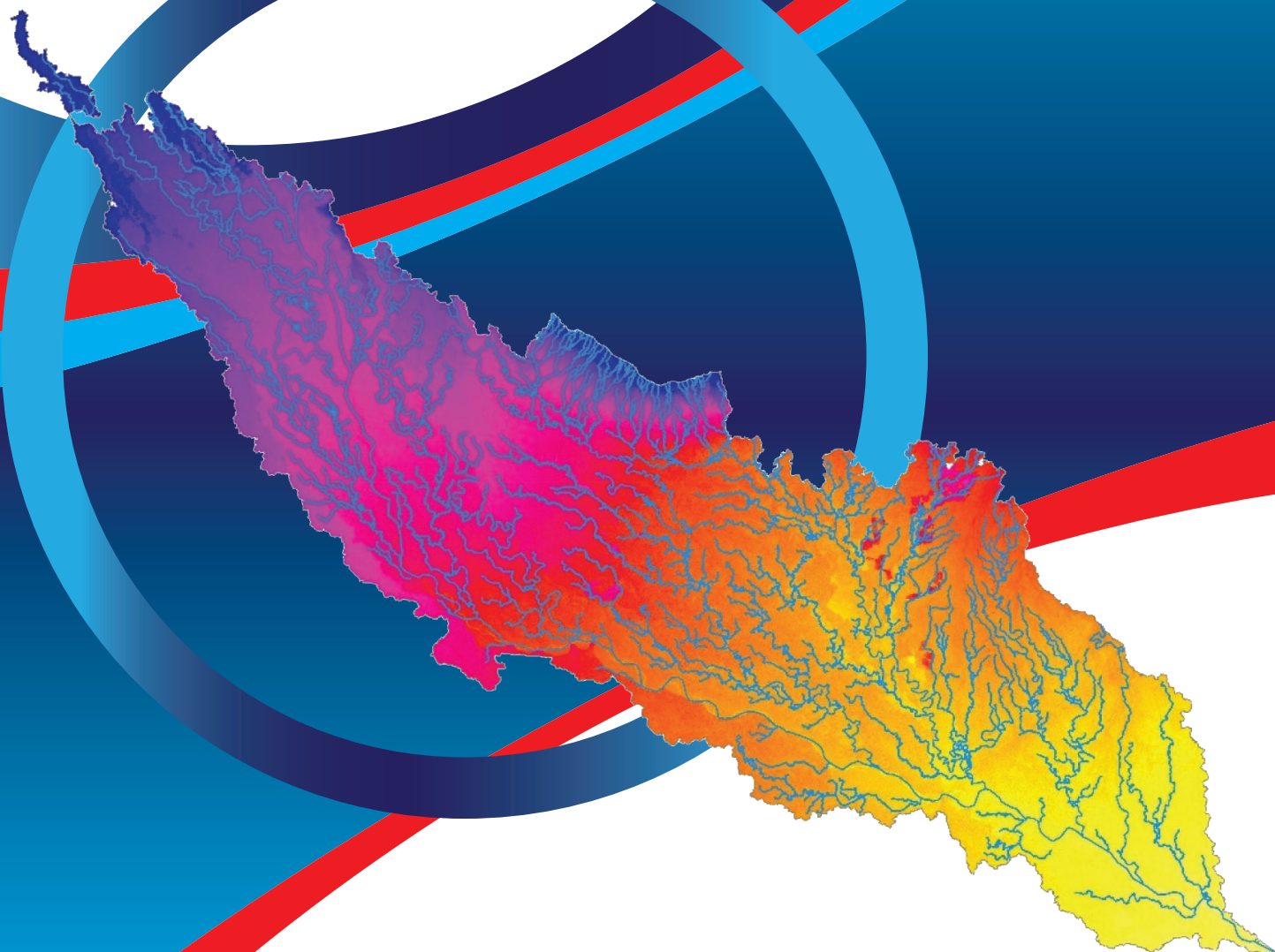




National Mission for Clean Ganga

Ministry of Jal Shakti

Department of Water Resources, River Development & Ganga Rejuvenation
Government of India



GHAGHRA

RIVER BASIN ATLAS



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December 2022

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GHAGHRA

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DECEMBER 2022

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National Mission for Clean Ganga (NMCG)

NMCG is the implementation wing of National Ganga Council which was setup in October 2016 under the River Ganga Authority order 2016. Initially NMCG was registered as a society on 12th August 2011 under the Societies Registration Act 1860. It acted as implementation arm of National Ganga River Basin Authority (NGRBA) which was constituted under the provisions of the Environment (Protection) Act (EPA) 1986. NGRBA has since been dissolved with effect from the 7th October 2016, consequent to constitution of National Council for Rejuvenation, Protection and Management of River Ganga (referred to as National Ganga Council).

www.nmcg.in

Centre for Ganga River Basin Management and Studies (cGanga)

cGanga is a think tank formed under the aegis of NMCG, and one of its stated objectives is to make India a world leader in river and water science. The Centre is headquartered at IIT Kanpur and has representation from most leading science and technological institutes of the country. cGanga's mandate is to serve as think-tank in implementation and dynamic evolution of Ganga River Basin Management Plan (GRBMP) prepared by the Consortium of 7 IITs. In addition to this, it is also responsible for introducing new technologies, innovations, and solutions into India.

www.cganga.org

Acknowledgment

This river atlas document is a collective effort of a number of experts, institutions and organisations, some who had been associated with preparing the Ganga River Basin Management Plan (GRBMP) submitted to the Government of India in 2015, and others who joined later with their own independent expertise and enthusiasm. Contributions to the photographs and images for this document by individuals are gratefully acknowledged.

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PREFACE

The Centre for Ganga River Basin Management and Studies (“cGanga”) was established in the year 2016 as a comprehensive think-tank for river restoration and to assist the National Mission for Clean Ganga (NMCG), Jal Shakti Ministry, GoI, for “continual scientific support in the implementation and dynamic evolution of the Ganga River Basin Management Plan” for conservation of National River Ganga. In keeping with this goal, cGanga has been actively developing detailed knowledge capsules, tools and procedures to enable comprehensive and early rejuvenation of the Ganga River network across the whole basin. While a river basin approach is essential for analyzing and comprehending the Ganga river’s status and needs to regain her wholesomeness, the implementation strategies of the required interventions must keep in mind the role and individuality of each State. Thus, it is necessary to focus on state-level sub-strategies of natural resource management for holistic revival of River Ganga.

The present document attempts to provide a comprehensive picture of the Ghaghra basin river network in the States of Uttar Pradesh and Bihar. This Atlas for the selected basins was created entirely by cGanga, with original mapping of all identifiable rivers, and with selective additional information culled from different sources for completeness. Many of the rivers and maps given here are not readily available elsewhere, and we expect them to prove useful to the many Central, State, and other organizations engaged in the river, water or natural resource management in the Ghaghra basin.

In preparing this document dedicated members of cGanga spent a lot of time in diligently studying, analysing, acquiring, and compiling diverse information from diverse sources. Many people and organisations outside cGanga also helped in its preparation, which aided in its comprehensiveness. We are grateful to one and all of them.

VINOD TARE

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ACRONYMS AND ABBREVIATIONS

NCT	: Billion Cubic Meter
cGanga	: Centre for Ganga River Basin Management and Studies
Cumec	: Cubic meter per second
CWC	: Central Water Commission
DEM	: Digital Elevation Model
GIS	: Geographic Information System
GRBMP	: Ganga River Basin Management Plan
HE	: Hydroelectric
Km	: Kilometer
LULC	: Land Use/ Land Cover
M	: Meter
MCM	: Million Cubic Meter
mm	: millimeter
Sol	: Survey of India
Sq. Km	: Square Kilometer
SWAT	: Soil & Water Assessment Tool

INTRODUCTION

The state of Uttarakhand nestled in the Western Himalayas is unique for its mountainous terrain, temperate to freezing climate, verdant greenery, rich wildlife, speeding rivers, and opulent lakes and springs. The present volume is a first attempt to map the rich river network of Ghaghra basin in as fine a detail as possible. Much of the information contained in this River Atlas is not available in any other document and was created in original from available earth images with appropriate data and image processing tools and software on GIS platform. Naturally, there may be shortcomings in some of the maps herein, including missing small streams, which can be expected to be duly refined and included in later versions. Also, a river atlas is often useful in conjunction with other natural resource and anthropogenic information such as the distribution of rainfall and other climatic data, other waterbodies, forest cover, elevations, soil types, other physiographic information, land use, tourist and pilgrimage centres, and infrastructure including roads and highways. Such other relevant information is also expected to be processed, assembled and included later in a fuller version of this Atlas. In the meanwhile, it is hoped that this Atlas will provide a useful window to Ghaghra basin river resource.

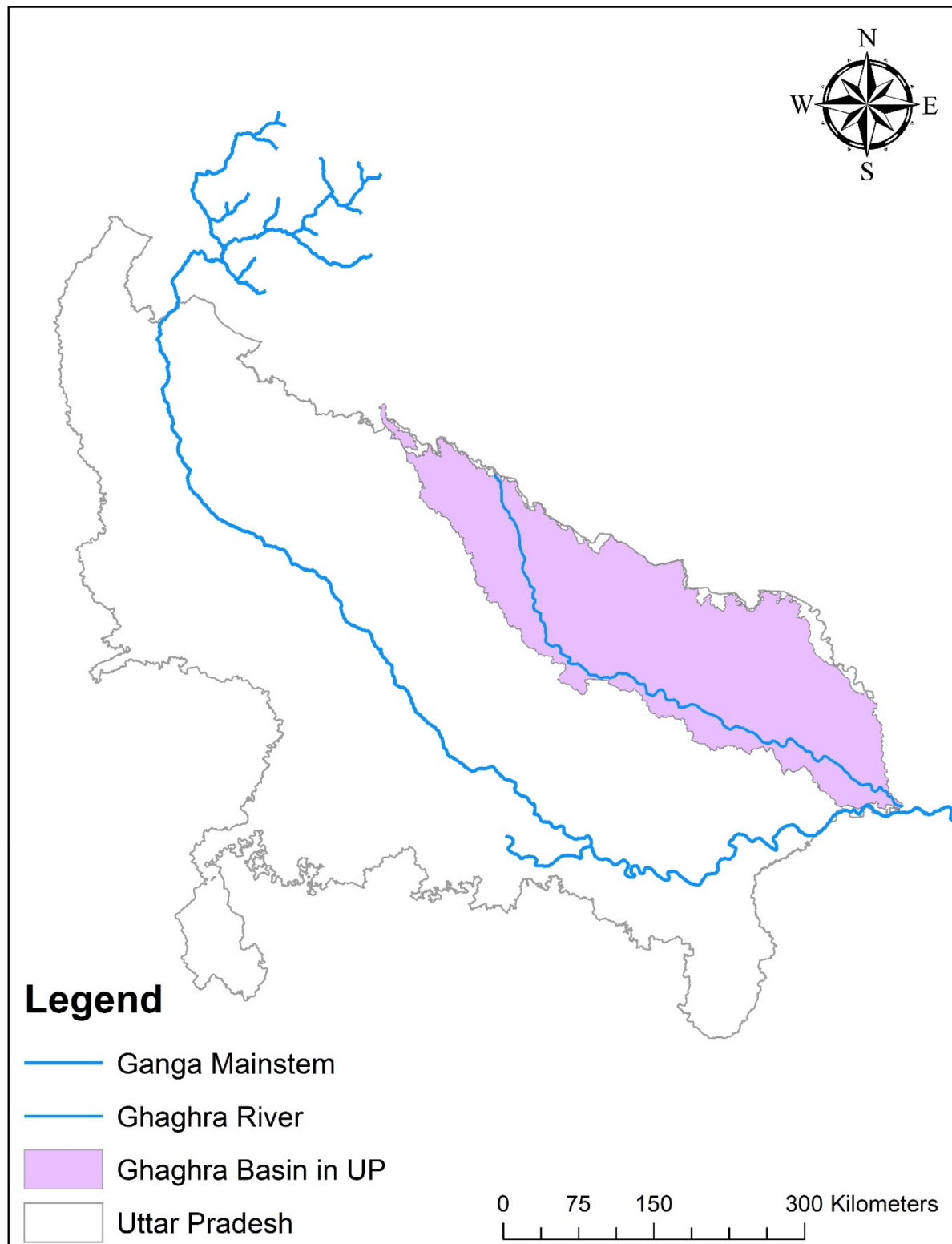


Figure: Location of Ghaghara Basin

GHAGHARA BASIN: SALIENT FEATURES

S No	Particulars	Details
1	State Extent	Latitude: 25°47' to 30°31' N and Longitude: 79°29' to 84°49' E
2	Total Geographical Area (sq. km)	In UP: 4881.50
3	Area contributing to Ganga Basin (sq km)	32,674.42
4	Percentage of the Ganga Basin Area (%)	0.56
5	Districts (Census 2011)	UP: 20
6	Towns (Census 2011)	Class I: 08, Class II: 06, Class III: 35
7	Total Population (Census 2011)	25,864,960
8	Gram Panchayats	18973
9	Census Villages (Census 2011)	25139
10	Average Annual Rainfall (mm)	1000.30
11	Average Temperature Range (oC)	10.9°C to 31.71°C
12	Major Rivers	Saryu, Sarda, Rapti, Kwano, Little Gandak, Seti
13	Number of Major Basins (04 or above order river basins)	08
14	Number of Water Resources Structures	(Dams: 0, Barrages: 05, Weir: 0, Anicuts: 0, Lifts: 0, Power houses: 0)
15	Number of HE projects (> 25 MW)	0
16	Number of Ground Water Observation wells	Groundwater level monitoring wells: 1745 Groundwater quality monitoring wells: 181
17	Number of CWC Sites	25





GHAGHRA BASIN: RIVERS TRAVERSING THROUGH VARIOUS DISTRICTS IN BASIN AREA

S.No	State	District	Area (sq km)	Population (census 2011)	Growth Rate (%)	Density	River
1	Uttar Pradesh	Lakhimpur Kheri	7,680	4,021,243	25.38	524	Babai River, Bagtala Nala, Baha Nadi, Bajahi, Bhagahar Nadi, Bhatiya Nadi, Bhola Nala, Chawa Nala, Chhauwa Nala, Dahawar River, Ghaghi Nadi, Ghaghra, Ghaghra Nadi or Ull River, Jarahi Nala, Jauraha Nala, Jhana, Kewani Nadi or Kewani Nala, Phataha Nala, Saidapur Drain, Sardha River, Sarju or Suhelli River, Shukhni Nadi, Shukhni Nala, Sotia Nala, Sotiya Nala., Surma Nala, Sutiya Nala, Tikona Nala
2		Bahraich	5,237	3,487,731	46.48	666	Babai Nala, Babai River, Babhni Nadi, Bhaghar Nala, Dhundra Nala, Ghaghra, Ghagwa Nadi, Jamaar Nala, Jhingri Nala, Jhinha Nala, Karhera Nala or Bhakausa Nala, Katuwa Nala, Khudwa Nala, kurai Nala, Madarla Nala, Maila Nala, Muhammada Nala, Narwa Nala, Old Bed of Chaureri River, Rakya Tal, Risia Nala, Sarju or Suhelli River, Sarju River, Seti, Sigahi Nala, Soti Nadi or Chuka Nala, Soti Nala, Soti Nala, Sotia Nala, Sotiya Nala, Sukhni Nala, Tehri Nadi
3		Maharajganj	2,952	2,684,703	23.5	909	Baghela, Balia Nala, Bijaisalahi Nala, Bokwa Nala, Choti Gandak, Dandoh Nala, Dhunakwa Nala, Dumraha, Ghonghi Nadi, Hirni Nala, Kakera Nala., Kalan Nala, Kanchi or Duranchi Nala, Khamukhar Nala, Khekhra Nala, Khurna Nala, Kula Nala, Madrahi, Mahau, Majhna Nala, Malaon, Maun Nala, Nadao Nala, Pharend Nala, Piyas Nala, Potaha, Powa Nala Ghonghi, Rihaw Nala, Rohini River, Sonia, Sota Nala, Soya Nala, Terhar Nala, Tura Nala.,,,
4		Kushinagar	2,905	3,564,544	23.2	1227	Bagahi Nala, Banri Nala, Barhari Nala, Chauwar Nala, Daha River, Duhari Nala, Ghaghart Nala, Ghaghi Nala, Jamuhar Nala, Jethan Nala, Kakera Nala, Kanchi or Duranchi Nala, Kurna Nala, Majhna Nala, Maun Nala, Pharend Nala., Sonda Nala, Sonda Nala Luvkhush Drain, Sonra Nala.,,
5		Deoria	2,540	3,100,946	14.31	1221	Bathwa Nala, Choti Gandak, Duhari Nala, Duna Nala, Haha Nala., Jamuar Nala, Jharahi, Kanchi or Duranchi Nala, Karmani Nala, Katna Khurd Nadi, Khanarwa Nala, Khand Nala, Khanua Nadi, Kirhi Nala, Koilar Nala, Kurna Nala, Mahlan Nala, Majhana Nala, Nakta Nala, Pakul Nala, Rapti River, Taraina Nadi
6		Sitapur	5,743	4,483,992	23.88	781	Bakwa Nala, Chaurari Nadi, Dhudha Nala, Gabaria Nala, Gobaria Nala, Kakrehia Nala, Kewani Nadi or Kewani Nala, Naiya Nala, Saidapur Drain, Somli Nadi, Ull River or Chauka River
7		Azamgarh	4,054	4,613,913	17.11	1138	Choti Saryu River, Choti Saryu River, Deonai Jhil, Gandhaiya Nala, Ghaghra, Kunwano River, Pikia Nala

S.No	State	District	Area (sq km)	Population (census 2011)	Growth Rate (%)	Density	River
8		Ambedkar Nagar	2,350	2,397,888	18.3	1020	Achhnain Nala, Choti Saryu River, Ghaghra, Pikia Nala
9		Ayodhya	2,341	2,470,996	18.29	1056	Ghaghra, Kasera Nala, Kasera Nala, Terhi Nadi, Tihora Nala
10		Ballia	2,981	3,239,774	17.31	1087	Ghaghra, Ghorī Nala, Jharahi, Kol Nala, Pharhi Nala
11		Gonda	4,003	3,433,919	24.17	858	Baghnarwa Nala, Barsot Nala, Belai Nala, Bisahi Nadi, Chamdai Nadi, Chandahi Nadi, Chaubepur Nala, Ghadhauwa Nala, Ghaghra., Jahda Nala, Karhera Nala or Bhakausa Nala, Kunwano River, Kurai Nala, Manawar River or Manorama, Mutaha Nala, Nagaria Nala, Narkutwa Nala, Pindariya Nala, Rawai Nadi, Sarju River, Sevei Nala, Terhi Nadi
12		Barabanki	4,402	3,260,699	21.96	741	Bahoriya Nala, Jori Nala, Jyori Nala, Old Bed Of Chaureri River, Somli Nadi
13		Gorakhpur	3,321	4,440,895	17.81	1337	Aami River, Baluahwa Nala, Barhari Nala, Chillua Nala, Churma Nala, Ghaghra, Hasuni Nadi, Jahda Tal, Jamura Nala, Kalan Nala, Kapuri Nala, Katna Nadi or Gaura Nadi, Khudwa Nala, Khurna Nala, Kunwano River., Majhna Nala, Manjharīa Tal, Pharend Nala, Pikia Nala, Powa Nala Ghonghi, Rapti River, Rohini River, Salahni Nala, Sonwan Nala, Surma Nala, Taraina Nadi, Taraina Nala, Tura Nala, Wayasi Nala, Zaidi Nala
16		Sant Kabir Nagar	1,646	1,715,183	20.77	1042	Aami River, Barka Nala, Budha Nadi, Garia Nala, Ghaghra, Kathinayya River, Keonaiya Nadi, Khudwa Nala, Kunwano River, Kusiya Nala, Pachhu Nala, Repti River, Reruwa Nadi
17		Mau	1,713	2,205,968	18.98	1288	Ghaghra, Haha Nala, Pharhi Nala
18		Sharwasti	1,640	1,117,361	-5.02	681	Ajgarwa K, Badalpur Nala, Bakawa, Banrwa, Banrwa Nala, Barikundia Nala, Bhanwariya K, Bhanwariya Kula, Bhawa, Bisahi Nadi., Gainjhawa Nala, Ganjri Nala, Gauriya Nala, Gobrahwa Nala, Gurdangauri K, Hathikund Nala, Jahriwa Kula, Jamawar Nala, Jokahi Nala, Kaiyan Nadi, Kaiyan Nala, Kakrawa Nala, Khairbhati Kula, Khurpiwa Nala, Kunwano River, Madaura, Muhammada Nala, Murkata K, Nakahia, Narkutwa Nala, Pera Nadi or Khair Nala, Rakya Tal, Rapti or Khurpiwa River, Rapti River, Retahi Nala, Risia Nala, Terhi Nadi
19		Balrampur	3,349	2,148,665	27.72	642	Amsotia, Barai, Barandariya Nala, Bargadwa, Barrauwa Nala, Baswaria, Bhamrewa, Bisahi Nadi, Budhi Repti River, Burhi Rapti or Burhatti Nadi, Chikni Nala, Dhandia Nala, Dhobha, Durwa Chakalya Nala, Dundra, Gauriya Nala, Ghagraol, Guhawa, Gurung K, Hahwa, Hathikund Nala, Hengwa Nala, Jamgarhwa, Jamgarhwa, Juraniya, Kachni, Kakrahwa, Kakrawa Nala, Kankra, Kardahwa Nala, Kataha Nala, kauhi Nala, Kawahi, Khajhar Nadi, Kohi, Kunwano River., Musahwa Nala, Musi, Nakti Nala, Patharwa, Pathrahwa, Pera Nadi or Khair Nala, Ratohiya Nala or Bhulwa Nala, Rapti River, Rapti or Khurpiwa River, Singhwa Nala, Sonahi, Stream 8 or Bhambhar, Suwawan Nadi, Ujhawa





GHAGHRA BASIN: MAJOR BARRAGES ON THE RIVER GHAGHRA AND HER TRIBUTARIES

MAJOR BARRAGES ON THE RIVER GHAGHRA AND HER TRIBUTARIES														
S.No	State	District	Name	Lat	Long	River	Year Completed	Status	Type	Length (m)	Max ht. Above Foundation (m)	Total Volume (cumec)	Design Flood (cumec)	Purpose
1	Uttar Pradesh	Bahraich	Girija Barrage	28.2723	81.0834	Gh-aghra	1976	Completed						
2		Bahraich	Saryu Barrage	28.0522	81.4129	Saryu		Completed						
3		Kheri	Lower Sarda Barrage	28.0649	80.9668	Shar-da	1974	Completed						
4		Siddharth Nagar	Banganga Barrage	27.4372	82.9374	Ban-ganga	1956	Completed						
5		Kheri	Suheli Barrage	28.3422	80.7717	Suheli		Completed						

CWC BASINS

Basin Code	Basin Name
1	Indus (Up to border)
2a	Ganga
2b	Brahmaputra
2c	Barak and others
3	Godavari
4	Krishna
5	Cauvery
6	Subernarekha
7	Brahmani and Baitarni
8	Mahanadi
9	Pennar
10	Mahi
11	Sabarmati
12	Narmada
13	Tapi
14	West flowing rivers from Tapi to Tadri
15	West flowing rivers from Tadri to Kanyakumari
16	East flowing rivers between Mahanadi and Pennar
17	East flowing rivers between Pennar and Kanyakumari
18	West flowing rivers of Kutch and Saurashtra including Luni
19	Area of inland drainage in Rajasthan
20	Minor rivers draining into Myanmar (Burma and Bangladesh)

Source: River Basin Atlas of India, Ministry of Water Resources, Gol (October 2012)



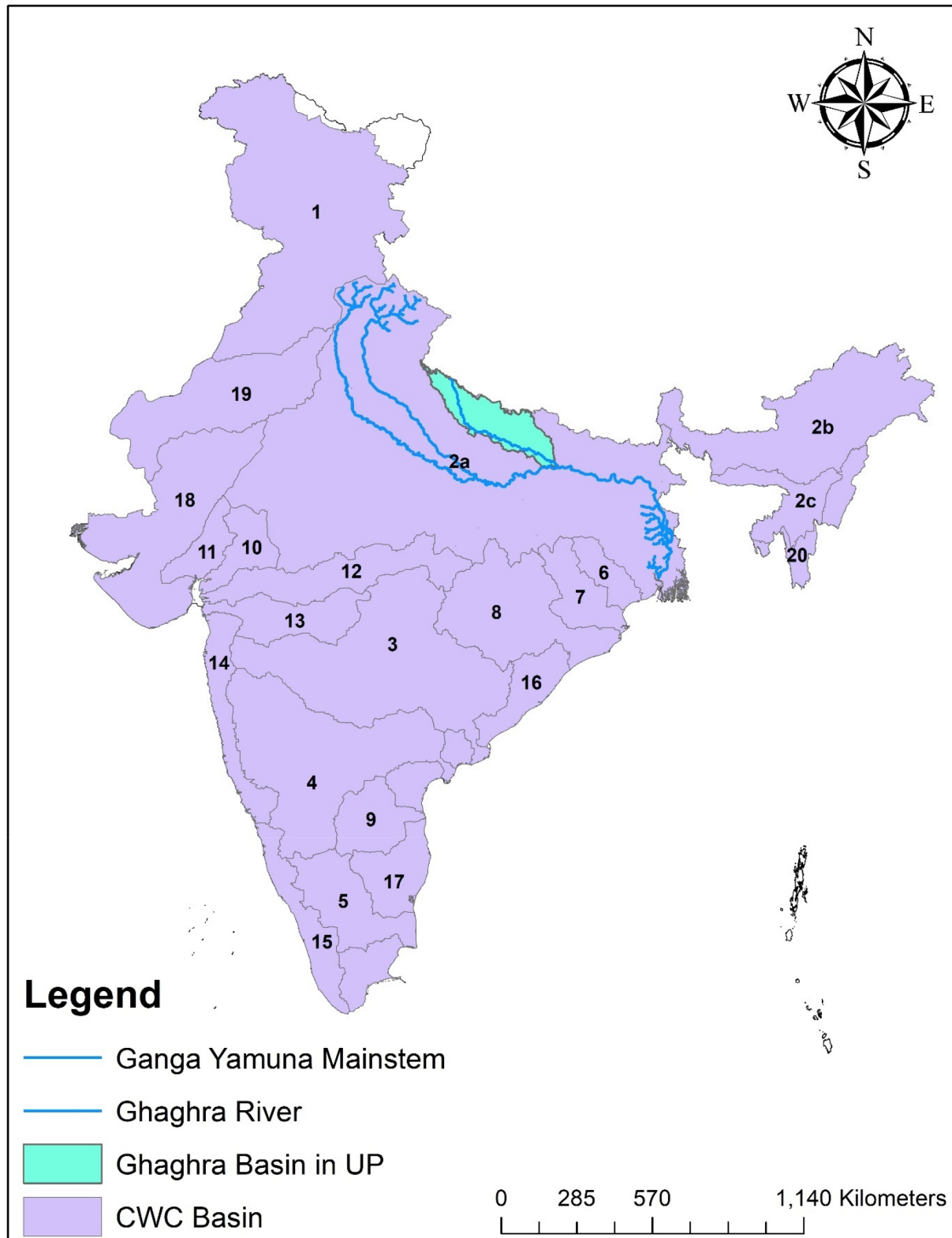
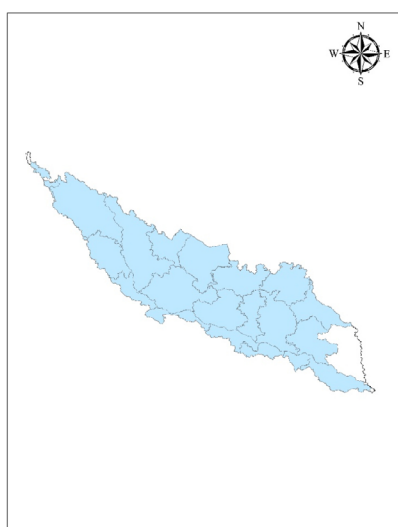


Figure: CWC Basins in India

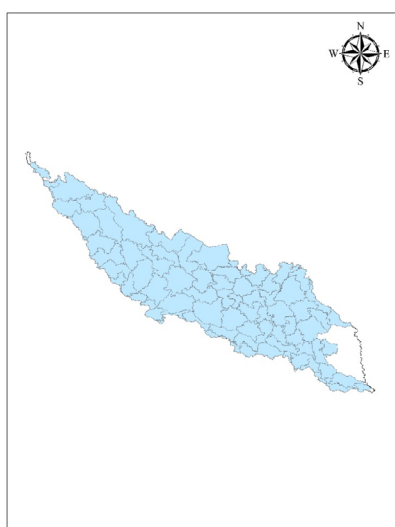




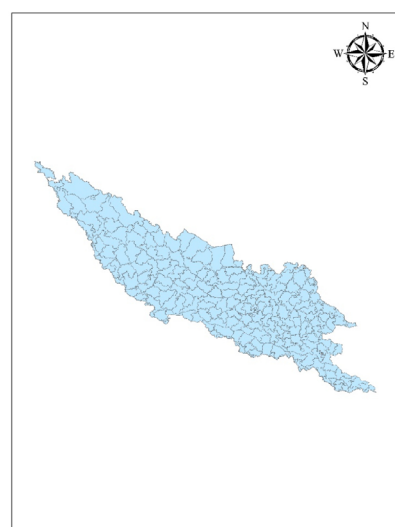
GHAGHRA BASIN: ADMINISTRATIVE STRUCTURE



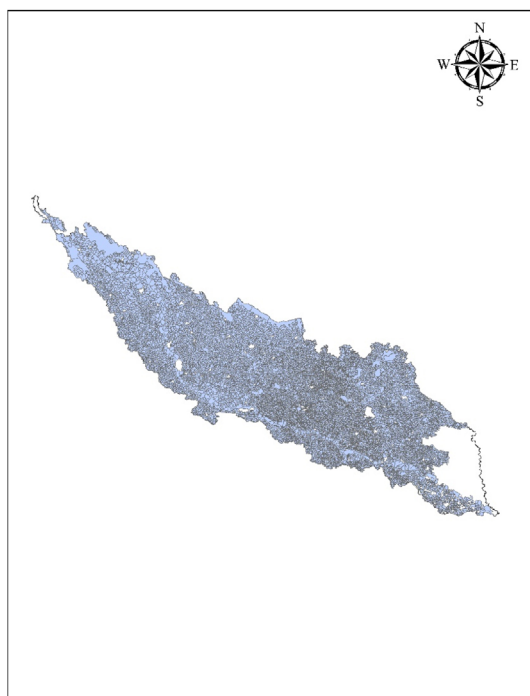
Districts: UP: 20



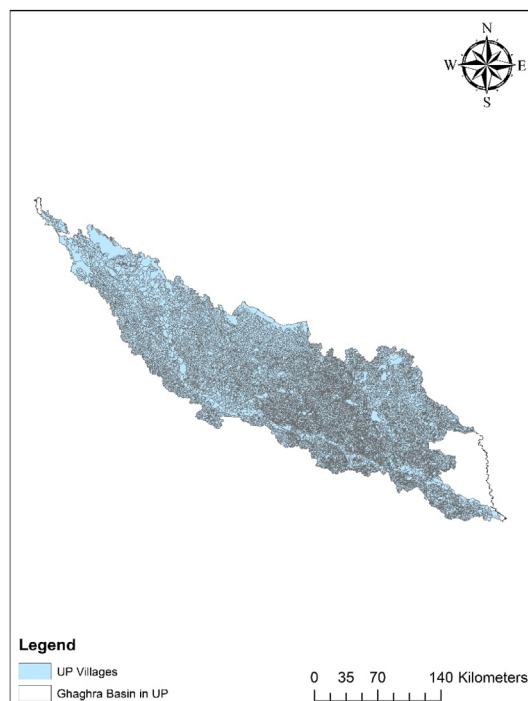
Tehsil: UP: 79



Blocks: UP: 217



Gram Panchayat: UP: 18973



Villages: UP: 25139

Figure: Administrative Structure of the Ghaghra River Basin;

Source: S01

GHAGHRA BASIN: CANAL NETWORK

Total Canal Network: 10,320.95 Km

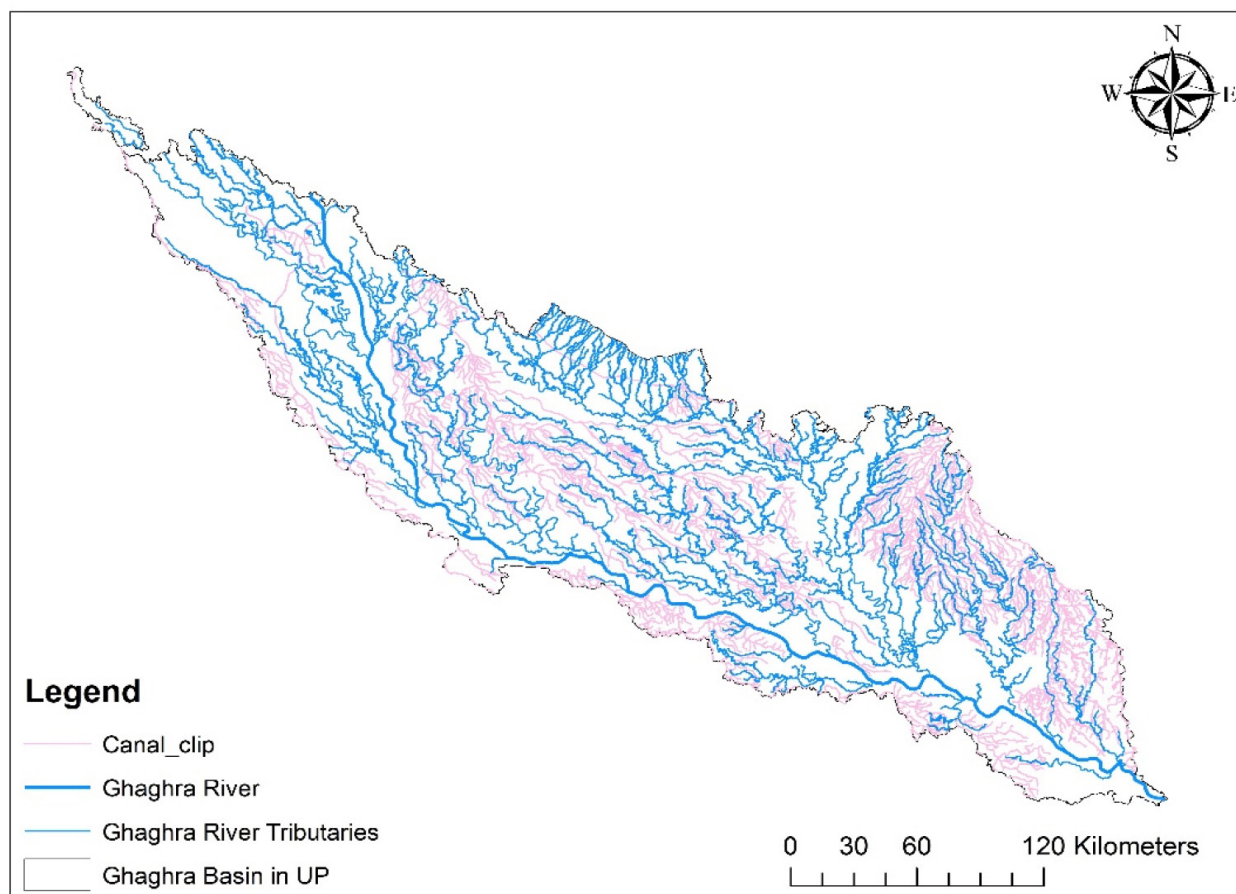
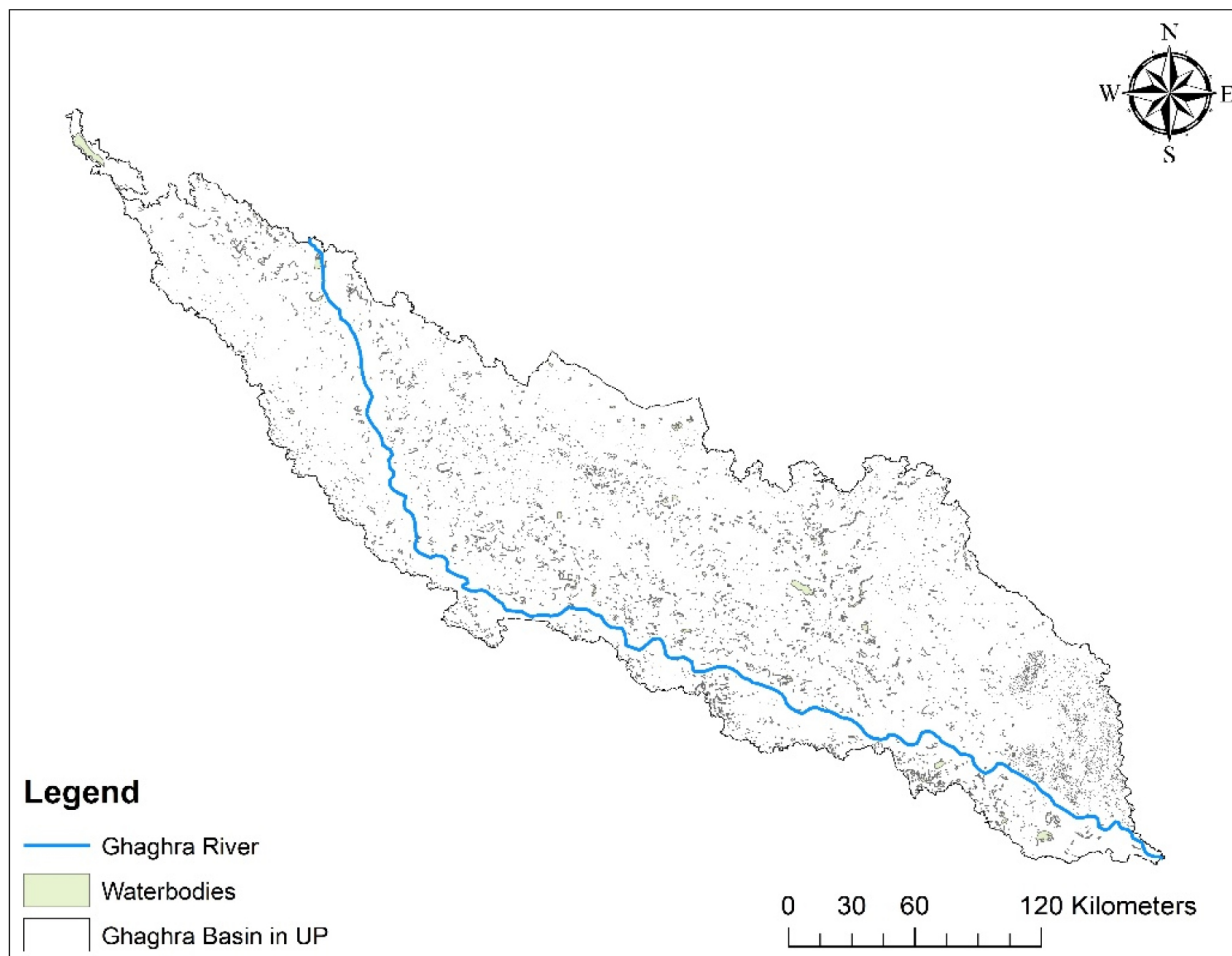


Figure: Canal Network in Ghaghra River Basin, Source: NWIC

S No	Project Name	Length (Km)
1	Banganga Canal Irrigation Project	111.39
2	Chittaurgarh Reservoir Major Irrigation Project	112.26
3	Dohrighat Pump Canal Major Irrigation Project	539.43
4	Gandak Canal Major Irrigation Project	11.76
5	Gandak Major Irrigation Project	302.26
6	Kuwano Pump Canal Project	86.59
7	Lower Ganga Canal Major Irrigation Project	11.62
8	Sarda Canal Major Irrigation Project	333.58
9	Sarju Pump Canal Major Irrigation Project	127.96
10	Saryu Nahar Pariyojana	3493.61
11	Saryu Nahar Pariyojana Major Irrigation Project	181.56
12	Sharda Sahayak Major Irrigation Project	670.86
13	Sone Canals Major Irrigation Project	6.08
14	Suheli Major Irrigation Project	112.9
15	Tanda Pump Canal	6.41
16	Tanda Pump Canal Major Irrigation Project	333.84



GHAGHRA BASIN: WATERBODIES MAP

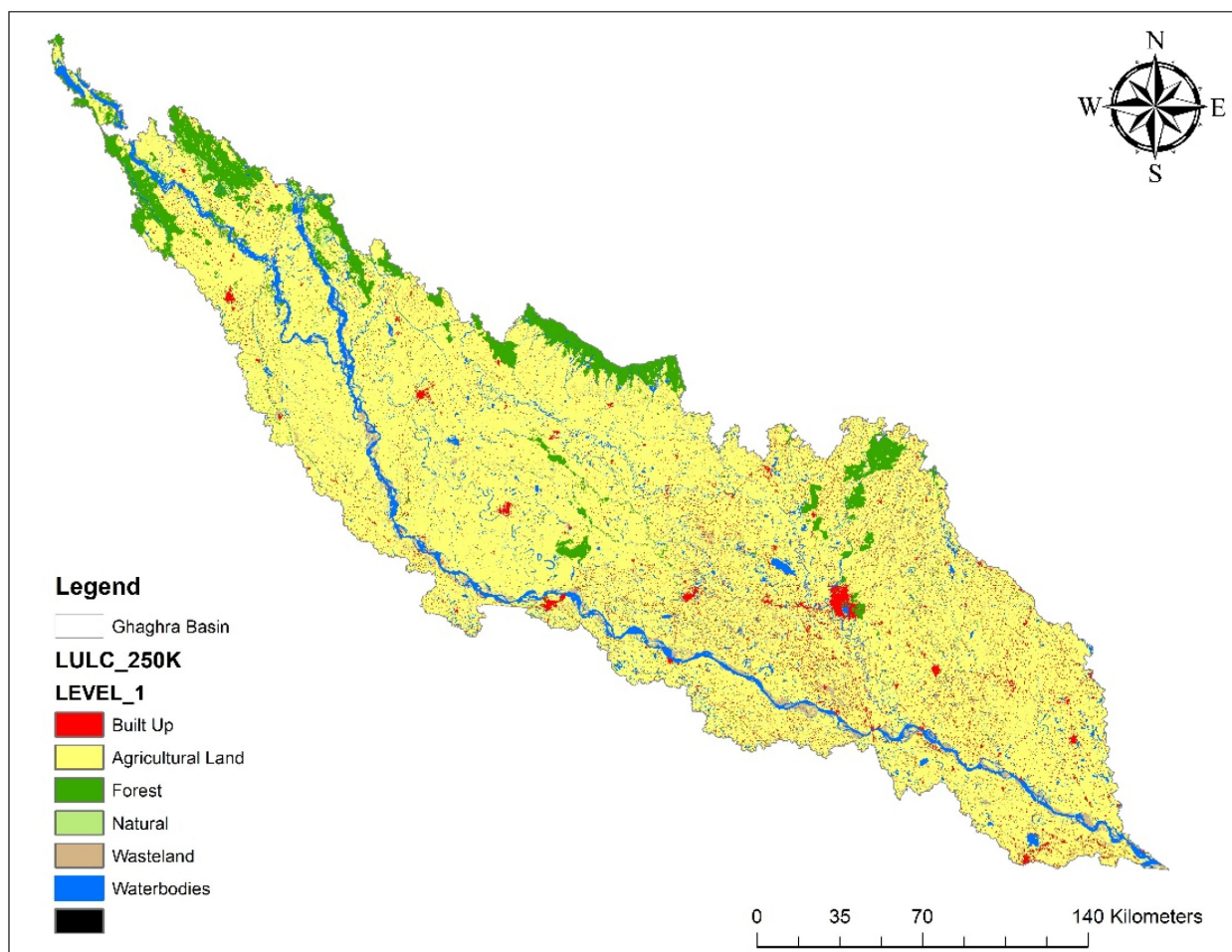


Total No. of waterbodies: 8317

Source: NWIC

Figure: Number of waterbodies in Ghaghra River Basin

GHAGHRA BASIN: LAND USE LAND COVER [250K]



Imagery: multi-temporal satellite data of IRS AWiFS sensor

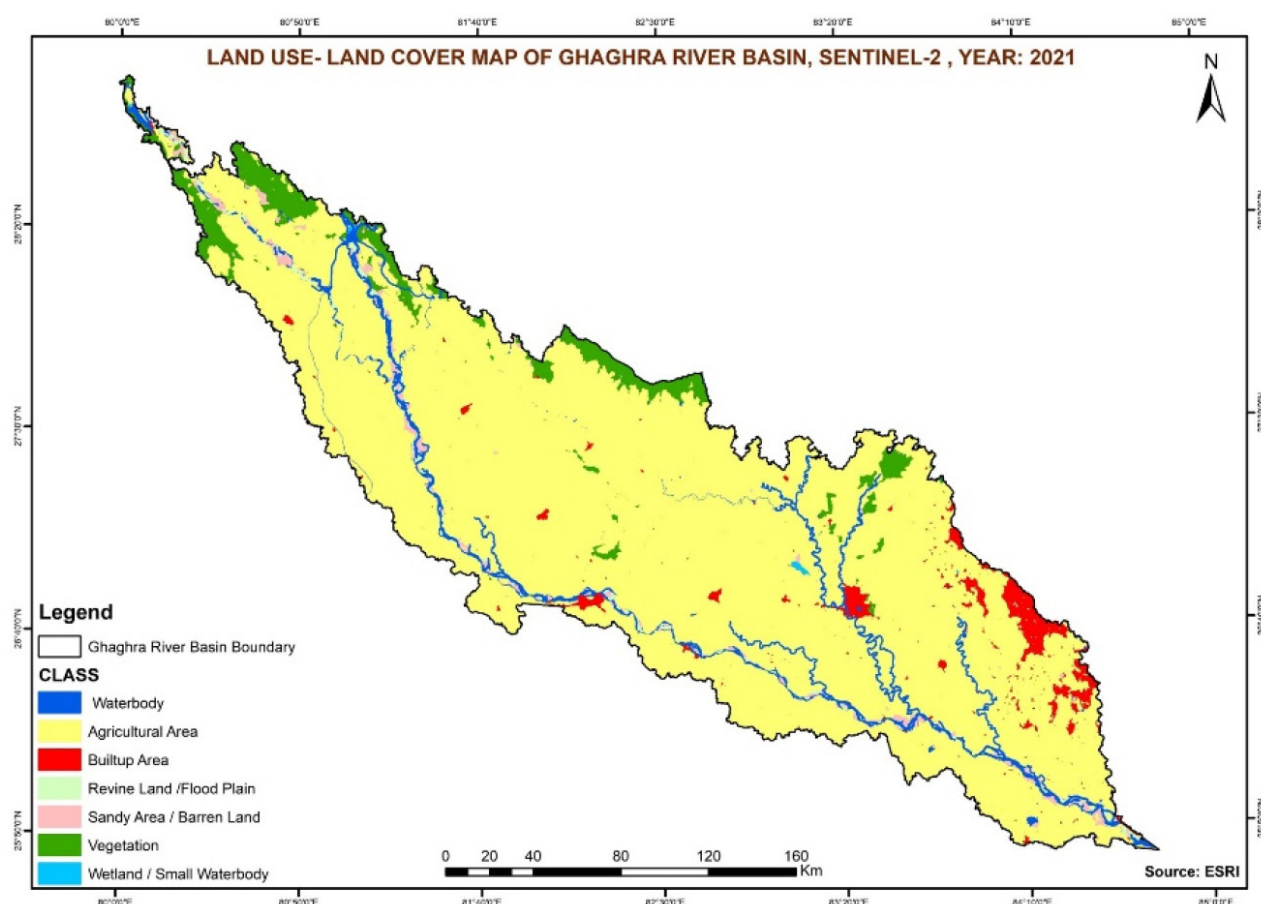
Year: 2017-18

Accuracy: 90.07 % with a range of 86 to 95 % in different states.

Source: NRSC



GHAGHRA BASIN: LAND USE LAND COVER [SENTINEL]



Imagery: Sentinel-2

Year: 2021

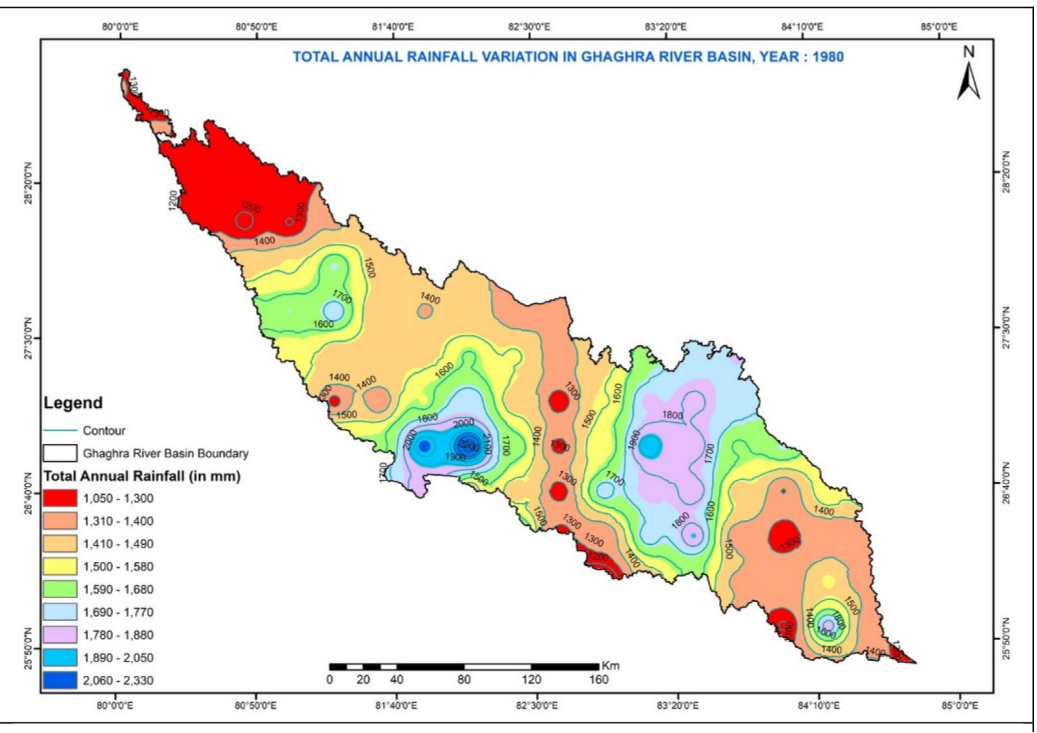
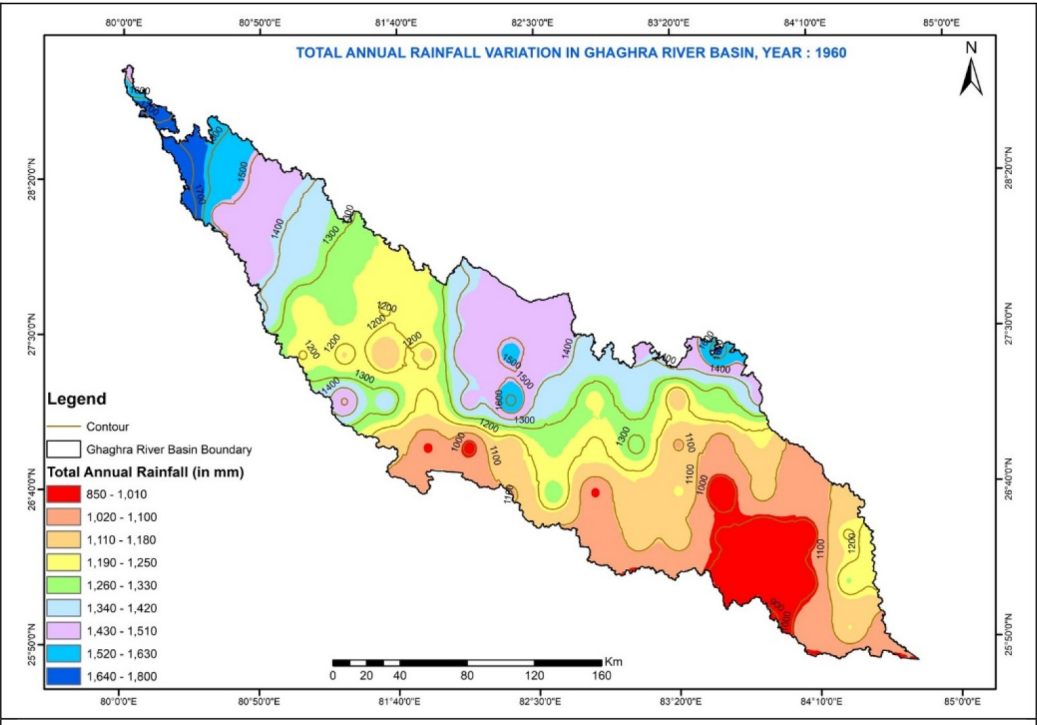
Accuracy: 85.96%

Source: ESRI

Table: Land Use- Land Cover in Ghaghra river basin in year-2021, Source: ESRI

Class Name	Area (in Ha.)	% Area
Agricultural Area	3504784.4	71.7
Builtup Area	726044.8	14.85
Revine Land/ Flood Plain	75664.92	1.55
Sandy Area/ Barren Land	156718.14	3.21
Vegetation	307607.95	6.29
Waterbody	109573.74	2.24
Wetland/ Small Biodiversity	7754.67	0.16
Grand Total	4888148.162	100

GHAGHRA BASIN: ANNUAL RAINFALL [1960 – 2020]



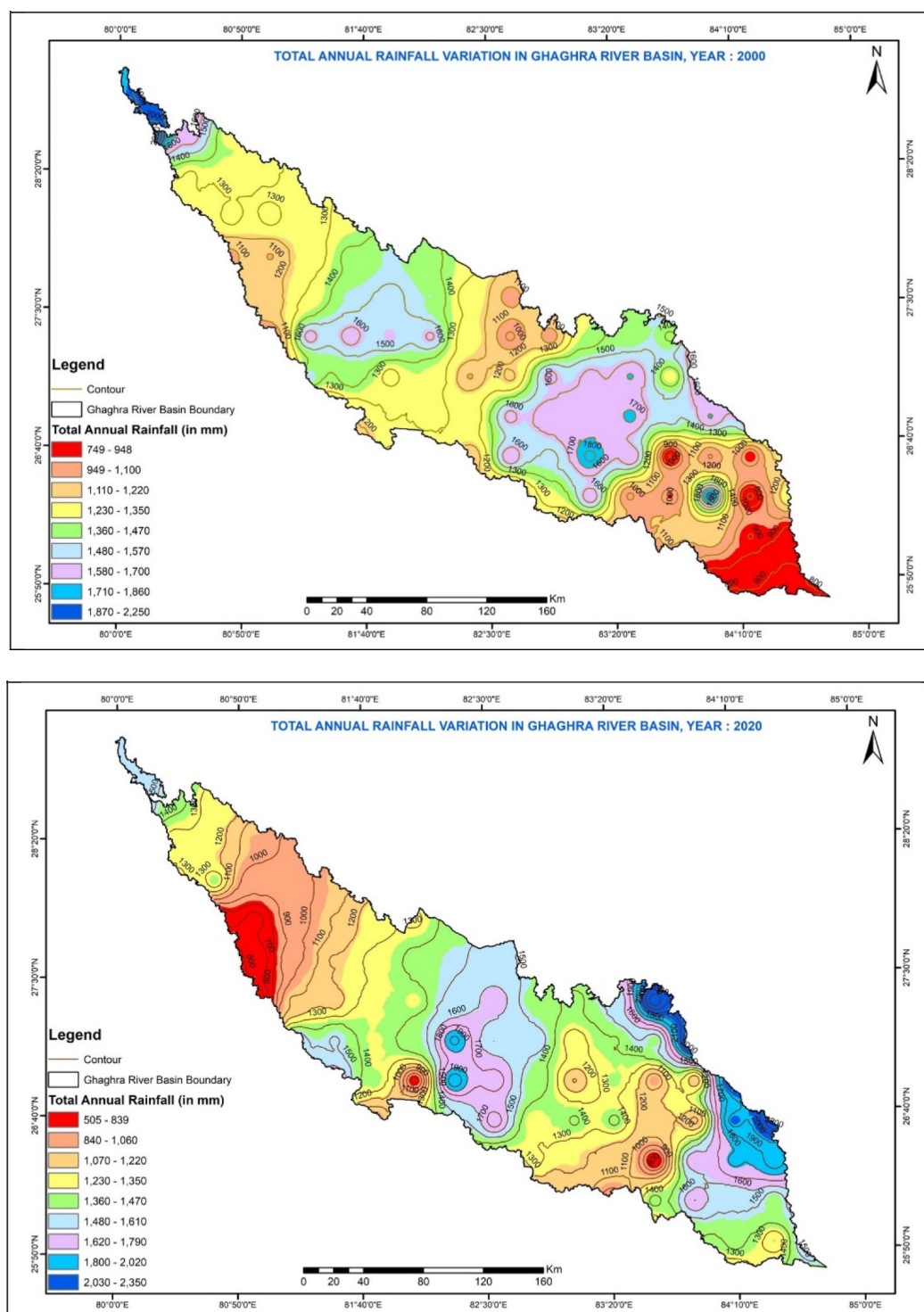


Figure: Comparative Annual Rainfall variation (in mm) in Ghaghra Basin from the year 1960 to 2020;
Source: IMD rainfall data

GHAGHRA BASIN: GW LEVEL STATION

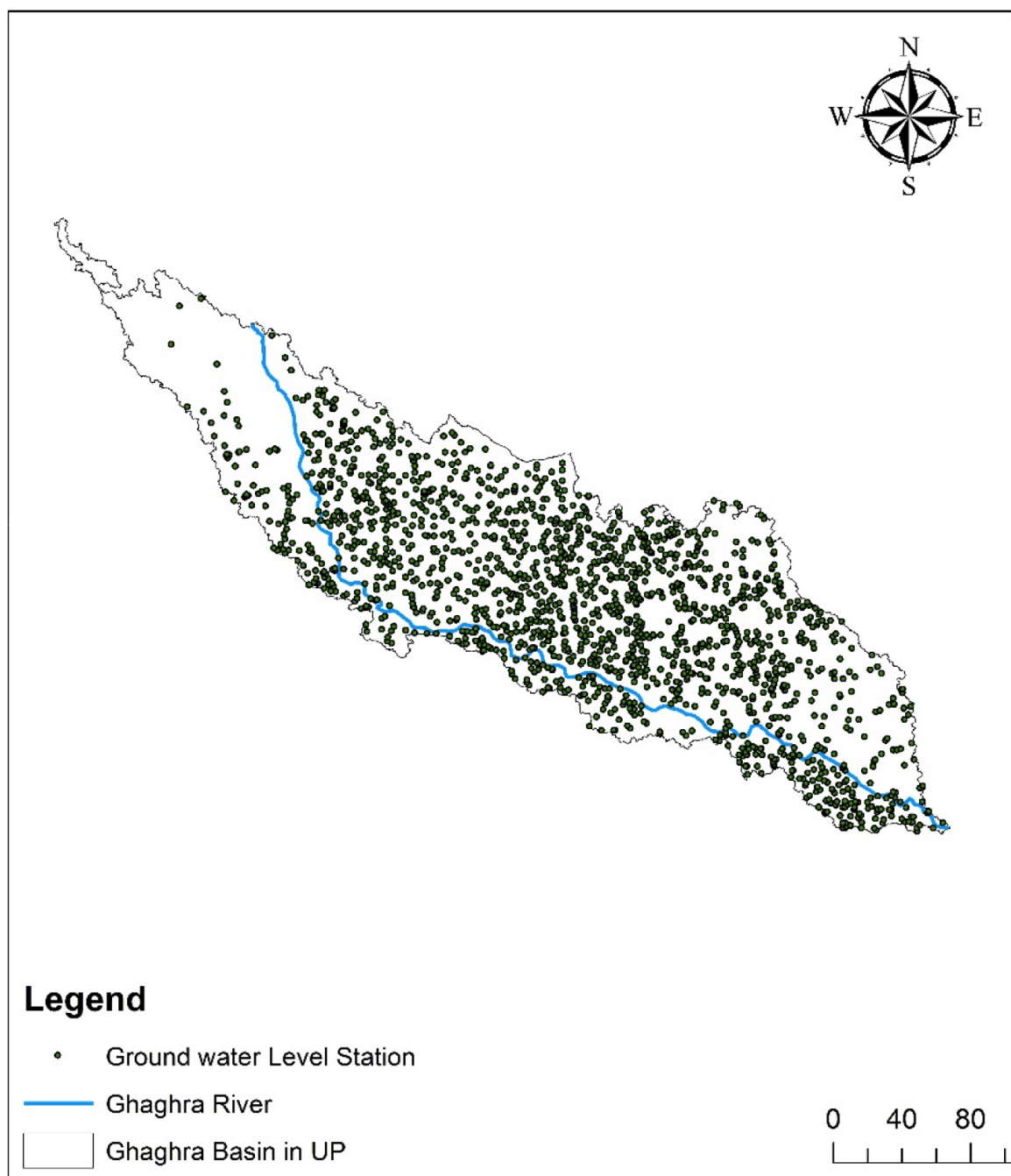


Figure: Groundwater level monitoring stations in Ghaghra River Basin; Source: CGWB



GHAGHRA BASIN: GW QUALITY STATION

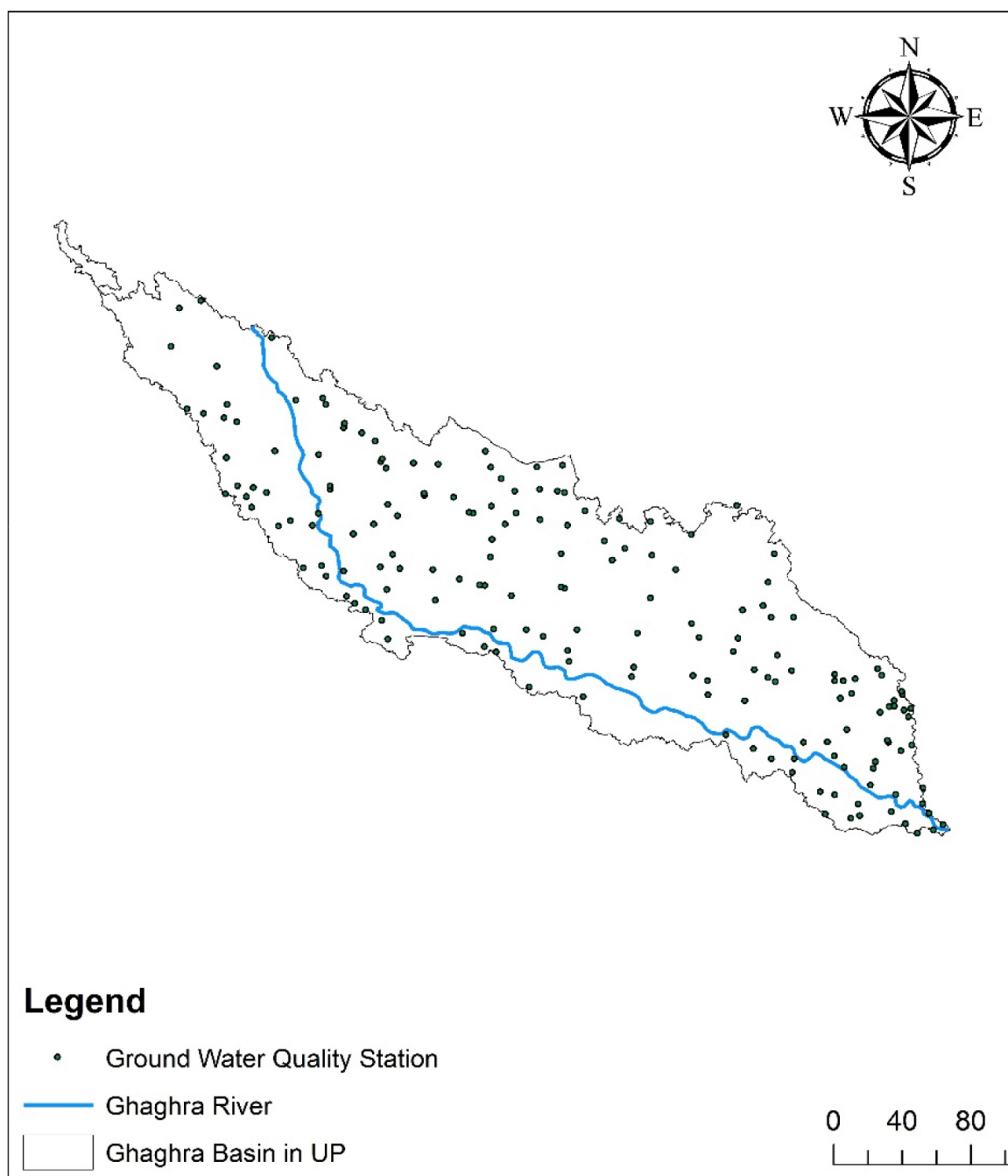
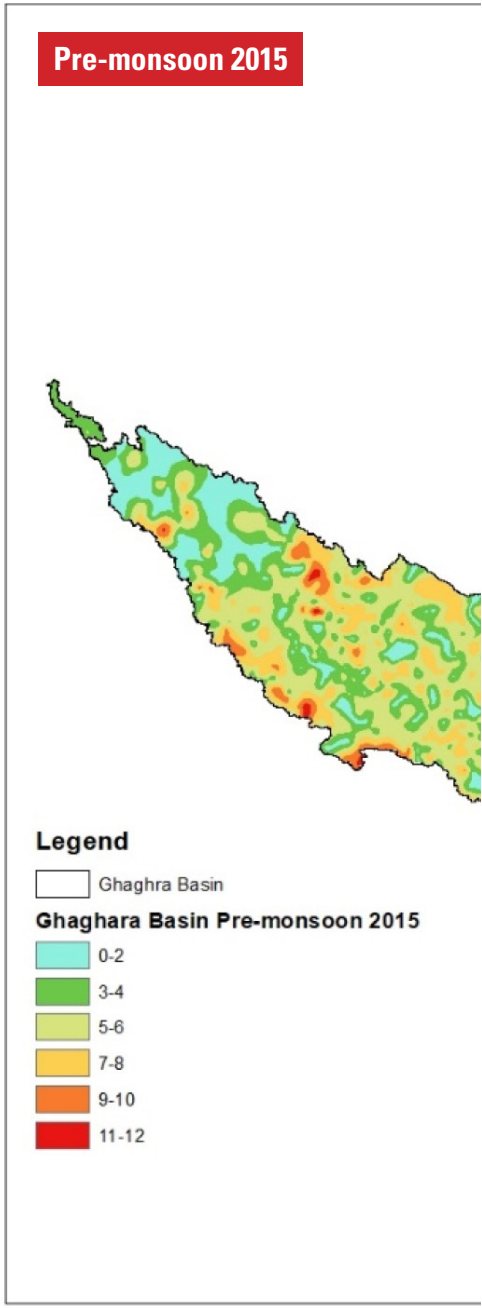
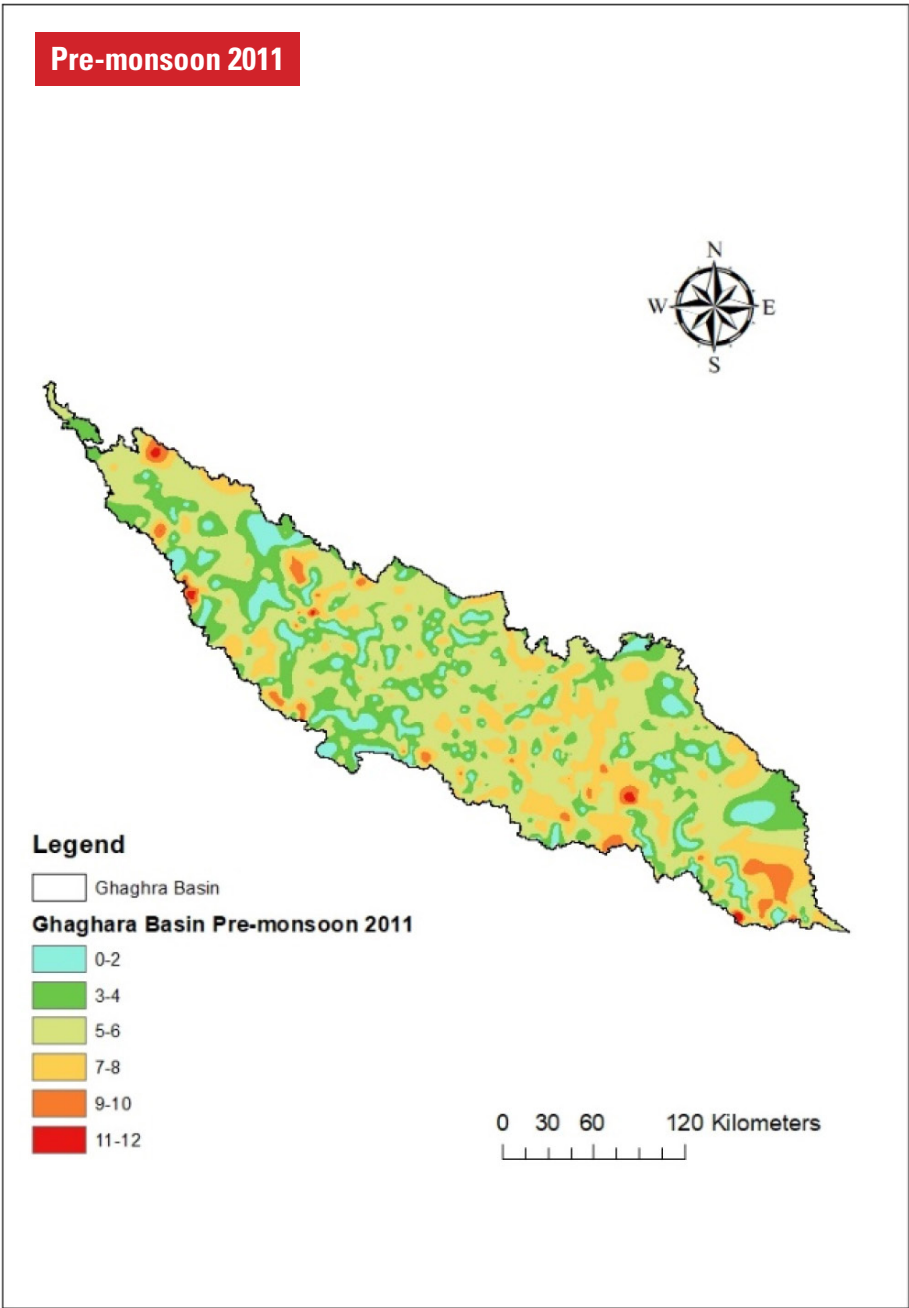
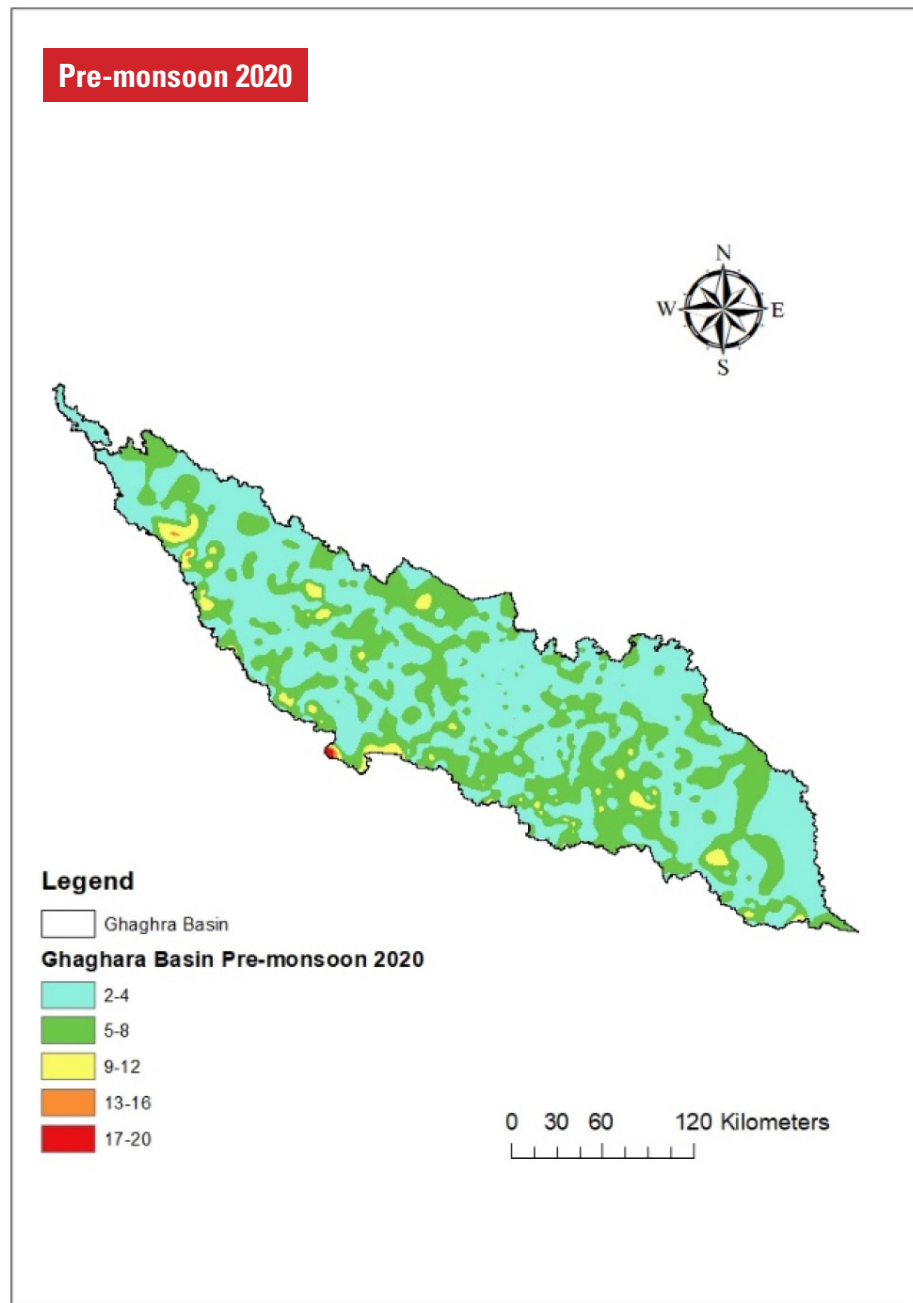
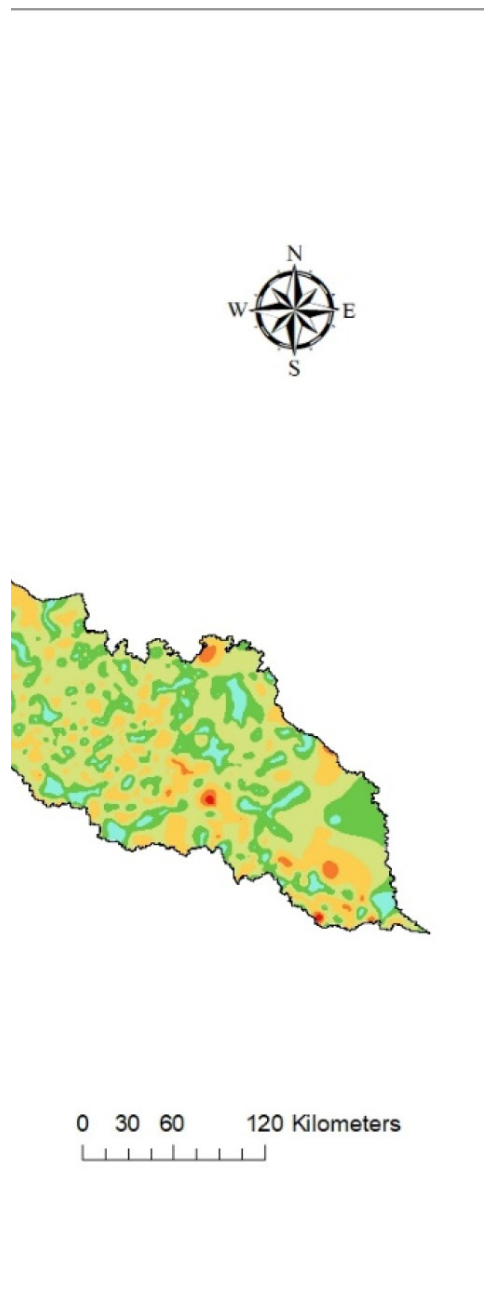


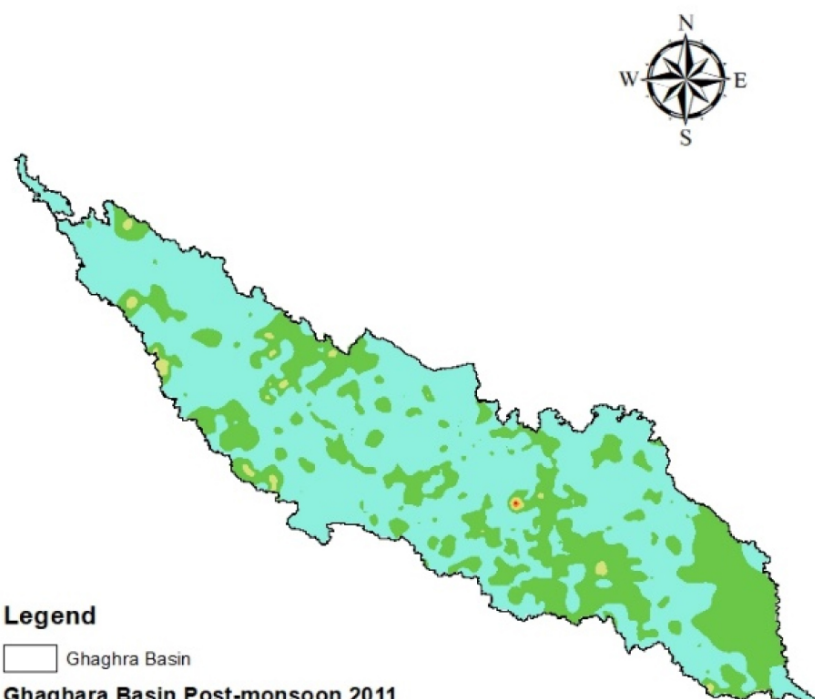
Figure: Groundwater quality monitoring stations in Ghaghra river basin; Source: CGWB

GHAGHRA BASIN: GROUNDWATER ELEVATION CONTOUR





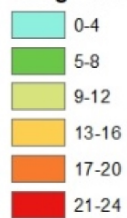
Pre-monsoon 2011



Legend

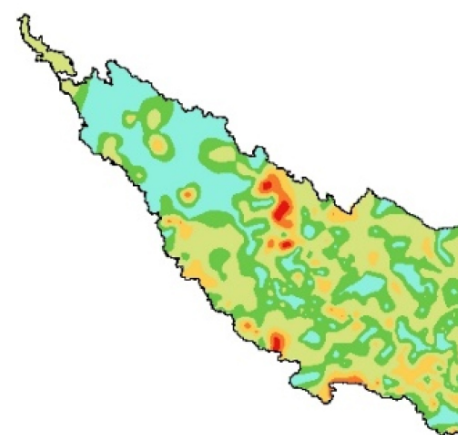
Ghaghara Basin

Ghaghara Basin Post-monsoon 2011



0 30 60 120 Kilometers

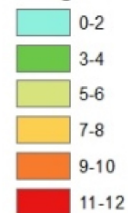
Pre-monsoon 2015

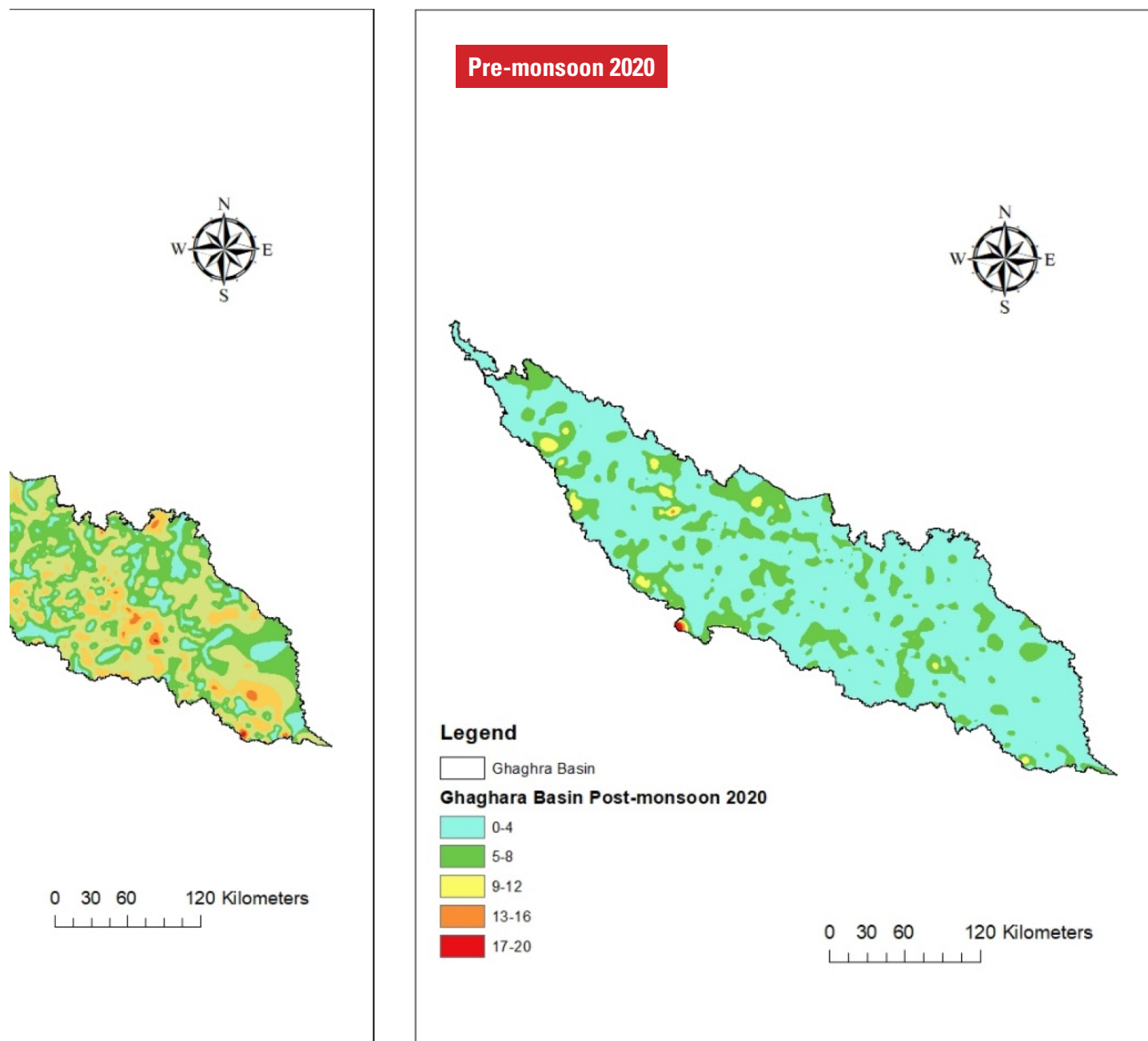


Legend

Ghaghara Basin

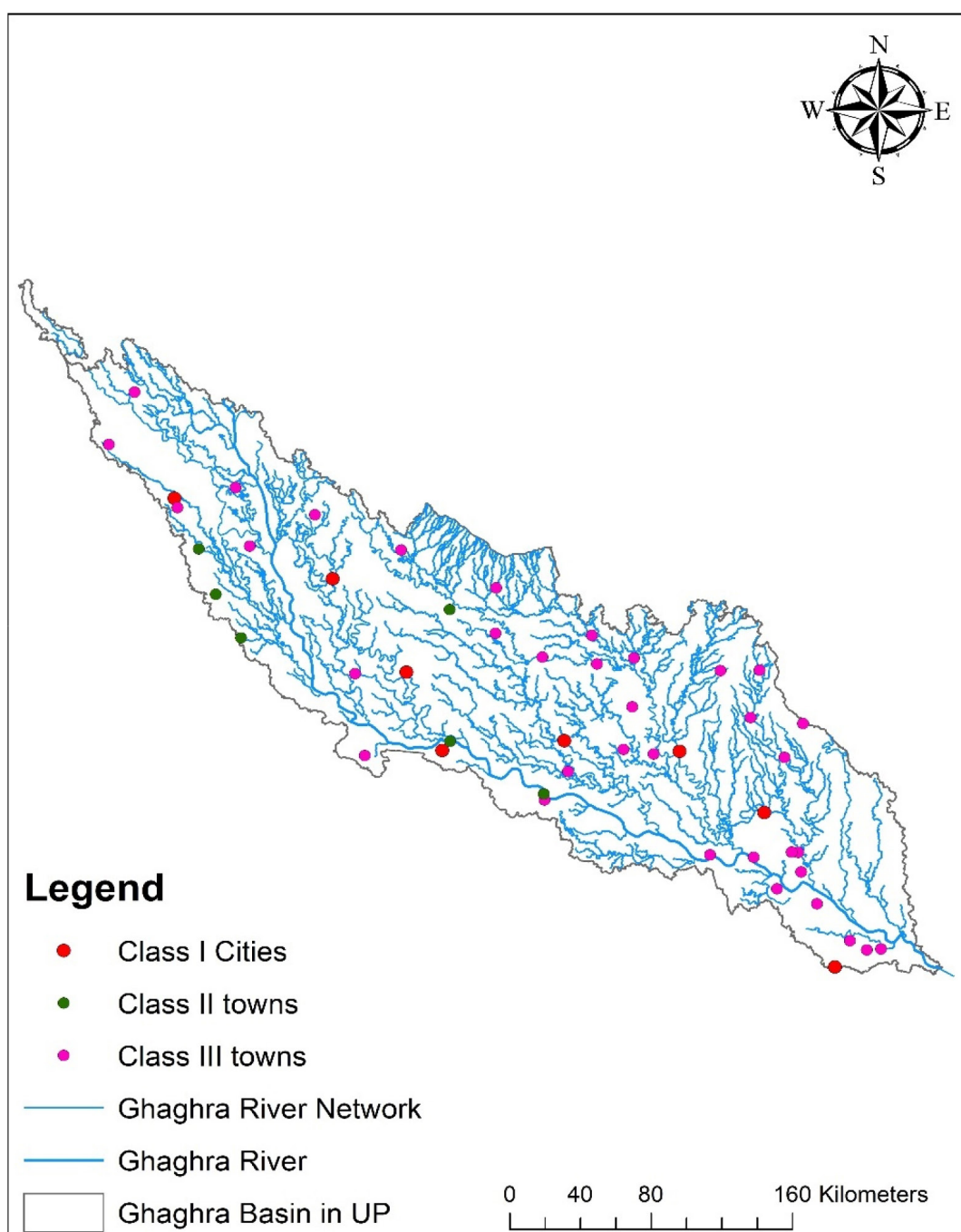
Ghaghara Basin Post-monsoon 2015





**Figure: Groundwater level (in mbgl) maps in Pre and Post monsoon periods for the years 2011, 2015 and 2020;
Source: CGWB**

GHAGHRA BASIN: CLASS I, II AND III CITIES



08 Class I cities,
06 Class II and 35 Class III towns

Figure: Class-wise representation of population of the Ghaghra River Basin; Source: Census-2011



GHAGHRA BASIN: CWC SITE LOCATION

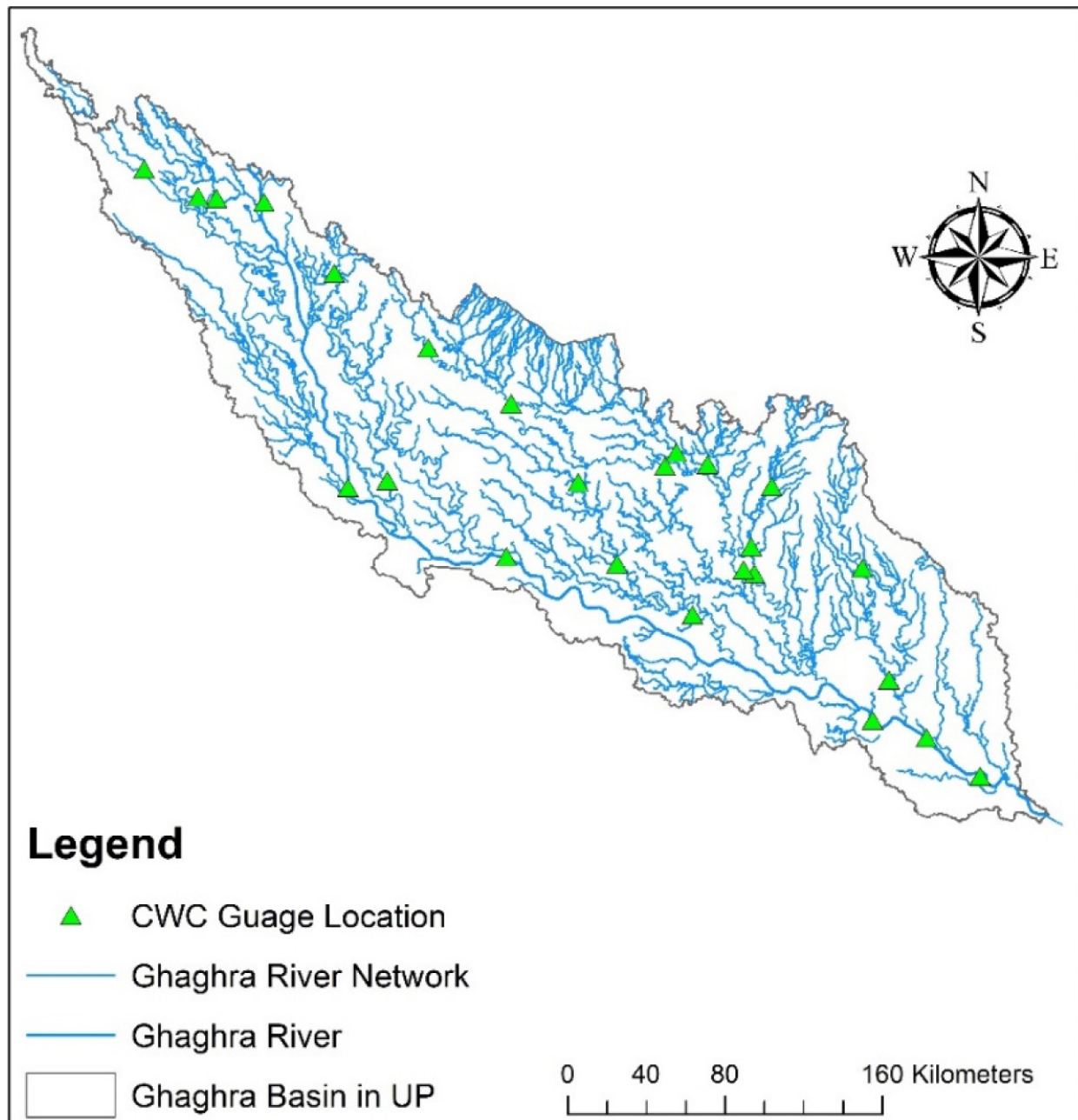


Figure: CWC site location in Ghaghra river basin

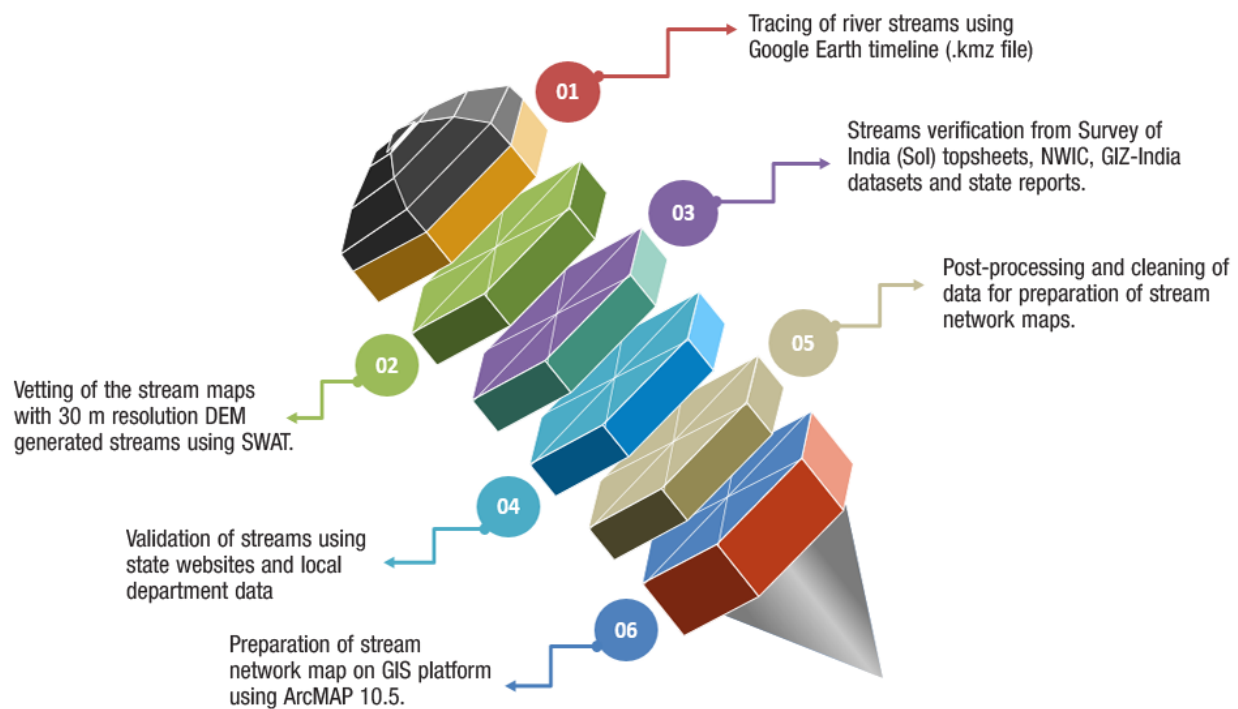
S No.	Station Name	River	District	Measurement Type	Data Available
1	Ayodhya	Saryu	Ayodhya	GDSQ	7/7/1970 Onwards
2	B.K.Ghat	Ghaghra	Bahraich	G	4/6/1963 Onwards
3	Balrampur	Rapti	Balrampur	GDSQ	11/7/1970 Onwards
4	Bansi	Rapti	Siddarthnagar	G	6/16/1971 Onwards
5	Basti	Kwano	Basti	GDQ	4/24/1959 Onwards
6	Bhinga	Rapti	Srawasti	GDQ	6/16/1974 Onwards
7	Birdghat	Rapti	Gorakhpur	GDSQ	4/26/1959 Onwards
8	Chandradeepghat	Kwano	Gonda	G	6/15/1987 Onwards
9	Colonelganj	Sarju	Gonda	G	12/1/1970 Onwards
10	Darauli	Ghaghra	Siwan	G	6/1/1972 Onwards
11	Elginbridge	Ghaghra	Barabanki	GDSQ	1/5/1959 Onwards
12	Gangpur Siswan	Ghaghra	Siwan	G	7/1/1970 Onwards
13	Ghaighat	Sarju	Bahraich	G	4/11/1963 Onwards
14	Hetimpur	Choti Gandak	Deoria	G	6/1/1976 Onwards
15	Kakrahi	Bhuri Rapti	Siddarthnagar	GD	6/15/1971 Onwards
16	Maniram	Rohin	Gorakhpur	G	5/20/1970 Onwards
17	Motipur	Suheli	Lakhimpur Kheri	G	7/1/1977 Onwards
18	Mukhlispur	Kwano	Sant Kabir Nagar	G	12/1/1970 Onwards
19	Paliakalan	Sharda	Lakhimpur Kheri	GDSQ	4/15/1959 Onwards
20	Regauli	Rapti	Gorakhpur	GDSQ	1/1/1976 Onwards
21	Salempur	Choti Gandak	Deoria	G	4/22/1959 Onwards
22	Shardanagar	Shadra	Lakhimpur Kheri	G	7/21/1969 Onwards
23	Trimohinighat	Rohin	Maharajganj	G	6/16/1971 Onwards
24	Turtipar	Ghaghra	Ballia	GDSQ	12/11/1962 Onwards
25	Uskabazar	Kunhara	Siddarthnagar	G	6/16/1971 Onwards





RIVER NETWORK PREPARATION METHODOLOGY

The method adopted, in brief, to obtain the river network are stepwise as follows:



- Streams less than 2.5 km and coming from local agriculture land is not covered.
- All streams covered which are coming from populated area (Urban or Rural) even if they are less than 1 km. (if it is visible).

Disclaimer: The accuracies of the maps generated by the above method are subject to the limitations of the data processing tools and software used for the particular geographical regions as represented in Google Earth images, and are subject to future refinement.



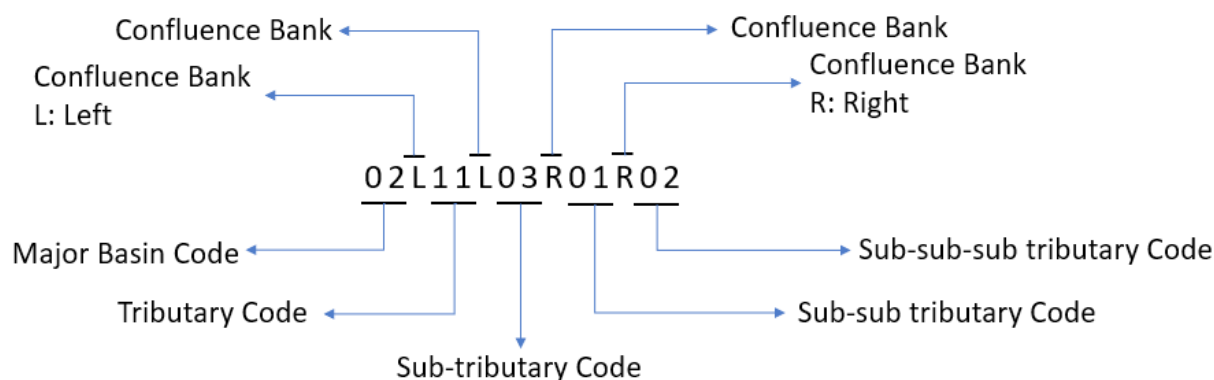
RIVER CODIFICATION SYSTEM

In the present Atlas alphanumeric characters are used for coding the river systems within natural and administrative boundaries. Each sub step in codification system is assigned a digit which reflects the length of the code up to that sub step. The coding has been done for the two different types of compartmentalizing river basins as stated below.

- a) Codification system based on natural delineation
- b) Codification system based on administrative delineation

The natural delineation approach is better suited to study and understand the basin area as a natural ecological unit while administrative delineation is good for determining specific interventions and fixing responsibilities in the implementation of any project relevant to rivers. Both approaches are important for their own reasons and, therefore, it was decided to develop the codification system for both natural as well as administrative delineations.

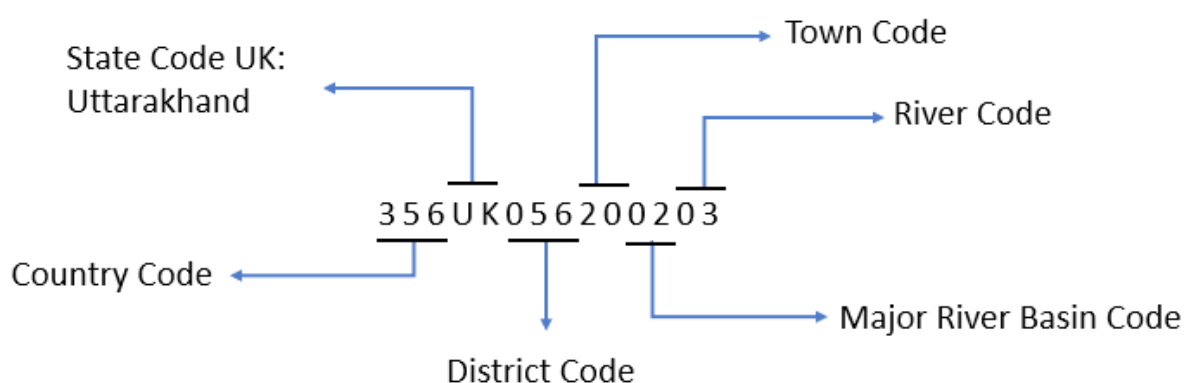
a) Codification system based on natural delineation: In the natural delineation approach, major basin codes given by CWC in River Basin Atlas of India, jointly published by CWC and NRSC, ISRO in October 2012, have been adopted here. These codes are accepted at regional level. In the second step, tributary code is given based on their confluence bank and their sequential number from the origin of the major river. R and L represents Right Bank and Left Bank, respectively, for the confluence bank in this code. For example, L11 in the code represents the 11th tributary (from the head of the major river) joining the major river at the left bank. In steps 3, 4, 5,



etc. the same coding procedure as in step 2 is followed for sub-tributaries joining the tributaries and so on. Thus, the code can be extended without any alteration until it reaches down to the lowest order river.

b) Codification system based on administrative delineation: In administrative delineation codes are generated separately for areas coming under urban and rural jurisdictions as further described.

Codification system based on administrative delineation – Urban: In administrative delineation-urban the first 3 digits of the code represent the country code adopted from ISO 3166-1. The next 5 digits give the state code and district code. State code is taken from transportation department and district code is adopted from Census codes. The next 2

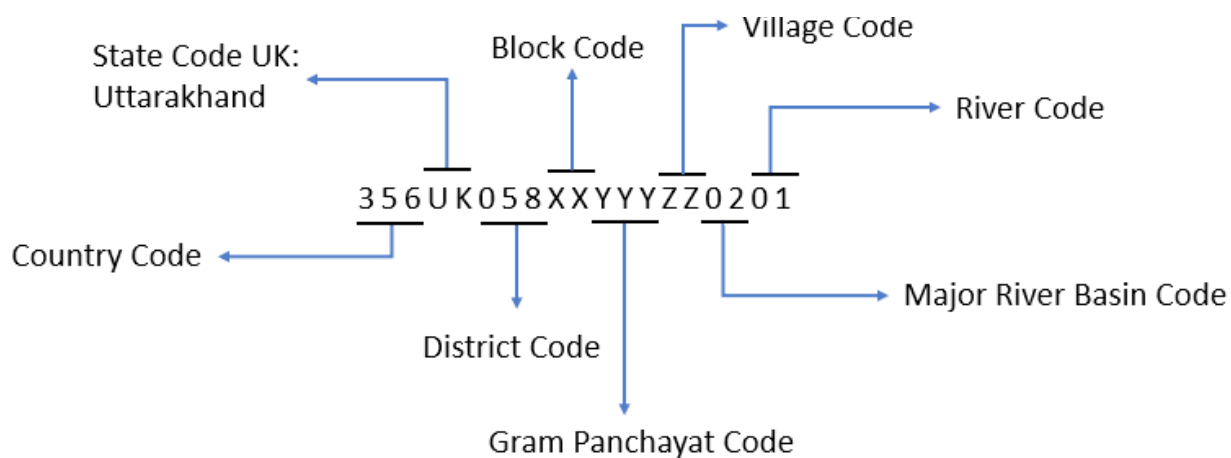


digits represent the town, which adopted from the census town codes. In the next step, 2 digits are assigned for major river basins and the codes are adopted from River Basin Atlas of India given by CWC. The last 2 digits of the code represent the river based on higher to lower river order approach, and if there are more than one river of the same order then code is allotted in alphabetical order.

Codification system based on administrative delineation-Rural: In administrative delineation-rural the first 3 digits of the code represent the country code adopted from ISO 3166-1. The next 5 digits give the state code and district code State code is taken from transportation department and district code is adopted from Census codes. Block, Gram Panchayat and Village codes are further generated based on district codes. In the next step, 2 digits are assigned for major river basin as per the River Basin Atlas



of India given by CWC. The last 2 digits of the code represent the river code based on higher to lower river order approach, and if there be more than one river of same order then the code is allotted in alphabetical order.



GHAGHRA BASIN AND ITS RIVER NETWORK

Ghaghra River UID Code:

Basin Area: Sq. Km. : 4881.50

Major Rivers:

Number of rivers- 490

River Network- 13884.05 m

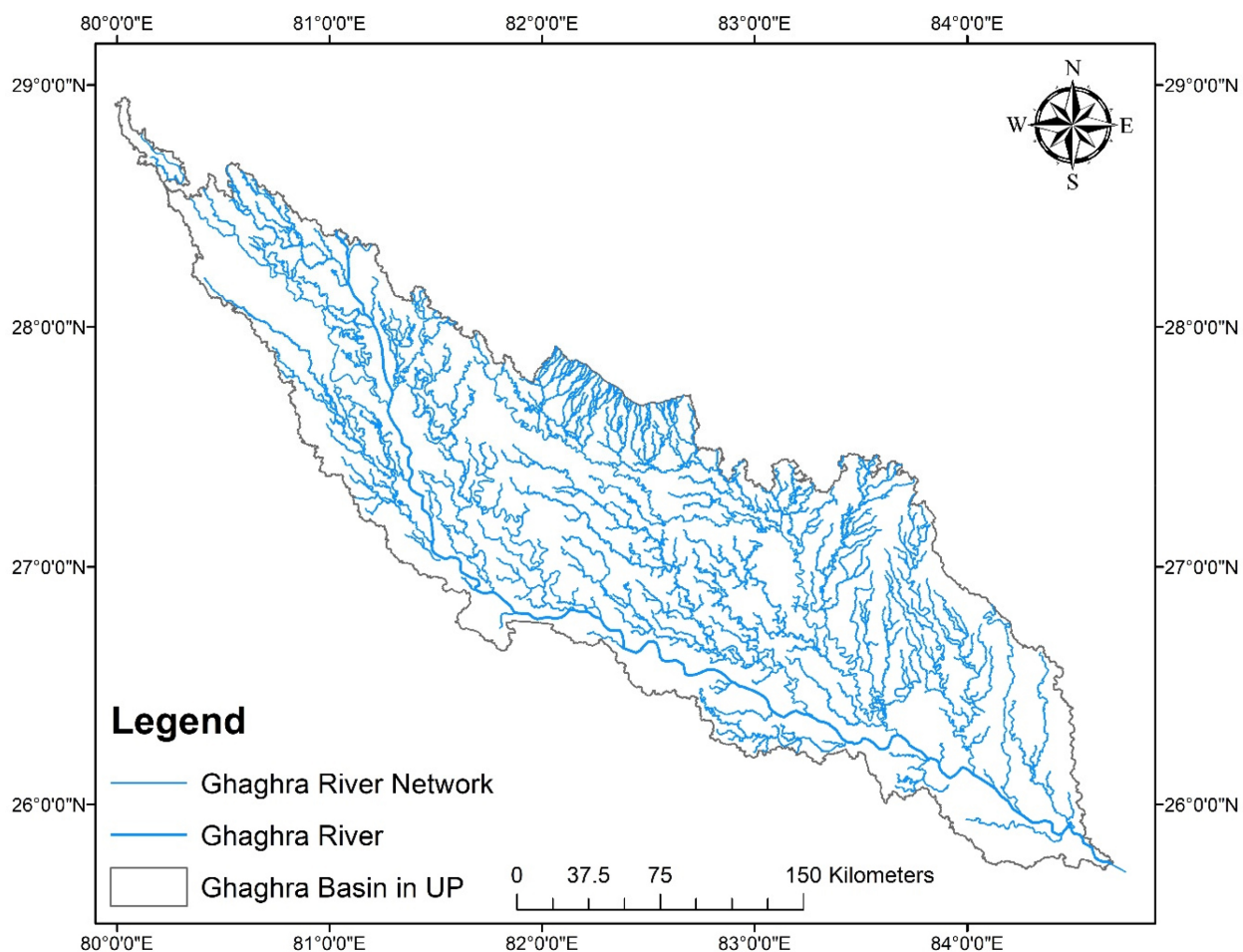
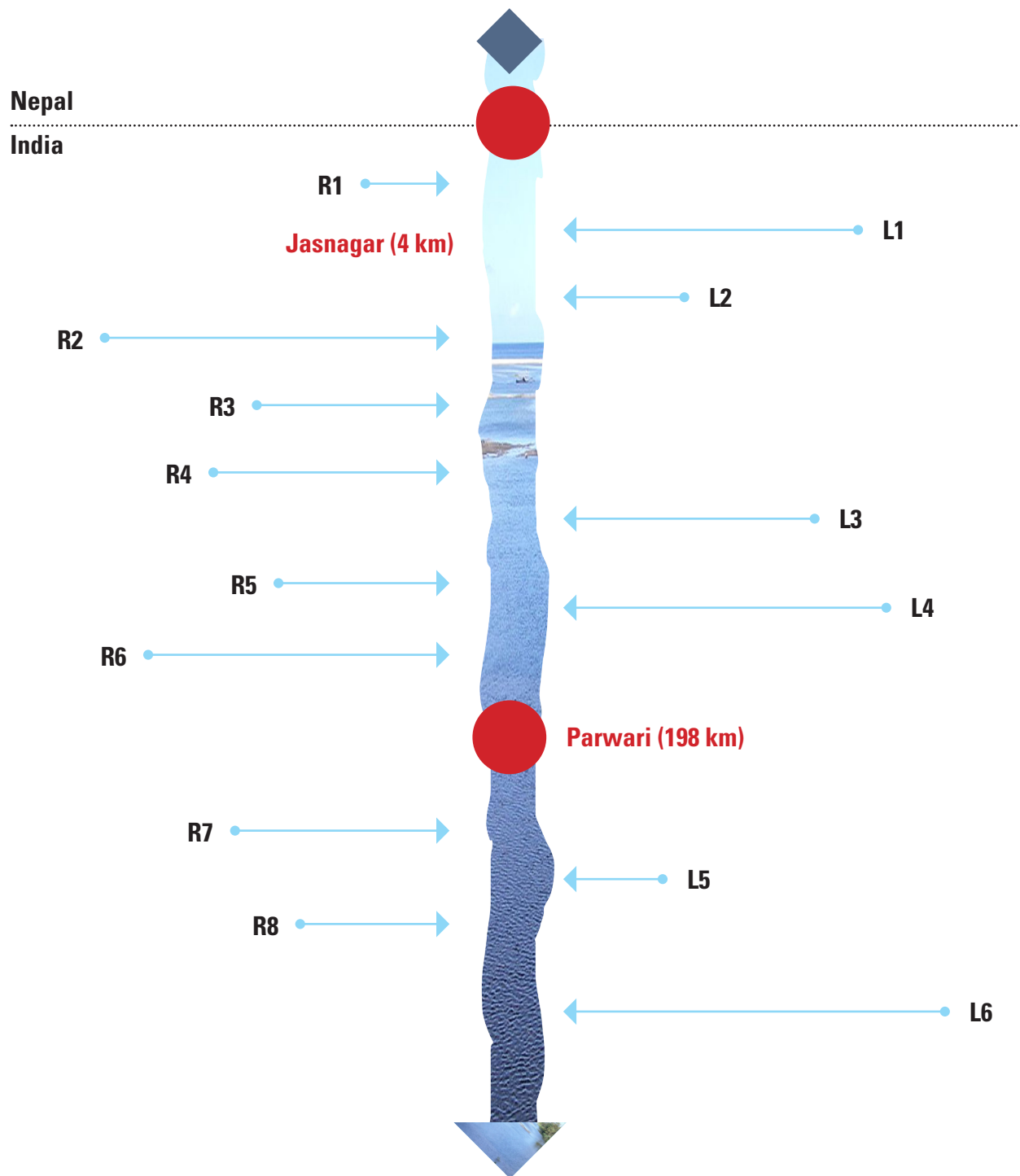


Figure: Ghaghra river network



GHAGHRA RIVER MAINSTEM FLOW DIAGRAM



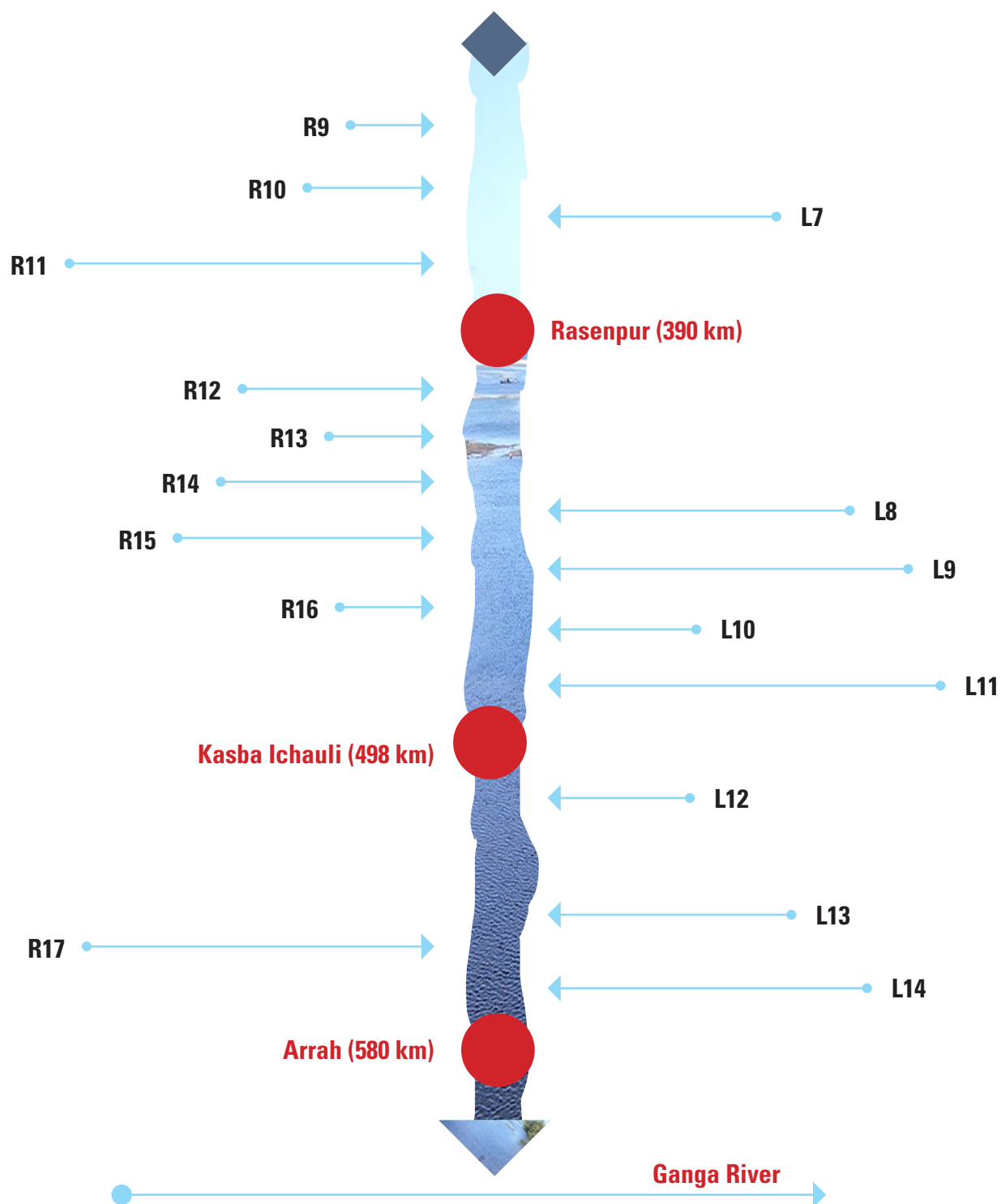


Figure: Flow Diagram of Ghaghra River

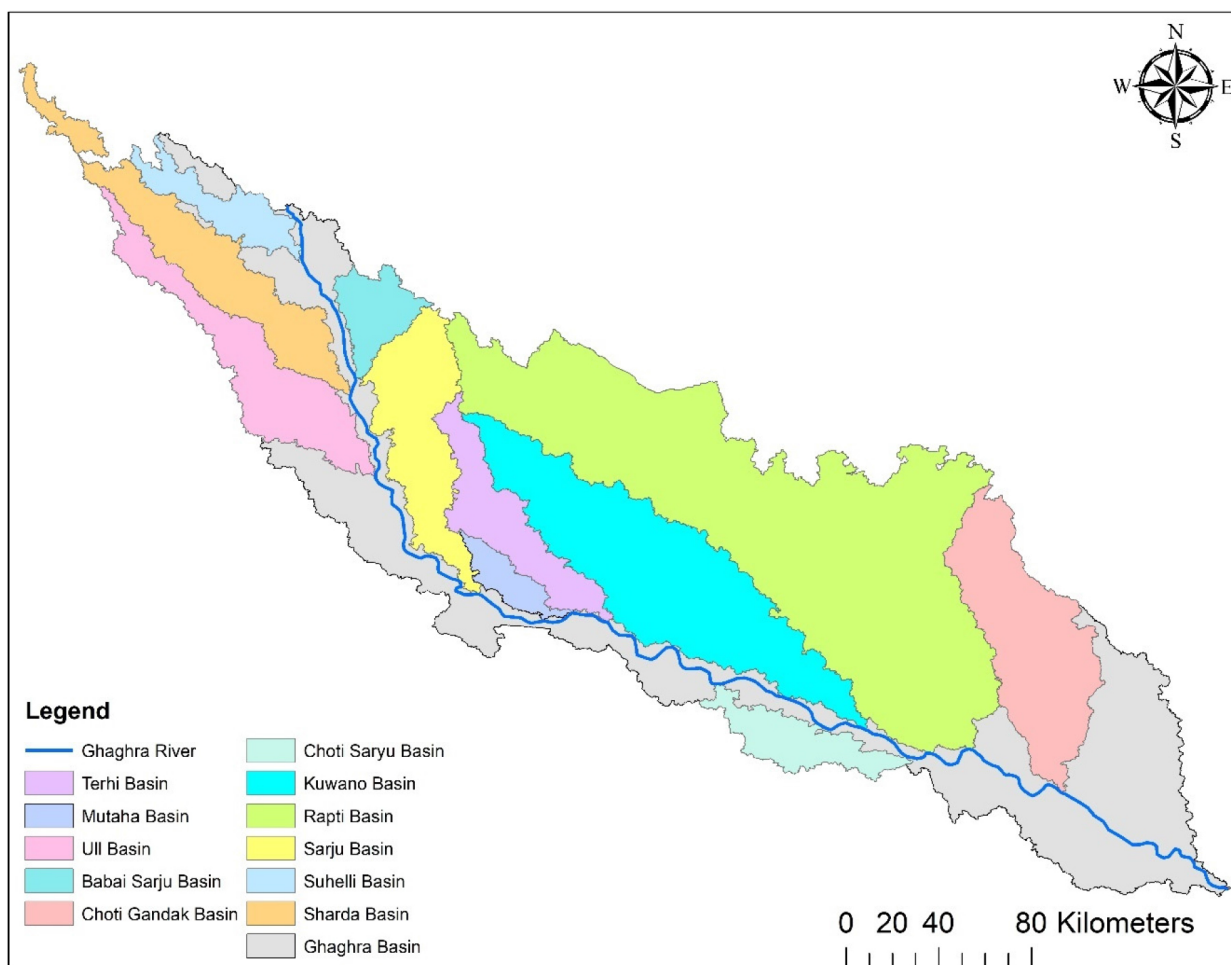


GHAGHRA RIVER MAINSTEM NETWORK						
S.No.	River Name	Confluence Bank	River Length (Km)	Confluence Co-ordinate		Distance from origin (km)
				Lat	Long	
1	Stream 4	R1	19.2	28.39	81.03	6
2	Stream 3	L1	39.3	28.35	81.06	10
3	Seti	L2	21.2	28.28	81.09	19
4	Sarju	R2	131	28.18	81.09	29
5	Stream 2	R3	20.5	28.18	81.09	40
6	Sukhni Nala	R4	61.4	28.05	81.17	47
7	Stream 6	L3	27	28.02	81.20	51
8	Stream 5	R5	41	28.01	81.21	54
9	Babai river	L4	87.8	27.73	81.29	85
10	Sharda river	R6	337	27.67	81.28	94
11	Ull or Chauka river	R7	117.1	27.35	81.37	132
12	Stream 1	L5	19.2	27.20	81.47	156
13	Chuaka river	R8	66.6	27.09	81.48	167
14	Jyori Nala	R9	24	27.03	81.52	174
15	Jori Nala	R10	13.7	26.91	81.69	204
16	Sarju	L6	233	26.89	81.77	213
17	Kasera Nala	R11	17	26.81	81.87	228
18	Mutaha Nala	L7	64.5	26.82	82.15	257
19	Terhi Nadi	L8	240	26.78	82.27	271
20	Tihora Nala	R12	22	26.66	82.39	291
21	Achhnain Nala	R13	13.8	26.52	82.89	358
22	Pikia Nala	R14	46.7	26.39	83.09	384
23	Kuwano river	L9	391	26.38	83.27	404
24	Choti Saryu river	R15	152	26.27	83.43	422
25	Rapti Ghaghara river	L10	525	26.30	83.67	453
26	Haha Nala	R16	13.9	26.19	83.82	472
27	Jamuar Nala	L11	14.8	26.18	83.87	478
28	Choti Gandak rivr	L 12	326	26.13	84.03	501.7
29	Ghori Nala	L13	12.9	26.07	84.12	513.9
30	Jhararhi	L14	74.8	25.96	84.25	532.5
31	Kol Nala	R17	70	25.88	84.44	556.1
32	Daha Ghaghara river	L15	138	25.90	84.49	562.4

GHAGHRA BASIN: MAJOR SUB-BASINS

Major sub-basins of Ghaghra River are as follows:

- | | | |
|----------------------|----------------|-------------------|
| ■ Babai basin | ■ Rapti basin | ■ Ull drain basin |
| ■ Choti Gandak basin | ■ Suheli basin | ■ Mutaha basin |
| ■ Choti Saryu basin | ■ Sarju basin | ■ Terhi basin |
| ■ Kuwano basin | ■ Sharda basin | |





BABAI BASIN

Babai River UID Code:
 Basin Area: 899.938 Sq. Km.
 Number of rivers- 21
 River Network-573.76 Km

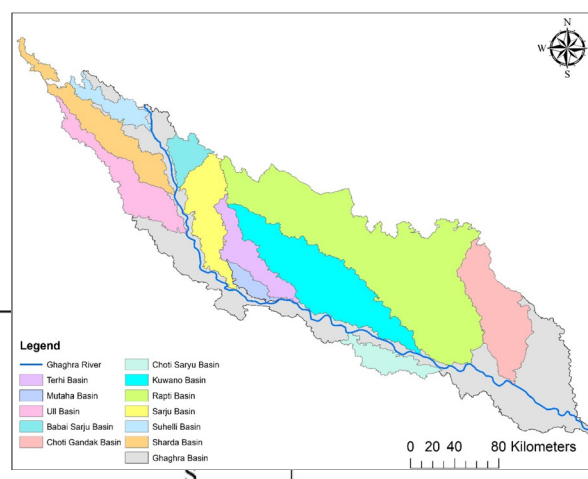
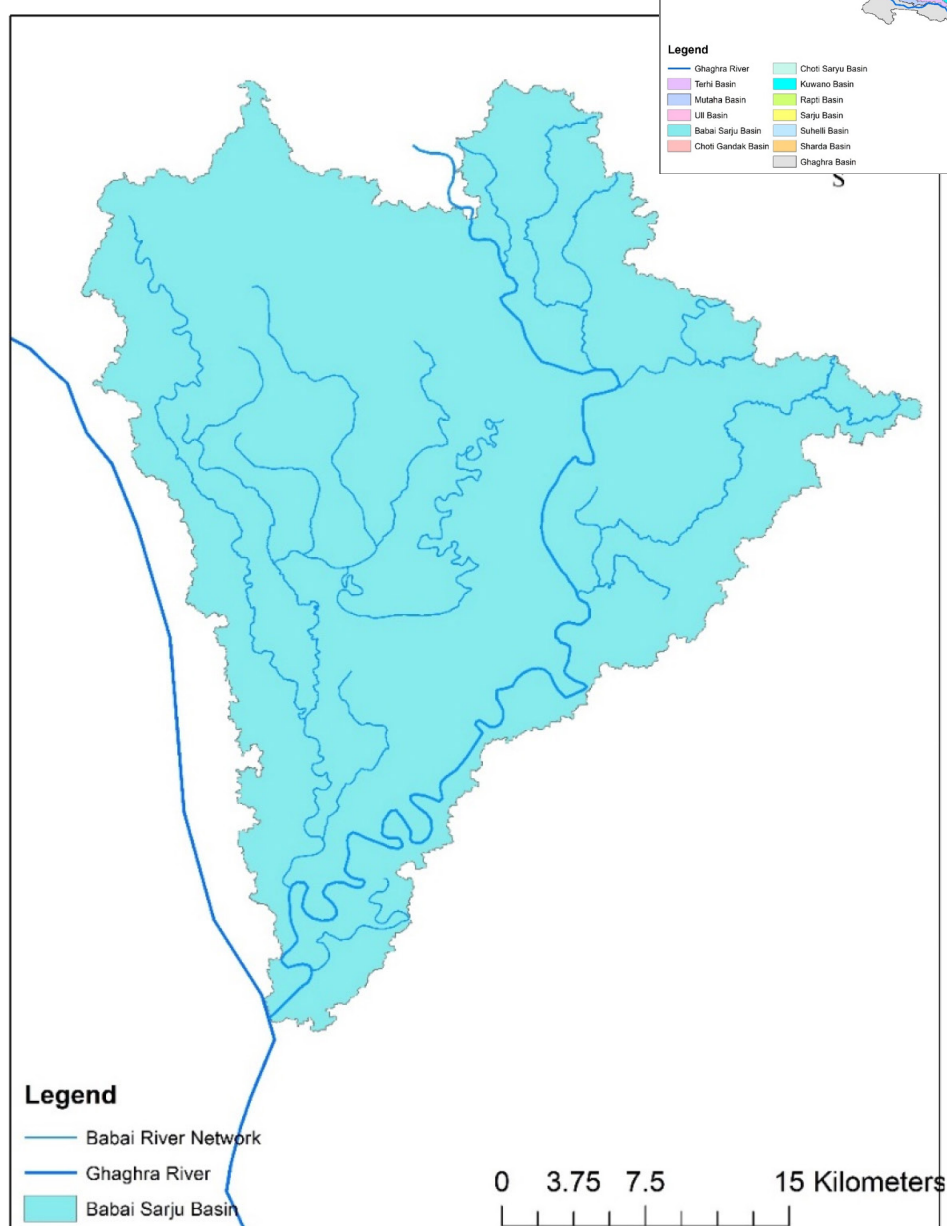


Figure: Babai River Network

BABAI/ SARJU RIVER MAINSTEM FLOW DIAGRAM

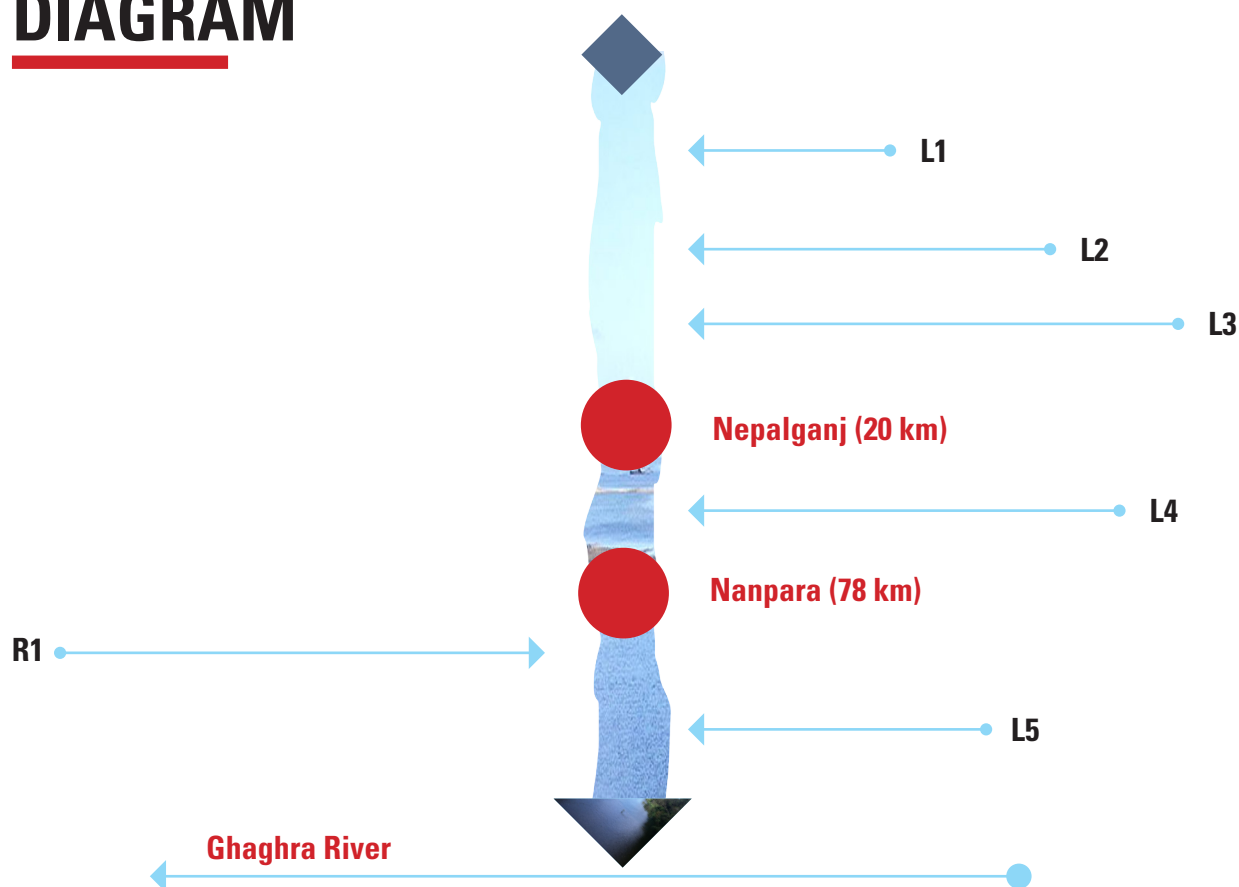


Figure: Flow Diagram of Babai River

SHAHDARA DRAIN MAINSTEM NETWORK						
S.No.	River Name	Confluence Bank	River Length (Km)	Confluence Co-ordinate		Distance from origin (km)
				Lat	Long	
1	Stream 4	L1	8.67	28.08	81.40	10
2	Stream 3	L2	30.2	28.04	81.45	18
3	Stream 1	L3	63	28.03	81.46	20
4	Bhaghar Nala	L4	44.8	27.93	81.44	34
5	Soti Nadi or Chuka Nala	R1	49.4	27.79	81.30	78
6	Stream 1	L5	12.8	27.75	81.31	84





CHOTI GANDAK BASIN

Choti Gandak River UID Code:

Basin Area: 3670.75 Sq. Km.

Number of rivers- 42

River Network- 1109.64 Km

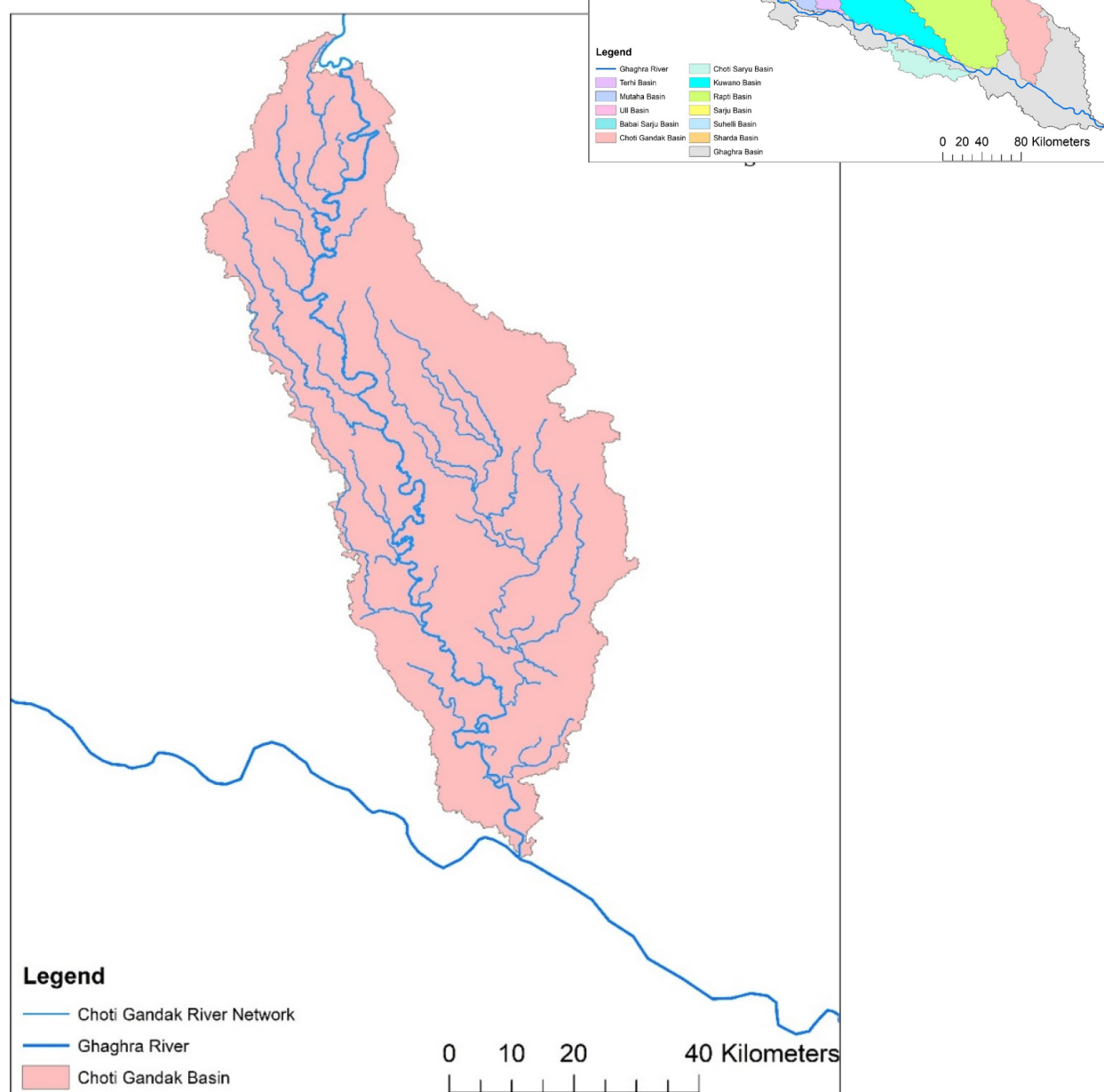


Figure: Choti Gandak River Network

CHOTI GANDAK RIVER MAINSTEM FLOW DIAGRAM

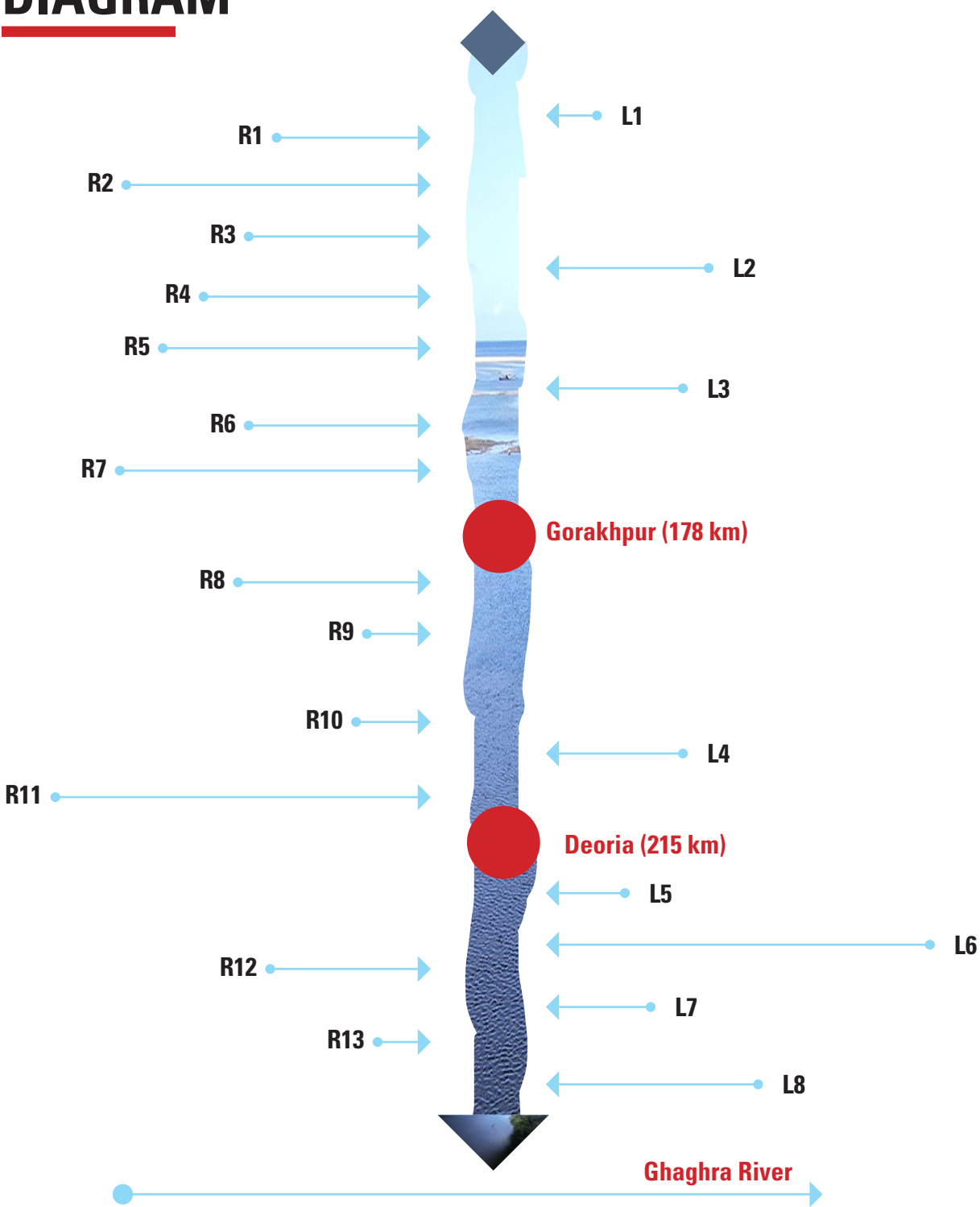


Figure: Flow diagram of Choti Gandak River



CHOTI GANDAK RIVER MAINSTEM NETWORK						
S.No.	River Name	Confluence Bank	River Length (Km)	Confluence Co-ordinate		Distance from origin (km)
				Lat	Long	
1	Stream 10	L1	3.27	27.32	83.78	39
2	Stream 2	R1	11.6	27.11	83.78	93
3	Khekhra Nala	R2	39.6	27.08	83.75	99
4	Sota Nala	R3	15.2	27.06	83.74	109
5	Kakera Nala	L2	11.3	27.00	83.76	122
6	Stream 1	R4	16.7	26.99	83.73	128
7	Stream 9	R5	8.6	26.94	83.71	135
8	Stream 8	L3	7.27	26.88	83.78	152
9	Jethan Nala	R6	13.4	26.79	83.80	170
10	Maun Nala	R7	71.7	26.74	83.83	178
11	Duhari Nala	R8	19	26.59	83.85	217
12	Stream 7	R9	3.14	26.56	83.85	229
13	Karmaini Nala	R10	6.58	26.56	83.85	230
14	Stream 6	L4	8.44	26.49	83.88	244
15	Kanchi or Duranchi Nala	R11	88.4	26.46	83.89	251
16	Stream 5	L5	3.15	26.39	83.98	270
17	Khanua River	L6	73.6	26.35	84.01	277
18	Koilar Nala	R12	27.3	26.31	83.94	293
19	Stream 4	L7	4.83	26.29	83.97	300
20	Stream 3	R13	3.13	26.23	83.99	308
21	Duna Nala	L8	20.5	26.23	84.01	310

CHOTI SARYU BASIN

Choti Saryu River UID Code:
 Basin Area: 1161 Sq. Km.
 Number of rivers- 12
 River Network-277.98 Km

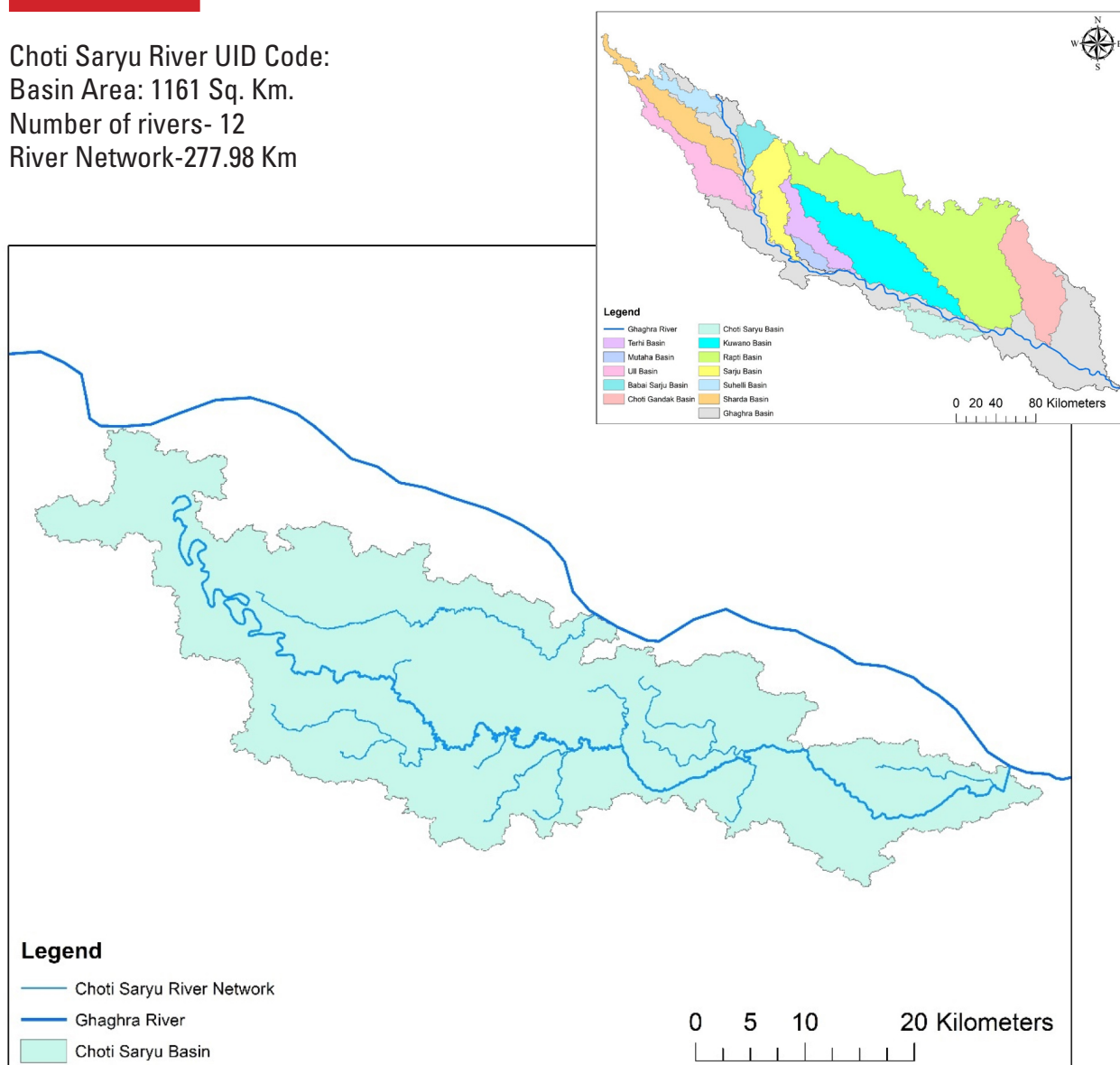


Figure: Choti Saryu River Network



CHOTI SARYU RIVER MAINSTEM FLOW DIAGRAM

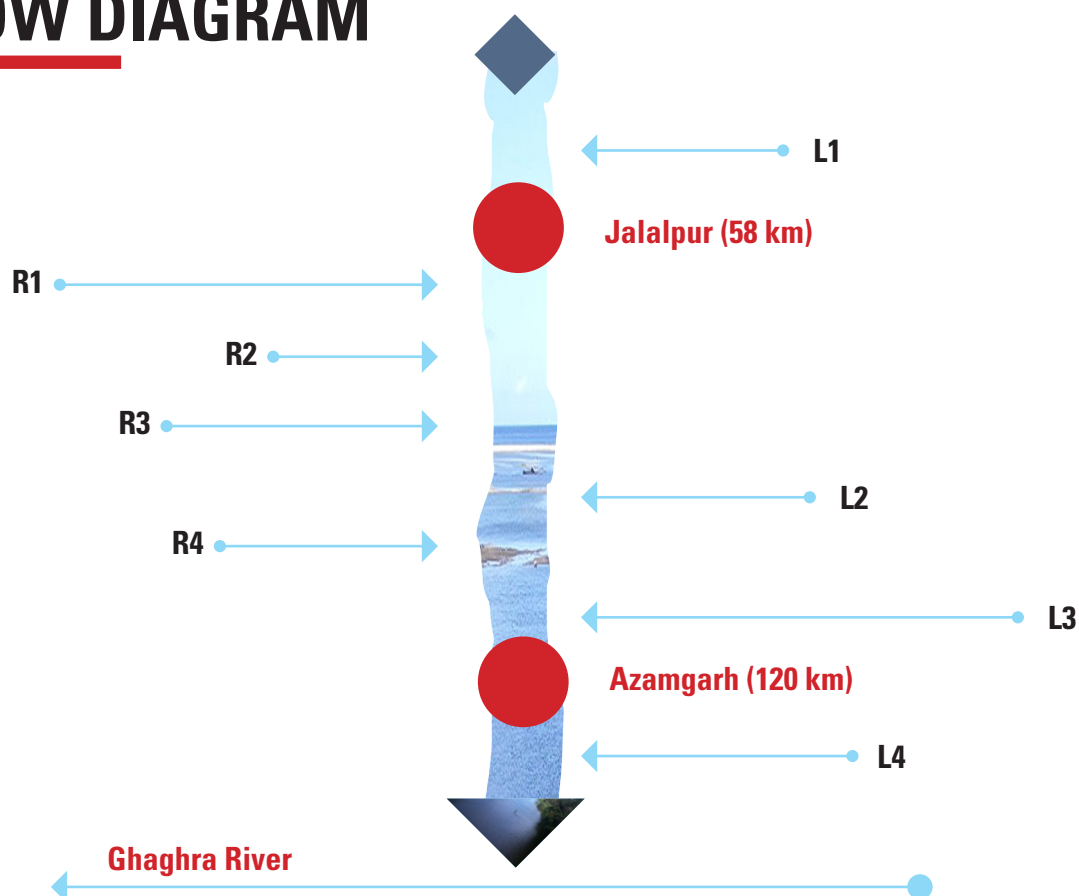


Figure: Flow Diagram of Choti Saryu River

CHOTI SARYU RIVER MAINSTEM NETWORK						
S.No.	River Name	Confluence Bank	River Length (Km)	Confluence Co-ordinate		Distance from origin (km)
				Lat	Long	
1	Stream 2	L1	3.28	26.34	82.92	58
2	Stream 5	R1	25.5	26.29	82.96	67
3	Gandhaiya Nala	R2	5	26.29	83.01	81
4	Chumkuni Nala	R3	14.8	26.28	83.07	95
5	Stream 1	L2	11	26.28	83.11	103
6	Deonai Jhil	R4	8.2	26.27	83.21	118
7	Stream 3	L3	20.9	26.28	83.21	120
8	Stream 4	L4	12.2	26.25	83.41	149

KUWANO BASIN

Kuwano River UID Code:
Basin Area:5825.43 Sq. Km.
Number of rivers- 76
River Network-1724.53 Km

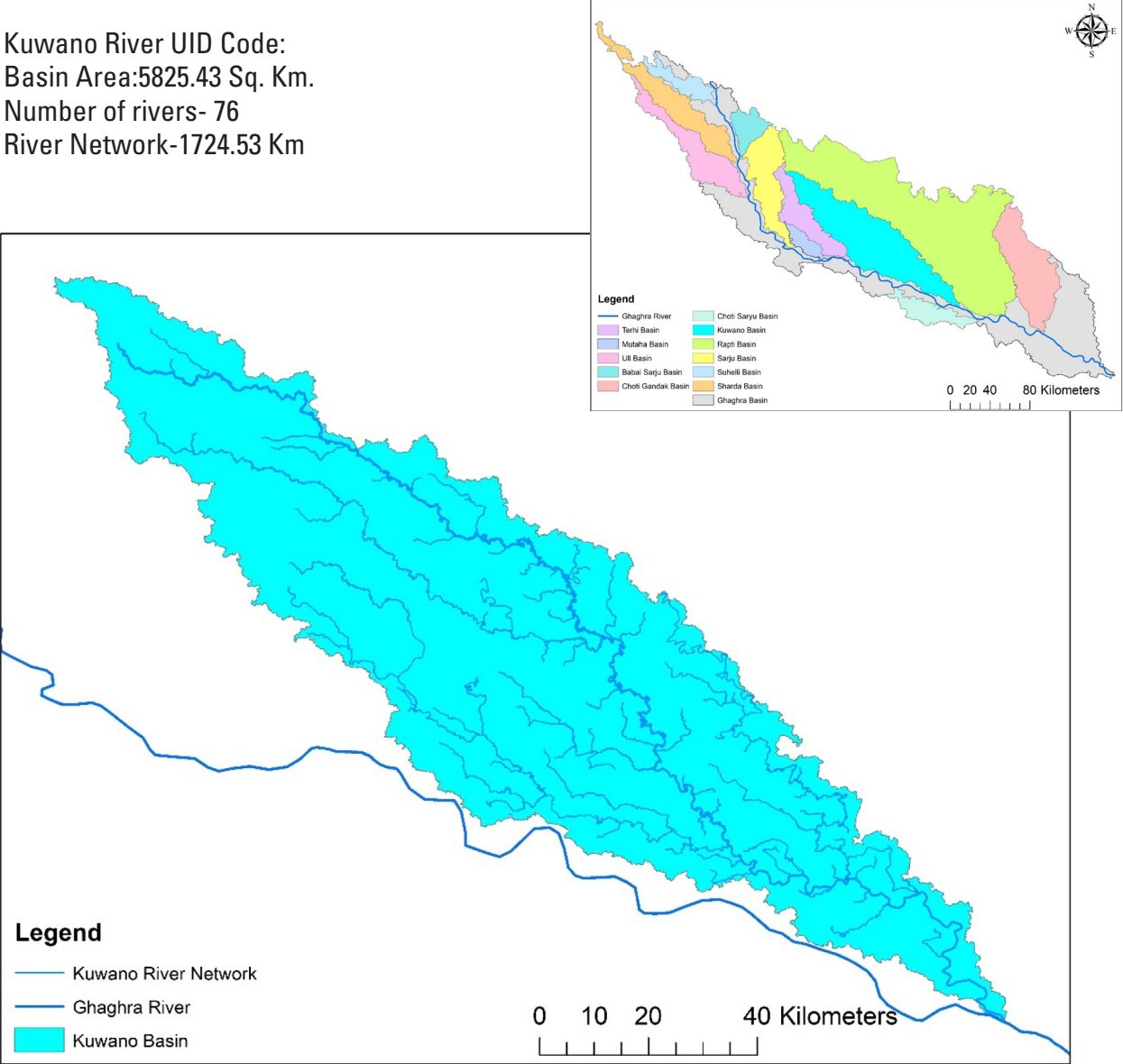
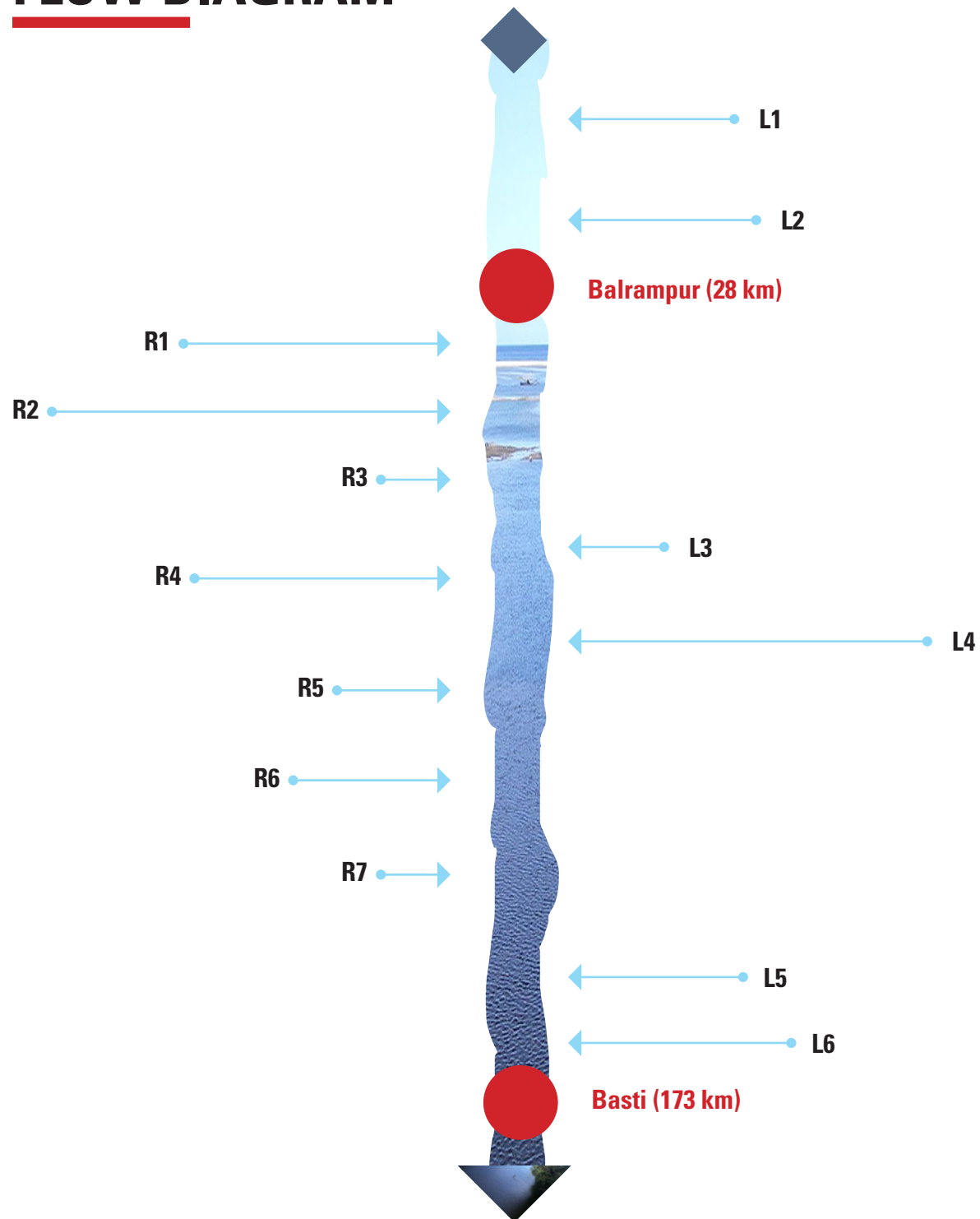
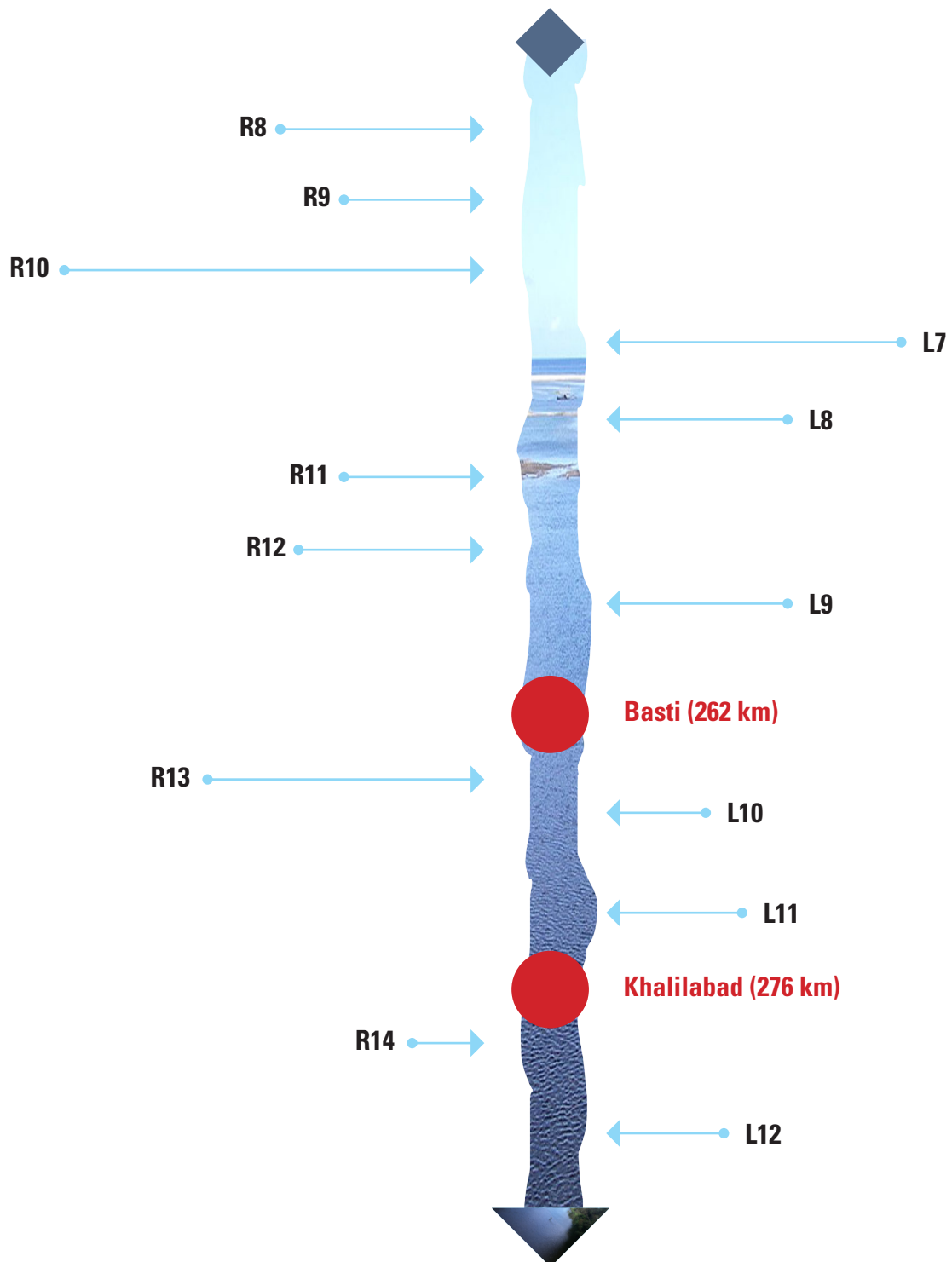


Figure: Kuwano River Network



KUWANO RIVER MAINSTEM FLOW DIAGRAM





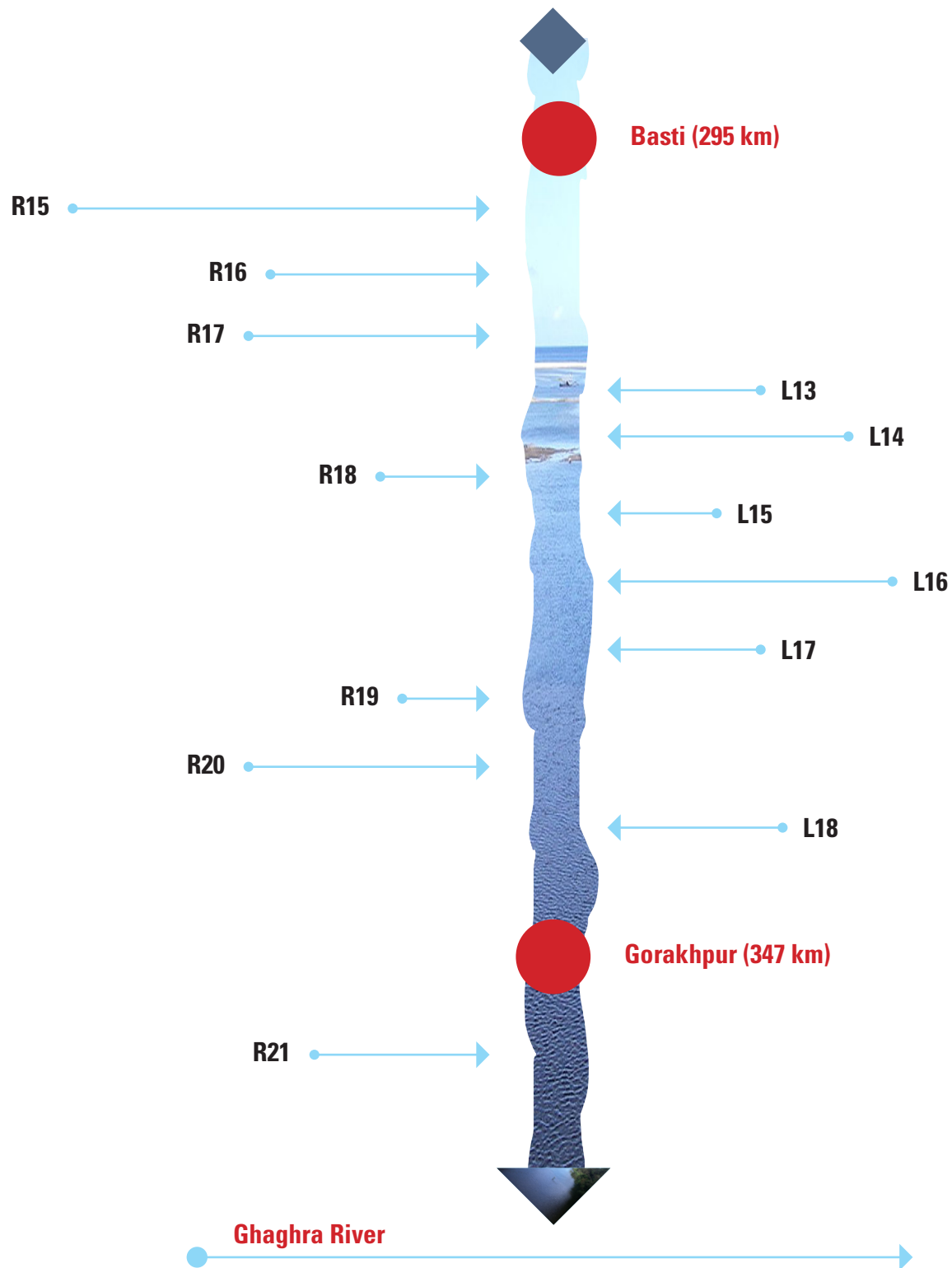


Figure: Flow diagram of Kuwano river network

KUWANO RIVER MAINSTEM NETWORK						
S.No.	River Name	Confluence Bank	River Length (Km)	Confluence Co-ordinate		Distance from origin (km)
				Lat	Long	
1	Stream 24	L1	3.62	27.44	81.90	17
2	Narkutwa Nala	L2	16.8	27.43	81.96	28
3	Jahda Nala	R1	12.6	27.33	82.15	74
4	Pindariya Nala	R2	19.1	27.32	82.19	81
5	Stream 23	R3	3.53	27.26	82.26	97
6	Stream 22	L3	3.75	27.25	82.30	105
7	Singhwa Nala	R4	9.48	27.17	82.37	125
8	Kardahwa Nala	L4	22	27.17	82.40	131
9	Stream 21	R5	4	27.15	82.45	145
10	Stream 20	R6	6.16	27.12	82.50	163
11	Stream 19	R7	2.58	27.12	82.54	168
12	Bhitri Nala	L5	8.66	27.10	82.55	172
13	Majotia Nala	L6	9.21	27.10	82.55	173
14	Stream 18	R8	12	27.07	82.56	177
15	Stream 17	R9	7.35	27.04	82.56	187
16	Bisahi Nadi	R10	187	27.00	82.61	203
17	Rahawar Nala	L7	20.3	27.00	82.63	206
18	Stream 16	L8	10.9	27.00	82.64	207
19	Devvhua Nala	R11	11.2	26.91	82.64	227
20	Stream 15	R12	17.4	26.82	82.70	257





KUWANO RIVER MAINSTEM NETWORK						
S.No.	River Name	Confluence Bank	River Length (Km)	Confluence Co-ordinate		Distance from origin (km)
				Lat	Long	
21	Stream 14	L9	16.8	26.81	82.70	258
22	Rewai Nadi	R13	52.7	26.79	82.70	262
23	Stream 13	L10	2.32	26.76	82.75	273
24	Stream 12	L11	5.43	26.74	82.76	276
25	Stream 11	R14	5.7	26.71	82.77	282
26	Stream 10	L12	5.59	26.71	82.79	285
27	Manawar River or Manorama	R15	177	26.66	82.82	295
28	Stream 9	R16	11	26.63	82.84	300
29	Stream 8	R17	11.4	26.61	82.86	305
30	Stream 7	L13	11	26.61	82.92	316
31	Stream 6	L14	19	26.61	82.94	318
32	Barka Nala	R18	7.89	26.59	82.99	326
33	Stream 5	L15	4.12	26.60	83.00	329
34	Kathinaya River	L16	129	26.60	83.02	331
35	Stream 4	L17	7.54	26.60	83.03	332
36	Stream 3	R19	4.81	26.58	83.05	335
37	Keonaiya Nadi	R20	17.7	26.56	83.08	341
38	Stream 2	L18	17.3	26.58	83.13	347
39	Stream 1	R21	11.4	26.48	83.17	367

RAPTI BASIN

Rapti River UID Code:
Basin Area: 14031.1 Sq. Km.
Number of rivers- 206
River Network- 5278.17 Km

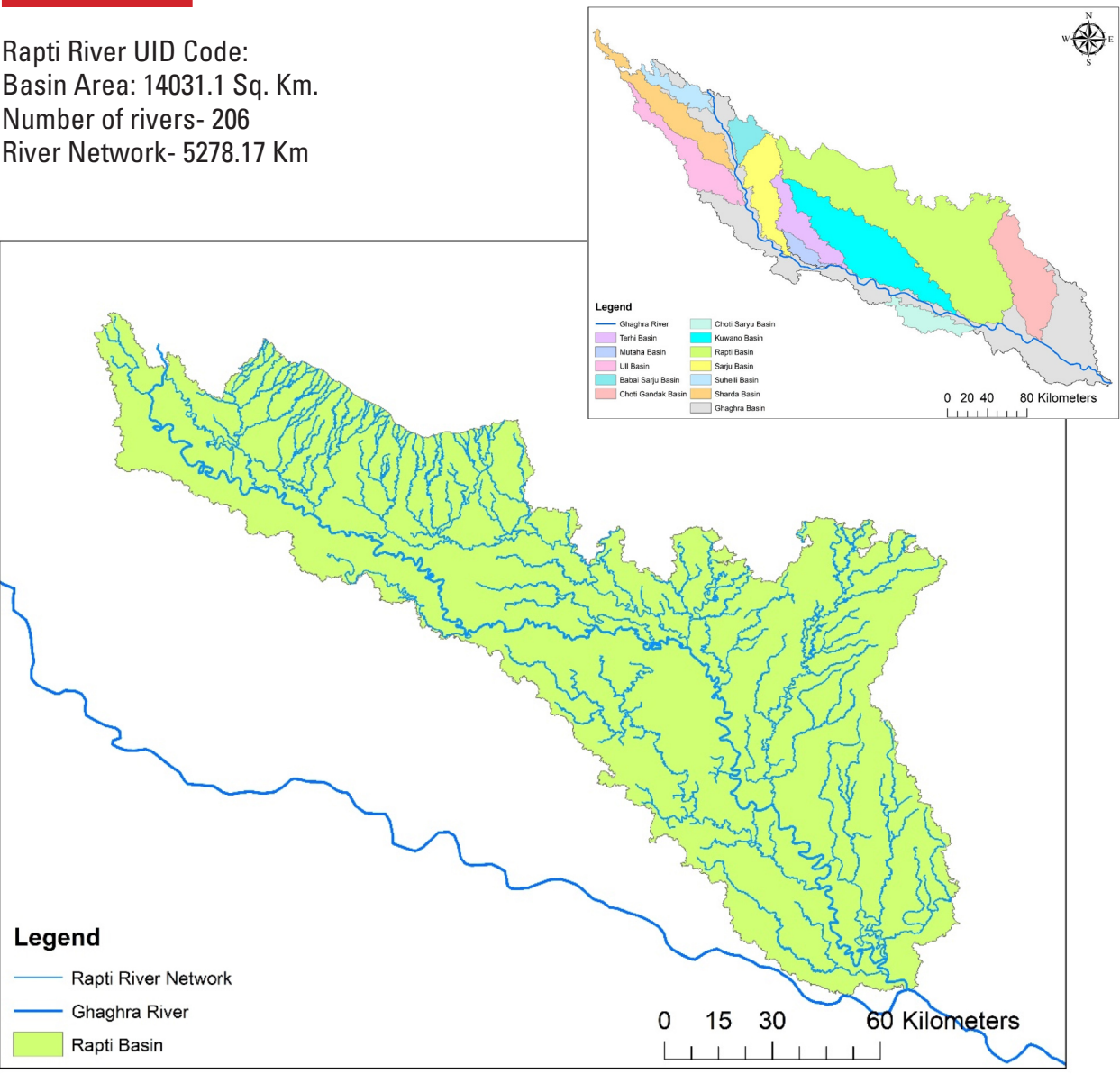


Figure: Rapti River Network



RAPTI RIVER MAINSTEM FLOW DIAGRAM

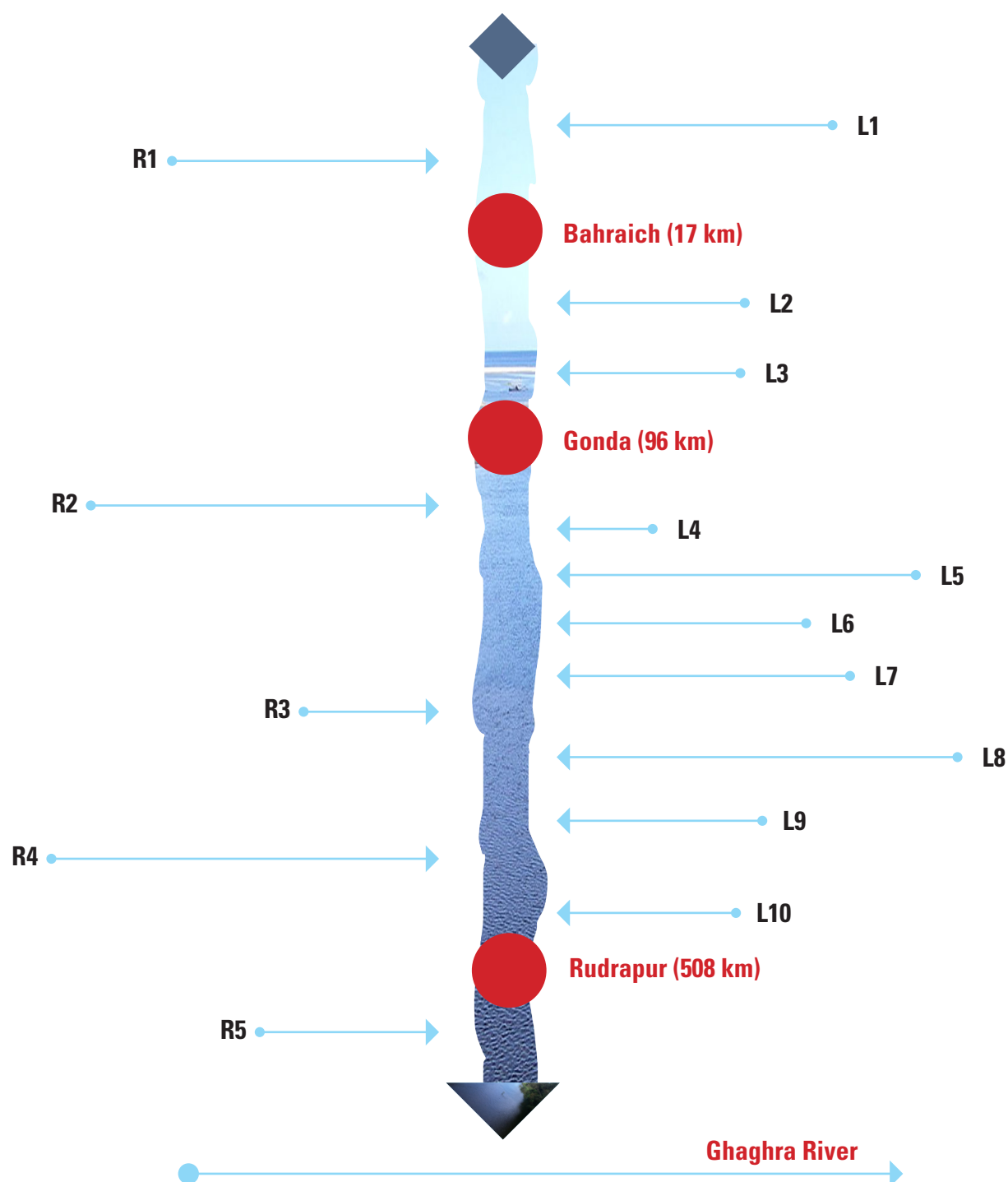


Figure: Flow Diagram of Rapti River Network

RAPTI RIVER MAINSTEM NETWORK						
S.No.	River Name	Confluence Bank	River Length (Km)	Confluence Co-ordinate		Distance from origin (km)
				Lat	Long	
1	Repti or Khurpiwa River	L1	81.2	27.84	81.82	9
2	Stream 1	R1	35.1	27.78	81.77	17
3	Khurpiwa Nala	L2	27.6	27.57	81.99	81
4	Burhi Rapti or Burhatti Nadi	L3	27.3	27.48	82.18	96
5	Suwawan Nadi	R2	82.3	27.18	82.57	116
6	Stream 2	L4	6.68	27.20	82.89	210
7	Phajitwa Nala	L5	94.5	27.15	83.03	285
8	Dono River	L6	54	27.15	83.12	308
9	Powa Nala	L7	59.5	27.05	83.20	329
10	Churma Nala	R3	11.7	26.83	83.23	374
11	Rohini River	L8	188	26.76	83.33	398
12	Katna Nadi or Gaura Nadi	L9	44.1	26.60	83.47	439
13	Aami River	R4	191	26.55	83.45	449
14	Bathwa Nala	L10	25.8	26.37	83.62	508
15	Taraina Nadi	R5	44.3	26.33	83.62	516



SUHELLI BASIN

Suheli River UID Code:
 Basin Area: 1002.36 Sq. Km.
 Number of rivers- 17
 River Network- 473.44 Km

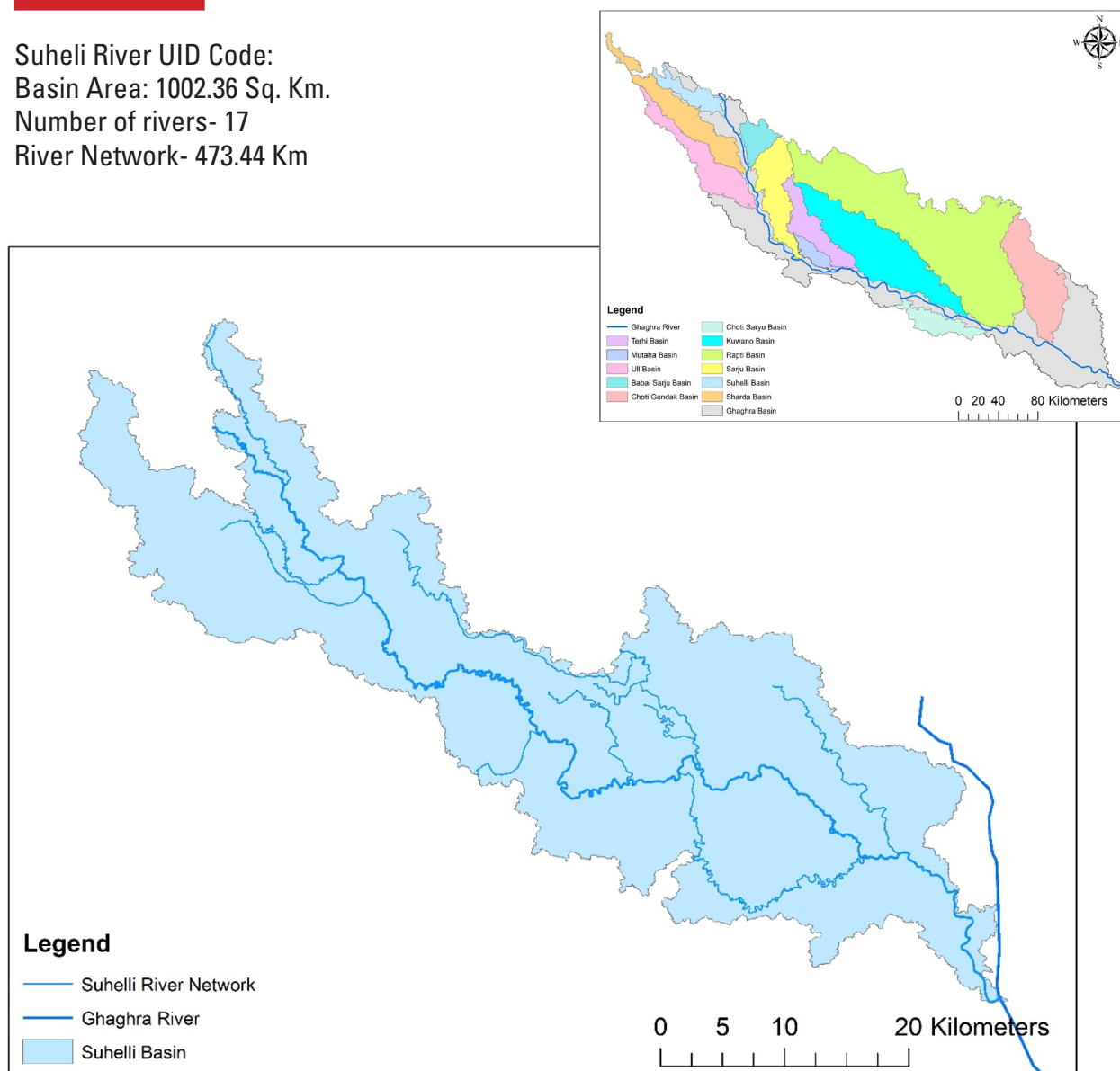


Figure: Suheli River Network

SUHELI RIVER MAINSTEM FLOW DIAGRAM

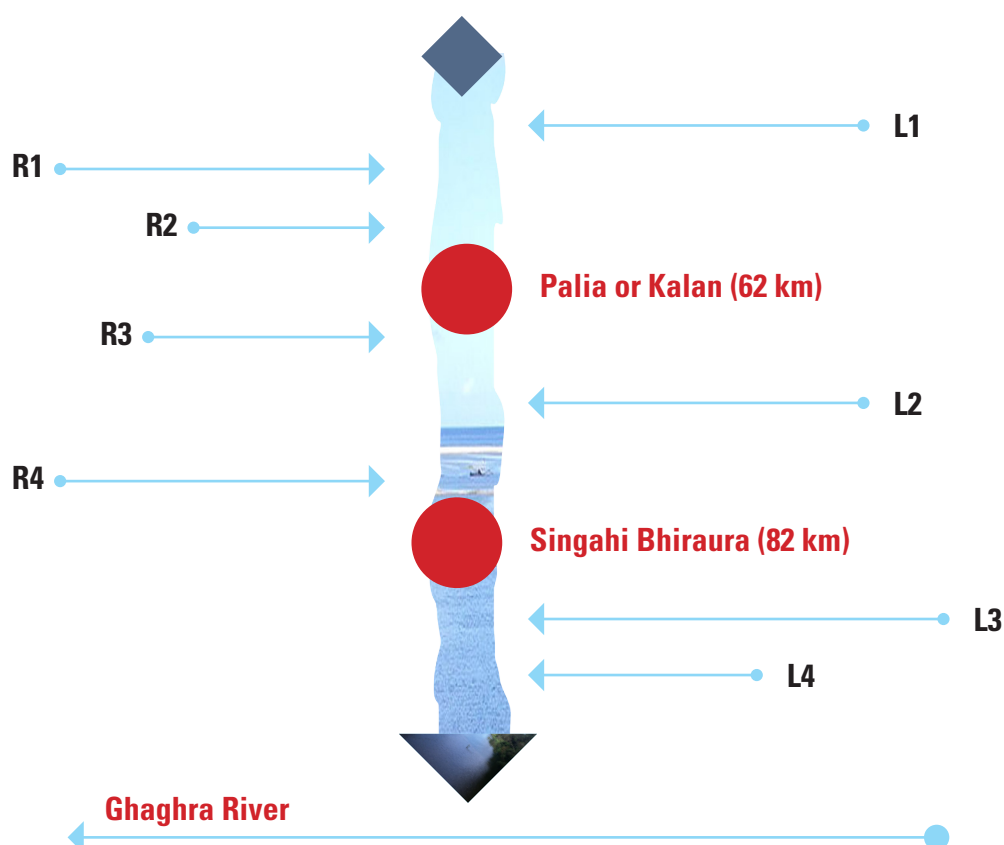


Figure: Flow Diagram of Suheli River Network

SARJU OR SUHELI RIVER MAINSTEM NETWORK						
S.No.	River Name	Confluence Bank	River Length (Km)	Confluence Co-ordinate		Distance from origin (km)
				Lat	Long	
1	Stream 5	L1	21.7	28.55	80.57	10
2	Stream 4	R1	31.2	28.49	80.61	22
3	Stream 3	R2	14.9	28.48	80.63	26
4	Tikona Nala	R3	13.4	28.37	80.76	62
5	Phataha Nala	L2	15.3	28.34	80.82	79
6	Stream 2	R4	44.9	28.34	80.86	84
7	Chhauwa Nala	L3	48.9	28.35	80.87	88
8	Stream 1	L4	24	28.29	81.02	113



SARJU BASIN

Sarju River UID Code:
Basin Area: 2528.93 Sq. Km.
River Network- 23

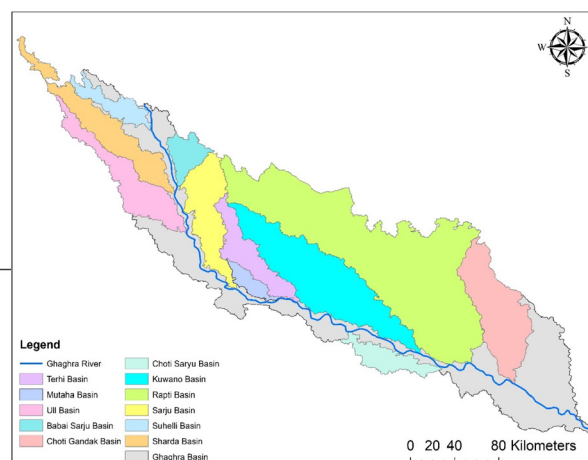
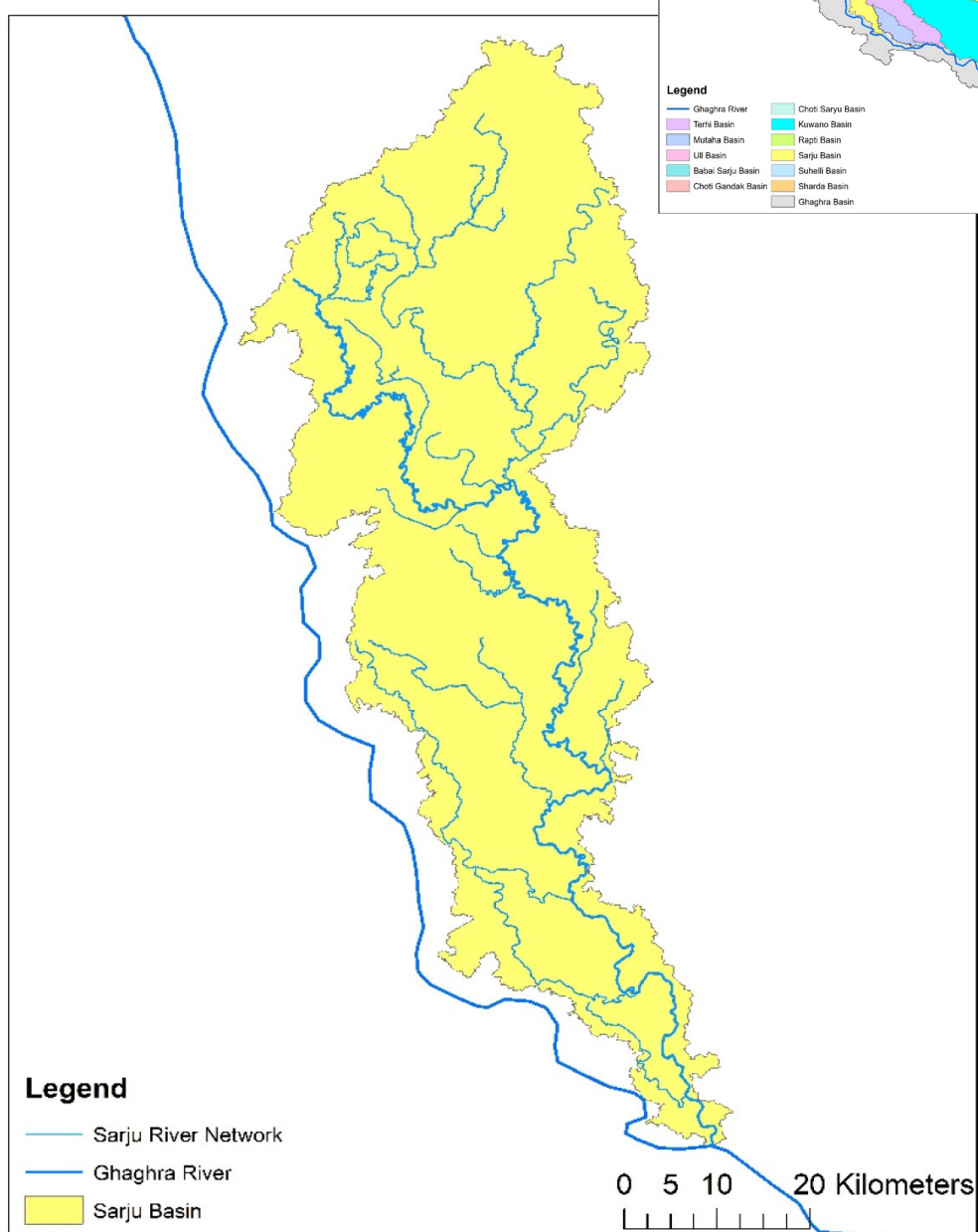


Figure: Sarju River Network

SARJU RIVER MAINSTEM FLOW DIAGRAM

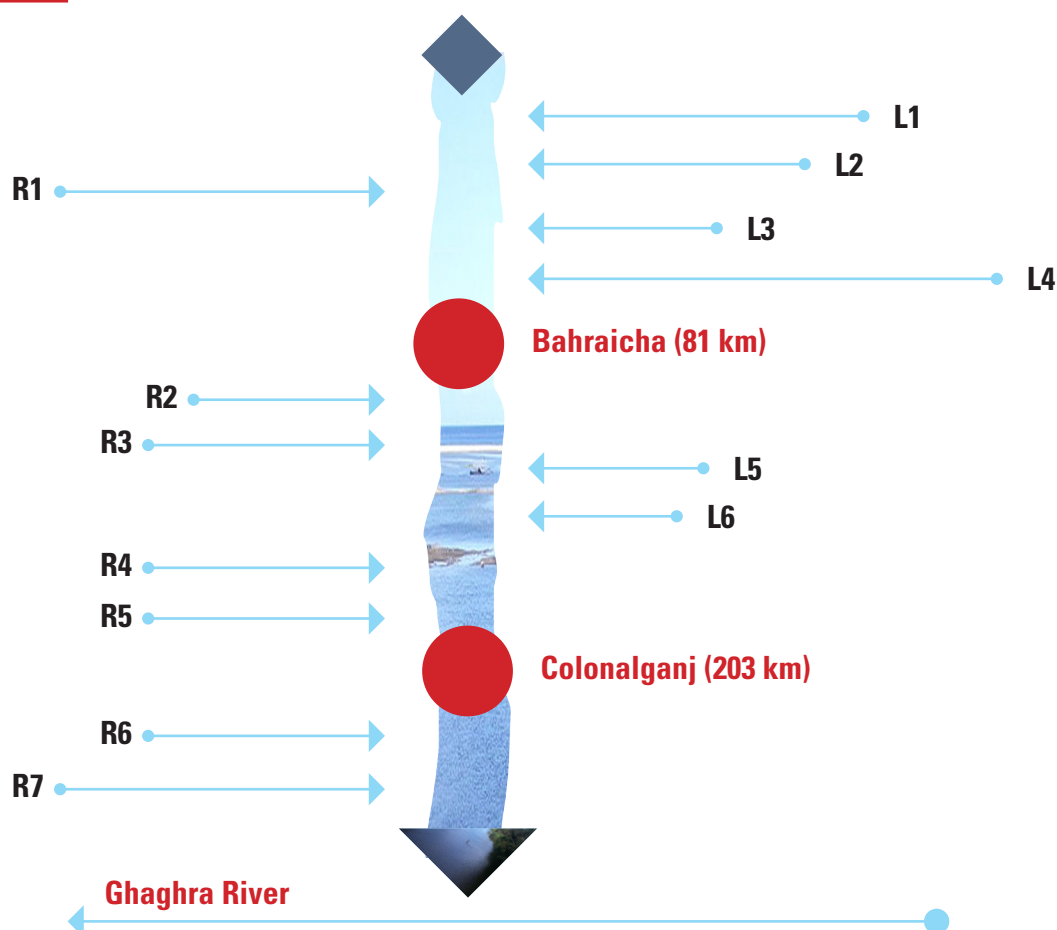


Figure: Flow Diagram of Sarju River Network

SARJU RIVER MAINSTEM NETWORK						
S.No.	River Name	Confluence Bank	River Length (Km)	Confluence Co-ordinate		Distance from origin (km)
				Lat	Long	
1	Stream 4	L1	33.5	27.74	81.39	4
2	Katuwa Nala	L2	23	27.59	81.47	54
3	Sigahi Nala	R1	11.6	27.53	81.53	72
4	Stream 3	L3	17.5	27.56	81.57	80
5	Babhni Nadi	L4	69.4	27.56	81.57	81
6	Madarla Nala	R2	6.57	27.49	81.56	100
7	Soti Nala	R3	14	27.47	81.58	106
8	Narwa Nala	L5	13.2	27.35	81.63	133
9	Stream 2	L6	12.8	27.27	81.67	155
10	Sotia Nala	R4	26.4	27.24	81.61	165
11	Karhera Nala or Bhakausa Nala	R5	55	27.14	81.63	185
12	Kurai Nala	R6	35.2	27.05	81.69	203
13	Stream 1	R7	21.7	26.94	81.74	225



SHARDA BASIN

Sharda UID Code:
 Basin Area: 2769.37 Sq. Km.
 Number of rivers- 17
 River Network- 725.88 Km

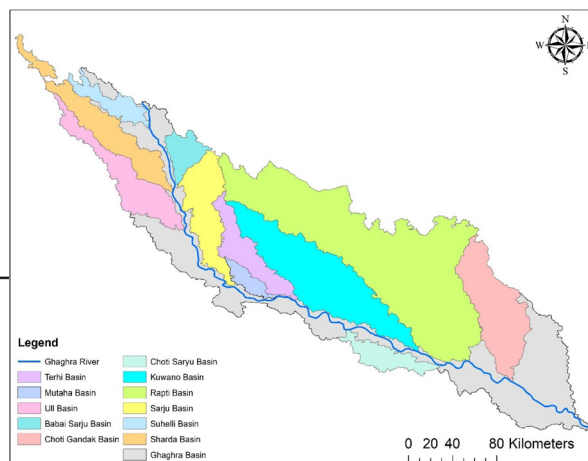
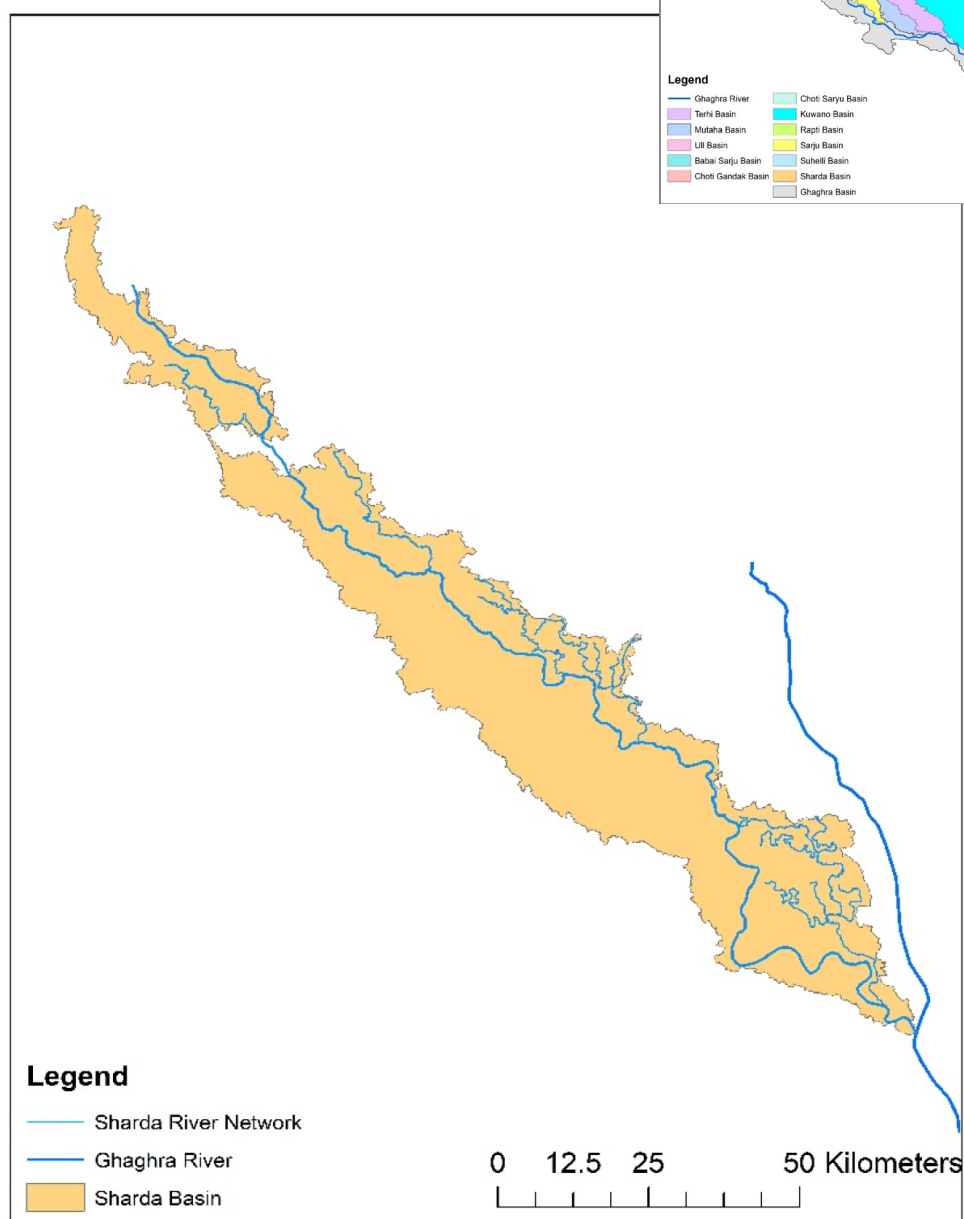


Figure: Sharda River Network

SHARDA MAINSTEM FLOW DIAGRAM

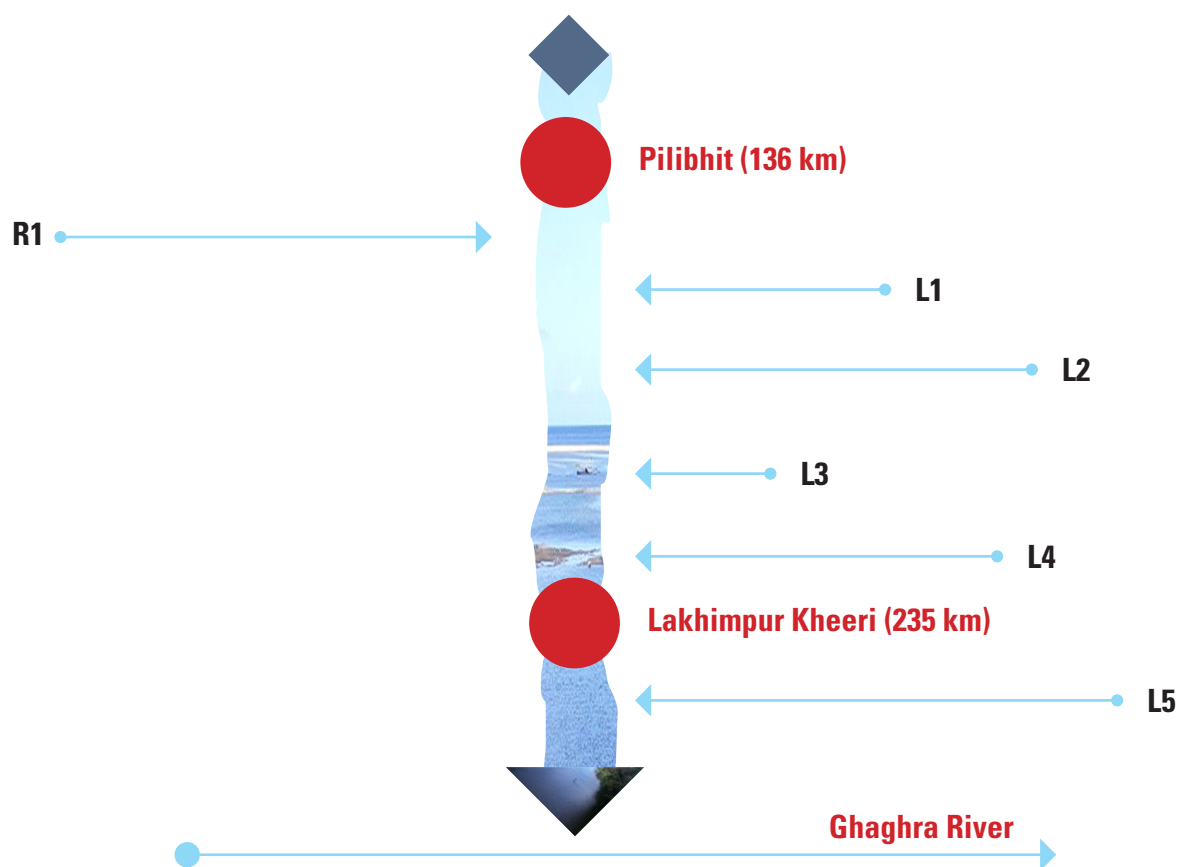


Figure: Flow Diagram of Sharda River

SHARDA RIVER MAINSTEM NETWORK						
S.No.	River Name	Confluence Bank	River Length (Km)	Confluence Co-ordinate		Distance from origin (km)
				Lat	Long	
1	Chuka Nadi	R1	35	28.60	80.30	136
2	Stream 1	L1	27.2	28.54	80.34	143
3	Sotia Nala	L2	52.4	28.39	80.55	177
4	Sutiya Nala	L3	13.3	28.22	80.75	212
5	Bahatiya Nadi or Ghaghi Nadi	L4	48.2	28.12	80.87	235
6	Dahawar River	L5	67.2	27.71	81.23	327



ULL BASIN

Ull UID Code:

Basin Area: 2769.37 Sq. Km.

Number of rivers- 17

River Network- 725.88 Km

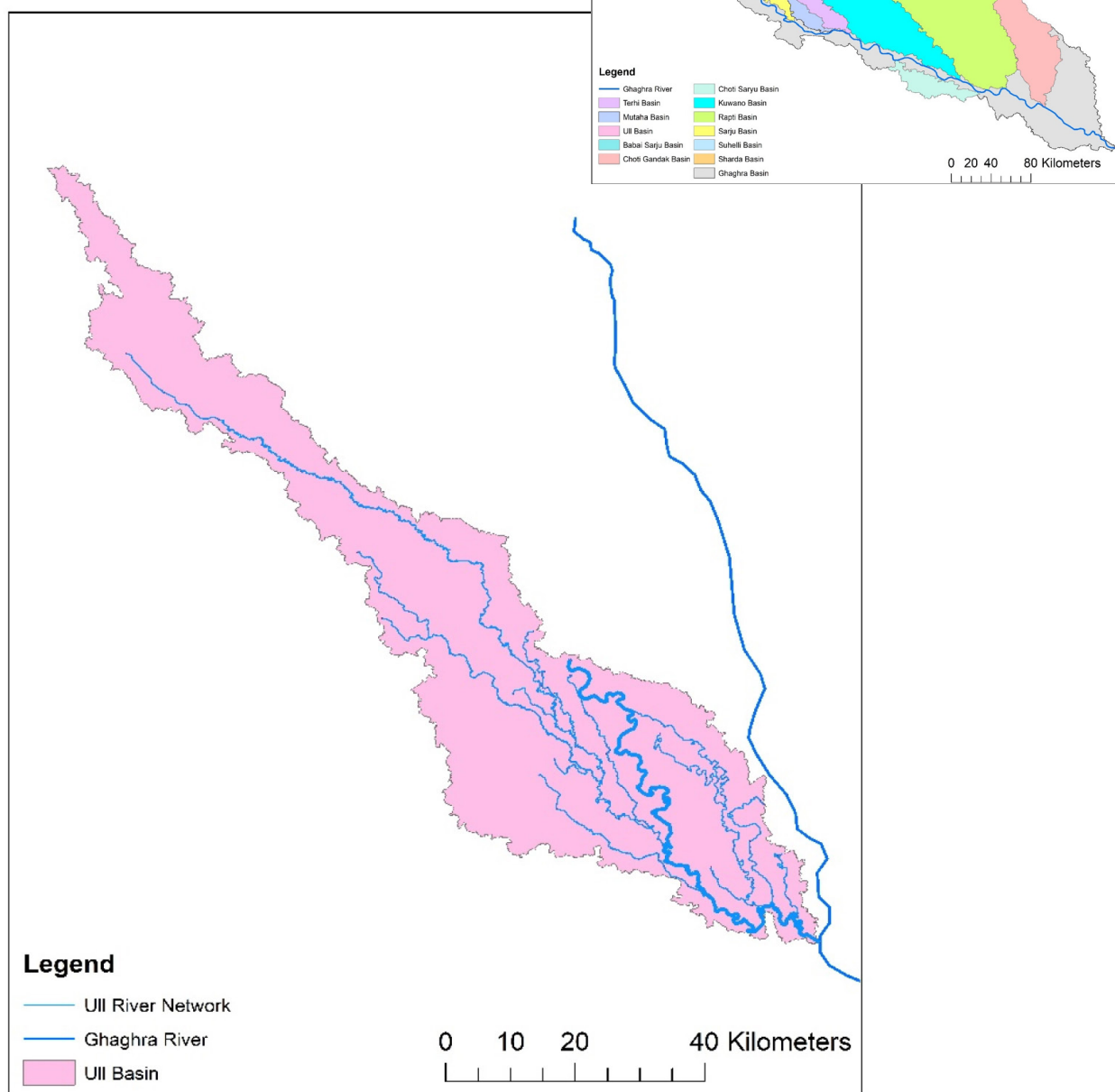


Figure: Ull River Network

ULL MAINSTEM FLOW DIAGRAM

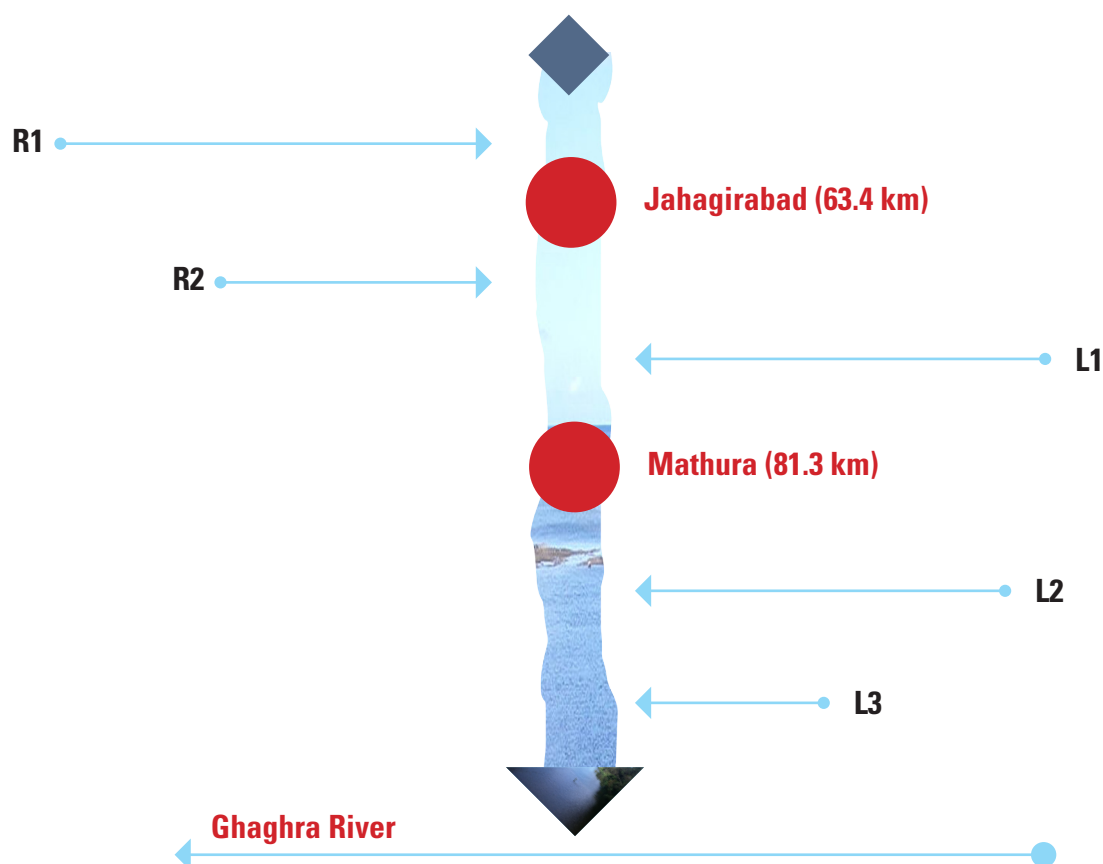


Figure: Flow diagram of Ull River

ULL RIVER MAINSTEM NETWORK						
S.No.	River Name	Confluence Bank	River Length (Km)	Confluence Co-ordinate		Distance from origin (km)
				Lat	Long	
1	Kewani Nadi	R1	90.7	27.50	81.16	63.4
2	Bakwa Nala	R2	41.8	27.42	81.21	102.1
3	Gobarhia Nadi	L1	62.2	27.41	81.30	81.3
4	Stream 2	L2	31.2	27.41	81.31	79.7
5	Stream 1	L3	17.2	27.39	81.34	71.94





MUTAHA DRAIN BASIN

Mutaha Drain UID Code:
 Basin Area: 719.64 Sq. Km.
 Number of rivers- 06
 River Network- 117.85 Km

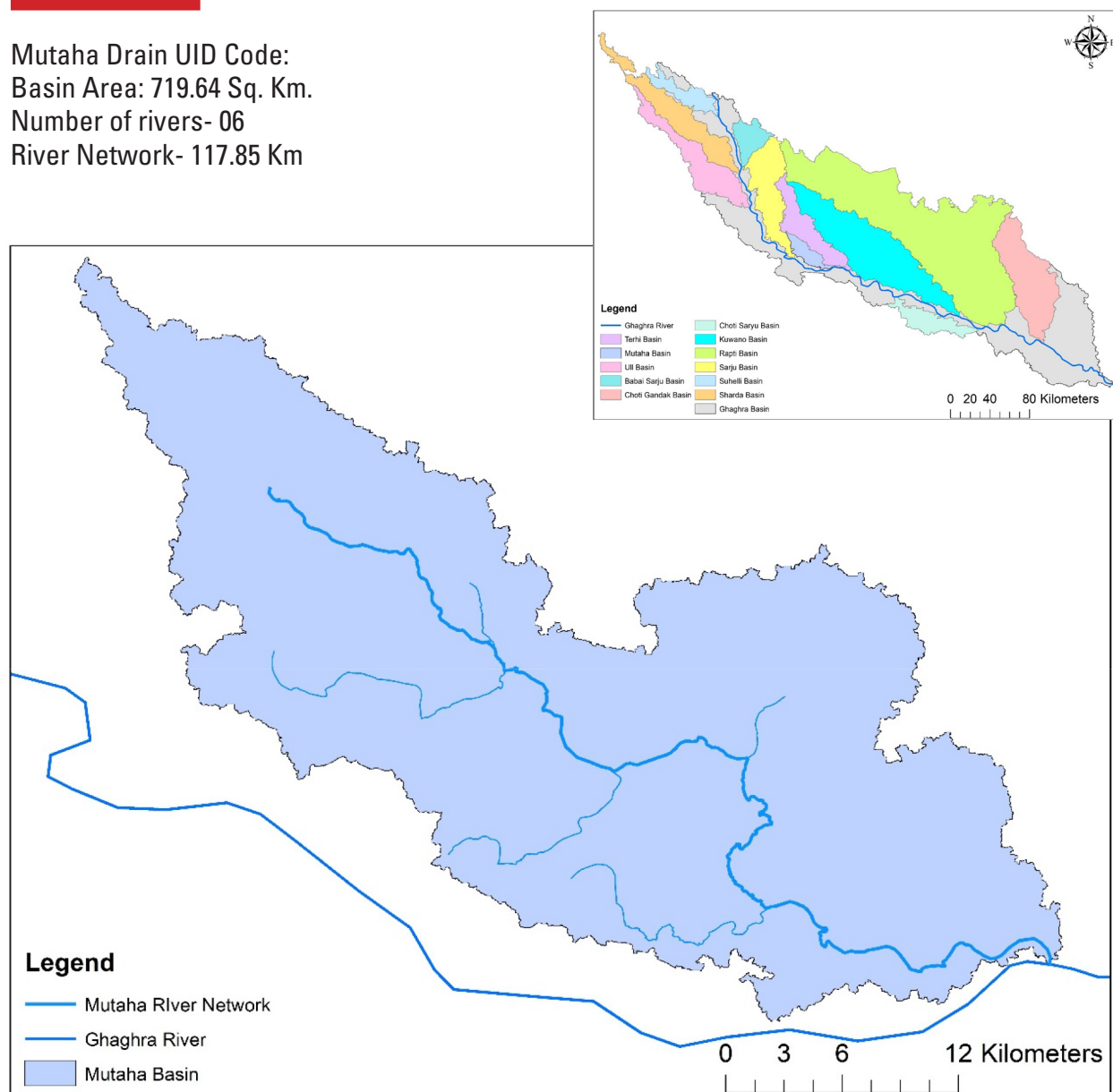


Figure: Mutaha River Network

MUTAHA MAINSTEM FLOW DIAGRAM

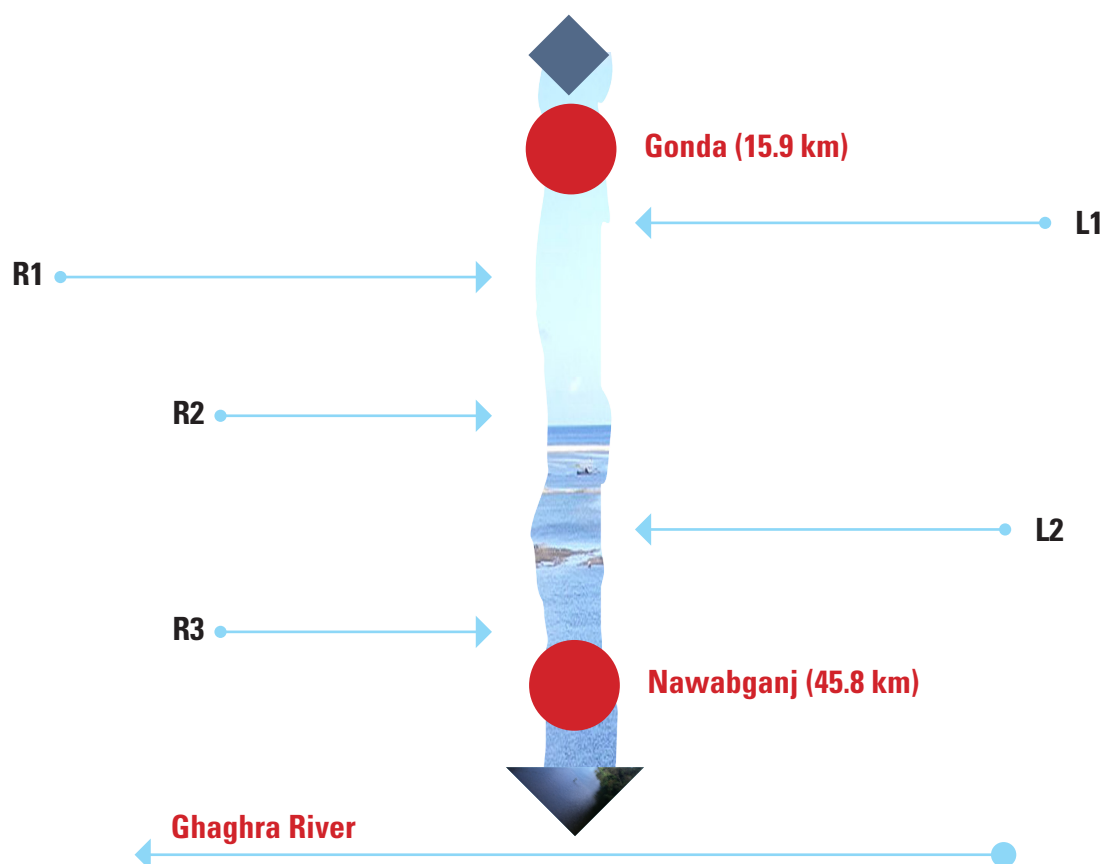


Figure: Flow Diagram of Mutaha River

MUTAHA NALA MAINSTEM NETWORK						
S.No.	River Name	Confluence Bank	River Length (Km)	Confluence Co-ordinate		Distance from origin (km)
				Lat	Long	
1	Stream 2	L1	3.85	26.97	81.89	15.9
2	Belai Nala	R1	16.4	26.96	81.90	17.2
3	Barsot Nala	R2	12.8	26.91	81.95	26
4	Stream 1	L2	4.1	26.91	82.01	33.3
5	Bhagla Nala	R3	16.2	26.85	82.02	45.8



TERHI BASIN

Terhi River UID Code:
 Basin Area: 1756.12 Sq. Km.
 Number of rivers- 11
 River Network- 414.83 Km

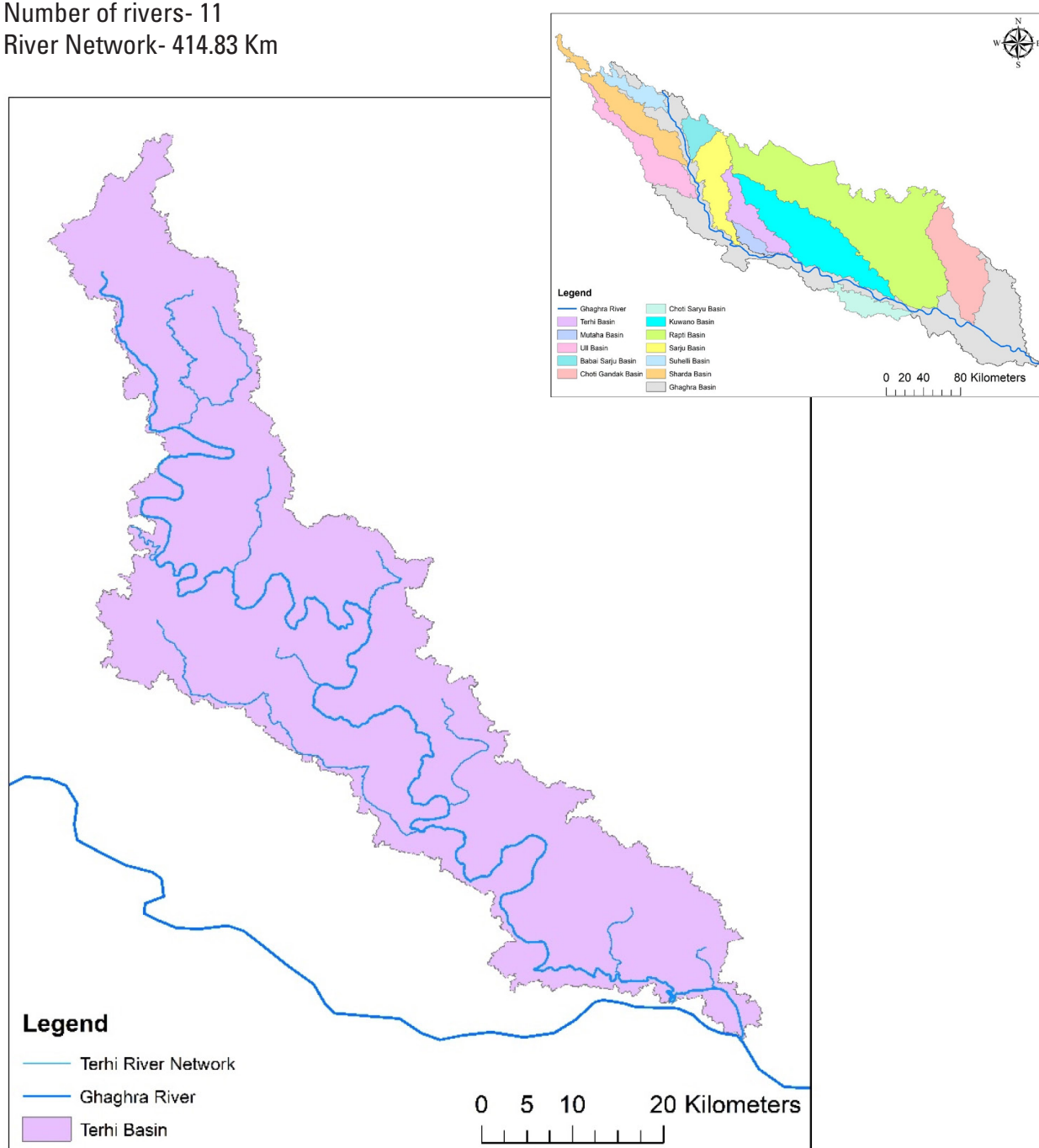


Figure: Terhi river network

TERHI RIVER MAINSTEM FLOW DIAGRAM

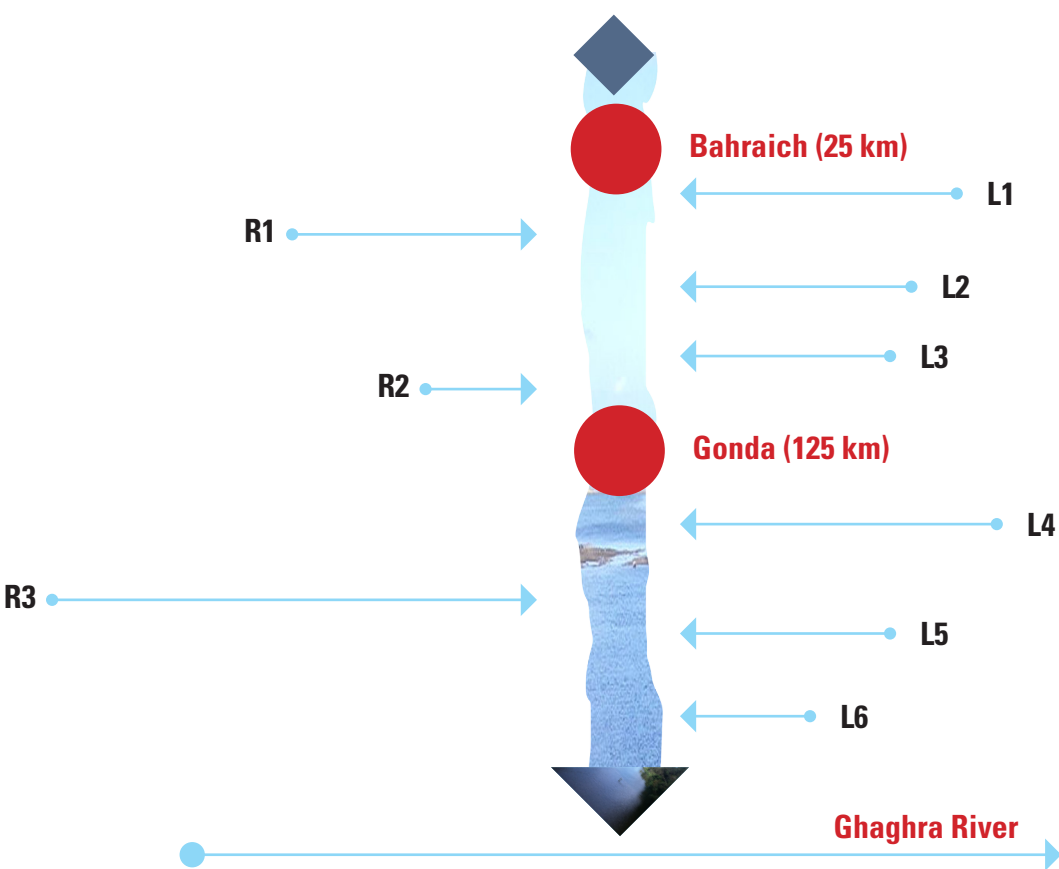


Figure: Flow diagram of Terhi river

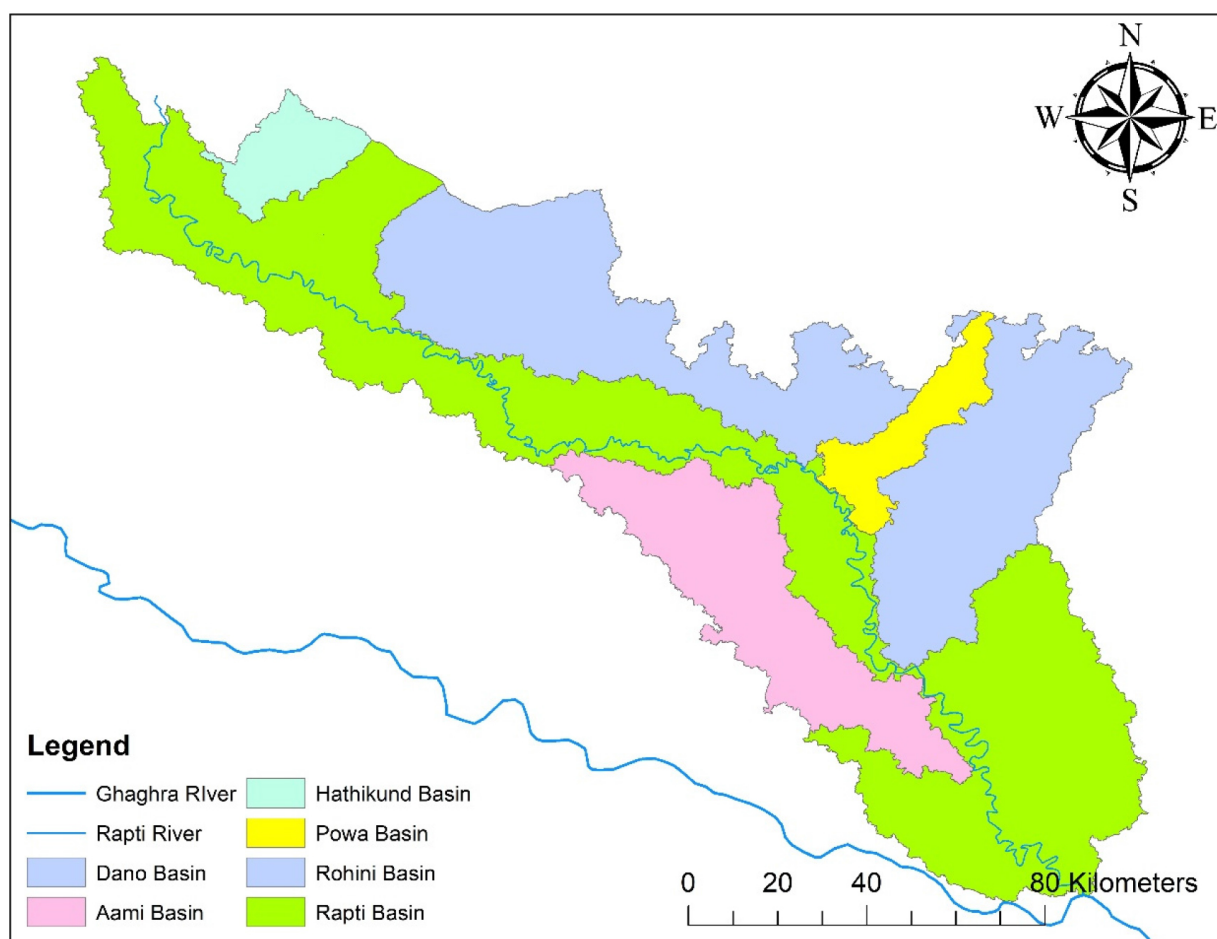
TERHI RIVER MAINSTEM NETWORK						
S.No.	River Name	Confluence Bank	River Length (Km)	Confluence Co-ordinate		Distance from origin (km)
				Lat	Long	
1	Jamwar Nala	L1	27.4	27.39	81.72	25
2	Stream 2	R1	8.36	27.26	81.69	57
3	Barikundia Nala	L2	15	27.24	81.77	76
4	Ghaghwa Nala	L3	12.5	27.21	81.90	112
5	Nagaria Nala	R2	7.69	27.13	81.86	125
6	Chaubepur Nala	L4	20.1	27.01	81.99	158
7	Chandahi Nadi	R3	49.2	26.99	81.96	164
8	Stream 1	L5	10.7	26.84	82.15	218
9	Ghadhauwa Nala	L6	6.58	26.83	82.25	234



RAPTI BASIN: MAJOR SUB-BASINS

Major sub-basins of Rapti River are as follows:

- Dano basin ■ Powa Drain basin
- Hathikund basin ■ Rohini Basin
- Aami basin



DANO BASIN

Dano River UID Code:
 Basin Area: 2616 Sq. Km.
 Number of rivers- 69
 River Network- 1503 Km

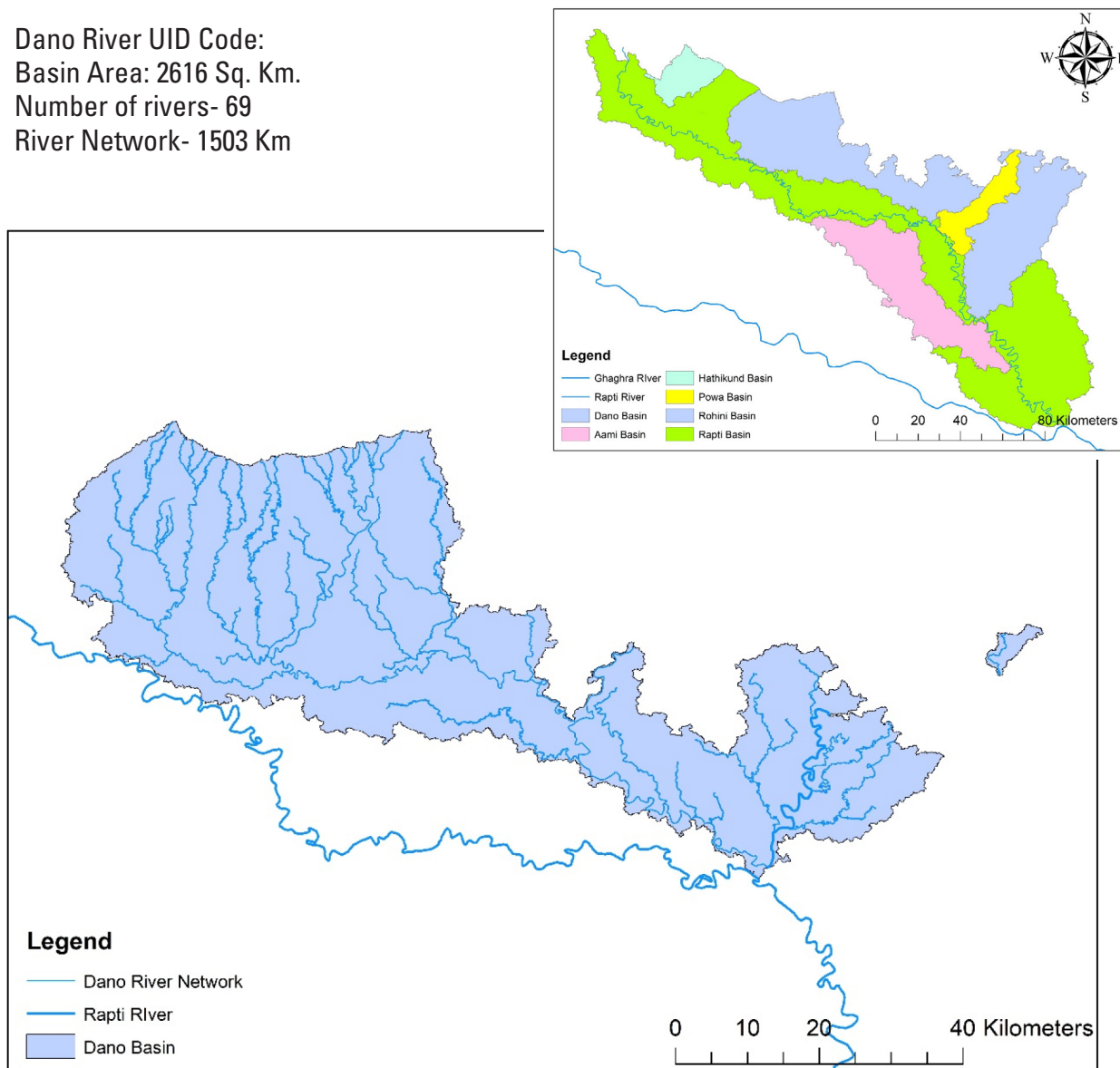


Figure: Dano River Network

DANO RIVER MAINSTEM FLOW DIAGRAM

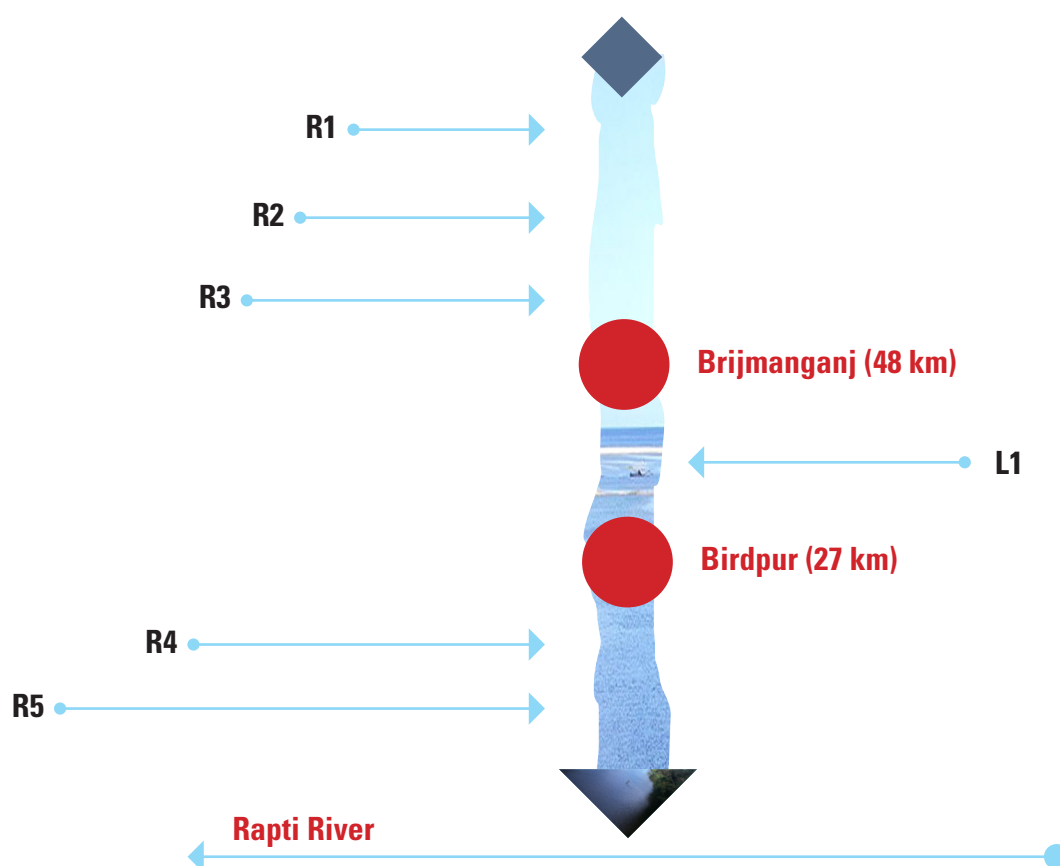


Figure: Flow Diagram of Dano River Network

DANO RIVER MAINSTEM NETWORK						
S.No.	River Name	Confluence Bank	River Length (Km)	Confluence Co-ordinate		Distance from origin (km)
				Lat	Long	
1	Telar	R1	13.6	27.36	83.17	16
2	Hagni	R2	14.3	27.29	83.17	27
3	Hagni 2	R3	29.5	27.27	83.17	34
4	Ghonghi Nadi	L1	73.2	27.22	83.15	46
5	Jamauar Nadi	R4	58.1	27.21	83.13	48

HATHIKUND BASIN

Hathikund River UID Code:
 Basin Area: 443 Sq. Km.
 Number of rivers- 29
 River Network- 387.95 Km

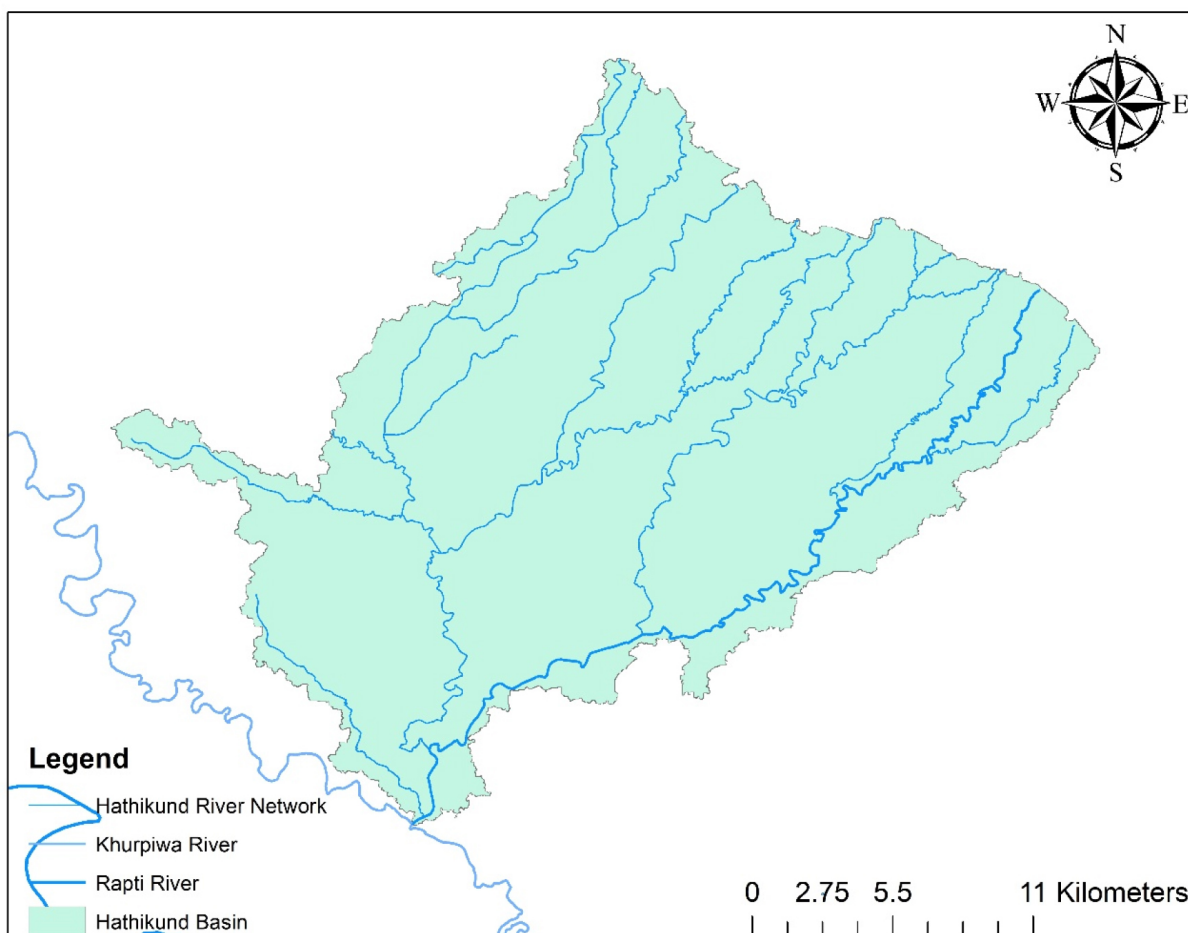
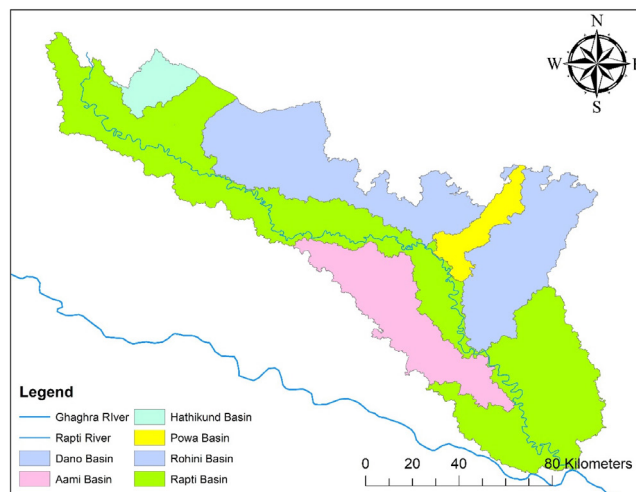


Figure: Hathikund River Network



HATHIKUND RIVER MAINSTEM FLOW DIAGRAM

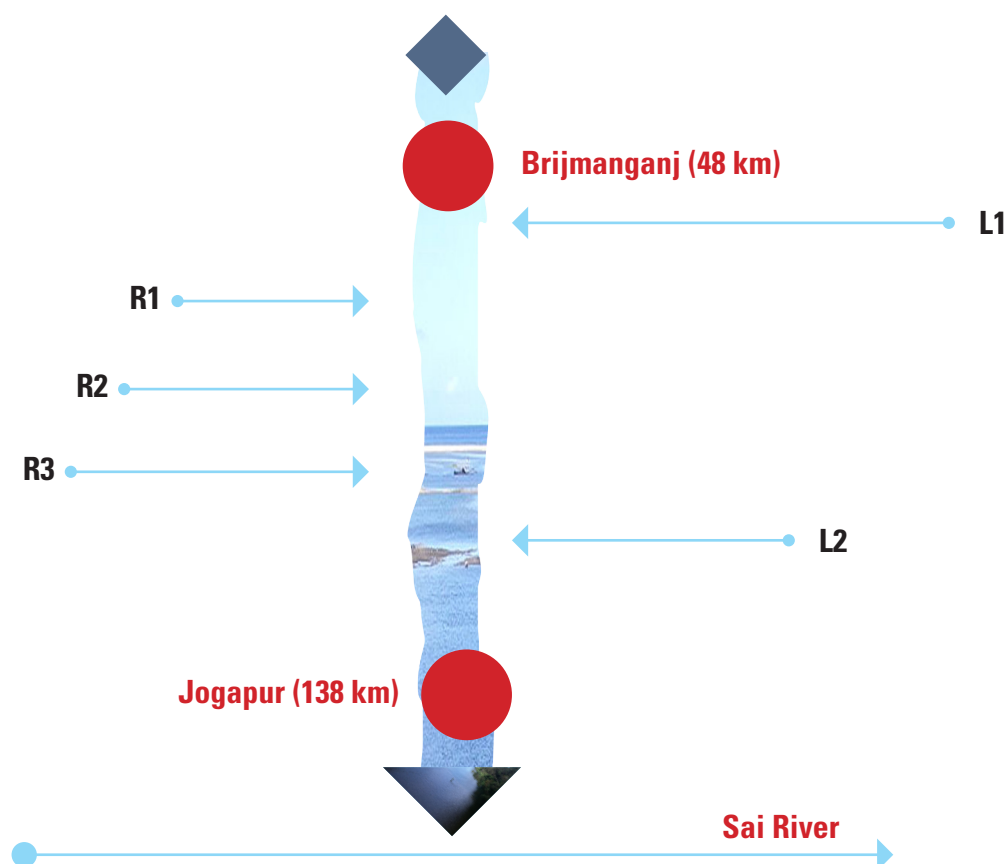


Figure: Flow Diagram of Hathikund River

HATHIKUND RIVER MAINSTEM NETWORK						
S.No.	River Name	Confluence Bank	River Length (Km)	Confluence Co-ordinate		Distance from origin (km)
				Lat	Long	
1	Juraniya	L1	10.2	27.78	82.17	12
2	Nakahia	R1	14.4	27.77	82.14	18.2
3	Stream 1	R2	31.2	27.72	82.07	33.3
4	kaiyan nadi	L2	38.9	27.68	82.00	44.38
5	Jokahi nala	R3	12	27.65	82.00	47.41

ROHINI BASIN

Rohini River UID Code:
Basin Area: 1924 Sq. Km.
Number of rivers- 29
River Network- 783.67 Km

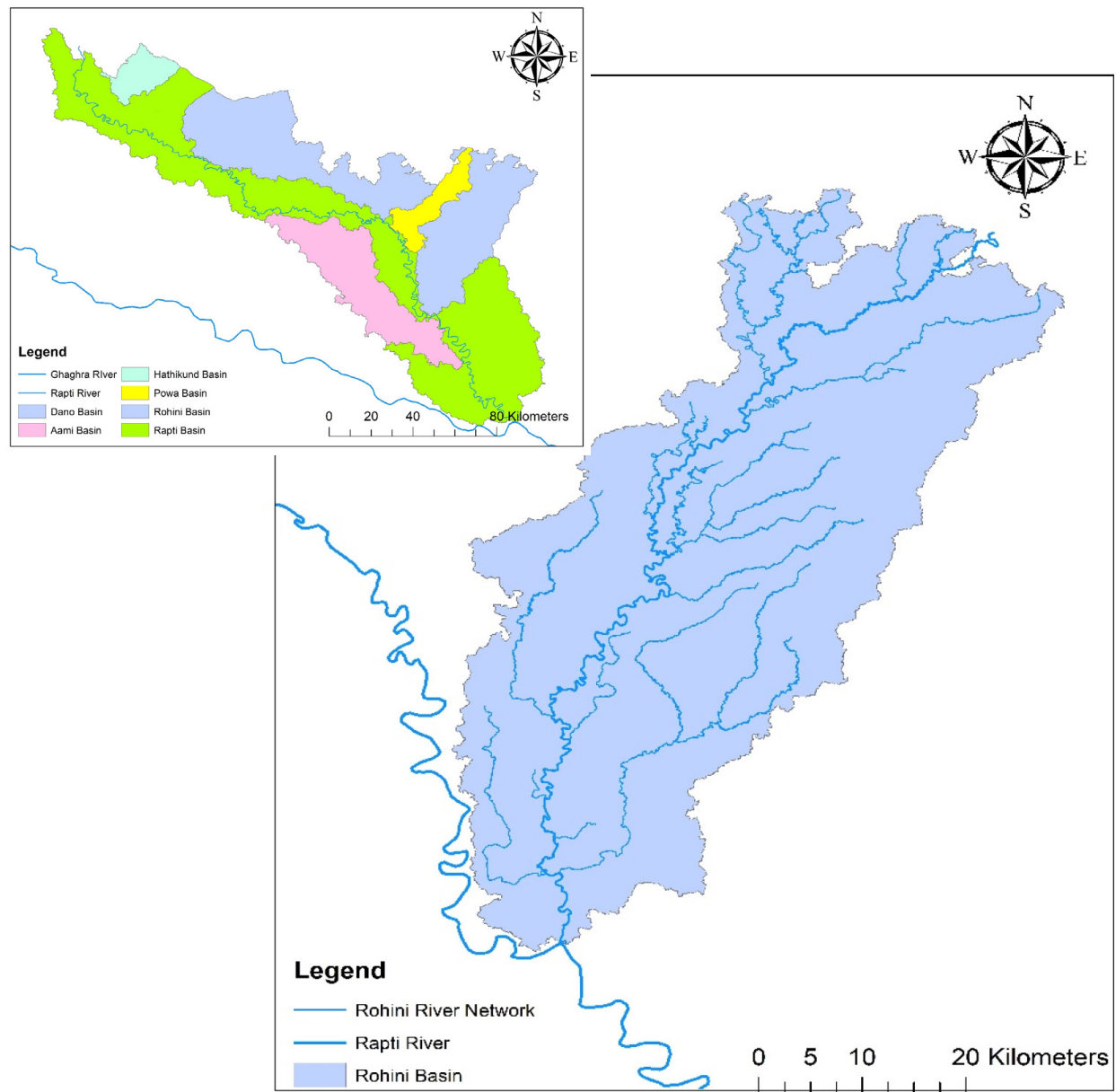


Figure: Rohini River Network



ROHINI RIVER MAINSTEM FLOW DIAGRAM

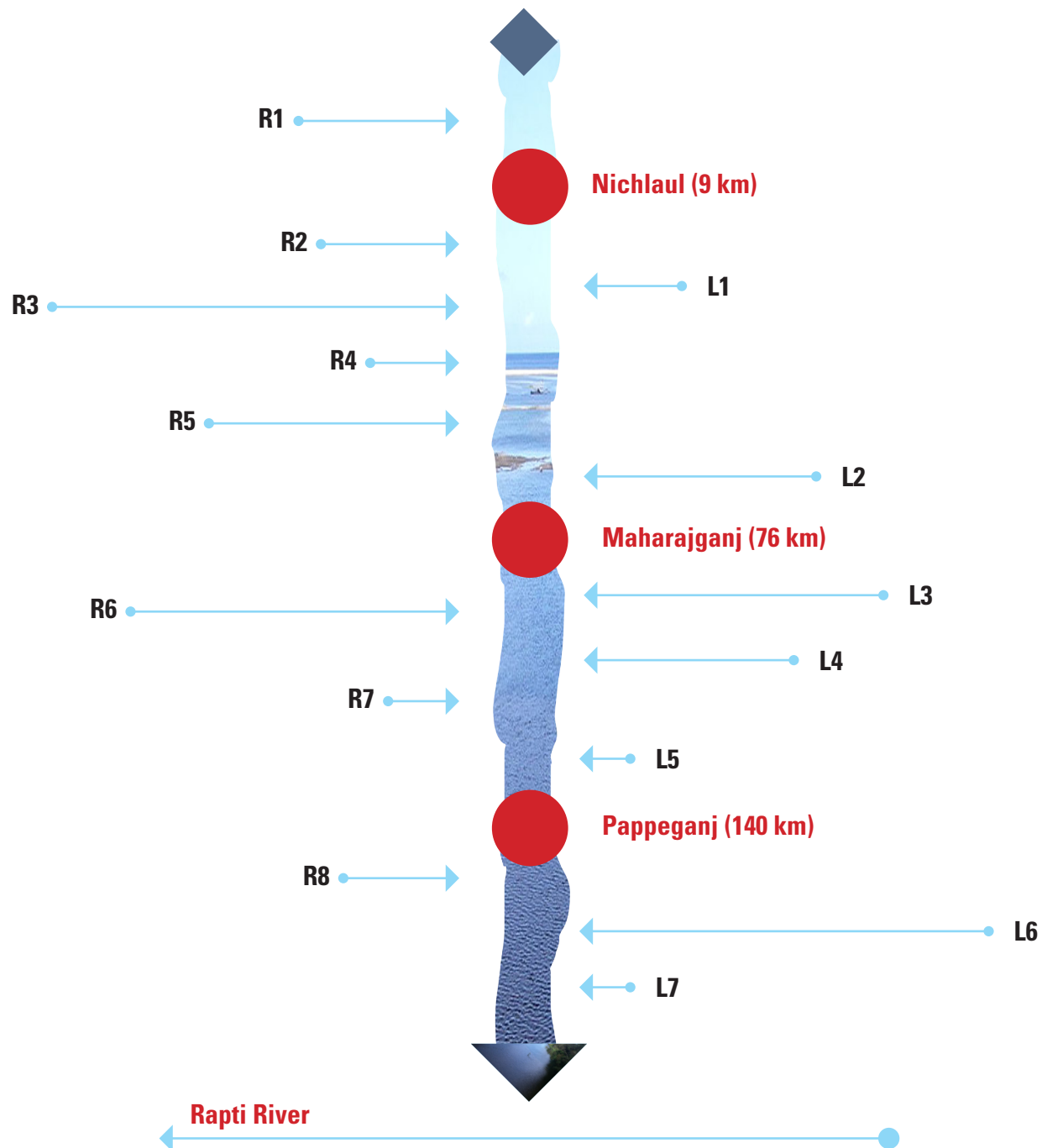


Figure: Flow Diagram of Rohini River Network

ROHINI RIVER MAINSTEM NETWORK						
S.No.	River Name	Confluence Bank	River Length (Km)	Confluence Co-ordinate		Distance from origin (km)
				Lat	Long	
1	Stream 6	R1	15	27.39	83.66	9
2	Sonia	R2	13.5	27.36	83.63	17
3	Stream 5	R3	70.9	27.29	83.51	43
4	Stream 4	L1	9.62	27.25	83.49	48
5	Bokwa Nala	R4	7.51	27.22	83.45	58
6	Stream 3	R5	25.5	27.16	83.41	68
7	Nadao Nala	L2	26.6	27.12	83.43	76
8	Balia Nala	L3	28.9	27.08	83.43	87
9	Kalan Nala	R6	43.8	26.97	83.32	118
10	Stream 2	L4	20	26.95	83.34	124
11	Manjharia Tal	R7	5.07	26.89	83.32	134
12	Jahda Tal	L5	5	26.85	83.33	140
13	Baluahwa Nala	R8	9.53	26.82	83.32	146
14	Chillua Nala	L6	61.1	26.82	83.33	147
15	Stream 1	L7	1.1	26.76	83.33	158



POWA BASIN

Powa River UID Code:
 Basin Area: 522 Sq. Km.
 Number of rivers- 06
 River Network- 126.3 Km

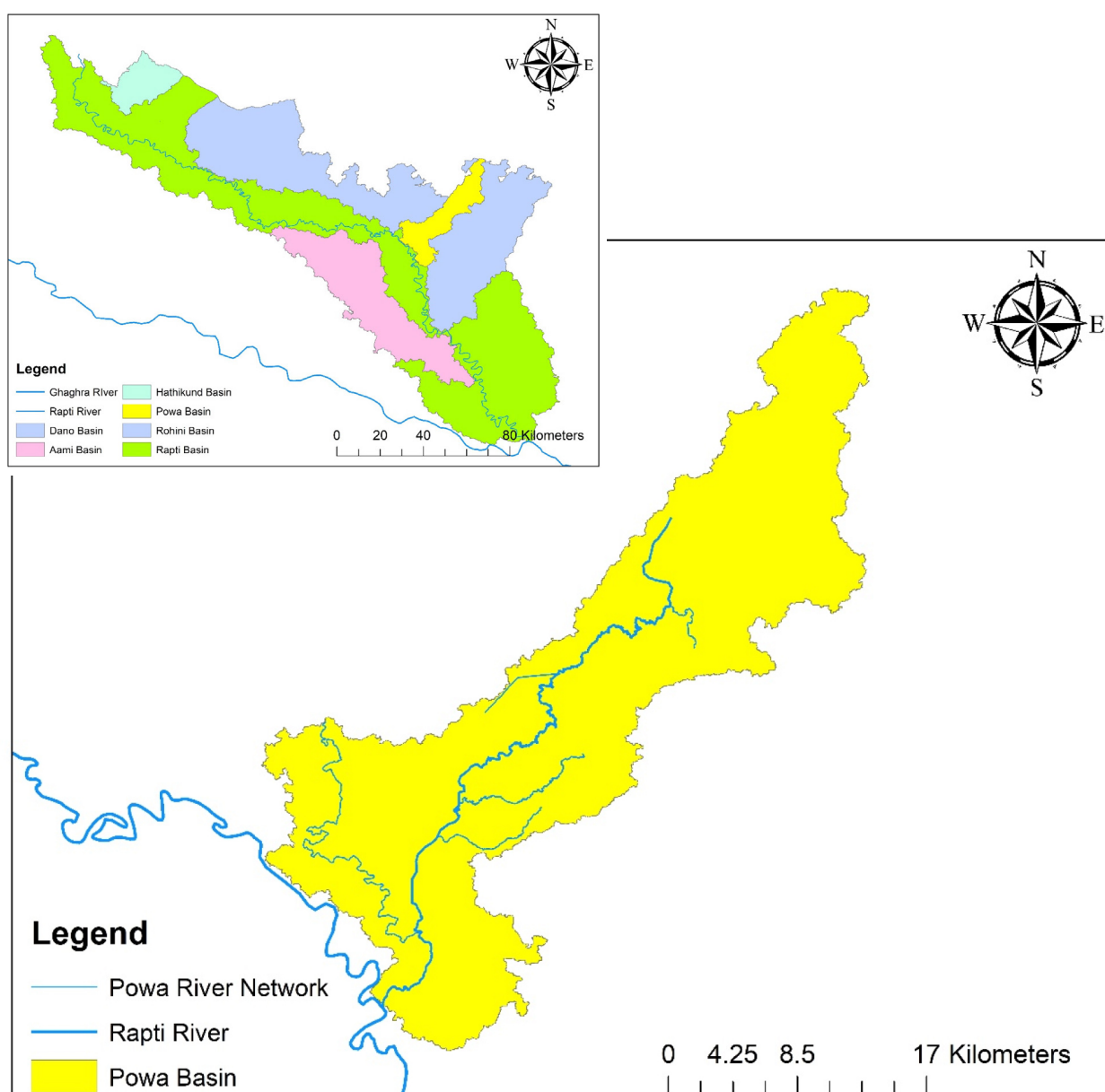


Figure: Powa River Network

POWA RIVER MAINSTEM FLOW DIAGRAM

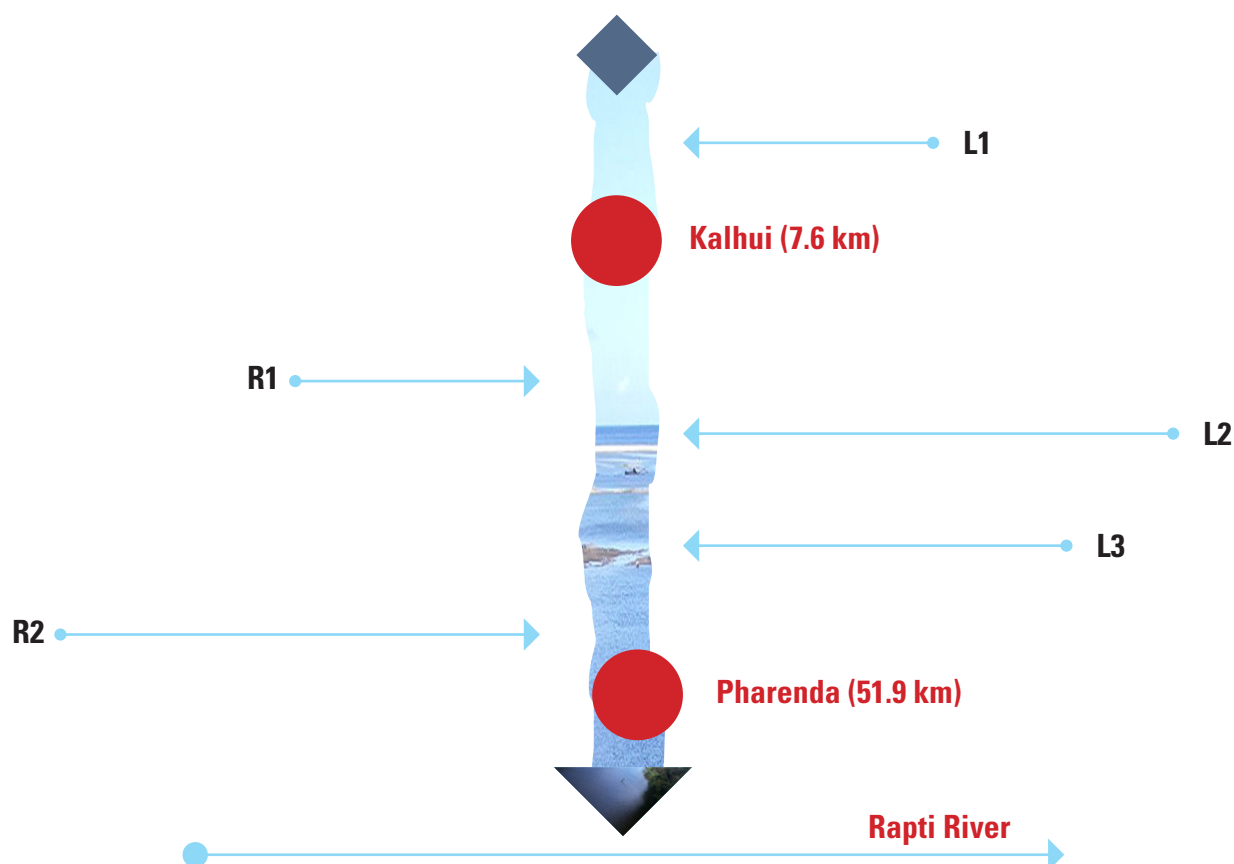


Figure: Flow Diagram of Powa River Network

POWA DRAIN MAINSTEM NETWORK						
S.No.	River Name	Confluence Bank	River Length (Km)	Confluence Co-ordinate		Distance from origin (km)
				Lat	Long	
1	Stream 2	L1	5.47	27.28	83.37	7.6
2	Kula Nala	R1	5.38	27.24	83.31	21.3
3	Bijaisalahi Nala	L2	13.4	27.17	83.25	40.7
4	Dandoh Nala	L3	8.55	27.15	83.23	44.1
5	Stream 1	R2	34	27.09	83.22	51.9



AAMI RIVER BASIN

Aami River UID Code:
 Basin Area: 1806 Sq. Km.
 Number of rivers- 19
 River Network- 490.59 Km

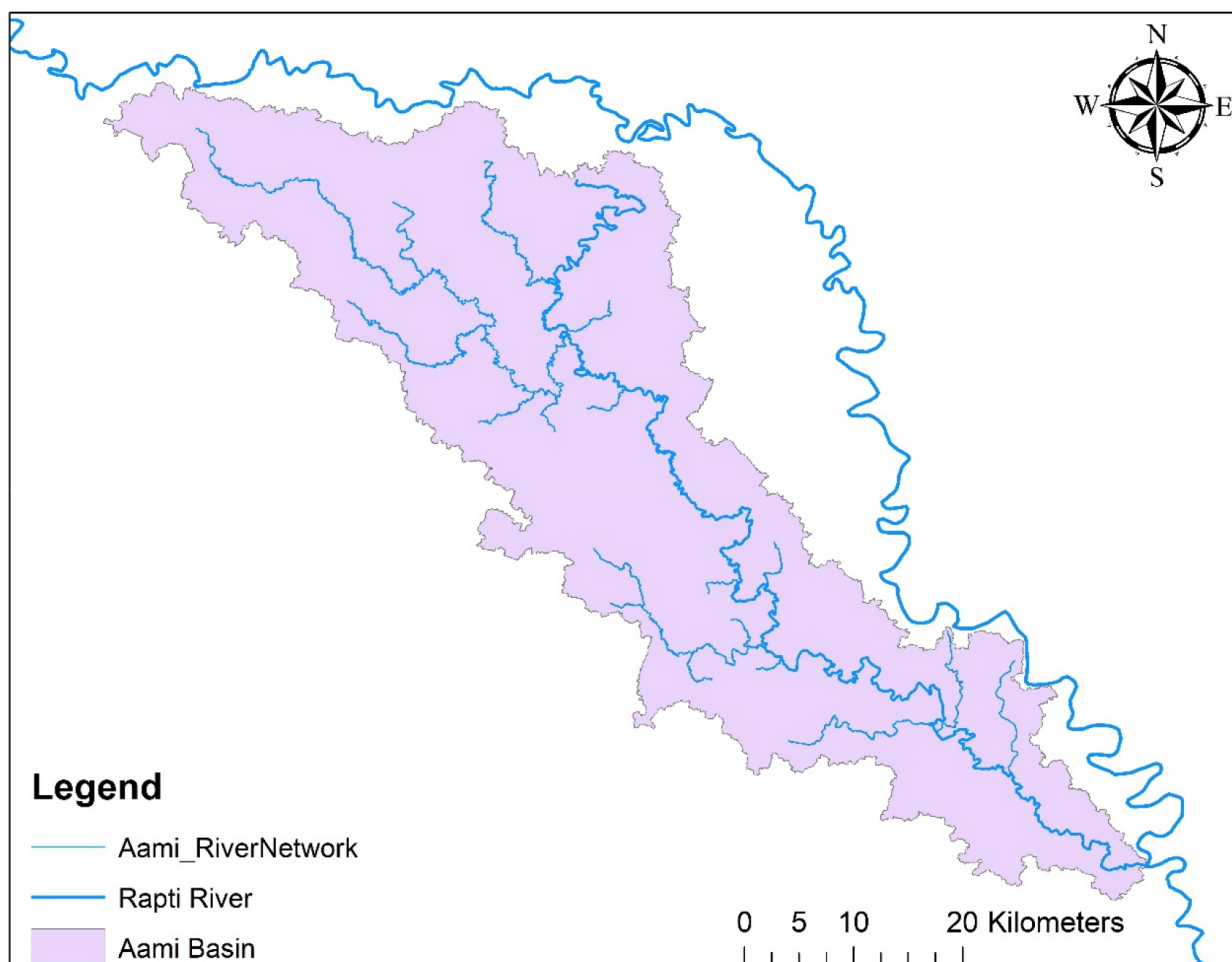
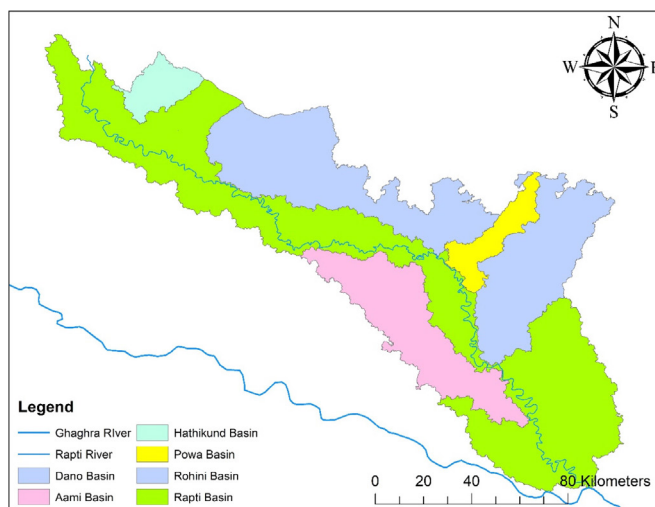


Figure: Aami River Network

AAMI RIVER MAINSTEM FLOW DIAGRAM

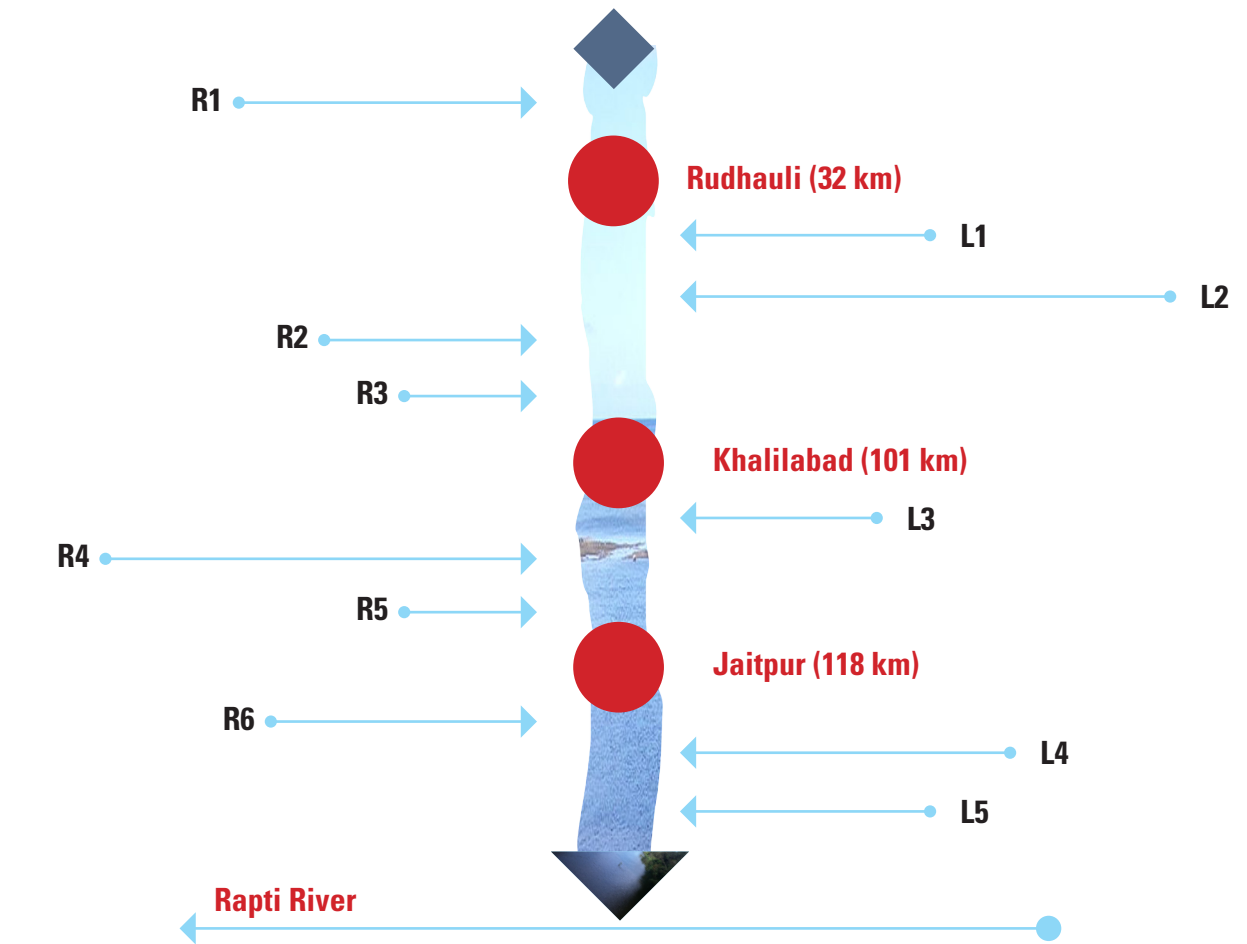


Figure: Flow Diagram of Aami River Network

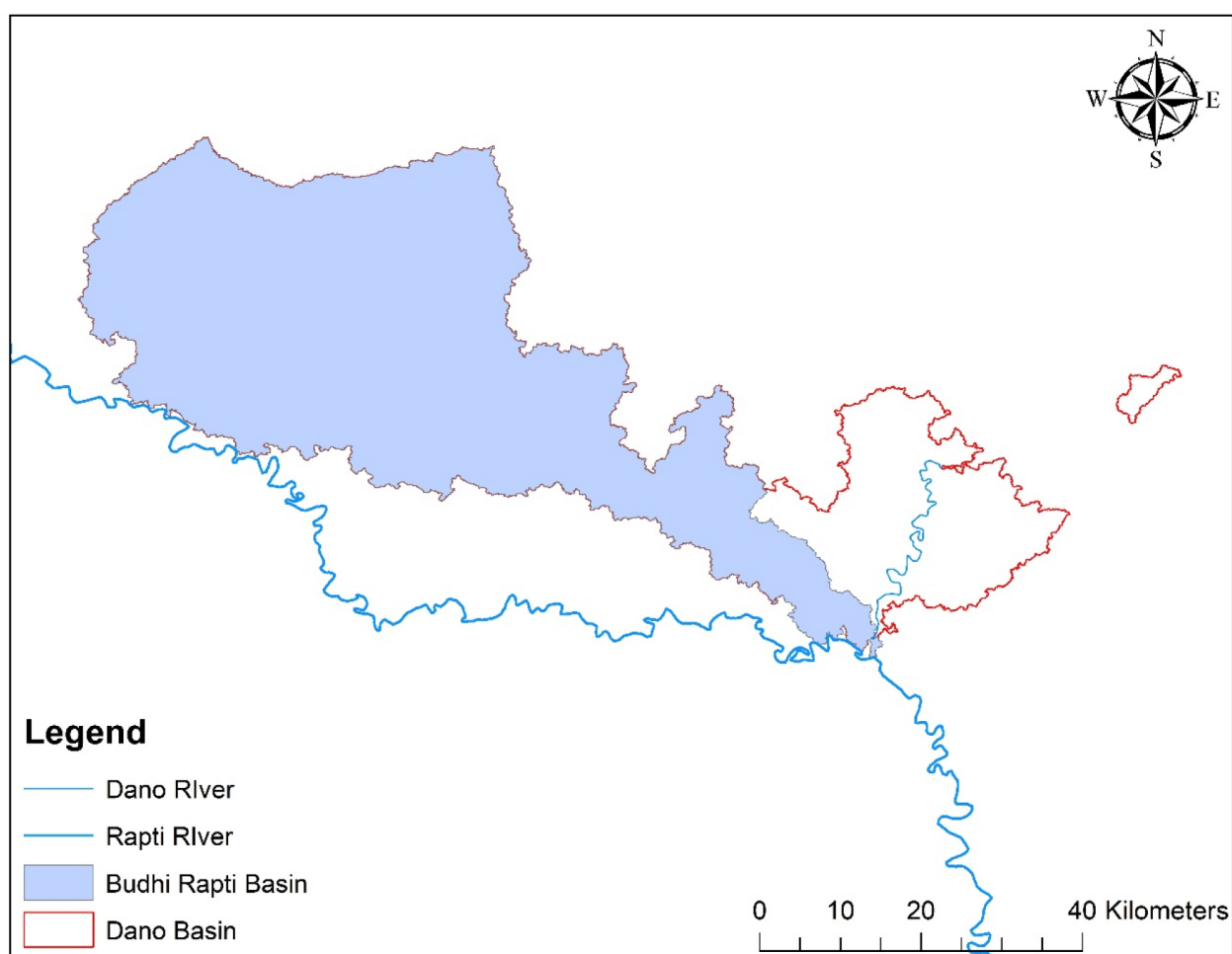
POWA DRAIN MAINSTEM NETWORK						
S.No.	River Name	Confluence Bank	River Length (Km)	Confluence Co-ordinate		Distance from origin (km)
				Lat	Long	
1	Budha Nadi	R1	26.6	27.03	82.95	32
2	Stream 4	L1	7.17	26.99	82.97	43
3	Kusiyari Nala	L2	93.1	26.98	82.97	45
4	Pachhu Nala	R2	5.98	26.94	83.02	58
5	Stream 3	R3	4.69	26.78	83.11	101
6	Stream 2	L3	6.38	26.78	83.14	107
7	Khudwa Nala	R4	33	26.73	83.13	116
8	Stream 1	R5	3.46	26.72	83.15	118
9	Jamura Nala	R6	21.3	26.66	83.27	152
10	Sonwan Nala	L4	14	26.66	83.27	153
11	Hasuni Nadi	L5	12.9	26.62	83.34	167



DANO BASIN: MAJOR SUB-BASINS

Major sub-basins of Dano River are as follows:

- Budhi Rapti Basin



BUDHI RAPTI BASIN

Budhi Rapti UID Code:
 Basin Area: 2105 Sq. Km.
 Number of rivers- 53
 River Network- 1115.71 Km

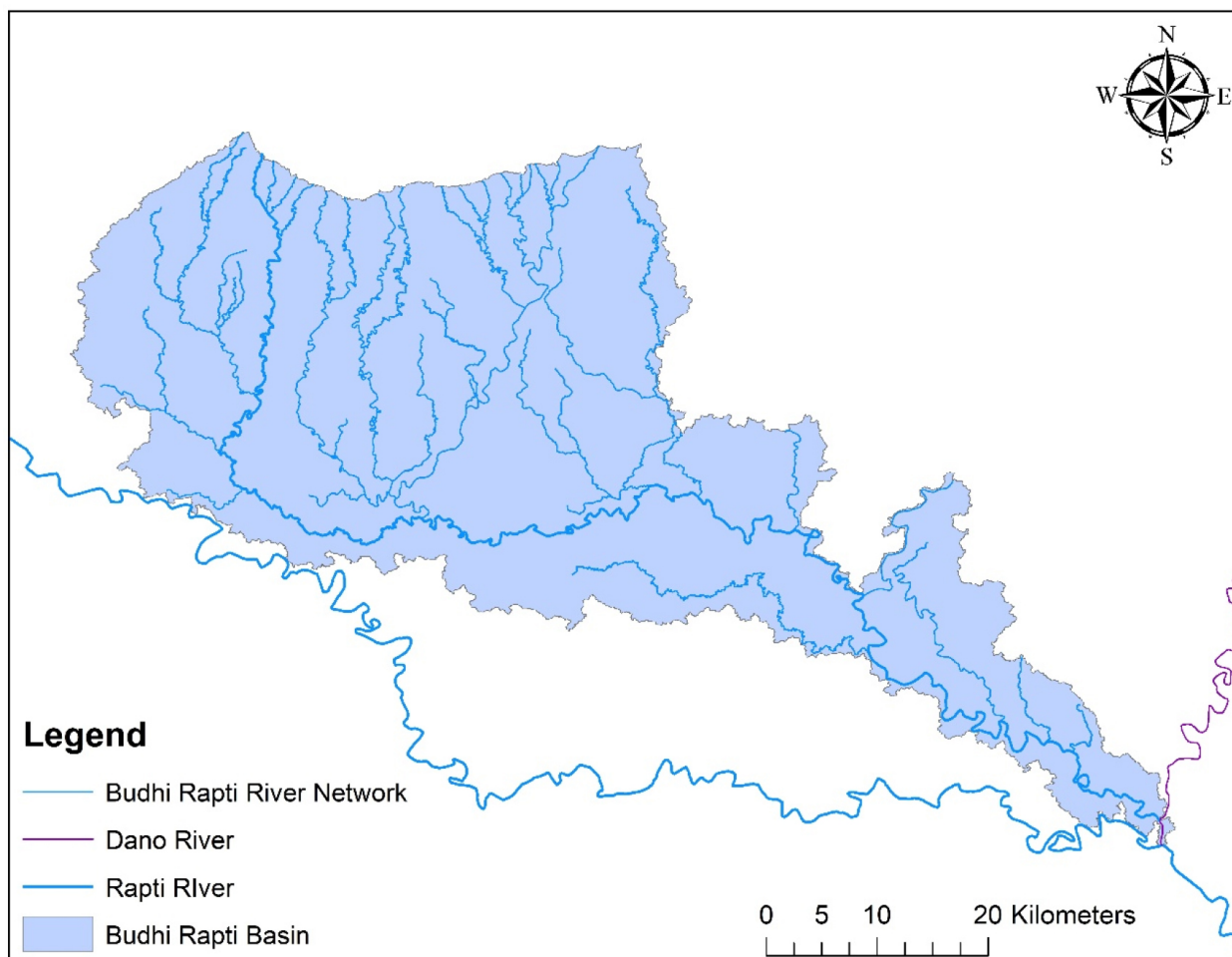
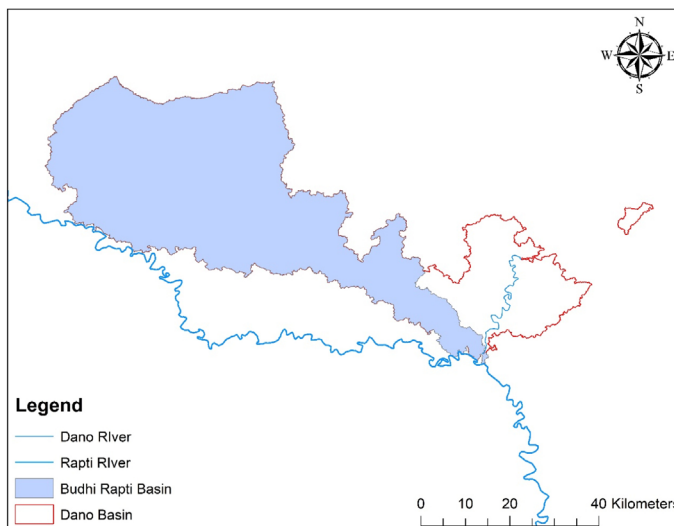


Figure: Biudhi Rapti River Network



BUDHI RAPTI RIVER MAINSTEM FLOW DIAGRAM

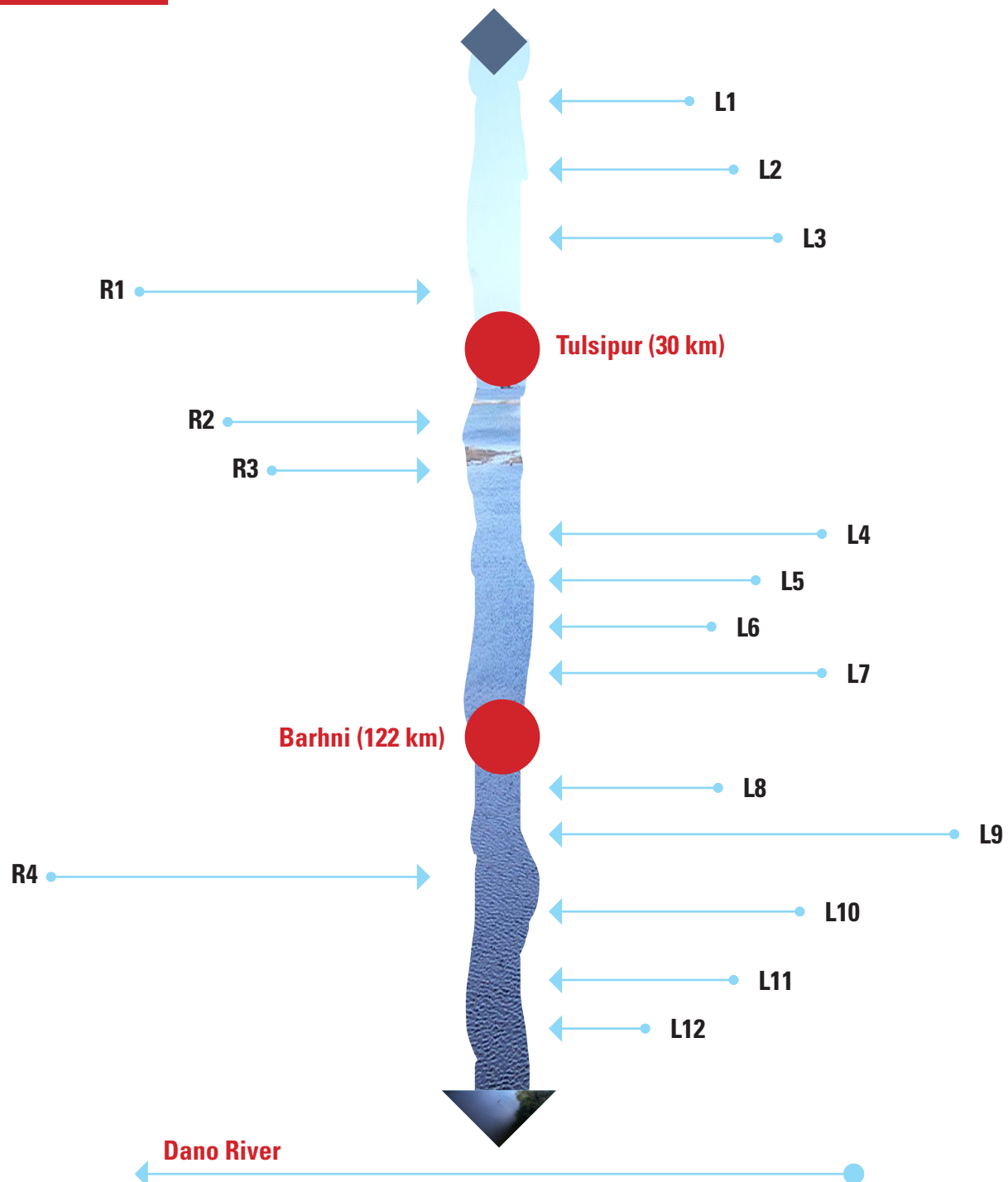


Figure: Flow Diagram of the Budhi Rapti River

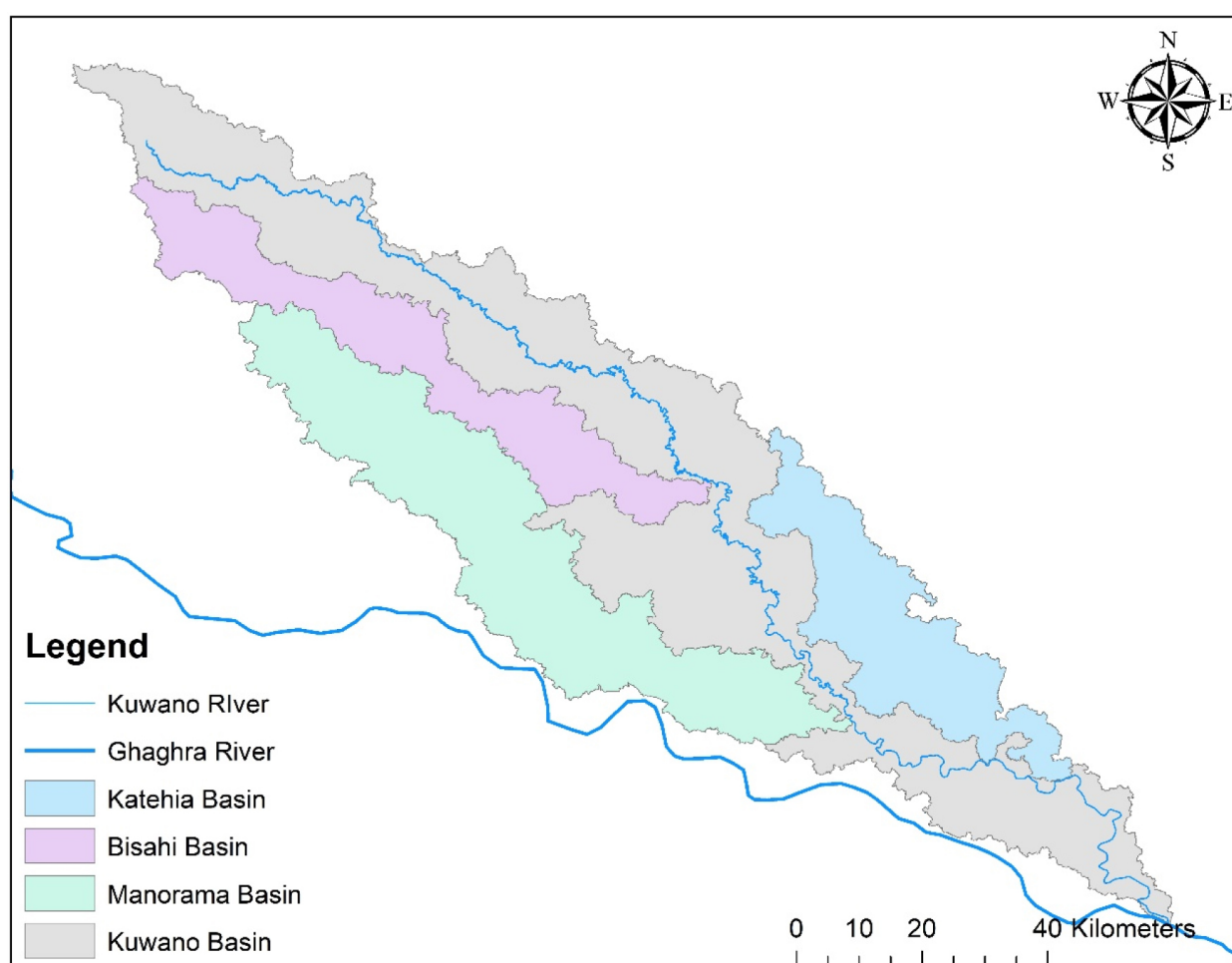
BISAHI RIVER MAINSTEM NETWORK						
S.No.	River Name	Confluence Bank	River Length (Km)	Confluence Co-ordinate		Distance from origin (km)
				Lat	Long	
1	Stream 14	L1	8.44	27.665869	82.393455	6
2	Stream 13	L2	11.2	27.662405	82.395723	6
3	Stream 12	L3	12.3	27.645355	82.403158	9
4	Stream 11	R1	30.2	27.514825	82.385299	30
5	Stream 10	R2	14.6	27.467103	82.35685	40
6	Stream 9	R3	9	27.439366	82.374529	45
7	Stream 8 or Bhambhar Nala	L4	54	27.415153	82.520276	69
8	Stream 7	L5	49.2	27.441279	82.704976	102
9	Stream 6	L6	27.2	27.432636	82.744141	108
10	Stream 5	L7	58	27.405368	82.822192	122
11	Sotwa	L8	23.5	27.354884	82.87587	136
12	Banganga River	L9	96.1	27.351914	82.878131	136
13	Stream 4	R4	56.4	27.3068	82.882829	145
14	Stream 3	L10	29.6	27.250537	82.99036	168
15	Stream 2	L11	10.8	27.2341	83.027819	176
16	Stream 1	L12	8.47	27.225727	83.047776	179



KUWANO BASIN: MAJOR SUB-BASINS

Major sub-basins of Kuwano River are as follows:

- Bisahi basin
- Manorama Basin
- Katehia Basin



BISAHI BASIN

Bisahi River UID Code:
 Basin Area: 819 Sq. Km.
 Number of rivers- 07
 River Network- 245.98 Km

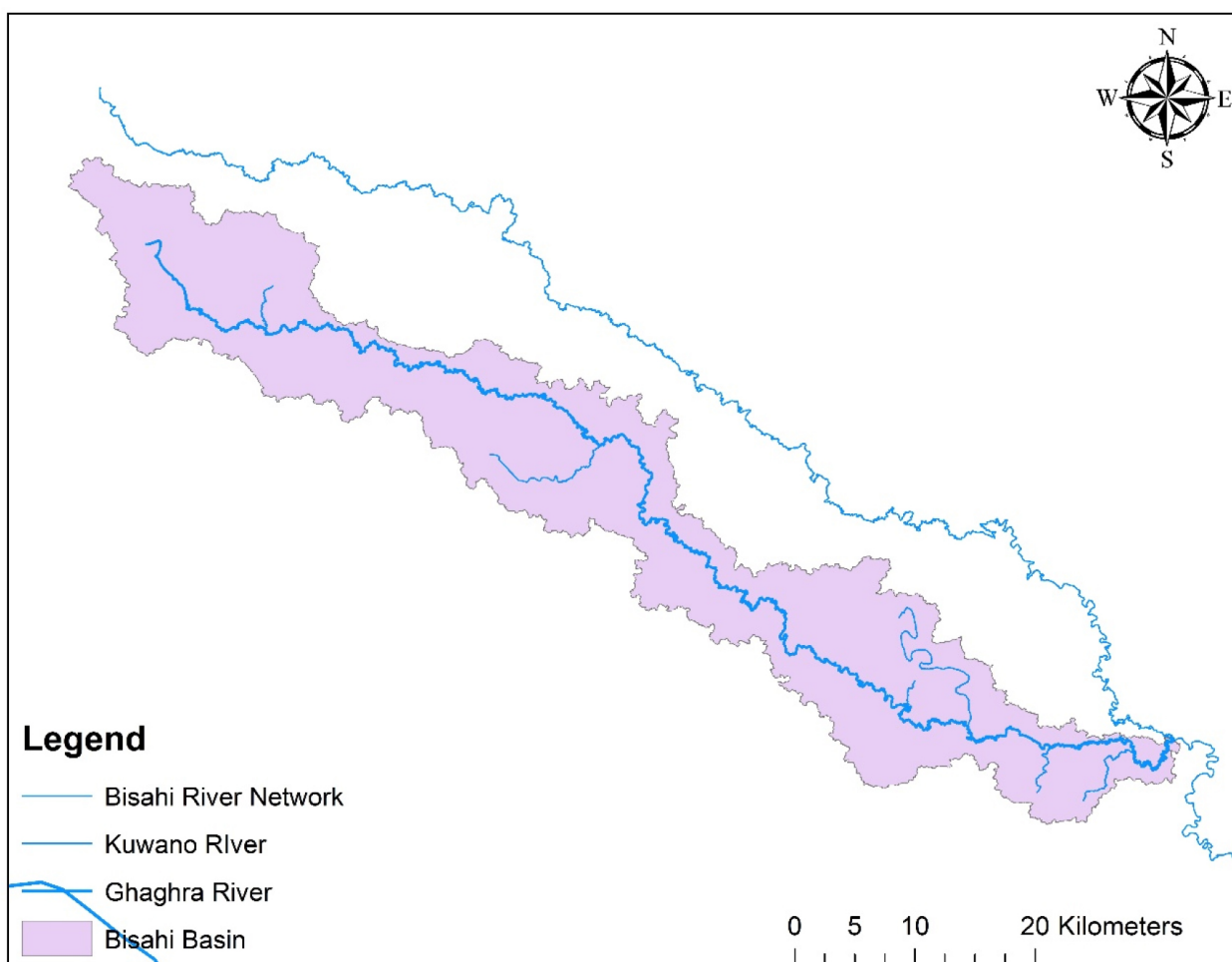
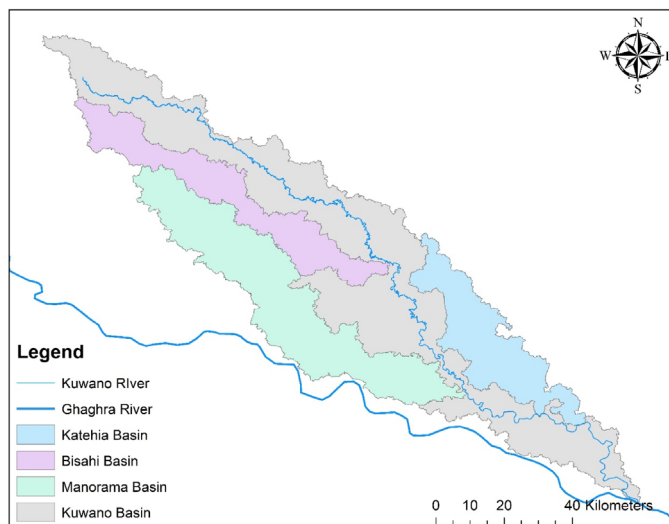


Figure: Bisahi River Network



BISAHI RIVER MAINSTEM FLOW DIAGRAM

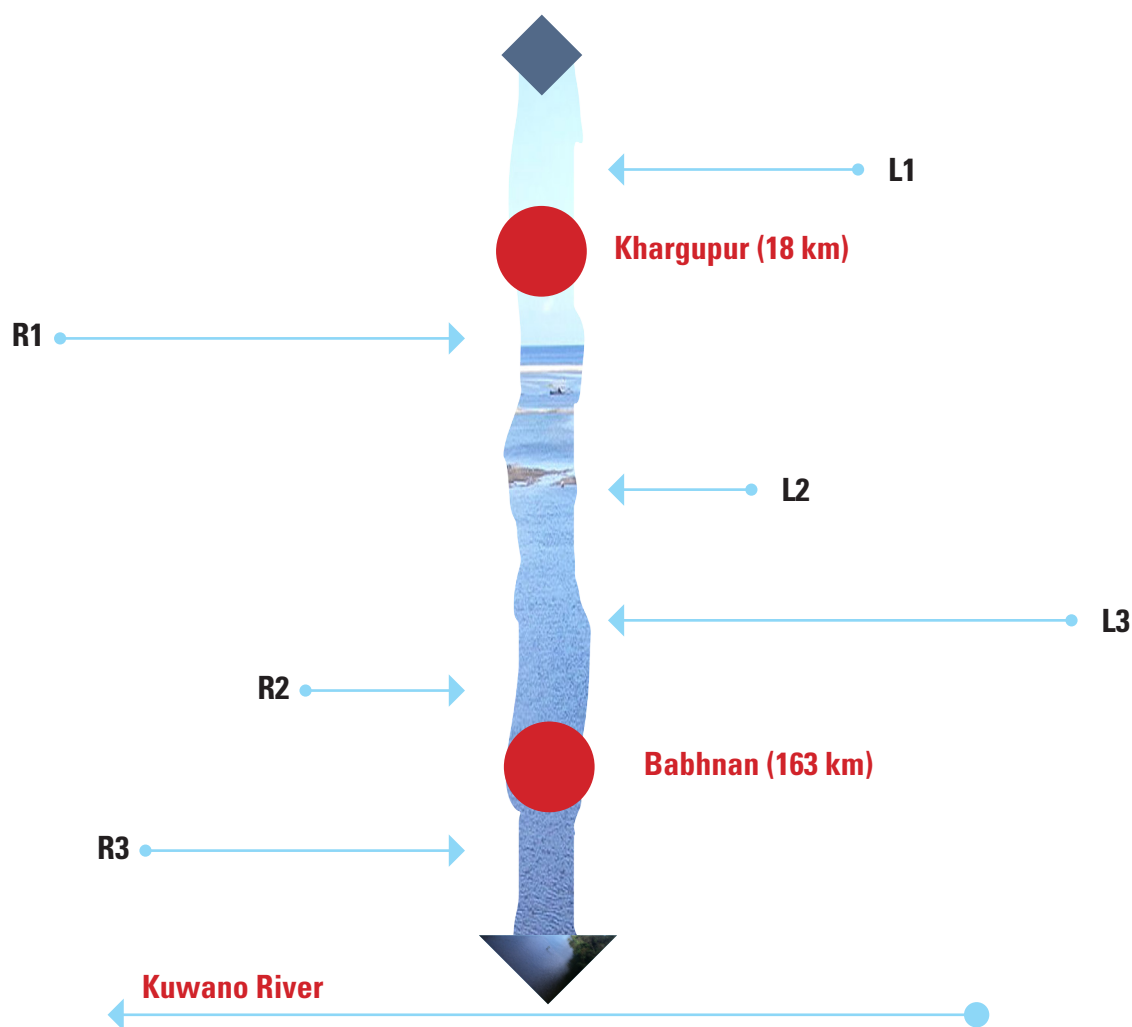


Figure: Flow Diagram of Bisahi River

BISAHI RIVER MAINSTEM NETWORK						
S.No.	River Name	Confluence Bank	River Length (Km)	Confluence Co-ordinate		Distance from origin (km)
				Lat	Long	
1	Baghnarwa Nala	L1	5.62	27.31	81.93	18
2	Deoka Nala	R1	13.2	27.22	82.18	72
3	Stream 3	L2	3	27.03	82.42	38
4	Sevei Nala	L3	22	27.01	82.46	51
5	Stream 2	R2	5.94	26.99	82.52	163
6	Stream 1	R3	9.22	26.99	82.58	175

MANORAMA BASIN

Manorama River UID Code:

Basin Area: 1442.Sq Km.

Number of rivers- 13

River Network- 373.53 Km

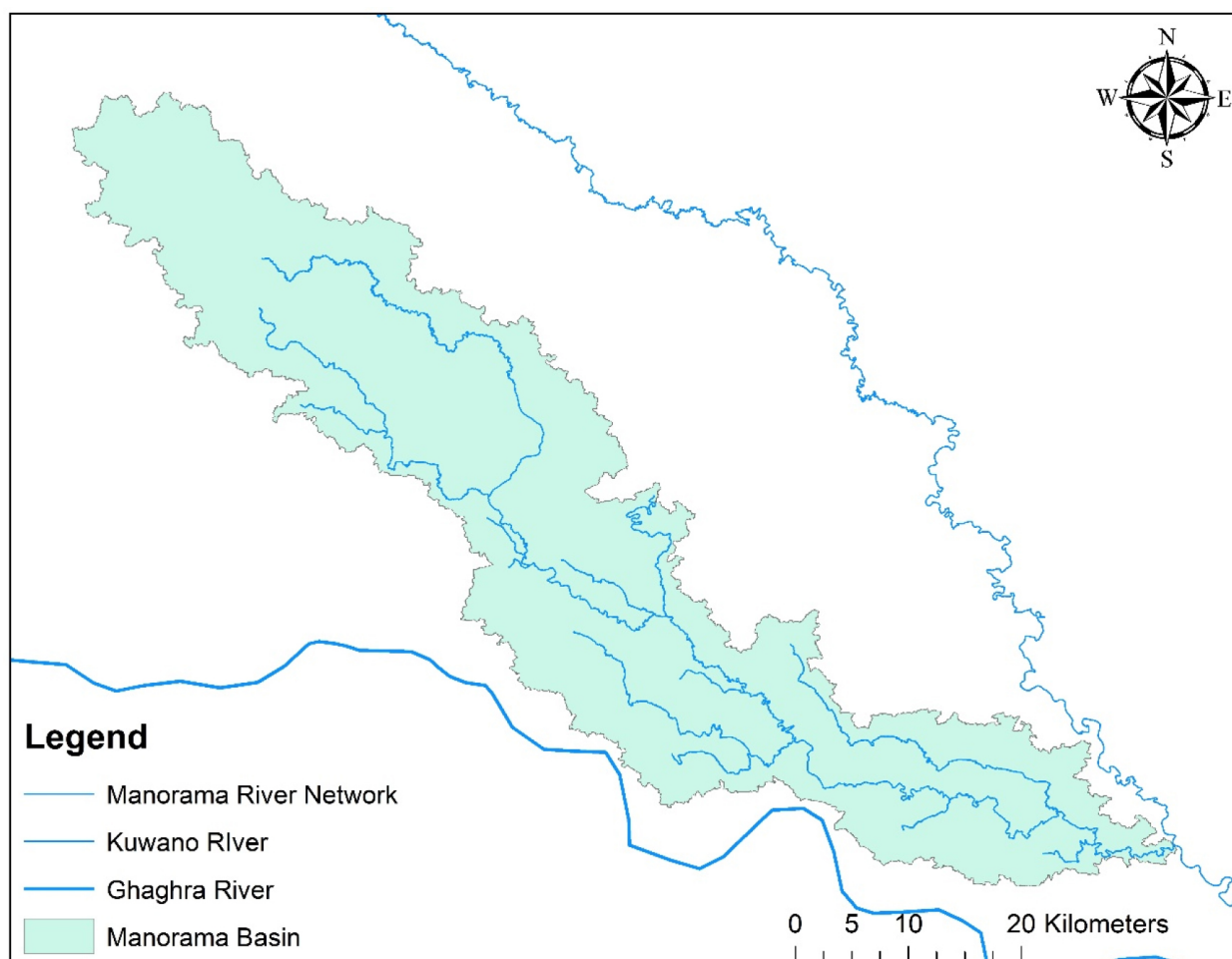
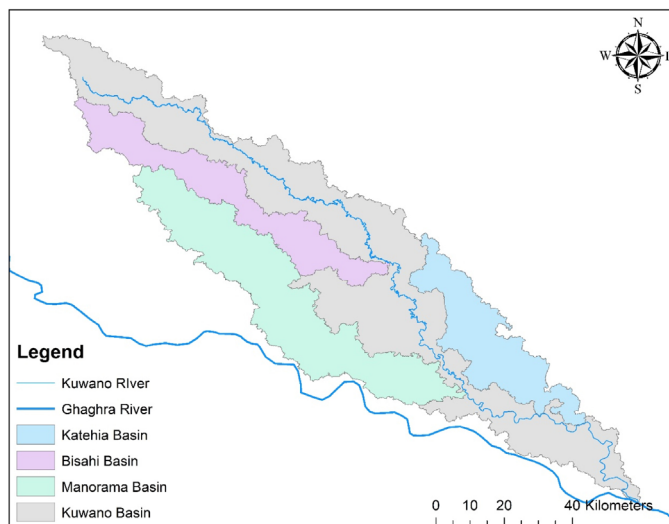


Figure: Manorama River Network



MANORAMA RIVER MAINSTEM FLOW DIAGRAM

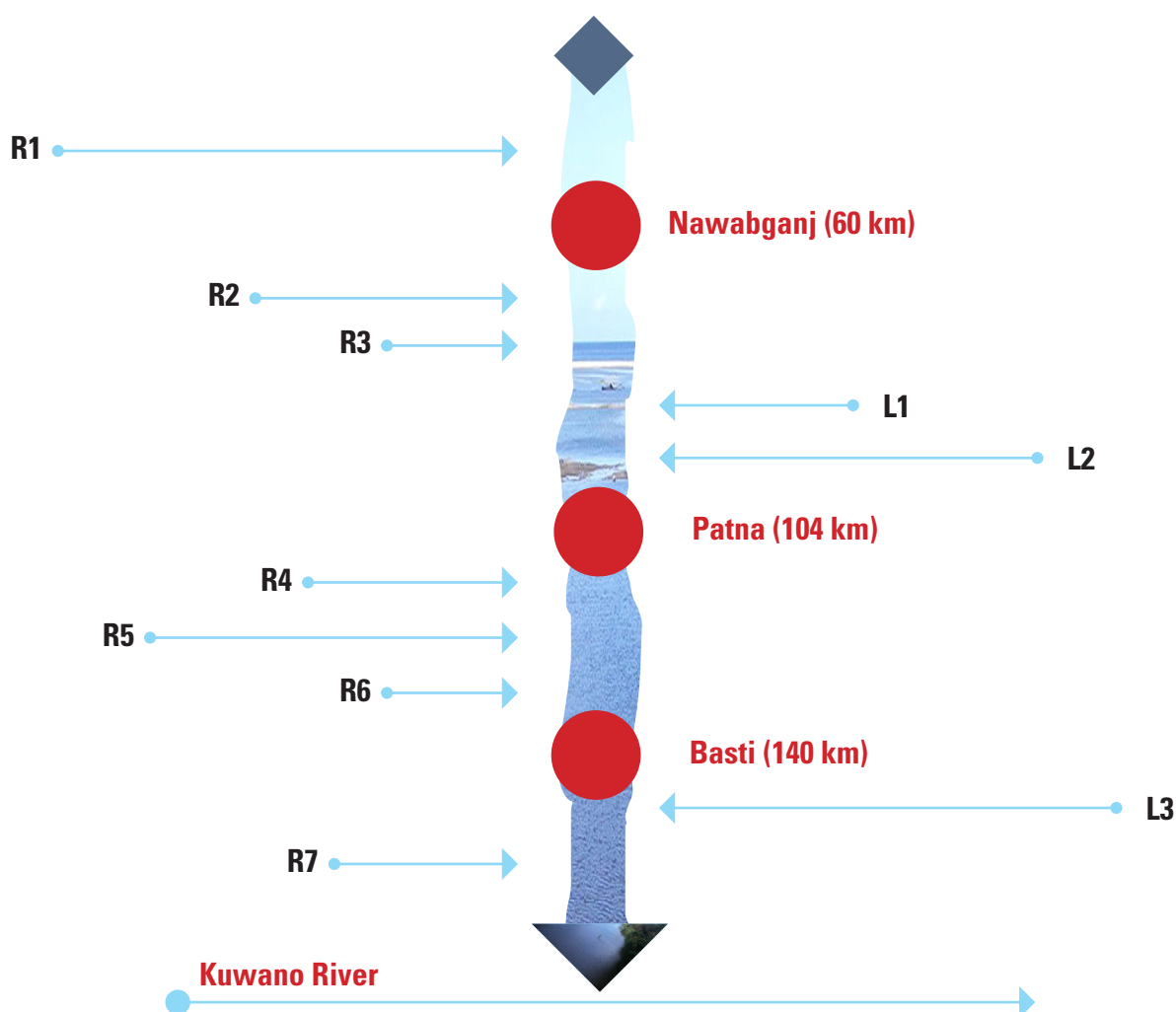


Figure: Flow Diagram of Manorama River

MANORAMA RIVER MAINSTEM NETWORK						
S.No.	River Name	Confluence Bank	River Length (Km)	Confluence Co-ordinate		Distance from origin (km)
				Lat	Long	
1	Chamdai Nadi	R1	41.2	26.94	82.27	60
2	Stream 6	R2	4.97	26.89	82.30	68
3	Stream 5	R3	2.66	26.88	82.31	70
4	Stream 4	L1	10.8	26.84	82.40	88
5	Sringanari Nala	L2	23.3	26.84	82.42	90
6	Stream 2	R4	6.94	26.78	82.48	104
7	Ramrekha Nadi	R5	32.7	26.74	82.52	117
8	Stream 3	R6	5.82	26.70	82.64	140
9	Gauria Nala	L3	39.5	26.69	82.73	157
10	Stream 1	R7	8.24	26.66	82.76	164

KATEHIA BASIN

Katehia River UID Code:
Basin Area: 734 Sq. Km.
Number of rivers- 13
River Network- 265.09 Km

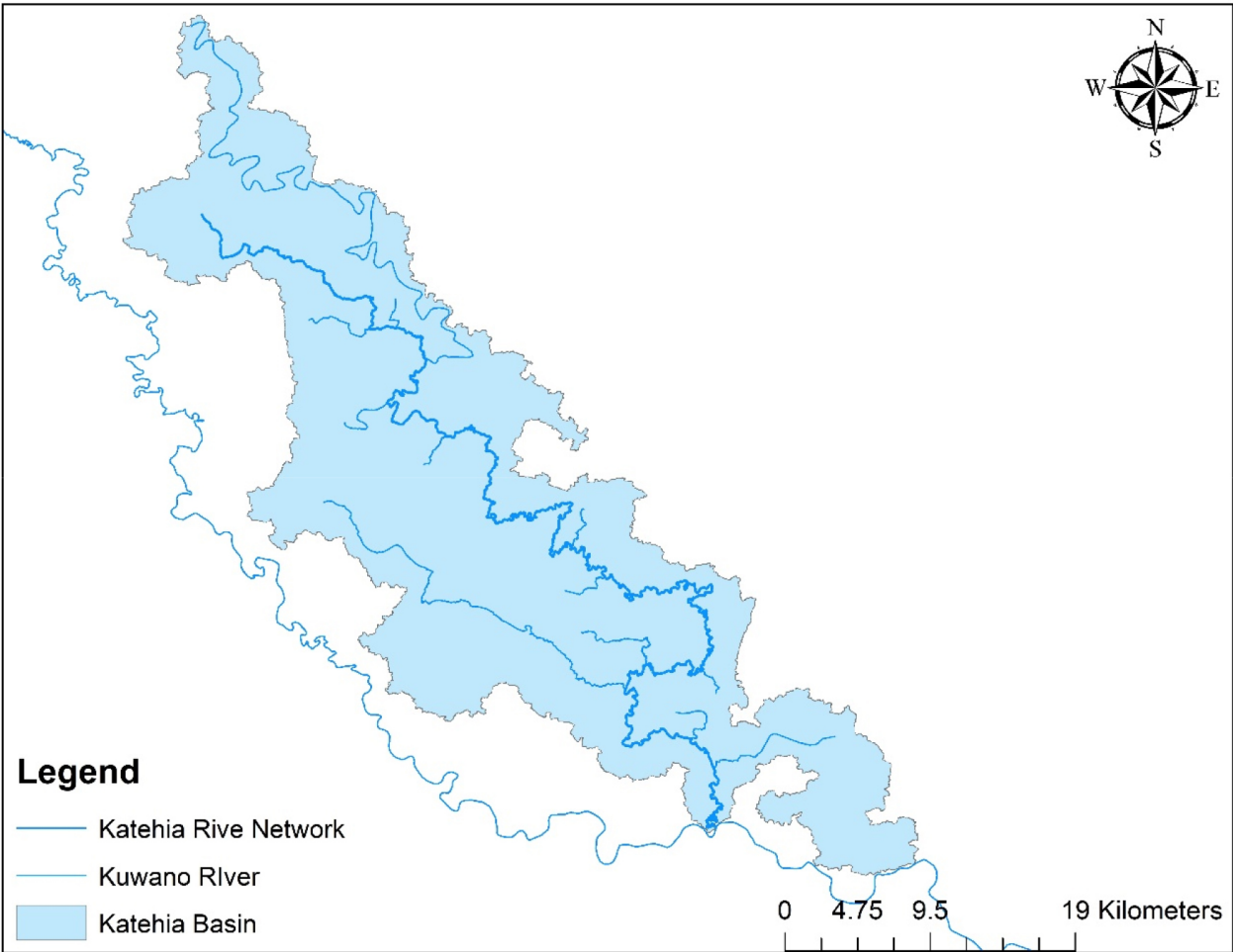
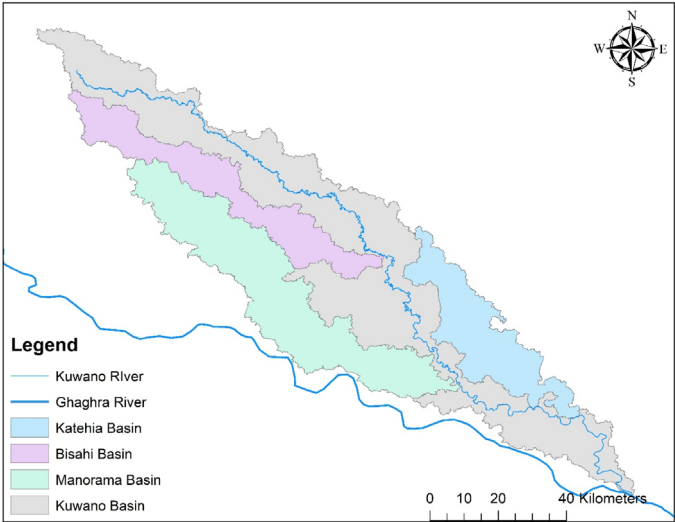


Figure: Katehia River Network





KATEHIA RIVER MAINSTEM FLOW DIAGRAM

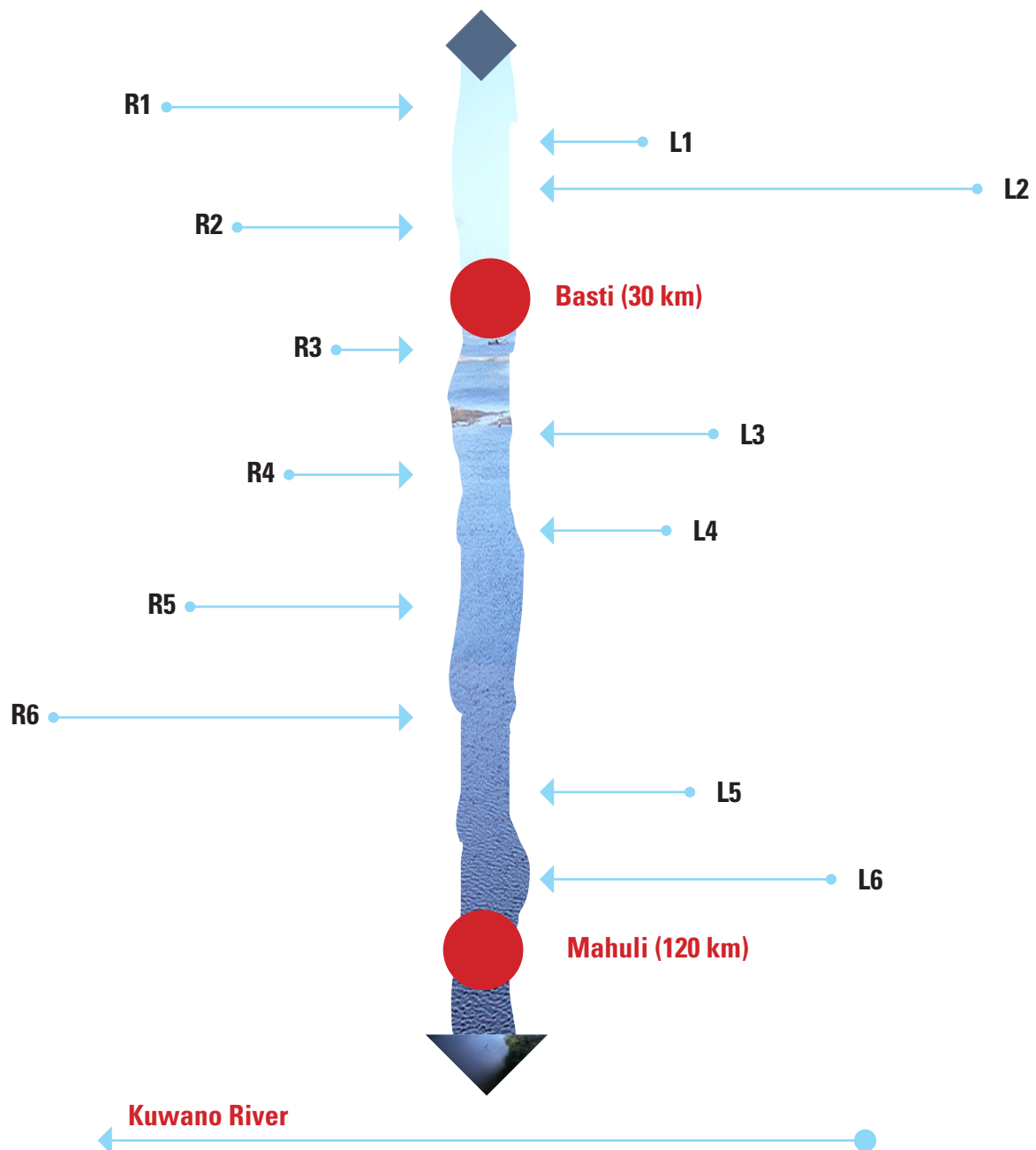


Figure: Flow Diagram of Katehia River

KATHEHIA RIVER MAINSTEM NETWORK						
S.No.	River Name	Confluence Bank	River Length (Km)	Confluence Co-ordinate		Distance from origin (km)
				Lat	Long	
1	Stream 9	R1	5.33	26.894006	82.812655	19
2	Stream 8	L1	2.58	26.894341	82.828485	20
3	Garia Nala	L2	58.9	26.875766	82.846319	24
4	Stream 7	R2	4.87	26.850569	82.823203	30
5	Stream 6	R3	2.77	26.830432	82.857879	37
6	Stream 5	L3	3.55	26.765452	82.931181	65
7	Stream 4	R4	3.79	26.747485	82.95144	71
8	Stream 3	L4	2.60	26.692021	83.005304	95
9	Drain 1	R5	8.1	26.696218	82.97534	101
10	Ichara Nala	R6	29.4	26.681686	82.96339	105
11	Stream 2	L5	5.1	26.651518	83.001621	117
12	Stream 1	L6	9.1	26.635268	83.015102	120

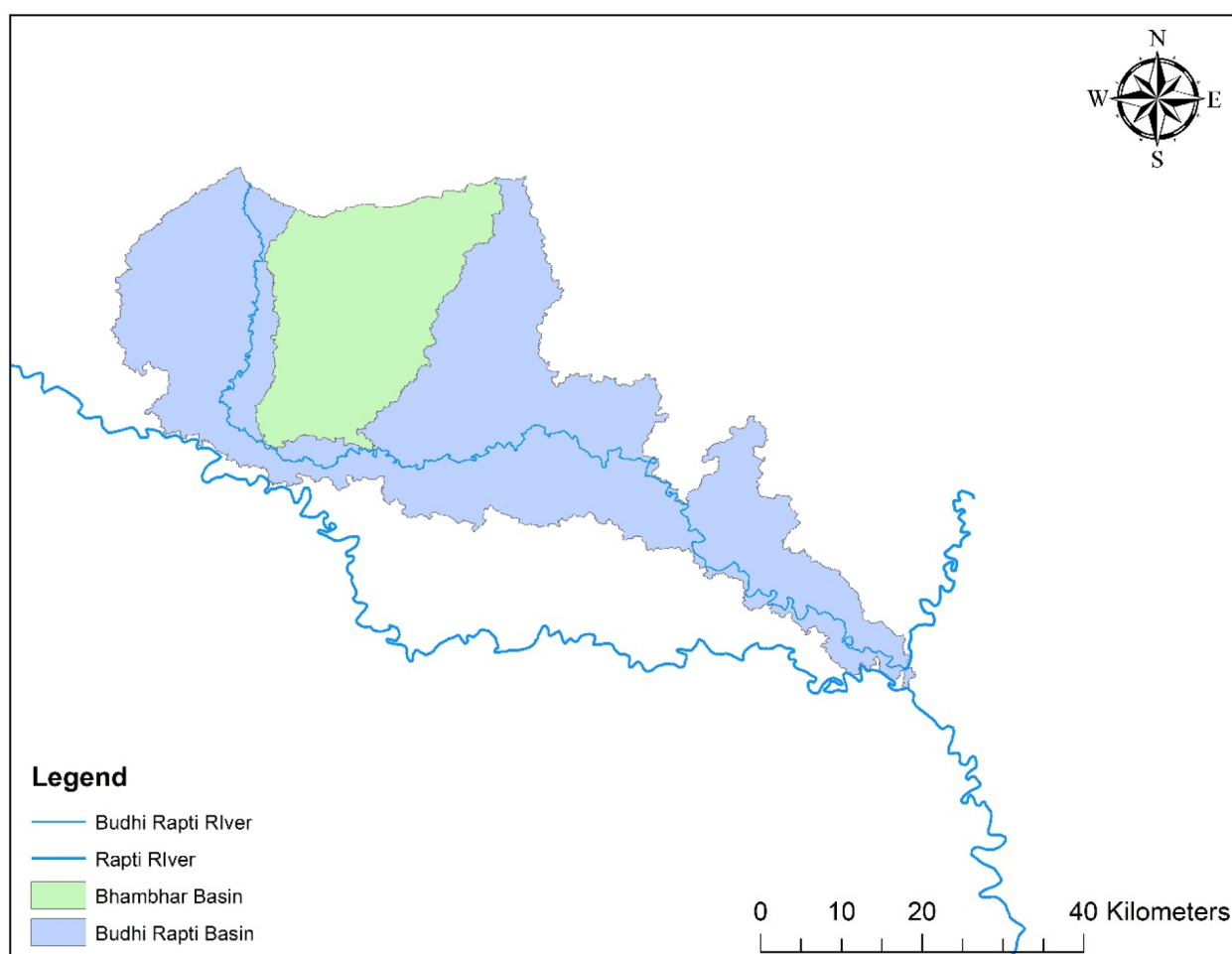




BUDHI RAPTI BASIN: MAJOR SUB-BASINS

Major sub-basins of Budhi Rapti River are as follows

- Bhambhar basin



BHAMBHAR BASIN

Bhambhar River UID Code:

Basin Area: 535 Sq. Km.

Number of rivers- 21

River Network- 293.63 Km

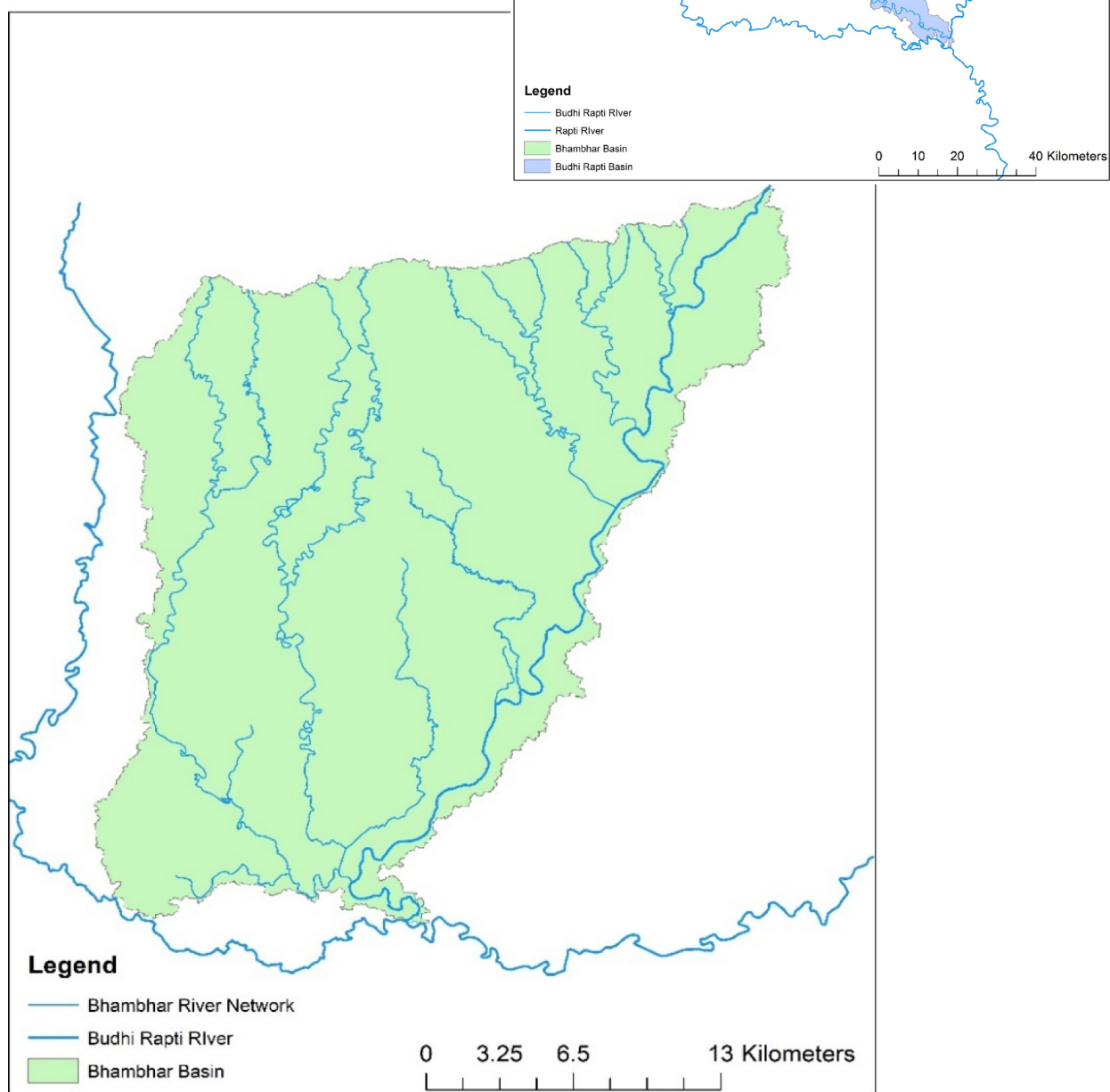


Figure: Bhambhar River Network



BHAMBHAR BASIN RIVER MAINSTEM FLOW DIAGRAM

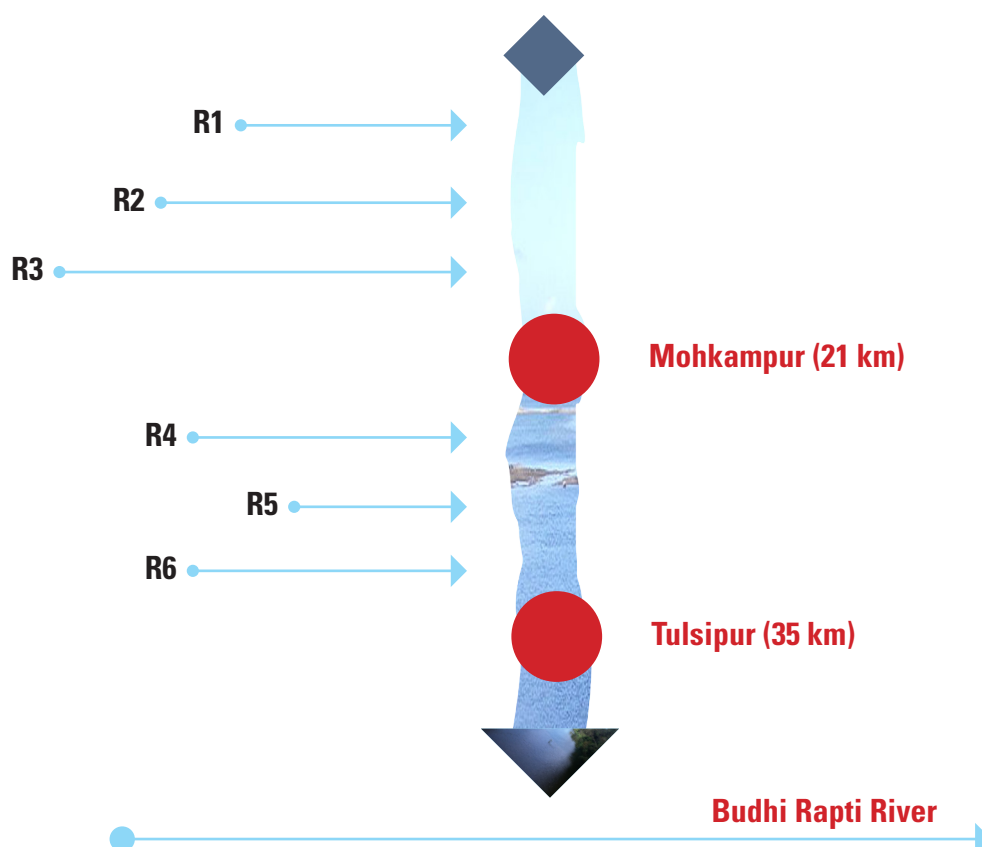


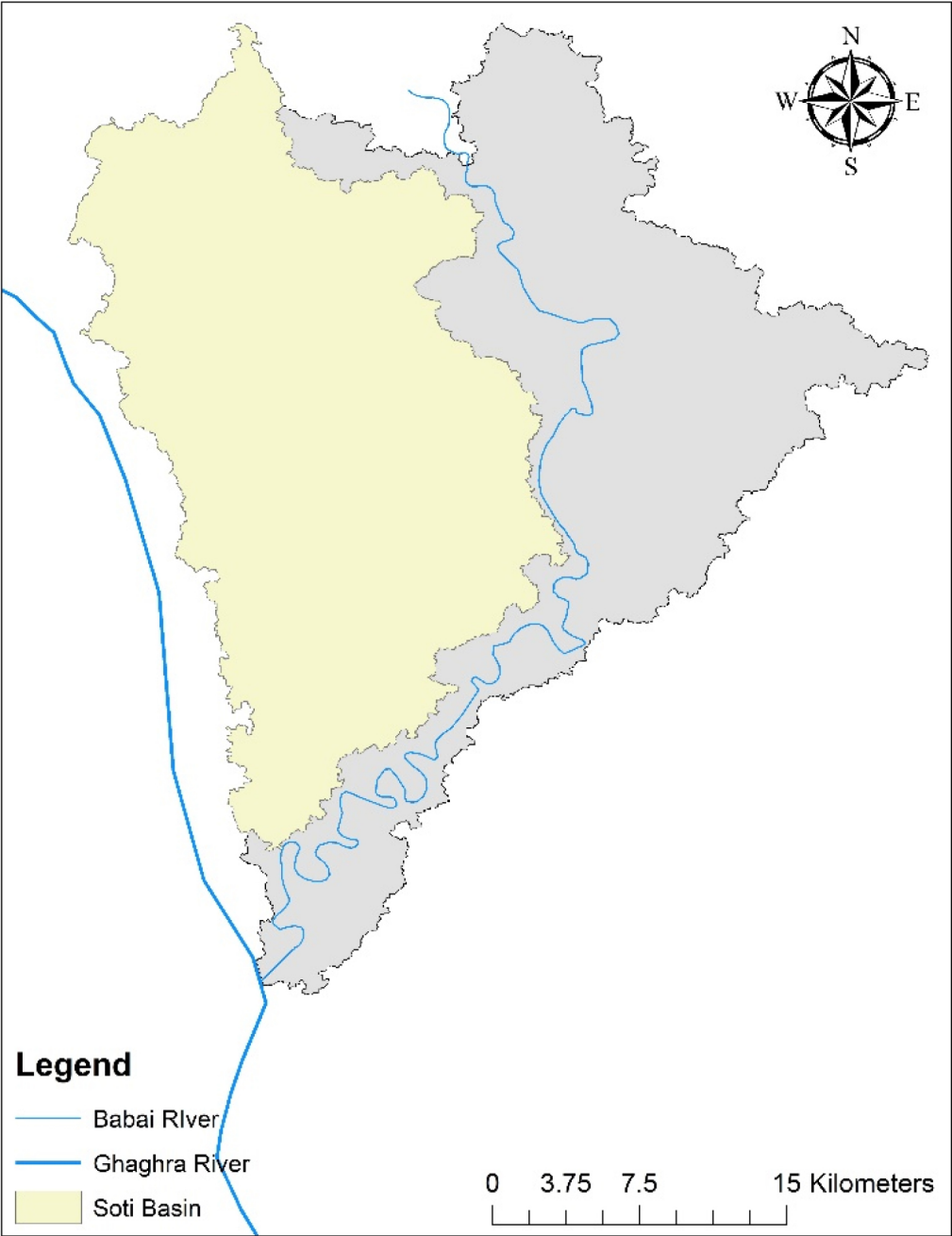
Figure: Flow Diagram of Bhambhar River

BHAMBHAR RIVER MAINSTEM NETWORK						
S.No.	River Name	Confluence Bank	River Length (Km)	Confluence Co-ordinate		Distance from origin (km)
				Lat	Long	
1	Amsotia	R1	6.13	27.67	82.63	8
2	Ghagraol	R2	15.07	27.62	82.61	16
3	Musi	R3	19.5	27.59	82.60	21
4	Barai	R4	17.7	27.51	82.57	33
5	Hahwa	R5	3.19	27.50	82.56	35
6	Stream 1	R6	13	27.43	82.50	48

BABAI BASIN: MAJOR SUB-BASINS

Major sub-basins of Babai River are as follows:

- Soti Basin





SOTI BASIN

Soti River UID Code:
 Basin Area: 485 Sq. Km.
 Number of rivers- 08
 River network- 184.18 Km

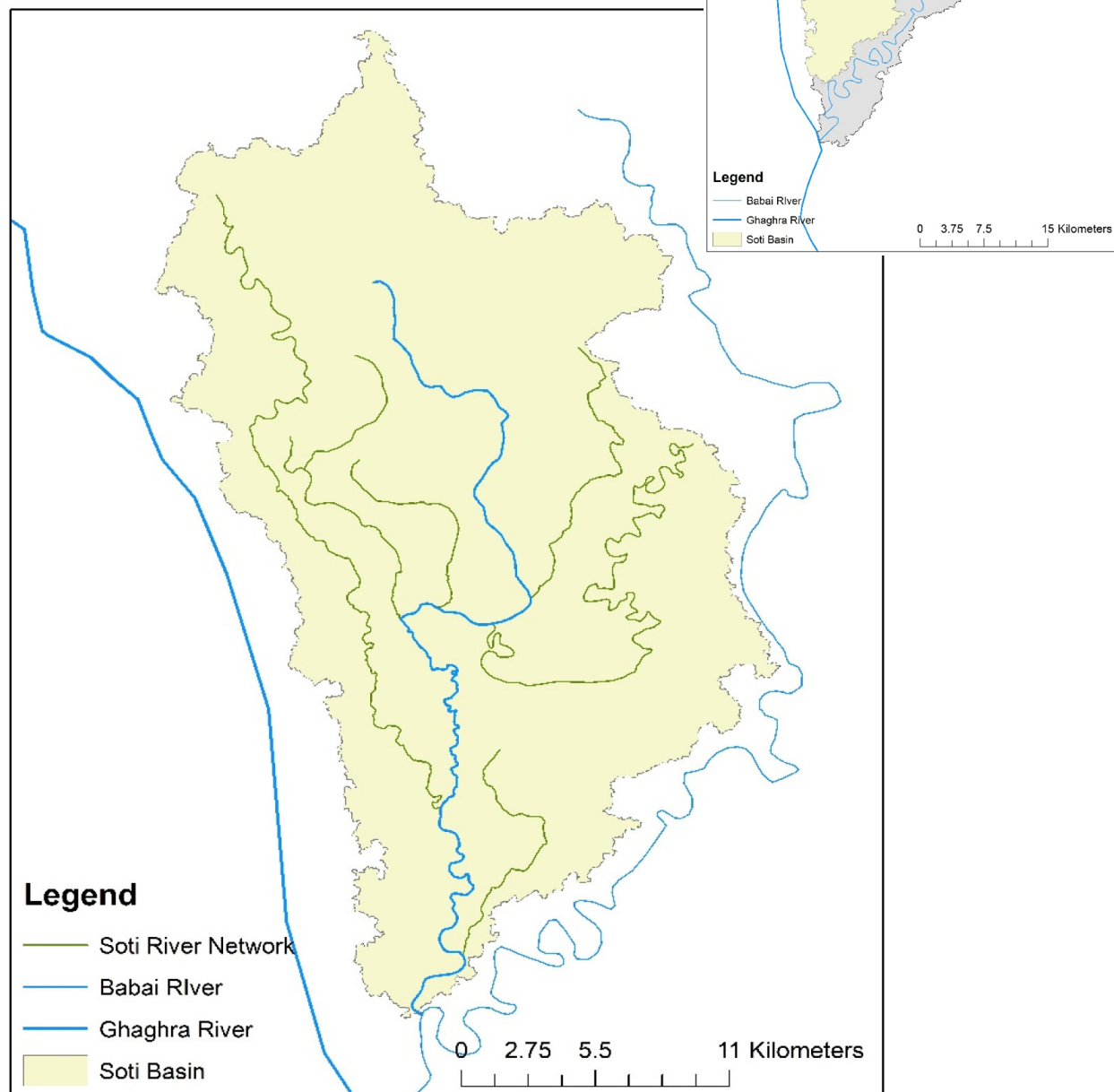


Figure: Soti River Network

SOTI RIVER MAINSTEM FLOW DIAGRAM

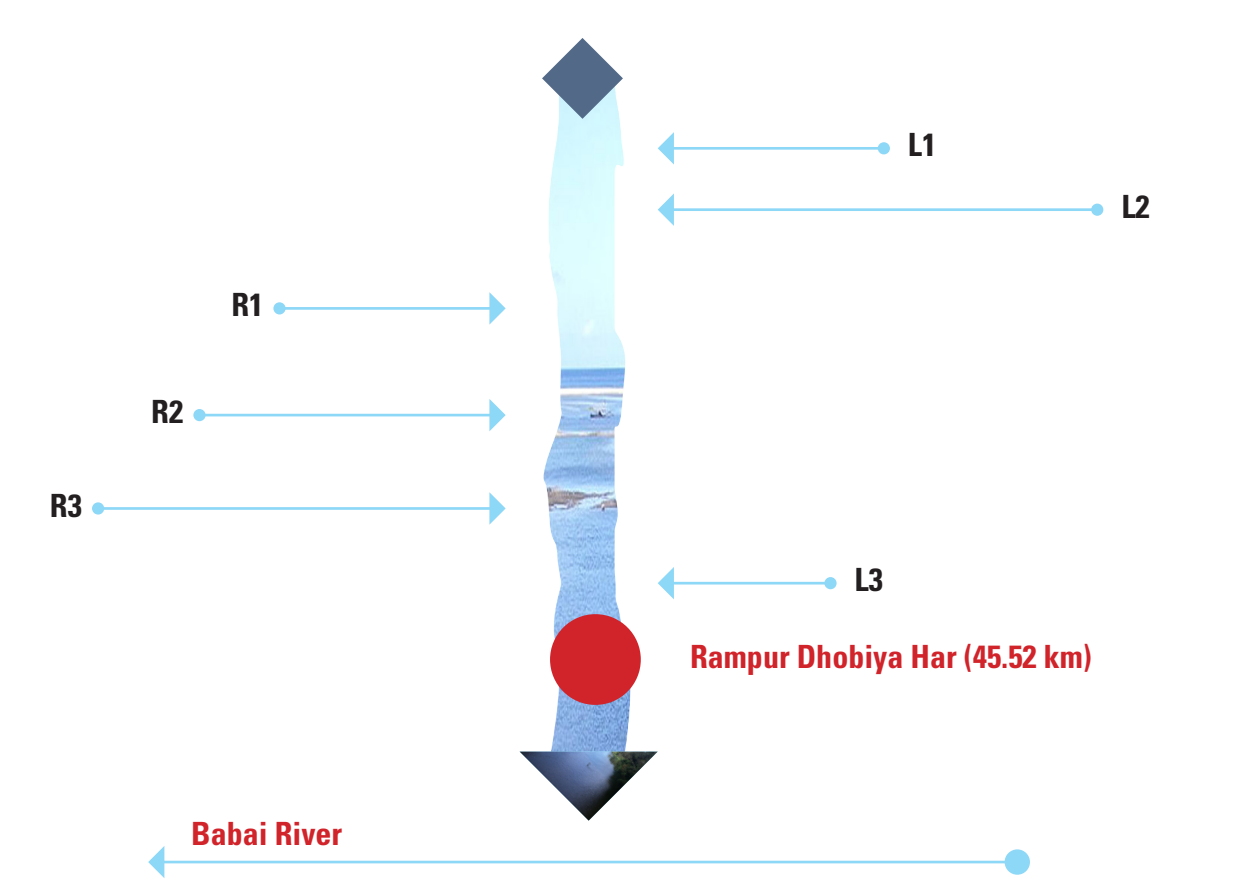


Figure: Flow diagram of Soti River Network

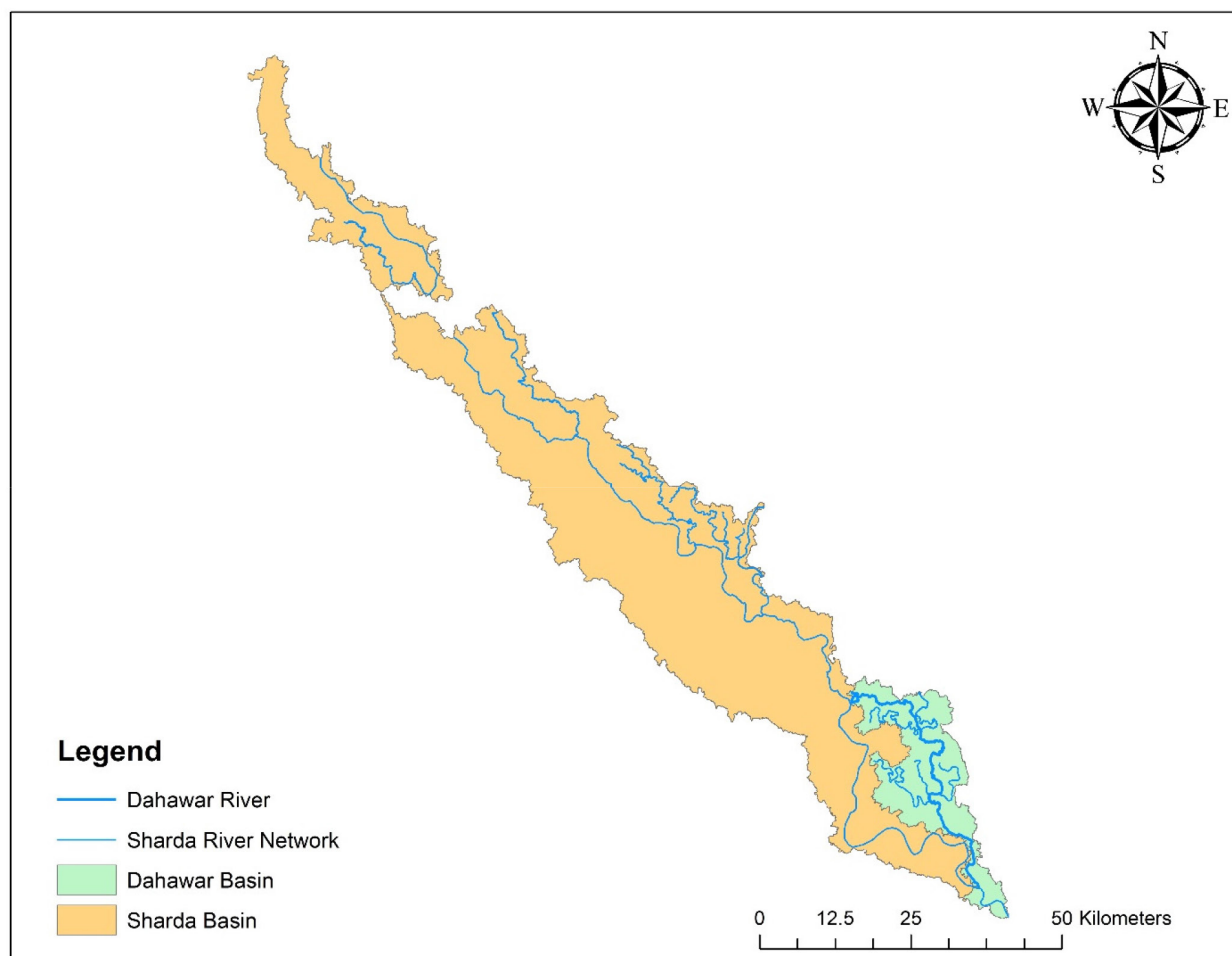
SOTI RIVER MAINSTEM NETWORK						
S.No.	River Name	Confluence Bank	River Length (Km)	Confluence Co-ordinate		Distance from origin (km)
				Lat	Long	
1	Ghagwa Nadi	L1	14.7	27.95	81.34	17.9
2	Babai Nala	L2	38.9	27.94	81.33	19.9
3	Stream 2	R1	9.78	27.95	81.31	22.1
4	Stream 1	R2	11.4	27.94	81.30	23.8
5	Sotiya Nala	R3	40.7	27.87	81.31	35.9
6	Soti Nala	L3	12.3	27.81	81.32	45.52



SHARDA BASIN: MAJOR SUB-BASINS

Major sub-basins of Sharda River are as follows:

- Dahawar Basin



DAHAWAR BASIN

Dahawar River UID Code:
Basin Area: 344.70 Sq. Km.
Number of rivers- 08
River network- 184.18 Km

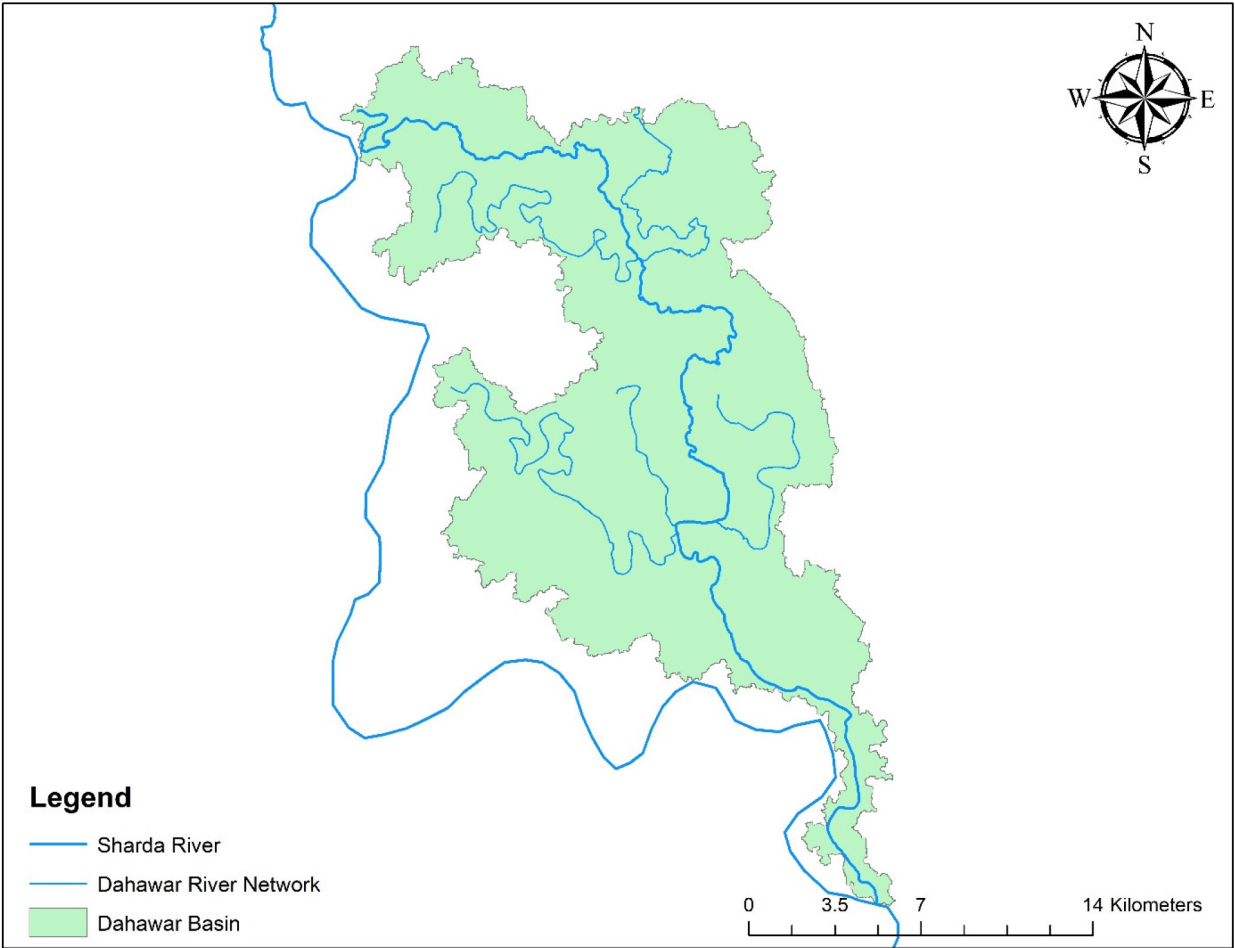
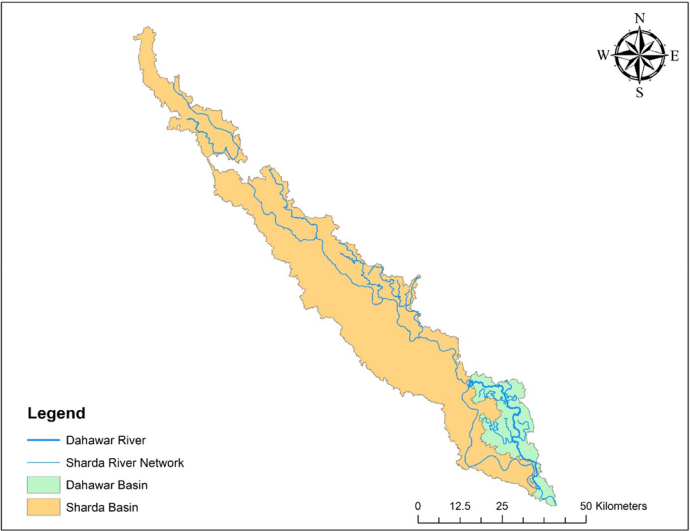


Figure: Dahawar River Network



DAHAWAR RIVER MAINSTEM FLOW DIAGRAM

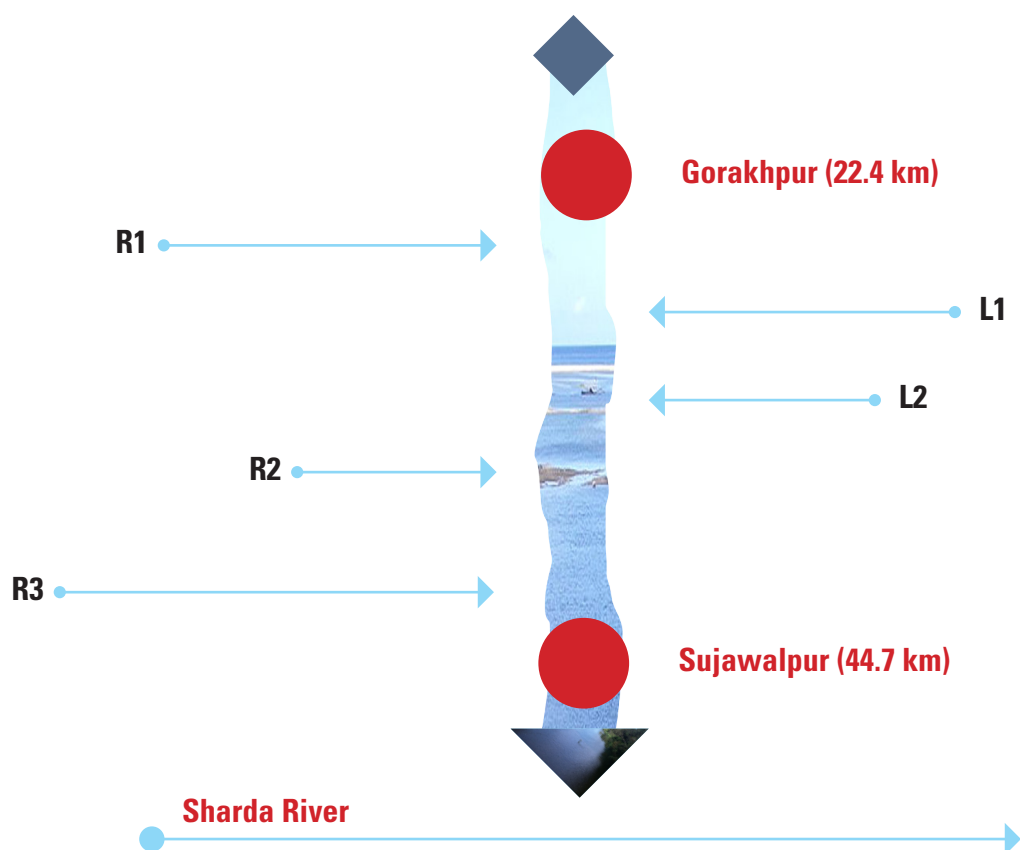


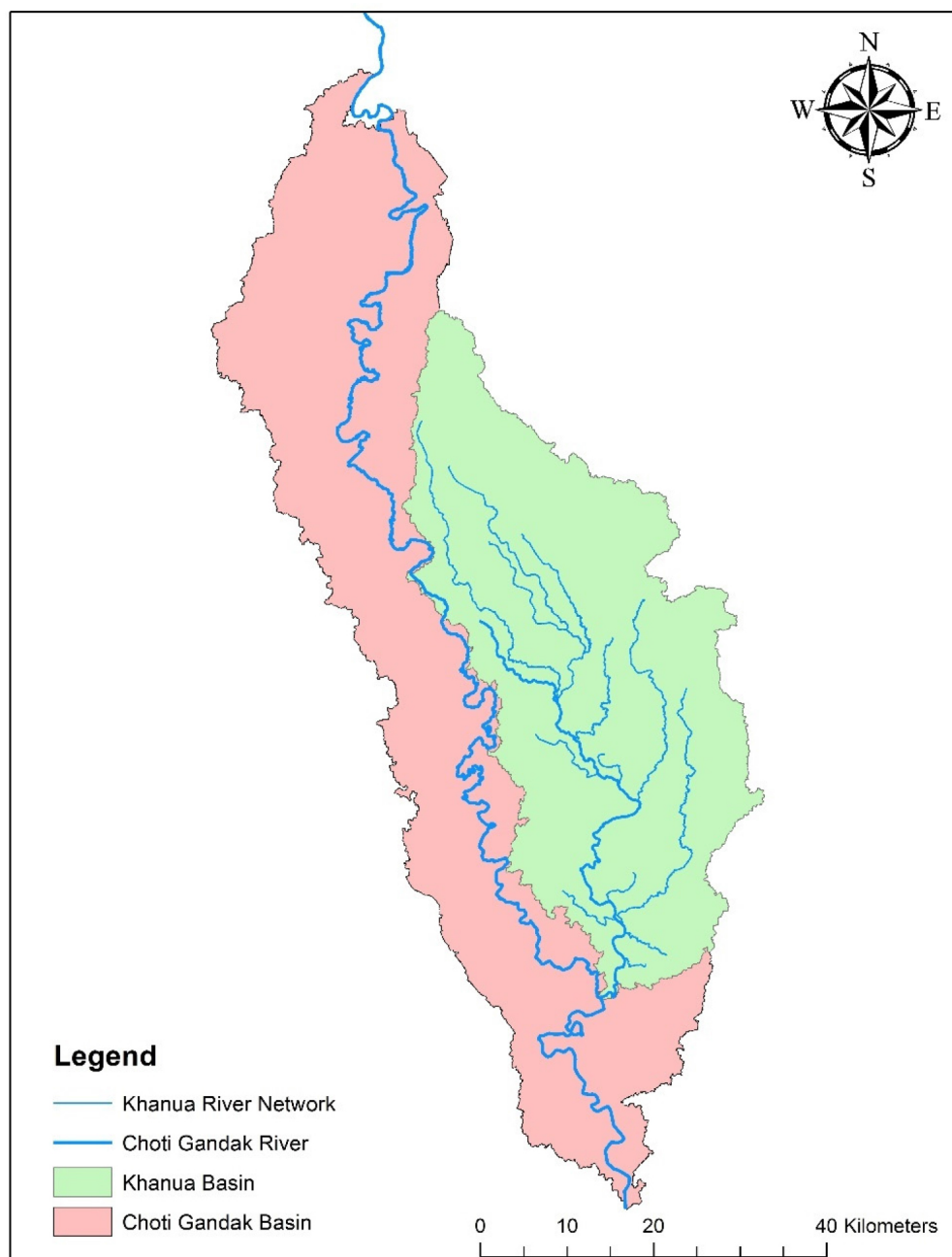
Figure: Flow diagram of Dahawar River Network

DAHAWAR RIVER MAINSTEM NETWORK						
S.No.	River Name	Confluence Bank	River Length (Km)	Confluence Co-ordinate		Distance from origin (km)
				Lat	Long	
1	Sukhni Nadi	R1	24	27.95	81.13	22.4
2	Stream 2	L1	17.6	27.95	81.13	22.7
3	Bhagahar N	L2	14.3	27.85	81.16	42.7
4	Stream 1	R2	7.71	27.85	81.14	44.4
5	Baha Nadi	R3	28.4	27.85	81.14	44.7

CHOTI GANDAK BASIN: MAJOR SUB-BASINS

Major sub-basins of Choti Gandak River are as follows:

- Khanua Basin





KHANUA BASIN

Khanua River UID Code:
 Basin Area: 1680.12 Sq. Km.
 Number of rivers- 08
 River network- 184.18 Km

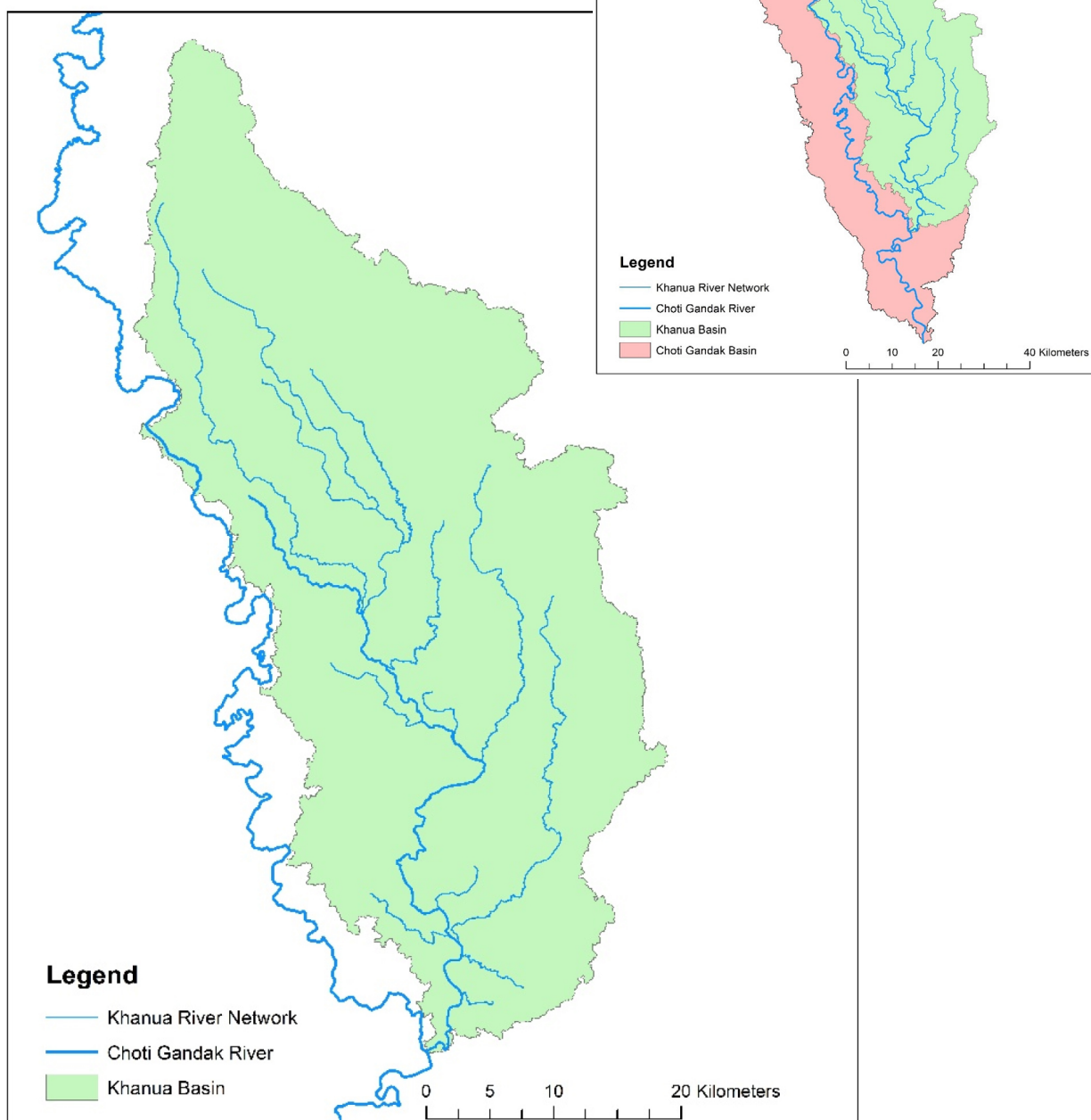


Figure: Khanua River Network

KHANUA RIVER MAINSTEM FLOW DIAGRAM

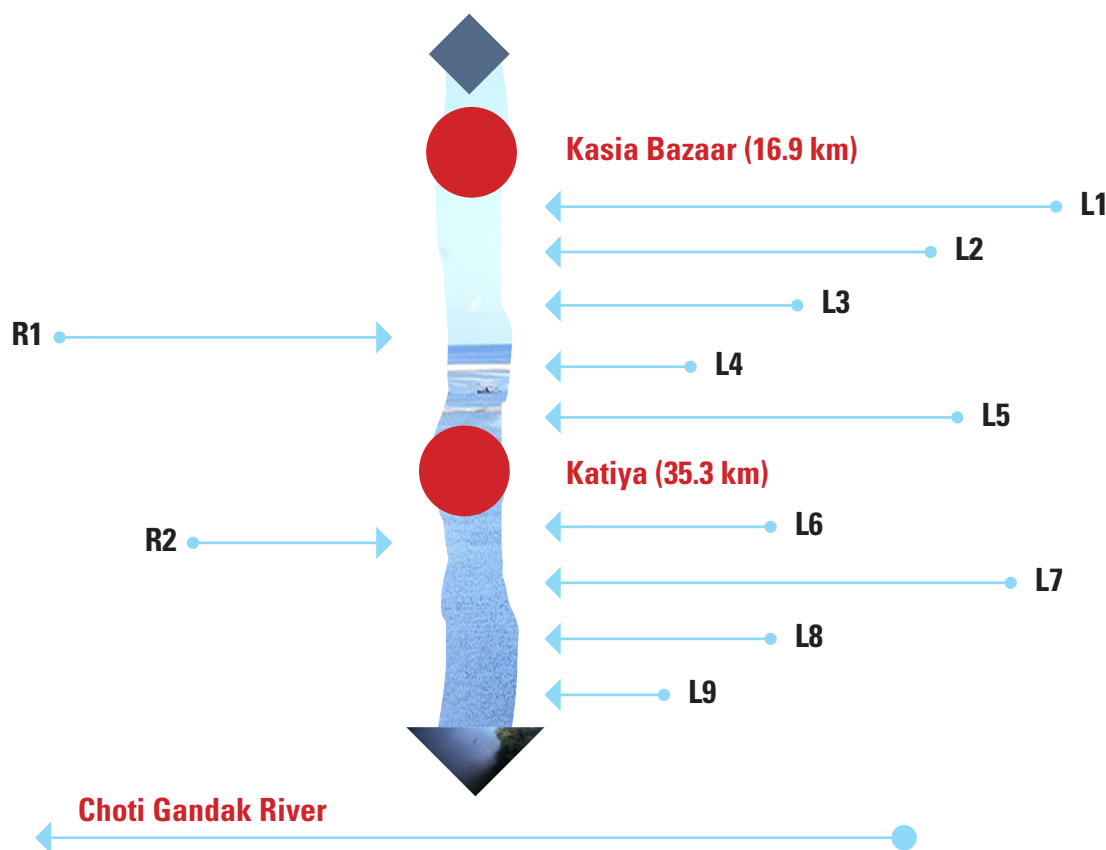
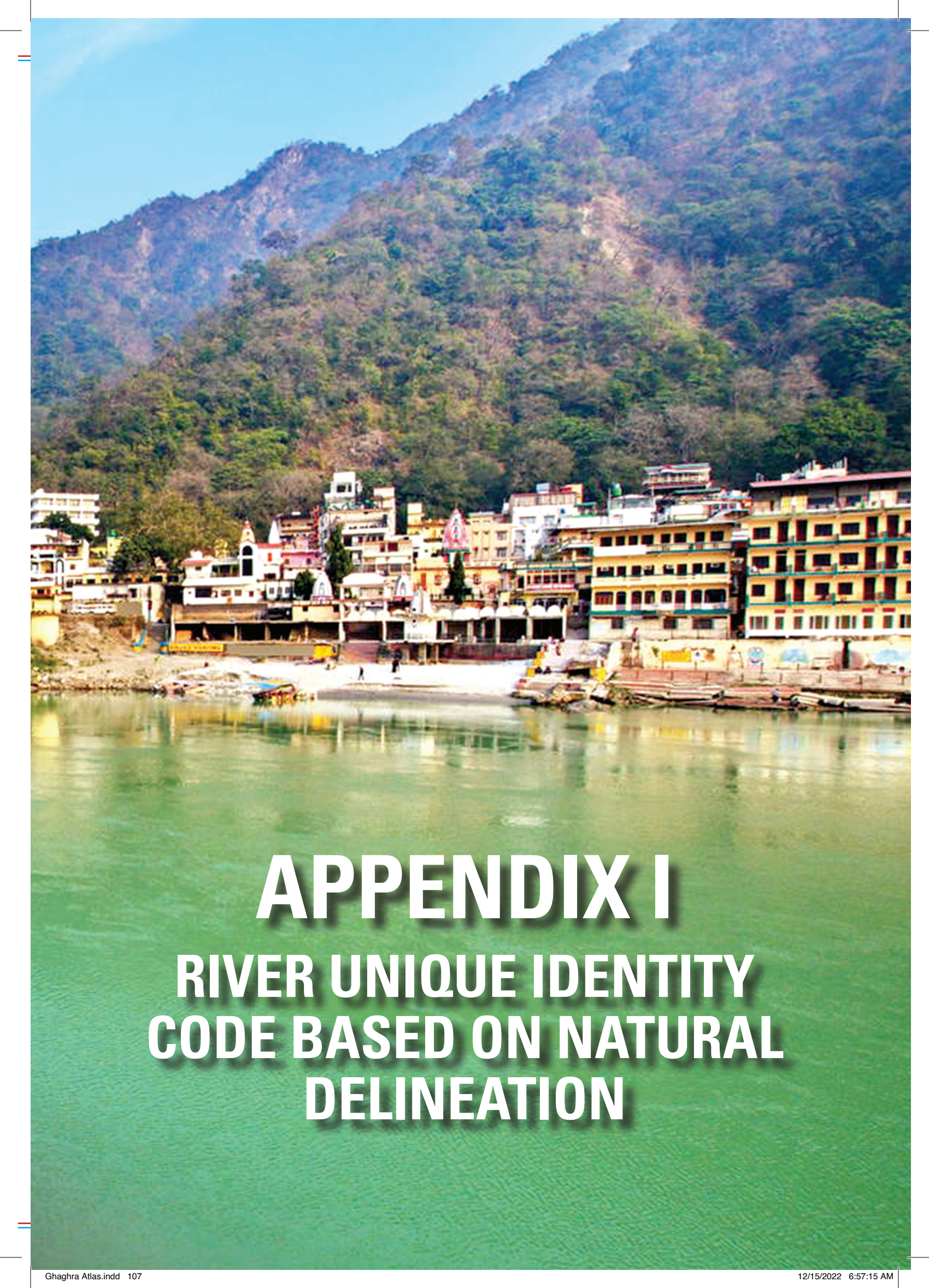


Figure: Flow Diagram of Khanua River

Khanua River Mainstem Network						
S.No.	River Name	Confluence Bank	River Length (Km)	Confluence Co-ordinate		Distance from origin (km)
				Lat	Long	
1	Sonra Nala or Bakia Nala	L1	48.5	26.66	83.96	16.5
2	Ghaghi Nala	L2	29.9	26.65	83.96	16.9
3	Sonda Nala or Luvkhush	L3	22.9	26.62	83.98	22.3
4	Khand Nala	R1	11.8	26.58	84.01	28.8
5	Ghaghart Nala	L4	7	26.57	84.03	32.1
6	Sonda Nala	L5	33.1	26.55	84.06	35.3
7	Stream 2	L6	6.11	26.45	84.02	67.49
8	Mahlan Nala	R2	10.7	26.43	84.03	59.4
9	Jamuhar Nala	L7	43.2	26.42	84.03	60.3
10	Haha Nala	L8	7.8	26.41	84.03	61.6
11	Stream 1	L9	3.96	26.39	84.03	65.93

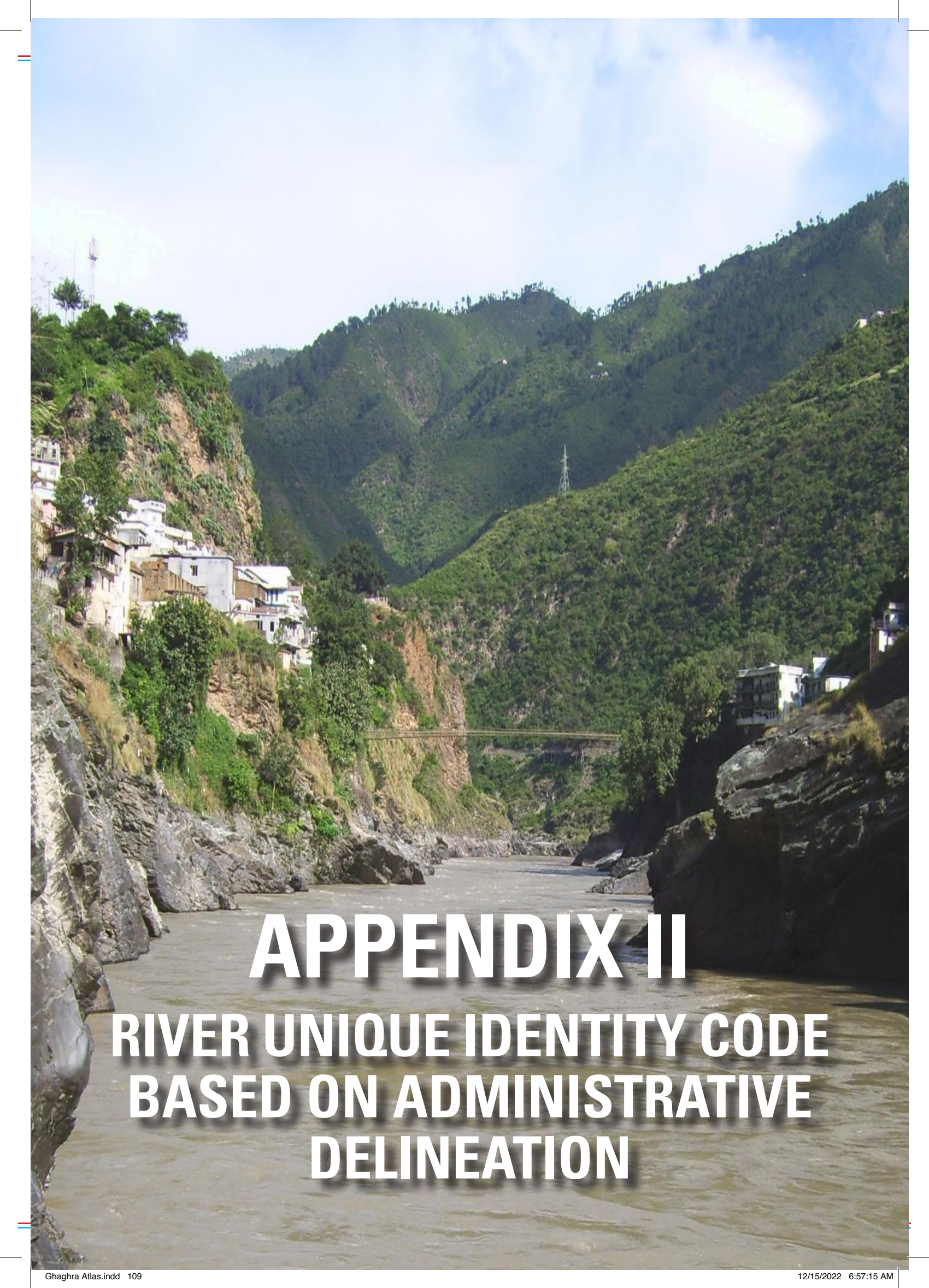


APPENDIX I

RIVER UNIQUE IDENTITY CODE BASED ON NATURAL DELINEATION

RIVER UNIQUE IDENTITY CODE BASED ON NATURAL DELINEATION: GHAGHRA BASIN

S.No	River Code	Origin Data			Confluence Data				Length Of the river (km.)
	Unique Identification Number	Co-ordinate		Ele (m)	Co-ordinate		Ele (m)	Confluence with	
		Lat	Long		Lat	Long			
1	02-L-48-R-01	28.45	80.99	145	28.39	81.03	137	Ghagra	19.2
2	02-L-48-L-01	28.59	81.25	185	28.35	81.06	137	Ghagra	39.3
3	02-L-48-R-03	28.59	80.52	188	28.18	81.09	134	Ghagra	131
4	02-L-48-R-03-L-01	28.68	80.51	203	28.55	80.57	163	Sarju or Suheli River	21.7
5	02-L-48-R-03-R-01	28.58	80.47	173	28.49	80.61	157	Sarju or Suheli River	31.2
6	02-L-48-R-03-R-02	28.52	80.52	166	28.48	80.63	156	Sarju or Suheli River	14.9
7	02-L-48-R-03-L-02	28.52	80.65	195	28.35	80.87	138	Sarju or Suheli River	48.9
8	02-L-48-R-03	28.24	81.01	140	28.18	81.09	132	Ghagra	20.5
9	02-L-48-R-05	28.21	80.85	134	28.05	81.17	126	Ghagra	61.4
10	02-L-48-R-05-R-01	28.03	81.11	133	28.07	81.12	128	Sukhni Nala	7.68
11	02-L-48-L-02	28.21	81.20	142	28.02	81.20	126	Ghagra	27
12	02-L-48-R-06	28.07	80.98	138	28.01	81.21	123	Ghagra	41
13	02-L-48-L-03	28.14	81.36	140	27.73	81.29	115	Ghagra	87.7
14	02-L-48-L-03-L-01	28.14	81.38	139	28.08	81.40	132	Babai River	8.67
15	02-L-48-L-03-L-02	28.20	81.46	148	28.06	81.44	127	Babai River	30.2
16	02-L-48-L-03-L-02-L-01	28.24	81.49	167	28.06	81.44	130	Stream 3	30.1
17	02-L-48-L-03-L-03	28.33	81.68	628	28.03	81.46	225	Babai River	63
18	02-L-48-L-03-L-03-R-01	28.36	81.55	381	28.21	81.56	200	Stream 1	23.7
19	02-L-48-L-03-L-03-L-01	28.31	81.73	728	28.04	81.49	225	Stream 1	61.8



APPENDIX II

RIVER UNIQUE IDENTITY CODE BASED ON ADMINISTRATIVE DELINEATION

RIVER UNIQUE IDENTITY CODE BASED ON ADMINISTRATIVE DELINEATION: GHAGHRA BASIN

S.No	River Code	Village/ Town Entry Data		Village/ Town Exit Data		
	Unique Identification Number	Coordinates		Coordinates		Village/Town
		Lat	Long	Lat	Long	
1	356-UP-153-XX-02-01	28.218	28.218	28.164	81.098	Jungle Sujanpur
2	356-UP-153-XX-02-01	28.164	81.098	28.147	81.106	Ramnagar Bagha
3	356-UP-153-XX-02-01	28.147	81.106	28.124	81.121	Gularhia
4	356-UP-153-XX-02-01	28.124	81.121	28.110	81.136	Dev Maniyan
5	356-UP-153-XX-02-01	28.110	81.136	28.056	81.164	Matera Resrved Forest
6	356-UP-153-XX-02-01	28.056	81.164	28.049	81.174	Bachey Para
7	356-UP-153-XX-02-01	28.049	81.174	28.037	81.182	Binjaha
8	356-UP-153-XX-02-01	28.037	81.182	27.980	81.225	Parsa
9	356-UP-153-XX-02-01	27.980	81.225	27.949	81.236	Ramllok
10	356-UP-153-XX-02-01	27.949	81.236	27.940	81.237	Fakir Purwa
11	356-UP-153-XX-02-01	27.940	81.237	27.926	81.242	Chahlua
12	356-UP-153-XX-02-01	27.926	81.242	27.905	81.248	Ojhapurwa
13	356-UP-153-XX-02-01	27.905	81.248	27.873	81.251	Belagarhi
14	356-UP-153-XX-02-01	27.873	81.251	27.865	81.251	Saraiyan Kalan
15	356-UP-153-XX-02-01	27.865	81.251	27.837	81.252	Mirzapur Mallapur
16	356-UP-153-XX-02-01	27.837	81.252	27.814	81.257	Firozabad
17	356-UP-153-XX-02-01	27.814	81.257	27.801	81.261	Dundaki
18	356-UP-153-XX-02-01	27.801	81.261	27.785	81.266	Chandauli
19	356-UP-153-XX-02-01	27.785	81.266	27.773	81.271	Bulaki Purwa
20	356-UP-153-XX-02-01	27.773	81.271	27.759	81.280	Chakdaha
21	356-UP-153-XX-02-01	27.710	81.290	27.685	81.282	Gori
22	356-UP-154-XX-02-01	27.685	81.282	27.672	81.277	Amritpur
23	356-UP-154-XX-02-01	27.672	81.277	27.643	81.277	Mori Chula
24	356-UP-154-XX-02-01	27.643	81.277	27.633	81.281	Taipur
25	356-UP-180-XX-02-01	27.633	81.281	27.574	81.321	Golok Kuar
26	356-UP-180-XX-02-01	27.574	81.321	27.555	81.332	Siasiya Churaman
27	356-UP-180-XX-02-01	27.555	81.332	27.536	81.339	Baharpur
28	356-UP-180-XX-02-01	27.536	81.339	27.503	81.364	Murauwa
29	356-UP-180-XX-02-01	27.503	81.364	27.495	81.375	Pipri



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