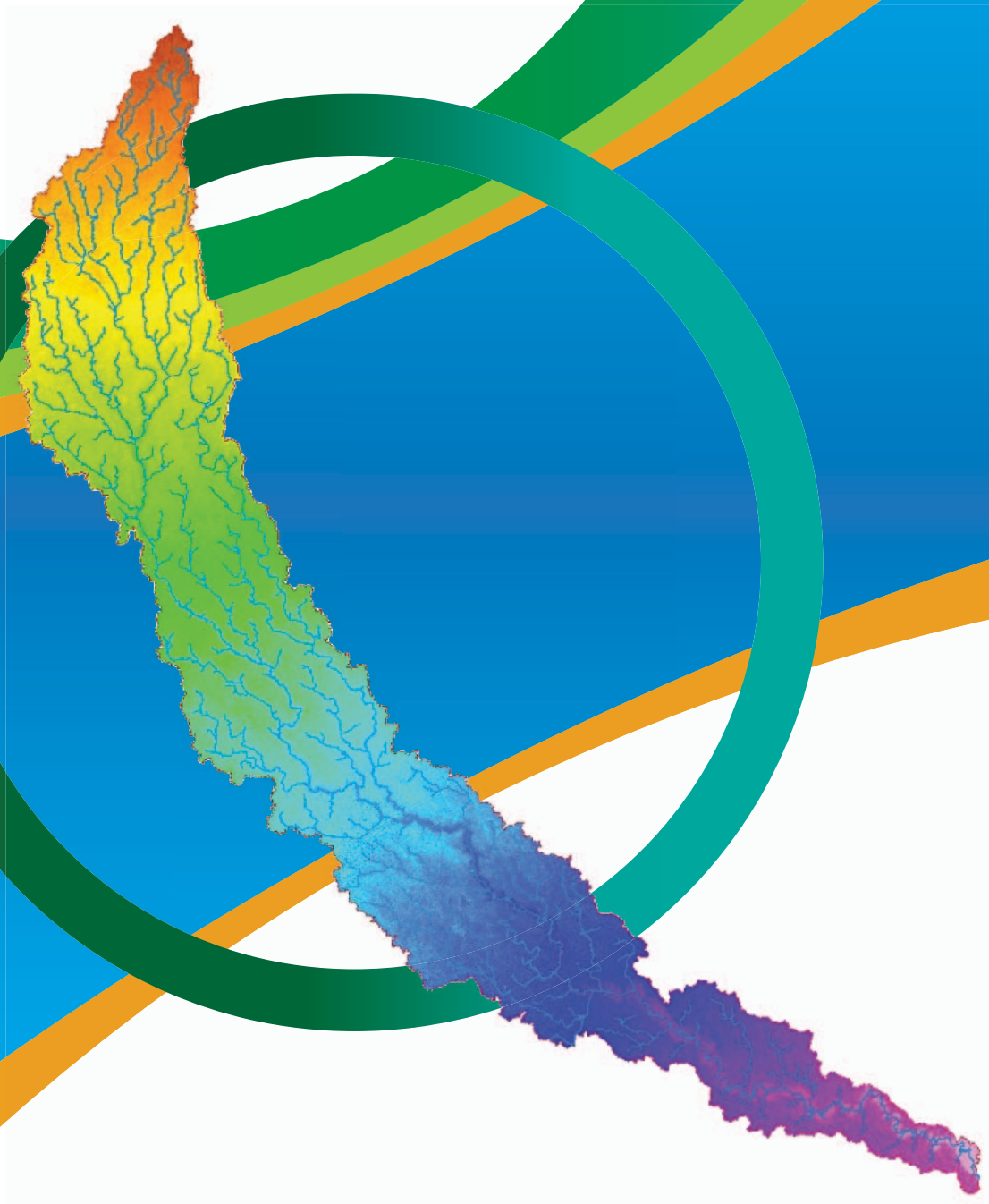


National Mission for Clean Ganga

Ministry of Jal Shakti

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



KALI EAST

RIVER BASIN ATLAS



cGanga
Centre for Ganga River Basin Management and Studies
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December 2022

Version - 1

KALI EAST

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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.

Suggested Citation

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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 Kali East basin river network in the State of Uttar Pradesh. 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 Kali East 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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IIT Kanpur*

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ACRONYMS AND ABBREVIATIONS

BCM	: 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
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

Kali East River is an important tributary of the Ganges flows through twelve districts of Uttar Pradesh before its confluence with Ganga River near Kannauj. The present volume is a first attempt to map the rich river network of Kali East 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 Kali East basin river resources

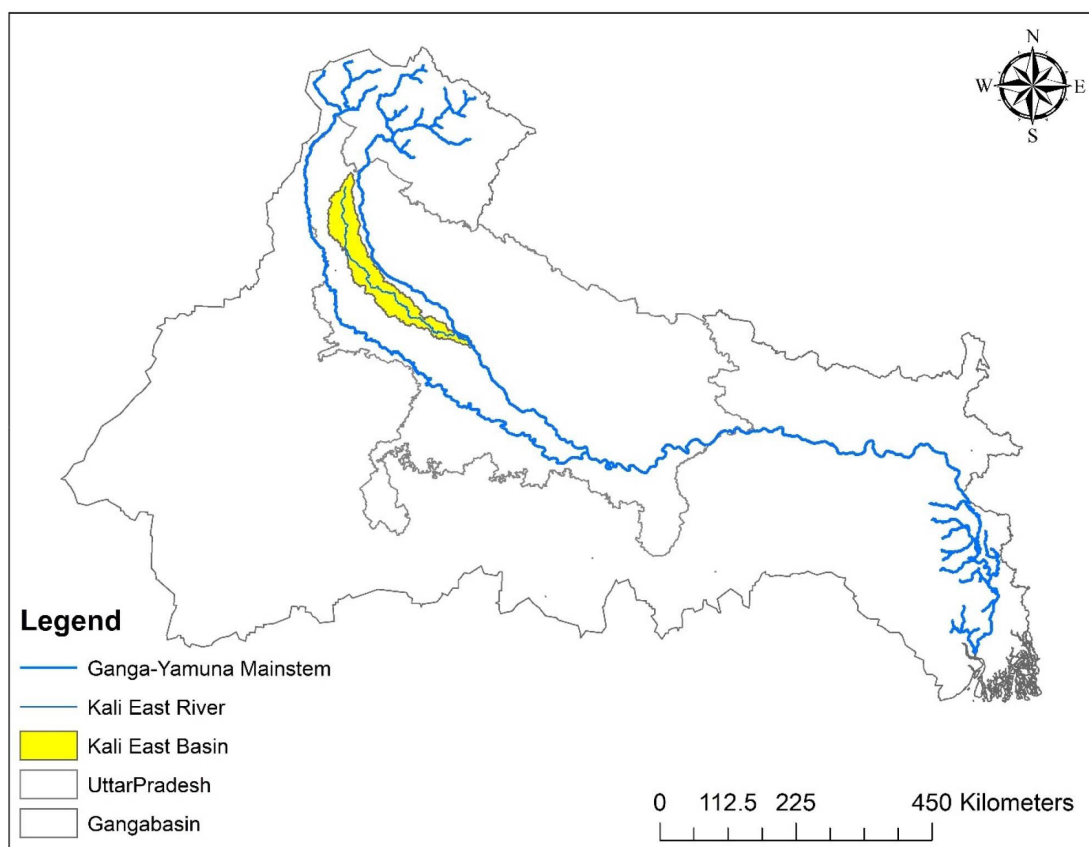


Figure: Location of Kali East Basin



KALI EAST BASIN: SALIENT FEATURES

S No	Particulars	Details
1	State Extent	Latitude: 26° 50' to 29° 30' N and Longitude: 77° 30' to 80° 00'E
2	Total Geographical Area (sq. km)	12,212.4
3	Area contributing to Ganga Basin (sq km)	12,212.4
4	Percentage of the Ganga Basin Area (%)	1.42
5	Districts (Census 2011)	12
6	Towns (Census 2011)	(Class I: 07; Class II: 09; Class III: 16; Class IV;; Class V: ; Class VI:)
7	Total Population (Census 2011)	
8	Gram Panchayats	3655
9	Census Villages (Census 2011)	4467
10	Average Annual Rainfall (mm)	800 – 900
11	Average Temperature Range (oC)	5° to 45°
12	Major Rivers	Nim and Chhoiya
13	Number of Major Basins	03
14	Number of Water Resources Struc-tures	(Dams: 00, Barrages: 01, Weir: 00, Anicuts, Lifts, Power houses: 00)
15	Number of Ground Water Observation wells	Level: 633 Quality: 45
16	Number of CWC Sites	01

KALI EAST 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	Hardoi	5986	4,092,845	20.44%	684	Kali
2		Meerut	2559	3,443,689	14.89%	1346	Abu ka Nala, Abu Nala2, Bali Drain, Chan-dasamand Drain, Chhoiya Nala2, Chhoiya Nala3, Dindala Drain, Gagsona Drain, Hawa Nala, Ikla Drain, Kaili Drain, Kali, kharauli Nala or Chhoiya Nala, Khatauli Nala, Kithor Drain, Mawana Drain, Meerut Nala, Raidhana Drain, Sheikhpur Drain
3		Kannauj	2093	1,656,616	19.27%	792	Janaura Supplementary cut, Kali, Udhannapur Drain
4		Farrukhabad	2181	1,885,204	20.05%	864	Janaura Supplementary cut, Kali, Kharwa Nala
5		Mainpuri	2760	1,868,529	17.02%	677	Bikrampur Drain, Ganga Jamni Nala, Janaura Supplementary cut, Junesi Escape, Kali, Khara Nala, Kinhawar Drain or Naya Nala, Malawan Nala, Naka Drain, Rajwana Drain, Shibpur Drain, Sirsa Drain
6		Etah	2431	1,774,480	13.62 %	730	Baghwala Nala, Bhaupura Drain, Junesi Es-cape, Kachaura Drain, Kansuri Drain,Kali , Ka-ron Nala, Kartala Drain, Khajura Drain, Khara Nala, Khara Nala 2, Malawan Nala, Marahra Drain, Milak Banehra Nala , Mohanpur Drain, Rajwana Drain, Targawan Drain,
7		Kansiram Nagar	1955	1,436,719	16.93 %	735	Behta Drain, Bhaupura Drain, Etbarpur Drain, Jhabar Drainage cut, Kartala Drain, Khajura Drain, Khojpur Drain, Mohanpur Drain, Namaini Drain, Nim River, Sanmothi Mohan-pur Drain, Sevka Nala, Sidhpura Nala, Sikaira Drain, Singpur Drain, Wazirpur Nala
8		Mahamaya Nagar	1840	1,564,708	17.12 %	850	Arabamada Nala, Karon Nala, Kachaura Drain, Kali
9		Aligarh	3650	3,673,889	22.78%	1007	Arabamada Nala, Bainjana Drain, Chhoiya Nala, Choiya Drain, Dadon Drain, Daheli Drain-age Cut, Dabthala Branch, Kali, Karaila Drain Cut, Palra Drainage cut, Tejpur Cut, Teori Drainage Cut
10		Bulandshahr	4512	3,499,171	20.12 %	776	Baral Nala , Bhatola Nala, Chhoiya River, Gu-laothi Nala, Nim River, Palra Drainage cut, Si-yana Drain, Teori Drainage Cut, Zainpur Drain,,,
11		Ghaziabad	1179	4,681,645	42.27%	3971	Kali , Bajhera Drain, Baral Nala, Chhajarsi Drain, Chhoiya Nala 2, Dhaulana Drain, Dindala Drain, Hawa Nala, Hiwai Drain, ikla Drain, Kali , kharauli Nala or Chhoiya Nala, Kithor Drain, Nijampur Drain, Nim River, Niwari Drain, Nurpur Drain, Raidhana Drain, Ratanpura Drain, Shamli Drain, Sheikhpur Drain, Sikri Khurd Nala, Siwia Escape, Tibara Nala
12		Muzaffarnagar	4008	4,143,512	16.94 %	1034	Abu Nala 2, Basaich Drain, Chandasamand Drain, Gagsona Drain, Jansath Nala , Khatauli Nala , Ladpur Drain, Rataur Drain,



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)

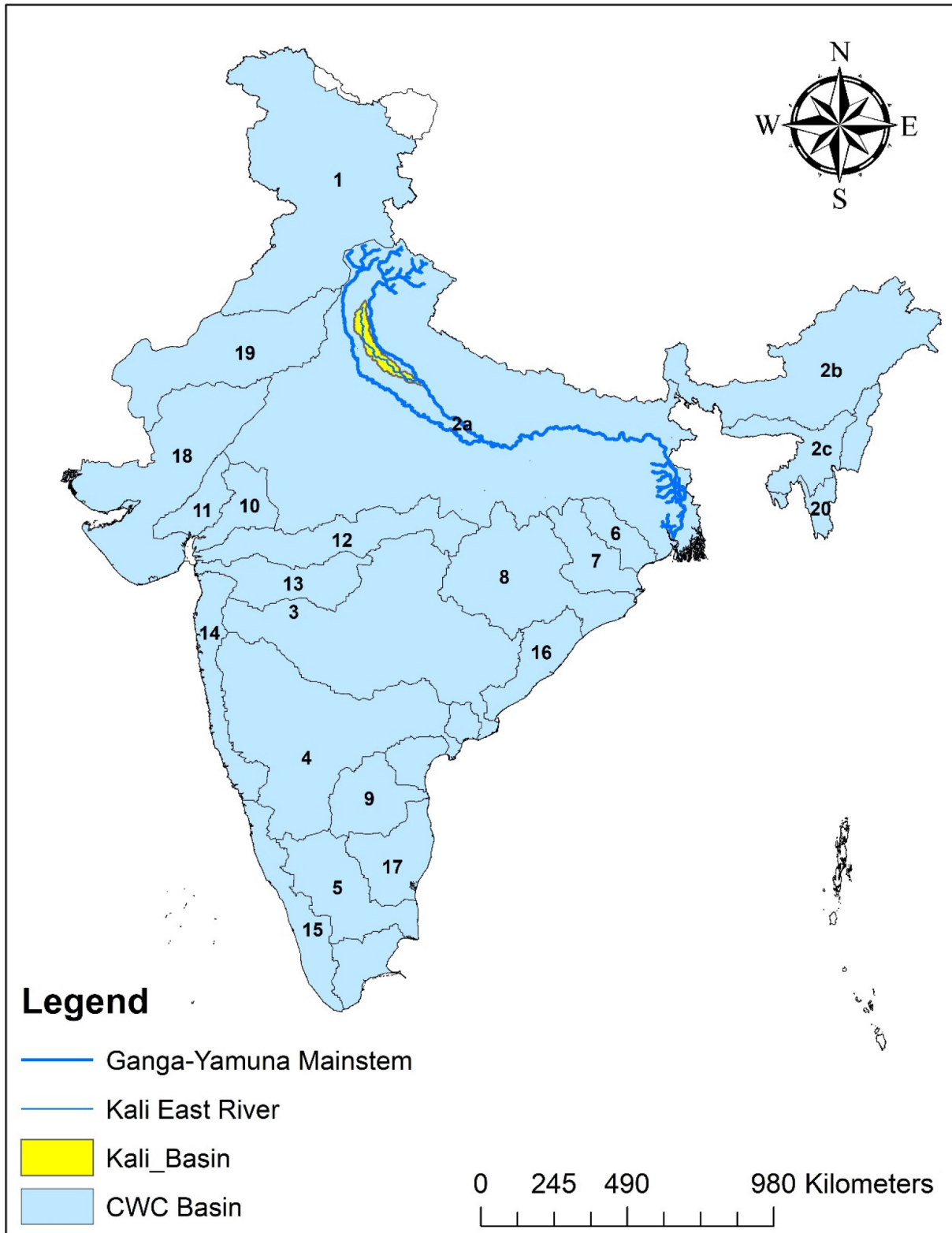


Figure: CWC Basins in India



KALI EAST BASIN: ADMINISTRATIVE STRUCTURE

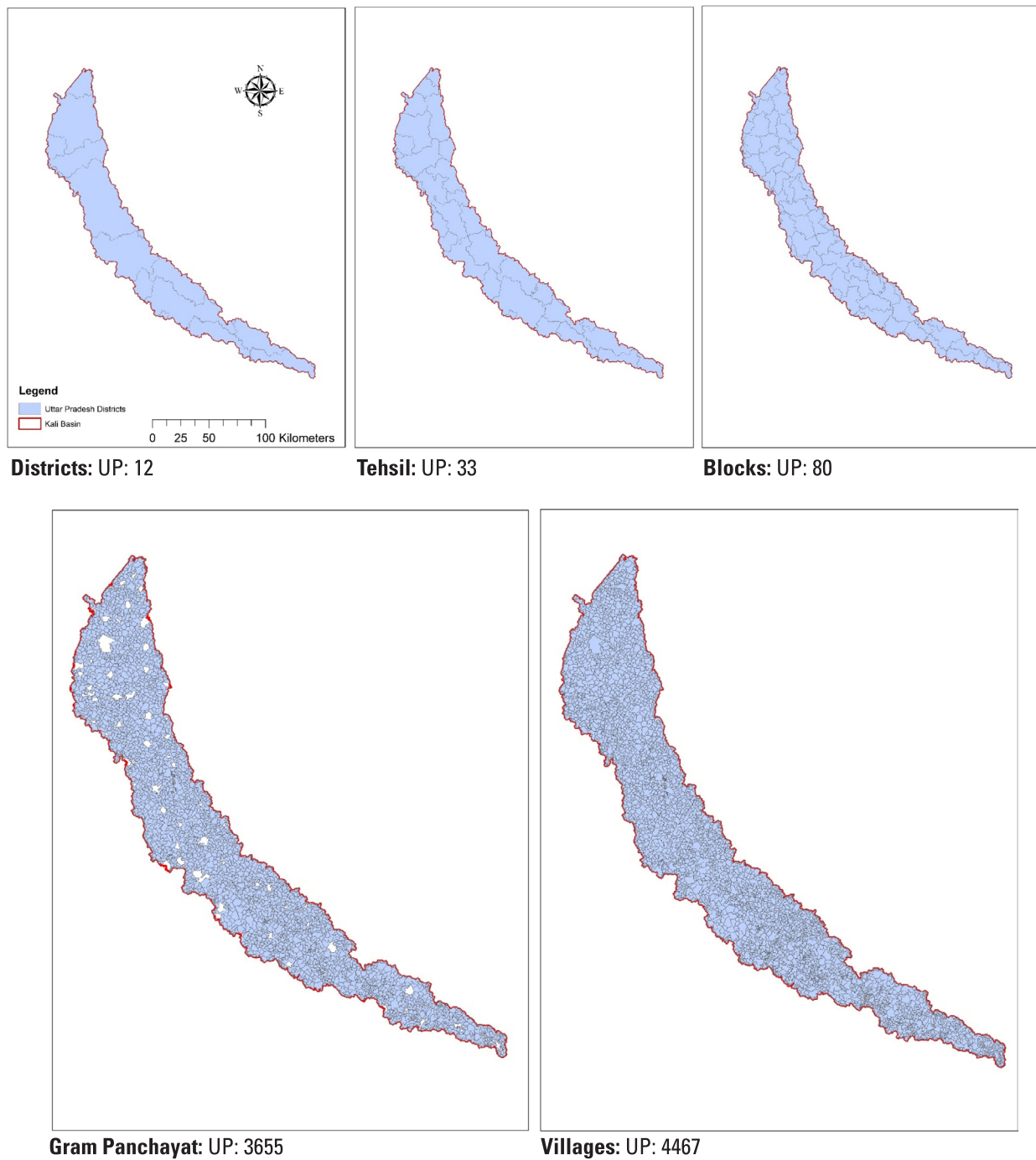


Figure: Administrative Structure of the Kali East River Basin

Source: SOI

KALI EAST BASIN: CANAL NETWORK

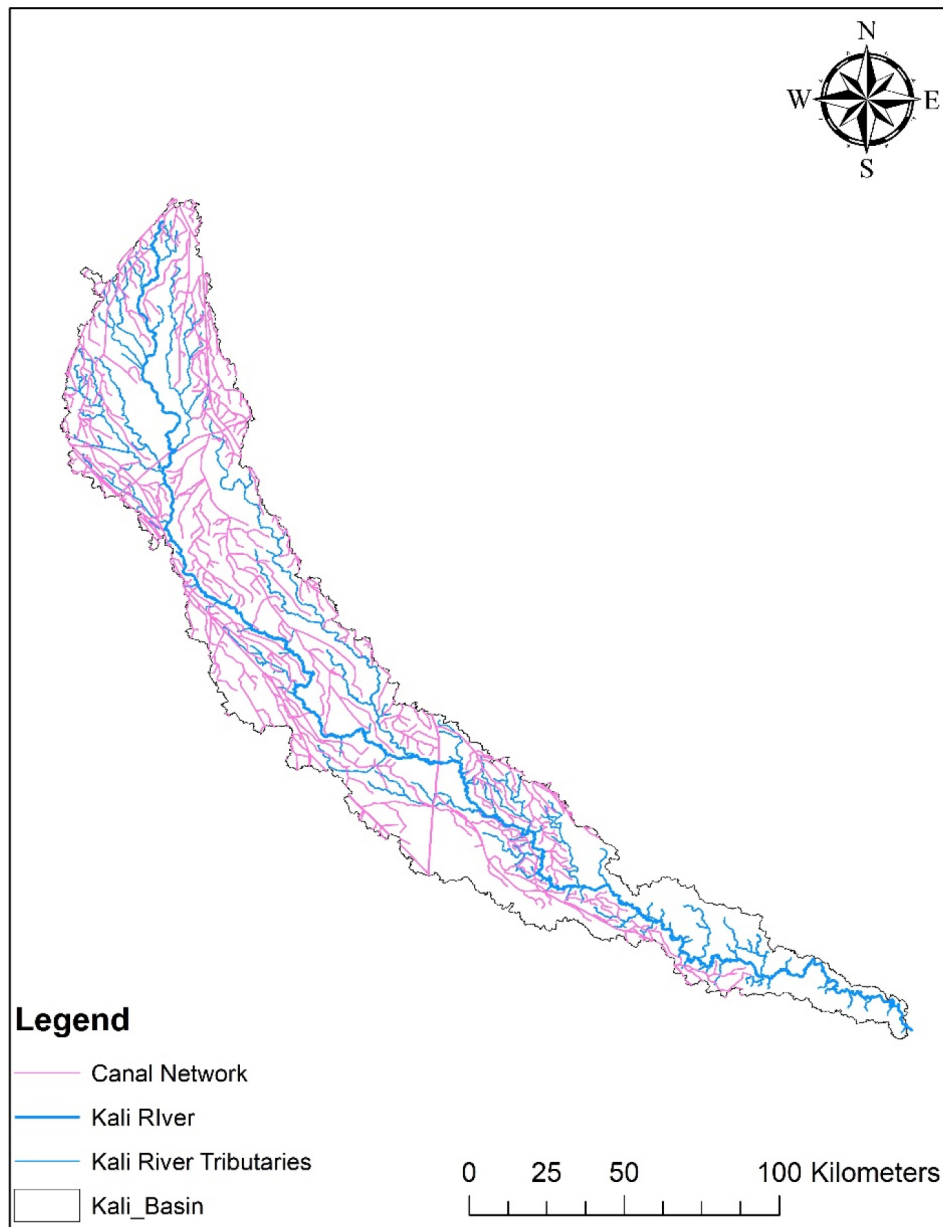


Figure: Canal Network of Kali East River Basin

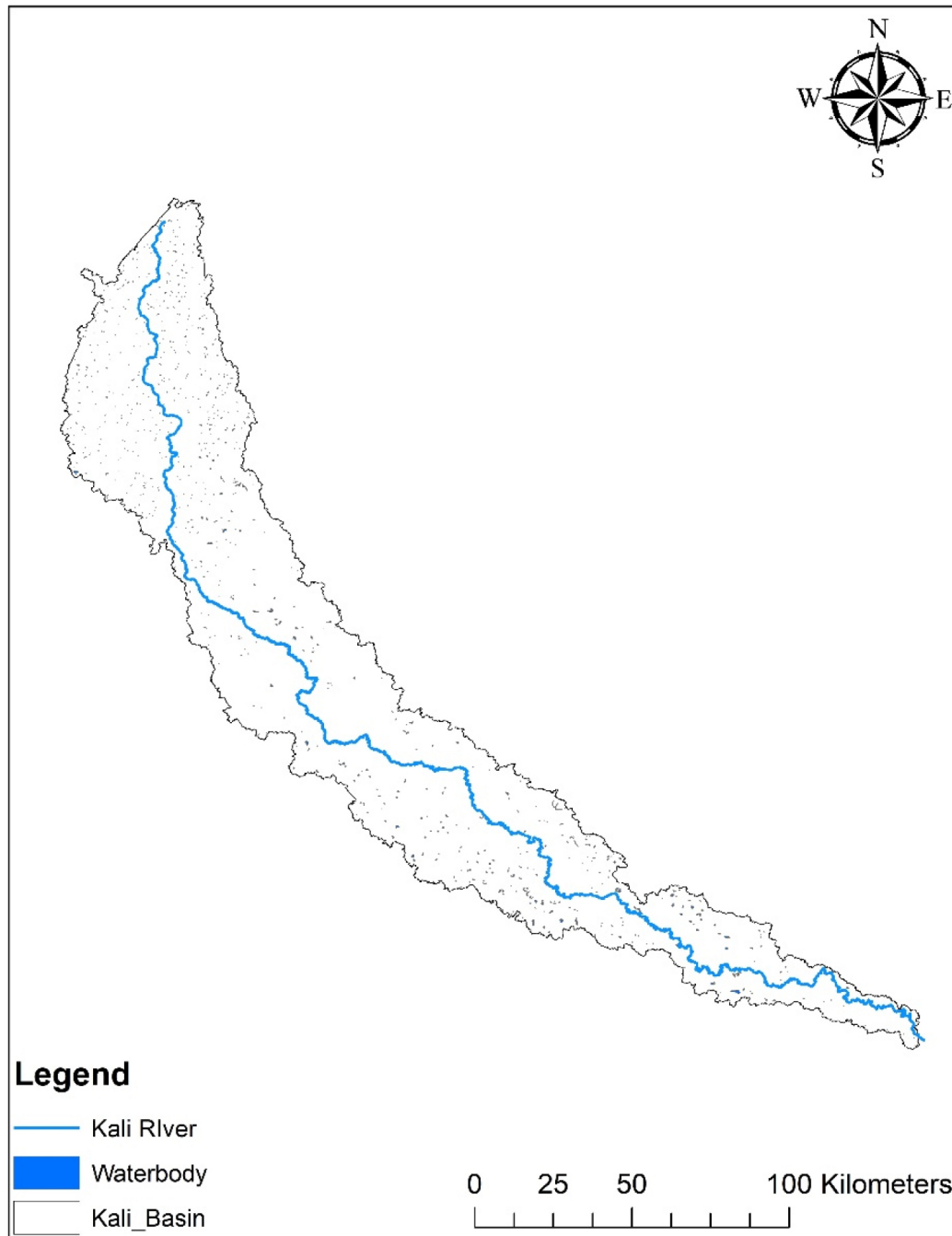
Source: NWIC

Total Canal Network: 4127.10 Km
Bevar Feeder Canal Major Irrigation Project: 258.12 Km
Lower Ganga Canal Major Irrigation Project: 259.10 Km
Madhya Ganga Canal Stage - I Major Irrigation Project: 20.50 Km
Parallel Lower Ganga Canal Major Irrigation Project: 59.48 Km
Upper Ganga Canal: 74.56 Km
Upper Ganga Canal Major Irrigation Project: 2452.16 Km





KALI EAST BASIN: WATERBODIES MAP

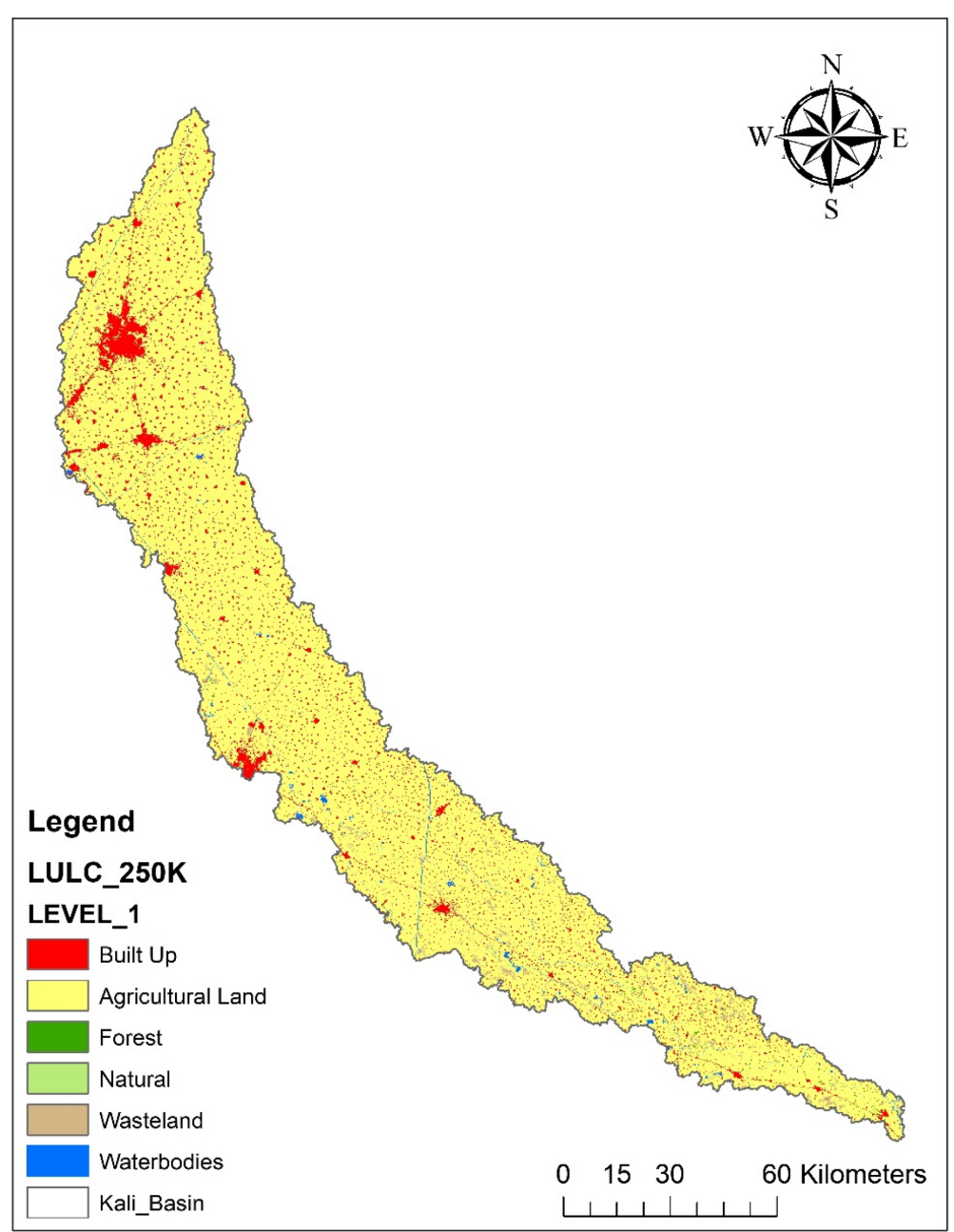


Total No. of waterbodies: 943

Figure: No. of water bodies present in the Kali East River Basin

Source: NWIC

KALI EAST BASIN: LAND USE LAND COVER [250K]



Imagery: multi-temporal satellite data of IRS AWiFS sensor

NRSC BHUVAN

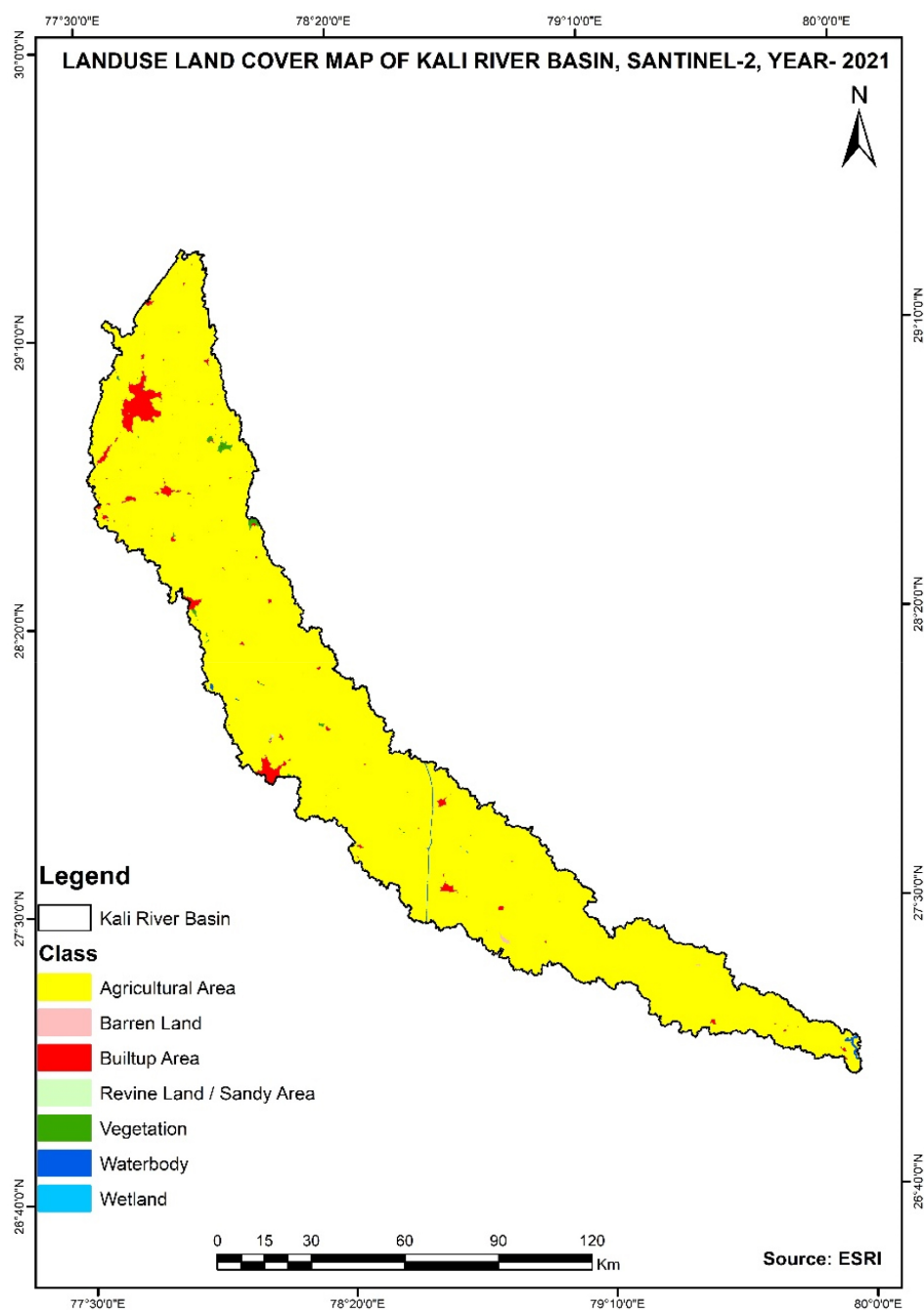
Year: 2017-18

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





KALI EAST BASIN: LAND USE LAND COVER



Imagery: Sentinel-2

Year: 2021

Accuracy: 85.96%

Source: ESRI

Figure: Land Use - Land Cover Pattern in Kali East River Basin

KALI EAST BASIN: GW LEVEL AND QUALITY STATION

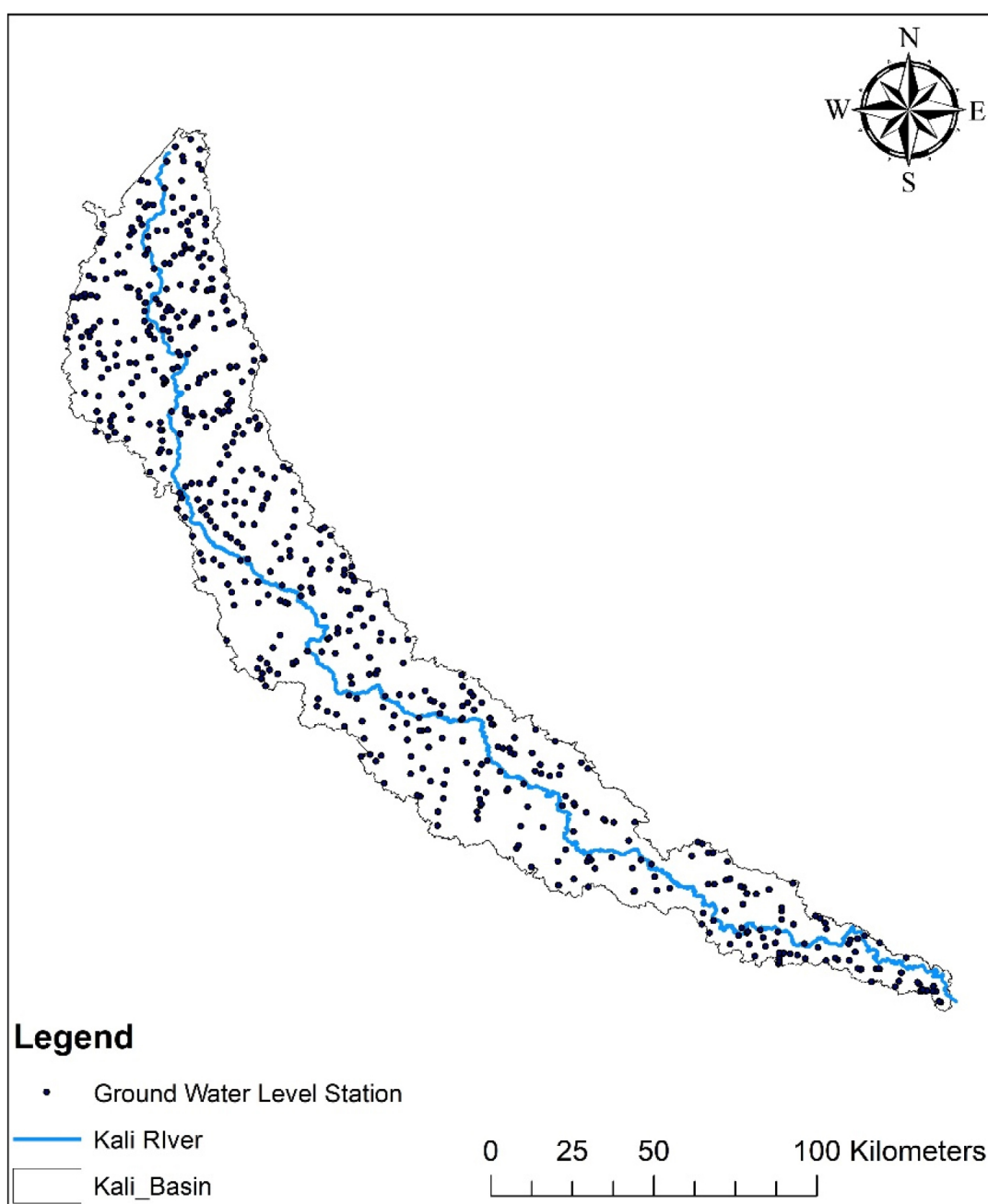


Figure: Groundwater Level stations in Kali East River Basin,

Source: CGWB



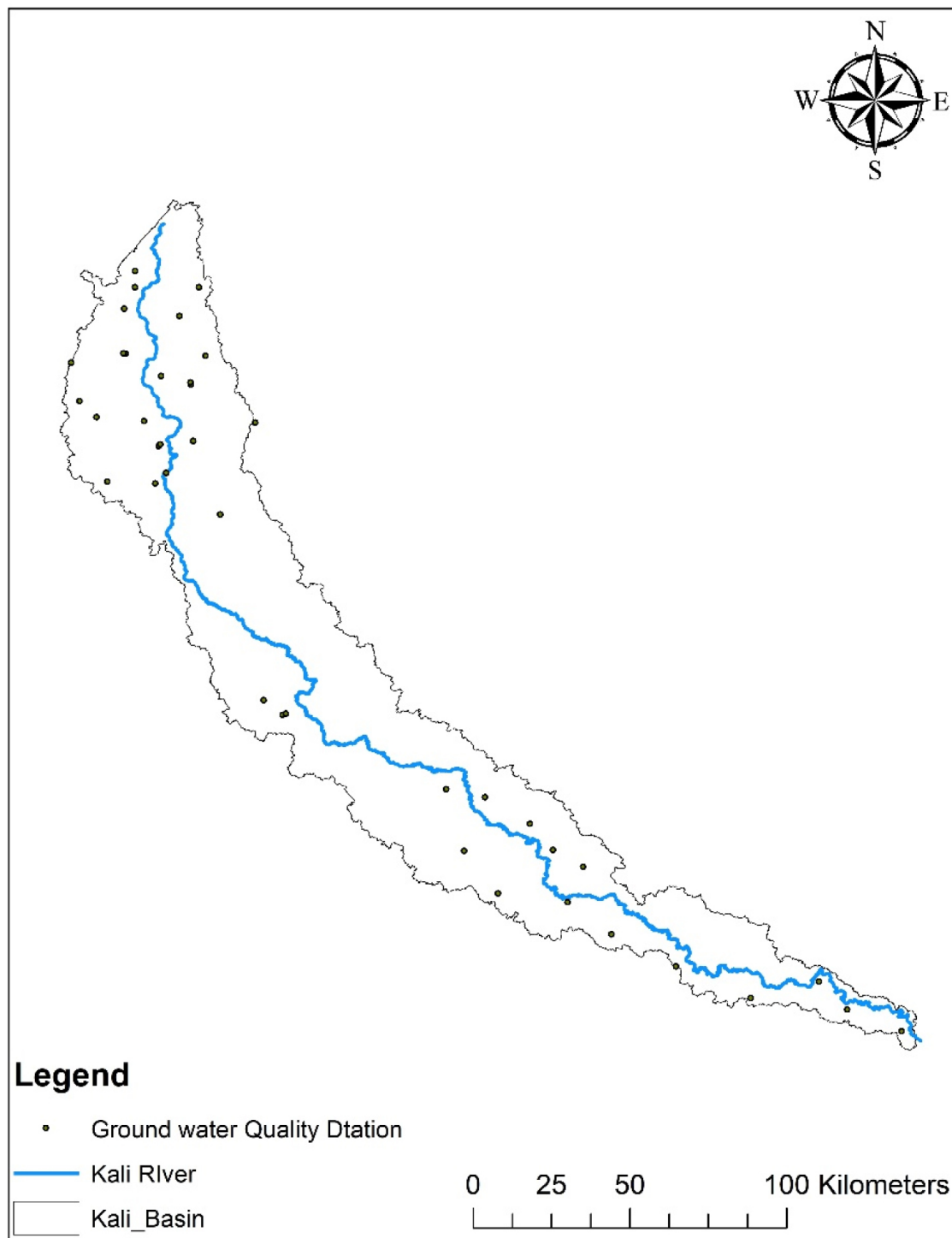
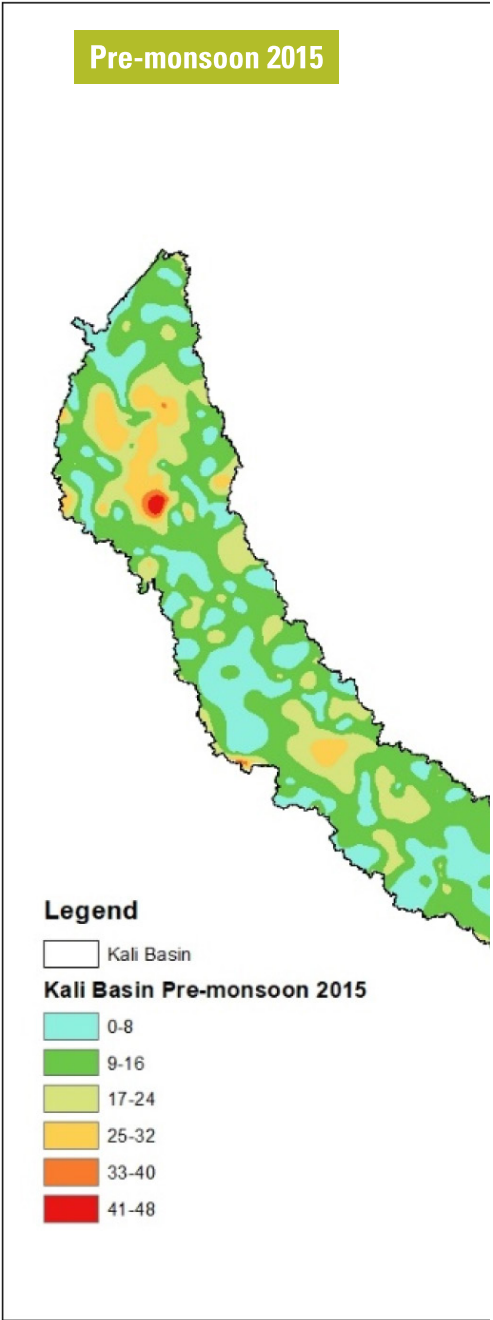
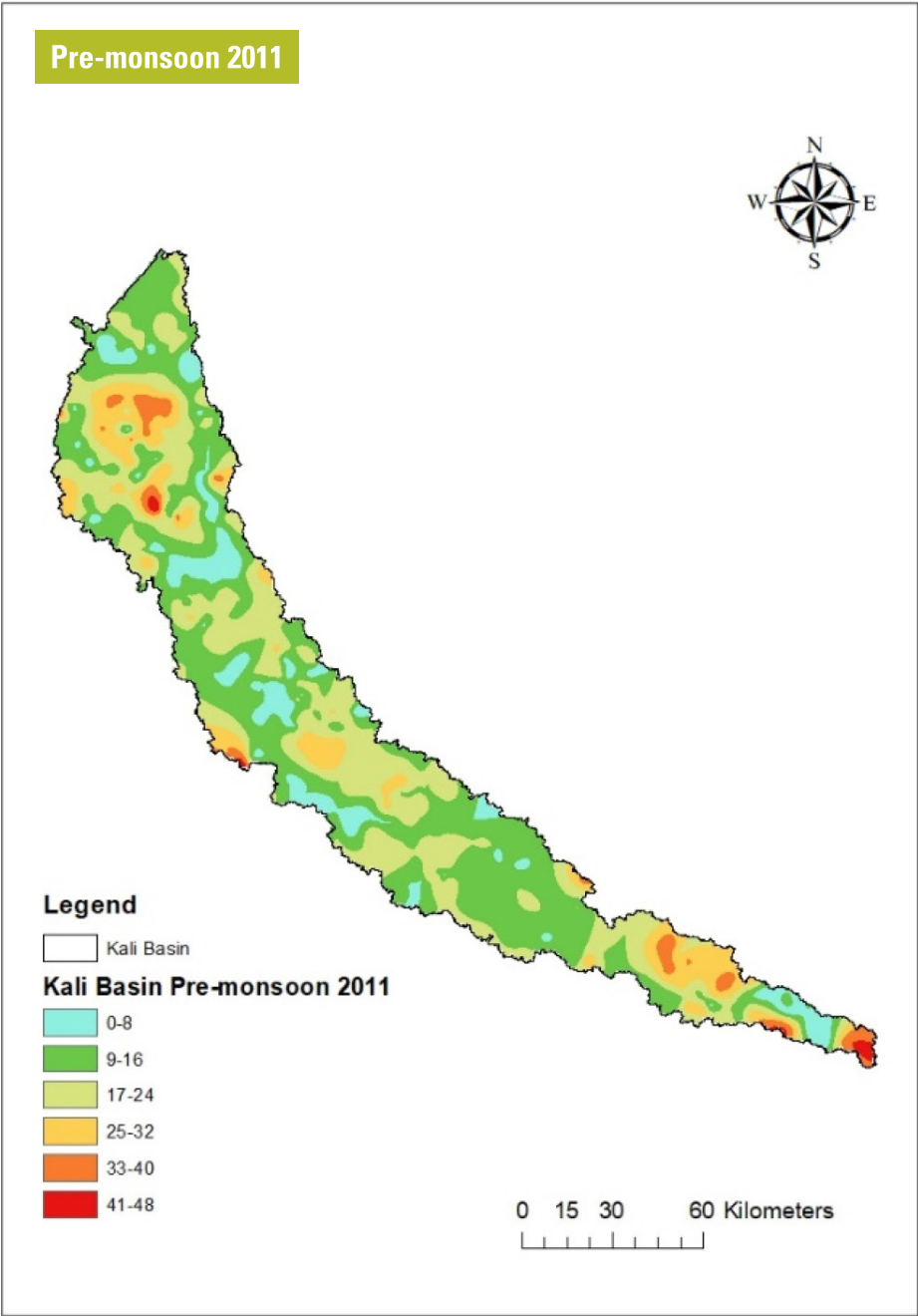
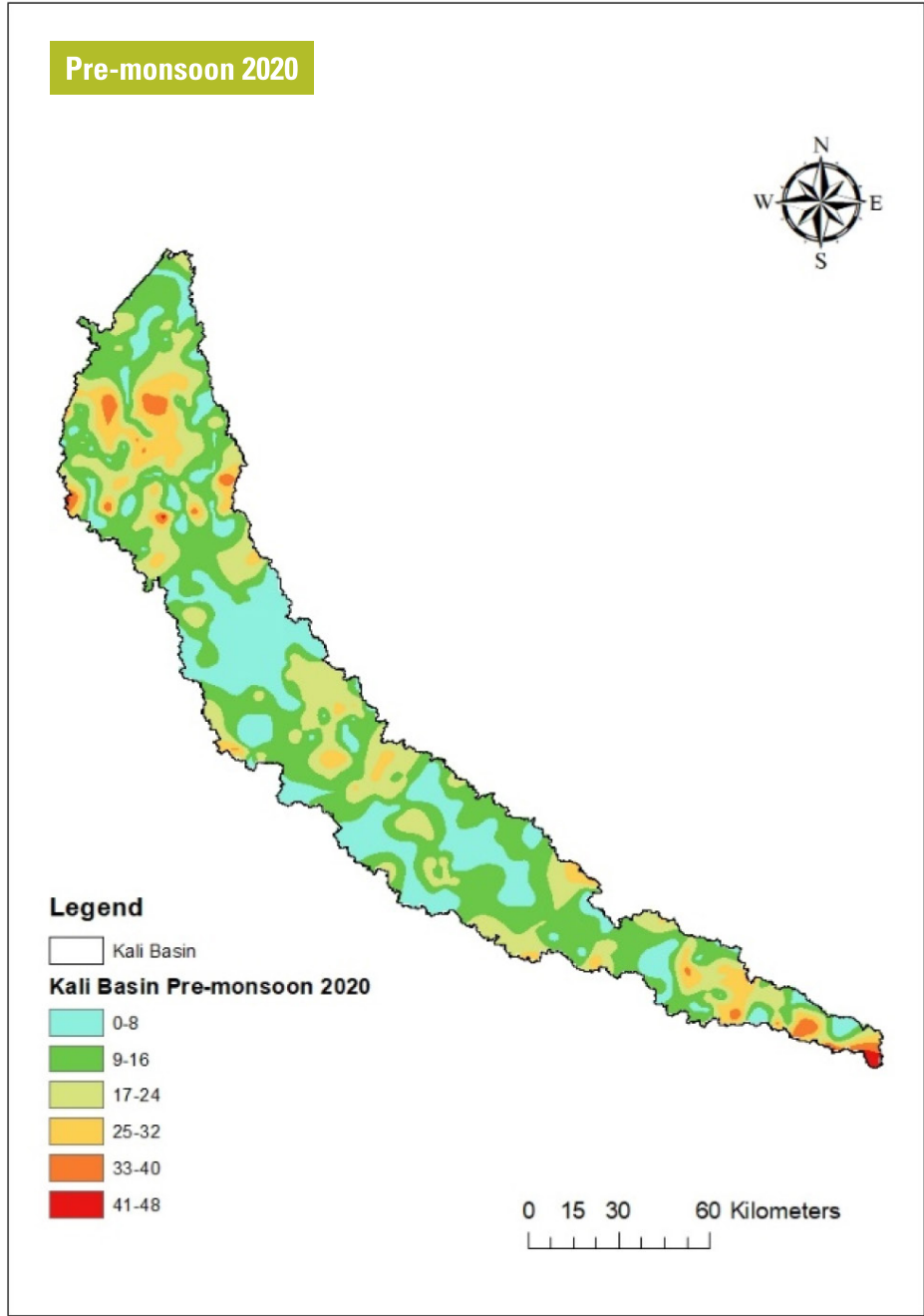
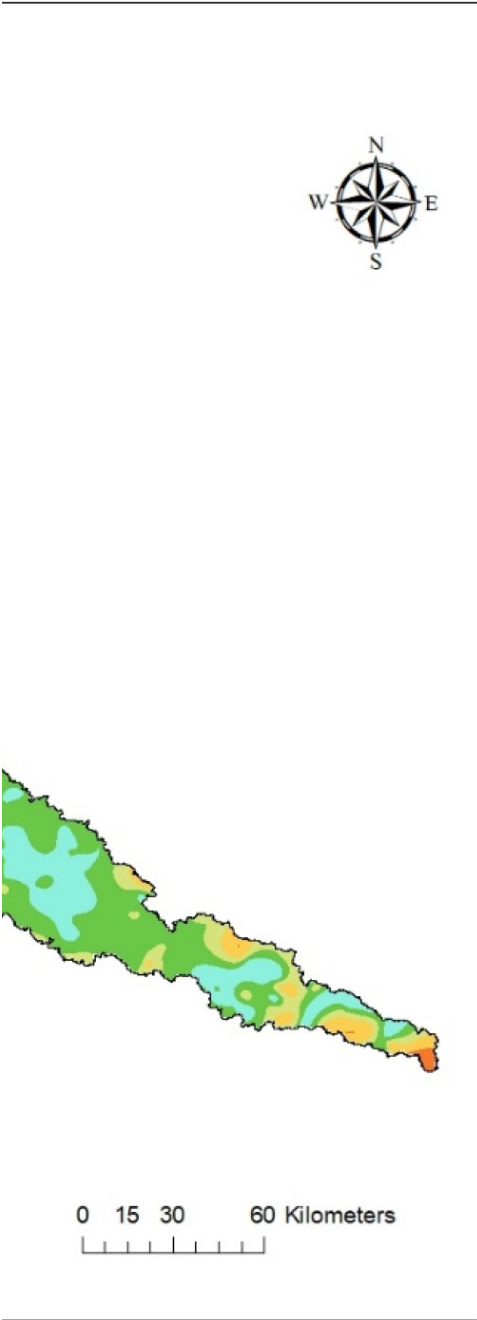


Figure: Groundwater Quality Stations in Kali East River Basin

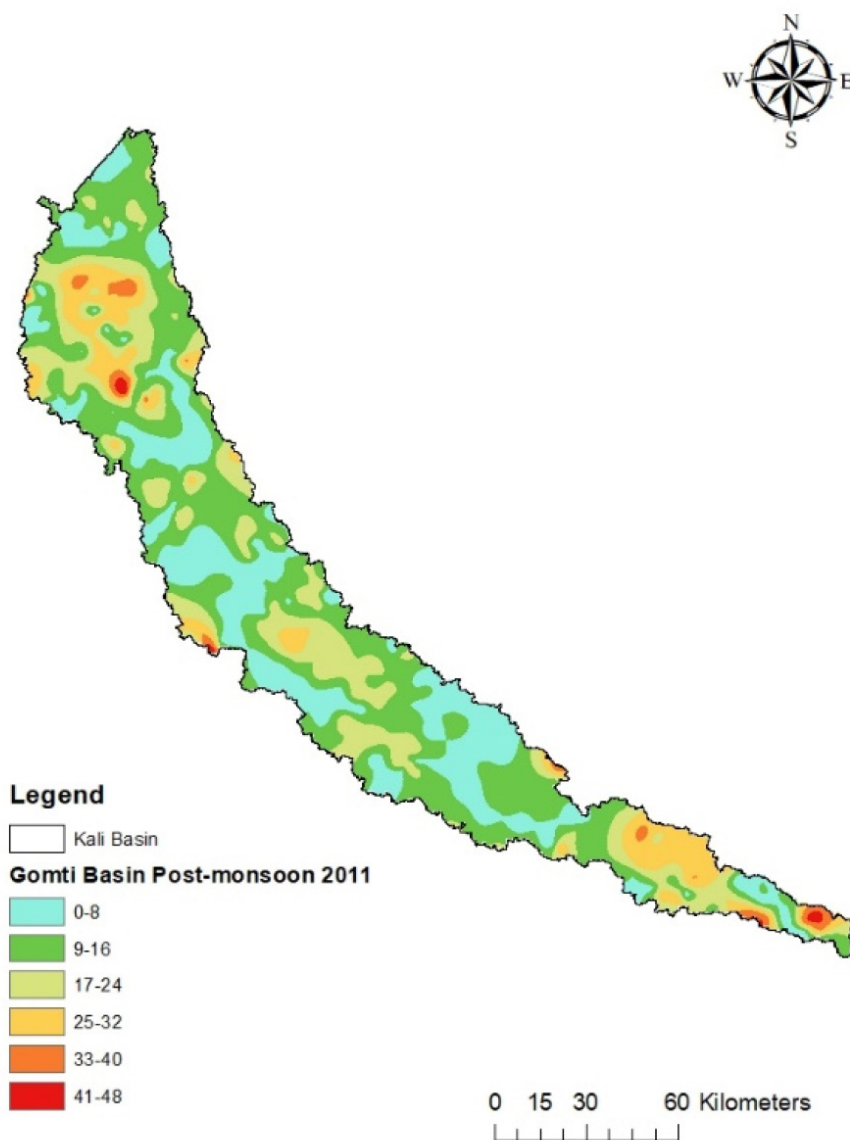
Source: CGWB

KALI EAST BASIN: GROUNDWATER ELEVATION CONTOUR

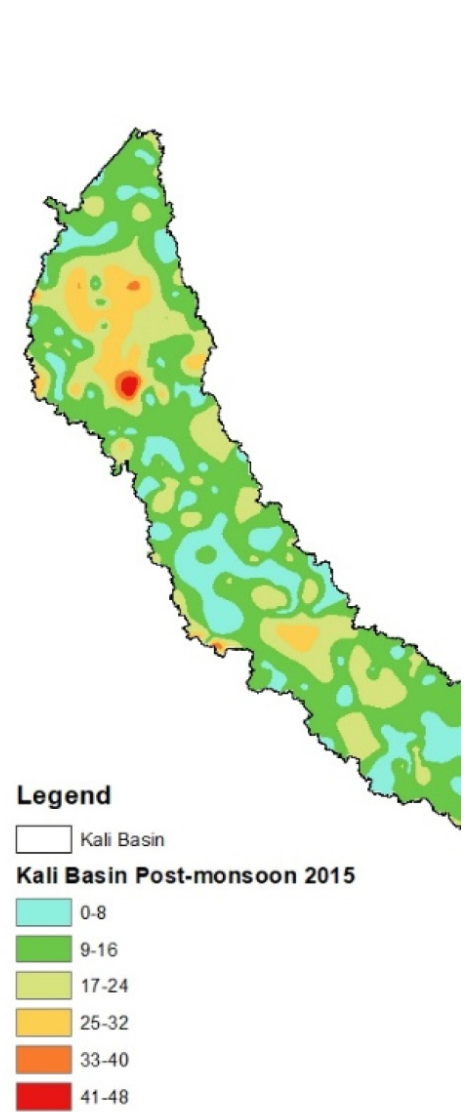




Pre-monsoon 2011



Pre-monsoon 2015



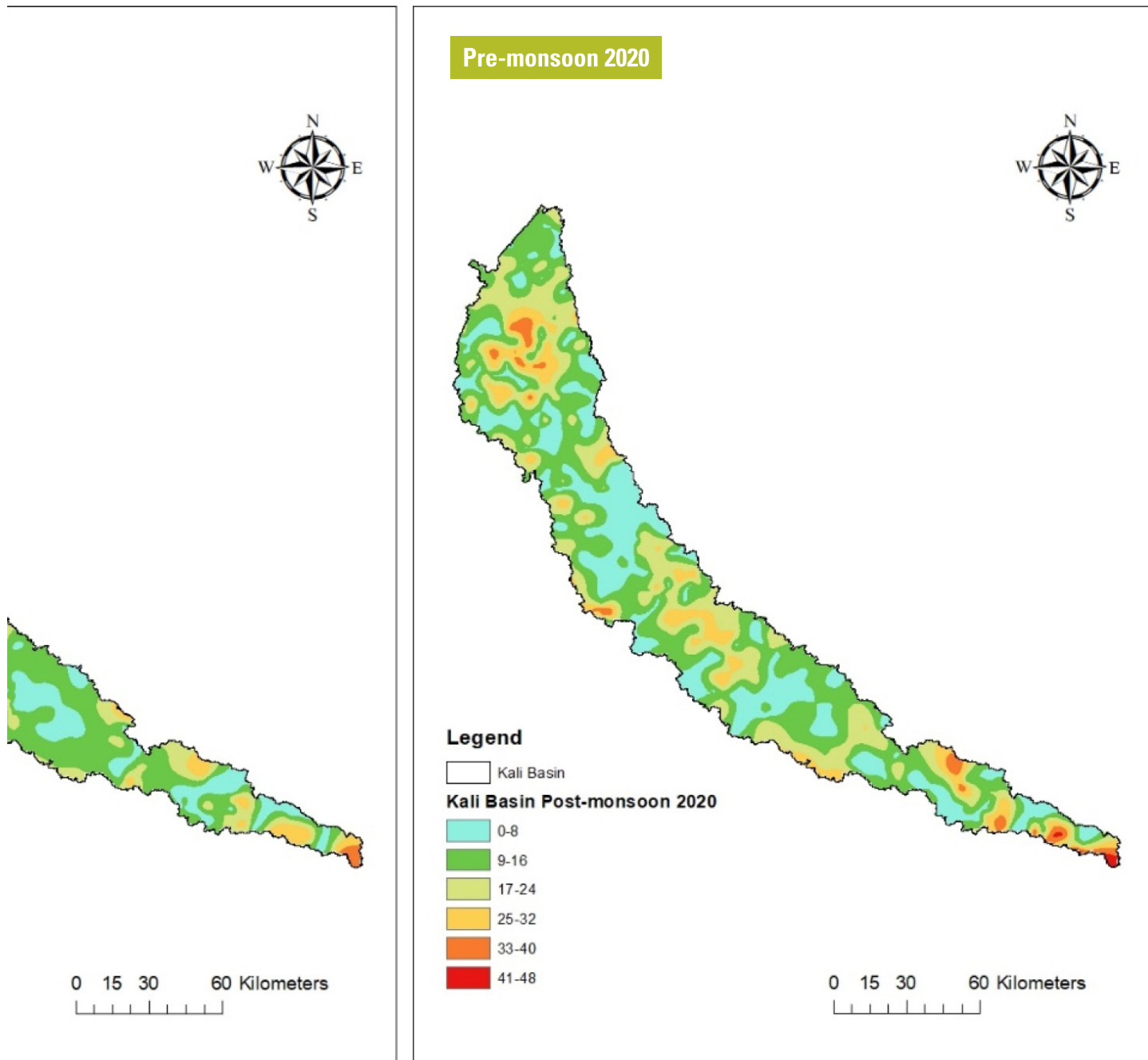
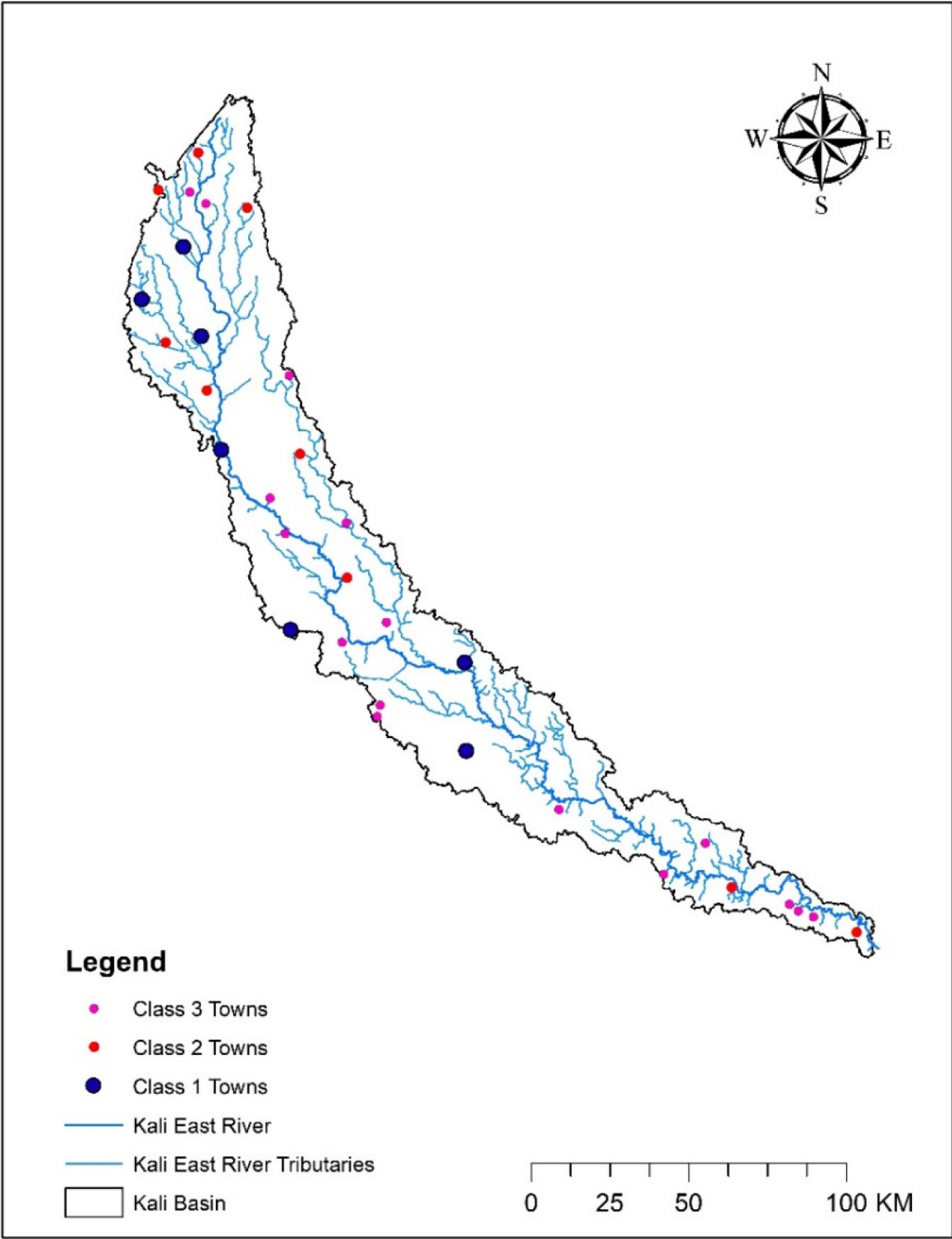


Figure: Groundwater Level (in mbgl) elevation pattern variation in Pre and Post Monsoon Period in the years 2011, 2015 and 2020
Source: CGWB

KALI EAST BASIN: CLASS I, II AND III CITIES



07 Class I cities,
09 Class II and 16 Class III towns
Source: Census 2011



KALI EAST BASIN: CWC SITE LOCATION

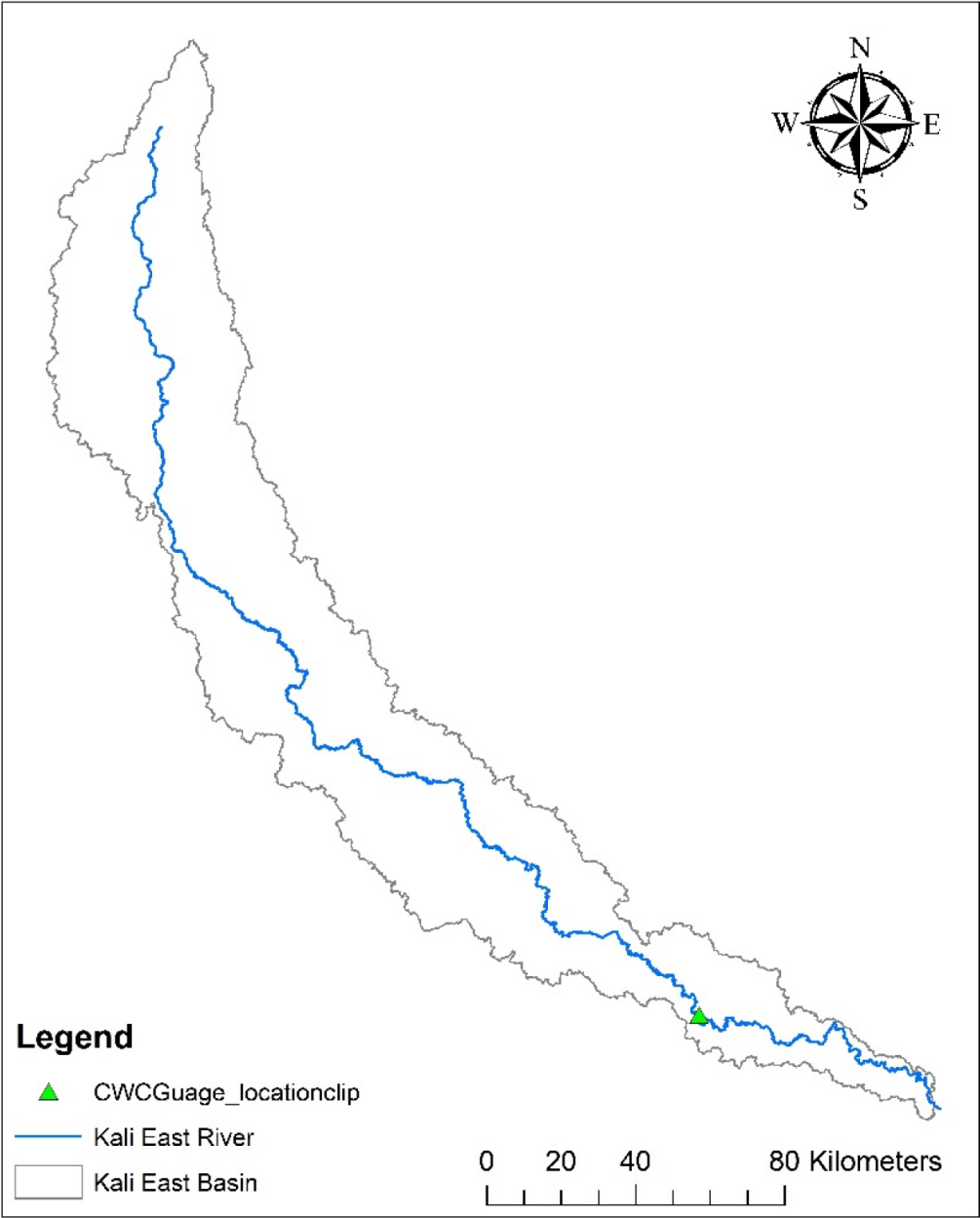


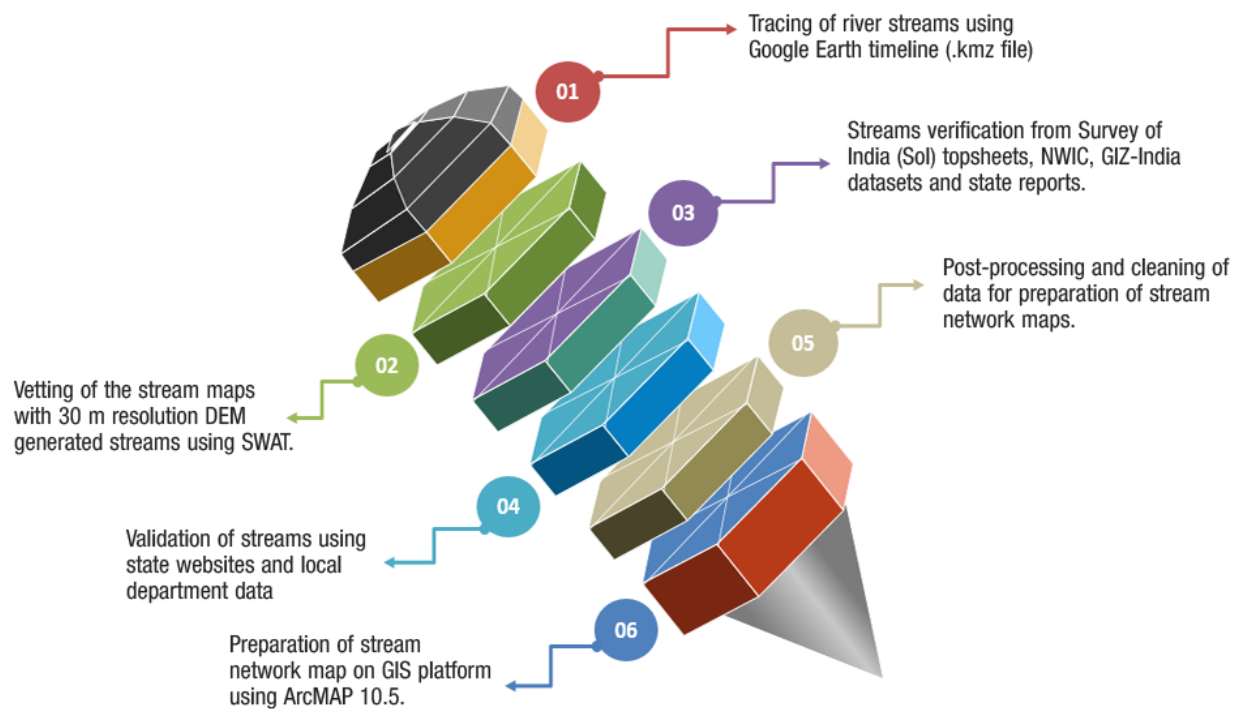
Figure: CWC site locations in Kali East River Basin

Source: CWC

S No.	Station Name	River	District	Measurement Type	Data Available
1	Bewar	Kali East	Manipur	G	7/15/1970 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.



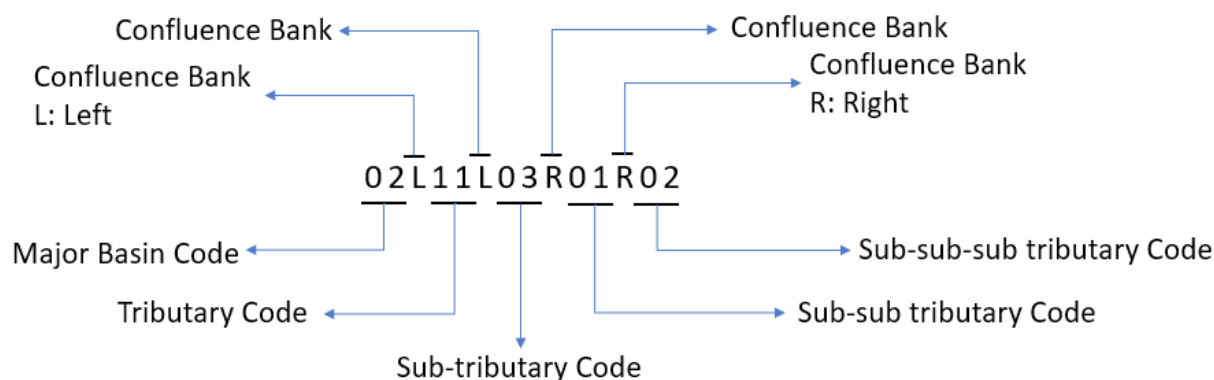
RIVER CODIFICATION SYSTEM

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.

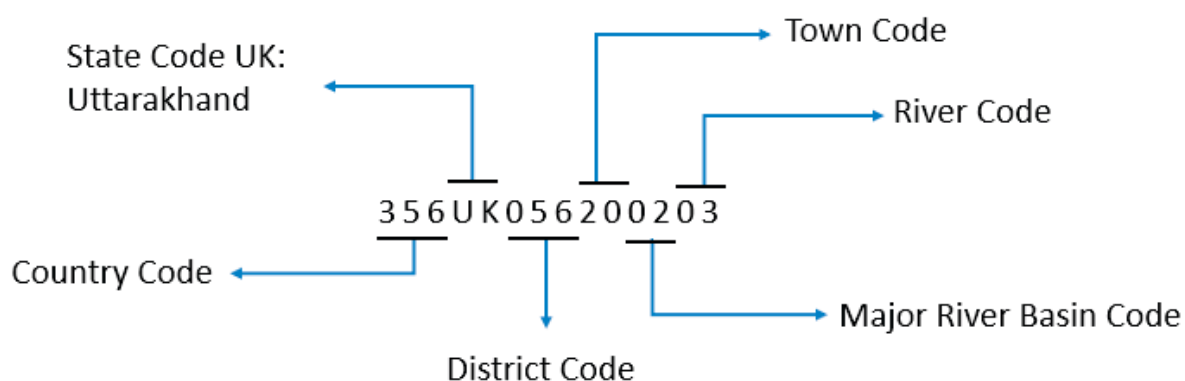
a) Codification system based on natural delineation: In the natural delineation approach, major basin codes given by CWC in River Basin Atlas of India, jointly published by CWC and NRSC, ISRO in October 2012, have been adopted here. These codes are accepted at regional level. In the second step, tributary 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.

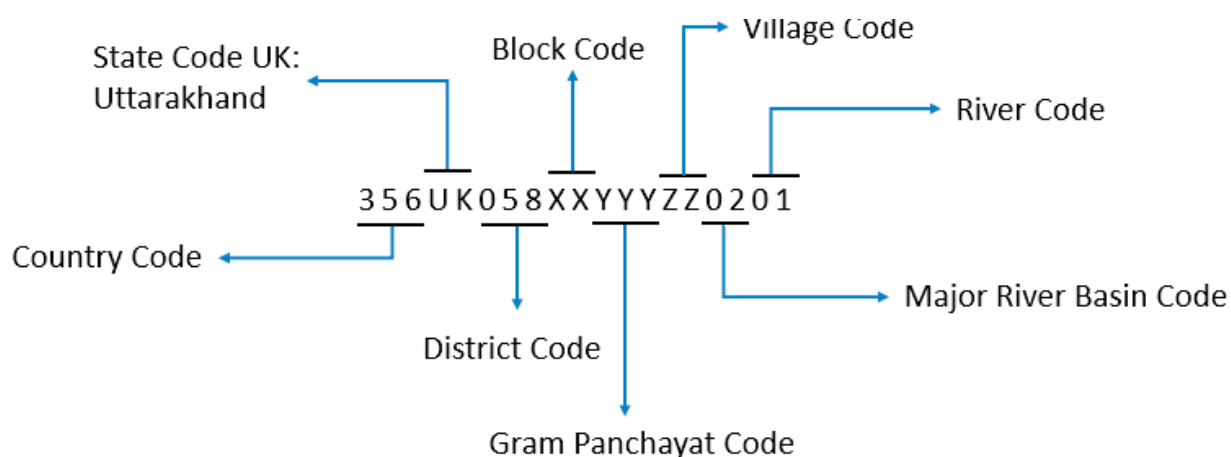
Codification system based on administrative delineation – Urban: In administrative delineation-urban the first 3 digits of the code represent the country code adopted from ISO 3166-1. The next 5 digits give the state code and district code. State code is taken from transportation department and district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



KALI EAST BASIN AND ITS RIVER NETWORK

Kali East River UID Code:

Basin Area: 11699 Sq. Km.

Major Rivers: Nim, Chhoeya, Qadirabad Drain

Number of rivers- 142

River network- 2280.57 Km

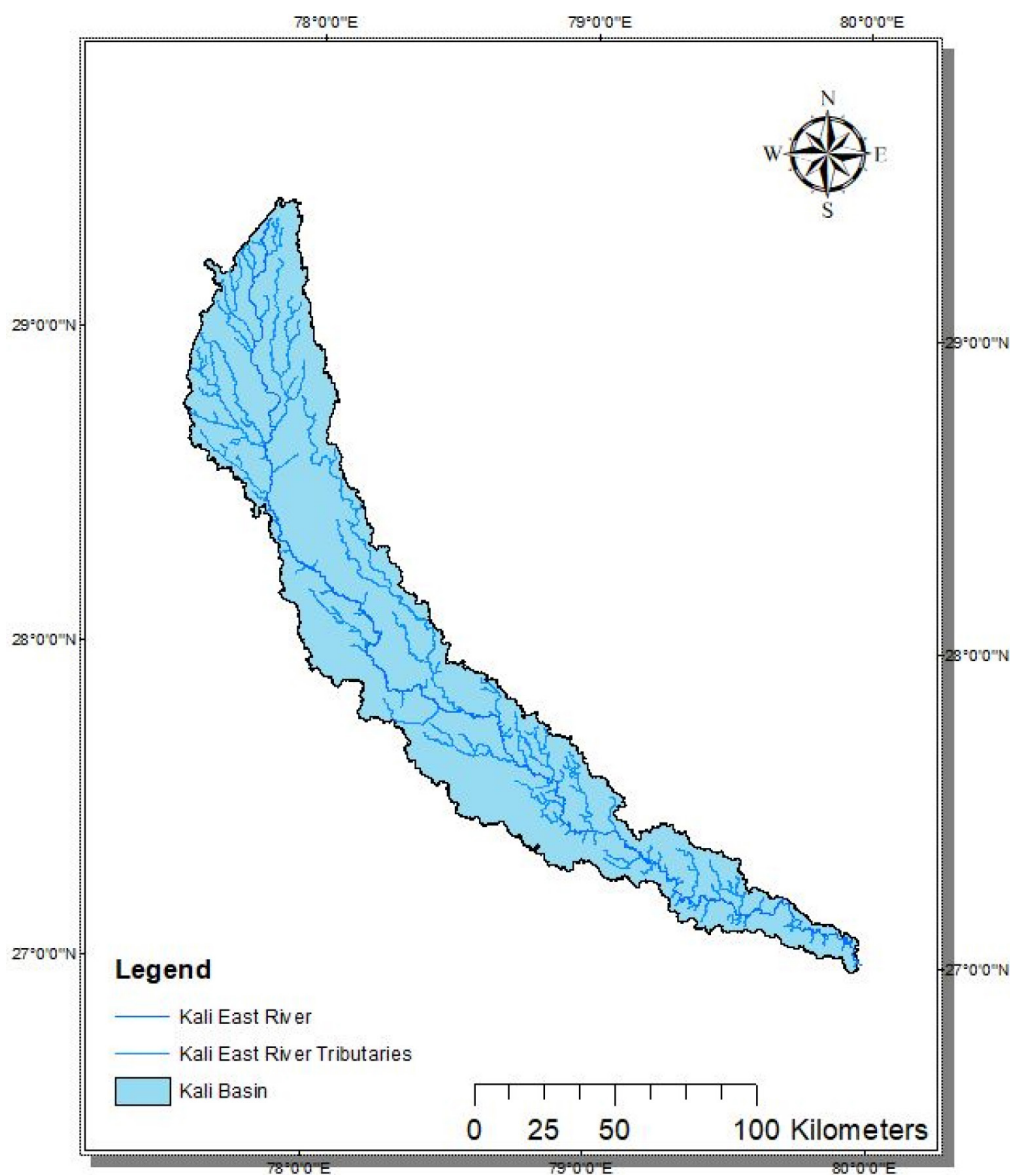
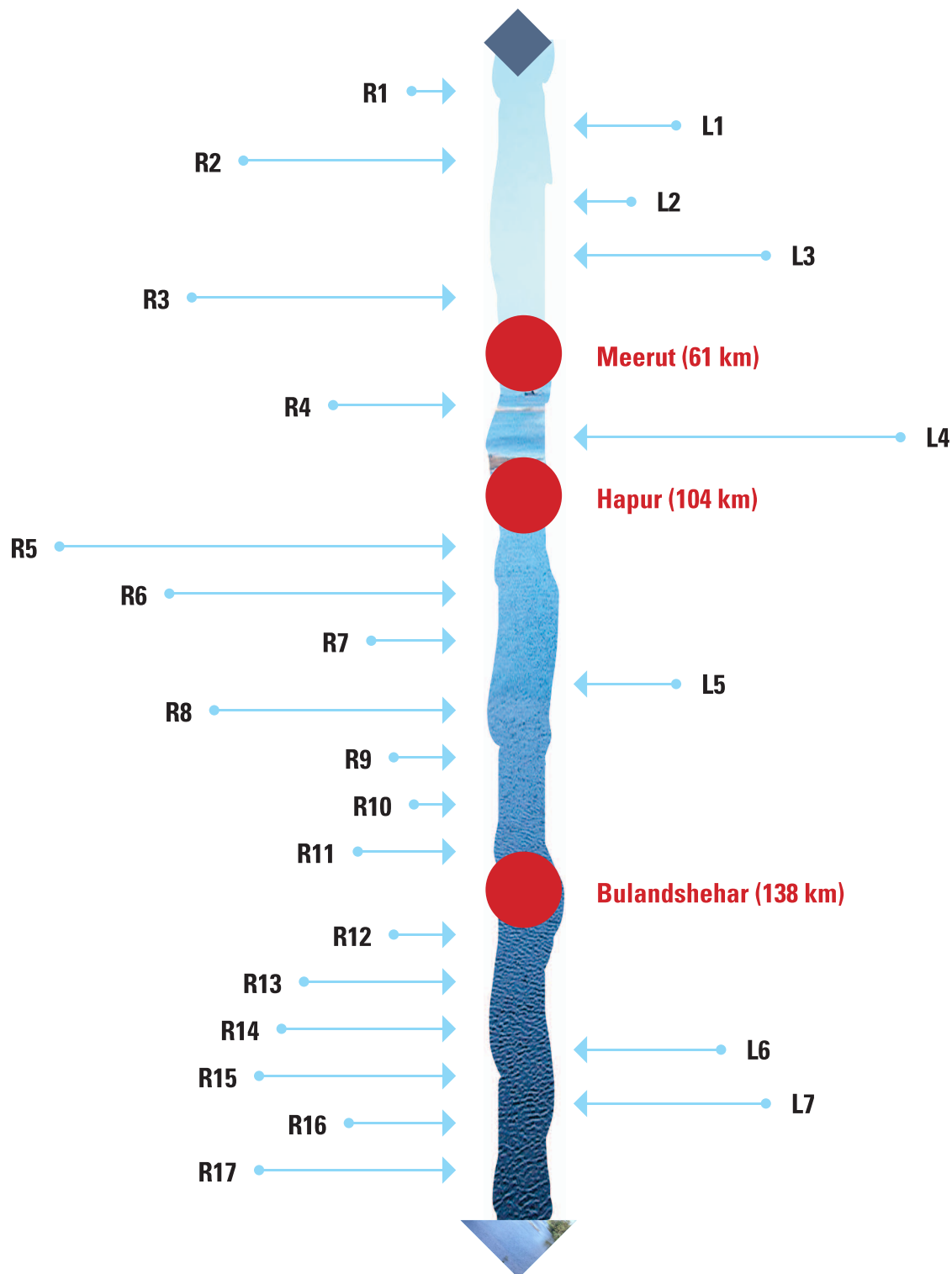
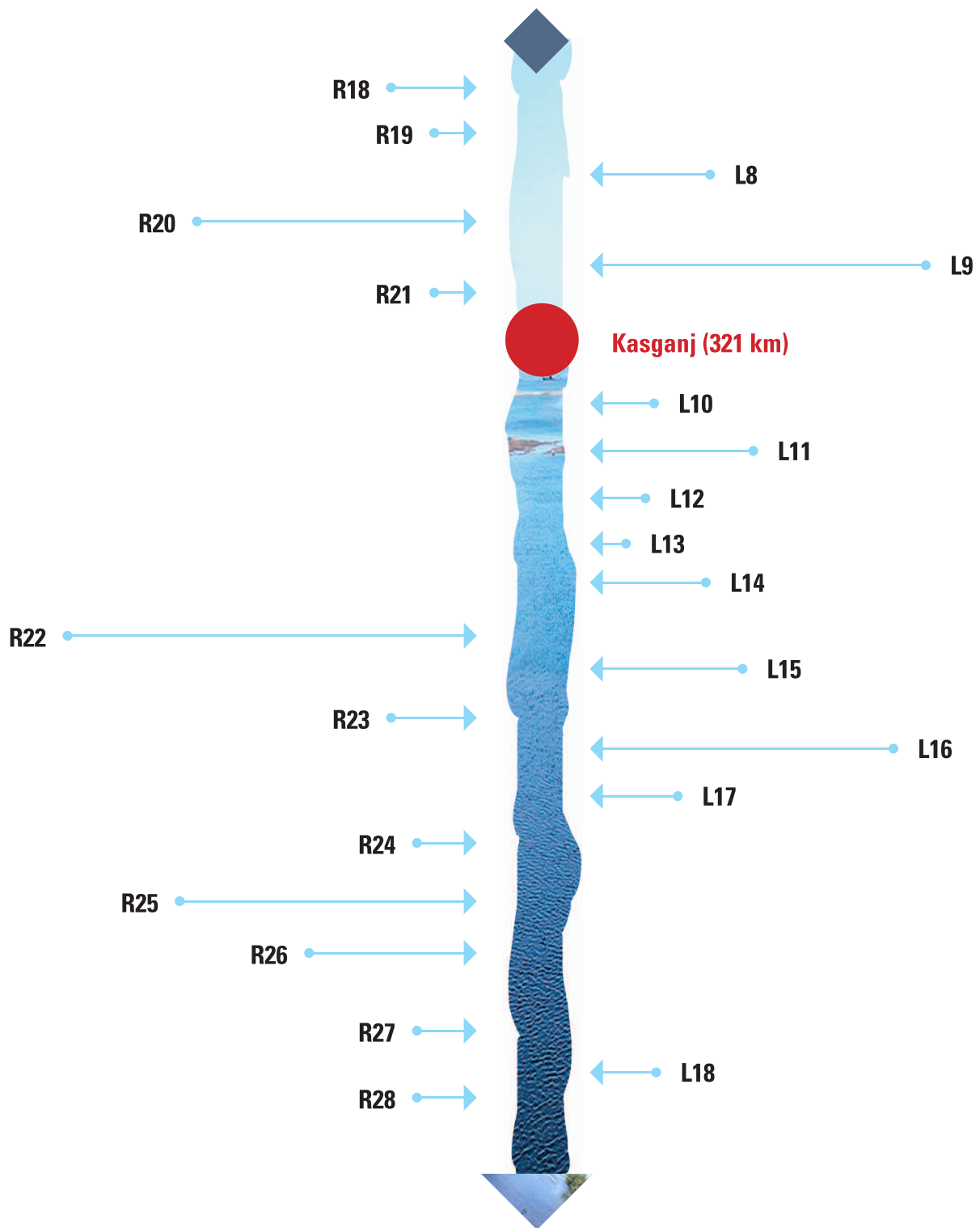


Figure: Kali East basin river network.



KALI EAST RIVER MAINSTEM FLOW DIAGRAM





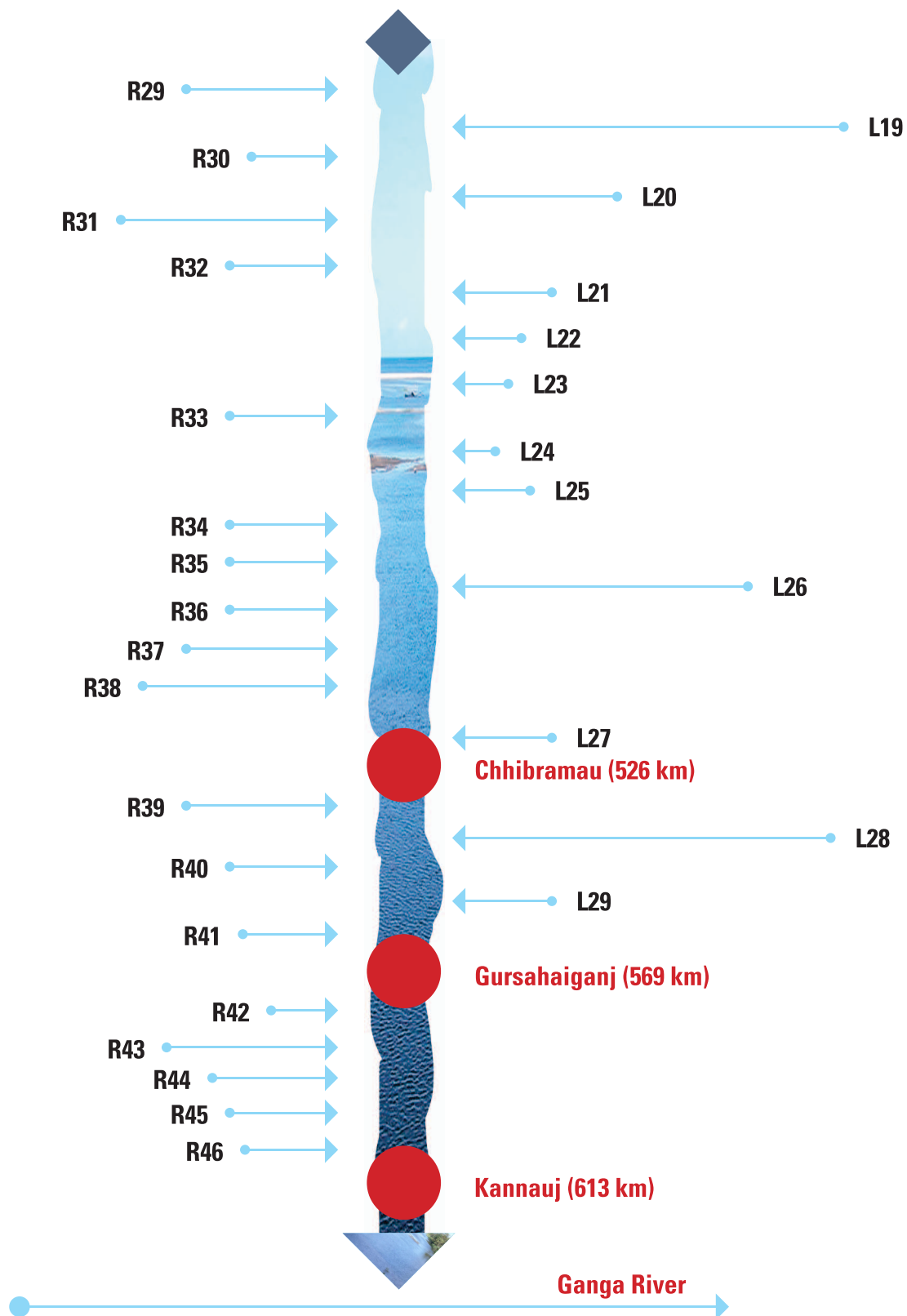


Figure: Flow Diagram of the Kali East River

KALI EAST RIVER MAINSTEM NETWORK						
S.No.	River Name	Confluence Bank	River Length (Km)	Confluence Co-ordinate		Distance from origin (km)
				Lat	Long	
1	Ladpur Drain	R1	3.92	29.28	77.79	11
2	Jansath Nala	L1	14.9	29.25	77.8	16
3	Khatauli Nala	R2	16	29.16	77.75	29
4	Chhoiya Nala	L2	11.6	29.04	77.78	45
5	Abu Nala	L3	38.5	28.96	77.77	56
6	Abu Ka Nala	R3	31.3	28.93	77.76	60
7	Meerut Nala	R4	8.38	28.93	77.76	61
8	Chhoiya Nala	L4	73	28.7	77.85	98
9	Kharauli Nala Chhoiya Nala	R5	59.6	28.64	77.81	108
10	Hawa Nala Qadirabad Nala Badirabad Nala	R6	55.5	28.63	77.81	109
11	Gulaothi Nala	R7	2.38	28.6	77.82	113
12	Steam 35	L5	11.9	28.55	77.84	117
13	Barai Nala	R8	36.7	28.48	77.83	129
14	Zainpur Nala	R9	6.88	28.47	77.82	131
15	Stream 34	R10	0.95	28.46	77.82	131
16	Stream 33	R11	2.32	28.43	77.84	135
17	Stream 32	R12	1.77	28.39	77.86	141
18	Bhatola Nala	R13	4.1	28.3	77.91	156
19	Deorala Nala	R14	5	28.26	77.97	170
20	Stream 31	L6	4.45	28.25	77.99	173
21	Stream 30	R15	4.92	28.18	78.07	188
22	Stream 29	L7	5.22	28.14	78.17	206
23	Stream 28	R16	3.51	28.11	78.18	212
24	Palra Drainage	R17	20.7	28.01	78.2	240
25	Stream 27	R18	7.18	27.99	78.2	243





KALI EAST RIVER MAINSTEM NETWORK						
S.No.	River Name	Confluence Bank	River Length (Km)	Confluence Co-ordinate		Distance from origin (km)
				Lat	Long	
26	Kareaila Drain	R19	7.1	27.86	78.33	271
27	Chhoiya Nala	L8	6.18	27.87	78.4	282
28	Arabamada Nala	R20	30.3	27.81	78.46	294
29	Nim River	L9	195	27.81	78.54	304
30	Stream 26	R21	1.1	27.79	78.63	318
31	Stream 25	L10	1.78	27.79	78.65	321
32	Jhabar Drainage Cut	L11	18.6	27.78	78.68	324
33	Wazirpur Nala	L12	2.35	27.76	78.68	329
34	Stream 24	L13	0.49	27.74	78.69	331
35	Stream 23	L14	4.5	27.72	78.69	334
36	Karon Nala	R22	46.1	27.65	78.73	347
37	Sevka Nala	L15	13.2	27.63	78.78	356
38	Kartala Drain	R23	5.98	27.58	78.86	371
39	Sidhpura Nala	L16	31	27.59	78.87	374
40	Bhaupura Drain	L17	7.45	27.58	78.89	376
41	Milak Banehra Nala	R24	3.85	27.56	78.88	380
42	Baghwala Nala	R25	31.4	27.51	78.91	390
43	Malawan Nala	R26	10.8	27.47	78.9	396
44	Stream 22	R27	1.95	27.45	78.92	398
45	Stream 21	L18	1.1	27.45	78.94	401
46	Ganga Jamni Nala	R28	3.76	27.43	78.94	405
47	Sirsa Drain	R29	5.65	27.43	79	414
48	Mohanpur Drain	L19	42.7	27.43	79.02	416
49	Junesi Escape	R30	6.86	27.43	79.04	418
50	Stream 20	L20	16.7	27.43	79.1	425

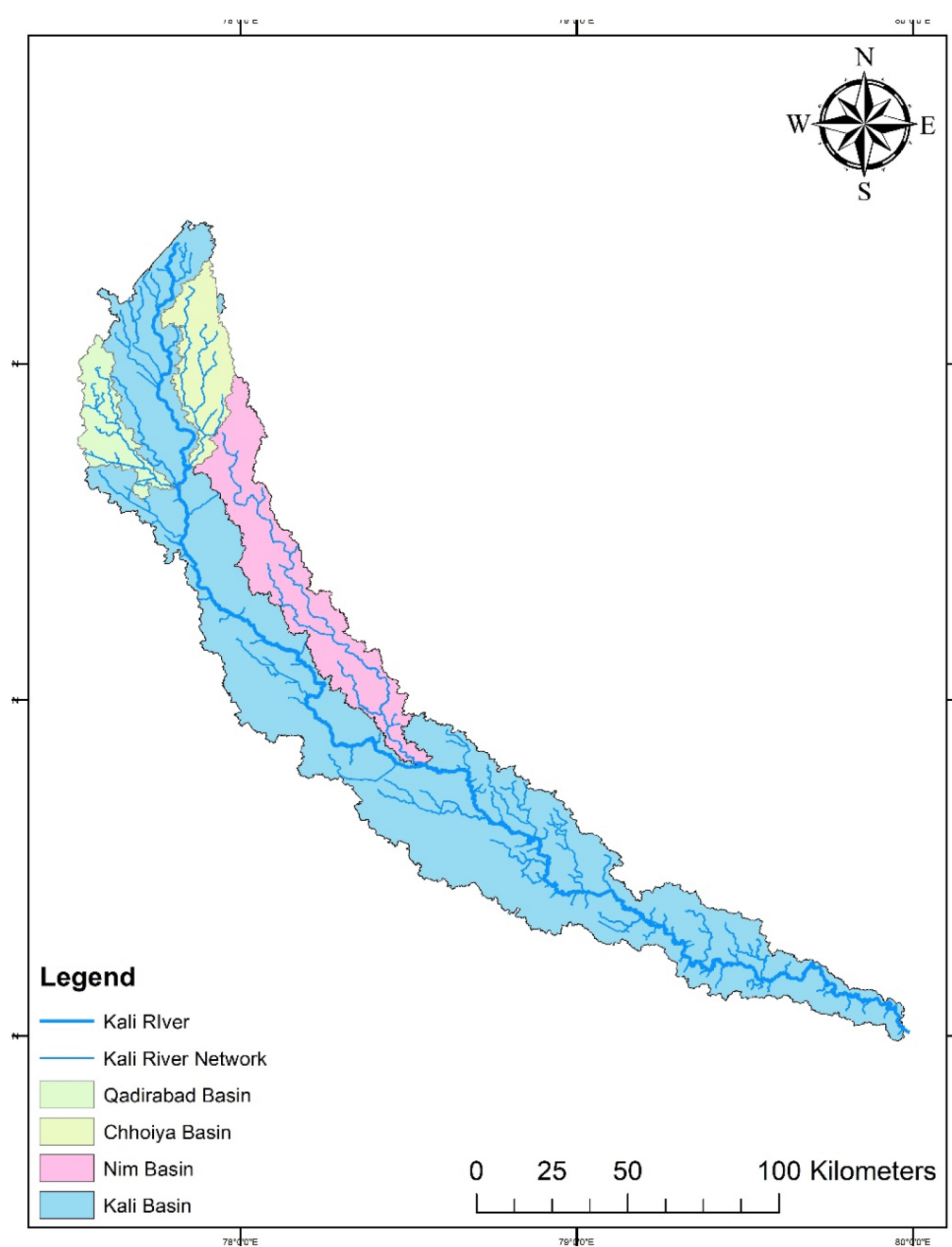
KALI EAST RIVER MAINSTEM NETWORK						
S.No.	River Name	Confluence Bank	River Length (Km)	Confluence Co-ordinate		Distance from origin (km)
				Lat	Long	
51	Khara Or Naka Drain 2	R31	11.2	27.35	79.2	449
52	Rajwana Drain	R32	5.75	27.33	79.24	456
53	Khara Nala	L21	9.37	27.33	79.25	458
54	Stream 19	L22	5.14	27.33	79.26	459
55	Stream 18	L23	3.1	27.3	79.28	466
56	Stream 17	R33	2.11	27.27	79.31	472
57	Stream 16	L24	2.48	27.28	79.32	475
58	Stream 15	L25	3.2	27.27	79.32	476
59	Stream 14	R34	3.69	27.24	79.32	481
60	Stream 13	R35	3.58	27.21	79.34	485
60	Kharwa Nala	L26	32	27.22	79.37	491
62	Stream 12	R36	3.1	27.2	79.39	496
63	Janaura Supplementry Cut	R37	4.49	27.21	79.41	499
64	Udhannapur Drain	R38	10	27.21	79.44	508
65	Stream 11	L27	8.39	27.22	79.48	515
66	Stream 10	R39	12	27.17	79.55	526
67	Stream 9	L28	35.9	27.17	79.55	526.8
68	Stream 8	R40	6.54	27.16	79.58	529.8
69	Stream 7	L29	6.24	27.19	79.62	537.5
70	Stream 6	R41	5.47	27.15	79.74	563.4
71	Stream 5	R42	4.96	27.13	79.76	569.6
72	Stream 4	R43	7.78	27.12	79.81	577.1
73	Stream 3	R44	5.77	27.1	79.86	588.2
74	Stream 2	R45	4	27.08	79.93	600.9
75	Stream 1	R46	3.38	27.02	79.97	613.79



KALI EAST: MAJOR SUB-BASINS

Major sub-basins of Kali East River are as follows:

- Nim Basin
- Chhoiya Basin
- Qadirabad Drain



NIM BASIN

Nim River UID Code:
 Basin Area: 1776 Sq. Km.
 Number of rivers- 09
 River network- 294.15 Km

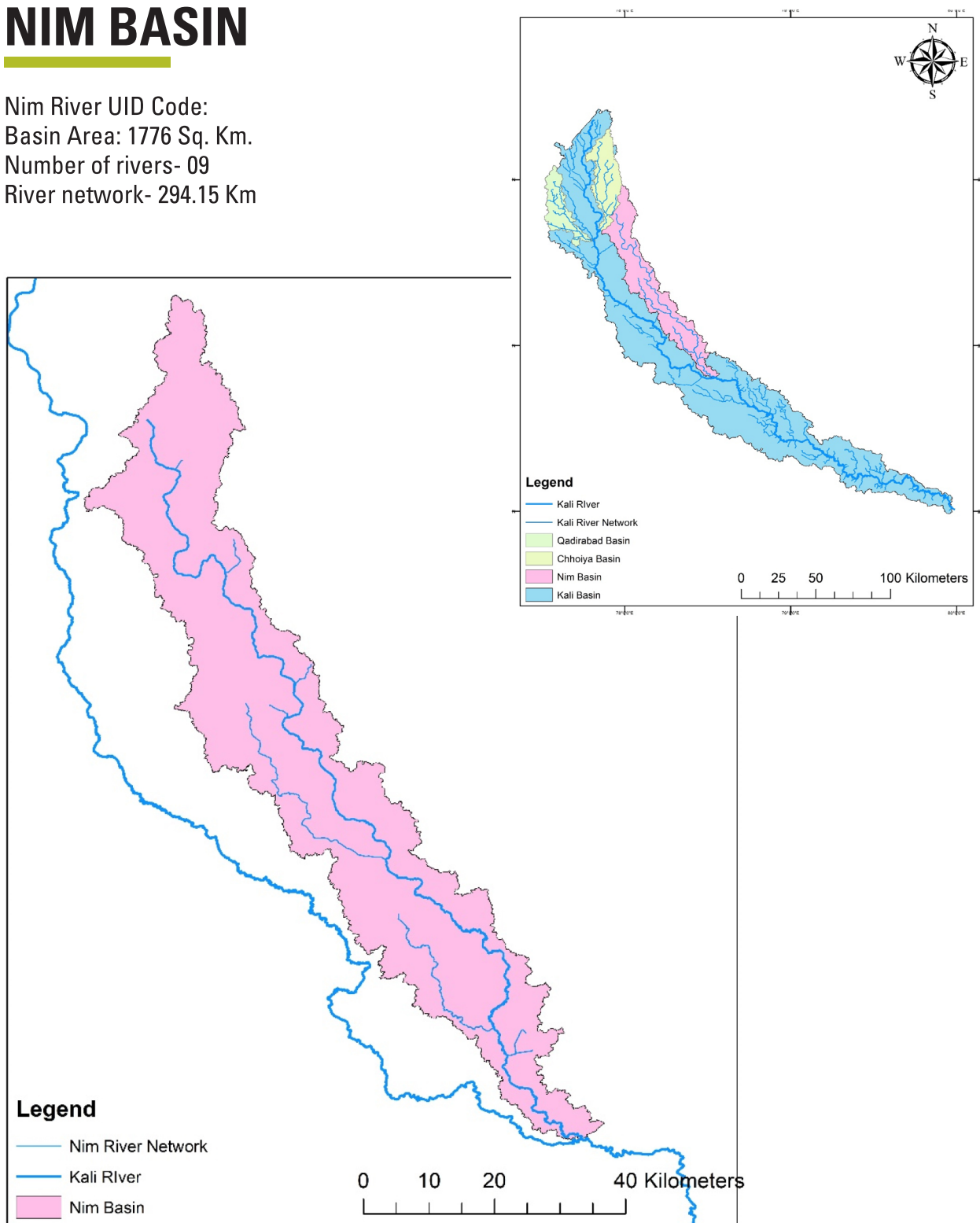


Figure: Nim River Network



NIM RIVER MAINSTEM FLOW DIAGRAM

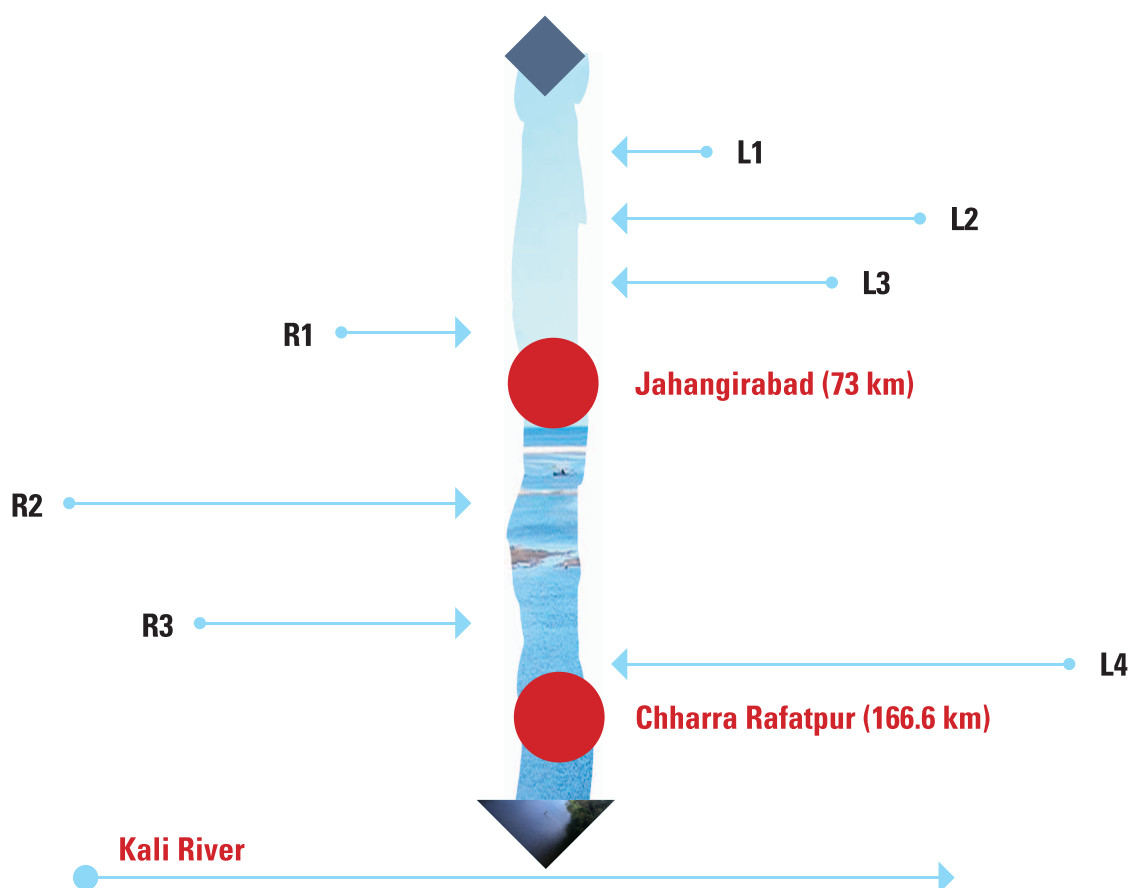


Figure: Flow Diagram of Nim River

NIM RIVER MAINSTEM NETWORK						
S.No.	River Name	Confluence Bank	River Length (Km)	Confluence Co-ordinate		Distance from origin (km)
				Lat	Long	
1	Ratanpura Drain	L1	1.78	28.73	77.98	10
2	Siyana Drain	L2	6.58	28.59	78.05	41
3	Stream 2	L3	5.23	28.42	78.15	67
4	Stream 1	R1	3.58	28.39	78.14	73
5	Chhoiya River	R2	41.5	28.19	78.27	105
6	Chhoiya	R3	32.1	27.96	78.42	160.5
7	Dadon Drain	L4	6	27.92	78.44	166.6
8	Khichripur Drain	R5	1.21	28.60	77.31	17.62

CHHOIYA BASIN

Chhoiya Drain UID Code:
 Basin area: 761 Sq. Km.
 Number of rivers- 07
 River network- 168.7 Km

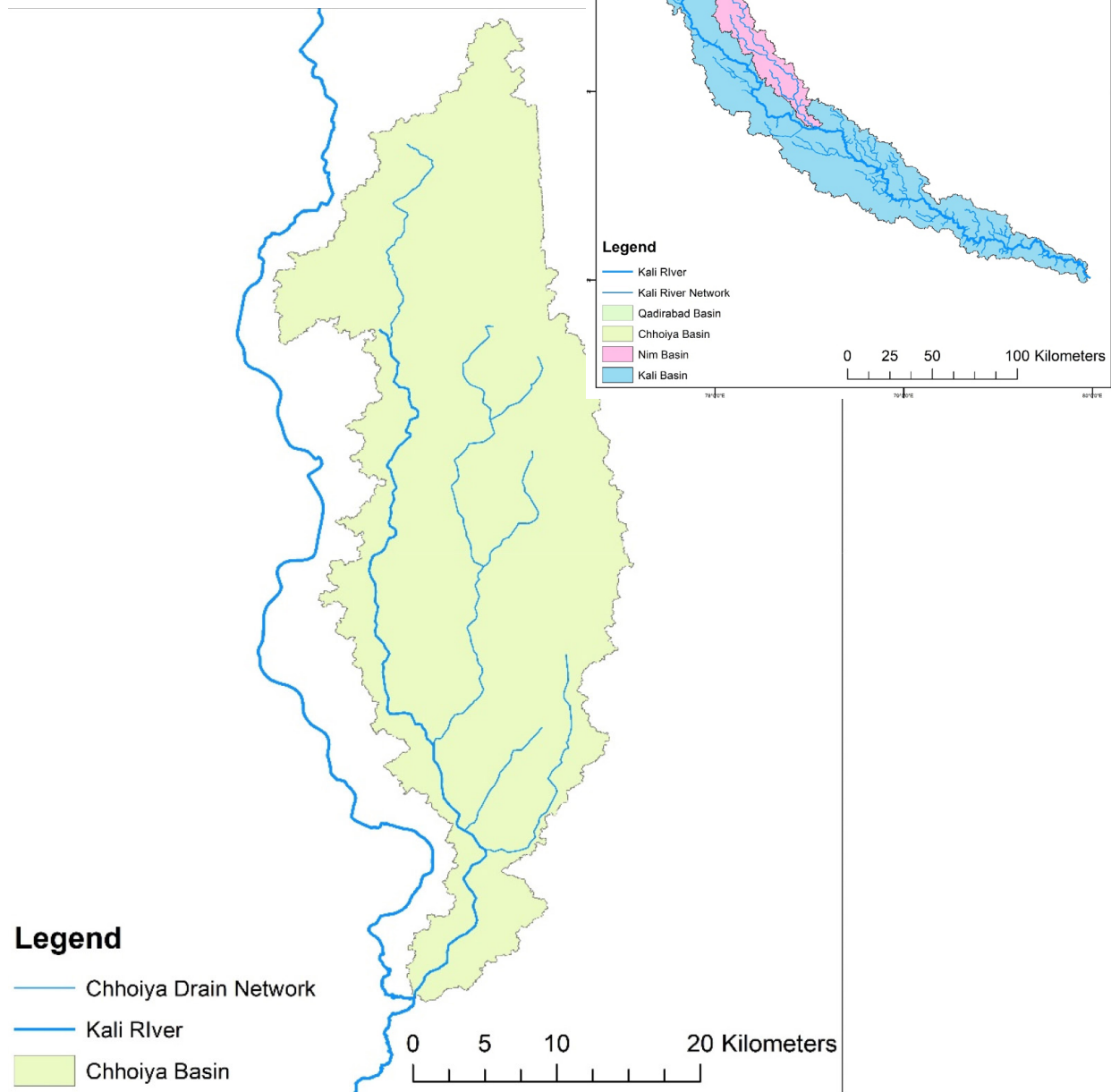


Figure: Chhoiya River Network



CHHOIYA MAINSTEM FLOW DIAGRAM

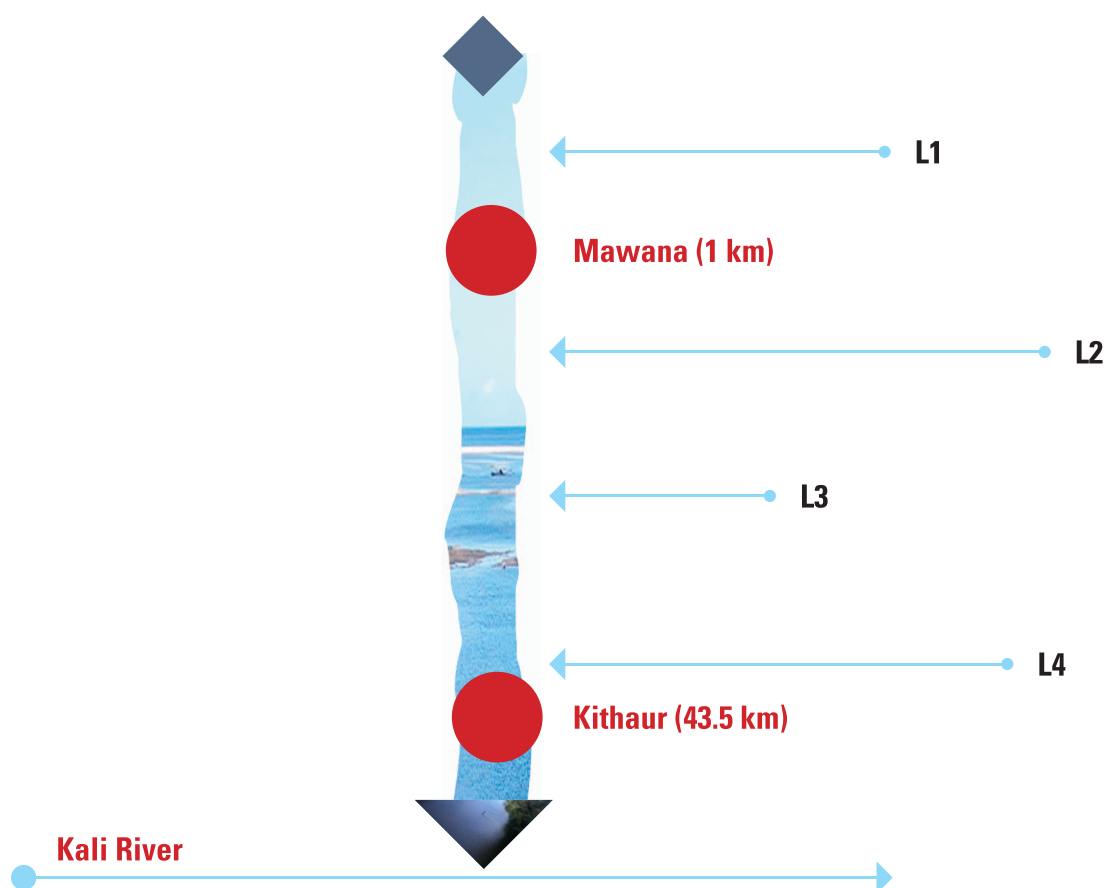


Figure: Flow Diagram of Chhoiya River

CHHOEYA DRAIN MAINSTEM NETWORK						
S.No.	River Name	Confluence Bank	River Length (Km)	Confluence Co-ordinate		Distance from origin (km)
				Lat	Long	
1	Gagsona Drain	L1	17.4	29.11	77.83	1
2	Ikla, Kheri maniya Drain	L2	35.5	28.85	77.86	35
3	Kithor Drain	L3	8.83	28.80	77.88	41.6
4	Raidhana Drain	L4	17.7	28.79	77.90	43.5

HAWA/QADIRABAD DRAIN BASIN

Qadirabad River UID Code:
Basin Area: 539 Sq. Km.
Number of rivers - 11
River network- 135.54 Km

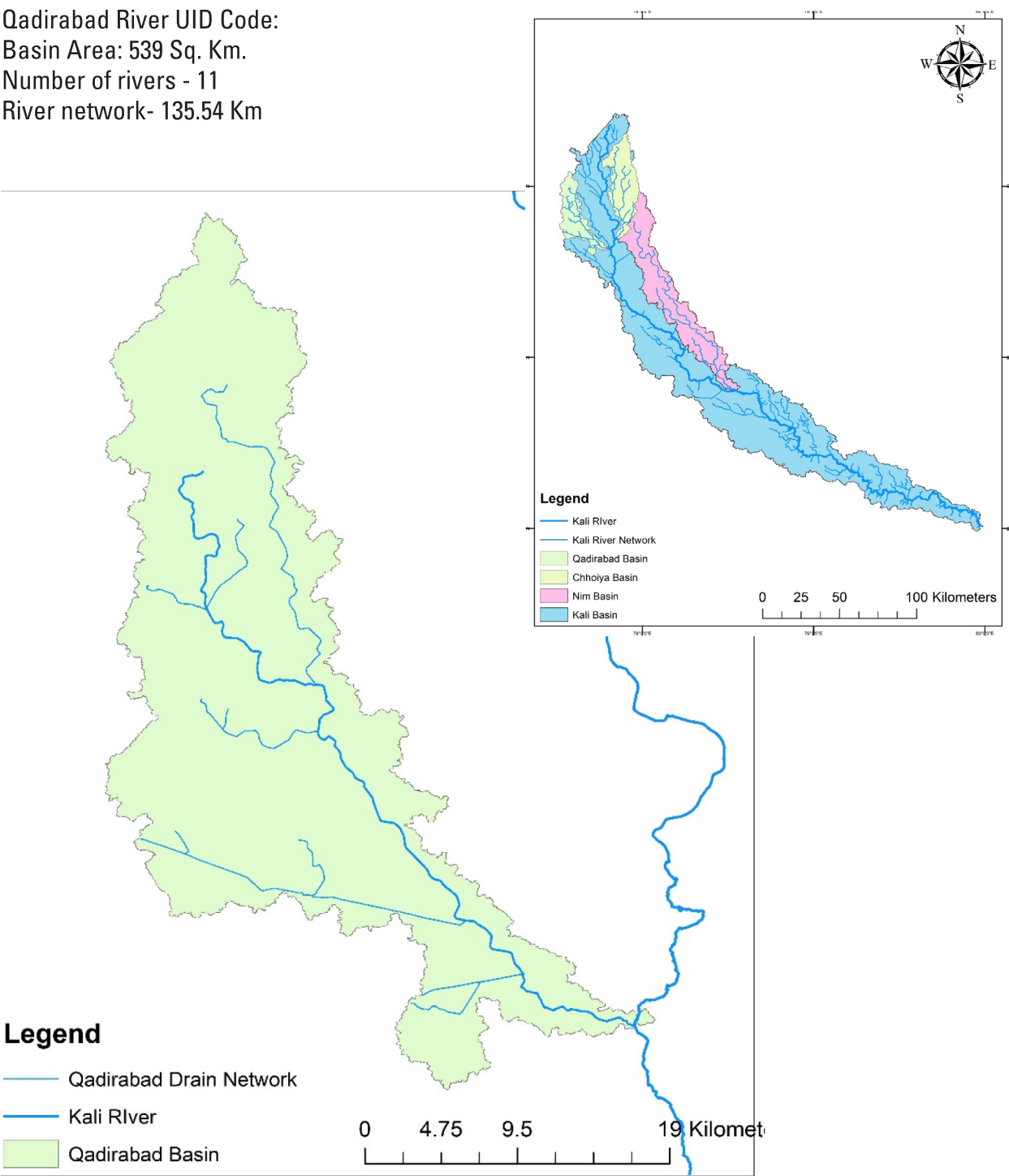


Figure: Qadirabad Drain Network



QADIRABAD MAINSTEM FLOW DIAGRAM

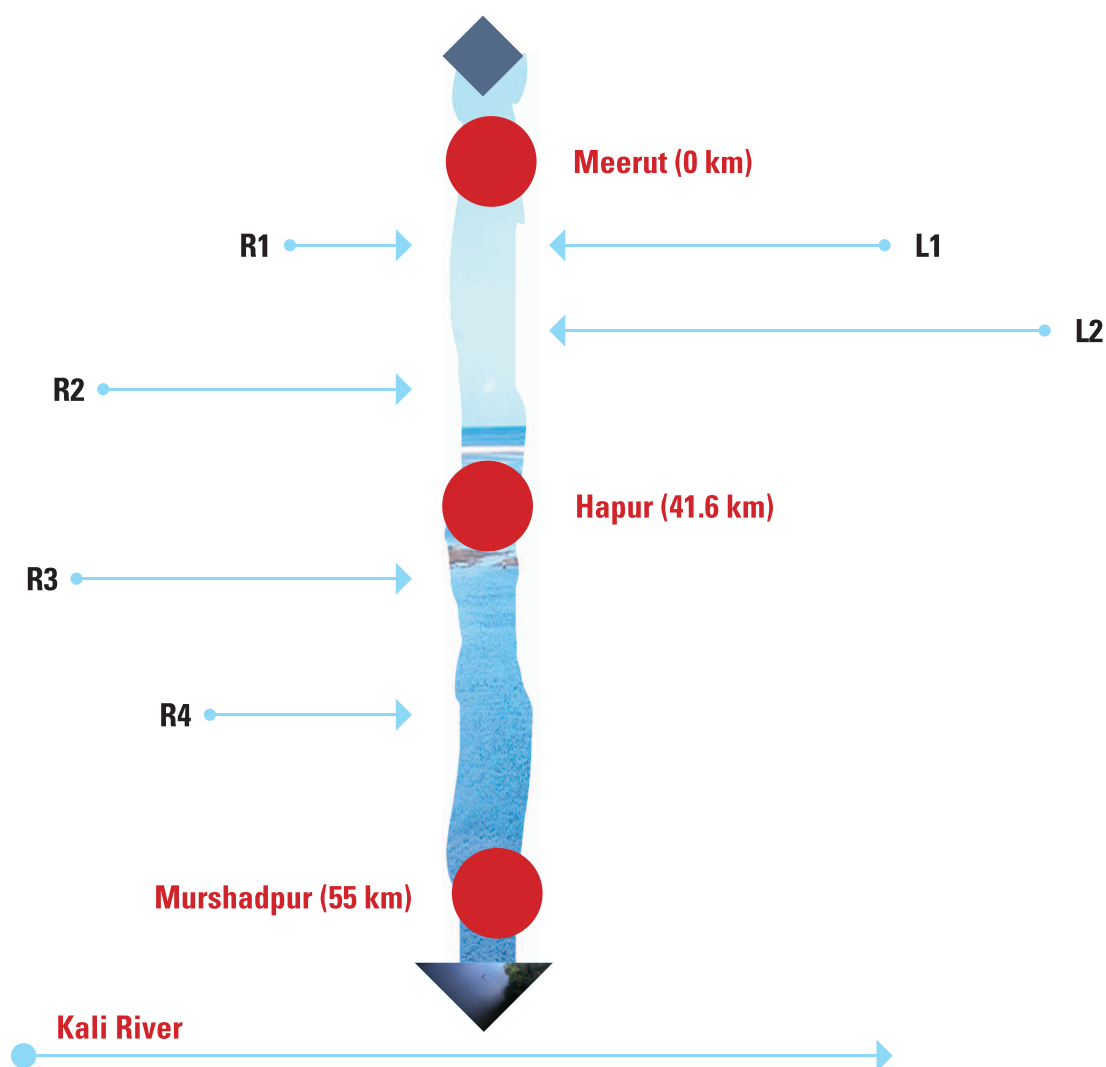
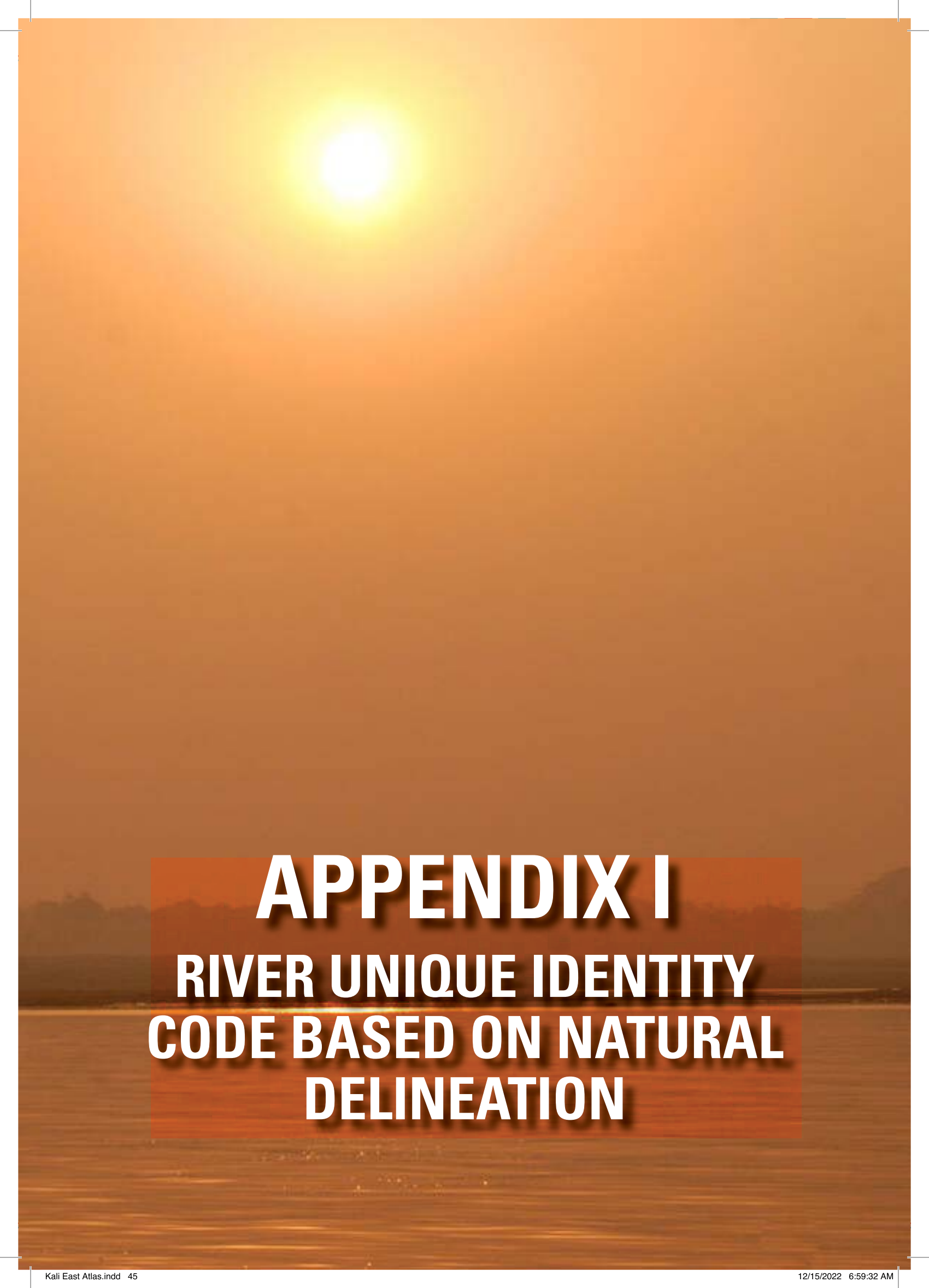


Figure: Flow Diagram of Qadirabad Drain

QADIRABAD DRAIN/ HAWA DRAIN MAINSTEM NETWORK						
S.No.	River Name	Confluence Bank	River Length (Km)	Confluence Co-ordinate		Distance from origin (km)
				Lat	Long	
1	Niwari Drain	R	28.86	77.57	4.1	12.2
2	Dhindala Drain	L	28.86	77.57	7	12.2
3	Sheikhpur Drain	L	28.82	77.63	25.2	21.9
4	Sikri Khurd Drain	R	28.80	77.63	8.96	25.7
5	Chhajarsi Drain	R	28.69	77.72	16.31	41.6
6	Siwia Escape	R	28.66	77.75	5.62	46.83





APPENDIX I

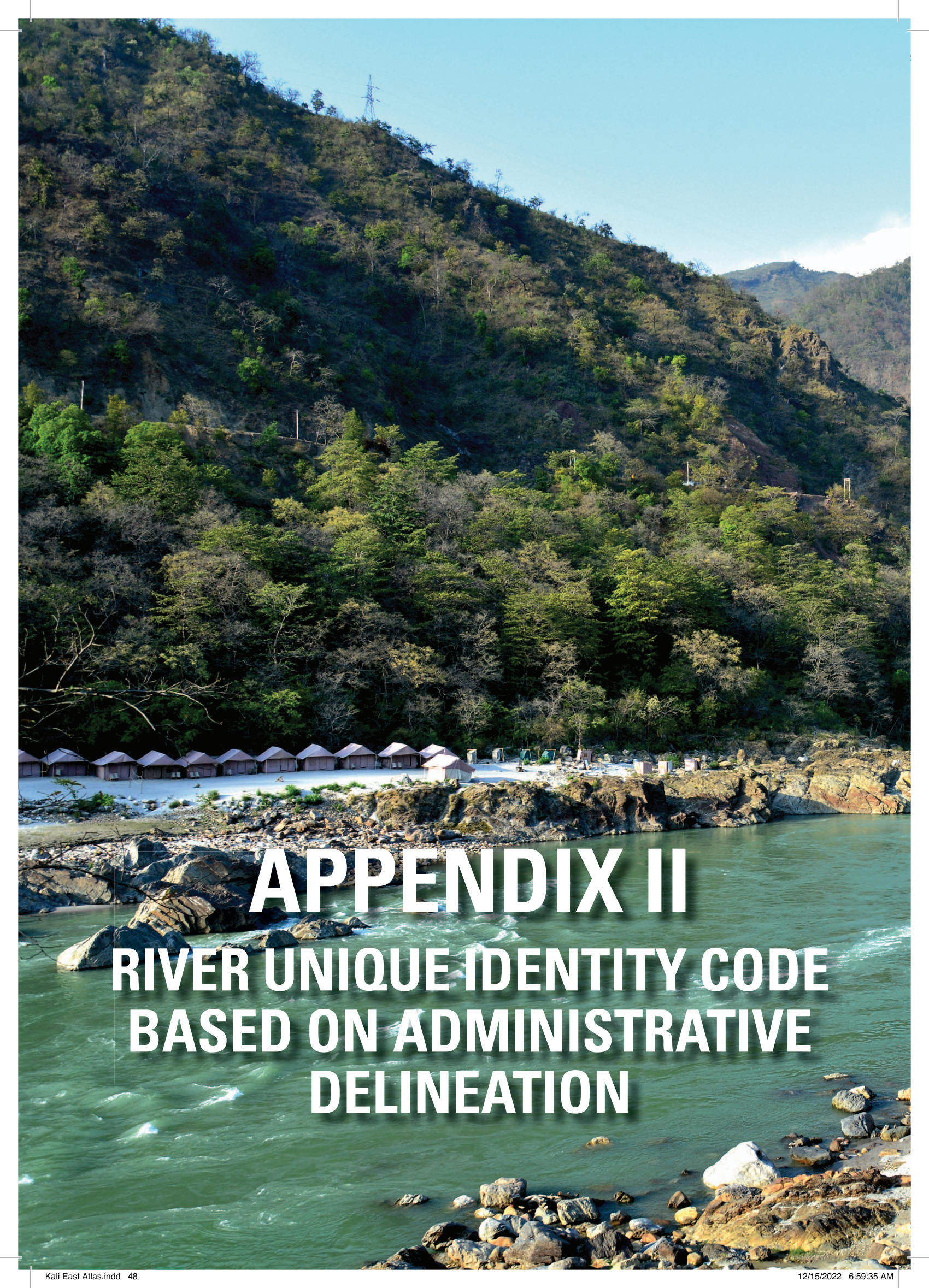
RIVER UNIQUE IDENTITY CODE BASED ON NATURAL DELINEATION

RIVER UNIQUE IDENTITY CODE BASED ON NATURAL DELINEATION: KALI EAST BASIN

S.No	River Code	Origin Data			Confluence Data					
	Unique Identification Number	Co-ordinate		Ele (m)	Co-ordinate		Ele (m)	Confluence with		Length Of the river (km.)
		Lat	Long		Lat	Long				
1	02-L-33	29.36	77.81	240	27.01	79.99	122	Ganga	616	
2	02-L-33-R-01	27.00	79.96	137	27.02	79.97	125	Kali River	3.38	
3	02-L-33-R-02	27.05	79.92	132	27.08	79.93	126	Kali River	4	
4	02-L-33-R-03	27.07	79.85	137	27.10	79.86	130	Kali River	5.77	
5	02-L-33-R-04	27.08	79.80	141	27.12	79.81	131	Kali River	7.78	
6	02-L-33-R-05	27.12	79.73	144	27.13	79.76	133	Kali River	4.96	
7	02-L-33-R-06	27.13	79.71	141	27.15	79.74	133	Kali River	5.47	
8	02-L-33-R-07	27.22	79.64	142	27.19	79.62	134	Kali River	6.24	
9	02-L-33-R-08	27.13	79.57	141	27.16	79.58	132	Kali River	6.54	
10	02-L-33-L-01	27.34	79.44	149	27.17	79.55	132	Kali River	35.9	
11	02-L-33-L-01-L-01	27.24	79.57	142	27.23	79.56	138	Stream 9	2.73	
12	02-L-33-L-01-L-02	27.29	79.54	146	27.23	79.54	141	Stream 9	11.3	
13	02-L-33-L-01-L-03	27.27	79.51	147	27.24	79.52	142	Stream 9	5.95	
14	02-L-33-R-09	27.15	79.51	144	27.17	79.55	135	Kali River	12	



15	02-L-33-R-09-R-01	27.14	79.54	144	27.16	79.55	135	Stream 10	3.38
16	02-L-33-R-09-R-02	27.14	79.52	144	27.15	79.53	138	Stream 10	2.43
17	02-L-33-L-02	27.26	79.45	146	27.22	79.48	136	Kali River	8.39
18	02-L-33-L-2-L-01	27.24	79.47	145	27.24	79.47	140	Stream 1	1.22
19	02-L-33-R-10	27.14	79.41	147	27.21	79.44	137	Kali River	10
20	02-L-33-R-11	27.18	79.39	147	27.21	79.41	139	Kali River	4.49
21	02-L-33-R-12	27.18	79.37	148	27.20	79.39	140	Kali River	3.1
22	02-L-33-L-03	27.37	79.32	151	27.22	79.37	139	Kali River	32
23	02-L-33-L-03-L-01	27.32	79.36	153	27.31	79.39	151	Kharwa Drain	4.44
24	02-L-33-R-13	27.19	79.32	147	27.21	79.34	142	Kali River	3.58
25	02-L-33-R-14	27.23	79.30	150	27.24	79.32	141	Kali River	3.69
26	02-L-33-L-04	27.27	79.35	149	27.27	79.32	140	Kali River	3.2
27	02-L-33-L-05	27.28	79.34	150	27.28	79.32	141	Kali River	2.48
28	02-L-33-R-15	27.27	79.29	143	27.27	79.31	142	Kali River	2.11
29	02-L-33-L-06	27.32	79.29	150	27.30	79.28	143	Kali River	3.1
30	02-L-33-L-07	27.36	79.26	151	27.33	79.26	144	Kali River	5.14
31	02-L-33-R-16	27.38	79.23	152	27.33	79.25	143	Kali River	11.2



APPENDIX II

RIVER UNIQUE IDENTITY CODE BASED ON ADMINISTRATIVE DELINEATION



RIVER UNIQUE IDENTITY CODE BASED ON ADMINISTRATIVE DELINEATION: KALI EAST BASIN

S.No	River Code	Village/ Town Entry Data		Village/ Town Exit Data		Village/Town
	Unique Identification Number	Coordinates		Coordinates		
		Lat	Long	Lat	Long	
1	356-UP-133-XX-02-01	29.36	77.82	29.35	77.81	Chitaura
2	356-UP-133-XX-02-01	29.35	77.81	29.34	77.80	Rathaur
3	356-UP-133-XX-02-01	29.34	77.80	29.32	77.80	Mawisadat
4	356-UP-133-XX-02-01	29.32	77.80	29.30	77.79	Antwara
5	356-UP-133-XX-02-01	29.30	77.79	29.28	77.79	Palri
6	356-UP-133-XX-02-01	29.28	77.79	29.27	77.79	Rasulpur
7	356-UP-133-XX-02-01	29.27	77.79	29.26	77.80	Khokni
8	356-UP-133-XX-02-01	29.26	77.80	29.25	77.80	Galibpur
9	356-UP-133-XX-02-01	29.25	77.80	29.24	77.80	Jawan
10	356-UP-133-XX-02-01	29.24	77.80	29.23	77.80	Jandheri Jatan
11	356-UP-133-XX-02-01	29.23	77.80	29.22	77.79	Sikandarpur Khurd
12	356-UP-133-XX-02-01	29.22	77.79	29.19	77.78	Kadhli
13	356-UP-138-XX-02-01	29.19	77.78	29.18	77.77	Nagli Ajar Salimpur
14	356-UP-138-XX-02-01	29.18	77.77	29.17	77.75	Tandi
15	356-UP-138-XX-02-01	29.17	77.75	29.15	77.76	Mahalka
16	356-UP-138-XX-02-01	29.15	77.76	29.15	77.75	Sarsua
17	356-UP-138-XX-02-01	29.15	77.75	29.14	77.75	Pipli Khera
18	356-UP-138-XX-02-01	29.14	77.75	29.14	77.75	Akhtiyarpur
19	356-UP-138-XX-02-01	29.14	77.75	29.12	77.74	Salempur
20	356-UP-138-XX-02-01	29.12	77.74	29.09	77.75	Ajhauta
21	356-UP-138-XX-02-01	29.09	77.75	29.08	77.76	Mamurpur
22	356-UP-138-XX-02-01	29.08	77.76	29.07	77.77	Jalalbad
23	356-UP-138-XX-02-01	29.07	77.77	29.06	77.77	Methna Indersingh
24	356-UP-138-XX-02-01	29.06	77.77	29.05	77.77	Ulakhpur
25	356-UP-138-XX-02-01	29.05	77.77	29.05	77.77	Mukhtiyarpur Nagla
26	356-UP-138-XX-02-01	29.05	77.77	29.04	77.78	Bahchaula
27	356-UP-138-XX-02-01	29.04	77.78	29.03	77.79	Muzaffarnagar Saini
28	356-UP-138-XX-02-01	29.03	77.79	28.99	77.79	Rasulpur Aurangabad
29	356-UP-138-XX-02-01	28.99	77.79	28.98	77.79	Bhawanpur





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