



# Final Feasibility Report

## National Waterway- 4

### Region V – Godavari River

#### Bhadrachalam to Nashik (1201.6 km)

Survey Period: 16 Mar 2016 to 05 Oct 2016



## Volume - I

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## List of Abbreviations

CD	Chart Datum
DGPS	Differential Global Positioning Systems
PDOP	Position Dilution of Precision
LBS	Left Bank Side
ETS	Electronic Total Station
FRP	Fiber Reinforced Plastic
GPS	Global Positioning Systems
LBM	Local Benchmark
MSL	Mean Sea Level
RL	Reference Level
SD	Sounding Datum
SBAS	Satellite-Based Augmentation System
TBC	Trimble Business Center
GTS	Great Trigonometrically Survey
R.	River
NH	National Highway
SH	State Highway
CWC	Central Water Commission
PWD	Public work Department
FRL	Full Reservoir Level
HFL	High Flood Level
MSL	Mean Sea Level
TBM	Temporary Benchmark
BM	Benchmark

**SALIENT FEATURES AT A GLANCE**

#	Particulars	Details																																																								
1.	Name of Consultant	IIC Technologies Limited, Hyderabad																																																								
2.	Region number & State(s)	Region – V – Maharashtra & Telangana																																																								
3.	Waterway stretch, NW # (from.... to; total length)	National Waterway No – 4 From Bhadrachalam to Nashik (1201.6km)																																																								
4.	Navigability status	Partially Navigable																																																								
a)	Tidal & non-tidal portions (from... to, length, average tidal variation)	The survey stretch of Godavari River is non tidal																																																								
b)	LAD status (w.r.t. CD) i) Survey period (15 <sup>th</sup> March to 5 <sup>th</sup> Oct) ii) < 1.2 m (km) iii) 1.2 m to 1.4 m (km) iv) 1.5 m to 1.7 m (km) v) 1.8 m to 2.0 m (km) vi) > 2.0 m (km)	<table border="1"> <thead> <tr> <th>LAD (m)</th> <th>0 -210 (km)</th> <th>210-420 (km)</th> <th>420-600 (km)</th> <th>600-810 (km)</th> <th>810-1020 (km)</th> <th>1020-1201.6 (km)</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>&lt;1.2</td> <td>210</td> <td>162.43</td> <td>86.25</td> <td>142.96</td> <td>160.2</td> <td>71.58</td> <td><b>833.42</b></td> </tr> <tr> <td>&lt;1.4</td> <td>0</td> <td>6.96</td> <td>38.02</td> <td>19.31</td> <td>3.13</td> <td>7.99</td> <td><b>75.41</b></td> </tr> <tr> <td>&lt;1.7</td> <td>0</td> <td>8.72</td> <td>16.5</td> <td>21.04</td> <td>3.49</td> <td>24.95</td> <td><b>74.7</b></td> </tr> <tr> <td>&lt;2</td> <td>0</td> <td>6.45</td> <td>14.18</td> <td>12.98</td> <td>18.95</td> <td>24.86</td> <td><b>77.42</b></td> </tr> <tr> <td>&gt;2</td> <td>0</td> <td>25.44</td> <td>25.05</td> <td>13.71</td> <td>24.23</td> <td>52.22</td> <td><b>140.65</b></td> </tr> <tr> <td><b>Total</b></td> <td><b>210</b></td> <td><b>210</b></td> <td><b>180</b></td> <td><b>210</b></td> <td><b>210</b></td> <td><b>181.6</b></td> <td><b>1201.6</b></td> </tr> </tbody> </table>	LAD (m)	0 -210 (km)	210-420 (km)	420-600 (km)	600-810 (km)	810-1020 (km)	1020-1201.6 (km)	Total	<1.2	210	162.43	86.25	142.96	160.2	71.58	<b>833.42</b>	<1.4	0	6.96	38.02	19.31	3.13	7.99	<b>75.41</b>	<1.7	0	8.72	16.5	21.04	3.49	24.95	<b>74.7</b>	<2	0	6.45	14.18	12.98	18.95	24.86	<b>77.42</b>	>2	0	25.44	25.05	13.71	24.23	52.22	<b>140.65</b>	<b>Total</b>	<b>210</b>	<b>210</b>	<b>180</b>	<b>210</b>	<b>210</b>	<b>181.6</b>	<b>1201.6</b>
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c)	Cross structures i) Dams, Weirs, barrages etc (total number; with navigation locks or not) ii) Bridges, Power cables etc [total number; range of horizontal and vertical clearances]	<p><b>Cross Structures</b></p> <p>i) Weirs – 3Nos. Barrages – 21 Nos. Dams – 5 Nos. Check Dams – 14 Nos.</p> <p>ii) Bridges – 83 Nos. Horizontal Clearance – 1.205 to 40.889m Vertical Clearance - -2.269 to 7.753m w.r.t HFL</p> <p>iii) Power cables – 9 Nos Vertical Clearance – 6.088 to 12.234m w.r.t HFL</p> <p>iv) High Tension Lines – 35 Nos Vertical Clearance – 10.555 to 25.119m w.r.t HFL</p>																																																								

#	Particulars	Details		
d)	Avg. discharge & no. of days	Discharge data is not available from authorities.		
e)	Slope (1 in ....)	<b>Chainage (km)</b>		<b>Slope (A/B)</b>
		<b>From</b>	<b>To</b>	
		0	30	1 : 0.428
		30	60	1 : 0.281
		60	90	1 : 0.338
		90	120	1 : 0.053
		120	150	1 : 0.262
		150	180	1 : 0.513
		180	210	1 : 0.303
		210	240	1 : 0.141
		240	270	1 : 0.463
		270	300	1 : 0.509
		300	330	1 : 0.123
		330	360	1 : 0.697
		360	390	1 : 1.005
		390	420	1 : 1.848
		420	450	1 : 1.725
		450	480	1 : 0.931
		480	510	1 : 0.106
		510	540	1 : 0.314
		540	570	1 : 0.104
		570	600	1 : 0.146
		600	630	1 : 0.491
		630	660	1 : 0.14
		660	690	1 : 0.217
		690	720	1 : 0.245
		720	750	1 : 0.199
		750	780	1 : 0.348
		780	810	1 : 0.155
		810	840	1 : 0.295
		840	870	1 : 0.298
		870	900	1 : 0.284

#	Particulars	Details		
		900	930	1 : 0.347
		930	960	1 : 0.368
		960	990	1 : 0.504
		990	1020	1 : 0.065
		1020	1050	1 : 0.518
		1050	1080	1 : 0.532
		1080	1110	1 : 0.175
		1110	1140	1 : 0.449
		1140	1170	1 : 0.759
		1170	1201.6	1 : 0.914
		Average Slope of River Godavari is 1 : 0.264		
5.	Traffic potential	Very less and depends on the availability of water		
a)	Present IWT operations, ferry services, tourism, cargo, if any	No IWT operations had been found. Local Ferry Service by small boats and operation of tourism boats.		
b)	Important industries within 50 km	i) Heavy water Plant, ITC Paper mill and Open pit Coal mines in Bhadrachalam ii) NTPC Ramagundam in Ramagundam iii) Wooden toys making (Koyya Bommalu) in Nirmal iv) Gangakhed Sugar and Energy Limited and cotton production in Gangakhed v) Small scale Textile and Sugar Mill in Nanded vi) Embroidered gold or silver borders of silk Sarees at Paithan vii) Sugar factories in Kopergaon viii) Hindustan Aeronautics Limited aircraft manufacturing plant, Indian currency and government stamp papers are printed, textile industry, e.g., carpet weaving in Nashik		
c)	Distance of Rail & Road from Industry	i) Heavy water Plant is 2.30km, ITC Paper mill is 0.3km are away from NH30 ii) NTPC Ramagundam is 2.49km away from Ramagundam Railway station and 0.78km away from NH563 iii) Nirmal is 35.6km away Armoor Railway Station iv) Gangakhed Sugar and Energy Limited is 1.79km away from SH170 v) Paithan Silk Weaving Center is 0.21 km away from Nagpur-Aurangabad-Mumbai Highway vi) Sanjivini Sugar factory is 0.42km away from MDR4 and 1.97km is away from SH10 Kopergaon. It is 0.5km away from the Kopergaon Railway Station		

#	Particulars	Details
		<p>vii) KSK Sugar Industry is 0.61km away from SH3 and 0.42km away from MDR3 at Kopelwadi, Kopergaon</p> <p>viii) Hindustan Aeronautics Limited aircraft manufacturing plant is 1.15 km away from NH60 and 1.94km is away from MDR42 Nashik</p> <p>ix) India Security Press is 1.32km away from Nashik Road Railway Station and 0.55 from SH 27</p> <p>x) Ventura Textiles Ltd is 0.29 km away from NH160 in Nashik</p>
6.	Consultant's recommendation for going ahead with TEF / DPR preparation	A major recommendation for improvement of depth and channel design will be required to make the part of the Godavari River as navigable. The design of the waterway cannot be altered to a major extent as this is used mainly for irrigation purpose and drinking water supply. The Dams present in the river stretch is used for irrigation purpose, power production and the water through the side way canals are used at large extent for cultivation, thus detailed study on the impact of any change in the channel design needs to be carried out for the entire stretch of Godavari River.
7.	Any other information/comment	Nil

(Signature)

Date:

IIC Technologies

# 1 Introduction

## 1.1 Background

The **Godavari** is the second longest river in India after the river Ganga of north India having its source at Tryambakeshwar, Maharashtra. The Godavari originates in the Western Ghats of central India near Nashik in Maharashtra. It flows for 1,465 km, first eastwards across the Deccan Plateau then turns southeast, entering the West Godavari district and the East Godavari district of Andhra Pradesh, until it splits into two watercourses that widen into a large river delta and flow into the Bay of Bengal. In terms of length, catchment area and discharge, the Godavari River are the largest in peninsular India and had been dubbed as the '**Dakshina Ganga**' - the South Ganga River.

In the entire course of flow, the river drains the states Maharashtra, Telangana, Andhra Pradesh, Chhattisgarh, Madhya Pradesh, Odisha and Karnataka through its extensive network of tributaries.

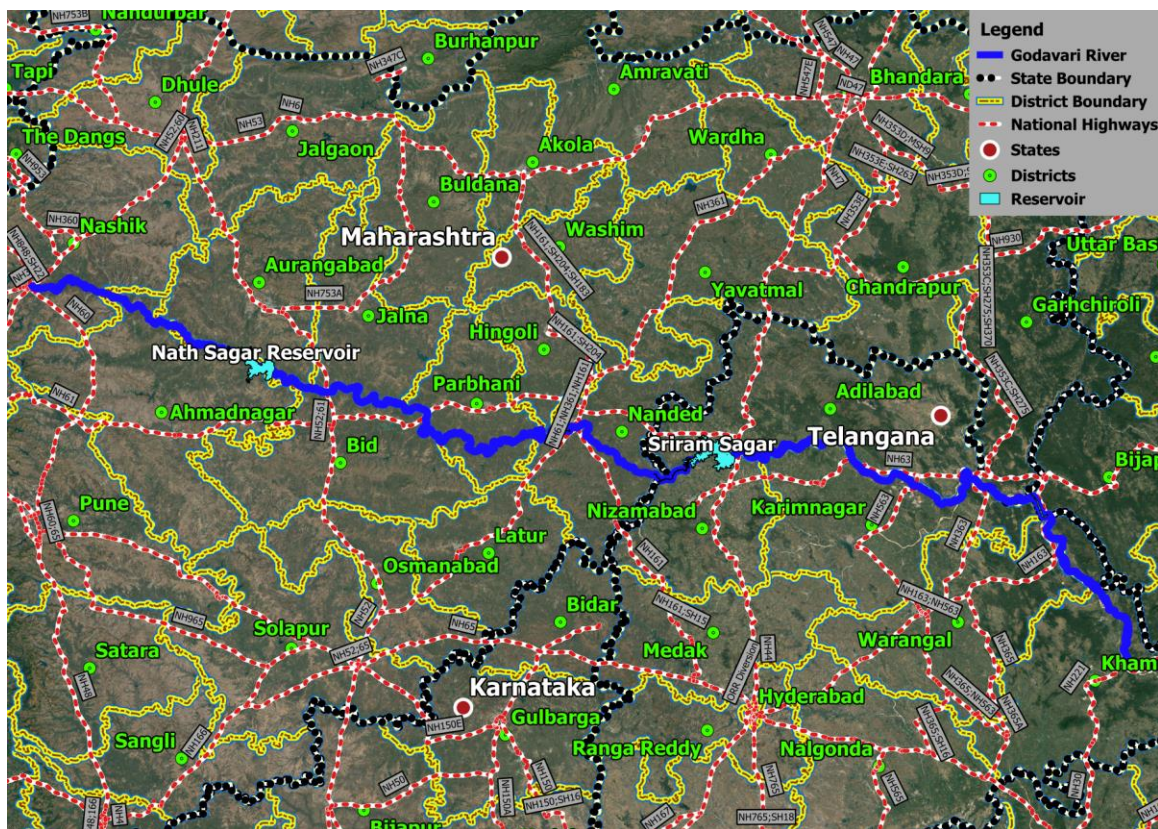


Figure 1 - Location around the survey stretch



IIC Technologies Ltd. has been assigned to prepare a feasibility report after conducting a bathymetric and topographic survey on behalf of IWAI for the stretch starting from Bhadrachalam to Nashik covering 1201.6km.

The weather was sunny towards the start of the survey in March. We encountered heavy rain showers during monsoon for the period of three to four months from June to end September making it unfavorable to conduct Topographic as well as Hydrographic survey. However, irrespective of all the difficulties the survey was carried out and completed by keeping all the standards.

## 1.2 Tributaries of Godavari River

As per the river PIA, the length of the Godavari River in Telangana is 463.35km, in Chatisgarh is 22.10km and in Maharastra is 716.45km.

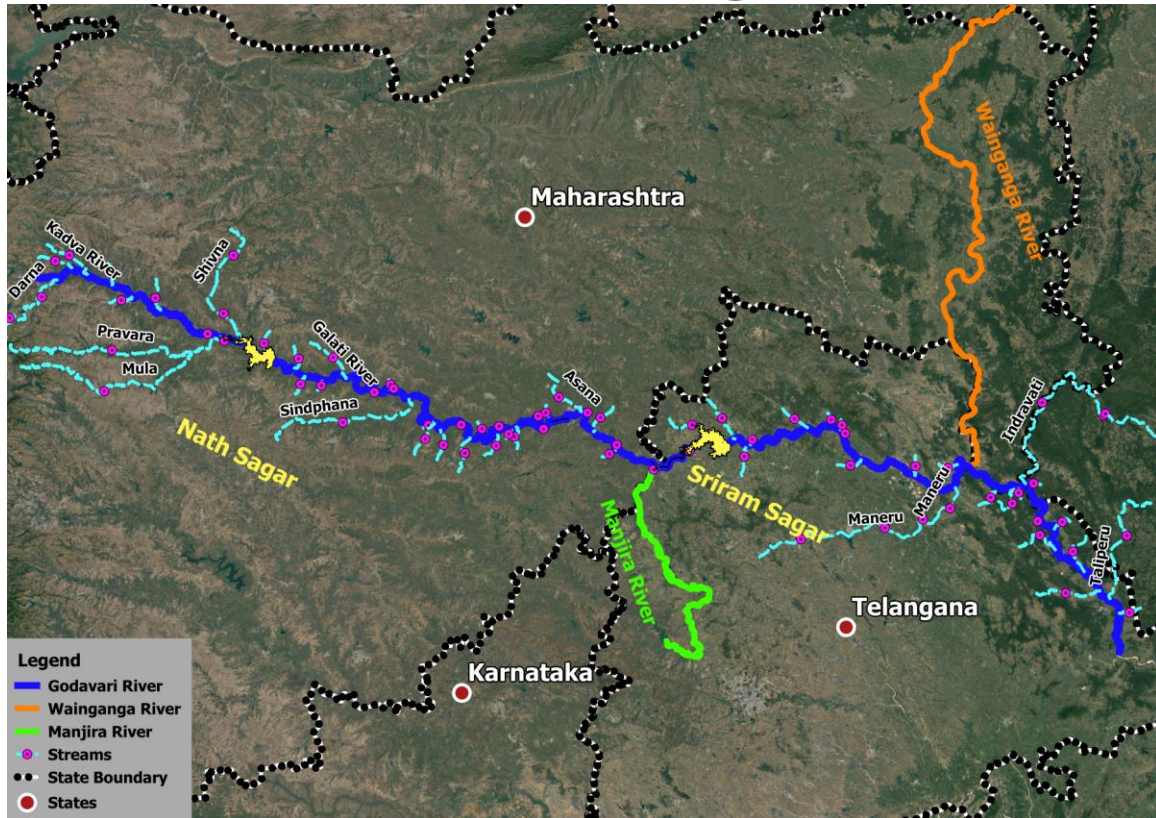
The major tributaries of the river can be classified as the left bank and right bank tributaries while coming downstream. The tributaries which confluence on the left bank are Purna, Pranhita, Indravati and Sabari River whereas the right bank tributaries are Pravara, Manjira, and Manair River.

Pranhita is the largest tributary. Though the river proper flows only for 113 km, by virtue of its extensive tributaries Wardha, Wainganga, and the Godavari.

Indravati is the 2<sup>nd</sup> largest tributary known as the “lifeline” of the Kalhandi, Nabarangapur of Odisha and Bastar district of Chattisgarh Manjira is the longest tributary and holds the Nizam Sagar reservoir. Purna is a prime river in the water scarce Marathwada region of Maharashtra. Sabari River has a sub-tributary namely Kolab and Machkund.

TRIBUTARY	BANK	CONFLUENCE LOCATION
Pravara	Right	Pravara Sangam, Nevasa, Ahmednagar, Maharashtra
Purna	Left	Jambulbet, Parbhani, Marathwada, Maharashtra
Manjira	Right	Kandakurthi, Renjal, Nizamabad, Telangana
Manair	Right	Arenda, Manthani, Karimnagar, Telangana
Pranhita	Left	Kaleshwaram, Mahadevpur, Karimnagar, Telangana
Indravati	Left	Somnoor Sangam, Sironcha, Gadchiroli, Maharashtra
Sabari	Left	Kunawaram, East Godavari, Andhra Pradesh

*Table 1 - Tributaries of Godavari River*



*Figure 2 - Tributaries of Godavari River*

### 1.3 State/ District through which river passes

#### 1.3.1 Maharashtra State

Godavari River originates in Nashik district and following its passage, it enters the Ahmednagar district. The river forms the natural boundary between Ahmednagar and Aurangabad district, between Beed and Jalna district and lastly between Beed and Parbhani district. It enters Parbhani district and following a small passage enters into Nanded district. In the later part of her flow, it also forms the natural boundary between Gadchiroli districts in Maharashtra and Karimnagar district in Telangana state.

#### 1.3.2 Telangana State

After leaving Nanded district in Maharashtra, the river enters Nizamabad district in Telangana state, further flowing down it enters Adilabad district followed by Karimnagar district. She also forms a natural boundary between the Bijapur district of Chhattisgarh state and Karimnagar district of Telangana state. Further flowing down, she enters Khammam district.



### 1.3.3 Andhra Pradesh State

After leaving Khammam district in Telangana state the river enters Andhra Pradesh state and flows by making the natural boundary between the East Godavari district and West Godavari district and finally meeting the Bay of Bengal.

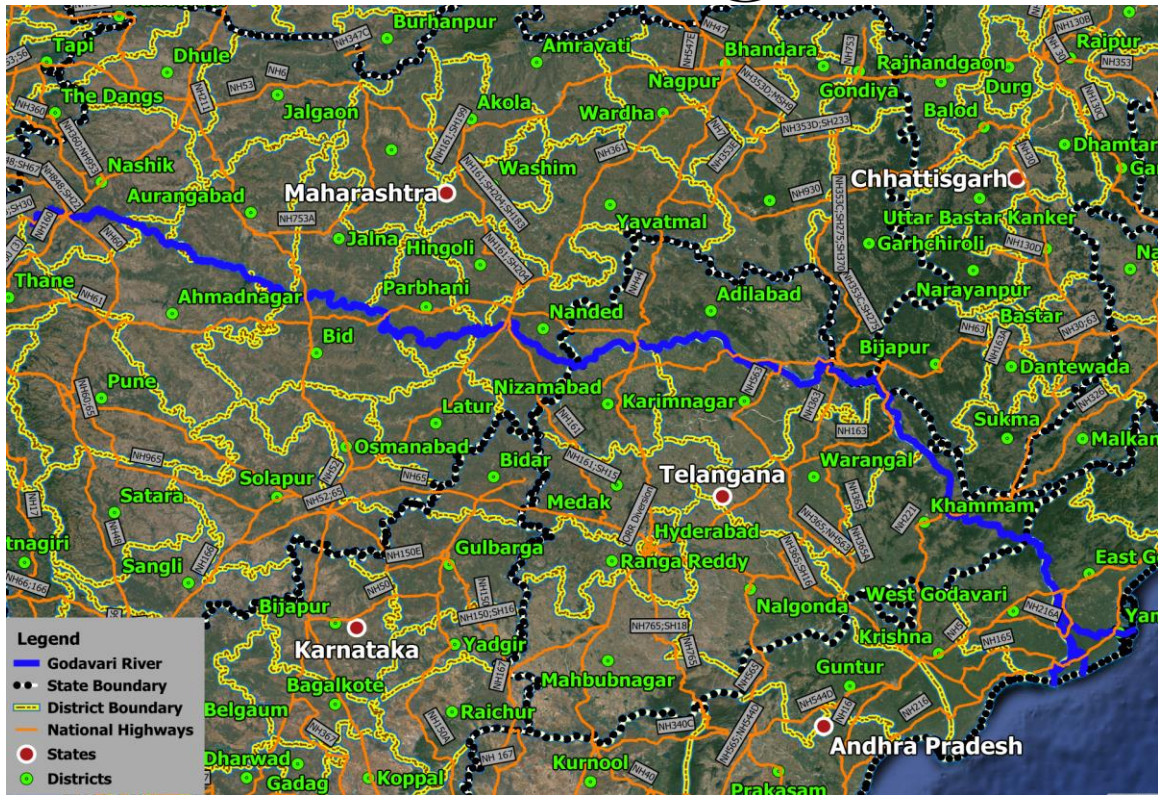
State Name	Chainage (km)		Total Length (km)
	From	To	
Telangana	0	1.5	439.5
	7.5	144.1	
	216.6	518	
Telangana - Andhra Pradesh	1.5	7.5	6
Telangana - Chattisgarh	144.1	164.1	20
Telangana - Maharashtra	164.1	216.6	62.5
	518	528	
Maharashtra	528	1201.6	673.6
<b>Total</b>			<b>1201.6</b>

*Table 2 - State wise waterway*

## 1.4 Maps

### 1.4.1 Full course of the waterway

The map displaying the state boundary with road and rail network for the course of the waterway is represented as below:



*Figure 3 - Full Course of Godavari River*

### 1.4.2 Course of the waterway under study

The waterway under study is about 1201.6 km in length and covers the area between road bridge at Bhadrachalam, Telangana state and Mumbai-Agra Highway road bridge in Nashik, Maharashtra state.



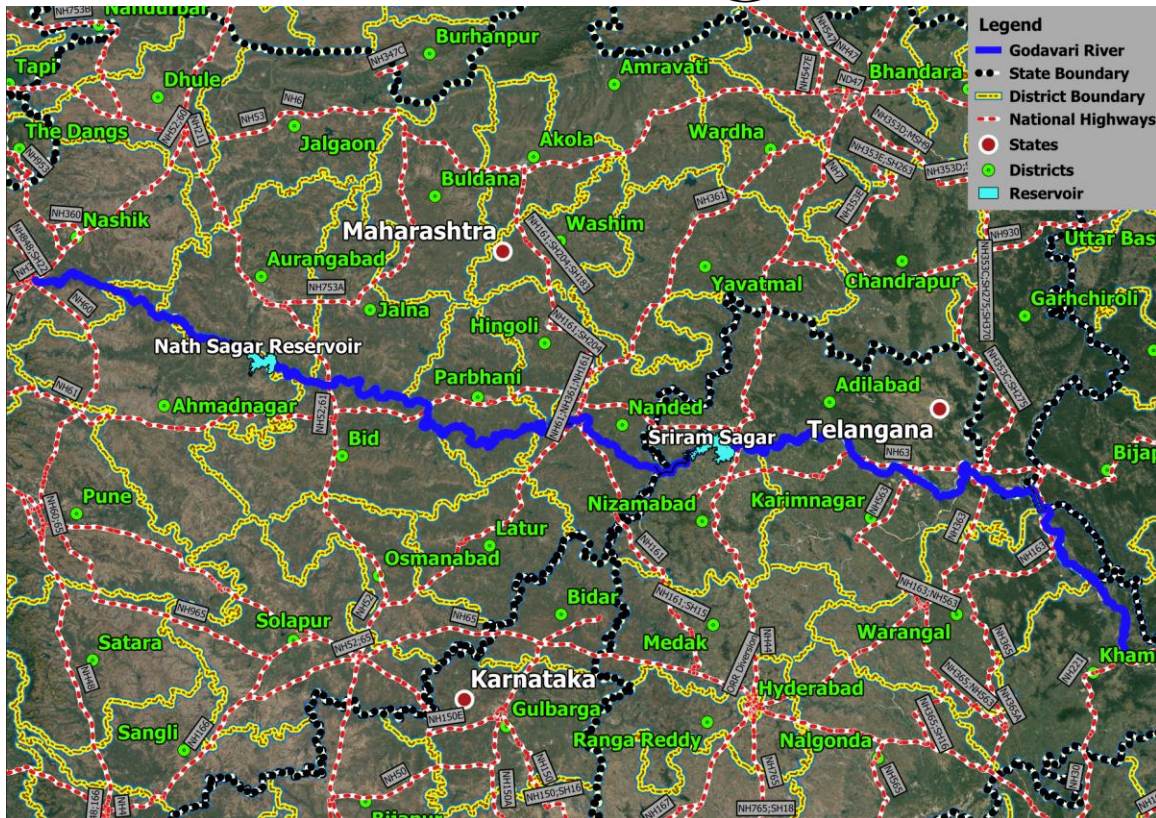


Figure 4 - Course of Godavari River

## 1.5 Scope of work

IIC Technologies Ltd. conducted a hydrographic and topographic survey of Godavari River from a road bridge at Bhadrachalam across Godavari River at Lat 17°40'39"N, Long 80°52'5"E to a road bridge on Mumbai-Agra Highway at Nashik across Godavari River at Lat 20°00'06.80"N, Long 73°48'11.72"E.

The scope of the work for the conduct of a survey of Godavari River includes:

- Undertake bathymetrically and topographic survey of proposed waterway.
- Establishing horizontal and vertical control stations
- Construction of benchmark pillars and establishing its reduced level w.r.to Mean Sea Level
- Setting up and deployment of water level gauges
- Current velocity and discharge measurements
- Collection and analysis of water and bottom samples.
- A collection of topographic features including existing cross structures.
- Preparation of inventory of industries in the project influence area (PIA)

- Analysis of survey data, including assessment of water availability for navigation.
- Preparation of survey charts and feasibility report on methodology adopted to undertake Study

## 2 Methodology Adopted to undertake Study

### 2.1 Recce

Advance recce of the survey stretch was conducted on early 05 Feb 16 by a detach survey party. The recce party starts from Bhadrachalam, Telangana to Nashik, Maharashtra.

The following observation has been made:

- The survey area is 1201.6 km, from Bhadrachalam to Nashik.
- River width varied between 1500m to 200m from Bhadrachalam to Nasik.
- It was observed that most of the river stretch was dry and preliminary queries revealed that the river remains dry for most of the year. Hence a decision was taken to undertake topographic survey initially for the complete river stretch, the hydrographic survey would be undertaken depending on the field conditions and availability of water in limited pockets of the river stretch under consideration.

It was observed that wherever there is water reservoir, up to 50 to 60km upstream hydrographic surveys can be conducted and the rest of the areas need to be surveyed by topographic method. The summary of the same in stretches as mentioned below.

From Bhadrachalam to Yellampalli Dam, the river found to be almost dry and at few places water is accumulated in small pockets which are considered as not a navigable water. Hence topographic survey was planned.

From Yellampalli Dam to 30km upstream near Dharmapuri village, hydrographic survey can be conducted.

From Dharmapuri village to 105km upstream near Sri Ram Sagar Dam the river was dry and not navigable with the presence of rocks in the stretch.

From Sri Ram Sagar to 70km upstream towards Dharmabad Village river is navigable and hydrographic survey can be conducted.

From Dharmabad to 40km upstream near Baligaon Barrage river is dry and non navigable.

From Baligaon to 140km upstream river is navigable because of Barrages in between the stretch up to Gangakhed village.

From Gangakhed to 260km upstream near Jayakwadi Dam River is non-navigable with the presence of rocks in the stretch.

From Jayakwadi Dam to 70km upstream near Domegram Village river is navigable and hydrographic survey can be conducted.

From Domegram village to 100km upstream to Kanlad Village river is non-navigable with the presence of hard rocks in the stretch.

From Kanlad village to 10km upstream near Tamaswadi Village river is navigable.

From Tamaswadi village to 10km near Nandur Madhyameshwar Dam River is non-navigable.

From Nandur Madhyameshwar Dam to 20km upstream near Darnasangvi village in Maharashtra.

From Darnasangvi village to upstream 20km near Nashik river flow is just like Nala thus making it as non-navigable. Topographic survey was planned in this area.

Mobilisation commenced on 15<sup>th</sup> Aug 2016 and was completed on 20<sup>th</sup> Aug 2016.

### **2.1.1 Survey Resources and Methodology**

The actual survey was commenced on 16<sup>th</sup> Mar 2016 and completed on 05<sup>th</sup> Oct 2016. The survey chart scheming was undertaken on a scale of 1:600000 for 43N and 1:400000 for 44N, with sounding line spacing, kept at 200 m and plotted on UTM Projection at Zone 44N and 43N as directed in the contract specifications.

### **2.1.2 Survey Launch**

The bathymetric survey was conducted by using the shallow draft boat (small FRP boat fitted with OBM) namely 'IIC RS-01' for the river stretch. The survey boat was also used for collection of samples and current meter observations.



*Figure 5 - Survey Boat, IIC RS-01*

### 2.1.3 Survey Equipment

Following equipment were deployed for the hydrographic survey.

<b>HYDROGRAPHIC SURVEY EQUIPMENT</b>			
<b>Equipment</b>	<b>Make</b>	<b>Equipt Serial No.</b>	<b>Qty. Employed</b>
Echosounder	ELAC Hydrostar Digital Echosounder	310	01
DGPS	Trimble SPS 461(Controllor)	5516R80001	01
	Trimble GA530 (Antenna)	16438	01
Current Meter	Valeport801	42628	01
Tide Gauge	Manual (Pole type)	--	03 set
Grab Sampler	Vanveen	--	01
Water sampler	Niskin Water Sampler	--	01

*Table 3 - Hydrographic Survey Equipment Used*

Following equipment were employed for the topographic survey.

<b>TOPOGRAPHIC SURVEY EQUIPMENT</b>			
<b>Equipment</b>	<b>Make</b>	<b>Equipt Serial No.</b>	<b>Qty. Employed</b>
DGPS	Trimble R3/R4	--	06
Auto Level	Sokkia Auto level & Accessories	--	06
ETS	Electronic Total Station	120840,120775,102662	01
E/S Calibration	Bar Check	--	01
Software	TBC	Version 12	01



Software	AUTOCAD	2012	01
Software	Microsoft Office	2013	01
Software	HYPACK data acquisition	2015	01

*Table 4 - Topographic Survey Equipment Used*

#### 2.1.4 Topography Survey

The actual survey was commenced on 16<sup>th</sup> Mar 2016 and completed on 30<sup>th</sup> Sep 2016. The weather was sunny throughout the period during survey operations. The weather was favorable with moderate hot climate for the conduct of survey and the weather condition remains same for the entire duration of the survey.

The survey was undertaken as per the line plan provided and the spot level points in the cross line were spaced at the 20m interval. The plotting of the chart was done on UTM projection at zone 44N and 43N as directed in the contract specifications. The spot levels along the river were obtained by using Trimble DGPS. The data was post processed using Trimble Business Center to get the precise position and MSL height values of the rover locations. The topographic survey for the entire survey stretch was conducted to collect the following data:-

- Spot levels
- Delineation of Islands
- Fixing of bridges and marks
- Assess the type of river bank
- Extending the vertical and horizontal control throughout the survey area
- Collection of local information along the river banks

The details of all spot levels are provided in the respective sheets being presented along with this report. Additionally, a soft copy of the same in XYZ format is being handed over as deliverable data.



*Figure 6 - Spot leveling by DGPS*

### 2.1.5 Bathymetric Survey

ELAC Hydro star was used to obtain soundings onboard the survey boat. A working frequency of 210 KHz was used for sounding operations. The digital output from the echo sounder was automatically fed to the HYPACK data logging software on a real-time basis for the acquisition of survey data. No breakdown of equipment was reported and the performance of the equipment was found to be satisfactory during the entire duration of the survey.

The sound velocity was set to 1500 m/s on single beam echo sounder during acquisition. The Daily bar checks were done prior to the sounding operation and before the closing of the sounding operation for the day. Being very shallow depths, the echo sounder depths were also cross-checked in between by using demarcated sounding poles during the conduct of the survey.

The survey was carried on WGS 84 Datum. The projection used was Transverse Mercator. The Bathymetric survey of NW-4 in Godavari River was commenced on 16<sup>th</sup> Aug 2016 and completed on 05<sup>th</sup> Oct 2016. The area intended to be surveyed has been completely sounded as per the required specifications, and there are no portions of the assigned survey area that would require further sounding. The bathymetric survey was carried out using a small fiber boat. The boat was deployed during the entire survey, often concurrently along with the topographic team. During the bathymetry survey, the sounding of the river was carried out at a line spacing of 200 meters.



There were no significant interruptions till the arrival of monsoon. As the monsoon arrived the survey was interrupted many times due to continuous heavy rain for two to six days. Due to this flooding happened which caused erosion at one place and deposition at some other place. The result of which was, one of the BM pillar went under the sand and due to flooding the four BM pillars got submerged.



*Figure 7 - Boat Sounding in Godavari River*



Benchmark pillar before flooding



Benchmark pillar after flooding

*Figure 8 - Tacky Stave held over BM pillar*



*Figure 9 - Sand deposition over BM pillar*

### **2.1.6 Calibration**

The equipment used for the survey was calibrated by the equipment supplier. The equipment calibration certificates are placed at Annexure-14 to this report.

### **2.2 Description of Bench Marks (B.M.) Reference Level**

In order to extend horizontal control for survey, the station (IWAI BM GDV-01) were established by carrying out simultaneous 25 hours GPS observation with reference as NW-4 IWAI BM -17 (The position of NW-4 IWAI BM-17 is derived from previous IWAI report of survey NW-4 stretch of Godavari River from Rajahmundry to Bhadrachalam dated November 15<sup>th</sup> November 2014). The Data was processed using Trimble Business Centre software in Baseline processing method.

The Reference level (MSL) value of NW-4 IWAI-17 is used as the initial reference for vertical control and the reference level value of the same was transferred to station IWAI BM GDV-01 using Auto Level. The leveling data for establishing the reference level for the newly constructed benchmark pillar



*Figure 10 - Reference Benchmark Pillar at Bhadrachalam NW-4 IWAI-17(2013)*

The final accepted co-ordinates and Reference Level (R.L) values of these Bench Marks and other station established for setting up of reference DGPS base stations are as below:

Sl. No.	Station	Chainage (km)	Latitude	Longitude	BM height above MSL (m)	Reference
01	NW-4 BM-IWAI-17	-0.84	N17°39'57.14403"	E80°52'48.71052"	55.461	Accepted coordinate from IWAI ROS of Rajamundry to Bhadrachalam 15 Nov 14
02	IWAI BM GDV-01	0.37	N17°40'35.02008"	E80°53'12.29678"	48.568	BM-IWAI-17 (2013)
03	IWAI BM GDV-02	9.83	N17°45'37.29972"	E80°53'03.95847"	54.183	IWAI BM GDV-01
04	IWAI BM GDV-03	20.73	N17°50'50.54937"	E80°53'00.31946"	63.387	IWAI BM GDV-02
05	IWAI BM GDV-04	30.58	N17°56'02.11242"	E80°53'41.44123"	61.458	IWAI BM GDV-03
06	IWAI BM GDV-05	39.43	N17°59'51.80410"	E80°50'45.33186"	62.340	IWAI BM GDV-04
07	IWAI BM GDV-06	52.00	N18°03'16.37856"	E80°47'19.35688"	60.181	IWAI BM GDV-05
08	IWAI BM GDV-07	57.33	N18°07'27.49350"	E80°47'19.35688"	70.785	IWAI BM GDV-06



Sl. No.	Station	Chainage (km)	Latitude	Longitude	BM height above MSL (m)	Reference
09	IWAI BM GDV-08	72.12	N18°12'09.37541"	E80°40'10.84797"	64.187	IWAI BM GDV-07
10	IWAI BM GDV-09	82.20	N18°15'52.06412"	E80°35'52.02881"	65.226	IWAI BM GDV-08
11	IWAI BM GDV-10	96.07	N18°18'27.34790"	E80°30'48.45790"	69.884	IWAI BM GDV-09
12	IWAI BM GDV-11	103.53	N18°21'51.14480"	E80°28'17.91930"	72.247	IWAI BM GDV-10
13	IWAI BM GDV-12	117.00	N18°27'31.54834"	E80°28'22.51289"	72.942	IWAI BM GDV-11
14	IWAI BM GDV-13	127.19	N18°29'05.51905"	E80°23'31.74818"	76.765	IWAI BM GDV-12
15	IWAI BM GDV-14	136.63	N18°32'52.97768"	E80°23'22.71667"	81.950	IWAI BM GDV-13
16	IWAI BM GDV-15	146.37	N18°36'20.19104"	E80°21'37.41416"	84.821	IWAI BM GDV-14
17	IWAI BM GDV-16	158.00	N18°40'15.56775"	E80°19'06.72022"	89.665	IWAI BM GDV-15
18	IWAI BM GDV-17	169.10	N18°42'35.05847"	E80°14'33.98361"	92.943	IWAI BM GDV-16
19	IWAI BM GDV-18	180.06	N18°42'52.32624"	E80°09'06.78347"	92.155	IWAI BM GDV-17
20	IWAI BM GDV-19	189.16	N18°42'29.45916"	E80°05'31.29493"	93.983	IWAI BM GDV-18
21	IWAI BM GDV-20	201.34	N18°46'04.35483"	E80°01'18.56699"	92.306	IWAI BM GDV-19
22	IWAI BM GDV-21	211.00	N18°48'14.00859"	E79°57'14.00992"	100.110	IWAI BM GDV-20
23	IWAI BM GDV-22	220.11	N18°49'10.78664"	E79°52'39.45701"	105.558	IWAI BM GDV-21
24	IWAI BM GDV-23	231.12	N18°50'33.13888"	E79°49'52.92878"	103.219	IWAI BM GDV-22
25	IWAI BM GDV-24	243.00	N18°45'51.27953"	E79°49'48.85322"	110.571	IWAI BM GDV-23
26	IWAI BM GDV-25	253.60	N18°41'43.53382"	E79°47'52.12700"	115.954	IWAI BM GDV-24
27	IWAI BM GDV-26	263.88	N18°40'54.91753"	E79°42'35.51484"	122.575	IWAI BM GDV-25
28	IWAI BM GDV-27	274.28	N18°42'56.50753"	E79°38'35.96895"	124.772	IWAI BM GDV-26
29	IWAI BM GDV-28	283.28	N18°45'24.41696"	E79°34'27.07525"	127.567	IWAI BM GDV-27
30	IWAI BM GDV-29	293.25	N18°47'46.29245"	E79°30'08.33567"	132.028	IWAI BM GDV-28
31	IWAI BM GDV-30	302.11	N18°51'05.69813"	E79°26'19.00318"	130.954	IWAI BM GDV-29
32	IWAI BM GDV-31	310.51	N18°51'03.74117"	E79°21'47.84192"	143.010	IWAI BM GDV-30
33	IWAI BM GDV-32	322.35	N18°49'55.37747"	E79°16'43.59923"	146.402	IWAI BM GDV-31
34	IWAI BM GDV-33	331.68	N18°52'14.78463"	E79°12'05.99097"	147.899	IWAI BM GDV-32
35	IWAI BM GDV-34	343.02	N18°55'46.92027"	E79°07'35.20141"	151.813	IWAI BM GDV-33
36	IWAI BM GDV-35	351.73	N18°59'44.81483"	E79°05'35.92607"	160.707	IWAI BM GDV-34
37	IWAI BM GDV-36	361.94	N19°03'56.32027"	E79°02'17.20798"	165.357	IWAI BM GDV-35
38	IWAI BM GDV-37	372.06	N19°04'39.28465"	E78°56'55.52862"	174.711	IWAI BM GDV-36
39	IWAI BM GDV-38	382.91	N19°03'09.65421"	E78°52'51.78189"	185.700	IWAI BM GDV-37
40	IWAI BM GDV-39	393.76	N19°02'59.93484"	E78°47'52.26974"	195.301	IWAI BM GDV-38
41	IWAI BM GDV-40	405.00	N19°01'58.65123"	E78°42'50.19536"	227.510	IWAI BM GDV-39
42	IWAI BM GDV-41	416.39	N18°58'25.17414"	E78°38'13.02849"	239.145	IWAI BM GDV-40

Sl. No.	Station	Chainage (km)	Latitude	Longitude	BM height above MSL (m)	Reference
43	IWAI BM GDV-42	427.36	N18°57'47.07704"	E78°33'34.13418"	284.522	IWAI BM GDV-41
44	IWAI BM GDV-43	437.32	N18°58'13.91676"	E78°29'29.50748"	288.336	IWAI BM GDV-42
45	IWAI BM GDV-44	447.79	N18°59'37.98390"	E78°24'49.24075"	300.674	IWAI BM GDV-43
46	IWAI BM GDV-45	457.28	N18°57'44.81693"	E78°21'04.49904"	317.030	IWAI BM GDV-44
47	IWAI BM GDV-46	469.23	N18°59'27.80708"	E78°18'41.78310"	338.507	IWAI BM GDV-45
48	IWAI BM GDV-47	478.32	N19°02'01.58373"	E78°12'33.34996"	336.808	IWAI BM GDV-46
49	IWAI BM GDV-48	490.00	N18°59'01.14521"	E78°07'42.39688"	333.557	IWAI BM GDV-47
50	IWAI BM GDV-49	498.95	N18°56'32.55535"	E78°02'55.34790"	335.669	IWAI BM GDV-48
51	IWAI BM GDV-50	510.54	N18°53'02.34955"	E77°59'59.54898"	336.507	IWAI BM GDV-49
52	IWAI BM GDV-51	520.89	N18°49'19.47607"	E77°56'20.58238"	340.455	IWAI BM GDV-50
53	IWAI BM GDV-52	531.13	N18°50'15.91747"	E77°51'03.00893"	341.297	IWAI BM GDV-51
54	IWAI BM GDV-53	540.69	N18°52'08.73102"	E77°46'36.67744"	342.224	IWAI BM GDV-52
55	IWAI BM GDV-54	552.58	N18°53'57.37645"	E77°40'54.15066"	343.294	IWAI BM GDV-53
56	IWAI BM GDV-55	563.75	N18°55'51.79051"	E77°36'04.46215"	341.678	IWAI BM GDV-54
57	IWAI BM GDV-56	574.72	N18°59'45.23322"	E77°32'26.54250"	348.690	IWAI BM GDV-55
58	IWAI BM GDV-57	584.69	N19°01'58.33586"	E77°28'10.61433"	346.961	IWAI BM GDV-56
59	IWAI BM GDV-58	593.88	N19°05'04.76481"	E77°24'13.34955"	353.639	IWAI BM GDV-57
60	IWAI BM GDV-59	603.58	N19°09'13.52444"	E77°24'29.00902"	356.538	IWAI BM GDV-58
61	IWAI BM GDV-60	613.54	N19°08'26.11321"	E77°19'38.11218"	350.391	IWAI BM GDV-59
62	IWAI BM GDV-61	623.56	N19°07'24.43956"	E77°15'54.95316"	357.745	IWAI BM GDV-60
63	IWAI BM GDV-62	634.35	N19°07'13.51638"	E77°10'36.16333"	362.694	IWAI BM GDV-61
64	IWAI BM GDV-63	643.83	N19°04'35.84951"	E77°07'48.82017"	357.261	IWAI BM GDV-62
65	IWAI BM GDV-64	652.34	N19°05'35.87864"	E77°06'06.87026"	364.719	IWAI BM GDV-63
66	IWAI BM GDV-65	661.82	N19°06'28.07144"	E77°03'33.63021"	374.337	IWAI BM GDV-64
67	IWAI BM GDV-66	671.13	N19°05'33.42112"	E77°00'44.54894"	372.499	IWAI BM GDV-65
68	IWAI BM GDV-67	679.69	N19°04'34.95972"	E76°57'30.57821"	371.871	IWAI BM GDV-66
69	IWAI BM GDV-68	689.61	N19°03'44.51253"	E76°53'06.78712"	374.929	IWAI BM GDV-67
70	IWAI BM GDV-69	699.21	N19°02'33.14676"	E76°49'42.61649"	374.153	IWAI BM GDV-68
71	IWAI BM GDV-70	709.36	N19°00'38.45713"	E76°47'37.07934"	374.193	IWAI BM GDV-69
72	IWAI BM GDV-71	720.40	N19°00'51.42467"	E76°44'54.99062"	374.599	IWAI BM GDV-70
73	IWAI BM GDV-72	729.89	N19°00'00.54706"	E76°41'07.28602"	378.890	IWAI BM GDV-71
74	IWAI BM GDV-73	739.38	N19°01'43.60932"	E76°38'10.01400"	383.080	IWAI BM GDV-72
75	IWAI BM GDV-74	748.25	N19°04'42.71648"	E76°36'28.40118"	387.182	IWAI BM GDV-73
76	IWAI BM GDV-75	758.29	N19°06'37.70075"	E76°32'08.12346"	387.031	IWAI BM GDV-74

Sl. No.	Station	Chainage (km)	Latitude	Longitude	BM height above MSL (m)	Reference
77	IWAI BM GDV-76	767.30	N19°04'25.82304"	E76°28'33.23417"	386.582	IWAI BM GDV-75
78	IWAI BM GDV-77	777.24	N19°05'54.87997"	E76°26'09.46102"	388.213	IWAI BM GDV-76
79	IWAI BM GDV-78	788.11	N19°07'12.96382"	E76°21'40.01342"	390.075	IWAI BM GDV-77
80	IWAI BM GDV-79	797.18	N19°07'50.61025"	E76°19'50.16782"	389.749	IWAI BM GDV-78
81	IWAI BM GDV-80	806.07	N19°11'35.77959"	E76°21'10.28018"	398.248	IWAI BM GDV-79
82	IWAI BM GDV-81	816.43	N19°15'22.12590"	E76°19'19.43390"	393.934	IWAI BM GDV-80
83	IWAI BM GDV-82	826.33	N19°14'35.83481"	E76°14'43.44407"	402.998	IWAI BM GDV-81
84	IWAI BM GDV-83	835.04	N19°17'05.94282"	E76°11'56.58340"	401.715	IWAI BM GDV-82
85	IWAI BM GDV-84	844.86	N19°18'06.19172"	E76°08'05.03316"	410.707	IWAI BM GDV-83
86	IWAI BM GDV-85	855.56	N19°17'08.36801"	E76°03'50.27101"	414.970	IWAI BM GDV-84
87	IWAI BM GDV-86	865.23	N19°20'25.14017"	E76°01'10.50143"	410.225	IWAI BM GDV-85
88	IWAI BM GDV-87	874.57	N19°17'50.67538"	E75°56'43.88942"	418.712	IWAI BM GDV-86
89	IWAI BM GDV-88	884.53	N19°21'19.66517"	E75°54'34.80314"	417.978	IWAI BM GDV-87
90	IWAI BM GDV-89	894.63	N19°23'01.18940"	E75°52'15.86636"	421.831	IWAI BM GDV-88
91	IWAI BM GDV-90	904.81	N19°24'04.76961"	E75°47'09.68807"	423.289	IWAI BM GDV-89
92	IWAI BM GDV-91	914.12	N19°21'36.00971"	E75°43'57.42634"	430.944	IWAI BM GDV-90
93	IWAI BM GDV-92	921.71	N19°22'09.75009"	E75°40'19.39076"	428.250	IWAI BM GDV-91
94	IWAI BM GDV-93	932.71	N19°22'49.16049"	E75°35'03.13257"	437.921	IWAI BM GDV-92
95	IWAI BM GDV-94	941.91	N19°25'04.44713"	E75°31'06.07312"	436.065	IWAI BM GDV-93
96	IWAI BM GDV-95	951.86	N19°25'01.12704"	E75°27'26.22639"	442.559	IWAI BM GDV-94
97	IWAI BM GDV-96	961.84	N19°28'13.22107"	E75°24'32.90856"	442.004	IWAI BM GDV-95
98	IWAI BM GDV-97	969.61	N19°30'56.38568"	E75°22'24.91678"	465.920	IWAI BM GDV-96
99	IWAI BM GDV-98	980.14	N19°32'16.12690"	E75°16'35.93017"	465.884	IWAI BM GDV-97
100	IWAI BM GDV-99	987.00	N19°35'04.54962"	E75°14'54.33072"	470.098	IWAI BM GDV-98
101	IWAI BM GDV-100	1001.58	N19°36'52.22542"	E75°07'42.43715"	467.425	IWAI BM GDV-99
102	IWAI BM GDV-101	1008.83	N19°36'30.54005"	E75°03'25.03194"	466.467	IWAI BM GDV-100
103	IWAI BM GDV-102	1018.75	N19°38'17.45643"	E74°59'13.53428"	470.895	IWAI BM GDV-101
104	IWAI BM GDV-103	1027.67	N19°38'55.27740"	E74°55'05.66720"	469.834	IWAI BM GDV-102
105	IWAI BM GDV-104	1037.15	N19°38'49.86793"	E74°50'58.68894"	469.204	IWAI BM GDV-103
106	IWAI BM GDV-105	1046.72	N19°42'14.82100"	E74°48'22.16318"	471.751	IWAI BM GDV-104
107	IWAI BM GDV-106	1057.62	N19°45'10.67648"	E74°44'46.45877"	471.849	IWAI BM GDV-105
108	IWAI BM GDV-107	1069.61	N19°46'33.91139"	E74°40'16.85541"	481.905	IWAI BM GDV-106
109	IWAI BM GDV-108	1079.46	N19°46'23.43309"	E74°35'53.81602"	486.023	IWAI BM GDV-107
110	IWAI BM GDV-109	1090.56	N19°50'19.34861"	E74°32'39.34602"	492.457	IWAI BM GDV-108

Sl. No.	Station	Chainage (km)	Latitude	Longitude	BM height above MSL (m)	Reference
111	IWAI BM GDV-110	1101.28	N19°52'41.70321"	E74°28'50.48175"	491.780	IWAI BM GDV-109
112	IWAI BM GDV-111	1111.13	N19°54'15.66522"	E74°25'03.95807"	498.735	IWAI BM GDV-110
113	IWAI BM GDV-112	1121.05	N19°56'09.82108"	E74°20'43.75205"	503.204	IWAI BM GDV-111
114	IWAI BM GDV-113	1132.71	N19°57'48.39077"	E74°15'35.96674"	509.287	IWAI BM GDV-112
115	IWAI BM GDV-114	1144.50	N19°59'20.67931"	E74°09'35.37740"	514.527	IWAI BM GDV-113
116	IWAI BM GDV-115	1154.46	N20°02'05.43769"	E74°05'32.75909"	532.857	IWAI BM GDV-114
117	IWAI BM GDV-116	1164.51	N20°02'17.19434"	E74°02'02.94077"	534.303	IWAI BM GDV-115
118	IWAI BM GDV-117	1176.23	N19°59'02.57014"	E73°58'47.93196"	535.021	IWAI BM GDV-116
119	IWAI BM GDV-118	1189.18	N19°59'43.45367"	E73°54'00.36299"	548.467	IWAI BM GDV-117
120	IWAI BM GDV-119	1200.78	N20°00'01.46099"	E73°48'39.64583"	557.632	IWAI BM GDV-118

*Table 5 - Accepted station coordinates (WGS-84)*

The details of horizontal and vertical control established and methodology followed for the conduct of survey is placed at Annexure-8.

## 2.3 Tidal Influence Zone and Tidal Variation

The survey stretch of Bhadrachalam Bridge to Nashik i.e. from downstream to upstream respectively is nontidal zone. In the full stretch, both Topographic and Hydrographic survey had been conducted. There was no tidal effect in the areas where Hydrographic survey was conducted.

### 2.3.1 Methodology to fix Chart Datum / Sounding Datums

The Godavari River is 1201.6 km stretch which is between Bhadrachalam to Nashik. As instructed by IWAI, datum value in the non-tidal region is required to be fixed as Average Lowest Water Level of last five years data received from CWC gauge stations. In our area of interest, the CWC gauges are located at Bhadrachalam, Dummagudem, Perur, Kaleswaram, Mancherial, Sri Ram Sagar, Basar, Babli, Yelli, Nanded, Phalla, G.R. Bridge, Dhalegaon, Jayakwadi Dam, Kopergaon, Chass, and Nashik.

The details of CWC gauges provided by IWAI had been used for cross checking our data collected during the course of the survey. Where ever the Topographic survey had been conducted the collected data is used for achieving Chart Datum on the basis of Least MSL obtained in that stretch. For the stretch where Hydrographic Survey had

been conducted the CD was defined by using CD of CWC gauges, water level MSL on Tide Gauges and Minimum Drawn Down Level (MDDL) of Dam/Barrage. The achieved CD has been cross-checked for accuracy at the gauge stations.

### 2.3.2 Sounding Datum

The established CWC Chart Datum values are available for the survey stretch of the Godavari River. Wherever the river found to be dry, it is divided into smaller stretches according to the slope of the river and the least MSL value obtained by topographic survey methodology. For the stretch where Hydrographic Survey had been carried out, the datum is fixed using CD of CWC gauges, lowest water level MSL on Tide Gauges and Minimum Drawn Down Level (MDDL) of Dam/Barrage. The achieved CD has been cross-checked for accuracy at the gauge stations. The defined CD was considered for the Dredging Volume calculations.

### 2.4 Average of 06 years minimum Water Levels to be used

Godavari River is non-tidal water body having the primary source of water receiving from various Dams present in respective stretches. Detailed attempt for obtaining the HFL and LFL of Godavari River was carried out and co-related it to the nearest CWC gauge data available for the river, which was obtained from CWC. There are CWC Bhadrachalam (Ch. -0.880km), Dummagudem (Ch. 19.635km), Perur (Ch. 140.376km), Kaleswaram (Ch. 213.990km), Mancherial (Ch. 300.156km), Sri Ram Sagar (Ch. 453.871km), Basar (Ch. 509.044km), Babli (Ch. 532.069km), Yelli (Ch. 582.792 km), Nanded (Ch. 610.545km), Phalla (Ch. 666.240km), G.R. Bridge (Ch. 718.730km), Dhalegaon (Ch. 805.141km), Jayakwadi Dam (Ch. 963.6km), Kopergaon (Ch. 1094.866km), Chass (Ch. 1124.239km), and Nashik (Ch. 1195.977km) water level data of Godavari River for the average of last 6 years.

<b>BHADRACHALAM CWC GAUGE 2009-15</b>							
<b>WL values in m.</b>							
	2009	2010	2011	2012	2013	2014	2015
Min/Max							
Jan Min.	33.56	33.65	34.12	33.94	33.93	34.29	33.94
Jan Max.	33.69	33.85	34.42	34.23	34.08	34.69	34.23
Feb Min.	33.46	33.43	34.01	33.88	33.83	34.16	33.86
Feb Max.	33.56	33.63	34.19	34.01	34.02	34.38	34.15
Mar Min.	33.22	33.35	33.86	33.68	33.77	34.04	33.79
Mar Max.	33.47	33.55	34.21	33.87	33.96	34.76	34.09
Apr Min.	33.21	32.81	33.66	33.52	33.66	33.85	33.53
Apr Max.	33.31	33.37	33.86	33.69	33.75	34.29	33.98
May Min.	33.19	<b>32.77</b>	33.52	33.41	33.5	33.83	<b>33.5</b>
May Max.	33.31	33.81	33.78	33.52	33.67	34.41	33.77
Jun Min.	<b>33.13</b>	33.16	<b>33.47</b>	<b>33.41</b>	<b>33.46</b>	<b>33.72</b>	
Jun Max.	33.22	34.61	34.81	35.36	42.77	34.12	
Jul Min.	33.16	34.31	34.8	34.18	36.69	33.81	



Jul Max.	40.23	43.37	38.4	41.73	49.49	43.78	
Aug Min.	35.01	38.97	35.71	37.61	39.67	36.27	
Aug Max.	41.39	50.14	41.17	46.43	50.96	40.8	
Sep Min.	34.93	38.67	36.9	37.9	37.5	36.63	
Sep Max.	40.3	49.45	44.96	45.59	42.06	48.7	
Oct Min.	34.25	36.09	34.95	35.33	36.91	35.35	
Oct Max.	35.61	38.25	36.69	39.45	42.16	37.97	
Nov Min.	34.03	35.22	34.32	34.51	35.22	34.51	
Nov Max.	35.73	36.56	34.93	37.73	37.99	35.32	
Dec Min.	33.63	34.44	34	34.09	34.58	34.065	
Dec Max.	34.625	46.61	34.34	34.49	35.2	34.57	
Yearly Min.	33.13	32.77	33.47	33.41	33.46	33.72	33.5
Yearly Max.	41.39	50.14	44.96	46.43	50.96	48.7	34.23
6yr. Min.	<b>32.77</b>						
6yr. Max.	<b>50.96</b>						
6yr. Ave. Min.	<b>33.388</b>						
6yr. Ave. Max.	<b>47.097</b>						
<b>Value of Chart Datum (CD) adopted</b>					<b>33.388</b>		

Table 6 - Bhadrachalam Gauge Data from 2009-15

<b>DUMMAGUDEM CWC GAUGE 2009-15</b>							
<b>WL values in m.</b>							
Min/Max	2009	2010	2011	2012	2013	2014	2015
Jan Min.	43.6	43.64	43.71	43.35	43.57	44.2	43.74
Jan Max.	43.76	43.81	44	43.76	43.68	44.33	43.87
Feb Min.	43.5	43.51	43.36	43.21	43.54	43.91	43.72
Feb Max.	43.6	43.68	43.69	43.5	43.71	44.2	43.82
Mar Min.	43.35	43.42	43.34	42.66	43.49	43.85	43.69
Mar Max.	43.5	43.6	43.64	43.14	43.67	44.35	43.84
Apr Min.	43.32	43.2	43.22	42.56	43.43	43.56	43.51
Apr Max.	43.4	43.42	43.44	<b>42.65</b>	43.56	44.1	43.68
May Min.	43.19	<b>43.19</b>	43.07	42.64	43.25	43.55	<b>43.47</b>
May Max.	43.32	43.35	43.35	42.76	43.42	43.7	43.65
Jun Min.	<b>43.18</b>	43.23	<b>43</b>	42.62	<b>43.24</b>	<b>42.9</b>	
Jun Max.	43.18	44.14	44.52	44.9	49.8	43.74	
Jul Min.	43.19	43.97	44.36	43.9	45.63	43.62	
Jul Max.	48.18	50.08	46.96	49.28	50.85	50.78	
Aug Min.	44.49	47.17	44.9	46.62	47.52	45.61	
Aug Max.	48.82	56.23	48.73	52.84	56.75	48.5	
Sep Min.	44.43	46.89	45.75	46.46	46	45.43	
Sep Max.	48.16	55.43	51.31	52.07	49.27	55.25	
Oct Min.	43.95	45.1	44.35	44.75	45.87	44.67	
Oct Max.	44.99	46.63	45.61	47.59	49.35	45.58	
Nov Min.	43.72	44.56	43.87	44.1	44.58	44.18	
Nov Max.	45.08	45.44	44.34	45.8	46.57	44.66	
Dec Min.	43.66	44.01	43.42	43.7	44.2	43.88	
Dec Max.	44.35	44.64	43.92	44.08	44.56	44.16	
Yearly Min.	43.18	43.19	43	42.56	43.24	42.9	43.47
Yearly Max.	48.82	56.23	51.31	52.84	56.75	55.25	43.87
6yr. Min.	<b>42.56</b>						
6yr. Max.	<b>56.75</b>						
6yr. Ave. Min.	<b>43.06</b>						

<b>DUMMAGUEDEM CWC GAUGE 2009-15</b>	
<b>WL values in m.</b>	
6yr. Ave. Max.	<b>53.533</b>
<b>Value of Chart Datum (CD) adopted</b>	<b>43.06</b>

*Table 7 - Dummagudem Gauge Data from 2009-15*

<b>PERUR CWC GAUGE 2009-15</b>							
<b>WL values in m.</b>							
Min/Max	2009	2010	2011	2012	2013	2014	2015
Jan Min.	70.39	70	70.71	69.99	69.8	70.01	69.79
Jan Max.	70.47	70.1	71.02	70.39	70.04	70.33	70.05
Feb Min.	70.3	69.83	70.63	69.82	69.74	69.84	69.67
Feb Max.	70.39	70	70.89	70.1	69.97	70.15	69.9
Mar Min.	70.11	69.71	70.48	69.65	69.57	69.84	69.6
Mar Max.	70.29	69.92	70.9	69.8	69.85	70.73	69.83
Apr Min.	69.96	69.55	70.32	69.57	69.36	69.59	69.43
Apr Max.	70.14	69.71	70.53	69.67	69.58	69.9	69.58
May Min.	69.76	<b>69.51</b>	70.17	69.46	<b>69.18</b>	69.56	<b>69.33</b>
May Max.	69.95	69.64	70.38	69.57	69.46	69.77	69.53
Jun Min.	<b>69.75</b>	69.6	70.16	<b>69.41</b>	69.19	<b>69.42</b>	
Jun Max.	69.91	70.98	71.72	71.84	79.22	69.65	
Jul Min.	69.91	70.93	71.27	70.25	73.15	69.62	
Jul Max.	77.02	79.18	74.96	78	83.86	79.84	
Aug Min.	71.25	74.44	71.91	73.94	76.04	71.92	
Aug Max.	77.75	83.79	77.91	81.48	85.08	76.55	
Sep Min.	71.22	74.7	73.11	74.2	73.55	72.36	
Sep Max.	75.98	83.28	80.93	81.25	78.53	83.65	
Oct Min.	70.51	72.53	71.04	71.36	72.81	71.24	
Oct Max.	72.17	74.6	72.59	75.45	78.62	74.42	
Nov Min.	70.3	71.76	70.34	70.37	70.87	70.28	
Nov Max.	72.29	72.79	71.06	71.83	73.6	71.19	
Dec Min.	69.94	71.02	<b>70.03</b>	69.98	70.34	69.83	
Dec Max.	70.5	71.73	70.34	70.39	70.84	70.24	
Yearly Min.	69.75	69.51	70.03	69.41	69.18	69.42	69.33
Yearly Max.	77.75	83.79	80.93	81.48	85.08	83.65	70.05
6yr. Min.	<b>69.18</b>						
6yr. Max.	<b>85.08</b>						
6yr. Ave. Min.	<b>69.48</b>						
6yr. Ave. Max.	<b>82.113</b>						
<b>Value of Chart Datum (CD) adopted</b>	<b>69.48</b>						

*Table 8 - Perur Gauge Data from 2009-15*

<b>Kaleshwaram CWC GAUGE 2009-15</b>							
<b>WL values in m.</b>							
Min/Max	2009	2010	2011	2012	2013	2014	2015
Jan Min.	92.9	92.92	93.51	93.28	93.39	93.68	93.28
Jan Max.	93.05	93.07	93.67	93.65	93.64	93.98	93.61
Feb Min.	92.94	92.86	93.47	93.12	93.34	93.57	93.33
Feb Max.	93	93.05	93.66	93.43	93.62	93.84	93.61
Mar Min.	92.88	92.86	93.39	92.85	93.28	93.55	93.24
Mar Max.	93.01	93.04	93.67	93.1	93.52	93.99	93.64

Kaleshwaram CWC GAUGE 2009-15							
WL values in m.							
Apr Min.	92.79	92.7	93.25	92.68	93.04	93.19	92.98
Apr Max.	92.9	92.85	93.39	92.95	93.29	93.64	93.22
May Min.	<b>92.7</b>	<b>92.63</b>	<b>93.12</b>	92.54	<b>92.84</b>	93.12	<b>92.95</b>
May Max.	92.86	92.87	93.29	92.67	93.02	93.4	93.38
Jun Min.	92.75	92.71	93.21	<b>92.5</b>	92.87	<b>93.04</b>	
Jun Max.	93.01	93.42	94.29	94.55	100.47	93.35	
Jul Min.	93.06	93.39	93.88	93.18	94.54	93.21	
Jul Max.	99.02	99.74	97.34	99.4	104.34	101.18	
Aug Min.	93.48	96.69	94.58	95.65	98.09	94.66	
Aug Max.	97.78	102.69	99.09	101.04	104.48	97.65	
Sep Min.	93.56	96.76	94.97	95.77	95.93	94.38	
Sep Max.	97.11	103.79	101.01	102.05	99.48	101.84	
Oct Min.	93.26	94.77	94.05	94.2	95.58	93.9	
Oct Max.	94.57	96.64	94.73	97.16	99.95	94.55	
Nov Min.	93.22	94.18	93.61	93.68	94.25	93.51	
Nov Max.	95.29	94.99	94.04	94.46	95.71	94	
Dec Min.	92.99	93.66	93.37	93.49	94.02	93.28	
Dec Max.	94.19	94.15	93.58	93.7	94.24	93.63	
Yearly Min.	92.7	92.63	93.12	92.5	92.84	93.04	92.95
Yearly Max.	99.02	103.79	101.01	102.05	104.48	101.84	93.64
6yr. Min.	<b>92.5</b>						
6yr. Max.	<b>104.48</b>						
6yr. Ave. Min.	<b>92.847</b>						
6yr. Ave. Max.	<b>102.032</b>						
<b>Value of Chart Datum (CD) adopted</b>					<b>92.847</b>		

Table 9 - Kaleshwaram Gauge Data from 2009-15

Mancherial CWC GAUGE 2009-15							
WL values in m.							
Min/Max	2009	2010	2011	2012	2013	2014	2015
Jan Min.	125.186	125.026	125.566	125.106	124.986	125.036	125.166
Jan Max.	125.266	125.196	125.666	125.196	125.316	125.236	125.216
Feb Min.	125.216	124.906	125.586	125.046	124.986	125.026	125.116
Feb Max.	125.446	125.026	125.796	125.106	125.296	125.226	125.166
Mar Min.	125.266	124.786	125.556	125.036	125.266	125.016	124.956
Mar Max.	125.406	124.906	125.796	125.056	125.316	125.696	125.046
Apr Min.	125.196	124.496	125.466	124.976	125.086	125.026	124.866
Apr Max.	125.286	124.786	125.566	125.036	125.266	125.236	124.966
May Min.	125.136	<b>124.456</b>	125.326	124.966	124.816	125.116	<b>124.836</b>
May Max.	125.226	124.486	125.536	125.016	125.086	125.576	124.856
Jun Min.	<b>124.976</b>		125.226	<b>124.936</b>	<b>124.816</b>	125.116	
Jun Max.	126.071		125.326	125.226	125.786	125.116	
Jul Min.	125.296	124.816	125.246	125.056	125.416	125.116	
Jul Max.	125.886	127.551	125.966	125.961	129.756	125.226	
Aug Min.	125.106	126.081	125.836	125.306	125.976	125.016	
Aug Max.	126.166	129.181	127.676	126.636	129.591	125.246	
Sep Min.	125.366	127.021	125.986	125.886	125.766	125.166	
Sep Max.	126.716	131.301	127.521	127.376	128.656	127.681	
Oct Min.	125.286	126.296	125.656	125.516	125.776	125.016	
Oct Max.	125.751	127.416	125.936	126.876	127.566	125.576	

<b>Mancherial CWC GAUGE 2009-15</b>							
<b>WL values in m.</b>							
Nov Min.	125.276	125.966	125.466	125.156	125.596	<b>124.996</b>	
Nov Max.	125.316	126.556	125.646	125.706	125.756	125.226	
Dec Min.	125.196	125.666	<b>125.206</b>	125.166	125.166	124.996	
Dec Max.	125.366	126.016	125.456	125.416	125.596	125.266	
Yearly Min.	124.976	124.456	125.206	124.936	124.816	124.996	124.836
Yearly Max.	126.716	131.301	127.676	127.376	129.756	127.681	125.216
6yr. Min.	<b>124.456</b>						
6yr. Max.	<b>131.301</b>						
6yr. Ave. Min.	<b>124.874</b>						
6yr. Ave. Max.	<b>128.418</b>						
<b>Value of Chart Datum (CD) adopted</b>					<b>124.874</b>		

Table 10 - Mancherial Gauge Data from 2009-15

<b>SRI RAM SAGAR CWC GAUGE 2010-15</b>							
<b>WL values in m.</b>							
Min/Max	2010	2011	2012	2013	2014	2015	
Jan Min.		330.708			331.074	323.88	
Jan Max.		332.08			332.232	324.033	
Feb Min.		329.245	326.502		329.489	323.484	
Feb Max.		330.647	328.635		331.013	323.88	
Mar Min.		326.593	323.728		327.721	323.118	
Mar Max.		329.184	326.502		329.458	323.423	
Apr Min.		323.85	321.991		326.014	322.631	
Apr Max.		326.502	323.728		327.63	323.118	
May Min.		323.423	<b>320.924</b>		325.709	<b>322.478</b>	
May Max.		323.82	321.991		326.014	322.57	
Jun Min.	<b>318.943</b>	<b>323.118</b>			325.374		
Jun Max.	319.248	323.393			325.709		
Jul Min.	318.943			<b>322.052</b>	325.283		
Jul Max.	327.721			332.293	325.435		
Aug Min.	328.087	327.447		332.354	325.039		
Aug Max.	332.384	332.537		332.537	325.283		
Sep Min.		332.354		332.323	325.252		
Sep Max.		332.537		332.537	326.41		
Oct Min.	332.415	331.44		332.537	325.313		
Oct Max.	332.537	332.476		332.537	326.41		
Nov Min.	332.537	330.738		332.537	324.917		
Nov Max.	332.537	331.44		332.537	325.313		
Dec Min.	332.08	330.251		332.262	<b>324.033</b>		
Dec Max.	332.537	330.738		332.537	324.917		
Yearly Min.	318.943	323.118	320.924	322.052	324.033	322.478	
Yearly Max.	332.537	332.537	328.635	332.537	332.232	324.033	
6yr. Min.	<b>318.943</b>						
6yr. Max.	<b>332.537</b>						
6yr. Ave. Min.	<b>321.925</b>						
6yr. Ave. Max.	<b>331.696</b>						
<b>Value of Chart Datum (CD) adopted</b>					<b>321.925</b>		

Table 11 - Sri Ram Sagar Gauge Data from 2010-15

<b>Basar CWC GAUGE 1976-82</b>							
<b>WL values in m.</b>							
Min/Max	1976	1977	1978	1979	1980	1981	1982
Jan Min.	323.158	323.008	323.113	322.953	322.853	323.043	323.073
Jan Max.	323.413	323.098	323.218	323.153	323.058	323.428	323.278
Feb Min.	323.023	323.018	323.003	322.903	322.913	322.913	322.948
Feb Max.	323.158	323.143	323.258	323.203	323.833	323.153	323.088
Mar Min.	322.903	322.803	322.818	322.728	322.588	322.638	322.828
Mar Max.	323.078	323.108	323.263	323.078	323.838	323.103	323.063
Apr Min.	322.733	322.603	322.723	322.583	<b>322.413</b>	322.573	322.773
Apr Max.	322.863	322.793	322.843	322.733	322.738	322.873	322.983
May Min.	<b>322.603</b>	<b>322.523</b>	<b>322.703</b>	<b>322.583</b>	322.563	<b>322.563</b>	<b>322.713</b>
May Max.	322.798	322.733	323.038	323.283	322.693	323.013	323.063
Jun Min.	322.663	322.578	322.798	322.628	322.663	322.918	322.818
Jun Max.	324.313	324.453	327.553	324.753	325.543	323.513	324.258
Jul Min.	323.588	323.228	323.178	322.758	323.268	323.013	323.098
Jul Max.	332.953	326.213	328.833	327.038	325.993	324.393	326.233
Aug Min.	323.813	323.213	324.023	323.213	324.053	323.553	323.493
Aug Max.	329.693	325.583	330.283	328.723	330.933	327.283	324.583
Sep Min.	323.593	323.308	323.588	323.133	323.888	323.893	
Sep Max.	329.753	329.483	325.073	330.613	333.253	329.653	
Oct Min.	323.323	323.208	323.368	323.338	323.393	323.573	
Oct Max.	323.593	325.883	325.583	327.653	323.898	326.993	
Nov Min.	323.143	323.093	323.143	323.168	323.243	323.268	
Nov Max.	323.348	326.623	323.663	323.608	323.413	323.923	
Dec Min.	323.088	323.223	323.063	323.083	323.133	323.168	
Dec Max.	323.193	325.893	323.278	325.148	323.263	323.303	
Yearly Min.	322.603	322.523	322.703	322.583	322.413	322.563	322.713
Yearly Max.	332.953	329.483	330.283	330.613	333.253	329.653	326.233
6yr. Min.	<b>322.413</b>						
6yr. Max.	<b>333.253</b>						
6yr. Ave. Min.	<b>322.583</b>						
6yr. Ave. Max.	<b>331.04</b>						
<b>Value of Chart Datum (CD) adopted</b>					<b>322.583</b>		

Table 12 - Basar Gauge Data from 1976-82

<b>BABLI CWC GAUGE 1973-78</b>							
<b>WL values in m.</b>							
Min/Max	1973	1974	1974	1975	1976	1977	1978
Jan Min.	305.293	305.783		327.736	327.831	327.621	327.706
Jan Max.	305.448	306.058		327.986	327.966	327.716	327.863
Feb Min.	305.208	305.653		327.861	327.706	327.556	327.596
Feb Max.	305.418	306.083		328.206	327.841	327.701	327.961
Mar Min.	305.108	<b>305.638</b>		327.431	327.541	327.386	327.356
Mar Max.	305.238	306.108		328.466	327.781	327.696	327.876
Apr Min.	<b>305.073</b>	305.803		327.366	327.401	327.206	327.251
Apr Max.	305.103	306.278		327.626	327.511	327.376	327.396
May Min.		306.078		<b>327.346</b>	<b>327.306</b>	<b>327.181</b>	<b>327.241</b>
May Max.		306.493		327.566	327.441	327.776	327.526
Jun Min.	305.493		327.863	327.378	327.396	327.247	
Jun Max.	306.925		329.838	330.636	329.433	329.778	
Jul Min.	305.998		327.796	327.783	328.046	327.938	

<b>BABLI CWC GAUGE 1973-78</b>							
<b>WL values in m.</b>							
Jul Max.	311.933		329.083	330.961	337.631	331.221	
Aug Min.	306.89		327.748	329.361	328.05	327.648	
Aug Max.	317.908		331.416	335.151	334.991	330.926	
Sep Min.	307.028		327.796	330.353	328.116	327.956	
Sep Max.	311.09		329.368	339.321	334.363	334.881	
Oct Min.	306.375		328.243	329.093	327.816	327.776	
Oct Max.	310.43		332.853	335.698	328.158	331.276	
Nov Min.	305.908		327.778	328.216	327.701	327.636	
Nov Max.	306.925		329.066	332.353	327.971	332.818	
Dec Min.	305.735		<b>327.646</b>	327.961	327.686	327.856	
Dec Max.	306.128		327.813	328.238	327.833	330.866	
Yearly Min.	305.073	305.638	327.646	327.346	327.306	327.181	327.241
Yearly Max.	317.908	306.493	332.853	339.321	337.631	334.881	327.961
6yr. Min.	<b>305.073</b>						
6yr. Max.	<b>339.321</b>						
6yr. Ave. Min.	<b>323.726</b>						
6yr. Ave. Max.	<b>328.181</b>						
<b>Value of Chart Datum (CD) adopted</b>					<b>323.726</b>		

Table 13 - Babli Gauge Data from 1973-78

<b>Yelli CWC GAUGE 2009-15</b>							
<b>WL values in m.</b>							
Min/Max	2009	2010	2011	2012	2013	2014	2015
Jan Min.			335.32			335.65	<b>334.3</b>
Jan Max.			335.43			335.77	<b>334.3</b>
Feb Min.			335.18			335.64	<b>334.3</b>
Feb Max.			335.41			335.8	<b>334.3</b>
Mar Min.	<b>334.3</b>		335.19			334.97	<b>334.3</b>
Mar Max.	335.75		335.28			335.75	335.2
Apr Min.			335.25			334.95	<b>334.3</b>
Apr Max.			335.3			335.04	<b>334.3</b>
May Min.			335.24	335		334.92	<b>334.3</b>
May Max.			335.36	335.08		334.95	<b>334.3</b>
Jun Min.			335.33	335.3	334.92	334.3	
Jun Max.			335.4	335.4	335.01	334.3	
Jul Min.	335.43	335.46	335.36		334.93	334.3	
Jul Max.	335.49	342.3	339.075		341.44	334.3	
Aug Min.	335.3	335.66	335.36	335.05	335.43	334.3	
Aug Max.	340.21	342.49	340.94	336.825	340.56	335.52	
Sep Min.	335.45	335.775	335.5	335.1	334.96	334.73	
Sep Max.	338.37	342.08	339.47	338.79	341.545	336.37	
Oct Min.	335.42	335.44	<b>335.12</b>	334.87	335	334.3	
Oct Max.	336.075	338.89	335.5	336.35	338.64	334.82	
Nov Min.	335.35	335.45		<b>334.7</b>	<b>334.88</b>	334.3	
Nov Max.	335.44	336.135		334.95	335.67	334.99	
Dec Min.	335.3	<b>335.38</b>			335.16	<b>334.3</b>	
Dec Max.	335.34	335.51			335.74	334.93	
Yearly Min.	334.3	335.38	335.12	334.7	334.88	334.3	334.3
Yearly Max.	340.21	342.49	340.94	338.79	341.545	336.37	335.2
6yr. Min.	<b>334.3</b>						

<b>Yelli CWC GAUGE 2009-15</b>	
<b>WL values in m.</b>	
6yr. Max.	<b>342.49</b>
6yr. Ave. Min.	<b>334.78</b>
6yr. Ave. Max.	<b>340.058</b>
<b>Value of Chart Datum (CD) adopted</b>	<b>334.78</b>

*Table 14 - Yelli Gauge Data from 2009-2015*

<b>NANDED CWC GAUGE 1988, 1990, 2011-15</b>							
<b>WL values in m.</b>							
Min/Max	1988	1990	2011	2012	2013	2014	2015
Jan Min.				340.77		342	<b>341.8</b>
Jan Max.				340.78		342.05	342
Feb Min.				<b>340.76</b>		341.95	<b>341.8</b>
Feb Max.				340.77		342	<b>341.8</b>
Mar Min.				340.77		341.95	<b>341.8</b>
Mar Max.				340.77		342	342.08
Apr Min.						341.95	341.9
Apr Max.						342.4	342.7
May Min.						342	342
May Max.						342.2	342.6
Jun Min.	<b>340.86</b>	341.12	340.64		<b>340.5</b>	341.95	
Jun Max.	341.7	343	341.04		342.05	342.3	
Jul Min.	340.96	<b>340.9</b>	340.61		342	<b>341.9</b>	
Jul Max.	351.8	341.84	342.9		342.8	344.6	
Aug Min.	341.05	340.98	340.64		342.15	342	
Aug Max.	346.2	351.76	344.15		345.35	343.7	
Sep Min.		341.28	<b>340.57</b>		342.15	342	
Sep Max.		344.4	343.4		342.8	346.1	
Oct Min.			340.8		342.1	342	
Oct Max.			342.46		343.7	342.05	
Nov Min.			340.78		342	342	
Nov Max.			340.8		342.1	342	
Dec Min.			340.77		342	342	
Dec Max.			340.78		342	342	
Yearly Min.	340.86	340.9	340.57	340.76	340.5	341.9	341.8
Yearly Max.	351.8	351.76	344.15	340.78	345.35	346.1	342.7
6yr. Min.				<b>340.5</b>			
6yr. Max.				<b>351.8</b>			
6yr. Ave. Min.				<b>341.072</b>			
6yr. Ave. Max.				<b>346.657</b>			
<b>Value of Chart Datum (CD) adopted</b>						<b>341.072</b>	

*Table 15 - Nanded Gauge Data from 1988, 1990, 2011-2015*

<b>PHALLA CWC GAUGE 1978-84</b>							
<b>WL values in m.</b>							
Min/Max	1978	1979	1980	1981	1982	1983	1984
Jan Min.	357.315	357.105	357.17	357.195	357.1	357.225	357.295
Jan Max.	357.405	357.255	357.275	357.695	357.405	357.505	357.59
Feb Min.	357.275	357.07	357.165	357.115	357.11	357.205	357.25
Feb Max.	357.735	357.215	357.735	357.31	357.325	357.445	357.7

<b>PHALLA CWC GAUGE 1978-84</b>							
<b>WL values in m.</b>							
Mar Min.	357.205	357.025	357.015	357.115	357.11	357.155	357.16
Mar Max.	357.395	357.305	357.805	357.275	357.28	357.33	357.33
Apr Min.	357.115	357.005	356.97	357.035	357.1	357.055	357.135
Apr Max.	357.255	357.09	357.045	357.2	357.22	357.235	357.32
May Min.	357.105	<b>356.955</b>	<b>356.965</b>	<b>357</b>	<b>357.085</b>	<b>357.015</b>	<b>357.105</b>
May Max.	357.225	357.055	357.225	357.225	357.4	357.285	357.355
Jun Min.	357.105	356.955	357.07	357.115	357.19	357.14	357.175
Jun Max.	361.455	357.45	359.585	358.005	358.955	358.02	358.055
Jul Min.	357.23	357	357.445	357.175	357.2	357.295	357.35
Jul Max.	359.945	359.505	360.955	358.585	360.515	361.135	359.735
Aug Min.	357.125	357.14	357.585	357.225	357.18	357.485	357.195
Aug Max.	357.565	360.975	364.365	359.425	357.605	367.465	357.595
Sep Min.	<b>357.025</b>	357.145	357.695	357.415	357.135	358.785	357.295
Sep Max.	358.835	365.035	363.695	362.425	358.445	366.915	361.015
Oct Min.	357.225	357.325	357.425	357.445	357.245	357.845	357.465
Oct Max.	358.295	360.035	358.025	360.185	357.955	366.735	360.675
Nov Min.	357.13	357.24	357.265	357.275	357.215	357.585	357.29
Nov Max.	357.625	357.675	357.48	357.915	357.515	357.855	357.755
Dec Min.	357.135	357.275	357.215	357.18	357.23	357.385	
Dec Max.	357.275	360.135	357.395	357.555	357.45	357.67	
Yearly Min.	357.025	356.955	356.965	357	357.085	357.015	357.105
Yearly Max.	361.455	365.035	364.365	362.425	360.515	367.465	361.015
6yr. Min.	<b>356.955</b>						
6yr. Max.	<b>367.465</b>						
6yr. Ave. Min.	<b>357.021</b>						
6yr. Ave. Max.	<b>363.543</b>						
<b>Value of Chart Datum (CD) adopted</b>				<b>357.021</b>			

Table 16 - Phalla Gauge Data from 1978-84

<b>G.R. Bridge CWC GAUGE 2009-15</b>							
<b>WL values in m.</b>							
Min/Max	2009	2010	2011	2012	2013	2014	2015
Jan Min.	365.4	364.65	365.77	367.8	365.51	369.09	365.7
Jan Max.	365.64	364.89	365.89	368.05	365.96	369.49	366.11
Feb Min.	365.39	364.42	365.82	367.9	365.17	368.6	365.26
Feb Max.	365.67	364.65	365.95	368.19	365.49	369.07	365.68
Mar Min.	365.46	364.13	365.85	367.8		368.58	364.58
Mar Max.	366.25	364.42	366.05	367.99		369.3	365.24
Apr Min.	365.69	<b>364.04</b>	365.92	367.32		368.54	364.22
Apr Max.	366.3	364.11	366.2	367.79		369.17	364.56
May Min.	365.53		365.91	366.39		367.89	<b>364.01</b>
May Max.	366.25		366.14	367.3		368.51	364.21
Jun Min.	365.46		<b>365.77</b>	365.91	<b>364.1</b>	366.71	
Jun Max.	366.6		366.13	366.37	364.73	367.88	
Jul Min.	365.72	364.07	365.87	365.85	364.64	366.1	
Jul Max.	367.315	368.225	367.47	366.305	367.62	366.7	
Aug Min.	365.23	365.94	366.09	<b>365.8</b>	366.01	<b>365.73</b>	
Aug Max.	367.89	367.82	367.65	365.88	368.05	367.555	
Sep Min.	365.56	366.1	366.2	365.88	366.25	367.55	
Sep Max.	367.39	368.36	367.54	368.025	369.58	368.01	



<b>G.R. Bridge CWC GAUGE 2009-15</b>							
<b>WL values in m.</b>							
Oct Min.	365.44	365.86	366.2	366.11	369.09	367.34	
Oct Max.	366.6	366.77	367.67	367.01	369.685	367.8	
Nov Min.	<b>364.33</b>	365.95	367.45	366.48	369.54	366.72	
Nov Max.	364.6	366.02	367.7	366.93	369.655	367.31	
Dec Min.	364.89	365.82	367.52	365.97	369.5	366.13	
Dec Max.	365.41	365.95	367.96	366.45	369.67	366.7	
Yearly Min.	364.33	364.04	365.77	365.8	364.1	365.73	364.01
Yearly Max.	367.89	368.36	367.96	368.19	369.685	369.49	366.11
6yr. Min.	<b>364.01</b>						
6yr. Max.	<b>369.685</b>						
6yr. Ave. Min.	<b>364.908</b>						
6yr. Ave. Max.	<b>368.596</b>						
<b>Value of Chart Datum (CD) adopted</b>					<b>364.908</b>		

Table 17 - G.R. Bridge Gauge Data from 2009-15

<b>DHALEGAON CWC GAUGE 2009-15</b>							
<b>WL values in m.</b>							
Min/Max	2009	2010	2011	2012	2013	2014	2015
Jan Min.	386.695		386.675			386.635	<b>386.575</b>
Jan Max.	386.915		386.715			386.645	<b>386.575</b>
Feb Min.	386.695					386.595	<b>386.575</b>
Feb Max.	386.855					386.635	<b>386.575</b>
Mar Min.	386.675	386.675				386.585	<b>386.575</b>
Mar Max.	386.715	386.875				386.705	<b>386.575</b>
Apr Min.	386.675					386.585	<b>386.575</b>
Apr Max.	386.695					386.605	<b>386.575</b>
May Min.	386.675	386.575					<b>386.575</b>
May Max.	386.985	386.575					<b>386.575</b>
Jun Min.	386.675				<b>386.575</b>	<b>386.575</b>	
Jun Max.	386.675				<b>386.575</b>	<b>386.575</b>	
Jul Min.	386.675	<b>386.575</b>	386.775	<b>386.675</b>	<b>386.575</b>	<b>386.575</b>	
Jul Max.	388.605	390.925	387.755	387.355	387.775	<b>386.575</b>	
Aug Min.	386.675	386.795	386.675	<b>386.675</b>	386.695	<b>386.575</b>	
Aug Max.	389.485	389.65	389.575	<b>386.675</b>	386.875	386.615	
Sep Min.	386.655	386.905	<b>386.245</b>	<b>386.675</b>	386.685	386.675	
Sep Max.	389.345	389.535	389.52	387.265	387.825	386.725	
Oct Min.	<b>386.595</b>	386.835	386.675	386.885	386.655	386.575	
Oct Max.	388.005	388.95	386.895	387.195	387.625	386.675	
Nov Min.		386.805			386.635	386.575	
Nov Max.		387.095			386.645	386.575	
Dec Min.		386.715			386.635	386.575	
Dec Max.		386.795			386.665	386.575	
Yearly Min.	386.595	386.575	386.245	386.675	386.575	386.575	386.575
Yearly Max.	389.485	390.925	389.575	387.355	387.825	386.725	386.575
6yr. Min.	<b>386.245</b>						
6yr. Max.	<b>390.925</b>						
6yr. Ave. Min.	<b>386.537</b>						
6yr. Ave. Max.	<b>388.648</b>						
<b>Value of Chart Datum (CD) adopted</b>					<b>386.537</b>		

Table 18 - Dhalegaon Gauge Data from 2009-15

<b>Jayakwadi Dam CWC GAUGE 2009-15</b>				
<b>WL values in m.</b>				
Min/Max	2001	2002	2013	2014
Jan Min.		457.066		
Jan Max.		457.694		
Feb Min.		456.95		
Feb Max.		457.066		
Mar Min.		456.761		
Mar Max.		456.932		
Apr Min.		455.789		
Apr Max.		456.743		
May Min.		<b>455.447</b>		
May Max.		455.77		
Jun Min.	455.828		454.475	456.057
Jun Max.	456.075		454.57	456.398
Jul Min.	<b>455.731</b>		454.457	<b>455.731</b>
Jul Max.	456.551		456.057	456.036
Aug Min.	456.38		456.188	456.057
Aug Max.	457.389		458.343	458.343
Sep Min.	457.294		458.191	458.514
Sep Max.	457.505		458.953	460.4
Oct Min.	457.505		458.953	459.675
Oct Max.	458.38		459.294	460.303
Nov Min.	458.114			
Nov Max.	458.38			
Dec Min.	457.712			
Dec Max.	458.075			
Yearly Min.	455.731	455.447	454.457	455.731
Yearly Max.	458.38	457.694	459.294	460.4
6yr. Min.	<b>454.457</b>			
6yr. Max.	<b>460.4</b>			
6yr. Ave. Min.	<b>455.342</b>			
6yr. Ave. Max.	<b>458.942</b>			
<b>Value of Chart Datum (CD) adopted</b>				<b>455.342</b>

Table 19 - Jayakwadi Dam Gauge Data from 2001-02, 2013-14

<b>KOPERGAON CWC GAUGE 1976-82</b>					
<b>WL values in m.</b>					
Min/Max	1976	1977	1978	1979	1980
Jan Min.				486.4	<b>485.5</b>
Jan Max.				486.85	<b>485.5</b>
Feb Min.				<b>485.5</b>	<b>485.5</b>
Feb Max.				<b>485.5</b>	<b>485.5</b>
Mar Min.				<b>485.5</b>	<b>485.5</b>
Mar Max.				<b>485.5</b>	<b>485.5</b>
Apr Min.				<b>485.5</b>	<b>485.5</b>
Apr Max.				<b>485.5</b>	<b>485.5</b>
May Min.				<b>485.5</b>	<b>485.5</b>
May Max.				<b>485.5</b>	<b>485.5</b>
Jun Min.	<b>485.5</b>		<b>485.5</b>	<b>485.5</b>	
Jun Max.	486.19		<b>485.5</b>	<b>485.5</b>	
Jul Min.	485.7	486.44	<b>485.5</b>	<b>485.5</b>	

<b>KOPERGAON CWC GAUGE 1976-82</b>					
<b>WL values in m.</b>					
Jul Max.	490.08	488.88	488.35	490.4	
Aug Min.	486.19	<b>486.22</b>	486.4	486.4	
Aug Max.	489.97	488.95	489.6	489.275	
Sep Min.	485.75	486.49	486.4	486.55	
Sep Max.	487.9	488.41	489.7	489.95	
Oct Min.		488.15	488.1	486.95	
Oct Max.		489	489.5	487.83	
Nov Min.		487.45	487.85	486.45	
Nov Max.		488.13	488.6	486.9	
Dec Min.		486.7	486.9	485.5	
Dec Max.		487.43	487.85	486.45	
Yearly Min.	485.5	486.22	485.5	485.5	485.5
Yearly Max.	490.08	489	489.7	490.4	485.5
6yr. Min.				<b>485.5</b>	
6yr. Max.				<b>490.4</b>	
6yr. Ave. Min.				<b>485.68</b>	
6yr. Ave. Max.				<b>488.936</b>	
<b>Value of Chart Datum (CD) adopted</b>				<b>485.68</b>	

*Table 20 - Kopergaon Gauge Data from 1976-82*

<b>CHASS CWC GAUGE 1991-97</b>							
<b>WL values in m.</b>							
Min/Max	1991	1992	1993	1994	1995	1996	1997
Jan Min.	<b>501.48</b>						
Jan Max.	503.59						
Feb Min.	501.94		<b>501.5</b>	501.88	502.1	503.42	<b>501.5</b>
Feb Max.	505.87		505.32	507.19	503	503.6	501.91
Mar Min.	502.45	501.64	501.8	502.3	501.75	501.85	<b>501.5</b>
Mar Max.	504.14	503.48	503.26	507.45	502.84	505.03	<b>501.5</b>
Apr Min.	501.57	<b>501.6</b>	501.69	501.65	<b>501.75</b>	<b>501.82</b>	
Apr Max.	502.58	504.75	505.03	506.3	503	503.36	
May Min.	501.53		501.7	<b>501.55</b>	501.84	501.86	
May Max.	502.11		503.65	501.66	502.24	503.81	
Jun Min.			501.7			502.42	
Jun Max.			502.1			502.98	
Jul Min.						501.94	
Jul Max.						502.4	
Aug Min.							
Aug Max.							
Sep Min.							
Sep Max.							
Oct Min.							
Oct Max.							
Nov Min.							
Nov Max.							
Dec Min.							
Dec Max.							
Yearly Min.	501.48	501.6	501.5	501.55	501.75	501.82	501.5
Yearly Max.	505.87	504.75	505.32	507.45	503	505.03	501.91
6yr. Min.							<b>501.48</b>

<b>CHASS CWC GAUGE 1991-97</b>	
<b>WL values in m.</b>	
6yr. Max.	<b>507.45</b>
6yr. Ave. Min.	<b>501.62</b>
6yr. Ave. Max.	<b>505.237</b>
<b>Value of Chart Datum (CD) adopted</b>	<b>501.62</b>

*Table 21 - Chass Gauge Data from 1991-97*

<b>NASHIK CWC GAUGE 2001-02</b>		
<b>WL values in m.</b>		
<b>Min/Max</b>	<b>2001</b>	<b>2002</b>
Jan Min.		<b>553.81</b>
Jan Max.		554.76
Feb Min.		554.71
Feb Max.		554.71
Mar Min.		<b>553.81</b>
Mar Max.		554.81
Apr Min.		<b>553.81</b>
Apr Max.		554.56
May Min.		<b>553.81</b>
May Max.		554.81
Jun Min.	<b>553.81</b>	
Jun Max.	554.01	
Jul Min.	<b>553.81</b>	
Jul Max.	554.11	
Aug Min.	554.01	
Aug Max.	554.36	
Sep Min.	<b>553.81</b>	
Sep Max.	554.41	
Oct Min.	<b>553.81</b>	
Oct Max.	555.71	
Nov Min.	<b>553.81</b>	
Nov Max.	554.91	
Dec Min.	<b>553.81</b>	
Dec Max.	554.31	
Yearly Min.	553.81	553.81
Yearly Max.	555.71	554.81
6yr. Min.		<b>553.81</b>
6yr. Max.		<b>555.71</b>
6yr. Ave. Min.		<b>553.81</b>
6yr. Ave. Max.		<b>555.26</b>
<b>Value of Chart Datum (CD) adopted</b>		<b>553.81</b>

*Table 22 - Gauge Data from 2001-02*

## 2.5 Transfer of Sounding Datum

The Godavari River is a non-tidal river and lowest MSL level of the stretch is considered as the datum value for computing sounding datum at different stretches. Depending on the availability of water in different stretches, manual tide pole were deployed to measure the water level and the lowest water level obtained during

observation correlated with the zero values of the tide gauge with respect to MSL to fix the datum for the stretch.

## 2.6 Table indicating Tidal Variation at different observation points

The survey stretch of Godavari River is non-tidal in nature and no water level variation was observed during the conduct of Survey.

The Manual tide pole was being erected at every 10km change at each IWAI benchmarks, on availability of water to calculate the rise and fall of water level for processing the bathymetric data as well as for slope calculation. And also leveled to the nearest GTS.



*Figure 11 – Manual Tide Pole*

Sl. No	Tide Gauge	Location	Latitude (N) Longitude (E)	Easting Northing	Chainage (km)	Zero of TP w.r.t CD (m)	UTM Zone
1	TP - GDV 31	Yellampalli	18°51'9.75"N 79°21'31.00"E	327073.721 2085330.636	310.64	4.624	44N
2	TP - GDV 32	Cheggaon	18°49'57.48"N 79°16'44.68"E	318671.073 2083188.108	322.35	4.254	44N
3	TP - GDV 33	Kotilingala	18°52'14.04"N 79°12'5.42"E	310538.004 2087468.009	331.70	3.934	44N
4	TP - GDV 34	Thimmapoor	18°55'45.59"N 79° 7'33.44"E	302645.934 2094055.351	343.02	3.673	44N
5	TP - GDV 46	Old Pochampad	18°59'25.30"N 78°18'42.52"E	216969.713 2101922.628	465.00	4.639	44N
6	TP - GDV 47	Sangvi	19° 1'56.11"N 78°12'31.19"E	206176.687 2106731.441	478.37	4.639	44N
7	TP - GDV 48	Pipri	18°58'16.97"N 78° 8'47.55"E	199523.883 2100094.63	487.20	4.288	44N
8	TP - GDV 49	Brahmeswar	18°56'24.25"N 78° 2'55.22"E	189152.788 2096796.472	499.16	4.935	44N
9	TP - GDV 50	Alzapur	18°53'0.55"N 77°59'58.75"E	816047.138 2090614.816	510.57	4.637	43N
10	TP - GDV 51	Thadbiloli	18°49'24.50"N 77°56'17.36"E	809673.396 2083858.72	520.86	4.775	43N

Sl. No	Tide Gauge	Location	Latitude (N) Longitude (E)	Easting Northing	Chainage (km)	Zero of TP w.r.t CD (m)	UTM Zone
11	TP - GDV 56 (Baligaon Barrage U/S)	Manur Tarf Ba	18°58'15.55"N 77°35'22.48"E	772673.7 2099621.289	568.43	6.186	43N
12	TP - GDV 56	Manur Tarf Ba	18°59'40.13"N 77°32'27.24"E	767507.847 2102148.23	574.68	5.720	43N
13	TP - GDV 57	Chilpimpri	19° 1'55.54"N 77°28'7.72"E	759855.989 2106205.078	584.63	4.210	43N
14	TP - GDV 58 (Amdura Barrage D/S)	Shankthirth	19° 4'34.81"N 77°24'51.02"E	754034.79 2111023.792	592.51	4.351	43N
15	TP - GDV 58 (Amdura Barrage U/S)	Shankthirth	19° 4'40.17"N 77°24'47.96"E	753943.034 2111187.419	592.69	7.409	43N
16	TP - GDV 58	Shankthirth	19° 5'2.73"N 77°24'13.96"E	752939.253 2111867.631	593.85	6.818	43N
17	TP - GDV 59	Brahmanwada	19° 9'15.56"N 77°24'24.78"E	753148.589 2119648.358	603.70	6.013	43N
18	TP - GDV 60	Nanded	19° 8'24.32"N 77°19'37.39"E	744769.551 2117958.492	613.55	4.487	43N
19	TP - GDV 61 (Vishnupuri Barrage D/S)	Thugaon	19° 7'48.67"N 77°16'46.32"E	739783.449 2116796.124	620.38	2.659	43N
20	TP - GDV 61 (Vishnupuri Barrage U/S)	Thugaon	19° 7'34.27"N 77°16'46.74"E	739801.503 2116353.41	620.82	14.365	43N
21	TP - GDV 61	Thugaon	19° 7'25.08"N 77°15'53.25"E	738241.538 2116050.444	623.61	13.632	43N
22	TP - GDV 62	Jaitapur	19° 7'14.57"N 77°10'32.14"E	728858.946 2115608.005	634.41	10.737	43N
23	TP - GDV 63	Dhanora Motya	19° 4'36.40"N 77° 7'49.36"E	724159.887 2110685.263	643.84	7.548	43N
24	TP - GDV 64	Anteshwar	19° 5'37.06"N 77° 6'7.77"E	721167.166 2112514.815	652.36	5.634	43N
25	TP - GDV 65	Dutka	19° 6'24.67"N 77° 3'54.18"E	717244.389 2113932.421	661.97	6.037	43N
26	TP - GDV 66 (Digras Barrage D/S)	Digras	19° 5'40.86"N 77° 0'49.11"E	711849.92 2112522.169	670.91	1.734	43N
27	TP - GDV 66 (Digras Barrage U/S)	Digras	19° 5'34.30"N 77° 0'40.74"E	711607.551 2112317.631	671.17	9.062	43N
28	TP - GDV 67	Farkhanda	19° 4'33.69"N 76°57'30.40"E	706064.045 2110390.795	679.71	6.309	43N
29	TP - GDV 68	Umarthadi	19° 3'42.09"N 76°53'5.46"E	698335.372 2108719.216	689.67	4.673	43N
30	TP - GDV 69	Sawangi Bhujbal	19° 2'29.72"N 76°49'42.19"E	692415.463 2106431.061	699.22	2.151	43N
31	TP - GDV 97	Paithan	19°30'49.95"N 75°22'19.97"E	539053.861 2157730.55	969.65	5.791	43N
32	TP - GDV 98	Vijaypur	19°32'9.36"N 75°16'31.48"E	528893.013 2160152.243	980.17	6.021	43N
33	TP - GDV 99	Narsingpur	19°34'40.11"N 75°14'14.69"E	524900.329 2164779.967	987.00	6.051	43N
34	TP - GDV 100	Warkhed	19°36'42.38"N 75° 7'47.72"E	513623.56 2168526.139	1001.44	6.081	43N
35	TP - GDV 101	Mhalapur	19°36'28.61"N 75° 3'24.22"E	505948.576 2168098.687	1008.78	3.967	43N
36	TP - GDV 102	Washim	19°38'13.77"N 74°59'10.31"E	498552.878 2171330.122	1018.70	2.301	43N
37	TP - GDV 103	Borgaon Old	19°38'53.31"N 74°55'6.28"E	491446.57 2172547.478	1027.62	1.213	43N

Sl. No	Tide Gauge	Location	Latitude (N) Longitude (E)	Easting Northing	Chainage (km)	Zero of TP w.r.t CD (m)	UTM Zone
38	TP - GDV 104	Chenduphal	19°38'48.44"N 74°51'2.02"E	484333.326 2172402.608	1037.06	-0.360	43N
39	TP - GDV 113(Kanlad Check Dam U/S)	Baktarpur	19°57'47.63"N 74°16'15.91"E	423732.52 2207578.049	1131.57	5.092	43N
40	TP - GDV 113	Baktarpur	19°57'47.89"N 74°15'35.55"E	422559.467 2207591.176	1132.72	2.102	43N
41	TP - GDV 114	Tamaswadi	19°59'19.99"N 74° 9'33.78"E	412058.498 2210471.982	1144.56	-0.428	43N
42	TP - GDV 115	Kurudgaon	20° 2'4.89"N 74° 5'32.18"E	405064.688 2215577.945	1154.47	-0.175	43N
43	TP - GDV 116	Shingave	20° 2'16.95"N 74° 2'6.02"E	399077.132 2215982.236	1164.48	-0.395	43N
44	TP - GDV 117	Shimpi Takali	19°59'2.63"N 73°58'49.01"E	393316.939 2210042.29	1176.23	-0.185	43N

*Table 23 - Details of Tide uages*

## 2.7 Salient features of Dam, Barrages, Weirs, etc.

The details of Dams, Barrages, Weirs and Check Dams were collected during the conduct of survey and the details are as follows:

### 2.7.1 Salient Features of Dam

#### 2.7.1.1 Sripada Yellampalli Dam


Sripada Yellampalli project is an irrigation project located at Yellampalli village, Ramagunda Mandal, between Karimnagar and Adilabad district in Telangana.

The project would supply water for NTPC power project reservoir in Ramagunda Mandal in Karimnagar. It is started on 2005 near Mormoor of Yellampalli village and supplying drinking water to Hyderabad city.

Salient Features of Yellampally Project - Sripada Sagar Reservoir			
Name of Reservoir	Yellampally Project Sripada Sagar Reservoir	Position Lat/Long	18° 50' 38.3350" N 079° 22' 24.9147" E
State	Andhra Pradesh	Construction began	28 July 2004
River	Godavari	Opening date	04 Aug 2016
Crest Level (m)	138.3	Basin	Godavari
Pond level (m)	148	Purpose	Irrigation



Salient Features of Yellampally Project - Sripada Sagar Reservoir			
Highest Flood Level (m)	139.3	Dead Storage Capacity (MCM)	19.5766
Height	26.3	Submergence Area (Th. Ha.)	6.509379
Maximum Water Level (m)	-	Catchment Area (Sq. Km.)	100000
Full Reservoir Level (m)	148	Spillway gates - Number	62
Minimum Draw Down Level (m)	134	Width of the river (m)	1008
Gross Storage Capacity (MCM)	571.2985	Length of Barrage and Anicut (m)	1180.7



*Table 24 - Salient features of Yellampally Project- Sripada Sagar Reservoir (Ch. 310.50km)*

### 2.7.1.2 Sri Ram Sagar Dam

The Sri Ram Sagar Dam is an Indian flood-flow project on the Godavari River. The Project is located in Nizamabad district, 3 km away from National Highway 44.

Sri Ram Sagar is an irrigation project across river Godavari in Telangana to serve irrigational needs in Karimnagar, Warangal, Adilabad, Nalgonda and Khammam districts.

It also provides drinking water to Warangal city. There is a hydroelectric plant working at the dam site, with 4 turbines each with 9 MW capacity generating 36 MW.

Salient Features of Sriram Sagar (SRSP)/ Pochampad Dam			
Name of the Dam	Sriram Sagar (SRSP)/ Pochampad Dam	Position Lat/Long	18° 57' 57.4490"N 078° 20' 42.6430"E
River	Godavari	Dam Status	Completed
Nearest City	Armur	Purpose	Hydroelectric, Irrigation
District	Nizamabad	Commencement Year	-
State	Telangana	Completion Year	1977

Salient Features of Sriram Sagar (SRSP)/ Pochampad Dam			
Basin Name	Godavari	Operating and Maintenance Agency	Irrigation & CAD Dept.
Seismic Zone	Seismic Zone-II	Max Height above Foundation(m)	43
Dam Type	Earthen / Gravity / Masonry	Total Volume content of Dam (TCM)	13095
Length of Dam (m)	15600	Type of Spillway Gates	RD
Type of Spillway	OG	Number of Spillway Gates	42
Length of Spillway (m)	765	Size of Spillway Gates (m X m)	15.24 x 10.668
Crest Level of Spillway	322.5	Mode of Operation	-
Spillway Capacity (cumec)	45300	Size of Sluice (M X M)	-
No. of River Sluice	-	Design Flood (cumec)	45296
Maximum Water Level (m)	333.146	Sluice Purpose	-
Full Reservoir Level (m)	332.54	Live Storage Capacity (MCM)	2565
Minimum Draw Down Level(m)	322.5	Submergence Area (Th.Ha.)	54.331
Gross Storage Capacity(MCM)	3172	Catchment Area (Sq.Km.)	91751



*Table 25 - Salient features of Pochampad Dam - Sri Ram Sagar Reservoir (Ch. 457.49km)*

### 2.7.1.3 Jayakwadi Dam

The Jayakwadi Dam is one of the largest irrigation projects in the state of Maharashtra. It is a multipurpose project. The water is mainly used to irrigate agricultural land. It also provides water for drinking and industrial usage to nearby

towns and villages. This dam has a hydroelectric power plant with installed power generating capacity of 12 MW. The water used for power generation is pumped back to the main reservoir using a pump house. The dam is also a primary source of water to the Parli Thermal Power Station

Salient Features of Jayakwadi Dam			
Name of the Dam	Jayakwadi Dam	Position Lat/Long	19°29'15.3248" N 075°22'16.5835" E
River	Sindphana	Purpose	Hydroelectric, Irrigation
Nearest City	Majalgaon	Completion Year	1987
District	Bid	Operating and Maintenance Agency	WRD, GOM
State	Maharashtra	Max Height above Foundation(m)	31.19
Basin Name	Godavari	Total Volume content of Dam (TCM)	13410
Seismic Zone	Seismic Zone-II	Type of Spillway Gates	RD
Dam Type	Earthen	Number of Spillway Gates	16
Length of Dam (m)	6488	Size of Spillway Gates (m X m)	12 x 8
Type of Spillway	OG	Mode of Operation	-
Length of Spillway (m)	239	Design Flood (cumec)	15500
Crest Level of Spillway	424	Spillway Capacity (cumec)	14500
Maximum Water Level (m)	465.59	Minimum Draw Down Level(m)	455.52
Full Reservoir Level (m)	463.9	Gross Storage Capacity(MCM)	2909.041



Table 26 - Salient features of Jayakwadi Dam – Nath Sagar Reservoir (Ch. 968.50km)

#### 2.7.1.4 Nandur Madhameshwar Dam

The main objective to build the Nandur Madhmeshwar Dam is to provide water for irrigation.

<b>Salient Features of Nandur Madhameshwar Dam</b>	
Irrigation Project Name	Nandur Madhameshwar Dam
Position Lat/Long	20° 00' 30.1827" N, 074° 07' 57.0407" E
Purpose of Project	Irrigation
Type of Project	Major
Engineering Type of Project	Diversion, Storage
State	Maharashtra
Districts Benefitted	Ahmednagar, Nashik, Aurangabad, Thane
Basin	Godavari
River	Godavari
Inter-Basin	No
Year of Completion of Work	1911
Design flood (Cumec)	1170
Length of Barrage and Anicut (m)	1103
Type of spillway gate	Radial
Spillway gates - Number	8
Spillway gates - Size (m)	12 X 5
Crest Level (m)	525.62
Catchment Area(Sq.Km.)	2278

**Salient Features of Nandur Madhameshwar Dam**



*Table 27 - Salient features of Nandur Madhameshwar Dam (Ch. 1149.29km)*

## 2.7.2 Salient Features of Barrages

### 2.7.2.1 Dummugudem Barrage

<b>Salient Features Dummugudem Barrage</b>	
Name of the Structure	Dummugudem Barrage
Position Lat Long	17° 51' 17.4829" N, 080° 53' 07.2042" E
Nearest city	Dummugudem
District	Khammam
State	Telangana
Name of River	Godavari
Basin	Godavari
Length of Barrage and Anicut (m)	41.573
No. of bays (i.e. number of openings)	06
Width of Bay (m)	30.234
Number of piers	05
Distance between piers	4.012
Vertical clearance from Ground level	10.216



**Salient Features Dummugudem Barrage**



*Table 28 - Salient features of Dummugudem Barrage (Ch. 21.91km)*

### 2.7.2.2 Babhali High-Level Barrage

<b>Salient Features Babhali High-Level Barrage</b>	
Name of the Structure	Babhali High-Level Barrage
Position Lat Long	18° 51' 18.3751" N, 077° 49' 12.7959" E
Nearest city	Biloli
District	Nanded
State	Maharashtra
Name of River	Godavari
Basin	Godavari
Year of commencement	2005
Mean annual rainfall (mm)	--
Total annual yield of catchment (MCM)	--
Design flood (Cumec)	27340
Length of Barrage and Anicut (m)	257
No. of bays (i.e. number of openings)	14
Width of Bay (m)	15
Type of spillway gate	Other
Spillway gates - Number	14
Spillway gates - Size (m)	15 x 11
Crest Level (m)	327
Pond level (m)	338



**Salient Features Babhali High-Level Barrage**



*Table 29 - Salient features of Babhali High-Level Barrage (Ch. 535.67km)*

### 2.7.2.3 Baligon Barrage

<b>Salient Features Baligon Barrage</b>	
Name of the Structure	Baligon Barrage
Position Lat Long	18° 58' 13.2558" N, 077° 35' 24.6469" E
Nearest city	Baligon
District	Nanded
State	Maharashtra
Name of River	Godavari
Basin	Godavari
Length of Barrage and Anicut (m)	285
No. of bays (i.e. number of openings)	16
Width of Bay (m)	6.881
Number of piers	15
Distance between piers	15.857
Vertical clearance from Ground level	22.236

**Salient Features Baligon Barrage**



*Table 30 - Salient features of Baligon Barrage (Ch. 568.34km)*

**Note:** Baligon Barrage is a newly constructed barrage, details of barrage were not available on the site nor any officials were there to give the details.

#### 2.7.2.4 Amdura High-Level Barrage


Salient Features Amdura High-Level Barrage	
Name of the Structure	Amdura High-Level Barrage
Position Lat Long	19° 04' 37.3887" N, 077° 24' 51.7117" E
Nearest city	Nanded
District	Nanded
State	Maharashtra
Name of River	Godavari
Basin	Godavari
Year of commencement	2006
Mean annual rainfall (mm)	--
Total annual yield of catchment (MCM)	--
Design flood (Cumec)	17324
Length of Barrage and Anicut (m)	277.5
Width of Bay (m)	15
Type of spillway gate	Other
Spillway gates - Number	16

Salient Features Amdura High-Level Barrage	
Spillway gates - Size (m)	15 x 5.50
Pond level (m)	243.5
	

*Table 31 - Salient features of Amdura High-Level Barrage (Ch. 592.58km)*

### 2.7.2.5 Vishnupuri Barrage

Salient Features of Vishnupuri Barrage	
Name of the Structure	Vishnupuri Barrage
Position Lat Long	19° 07' 39.3151" N, 077° 16' 57.6596" E
Nearest city	Nanded
District	Nanded
State	Maharashtra
Name of River	Godavari
Basin	Godavari
Year of commencement	1976
Full Reservoir Level (m)	355
Minimum Draw Down Level(m)	343.25
Dead Storage Capacity (MCM)	2.19
Catchment Area (Sq.Km.)	13870
Length of Barrage and Anicut (m)	339
Height up to crest (m)	9
No. of bays (i.e. number of openings)	18
Width of Bay (m)	15
Type of spillway gate	Other
Spillway gates - Number	18

<b>Salient Features of Vishnupuri Barrage</b>	
Spillway gates - Size (m)	17 - 15 x 9, 1 - 14 x 11
Crest Level (m)	346
Pond level (m)	355
	

*Table 32 - Salient features of Vishnupuri Barrage (Ch. 620.71km)*

### 2.7.2.6 Anteshwar Barrage

<b>Salient Features Anteshwar Barrage</b>	
Name of the Structure	Anteshwar Barrage
Position Lat Long	19° 06' 23.2478" N, 077° 06' 00.3366" E
Nearest city	Anteshwar
District	Nanded
State	Maharashtra
Name of River	Godavari
Basin	Godavari
Length of Barrage and Anicut (m)	254
Width of Bay (m)	11.847
Number of piers	13
Distance between piers	15.321
Vertical clearance from Ground level	5.521

**Salient Features Anteshwar Barrage**



*Table 33 - Salient features of Anteshwar Barrage (Ch. 653.87km)*

**Note:** Anteshwar barrage is an under construction barrage on Godavari river the details are as per the structure found in the river.

### 2.7.2.7 Digras High-Level Barrage

<b>Salient Features Digras High-Level Barrage</b>	
Name of the Structure	Digras High-Level barrage
Position Lat Long	19° 05' 34.4083" N, 077° 00' 41.9505" E
Nearest city	Gangakher
District	Parbhani
State	Maharashtra
Name of River	Godavari
Basin	Godavari
Year of completion	2011
Design flood (Cumec)	14474
Length of Barrage and Anicut (m)	282.5
No. of bays (i.e. number of openings)	14
Type of spillway gate	Other
Spillway gates - Number	14
Spillway gates - Size (m)	15 x 11
Crest Level (m)	355
Pond level (m)	366

**Salient Features Digras High-Level Barrage**



*Table 34 - Salient features of Digras High-Level Barrage (Ch. 671.14km)*

### 2.7.2.8 Multi Low-level Barrage

<b>Salient Features Multi Low-level Barrage</b>	
Name of the Structure	Muli Low-level barrage
Position Lat Long	19° 00' 47.5628" N, 076° 44' 53.6050" E
Nearest city	Gangakher
District	Parbhani
State	Maharashtra
Name of River	Godavari
Basin	Godavari
Year of commencement	2006
Design flood (Cumec)	13903
Width of the river (m)	231.5
Length of Barrage and Anicut (m)	231.5
Height up to crest (m)	2.88
No. of bays (i.e. number of openings)	20
Width of Bay (m)	10
Type of spillway gate	Other
Spillway gates - Number	20
Spillway gates - Size (m)	10 X 4
Crest Level (m)	366
Pond level (m)	370





*Table 35 - Salient features of Muli Low-level Barrage (Ch. 720.26km)*

### 2.7.2.9 Khadaka Barrage

<b>Salient Features Khadaka Barrage</b>	
Name of the Structure	Khadaka Barrage
Position Lat Long	19° 00' 51.4793" N, 076° 37' 35.9347" E
Nearest city	Khadaka
District	Parbhani
State	Maharashtra
Name of River	Godavari
Basin	Godavari
Length of Barrage and Anicut (m)	312
Width of Bay (m)	2.839
Number of piers	12
Distance between piers	18.572
Vertical clearance from Ground level	18.236

**Salient Features Khadaka Barrage**



*Table 36 - Salient features of Khadaka Barrage (Ch. 736.94km)*

### 2.7.2.10 Mudgal High-level Barrage


<b>Salient Features Mudgal High-level Barrage</b>	
Name of the Structure	Mudgal High-level Barrage
Position Lat Long	19° 05' 21.1653" N, 076° 29' 14.1570" E
Nearest city	Pathri
District	Parbhani
State	Maharashtra
Name of River	Godavari
Basin	Godavari
Year of commencement	2006
Design flood (Cumec)	12584
Width of the river (m)	282.5
Length of Barrage and Anicut (m)	282.5
Height up to crest (m)	1.66
No. of bays (i.e. number of openings)	16
Width of Bay (m)	10
Type of spillway gate	Other
Spillway gates - Number	16
Spillway gates - Size (m)	15 x 5
Crest Level (m)	379

Salient Features Mudgal High-level Barrage	
Pond level (m)	384
	

*Table 37 - Salient features of Mudgal High-level Barrage (Ch. 764.75km)*

### 2.7.2.11 Tarugavan High-Level Barrage

Salient Features Tarugavan High-Level Barrage	
Name of the Structure	Tarugavan High-Level Barrage
Position Lat Long	19° 06' 42.4025" N, 076° 23' 44.1939" E
Nearest city	Majalgaon
District	Bid
State	Maharashtra
Name of River	Godavari
Basin	Godavari
Year of commencement	2010
Design flood (Cumec)	11166
Width of the river (m)	300
Length of Barrage and Anicut (m)	300
Height up to crest (m)	1.96
No. of bays (i.e. number of openings)	17
Width of Bay (m)	15
Type of spillway gate	Other
Spillway gates - Number	17
Spillway gates - Size (m)	15 x 5
Crest Level (m)	382

<b>Salient Features Tarugavan High-Level Barrage</b>	
Pond level (m)	387
	

*Table 38 - Tarugavan High-Level Barrage (Ch. 782.89km)*

### 2.7.2.12 Dhalegaon High-Level Barrage

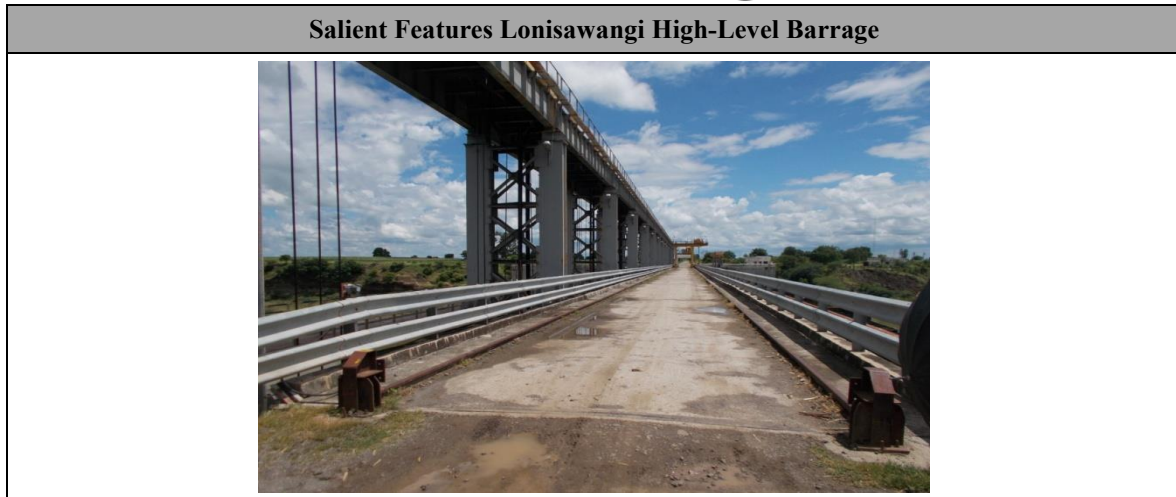
<b>Salient Features Dhalegaon High-Level Barrage</b>	
Name of the Structure	Dhalegaon High-Level Barrage
Position Lat Long	19° 13' 25.8626" N 76° 21' 52.0311" E
Nearest city	Majalgaon
District	Bid
State	Maharashtra
Name of River	Godavari
Basin	Godavari
Year of commencement	2005
Design flood (Cumec)	10876
Length of Barrage and Anicut (m)	282.5
Height up to crest (m)	2.86
No. of bays (i.e. number of openings)	16
Width of Bay (m)	15
Type of spillway gate	Other
Spillway gates - Number	16
Spillway gates - Size (m)	15 x 5
Crest Level (m)	389.2
Pond level (m)	394.2



*Table 39 - Salient features of Dhalegaon High-Level Barrage (Ch. 810.00km)*

### 2.7.2.13 Lonisawangi High-Level Barrage

Salient Features Lonisawangi High-Level Barrage	
Name of the Structure	Lonisawangi High-Level Barrage
Position Lat Long	19° 14' 40.2255" N, 076° 13' 43.9412" E
Nearest city	Pathri
District	Parbhani
State	Maharashtra
Name of River	Godavari
Basin	Godavari
Year of commencement	2006
Design flood (Cumec)	10159
Width of the river (m)	174.5
Length of Barrage and Anicut (m)	174.5
No. of bays (i.e. number of openings)	12
Width of Bay (m)	12
Type of spillway gate	Other
Spillway gates - Number	12
Spillway gates - Size (m)	12 X 7
Crest Level (m)	392.3
Pond level (m)	399.3



*Table 40 - Salient features of Lonisawangi High-Level Barrage (Ch. 828.14km)*

### 2.7.2.14 Rajatakli High-Level Barrage

<b>Salient Features Rajatakli High-Level Barrage</b>	
Name of the Structure	Rajatakli High-Level Barrage
Position Lat Long	19° 16' 56.5837" N, 076° 02' 51.3149" E
Nearest city	Gevrai
District	Bid
State	Maharashtra
Name of River	Godavari
Basin	Godavari
Year of commencement	2006
Design flood (Cumec)	9386
Width of the river (m)	282.5
Length of Barrage and Anicut (m)	282.5
No. of bays (i.e. number of openings)	16
Width of Bay (m)	15
Type of spillway gate	Other
Spillway gates - Number	16
Spillway gates - Size (m)	15 x 5
Crest Level (m)	402.4
Pond level (m)	407.4



**Salient Features Rajatakli High-Level Barrage**



*Table 41 - Salient features of Rajatakli High-Level Barrage (Ch. 857.15km)*

### 2.7.2.15 Mangrul High-Level Barrage

<b>Salient Features Mangrul High-Level Barrage</b>	
Name of the Structure	Mangrul High-Level Barrage
Position Lat Long	19° 18' 05.9895" N, 075° 57' 30.5940" E
Nearest city	Ambad
District	Jalna
State	Maharashtra
Name of River	Godavari
Basin	Godavari
Year of commencement	2006
Design flood (Cumec)	8763
Width of the river (m)	365
Length of Barrage and Anicut (m)	365
No. of bays (i.e. number of openings)	21
Width of Bay (m)	15
Type of spillway gate	Other
Spillway gates - Number	21
Spillway gates - Size (m)	15 x 5
Crest Level (m)	407.1
Pond level (m)	412.1



*Table 42 - Salient features of Mangrul High-Level Barrage (Ch. 873.22km)*

### 2.7.2.16 Jogledevi High-Level Barrage

Salient Features Jogledevi High-Level Barrage	
Name of the Structure	Jogledevi High-Level Barrage
Position Lat Long	19° 23' 26.0823" N, 075° 54' 03.5480" E
Nearest city	Ambad
District	Jalna
State	Maharashtra
Name of River	Godavari
Basin	Godavari
Year of commencement	2006
Design flood (Cumec)	5519
Width of the river (m)	347.5
Length of Barrage and Anicut (m)	347.5
No. of bays (i.e. number of openings)	20
Width of Bay (m)	15
Type of spillway gate	Other
Spillway gates - Number	20
Spillway gates - Size (m)	15 x 4
Crest Level (m)	412
Pond level (m)	416

**Salient Features Jogladevi High-Level Barrage**



*Table 43 - Salient features of Jogladevi High-Level Barrage (Ch. 890.80km)*

**2.7.2.17 Patharwala Barrage**

**Salient Features Patharwala Barrage**

Name of the Structure	Patharwala Barrage
Position Lat Long	19° 23' 31.2783" N, 075° 45' 40.0945" E
Nearest city	Ambad
District	Jalana
State	Maharashtra
Name of River	Godavari
Basin	Godavari
Length of Barrage and Anicut (m)	220
Width of Bay (m)	4.091
Number of piers	63
Distance between piers	2.211
Vertical clearance from Ground level	12.033



*Table 44 - Salient features of Patharwala Barrage (Ch. 907.62km)*

### 2.7.2.18 Shahgadh Barrage



Salient Features Shahgadh Barrage	
Name of the Structure	Shahgadh Barrage
Position Lat Long	19° 21' 23.7052" N, 075° 42' 59.3125" E
Nearest city	Ambad
District	Jalana
State	Maharashtra
Name of River	Godavari
Basin	Godavari
Length of Barrage and Anicut (m)	261
Width of Bay (m)	4.314
Number of piers	69
Distance between piers	Main Gate-4m Sub Gate-2m
Vertical clearance from Ground level	5.432
	

Table 45 - Salient features of Shahgadh Barrage (Ch. 915.82km)

### 2.7.2.19 Hiradpuri High-Level Barrage

Salient Features Hiradpuri High-Level Barrage	
Name of the Structure	Hiradpuri High-Level Barrage
Position Lat Long	19° 22' 46.2964" N, 075° 35' 06.1415" E
Nearest city	Gevrai
District	Bid
State	Maharashtra
Name of River	Godavari

<b>Salient Features Hiradpuri High-Level Barrage</b>	
Basin	Godavari
Year of commencement	2007
Year of completion	2010
Design flood (Cumec)	9417
Width of the river (m)	286
Length of Barrage and Anicut (m)	286
Height up to crest (m)	4
No. of bays (i.e. number of openings)	16
Width of Bay (m)	13.225
Type of spillway gate	Other
Spillway gates - Number	16
Spillway gates - Size (m)	15 x 4
Crest Level (m)	425
Pond level (m)	429
Highest Flood Level (m)	433.2
Means for dissipating energy (Hydraulic)	Stilling basin with end Weir
	

*Table 46 - Salient features of Hiradpuri High-Level Barrage (Ch. 932.59km)*

### 2.7.2.20 Apegaon High-Level Barrage

<b>Salient Features of Apegaon High-Level Barrage</b>	
Name of the Structure	Apegaon High-Level Barrage
Position Lat Long	19° 26' 34.4771" N, 075° 28' 58.0882" E
Nearest city	Paithan
District	Aurangabad




<b>Salient Features of Apegaon High-Level Barrage</b>	
State	Maharashtra
Name of River	Godavari
Basin	Godavari
Year of commencement	2006
Year of completion	2011
Design flood (Cumec)	10035.15
Width of the river (m)	277.5
Length of Barrage and Anicut (m)	277.5
Height up to crest (m)	4
No. of bays (i.e. number of openings)	16
Width of Bay (m)	15
Type of spillway gate	Other
Spillway gates - Number	16
Spillway gates - Size (m)	15 x 4
Crest Level (m)	428
Pond level (m)	432
Highest Flood Level (m)	439.29
Means for dissipating energy (Hydraulic)	Stilling basin with end Weir



*Table 47 - Salient features of Apegaon High-Level Barrage (Ch. 947.17km)*



### 2.7.2.21 Chanakwadi Barrage


Salient Features Chanakwadi Barrage	
Name of the Structure	Chanakwadi Barrage
Position Lat Long	19° 27' 41.4731" N, 075° 23' 03.7514" E
Nearest city	Paithan
District	Aurangabad
State	Maharashtra
Name of River	Godavari
Basin	Godavari
Length of Barrage and Anicut (m)	281
Width of Bay (m)	3.891
Number of piers	17
Distance between piers	8.511
Vertical clearance from Ground level	6.121
	

*Table 48 - Salient features of Chanakwadi Barrage (Ch. 964.64km)*

### 2.7.3 Salient Features of Weirs

#### 2.7.3.1 Dummugudem Weir


Dummugudem Weir across the Godavari River was constructed nearly 150 years back by the famous British India engineer Sir Arthur Cotton who also constructed Dowleswaram and Prakasam barrages. Somehow this weir is not well known among Telangana. The purpose of this weir was not for diverting the river water into canals but to use as a cross over bridge during lean flow season. This weir has lost its relevance after the construction of all-weather Road Bridge near Bhadrachalam town to cross the river.

<b>Salient Features Dummugudem Weir</b>	
Name of the Structure	Dummugudem Weir
Position Lat Long	17°52'20.38649" N, 080°53'19.32386" E
Nearest city	Borgampad
District	Khammam
State	Telangana
Basin	Godavari
Length of Weir (m)	1552
Height of Weir (m)	1.2
	

*Table 49 - Salient features of Dummugudem Weir (Ch. 24.04km)*


### 2.7.3.2 Nandur Madhameshwar Weir

<b>Salient Features Nandur Madhameshwar Weir</b>	
Name of the Structure	Nandur Madhameshwar Weir
Position Lat/Long	20° 00' 30.1827" N, 074° 07' 57.0407" E
Nearest city	Niphad
District	Nashik
State	Maharashtra
Name of River	Godavari
Basin	Godavari
Year of completion	1911
Length of Weir	1103
Height of Weir	3
Type of spillway gate	Radial
Spillway gates - Number	8
Spillway gates - Size (m)	12 X 5

Salient Features Nandur Madhameshwar Weir	
Crest Level (m)	525.62
	


*Table 50 - Salient features of Nandur Madhameshwar Weir (Ch. 1149.29km)*

### 2.7.3.3 Nanded Weir

Salient Features Nandur Madhameshwar Weir	
Name of the Structure	Nanded Weir
Position Lat/Long	19° 08' 46.37" N, 077° 18' 26.26" E
Nearest city	Nanded
District	Nanded
State	Maharashtra
Name of River	Godavari
Basin	Godavari
Length of Weir	260
Height of Weir	2.5
	

*Table 51 - Salient features of Nanded Weir (Ch. 615.78km)*

### 2.7.3.4 Nashik Weir


Salient Features Nashik Weir	
Name of the Structure	Nashik Weir
Position Lat/Long	19° 59' 40.3225" N, 073° 54' 13.5247" E
Nearest city	Nashik
District	Nashik
State	Maharashtra
Name of River	Godavari
Basin	Godavari
Length of Weir	140
Height of Weir	3
	

*Table 52 - Salient features of Nashik Weir (Ch. 1188.79km)*

### 2.7.4 Salient Features of Check Dams

#### 2.7.4.1 Salient Features of Domegram Check Dam

Salient Features Domegram Check Dam	
Name of the Structure	Domegram Check Dam
Position Lat Long	19° 40' 12.3837" N, 074° 49' 22.9385" E
Nearest city	Shrirampur
District	Ahmednagar
State	Maharashtra
Name of River	Godavari
Basin	Godavari

<b>Salient Features Domegram Check Dam</b>	
Length of Check Dam (m)	200
Width of Check Dam (m)	4.064
Number of piers	66
Distance between piers	2.004
Vertical clearance from Ground level	3.851
	

*Table 53 - Salient features of Domegram Check Dam (Ch. 1041.42km)*

#### 2.7.4.2 Salient Features Puntamba Kolhapur Check Dam

<b>Salient Features Puntamba Kolhapur Check Dam</b>	
Name of the Structure	Puntamba Kolhapur Check Dam
Position Lat Long	19° 46' 34.9568" N, 074° 36' 46.5004" E
Nearest city	Dongaon
District	Aurangabad
State	Maharashtra
Name of River	Godavari
Basin	Godavari
Length of Check Dam (m)	300
Width of Check Dam (m)	3.971
Number of piers	97
Distance between piers	2.002
Vertical clearance from Ground level	2.814

**Salient Features Puntamba Kolhapur Check Dam**



*Table 54 - Salient features of Puntamba Kolhapur Check Dam (Ch. 1077.22km)*

### 2.7.4.3 Salient Features Shingave Check Dam

<b>Salient Features Shingave Check Dam</b>	
Name of the Structure	Shingave Check Dam
Position Lat Long	19° 47' 59.1028" N, 074° 33' 51.4118" E
Nearest city	Kopergaon
District	Ahmednagar
State	Maharashtra
Name of River	Godavari
Basin	Godavari
Length of Check Dam (m)	245
Width of Check Dam (m)	2.034
Number of piers	81
Distance between piers	2.005
Vertical clearance from Ground level	3.012



**Salient Features Shingave Check Dam**



*Table 55 - Salient features of Shingave Check Dam (Ch. 1084.35km)*

**2.7.4.4 Salient Features Dauch Khurd Check Dam**

<b>Salient Features Dauch Khurd Check Dam</b>	
Name of the Structure	Dauch Khurd Check Dam
Position Lat Long	19° 51' 50.0972" N, 074° 27' 17.5084" E
Nearest city	Kopergaon
District	Ahmednagar
State	Maharashtra
Name of River	Godavari
Basin	Godavari
Length of Check Dam (m)	285
Width of Check Dam (m)	2.005
Number of piers	63
Distance between piers	2.011
Vertical clearance from Ground level	5.124



*Table 56 - Salient features of Dauch Khurd Check Dam (Ch. 1084.37km)*

#### 2.7.4.5 Salient Features Chandgavhan Check Dam

Salient Features Chandgavhan Check Dam	
Name of the Structure	Chandgavhan Check Dam
Position Lat Long	19° 53' 04.2149" N, 074° 25' 59.3544" E
Nearest city	Kopergaon
District	Ahmednagar
State	Maharashtra
Name of River	Godavari
Basin	Godavari
Length of Check Dam (m)	235
Width of Check Dam (m)	4.363
Number of piers	76
Distance between piers	2.005
Vertical clearance from Ground level	4.129

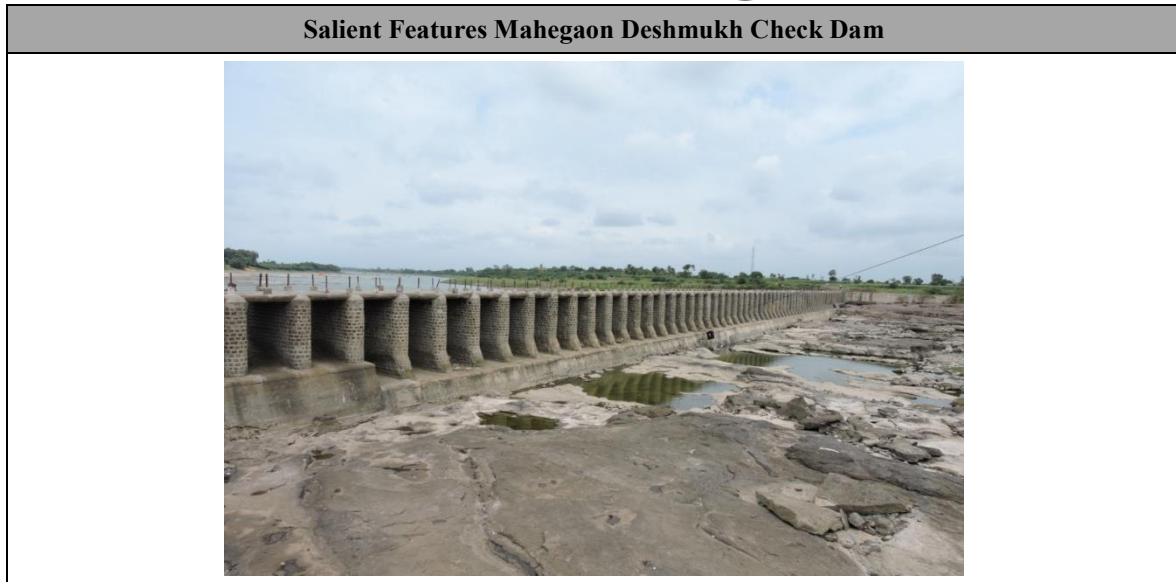
**Salient Features Chandgavhan Check Dam**



*Table 57 - Salient features of Chandgavhan Check Dam (Ch. 1107.71km)*

**2.7.4.6 Salient Features Mahegaon Deshmukh Check Dam**

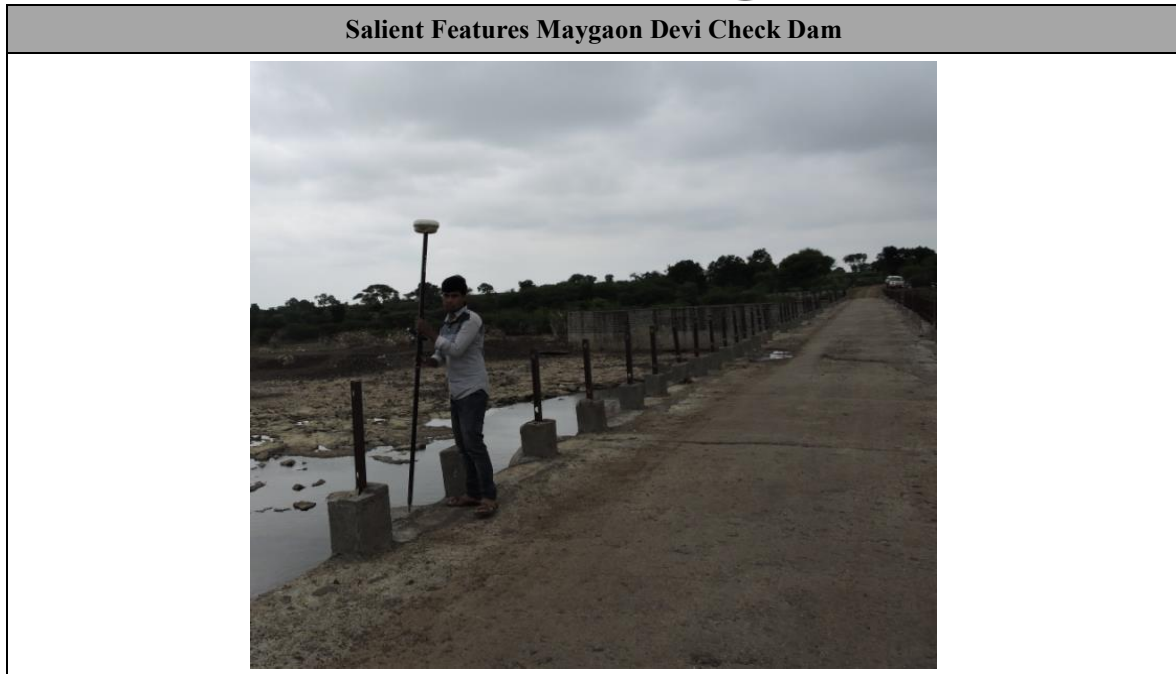
<b>Salient Features Mahegaon Deshmukh Check Dam</b>	
Name of the Structure	Mahegaon Deshmukh Check Dam
Position Lat Long	19° 55' 03.6389" N, 074° 23' 27.6997" E
Nearest city	Kumbhari
District	Nashik
State	Maharashtra
Name of River	Godavari
Basin	Godavari
Length of Check Dam (m)	200
Width of Check Dam (m)	3.652
Number of piers	65
Distance between piers	2.058
Vertical clearance from Ground level	5.148



*Table 58 - Salient features of Mahegaon Deshmukh Check Dam (Ch. 1115.34km)*

#### 2.7.4.7 Salient Features Maygaon Devi Check Dam

<b>Salient Features Maygaon Devi Check Dam</b>	
Name of the Structure	Maygaon Devi Check Dam
Position Lat Long	19° 56' 40.1573" N, 074° 19' 11.2653" E
Nearest city	Dhamori
District	Nashik
State	Maharashtra
Name of River	Godavari
Basin	Godavari
Length of Check Dam (m)	235
Width of Check Dam (m)	4.383
Number of piers	71
Distance between piers	2.014
Vertical clearance from Ground level	6.012



*Table 59 - Salient features of Maygaon Devi Check Dam (Ch. 1126.94km)*

#### 2.7.4.8 Salient Features Kanlad Check Dam

Salient Features Kanlad Check Dam	
Name of the Structure	Kanlad Check Dam
Position Lat Long	19° 57' 47.8333" N, 074° 16' 16.2594" E
Nearest city	Niphad
District	Nashik
State	Maharashtra
Name of River	Godavari
Basin	Godavari
Length of Check Dam (m)	220
Width of Check Dam (m)	4.098
Number of piers	73
Distance between piers	2.011
Vertical clearance from Ground level	5.012



*Table 60 - Salient features of Kanlad Check Dam (Ch. 1131.56km)*

#### 2.7.4.9 Salient Features Khedale Zunge Check Dam

Salient Features Khedale Zunge Check Dam	
Name of the Structure	Khedale Zunge Check Dam
Position Lat Long	19° 58' 28.0161" N, 074° 12' 57.2458" E
Nearest city	Niphad
District	Nashik
State	Maharashtra
Name of River	Godavari
Basin	Godavari
Length of Check Dam (m)	271
Width of Check Dam (m)	7.001
Number of piers	14
Distance between piers	16.501
Vertical clearance from HFL	-1.931
Vertical clearance from Ground level	6.717



**Salient Features Khedale Zunge Check Dam**



*Table 61 - Salient features of Khedale Zunge Check Dam (Ch. 1137.74km)*

## 2.8 Erected IWAI Benchmark Pillars

New bench Mark Pillars were constructed as per specification at suitable locations as specified in RFP. The extension of horizontal control was made by the baseline processing of 06 hourly DGPS observations carried out with the nearest reference station. The value of these benchmarks w.r.t. MSL was obtained by auto leveling from the NW-4 IWAI BM-17 as Reference Bench Mark to IWAI BM GDV-01 and thereafter one pillar to another. The final accepted co-ordinates and a Reference Level value of IWAI BM Pillars are as below:

Sl. No.	Station	Chainage (km)	Location	Latitude (N) Longitude (E)	Easting (E) Northing (N)	BM Height above MSL (m)	CD w.r.t MSL (m)	BM Height w.r.t. Established CD (m)
1	IWAI BM GDV-01	0.37	Ashok Nagar	17°40'35.020"N 80°53'12.296"E	487989.279 1954387.281	48.568	33.709	14.859
2	IWAI BM GDV-02	9.83	Narsapuram	17°45'37.299"N 80°53'03.958"E	487749.339 1963676.912	54.183	36.519	17.664
3	IWAI BM GDV-03	20.73	Dummugudem	17°50'50.549"N 80°53'00.319"E	487648.175 1973303.669	63.387	42.043	21.344
4	IWAI BM GDV-04	30.58	Parnasala	17°56'02.112"N 80°53'41.441"E	488863.850 1982877.892	61.458	46.553	14.905
5	IWAI BM GDV-05	39.43	Jettigudem	17°59'51.804"N 80°50'45.331"E	483689.046 1989940.44	62.340	48.141	14.199
6	IWAI BM GDV-06	52.00	Kathigudem	18°03'16.378"N 80°47'19.356"E	477639.159 1996233.493	60.181	50.804	9.377
7	IWAI BM GDV-07	57.33	Bandarugudem	18°07'27.493"N 80°44'08.730"E	472046.272 2003958.167	70.785	52.149	18.636
8	IWAI BM GDV-08	72.12	Albaka	18°12'09.375"N 80°40'10.847"E	465071.453 2012632.579	64.187	55.065	9.122
9	IWAI BM GDV-09	82.20	Burugudem	18°15'52.064"N 80°35'52.028"E	457484.189 2019491.789	65.226	57.287	7.939

Sl. No.	Station	Chainage (km)	Location	Latitude (N) Longitude (E)	Easting (E) Northing (N)	BM Height above MSL (m)	CD w.r.t MSL (m)	BM Height w.r.t. Established CD (m)
10	IWAI BM GDV-10	96.07	Punem Veerapuram	18°18'27.347"N 80°30'48.457"E	448583.197 2024285.958	69.884	61.637	8.247
11	IWAI BM GDV-11	103.53	Pusur Z	18°21'51.144"N 80°28'17.919"E	444182.185 2030561.824	72.247	64.374	7.873
12	IWAI BM GDV-12	117.00	Peddagollagudem	18°27'31.548"N 80°28'22.512"E	444347.389 2041023.606	72.942	65.257	7.685
13	IWAI BM GDV-13	127.19	Ayyavaripeta	18°29'05.519"N 80°23'31.748"E	435828.833 2043938.555	76.765	67.264	9.501
14	IWAI BM GDV-14	136.63	Chandrupatla	18°32'52.977"N 80°23'22.716"E	435587.625 2050930.46	81.950	71.747	10.203
15	IWAI BM GDV-15	146.37	Kotturu	18°36'20.191"N 80°21'37.414"E	432523.28 2057310.008	84.821	72.721	12.100
16	IWAI BM GDV-16	158.00	Dudheda	18°40'15.567"N 80°19'06.720"E	428134.57 2064560.802	89.665	74.347	15.318
17	IWAI BM GDV-17	169.10	Gummalkonda	18°42'35.058"N 80°14'33.983"E	420162.934 2068880.391	92.943	78.474	14.469
18	IWAI BM GDV-18	180.06	Ankisa Mal	18°42'52.326"N 80°09'06.783"E	410582.188 2069454.223	92.155	81.488	10.667
19	IWAI BM GDV-19	189.16	Kotapalli	18°42'29.459"N 80°05'31.294"E	404267.316 2068782.378	93.983	83.814	10.169
20	IWAI BM GDV-20	201.34	Madikunta	18°46'04.354"N 80°01'18.566"E	396901.185 2075426.971	92.306	87.547	4.759
21	IWAI BM GDV-21	211.00	Ramjapur	18°48'14.008"N 79°57'14.009"E	389763.982 2079453.084	100.110	91.147	8.963
22	IWAI BM GDV-22	220.11	Nagepalle	18°49'10.786"N 79°52'39.457"E	381737.652 2081247.449	105.558	93.508	12.050
23	IWAI BM GDV-23	231.12	Chenuur	18°50'33.138"N 79°49'52.928"E	376879.691 2083810.402	103.219	98.377	4.842
24	IWAI BM GDV-24	243.00	Annaram	18°45'51.279"N 79°49'48.853"E	376703.381 2075146.844	110.571	102.570	8.001
25	IWAI BM GDV-25	253.60	Arenda	18°41'43.533"N 79°47'52.127"E	373234.084 2067553.899	115.954	106.640	9.314
26	IWAI BM GDV-26	263.88	Khanapur	18°40'54.917"N 79°42'35.514"E	363948.333 2066124.071	122.575	110.570	12.005
27	IWAI BM GDV-27	274.28	Uppatla	18°42'56.507"N 79°38'35.968"E	356958.633 2069913.851	124.772	114.070	10.702
28	IWAI BM GDV-28	283.28	Mustila	18°45'24.416"N 79°34'27.075"E	349704.323 2074517.732	127.567	118.270	9.297
29	IWAI BM GDV-29	293.25	Ramaraopet	18°47'46.292"N 79°30'08.335"E	342163.606 2078941.606	132.028	121.635	10.393
30	IWAI BM GDV-30	302.11	Mancherial	18°51'05.698"N 79°26'19.003"E	335502.712 2085129.908	130.954	125.470	5.484
31	IWAI BM GDV-31	310.51	Yellampally	18°51'03.741"N 79°21'47.842"E	327564.999 2085141.336	143.010	134.000	9.010
32	IWAI BM GDV-32	322.35	Rampura	18°49'55.377"N 79°16'43.599"E	318638.805 2083123.770	146.402	142.067	4.335
33	IWAI BM GDV-33	331.68	Luxettipet	18°52'14.784"N 79°12'05.991"E	310554.949 2087490.734	147.899	143.485	4.414
34	IWAI BM GDV-34	343.02	Velga Pet	18°55'46.920"N 79°07'35.201"E	302697.908 2094095.708	151.813	144.119	7.694
35	IWAI BM GDV-35	351.73	Luxmikanta	18°59'44.814"N 79°05'35.926"E	299286.926 2101448.067	160.707	148.660	12.047
36	IWAI BM GDV-36	361.94	Chintaguda	19°03'56.320"N 79°02'17.207"E	293560.797 2109245.728	165.357	153.950	11.407

Sl. No.	Station	Chainage (km)	Location	Latitude (N) Longitude (E)	Easting (E) Northing (N)	BM Height above MSL (m)	CD w.r.t MSL (m)	BM Height w.r.t. Established CD (m)
37	IWAI BM GDV-37	372.06	Kalmaiduga	19°04'39.284"N 78°56'55.528"E	284170.741 2110674.581	174.711	162.040	12.671
38	IWAI BM GDV-38	382.91	Munyal	19°03'09.654"N 78°52'51.782"E	277010.803 2108003.039	185.700	172.750	12.950
39	IWAI BM GDV-39	393.76	Narsingapura	19°02'59.935"N 78°47'52.270"E	268248.316 2107812.001	195.301	183.530	11.771
40	IWAI BM GDV-40	405.00	Lingapur	19°01'58.651"N 78°42'50.195"E	259389.569 2106040.215	227.510	220.660	6.850
41	IWAI BM GDV-41	416.39	Mugli Pet	18°58'25.174"N 78°38'13.028"E	251194.378 2099581.78	239.145	230.610	8.535
42	IWAI BM GDV-42	427.36	Erdandi	18°57'47.077"N 78°33'34.134"E	243017.394 2098521.298	284.522	270.950	13.572
43	IWAI BM GDV-43	437.32	Domochandra	18°58'13.916"N 78°29'29.507"E	235870.346 2099447.388	288.336	275.610	12.726
44	IWAI BM GDV-44	447.79	Ranjarla	18°59'37.983"N 78°24'49.240"E	227706.563 2102151.941	300.674	292.170	8.504
45	IWAI BM GDV-45	457.28	Shri Ram Sagar Dam	18°57'44.816"N 78°21'04.499"E	221077.937 2098768.604	317.030	303.630	13.400
46	IWAI BM GDV-46	465.00	Bapparam	18°59'27.807"N 78°18'41.783"E	216949.328 2102000.082	338.507	322.508	15.999
47	IWAI BM GDV-47	478.32	Ratanapur	19°02'01.583"N 78°12'33.350"E	206242.560 2106898.833	336.808	322.662	14.146
48	IWAI BM GDV-48	490.00	Pipri	18°59'01.145"N 78°07'42.397"E	197639.016 2101484.728	333.557	322.760	10.797
49	IWAI BM GDV-49	498.95	Kankapur	18°56'32.555"N 78°02'55.348"E	189160.809 2097051.946	335.669	323.092	12.577
50	IWAI BM GDV-50	510.54	Basar	18°53'02.349"N 77°59'59.548"E	816069.599 2090670.583	336.507	323.530	12.977
51	IWAI BM GDV-51	520.89	Thadbiloli	18°49'19.476"N 77°56'20.582"E	809770.364 2083705.711	340.455	324.246	16.209
52	IWAI BM GDV-52	531.13	Triskon	18°50'15.917"N 77°51'03.008"E	800438.563 2085290.350	341.297	326.725	14.572
53	IWAI BM GDV-53	540.69	Patoda kh	18°52'08.731"N 77°46'36.677"E	792582.666 2088637.109	342.224	329.641	12.583
54	IWAI BM GDV-54	552.58	Kawalguda B.K	18°53'57.376"N 77°40'54.150"E	782500.994 2091824.600	343.294	331.074	12.220
55	IWAI BM GDV-55	563.75	Kogookr	18°55'51.790"N 77°36'04.462"E	773967.553 2095217.278	341.678	332.089	9.589
56	IWAI BM GDV-56	574.72	Rahti	18°59'45.233"N 77°32'26.542"E	767485.171 2102304.908	348.690	333.067	15.623
57	IWAI BM GDV-57	584.69	Chilpimpri	19°01'58.335"N 77°28'10.614"E	759939.444 2106292.265	346.961	334.528	12.433
58	IWAI BM GDV-58	593.88	Shankh Tirth	19°05'04.765"N 77°24'13.350"E	752920.543 2111929.972	353.639	336.436	17.203
59	IWAI BM GDV-59	603.58	Brahmanwada	19°09'13.524"N 77°24'29.010"E	753273.064 2119587.454	356.538	338.629	17.909
60	IWAI BM GDV-60	613.54	Karbala	19°08'26.113"N 77°19'38.112"E	744789.925 2118013.925	350.391	340.866	9.525
61	IWAI BM GDV-61	623.56	Thugaon	19°07'24.439"N 77°15'54.953"E	738291.581 2116031.393	357.745	344.032	13.713
62	IWAI BM GDV-62	634.35	Jaitapur	19°07'13.516"N 77°10'36.163"E	728976.957 2115577.066	362.694	347.050	15.644
63	IWAI BM GDV-63	643.83	Dhanora Mutya	19°04'35.849"N 77°07'48.820"E	724144.309 2110668.142	357.261	349.676	7.585

Sl. No.	Station	Chainage (km)	Location	Latitude (N) Longitude (E)	Easting (E) Northing (N)	BM Height above MSL (m)	CD w.r.t MSL (m)	BM Height w.r.t. Established CD (m)
64	IWAI BM GDV-64	652.34	Penoor	19°05'35.878"N 77°06'06.870"E	721141.298 2112478.17	364.719	352.078	12.641
65	IWAI BM GDV-65	661.82	Sarangi	19°06'28.071"N 77°03'33.630"E	716642.44 2114029.94	374.337	354.649	19.688
66	IWAI BM GDV-66	671.13	Digrus	19°05'33.421"N 77°00'44.548"E	711719.212 2112291.884	372.499	357.141	15.358
67	IWAI BM GDV-67	679.69	Banegaon	19°04'34.959"N 76°57'30.578"E	706068.819 2110429.897	371.871	358.433	13.438
68	IWAI BM GDV-68	689.61	Devlgaon dhudhate	19°03'44.512"N 76°53'06.787"E	698373.373 2108794.123	374.929	359.906	15.023
69	IWAI BM GDV-69	699.21	Wazur	19°02'33.146"N 76°49'42.616"E	692426.836 2106536.557	374.153	361.378	12.775
70	IWAI BM GDV-70	709.36	Nagthana	19°00'38.457"N 76°47'37.079"E	688792.104 2102972.265	374.193	363.145	11.048
71	IWAI BM GDV-71	720.40	Muli	19°00'51.424"N 76°44'54.990"E	684047.806 2103323.229	374.599	366.024	8.575
72	IWAI BM GDV-72	729.89	Chichtakli	19°00'00.547"N 76°41'07.286"E	677403.803 2101693.908	378.890	367.655	11.235
73	IWAI BM GDV-73	739.38	Mairal sawangi	19°01'43.609"N 76°38'10.014"E	672189.852 2104813.669	383.080	370.012	13.068
74	IWAI BM GDV-74	748.25	Shrisibadroo	19°04'42.716"N 76°36'28.401"E	669168.197 2110292.935	387.182	373.461	13.721
75	IWAI BM GDV-75	758.29	Wangi	19°06'37.700"N 76°32'08.123"E	661529.006 2113759.837	387.031	376.461	10.570
76	IWAI BM GDV-76	767.30	Vita	19°04'25.823"N 76°28'33.234"E	655283.096 2109651.360	386.582	380.125	6.457
77	IWAI BM GDV-77	777.24	Limba	19°05'54.880"N 76°26'09.461"E	651058.073 2112354.370	388.213	382.269	5.944
78	IWAI BM GDV-78	788.11	Umara	19°07'12.963"N 76°21'40.013"E	643164.603 2114691.975	390.075	385.016	5.059
79	IWAI BM GDV-79	797.18	Andhapur	19°07'50.610"N 76°19'50.167"E	639945.954 2115824.618	389.749	386.163	3.586
80	IWAI BM GDV-80	806.07	Walsa khord	19°11'35.779"N 76°21'10.280"E	642233.137 2122764.923	398.248	387.214	11.034
81	IWAI BM GDV-81	816.43	Patada	19°15'22.125"N 76°19'19.433"E	638942.612 2129698.569	393.934	389.409	4.525
82	IWAI BM GDV-82	826.33	Manjrath	19°14'35.834"N 76°14'43.444"E	630894.783 2128215.934	402.998	391.699	11.299
83	IWAI BM GDV-83	835.04	Sarangi	19°17'05.942"N 76°11'56.583"E	625990.825 2132796.248	401.715	394.156	7.559
84	IWAI BM GDV-84	844.86	Sangatpari	19°18'06.191"N 76°08'05.033"E	619219.587 2134602.903	410.707	397.285	13.422
85	IWAI BM GDV-85	855.56	Bhadli	19°17'08.368"N 76°03'50.271"E	611794.698 2132778.200	414.970	400.834	14.136
86	IWAI BM GDV-86	865.23	Rajatakli	19°20'25.140"N 76°01'10.501"E	607095.479 2138799.040	410.225	404.257	5.968
87	IWAI BM GDV-87	874.57	Mangrola	19°17'50.675"N 75°56'43.889"E	599341.798 2134006.627	418.712	407.212	11.500
88	IWAI BM GDV-88	884.53	Banegaon	19°21'19.665"N 75°54'34.803"E	595540.429 2140410.738	417.978	409.540	8.438
89	IWAI BM GDV-89	894.63	Sadegaon	19°23'01.189"N 75°52'15.866"E	591471.044 2143510.665	421.831	413.145	8.686
90	IWAI BM GDV-90	904.81	Gondi	19°24'04.769 75°47'09.688"E	582530.669 2145422.193	423.289	415.917	7.372

Sl. No.	Station	Chainage (km)	Location	Latitude (N) Longitude (E)	Easting (E) Northing (N)	BM Height above MSL (m)	CD w.r.t MSL (m)	BM Height w.r.t. Established CD (m)
91	IWAI BM GDV-91	914.12	Ghansayami	19°21'36.009"N 75°43'57.426"E	576942.319 2140824.812	430.944	419.810	11.134
92	IWAI BM GDV-92	921.71	Domalgaon	19°22'09.750"N 75°40'19.390"E	570577.238 2141836.086	428.250	422.624	5.626
93	IWAI BM GDV-93	932.71	Sinarigaon	19°22'49.160"N 75°35'03.132"E	561347.147 2143013.937	437.921	426.440	11.481
94	IWAI BM GDV-94	941.91	Nawgaon	19°25'04.447"N 75°31'06.073"E	554419.607 2147150.275	436.065	428.660	7.405
95	IWAI BM GDV-95	951.86	Naygaon	19°25'01.127"N 75°27'26.226"E	548008.455 2147030.074	442.559	432.554	10.005
96	IWAI BM GDV-96	961.84	Paithan	19°28'13.221"N 75°24'32.908"E	542939.927 2152921.879	442.004	435.477	6.527
97	IWAI BM GDV-97	969.61	Dalwadi	19°30'56.385"N 75°22'24.916"E	539197.607 2157928.682	465.920	455.520	10.400
98	IWAI BM GDV-98	980.14	Vijaypur	19°32'16.127"N 75°16'35.930"E	529022.362 2160360.451	465.884	456.328	9.556
99	IWAI BM GDV-99	987.00	Baandgaon	19°35'04.549"N 75°14'54.330"E	526054.126 2165532.825	470.098	457.307	12.791
100	IWAI BM GDV-100	1001.58	Jhakri	19°36'52.225"N 75°07'42.437"E	513469.456 2168828.647	467.425	458.104	9.321
101	IWAI BM GDV-101	1008.83	Mahalapur	19°36'30.540"N 75°03'25.032"E	505972.206 2168158.020	466.467	459.553	6.914
102	IWAI BM GDV-102	1018.75	Jamgaon	19°38'17.456"N 74°59'13.534"E	498646.787 2171443.427	470.895	461.526	9.369
103	IWAI BM GDV-103	1027.67	Shivnagar	19°38'55.277"N 74°55'05.667"E	491428.754 2172607.960	469.834	463.338	6.496
104	IWAI BM GDV-104	1037.15	Wagapur	19°38'49.868"N 74°50'58.689"E	484236.360 2172446.584	469.204	464.910	4.294
105	IWAI BM GDV-105	1046.72	Avawalgaon	19°42'14.821"N 74°48'22.163"E	479685.303 2178751.017	471.751	467.717	4.034
106	IWAI BM GDV-106	1057.62	Bhalgaon	19°45'10.676"N 74°44'46.458"E	473413.994 2184164.766	471.849	470.455	1.394
107	IWAI BM GDV-107	1069.61	Babulgaon	19°46'33.911"N 74°40'16.855"E	465572.863 2186736.758	481.905	473.583	8.322
108	IWAI BM GDV-108	1079.46	Karegaon	19°46'23.433"N 74°35'53.816"E	457918.091 2186431.174	486.023	476.713	9.310
109	IWAI BM GDV-109	1090.56	Sawantsar	19°50'19.348"N 74°32'39.346"E	452278.747 2193697.301	492.457	480.640	11.817
110	IWAI BM GDV-110	1101.28	Kopargaon	19°52'41.703"N 74°28'50.481"E	445635.175 2198092.417	491.780	484.723	7.057
111	IWAI BM GDV-111	1111.13	Dharangaon	19°54'15.665"N 74°25'03.958"E	439057.780 2201002.317	498.735	488.535	10.200
112	IWAI BM GDV-112	1121.05	Sangvi Bhusar	19°56'09.821"N 74°20'43.752"E	431505.733 2204539.287	503.204	493.256	9.948
113	IWAI BM GDV-113	1132.71	Kandara	19°57'48.390"N 74°15'35.966"E	422571.648 2207606.517	509.287	503.227	6.060
114	IWAI BM GDV-114	1144.50	Tamaswadi	19°59'20.679"N 74°09'35.377"E	412105.027 2210492.940	514.527	510.018	4.509
115	IWAI BM GDV-115	1154.46	Kodgaon	20°02'05.437"N 74°05'32.759"E	405081.604 2215594.691	532.857	531.253	1.604
116	IWAI BM GDV-116	1164.51	Gondegaon	20°02'17.194"N 74°02'02.940"E	398987.714 2215990.264	534.303	531.272	3.031
117	IWAI BM GDV-117	1176.23	Shimpi Takali	19°59'02.570"N 73°58'47.931"E	393285.596 2210040.640	535.021	531.980	3.041

Sl. No.	Station	Chainage (km)	Location	Latitude (N) Longitude (E)	Easting (E) Northing (N)	BM Height above MSL (m)	CD w.r.t MSL (m)	BM Height w.r.t. Established CD (m)
118	IWAI BM GDV-118	1189.18	Shilapur	19°59'43.453"N 73°54'00.363"E	384936.006 2211350.380	548.467	543.381	5.086
119	IWAI BM GDV-119	1200.78	Vaishnavi Park	20°00'01.461"N 73°48'39.645"E	375619.150 2211967.667	557.632	550.902	6.730

Table 62 - Accepted Benchmark coordinates with established Chart Datum

## 2.9 Chart Datum / Sounding Datum and Reductions details

Sl. No.	Benchmark / Tide Gauges	Chainage (km)	Stretch for corrected soundings and topo levels (km)	Established Sounding Datum w.r.t. MSL (m) at col. A.	Sounding Datum of Tide Gauge wrt MSL (m)	Correction in WL data for Bathymetric Survey (m)	Topo level data to be converted as depth for volume calculation wrt SD (m)		
				D			E	F = (E- WL data in MSL)	G = ((E- topo levels in MSL)
				+ve indicates above MSL -ve indicates below MSL					
1	-	-	0-1	-	33.709	Details at Annexure-4	Details placed at Godavari Stretchwise data in excel		
2	-	-	1-2	-	34.345				
3	-	-	2-3	-	34.836				
4	-	-	3-4	-	35.151				
5	-	-	4-5	-	35.155				
6	-	-	5-6	-	35.615				
7	-	-	6-7	-	35.74				
8	-	-	7-8	-	36.223				
9	-	-	8-9	-	36.364				
10	-	-	9-10	-	36.519				
11	-	-	10-11	-	37.635				
12	-	-	11-12	-	38.194				
13	-	-	12-13	-	38.418				
14	-	-	13-14	-	38.81				
15	-	-	14-15	-	38.89				
16	-	-	15-16	-	39.108				
17	-	-	16-17	-	40.468				
18	-	-	17-18	-	41.112				
19	-	-	18-19	-	41.209				
20	-	-	19-20	-	41.317				
21	-	-	20-21	-	42.043				
22	-	-	21-22	-	42.44				
23	-	-	22-23	-	42.615				
24	-	-	23-24	-	44.004				
25	-	-	24-25	-	44.741				
26	-	-	25-26	-	45.147				
27	-	-	26-27	-	45.214				
28	-	-	27-28	-	45.604				
29	-	-	28-29	-	45.953				
30	-	-	29-30	-	46.42				



Sl. No.	Benchmark / Tide Gauges	Chainage (km )	Stretch for corrected soundings and topo levels (km)	Established Sounding Datum w.r.t. MSL (m) at col. A.	Sounding Datum of Tide Gauge wrt MSL (m)	Correction in WL data for Bathymetric Survey (m)	Topo level data to be converted as depth for volume calculation wrt SD (m)
	A	B	C (50% stretch is to be selected on both side of tide gauge)	D	E	F = (E- WL data in MSL)	G = ((E- topo levels in MSL)
				+ve indicates above MSL -ve indicates below MSL			
31	-	-	30-31	-	46.553		
32	-	-	31-32	-	46.753		
33	-	-	32-33	-	46.965		
34	-	-	33-34	-	47.025		
35	-	-	34-35	-	47.447		
36	-	-	35-36	-	48.025		
37	-	-	36-37	-	48.05		
38	-	-	37-38	-	48.077		
39	-	-	38-39	-	48.111		
40	-	-	39-40	-	48.141		
41	-	-	40-41	-	48.214		
42	-	-	41-42	-	48.307		
43	-	-	42-43	-	48.579		
44	-	-	43-44	-	48.874		
45	-	-	44-45	-	49.147		
46	-	-	45-46	-	49.421		
47	-	-	46-47	-	49.515		
48	-	-	47-48	-	49.777		
49	-	-	48-49	-	49.977		
50	-	-	49-50	-	50.011		
51	-	-	50-51	-	50.166		
52	-	-	51-52	-	50.499		
53	-	-	52-53	-	50.804		
54	-	-	53-54	-	50.989		
55	-	-	54-55	-	51.125		
56	-	-	55-56	-	51.225		
57	-	-	56-57	-	52.025		
58	-	-	57-58	-	52.149		
59	-	-	58-59	-	52.274		
60	-	-	59-60	-	52.394		
61	-	-	60-61	-	52.405		
62	-	-	61-62	-	52.485		
63	-	-	62-63	-	52.542		
64	-	-	63-64	-	52.705		
65	-	-	64-65	-	52.906		
66	-	-	65-66	-	53.493		
67	-	-	66-67	-	53.506		
68	-	-	67-68	-	54.586		
69	-	-	68-69	-	54.736		
70	-	-	69-70	-	54.876		
71	-	-	70-71	-	55.005		
72	-	-	71-72	-	55.026		
73	-	-	72-73	-	55.065		
74	-	-	73-74	-	55.106		
75	-	-	74-75	-	55.18		

Sl. No.	Benchmark / Tide Gauges	Chainage (km )	Stretch for corrected soundings and topo levels (km)	Established Sounding Datum w.r.t. MSL (m) at col. A.	Sounding Datum of Tide Gauge wrt MSL (m)	Correction in WL data for Bathymetric Survey (m)	Topo level data to be converted as depth for volume calculation wrt SD (m)
	A	B	C (50% stretch is to be selected on both side of tide gauge)	D	E	F = (E- WL data in MSL)	G = ((E- topo levels in MSL)
				+ve indicates above MSL -ve indicates below MSL			
76	-	-	75-76	-	56.058		
77	-	-	76-77	-	56.226		
78	-	-	77-78	-	56.384		
79	-	-	78-79	-	56.731		
80	-	-	79-80	-	57.084		
81	-	-	80-81	-	57.091		
82	-	-	81-82	-	57.195		
83	-	-	82-83	-	57.287		
84	-	-	83-84	-	57.399		
85	-	-	84-85	-	57.409		
86	-	-	85-86	-	57.571		
87	-	-	86-87	-	57.659		
88	-	-	87-88	-	57.712		
89	-	-	88-89	-	60.115		
90	-	-	89-90	-	60.654		
91	-	-	90-91	-	60.774		
92	-	-	91-92	-	60.792		
93	-	-	92-93	-	60.874		
94	-	-	93-94	-	60.901		
95	-	-	94-95	-	61.113		
96	-	-	95-96	-	61.225		
97	-	-	96-97	-	61.637		
98	-	-	97-98	-	62.042		
99	-	-	98-99	-	62.498		
100	-	-	99-100	-	62.905		
101	-	-	100-101	-	63.214		
102	-	-	101-102	-	64.107		
103	-	-	102-103	-	64.229		
104	-	-	103-104	-	64.374		
105	-	-	104-105	-	64.434		
106	-	-	105-106	-	64.545		
107	-	-	106-107	-	64.61		
108	-	-	107-108	-	64.666		
109	-	-	108-109	-	64.672		
110	-	-	109-110	-	64.717		
111	-	-	110-111	-	64.727		
112	-	-	111-112	-	64.732		
113	-	-	112-113	-	64.74		
114	-	-	113-114	-	64.824		
115	-	-	114-115	-	64.979		
116	-	-	115-116	-	65.13		
117	-	-	116-117	-	65.214		
118	-	-	117-118	-	65.257		
119	-	-	118-119	-	65.286		
120	-	-	119-120	-	65.362		

Sl. No.	Benchmark / Tide Gauges	Chainage (km )	Stretch for corrected soundings and topo levels (km)	Established Sounding Datum w.r.t. MSL (m) at col. A.	Sounding Datum of Tide Gauge wrt MSL (m)	Correction in WL data for Bathymetric Survey (m)	Topo level data to be converted as depth for volume calculation wrt SD (m)
	A	B	C (50% stretch is to be selected on both side of tide gauge)	D	E	F = (E- WL data in MSL)	G = ((E- topo levels in MSL)
				+ve indicates above MSL -ve indicates below MSL			
121	-	-	120-121	-	65.672		
122	-	-	121-122	-	65.725		
123	-	-	122-123	-	65.855		
124	-	-	123-124	-	65.963		
125	-	-	124-125	-	66.174		
126	-	-	125-126	-	66.258		
127	-	-	126-127	-	67.193		
128	-	-	127-128	-	67.264		
129	-	-	128-129	-	67.957		
130	-	-	129-130	-	68.268		
131	-	-	130-131	-	69.401		
132	-	-	131-132	-	69.914		
133	-	-	132-133	-	70.327		
134	-	-	133-134	-	71.382		
135	-	-	134-135	-	71.456		
136	-	-	135-136	-	71.611		
137	-	-	136-137	-	71.747		
138	-	-	137-138	-	71.874		
139	-	-	138-139	-	71.964		
140	-	-	139-140	-	71.982		
141	-	-	140-141	-	72.015		
142	-	-	141-142	-	72.135		
143	-	-	142-143	-	72.258		
144	-	-	143-144	-	72.374		
145	-	-	144-145	-	72.577		
146	-	-	145-146	-	72.674		
147	-	-	146-147	-	72.721		
148	-	-	147-148	-	72.774		
149	-	-	148-149	-	72.833		
150	-	-	149-150	-	72.84		
151	-	-	150-151	-	72.854		
152	-	-	151-152	-	72.912		
153	-	-	152-153	-	72.923		
154	-	-	153-154	-	72.983		
155	-	-	154-155	-	73.083		
156	-	-	155-156	-	73.216		
157	-	-	156-157	-	73.51		
158	-	-	157-158	-	73.694		
159	-	-	158-159	-	74.347		
160	-	-	159-160	-	74.425		
161	-	-	160-161	-	74.947		
162	-	-	161-162	-	75.225		
163	-	-	162-163	-	75.859		
164	-	-	163-164	-	76.147		
165	-	-	164-165	-	76.322		

Sl. No.	Benchmark / Tide Gauges	Chainage (km )	Stretch for corrected soundings and topo levels (km)	Established Sounding Datum w.r.t. MSL (m) at col. A.	Sounding Datum of Tide Gauge wrt MSL (m)	Correction in WL data for Bathymetric Survey (m)	Topo level data to be converted as depth for volume calculation wrt SD (m)
	A	B	C (50% stretch is to be selected on both side of tide gauge)	D	E	F = (E- WL data in MSL)	G = ((E- topo levels in MSL)
				+ve indicates above MSL -ve indicates below MSL			
166	-	-	165-166	-	77.378		
167	-	-	166-167	-	77.712		
168	-	-	167-168	-	77.878		
169	-	-	168-169	-	78.285		
170	-	-	169-170	-	78.474		
171	-	-	170-171	-	78.825		
172	-	-	171-172	-	79.047		
173	-	-	172-173	-	79.624		
174	-	-	173-174	-	80.069		
175	-	-	174-175	-	80.163		
176	-	-	175-176	-	80.399		
177	-	-	176-177	-	80.655		
178	-	-	177-178	-	80.88		
179	-	-	178-179	-	81.039		
180	-	-	179-180	-	81.199		
181	-	-	180-181	-	81.488		
182	-	-	181-182	-	82.288		
183	-	-	182-183	-	82.354		
184	-	-	183-184	-	82.447		
185	-	-	184-185	-	82.525		
186	-	-	185-186	-	82.659		
187	-	-	186-187	-	83.025		
188	-	-	187-188	-	83.147		
189	-	-	188-189	-	83.583		
190	-	-	189-190	-	83.814		
191	-	-	190-191	-	84.214		
192	-	-	191-192	-	84.358		
193	-	-	192-193	-	84.658		
194	-	-	193-194	-	84.847		
195	-	-	194-195	-	85.226		
196	-	-	195-196	-	85.359		
197	-	-	196-197	-	85.671		
198	-	-	197-198	-	85.91		
199	-	-	198-199	-	86.626		
200	-	-	199-200	-	87.226		
201	-	-	200-201	-	87.359		
202	-	-	201-202	-	87.547		
203	-	-	202-203	-	87.647		
204	-	-	203-204	-	88.214		
205	-	-	204-205	-	88.347		
206	-	-	205-206	-	88.425		
207	-	-	206-207	-	88.865		
208	-	-	207-208	-	89.378		
209	-	-	208-209	-	89.654		
210	-	-	209-210	-	90.754		

Sl. No.	Benchmark / Tide Gauges	Chainage (km )	Stretch for corrected soundings and topo levels (km)	Established Sounding Datum w.r.t. MSL (m) at col. A.	Sounding Datum of Tide Gauge wrt MSL (m)	Correction in WL data for Bathymetric Survey (m)	Topo level data to be converted as depth for volume calculation wrt SD (m)
	A	B	C (50% stretch is to be selected on both side of tide gauge)	D	E	F = (E- WL data in MSL)	G = ((E- topo levels in MSL)
				+ve indicates above MSL -ve indicates below MSL			
211	-	-	210-211	-	90.874		
212	-	-	211-212	-	91.147		
213	-	-	212-213	-	91.225		
214	-	-	213-214	-	91.323		
215	-	-	214-215	-	91.552		
216	-	-	215-216	-	92.147		
217	-	-	216-217	-	92.298		
218	-	-	217-218	-	92.331		
219	-	-	218-219	-	92.863		
220	-	-	219-220	-	93.331		
221	-	-	220-221	-	93.508		
222	-	-	221-222	-	94.174		
223	-	-	222-223	-	94.275		
224	-	-	223-224	-	94.675		
225	-	-	224-225	-	94.875		
226	-	-	225-226	-	95.118		
227	-	-	226-227	-	95.758		
228	-	-	227-228	-	96.454		
229	-	-	228-229	-	96.862		
230	-	-	229-230	-	97.374		
231	-	-	230-231	-	97.774		
232	-	-	231-232	-	98.377		
233	-	-	232-233	-	98.687		
234	-	-	233-234	-	98.809		
235	-	-	234-235	-	99.08		
236	-	-	235-236	-	99.59		
237	-	-	236-237	-	99.74		
238	-	-	237-238	-	100.04		
239	-	-	238-239	-	100.58		
240	-	-	239-240	-	100.88		
241	-	-	240-241	-	101.34		
242	-	-	241-242	-	101.81		
243	-	-	242-243	-	102.37		
244	-	-	243-244	-	102.57		
245	-	-	244-245	-	102.98		
246	-	-	245-246	-	103.12		
247	-	-	246-247	-	103.52		
248	-	-	247-248	-	104.08		
249	-	-	248-249	-	104.93		
250	-	-	249-250	-	105.31		
251	-	-	250-251	-	105.57		
252	-	-	251-252	-	105.76		
253	-	-	252-253	-	106.34		
254	-	-	253-254	-	106.64		
255	-	-	254-255	-	106.94		

Sl. No.	Benchmark / Tide Gauges	Chainage (km )	Stretch for corrected soundings and topo levels (km)	Established Sounding Datum w.r.t. MSL (m) at col. A.	Sounding Datum of Tide Gauge wrt MSL (m)	Correction in WL data for Bathymetric Survey (m)	Topo level data to be converted as depth for volume calculation wrt SD (m)
	A	B	C (50% stretch is to be selected on both side of tide gauge)	D	E	F = (E- WL data in MSL)	G = ((E- topo levels in MSL)
				+ve indicates above MSL -ve indicates below MSL			
256	-	-	255-256	-	107.17		
257	-	-	256-257	-	107.54		
258	-	-	257-258	-	107.87		
259	-	-	258-259	-	108.57		
260	-	-	259-260	-	108.77		
261	-	-	260-261	-	109.67		
262	-	-	261-262	-	110.13		
263	-	-	262-263	-	110.34		
264	-	-	263-264	-	110.57		
265	-	-	264-265	-	110.96		
266	-	-	265-266	-	111.61		
267	-	-	266-267	-	111.701		
268	-	-	267-268	-	111.84		
269	-	-	268-269	-	112.07		
270	-	-	269-270	-	112.47		
271	-	-	270-271	-	112.94		
272	-	-	271-272	-	113.04		
273	-	-	272-273	-	113.84		
274	-	-	273-274	-	113.97		
275	-	-	274-275	-	114.07		
276	-	-	275-276	-	114.69		
277	-	-	276-277	-	114.81		
278	-	-	277-278	-	115.87		
279	-	-	278-279	-	116.21		
280	-	-	279-280	-	116.31		
281	-	-	280-281	-	116.58		
282	-	-	281-282	-	117.51		
283	-	-	282-283	-	118.16		
284	-	-	283-284	-	118.27		
285	-	-	284-285	-	118.57		
286	-	-	285-286	-	118.963		
287	-	-	286-287	-	119.48		
288	-	-	287-288	-	119.77		
289	-	-	288-289	-	119.96		
290	-	-	289-290	-	120.41		
291	-	-	290-291	-	120.79		
292	-	-	291-292	-	120.963		
293	-	-	292-293	-	121.29		
294	-	-	293-294	-	121.635		
295	-	-	294-295	-	121.97		
296	-	-	295-296	-	122.68		
297	-	-	296-297	-	122.77		
298	-	-	297-298	-	122.92		
299	-	-	298-299	-	123.46		
300	-	-	299-300	-	124.45		



Sl. No.	Benchmark / Tide Gauges	Chainage (km )	Stretch for corrected soundings and topo levels (km)	Established Sounding Datum w.r.t. MSL (m) at col. A.	Sounding Datum of Tide Gauge wrt MSL (m)	Correction in WL data for Bathymetric Survey (m)	Topo level data to be converted as depth for volume calculation wrt SD (m)
	A	B	C (50% stretch is to be selected on both side of tide gauge)	D	E	F = (E- WL data in MSL)	G = ((E- topo levels in MSL)
				+ve indicates above MSL -ve indicates below MSL			
301	-	-	300-301	-	124.76		
302	-	-	301-302	-	124.64		
303	-	-	302-303	-	125.47		
304	-	-	303-304	-	126.04		
305	-	-	304-305	-	127.34		
306	-	-	305-306	-	127.37		
307	-	-	306-307	-	128.04		
308	-	-	307-308	-	128.68		
309	-	-	308-309	-	129.72		
310	-	-	309-310.5	-	130.22		
311	TP - GDV 31	310.64	310.5-316.5	-	134		
312	TP - GDV 32	322.35	316.5-327.0	-	142.067		
313	TP - GDV 33	331.70	327.0-337.0	-	143.485		
314	TP - GDV 34	343.02	337.0-346.1	-	144.119		
315	-	-	346.1-347	-	147.14		
316	-	-	347-348	-	147.35		
317	-	-	348-349	-	147.69		
318	-	-	349-350	-	147.96		
319	-	-	350-351	-	148.35		
320	-	-	351-352	-	148.66		
321	-	-	352-353	-	149.39		
322	-	-	353-354	-	149.81		
323	-	-	354-355	-	150.45		
324	-	-	355-356	-	151.26		
325	-	-	356-357	-	151.55		
326	-	-	357-358	-	151.68		
327	-	-	358-359	-	152.58		
328	-	-	359-360	-	152.78		
329	-	-	360-361	-	153.35		
330	-	-	361-362	-	153.95		
331	-	-	362-363	-	154.47		
332	-	-	363-364	-	154.68		
333	-	-	364-365	-	156.24		
334	-	-	365-366	-	157.05		
335	-	-	366-367	-	157.26		
336	-	-	367-368	-	157.85		
337	-	-	368-369	-	160.51		
338	-	-	369-370	-	160.62		
339	-	-	370-371	-	161.12		
340	-	-	371-372	-	161.17		
341	-	-	372-373	-	162.04		
342	-	-	373-374	-	165.05		
343	-	-	374-375	-	165.215		
344	-	-	375-376	-	165.65		
345	-	-	376-377	-	166.66		

Sl. No.	Benchmark / Tide Gauges	Chainage (km )	Stretch for corrected soundings and topo levels (km)	Established Sounding Datum w.r.t. MSL (m) at col. A.	Sounding Datum of Tide Gauge wrt MSL (m)	Correction in WL data for Bathymetric Survey (m)	Topo level data to be converted as depth for volume calculation wrt SD (m)
	A	B	C (50% stretch is to be selected on both side of tide gauge)	D	E	F = (E- WL data in MSL)	G = ((E- topo levels in MSL)
				+ve indicates above MSL -ve indicates below MSL			
346	-	-	377-378	-	167.09		
347	-	-	378-379	-	168.05		
348	-	-	379-380	-	169.04		
349	-	-	380-381	-	171.84		
350	-	-	381-382	-	172.41		
351	-	-	382-383	-	172.75		
352	-	-	383-384	-	173.08		
353	-	-	384-385	-	174.74		
354	-	-	385-386	-	175.19		
355	-	-	386-387	-	176.16		
356	-	-	387-388	-	177.88		
357	-	-	388-389	-	178.06		
358	-	-	389-390	-	179.03		
359	-	-	390-391	-	180.23		
360	-	-	391-392	-	181.16		
361	-	-	392-393	-	183.18		
362	-	-	393-394	-	183.53		
363	-	-	394-395	-	187.45		
364	-	-	395-396	-	189.94		
365	-	-	396-397	-	192.65		
366	-	-	397-398	-	203.85		
367	-	-	398-399	-	211.34		
368	-	-	399-400	-	215.33		
369	-	-	400-401	-	217.65		
370	-	-	401-402	-	218.02		
371	-	-	402-403	-	218.49		
372	-	-	403-404	-	218.82		
373	-	-	404-405	-	219.07		
374	-	-	405-406	-	220.66		
375	-	-	406-407	-	222.02		
376	-	-	407-408	-	222.32		
377	-	-	408-409	-	222.38		
378	-	-	409-410	-	222.86		
379	-	-	410-411	-	223.08		
380	-	-	411-412	-	224.25		
381	-	-	412-413	-	224.55		
382	-	-	413-414	-	226.31		
383	-	-	414-415	-	227.66		
384	-	-	415-416	-	228		
385	-	-	416-417	-	230.61		
386	-	-	417-418	-	231.08		
387	-	-	418-419	-	232.14		
388	-	-	419-420	-	232.35		
389	-	-	420-421	-	241.35		
390	-	-	421-422	-	258.05		

Sl. No.	Benchmark / Tide Gauges	Chainage (km )	Stretch for corrected soundings and topo levels (km)	Established Sounding Datum w.r.t. MSL (m) at col. A.	Sounding Datum of Tide Gauge wrt MSL (m)	Correction in WL data for Bathymetric Survey (m)	Topo level data to be converted as depth for volume calculation wrt SD (m)
	A	B	C (50% stretch is to be selected on both side of tide gauge)	D	E	F = (E- WL data in MSL)	G = ((E- topo levels in MSL)
				+ve indicates above MSL -ve indicates below MSL			
391	-	-	422-423	-	264.51		
392	-	-	423-424	-	265.52		
393	-	-	424-425	-	269.74		
394	-	-	425-426	-	270.8		
395	-	-	426-427	-	270.8		
396	-	-	427-428	-	270.95		
397	-	-	428-429	-	271.15		
398	-	-	429-430	-	271.84		
399	-	-	430-431	-	272.35		
400	-	-	431-432	-	272.94		
401	-	-	432-433	-	273.62		
402	-	-	433-434	-	273.94		
403	-	-	434-435	-	274.56		
404	-	-	435-436	-	275.26		
405	-	-	436-437	-	275.52		
406	-	-	437-438	-	275.61		
407	-	-	438-439	-	282.14		
408	-	-	439-440	-	284.06		
409	-	-	440-441	-	290.06		
410	-	-	441-442	-	290.15		
411	-	-	442-443	-	290.22		
412	-	-	443-444	-	290.65		
413	-	-	444-445	-	291.22		
414	-	-	445-446	-	291.66		
415	-	-	446-447	-	291.83		
416	-	-	447-448	-	292.17		
417	-	-	448-449	-	292.7		
418	-	-	449-450	-	293.17		
419	-	-	450-451	-	293.66		
420	-	-	451-452	-	294.05		
421	-	-	452-453	-	294.52		
422	-	-	453-454	-	295.27		
423	-	-	454-455	-	297.54		
424	-	-	455-456	-	299.88		
425	-	-	456-457.75	-	303.63		
426	TP - GDV 46	458.34	457.75-468.4	-	322.508		
427	TP - GDV 47	478.37	468.4-482.7	-	322.662		
428	TP - GDV 48	487.20	482.7-493.1	-	322.76		
429	TP - GDV 49	499.16	493.1-505.0	-	323.092		
430	TP - GDV 50	510.57	505.0-516.0	-	323.53		
431	TP - GDV 51	520.86	516.0-524.74	-	324.246		
432	-	-	524.74-525	-	325.032		
433	-	-	525-526	-	325.145		
434	-	-	526-527	-	325.216		
435	-	-	527-528	-	325.816		

Sl. No.	Benchmark / Tide Gauges	Chainage (km )	Stretch for corrected soundings and topo levels (km)	Established Sounding Datum w.r.t. MSL (m) at col. A.	Sounding Datum of Tide Gauge wrt MSL (m)	Correction in WL data for Bathymetric Survey (m)	Topo level data to be converted as depth for volume calculation wrt SD (m)
	A	B	C (50% stretch is to be selected on both side of tide gauge)	D	E	F = (E- WL data in MSL)	G = ((E- topo levels in MSL)
				+ve indicates above MSL -ve indicates below MSL			
436	-	-	528-529	-	325.916		
437	-	-	529-530	-	326.216		
438	-	-	530-531	-	326.516		
439	-	-	531-532	-	326.725		
440	-	-	532-533	-	326.985		
441	-	-	533-534	-	327.025		
442	-	-	534-535	-	327.125		
443	-	-	535-535.7	-	327.425		
444	-	-	535.7-537	-	328.947		
445	-	-	537-538	-	329.112		
446	-	-	538-539	-	329.341		
447	-	-	539-540	-	329.579		
448	-	-	540-541	-	329.641		
449	-	-	541-542	-	329.712		
450	-	-	542-543	-	329.823		
451	-	-	543-544	-	329.936		
452	-	-	544-545	-	330.083		
453	-	-	545-546	-	330.283		
454	-	-	546-547	-	330.378		
455	-	-	547-548	-	330.488		
456	-	-	548-549	-	330.688		
457	-	-	549-550	-	330.845		
458	-	-	550-551	-	330.965		
459	-	-	551-552	-	330.985		
460	-	-	552-553	-	331.074		
461	-	-	553-554	-	331.247		
462	-	-	554-555	-	331.414		
463	-	-	555-556	-	331.759		
464	-	-	556-557	-	331.851		
465	-	-	557-558	-	331.925		
466	-	-	558-559	-	331.957		
467	-	-	559-560	-	331.97		
468	-	-	560-561	-	331.982		
469	-	-	561-562	-	331.991		
470	-	-	562-563	-	332.014		
471	-	-	563-564	-	332.089		
472	-	-	564-565	-	332.101		
473	-	-	565-566	-	332.115		
474	-	-	566-567	-	332.127		
475	-	-	567-568.3	-	332.145		
476	TP - GDV 56 (Baligaon Barrage U/S)	568.43	568.3-571.6	-	332.161		
477	TP - GDV 56	574.68	571.6-580.2	-	333.067		
478	TP - GDV 57	584.63	580.2-588.6	-	334.528		

Sl. No.	Benchmark / Tide Gauges	Chainage (km )	Stretch for corrected soundings and topo levels (km)	Established Sounding Datum w.r.t. MSL (m) at col. A.	Sounding Datum of Tide Gauge wrt MSL (m)	Correction in WL data for Bathymetric Survey (m)	Topo level data to be converted as depth for volume calculation wrt SD (m)
	A	B	C (50% stretch is to be selected on both side of tide gauge)	D	E	F = (E- WL data in MSL)	G = ((E- topo levels in MSL)
				+ve indicates above MSL -ve indicates below MSL			
479	TP - GDV 58 (Amdura Barrage D/S)	592.51	588.6-592.6	-	335.277		
480	TP - GDV 58	593.85	592.6-598.8	-	336.436		
481	TP - GDV 59	603.70	598.8-608.6	-	338.629		
482	TP - GDV 60	613.55	608.6-615.8	-	340.866		
483	TP - GDV 61 (Vishnupuri Barrage D/S)	620.38	615.8-620.7	-	343.178		
484	TP - GDV 61	623.61	620.7-629	-	344.032		
485	TP - GDV 62	634.41	629-639.1	-	347.05		
486	TP - GDV 63	643.84	639.1-648.2	-	349.676		
487	TP - GDV 64	652.36	648.2-653.8	-	352.078		
488	TP - GDV 65	661.97	653.8-663.5	-	354.649		
489	TP - GDV 66 (Digras Barrage D/S)	670.91	663.5-672.15	-	357.141		
490	TP - GDV 67	679.71	672.15-684.25	-	358.433		
491	TP - GDV 68	689.67	684.25-694.4	-	359.906		
492	TP - GDV 69	699.22	694.4-704.2	-	361.378		
493	-	-	704.2-705	-	362.101		
494	-	-	705-706	-	362.214		
495	-	-	706-707	-	362.422		
496	-	-	707-708	-	362.622		
497	-	-	708-709	-	362.711		
498	-	-	709-710	-	363.145		
499	-	-	710-711	-	363.374		
500	-	-	711-712	-	363.557		
501	-	-	712-713	-	363.625		
502	-	-	713-714	-	363.752		
503	-	-	714-715	-	363.944		
504	-	-	715-716	-	364.012		
505	-	-	716-717	-	364.544		
506	-	-	717-718	-	364.701		
507	-	-	718-719	-	364.834		
508	-	-	719-720.26	-	364.912		
509	-	-	720.26-721	-	366.024		
510	-	-	721-722	-	366.214		
511	-	-	722-723	-	366.459		
512	-	-	723-724	-	366.647		
513	-	-	724-725	-	366.845		
514	-	-	725-726	-	366.915		
515	-	-	726-727	-	367.035		
516	-	-	727-728	-	367.135		
517	-	-	728-729	-	367.337		
518	-	-	729-730	-	367.655		
519	-	-	730-731	-	367.94		
520	-	-	731-732	-	368.207		

Sl. No.	Benchmark / Tide Gauges	Chainage (km )	Stretch for corrected soundings and topo levels (km)	Established Sounding Datum w.r.t. MSL (m) at col. A.	Sounding Datum of Tide Gauge wrt MSL (m)	Correction in WL data for Bathymetric Survey (m)	Topo level data to be converted as depth for volume calculation wrt SD (m)
	A	B	C (50% stretch is to be selected on both side of tide gauge)	D	E	F = (E- WL data in MSL)	G = ((E- topo levels in MSL)
				+ve indicates above MSL -ve indicates below MSL			
521	-	-	732-733	-	368.347		
522	-	-	733-734	-	368.518		
523	-	-	734-735	-	368.667		
524	-	-	735-736	-	368.824		
525	-	-	736-736.9	-	368.938		
526	-	-	736.9-738	-	369.707		
527	-	-	738-739	-	369.918		
528	-	-	739-740	-	370.012		
529	-	-	740-741	-	370.312		
530	-	-	741-742	-	370.512		
531	-	-	742-743	-	370.832		
532	-	-	743-744	-	371.138		
533	-	-	744-745	-	371.24		
534	-	-	745-746	-	371.71		
535	-	-	746-747	-	372.203		
536	-	-	747-748	-	372.303		
537	-	-	748-749	-	373.461		
538	-	-	749-750	-	373.547		
539	-	-	750-751	-	373.853		
540	-	-	751-752	-	374.11		
541	-	-	752-753	-	374.343		
542	-	-	753-754	-	374.521		
543	-	-	754-755	-	374.916		
544	-	-	755-756	-	375.416		
545	-	-	756-757	-	375.817		
546	-	-	757-758	-	376.234		
547	-	-	758-759	-	376.461		
548	-	-	759-760	-	376.553		
549	-	-	760-761	-	376.855		
550	-	-	761-762	-	377.047		
551	-	-	762-763	-	377.564		
552	-	-	763-764	-	377.743		
553	-	-	764-764.7	-	378.276		
554	-	-	764.7-766	-	379.976		
555	-	-	766-767	-	380.065		
556	-	-	767-768	-	380.125		
557	-	-	768-769	-	380.654		
558	-	-	769-770	-	380.851		
559	-	-	770-771	-	380.869		
560	-	-	771-772	-	381.147		
561	-	-	772-773	-	381.164		
562	-	-	773-774	-	381.262		
563	-	-	774-775	-	381.467		
564	-	-	775-776	-	381.867		
565	-	-	776-777	-	381.984		



Sl. No.	Benchmark / Tide Gauges	Chainage (km )	Stretch for corrected soundings and topo levels (km)	Established Sounding Datum w.r.t. MSL (m) at col. A.	Sounding Datum of Tide Gauge wrt MSL (m)	Correction in WL data for Bathymetric Survey (m)	Topo level data to be converted as depth for volume calculation wrt SD (m)
	A	B	C (50% stretch is to be selected on both side of tide gauge)	D	E	F = (E- WL data in MSL)	G = ((E- topo levels in MSL)
				+ve indicates above MSL -ve indicates below MSL			
566	-	-	777-778	-	382.269		
567	-	-	778-779	-	382.325		
568	-	-	779-780	-	382.614		
569	-	-	780-781	-	382.814		
570	-	-	781-782	-	382.916		
571	-	-	782-782.8	-	383.144		
572	-	-	782.8-784	-	384.173		
573	-	-	784-785	-	384.476		
574	-	-	785-786	-	384.633		
575	-	-	786-787	-	384.833		
576	-	-	787-788	-	384.977		
577	-	-	788-789	-	385.016		
578	-	-	789-790	-	385.128		
579	-	-	790-791	-	385.238		
580	-	-	791-792	-	385.326		
581	-	-	792-793	-	385.523		
582	-	-	793-794	-	385.661		
583	-	-	794-795	-	385.861		
584	-	-	795-796	-	385.972		
585	-	-	796-797	-	386.019		
586	-	-	797-798	-	386.163		
587	-	-	798-799	-	386.363		
588	-	-	799-800	-	386.557		
589	-	-	800-801	-	386.641		
590	-	-	801-802	-	386.74		
591	-	-	802-803	-	386.814		
592	-	-	803-804	-	386.946		
593	-	-	804-805	-	387.08		
594	-	-	805-806	-	387.179		
595	-	-	806-807	-	387.214		
596	-	-	807-808	-	387.434		
597	-	-	808-809	-	387.54		
598	-	-	809-810	-	387.636		
599	-	-	810-811	-	387.741		
600	-	-	811-812	-	388.324		
601	-	-	812-813	-	388.892		
602	-	-	813-814	-	388.986		
603	-	-	814-815	-	389.182		
604	-	-	815-816	-	389.394		
605	-	-	816-817	-	389.409		
606	-	-	817-818	-	389.724		
607	-	-	818-819	-	389.836		
608	-	-	819-820	-	390.035		
609	-	-	820-821	-	390.424		
610	-	-	821-822	-	390.72		

Sl. No.	Benchmark / Tide Gauges	Chainage (km )	Stretch for corrected soundings and topo levels (km)	Established Sounding Datum w.r.t. MSL (m) at col. A.	Sounding Datum of Tide Gauge wrt MSL (m)	Correction in WL data for Bathymetric Survey (m)	Topo level data to be converted as depth for volume calculation wrt SD (m)
	A	B	C (50% stretch is to be selected on both side of tide gauge)	D	E	F = (E- WL data in MSL)	G = ((E- topo levels in MSL)
				+ve indicates above MSL -ve indicates below MSL			
611	-	-	822-823	-	390.999		
612	-	-	823-824	-	391.206		
613	-	-	824-825	-	391.311		
614	-	-	825-826	-	391.463		
615	-	-	826-827	-	391.699		
616	-	-	827-828.15	-	391.756		
617	-	-	828.15-829	-	392.854		
618	-	-	829-830	-	392.868		
619	-	-	830-831	-	393.054		
620	-	-	831-832	-	393.486		
621	-	-	832-833	-	393.552		
622	-	-	833-834	-	393.672		
623	-	-	834-835	-	394.084		
624	-	-	835-836	-	394.156		
625	-	-	836-837	-	394.356		
626	-	-	837-838	-	394.756		
627	-	-	838-839	-	394.996		
628	-	-	839-840	-	395.407		
629	-	-	840-841	-	395.561		
630	-	-	841-842	-	395.963		
631	-	-	842-843	-	396.399		
632	-	-	843-844	-	396.836		
633	-	-	844-845	-	397.285		
634	-	-	845-846	-	397.563		
635	-	-	846-847	-	397.923		
636	-	-	847-848	-	398.323		
637	-	-	848-849	-	398.774		
638	-	-	849-850	-	399.278		
639	-	-	850-851	-	399.687		
640	-	-	851-852	-	399.975		
641	-	-	852-853	-	400.254		
642	-	-	853-854	-	400.59		
643	-	-	854-855	-	400.834		
644	-	-	855-856	-	400.834		
645	-	-	856-857.15	-	400.932		
646	-	-	857.15-858	-	401.456		
647	-	-	858-859	-	402.512		
648	-	-	859-860	-	402.872		
649	-	-	860-861	-	403.115		
650	-	-	861-862	-	403.365		
651	-	-	862-863	-	403.702		
652	-	-	863-864	-	403.887		
653	-	-	864-865	-	403.999		
654	-	-	865-866	-	404.257		
655	-	-	866-867	-	404.508		

Sl. No.	Benchmark / Tide Gauges	Chainage (km )	Stretch for corrected soundings and topo levels (km)	Established Sounding Datum w.r.t. MSL (m) at col. A.	Sounding Datum of Tide Gauge wrt MSL (m)	Correction in WL data for Bathymetric Survey (m)	Topo level data to be converted as depth for volume calculation wrt SD (m)
	A	B	C (50% stretch is to be selected on both side of tide gauge)	D	E	F = (E- WL data in MSL)	G = ((E- topo levels in MSL)
				+ve indicates above MSL -ve indicates below MSL			
656	-	-	867-868	-	404.756		
657	-	-	868-869	-	404.987		
658	-	-	869-870	-	405.13		
659	-	-	870-871	-	405.412		
660	-	-	871-872	-	405.796		
661	-	-	872-873.21	-	405.874		
662	-	-	873.21-874	-	405.963		
663	-	-	874-875	-	407.212		
664	-	-	875-876	-	407.489		
665	-	-	876-877	-	407.594		
666	-	-	877-878	-	407.911		
667	-	-	878-879	-	408.097		
668	-	-	879-880	-	408.207		
669	-	-	880-881	-	408.686		
670	-	-	881-882	-	408.831		
671	-	-	882-883	-	408.919		
672	-	-	883-884	-	409.246		
673	-	-	884-885	-	409.54		
674	-	-	885-886	-	409.738		
675	-	-	886-887	-	409.947		
676	-	-	887-888	-	410.25		
677	-	-	888-889	-	410.397		
678	-	-	889-890	-	410.874		
679	-	-	890-890.8	-	410.932		
680	-	-	890.8-892	-	411.932		
681	-	-	892-893	-	412.532		
682	-	-	893-894	-	412.868		
683	-	-	894-895	-	413.145		
684	-	-	895-896	-	413.452		
685	-	-	896-897	-	413.747		
686	-	-	897-898	-	413.921		
687	-	-	898-899	-	414.052		
688	-	-	899-900	-	414.454		
689	-	-	900-901	-	414.725		
690	-	-	901-902	-	414.918		
691	-	-	902-903	-	415.14		
692	-	-	903-904	-	415.84		
693	-	-	904-905	-	415.917		
694	-	-	905-906	-	416.254		
695	-	-	906-907	-	416.554		
696	-	-	907-907.6	-	416.703		
697	-	-	907.6-909	-	417.87		
698	-	-	909-910	-	418.11		
699	-	-	910-911	-	418.407		
700	-	-	911-912	-	418.687		

Sl. No.	Benchmark / Tide Gauges	Chainage (km )	Stretch for corrected soundings and topo levels (km)	Established Sounding Datum w.r.t. MSL (m) at col. A.	Sounding Datum of Tide Gauge wrt MSL (m)	Correction in WL data for Bathymetric Survey (m)	Topo level data to be converted as depth for volume calculation wrt SD (m)
	A	B	C (50% stretch is to be selected on both side of tide gauge)	D	E	F = (E- WL data in MSL)	G = ((E- topo levels in MSL)
				+ve indicates above MSL -ve indicates below MSL			
701	-	-	912-913	-	418.927		
702	-	-	913-914	-	419.454		
703	-	-	914-915	-	419.81		
704	-	-	915-915.8	-	420.03		
705	-	-	915.8-917	-	421.267		
706	-	-	917-918	-	421.447		
707	-	-	918-919	-	421.718		
708	-	-	919-920	-	422.113		
709	-	-	920-921	-	422.324		
710	-	-	921-922	-	422.624		
711	-	-	922-923	-	422.74		
712	-	-	923-924	-	423.118		
713	-	-	924-925	-	423.312		
714	-	-	925-926	-	423.546		
715	-	-	926-927	-	423.641		
716	-	-	927-928	-	424.287		
717	-	-	928-929	-	424.498		
718	-	-	929-930	-	424.687		
719	-	-	930-931	-	424.898		
720	-	-	931-932	-	425.039		
721	-	-	932-932.6	-	425.109		
722	-	-	932.6-934	-	426.44		
723	-	-	934-935	-	426.74		
724	-	-	935-936	-	426.925		
725	-	-	936-937	-	427.417		
726	-	-	937-938	-	427.417		
727	-	-	938-939	-	427.516		
728	-	-	939-940	-	427.816		
729	-	-	940-941	-	428.349		
730	-	-	941-942	-	428.66		
731	-	-	942-943	-	428.825		
732	-	-	943-944	-	429.195		
733	-	-	944-945	-	429.306		
734	-	-	945-946	-	429.895		
735	-	-	946-947.2	-	430.855		
736	-	-	947.2-948	-	431.397		
737	-	-	948-949	-	431.687		
738	-	-	949-950	-	431.885		
739	-	-	950-951	-	431.987		
740	-	-	951-952	-	432.554		
741	-	-	952-953	-	432.928		
742	-	-	953-954	-	433.107		
743	-	-	954-955	-	433.452		
744	-	-	955-956	-	433.562		
745	-	-	956-957	-	433.944		

Sl. No.	Benchmark / Tide Gauges	Chainage (km )	Stretch for corrected soundings and topo levels (km)	Established Sounding Datum w.r.t. MSL (m) at col. A.	Sounding Datum of Tide Gauge wrt MSL (m)	Correction in WL data for Bathymetric Survey (m)	Topo level data to be converted as depth for volume calculation wrt SD (m)
	A	B	C (50% stretch is to be selected on both side of tide gauge)	D	E	F = (E- WL data in MSL)	G = ((E- topo levels in MSL)
				+ve indicates above MSL -ve indicates below MSL			
746	-	-	957-958	-	434.266		
747	-	-	958-959	-	434.573		
748	-	-	959-960	-	434.897		
749	-	-	960-961	-	435.111		
750	-	-	961-962	-	435.477		
751	-	-	962-963	-	435.807		
752	-	-	963-964	-	436.162		
753	-	-	964-964.6	-	436.162		
754	-	-	964.6-966	-	436.322		
755	-	-	966-967	-	437.522		
756	-	-	967-968.5	-	437.975		
757	TP - GDV 97	969.65	968.6-975.0	-	455.52		
758	TP - GDV 98	980.17	975.0-983.5	-	456.328		
759	TP - GDV 99	987.00	983.5-994.0	-	457.307		
760	TP - GDV 100	1001.44	994.0-1006.0	-	458.104		
761	TP - GDV 101	1008.78	1006.0-1013.6	-	459.553		
762	TP - GDV 102	1018.70	1013.6-1024.1	-	461.526		
763	TP - GDV 103	1027.62	1024.1-1032.3	-	463.338		
764	TP - GDV 104	1037.06	1032.3-1040.3	-	464.91		
765	-	-	1040.3-1041.4	-	466.241		
766	-	-	1041.4-1042	-	466.653		
767	-	-	1042-1043	-	466.857		
768	-	-	1043-1044	-	467.044		
769	-	-	1044-1045	-	467.235		
770	-	-	1045-1046	-	467.484		
771	-	-	1046-1047	-	467.717		
772	-	-	1047-1048	-	468.045		
773	-	-	1048-1049	-	468.325		
774	-	-	1049-1050	-	468.825		
775	-	-	1050-1051	-	468.825		
776	-	-	1051-1052	-	468.957		
777	-	-	1052-1053	-	469.322		
778	-	-	1053-1054	-	469.667		
779	-	-	1054-1055	-	469.922		
780	-	-	1055-1056	-	470.158		
781	-	-	1056-1057	-	470.255		
782	-	-	1057-1058	-	470.455		
783	-	-	1058-1059	-	470.674		
784	-	-	1059-1060	-	470.834		
785	-	-	1060-1061	-	471.159		
786	-	-	1061-1062	-	471.514		
787	-	-	1062-1063	-	471.697		
788	-	-	1063-1064	-	471.753		
789	-	-	1064-1064.7	-	472.065		
790	-	-	1064.7-1066	-	472.109		

Sl. No.	Benchmark / Tide Gauges	Chainage (km )	Stretch for corrected soundings and topo levels (km)	Established Sounding Datum w.r.t. MSL (m) at col. A.	Sounding Datum of Tide Gauge wrt MSL (m)	Correction in WL data for Bathymetric Survey (m)	Topo level data to be converted as depth for volume calculation wrt SD (m)
	A	B	C (50% stretch is to be selected on both side of tide gauge)	D	E	F = (E- WL data in MSL)	G = ((E- topo levels in MSL)
				+ve indicates above MSL -ve indicates below MSL			
791	-	-	1066-1067	-	472.399		
792	-	-	1067-1068	-	472.799		
793	-	-	1068-1069	-	473.166		
794	-	-	1069-1070	-	473.583		
795	-	-	1070-1071	-	473.683		
796	-	-	1071-1072	-	473.932		
797	-	-	1072-1073	-	474.294		
798	-	-	1073-1074	-	474.634		
799	-	-	1074-1075	-	474.976		
800	-	-	1075-1076	-	475.291		
801	-	-	1076-1077.2	-	475.754		
802	-	-	1077.2-1078	-	476.58		
803	-	-	1078-1079	-	476.663		
804	-	-	1079-1080	-	476.713		
805	-	-	1080-1081	-	476.738		
806	-	-	1081-1082	-	476.865		
807	-	-	1082-1083	-	477.226		
808	-	-	1083-1084.3	-	477.325		
809	-	-	1084.3-1085	-	477.664		
810	-	-	1085-1086	-	478.389		
811	-	-	1086-1087	-	478.782		
812	-	-	1087-1088	-	478.995		
813	-	-	1088-1089	-	479.231		
814	-	-	1089-1090.5	-	480.354		
815	-	-	1090.5-1092	-	480.64		
816	-	-	1092-1093	-	481.04		
817	-	-	1093-1094	-	481.74		
818	-	-	1094-1095	-	481.74		
819	-	-	1095-1096	-	482.14		
820	-	-	1096-1097	-	482.54		
821	-	-	1097-1098	-	482.936		
822	-	-	1098-1099	-	483.346		
823	-	-	1099-1100	-	483.746		
824	-	-	1100-1101	-	484.434		
825	-	-	1101-1102	-	484.723		
826	-	-	1102-1103.5	-	484.972		
827	-	-	1103.5-1105	-	485.317		
828	-	-	1105-1106	-	485.625		
829	-	-	1106-1107	-	486.166		
830	-	-	1107-1107.7	-	486.318		
831	-	-	1107.7-1109	-	486.954		
832	-	-	1109-1110	-	487.354		
833	-	-	1110-1111	-	488.344		
834	-	-	1111-1112	-	488.535		
835	-	-	1112-1113	-	488.723		



Sl. No.	Benchmark / Tide Gauges	Chainage (km )	Stretch for corrected soundings and topo levels (km)	Established Sounding Datum w.r.t. MSL (m) at col. A.	Sounding Datum of Tide Gauge wrt MSL (m)	Correction in WL data for Bathymetric Survey (m)	Topo level data to be converted as depth for volume calculation wrt SD (m)
	A	B	C (50% stretch is to be selected on both side of tide gauge)	D	E	F = (E- WL data in MSL)	G = ((E- topo levels in MSL)
				+ve indicates above MSL -ve indicates below MSL			
836	-	-	1113-1114	-	488.723		
837	-	-	1114-1115.3	-	489.534		
838	-	-	1115.3-1116	-	489.823		
839	-	-	1116-1117	-	490.254		
840	-	-	1117-1118	-	490.77		
841	-	-	1118-1119	-	491.59		
842	-	-	1119-1120	-	492.092		
843	-	-	1120-1121	-	492.27		
844	-	-	1121-1122	-	493.256		
845	-	-	1122-1123	-	493.434		
846	-	-	1123-1124	-	493.834		
847	-	-	1124-1125	-	494.234		
848	-	-	1125-1126	-	494.907		
849	-	-	1126-1126.9	-	496.26		
850	-	-	1126.9-1128	-	496.806		
851	-	-	1128-1129	-	497.682		
852	-	-	1129-1130	-	498.582		
853	-	-	1130-1131	-	500.433		
854	-	-	1131-1131.5	-	500.695		
855	TP - GDV 113	1132.72	1131.5-1137.74	-	503.227		
856	TP - GDV 114	1144.56	1137.74-1142.7	-	509.888		
857	-	-	1142.7-1144	-	509.998		
858	-	-	1144-1145	-	510.018		
859	-	-	1145-1146	-	510.125		
860	-	-	1146-1147	-	510.245		
861	-	-	1147-1148	-	510.41		
862	-	-	1148-1149.3	-	511.609		
863	TP - GDV 115	1154.47	1149.4-1159.5	-	531.253		
864	TP - GDV 116	1164.48	1159.5-1169.7	-	531.272		
865	TP - GDV 117	1176.23	1169.7-1180.62	-	531.98		
866	-	-	1180.6-1182	-	541.388		
867	-	-	1182-1183	-	541.585		
868	-	-	1183-1184	-	541.685		
869	-	-	1184-1185	-	541.885		
870	-	-	1185-1186	-	541.965		
871	-	-	1186-1187	-	542.265		
872	-	-	1187-1188	-	542.398		
873	-	-	1188-1188.8	-	542.762		
874	-	-	1188.8-1190	-	543.381		
875	-	-	1190-1191	-	543.895		
876	-	-	1191-1192	-	544.377		
877	-	-	1192-1193	-	544.877		
878	-	-	1193-1194	-	545.577		
879	-	-	1194-1195	-	545.963		
880	-	-	1195-1196	-	547.982		

Sl. No.	Benchmark / Tide Gauges	Chainage (km)	Stretch for corrected soundings and topo levels (km)	Established Sounding Datum w.r.t. MSL (m) at col. A.	Sounding Datum of Tide Gauge wrt MSL (m)	Correction in WL data for Bathymetric Survey (m)	Topo level data to be converted as depth for volume calculation wrt SD (m)
	A	B	C (50% stretch is to be selected on both side of tide gauge)	D	E	F = (E- WL data in MSL)	G = ((E- topo levels in MSL)
				+ve indicates above MSL -ve indicates below MSL			
881	-	-	1196-1197	-	548.365		
882	-	-	1197-1198	-	548.915		
883	-	-	1198-1199	-	549.549		
884	-	-	1199-1200	-	549.953		
885	-	-	1200-1201	-	550.902		
886	-	-	1201-1201.6	-	551.773		

Table 63 - CD/SD Reduction Details

## 2.10 HFL/MHWS values of Bridges/Cross Structures

The established HFL value of CWC gauges at Bhadrachalam, Dummagudem, Perur, Kaleswaram, Mancherial, Sri Ram Sagar, Basar, Babli, Yelli, Nanded, Phalla, G.R. Bridge, Dhalegaon, Jayakwadi Dam, Kopergaon, Chass, and Nashik w.r.t MSL for last 20 years was provided by IWAI. The HFL value for the remaining survey stretch is computed for the Godavari River. The details of established and computed HFL values for the entire stretch is as follows:-

Sl. No.	Location and description of CWC gauge Barrages / Weirs / Anicut / Barrages / Aqueducts	Cross-Structure Details	Chainage (km)	Established HFL/ FRL w.r.t. MSL (m)	Computed HFL at Cross-Structures w.r.t. MSL (m)
	A	B	C	D	E
1	Bhadrachalam CWC Gauge	Gauge	-1.08	50.960	-
2	Bhadrachalam Road Bridge (NH-221)	Bridge	0.00	-	51.151
3	Dummagudam CWC Gauge	Gauge	19.48	57.500	-
4	Dummagudam Power Plant Barrage	Barrage	21.91	-	58.105
5	Venkatapuram Road Bridge (NH-163)	Bridge	112.00	-	78.772
6	Perur CWC Gauge	Gauge	141.52	85.600	-
7	Sironcha Road Bridge (NH-16)	Bridge	213.50	-	104.169
8	Kaleshwaram CWC Gauge	Gauge	214.83	104.480	-
9	Hyderabad-Mancherial Road Bridge (NH-1)	Bridge	290.04	-	129.903

Sl. No.	Location and description of CWC gauge Barrages / Weirs / Anicut / Barrages / Aqueducts	Cross-Structure Details	Chainage (km)	Established HFL / FRL w.r.t. MSL (m)	Computed HFL at Cross-Structures w.r.t. MSL (m)
	A	B	C	D	E
10	Hyderabad-Mancherial Road Bridge (NH-1)	Bridge	290.05	-	129.903
11	Mancherial CWC Gauge	Gauge	300.79	133.456	-
12	Mancherial Railway Bridge (Kashmir→Kannyakumari)	Bridge	301.23	-	133.919
13	Mancherial Railway Bridge (Kashmir→Kannyakumari)	Bridge	301.78	-	133.919
14	Yellampally Dam	Dam	310.50	148.000	-
15	Nizamabad-Mancherial Road Bridge (NH-16)	Bridge	338.33	-	179.960
16	Nizamabad-Mancherial Road Bridge (NH-16)	Bridge	338.39	-	180.193
17	Kalmadugu-Kammanur Road Bridge	Bridge	372.14	-	218.918
18	Khanapur Road Bridge-2	Bridge	411.48	-	263.008
19	Khanapur Road Bridge-1	Bridge	411.68	-	263.008
20	Kamlapur Road Bridge	Bridge	434.73	-	289.602
21	Soan Bridge (NH-7)	Bridge	452.07	-	309.431
22	Soan Bridge (AH-43)	Bridge	452.10	-	309.431
23	Soan Bridge (AH-43)	Bridge	452.13	-	309.431
24	Sri Ram Sagar CWC Gauge	Gauge	457.63	332.537	-
25	Sri Ram Sagar Dam	Dam	457.49	332.540	-
26	Basar CWC Gauge	Gauge	512.86	339.153	-
27	Basar Road Bridge	Bridge	515.50	-	339.172
28	Basar Railway Bridge	Bridge	515.83	-	339.175
29	Khandhakurti Road Bridge	Bridge	527.36	-	339.260
30	Sirajkhed Road Bridge	Bridge	532.74	-	339.299
31	Babli Barrage	Barrage	535.67	-	339.319
32	Babli CWC Gauge	Gauge	536.11	339.321	-
33	Babli Road Bridge	Bridge	537.97	-	339.510
34	Kundalwadi-Jarikot Road Bridge	Bridge	545.59	-	340.246
35	Raher Road Bridge	Bridge	553.55	-	340.945
36	Baligon Road Bridge	Bridge	567.52	-	342.304
37	Baligon-Umri Barrage	Barrage	568.34	-	342.380
38	Mahati-Yelli Road Bridge	Bridge	585.55	-	344.023

Sl. No.	Location and description of CWC gauge Barrages / Weirs / Anicut / Barrages / Aqueducts	Cross-Structure Details	Chainage (km)	Established HFL / FRL w.r.t. MSL (m)	Computed HFL at Cross-Structures w.r.t. MSL (m)
	A	B	C	D	E
39	Yelli CWC Gauge	Gauge	586.78	344.110	-
40	Amdura Barrage	Barrage	592.58	-	344.555
41	Malkautha-Kamlaj Road Bridge	Bridge	600.95	-	345.143
42	Wajegaon Road Bridge (NH-204)	Bridge	610.45	-	345.831
43	Wajegaon Road Bridge	Bridge	611.88	-	345.917
44	Degloor Naka Road Bridge	Bridge	612.47	-	345.931
45	Navghat Bridge	Bridge	613.49	-	346.046
46	Nanded CWC Gauge	Gauge	614.30	346.100	-
47	Mondha Road Bridge	Bridge	614.64	-	346.656
48	Goverdhan Ghat Bridge-2	Bridge	615.64	-	348.046
49	Goverdhan Ghat Bridge-1	Bridge	615.64	-	348.046
50	Hsapur Road Bridge	Bridge	617.47	-	350.547
51	Vishnupuri Barrage	Barrage	620.71	355.000	-
52	Penur Road Bridge	Bridge	647.19	-	363.085
53	Anteshwar Barrage	Barrage	653.87	-	365.106
54	Purna-Loha Road Bridge	Bridge	665.76	-	368.720
55	Phalla CWC Gauge	Gauge	670.24	370.095	-
56	Digras Barrage	Barrage	671.14	-	370.221
57	Dhanura Kali Road Bridge	Bridge	679.68	-	371.577
58	Gangakhed Railway Bridge	Bridge	715.11	-	377.158
59	Muli Barrage	Barrage	720.26	-	377.977
60	GR Bridge CWC Gauge	Gauge	722.70	378.370	-
61	Dusalgaon Road Bridge	Bridge	723.03	-	378.424
62	Khadaka Barrage	Barrage	736.94	-	380.281
63	Shelgaon-Shirshi Road Bridge	Bridge	748.28	-	381.816
64	Mudgal Barrage	Barrage	764.75	384.000	-
65	Sonpeth-Pathari Road Bridge	Bridge	767.03	-	384.782
66	Pohner Road Bridge	Bridge	782.29	-	390.259
67	Tarugavhan Barrage	Barrage	782.89	-	390.473
68	Dhalegaon CWC Gauge	Gauge	809.61	399.855	-

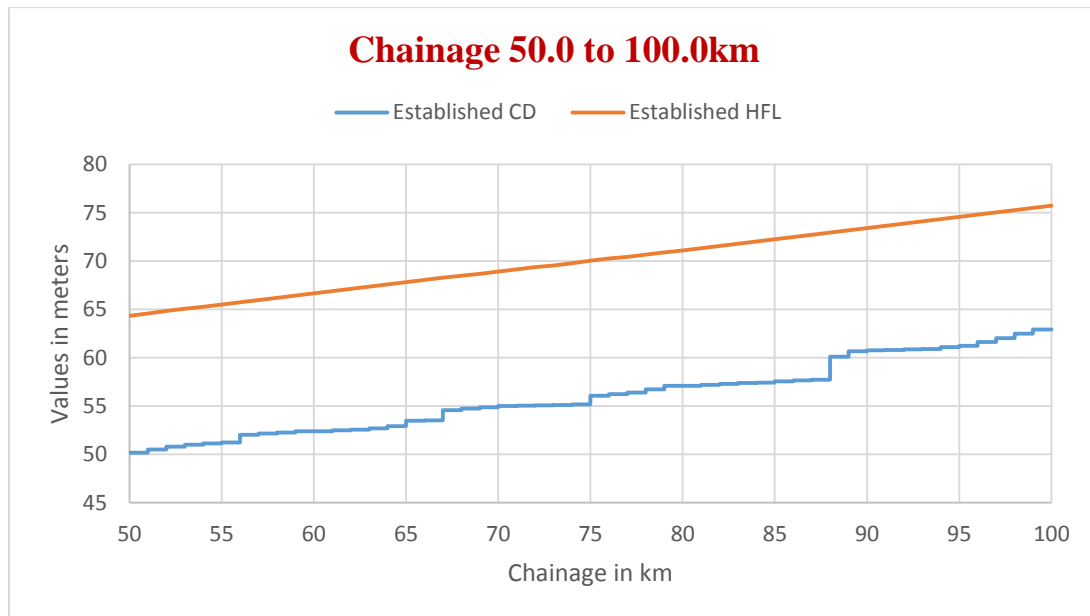
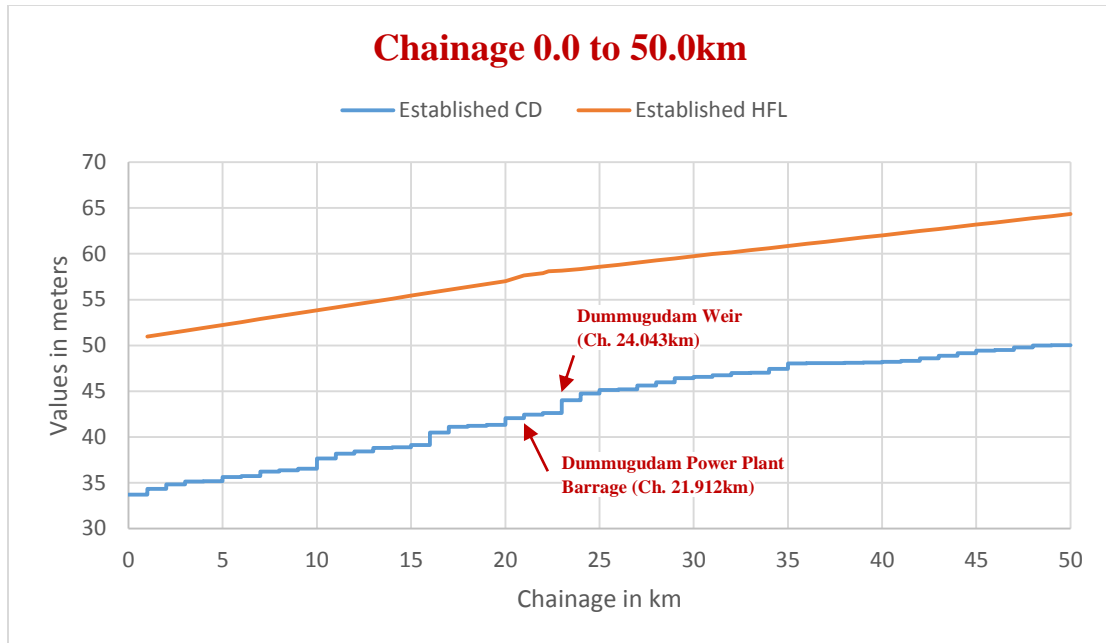
Sl. No.	Location and description of CWC gauge Barrages / Weirs / Anicut / Barrages / Aqueducts	Cross-Structure Details	Chainage (km)	Established HFL / FRL w.r.t. MSL (m)	Computed HFL at Cross-Structures w.r.t. MSL (m)
	A	B	C	D	E
69	Dhalegaon Barrage	Barrage	810.00	-	399.974
70	Dhalegaon Bridge (NH222)	Bridge	810.17	-	400.033
71	Dhalegaon Bridge (NH222)	Bridge	810.17	-	400.033
72	Lonisawangi Barrage	Barrage	828.14	-	405.369
73	Sadola-Ashti Road Bridge	Bridge	834.47	-	407.267
74	Rajatakli Barrage	Barrage	857.15	407.400	-
75	Mangrul Barrage	Barrage	873.22	412.100	-
76	Jogladevi Barrage	Barrage	890.80	416.00	-
77	Patharwala Bk. Barrage	Barrage	907.62	-	428.849
78	Shahgadh Barrage	Barrage	915.82	-	431.280
79	Shahgadh Old Bridge (NH211)	Bridge	916.64	-	431.517
80	Shahgadh New Bridge (NH211)	Bridge	916.66	-	431.517
81	Hiradpuri Barrage	Barrage	932.59	-	436.201
82	Apegaon Road Bridge	Bridge	946.77	-	440.411
83	Apegaon Barrage	Barrage	947.17	-	440.530
84	Paithan Road Bridge	Bridge	963.14	-	445.273
85	Chanakwadi Barrage	Barrage	964.64	-	445.688
86	Jayakwadi Road Bridge	Bridge	968.10	-	446.755
87	Jayakwadi CWC Gauge	Gauge	968.48	460.400	-
88	Jayakwadi Dam	Dam	968.50	463.900	-
89	Old Pravarasangam Bridge	Bridge	1013.80	-	473.025
90	New Pravarasangam Bridge	Bridge	1014.02	-	473.065
91	Wanjargaon Bridge	Bridge	1059.50	-	482.231
92	Naur Road Bridge	Bridge	1064.34	-	483.200
93	Dongaon Railway Bridge	Bridge	1077.01	-	485.744
94	Vari Road Bridge	Bridge	1086.72	-	487.682
95	Udapur-Muthalane Road Bridge	Bridge	1095.75	-	489.539
96	Sangamner-Kopargaon Road Bridge-2	Bridge	1099.29	-	490.225
97	Sangamner-Kopargaon Road Bridge-1	Bridge	1099.30	-	490.225
98	Kopergaon CWC Gauge	Gauge	1100.10	490.400	-

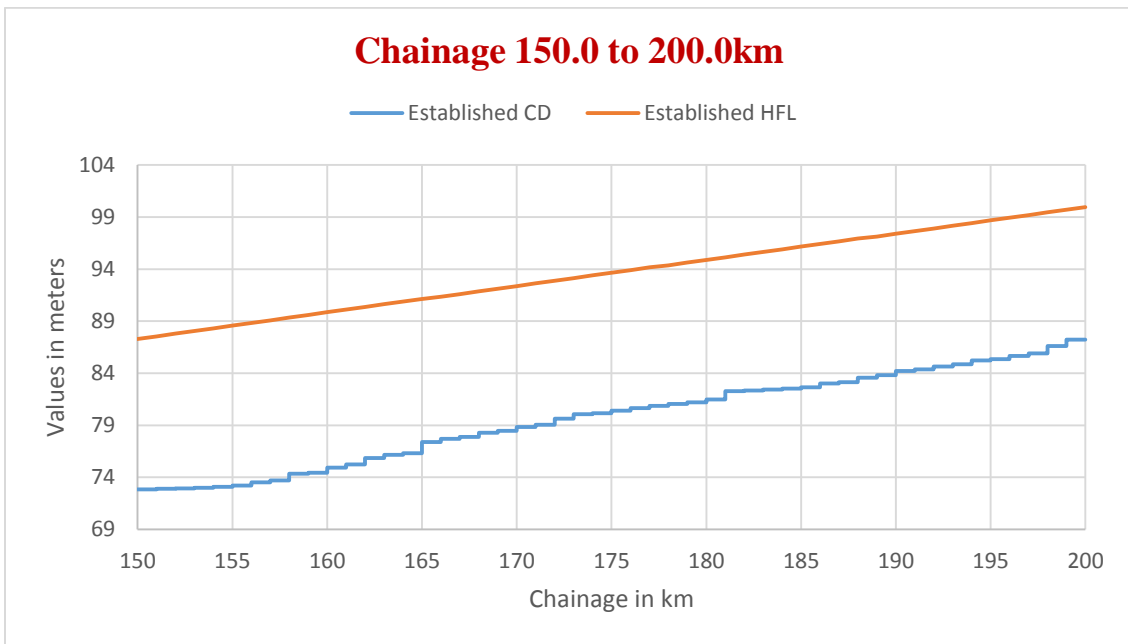
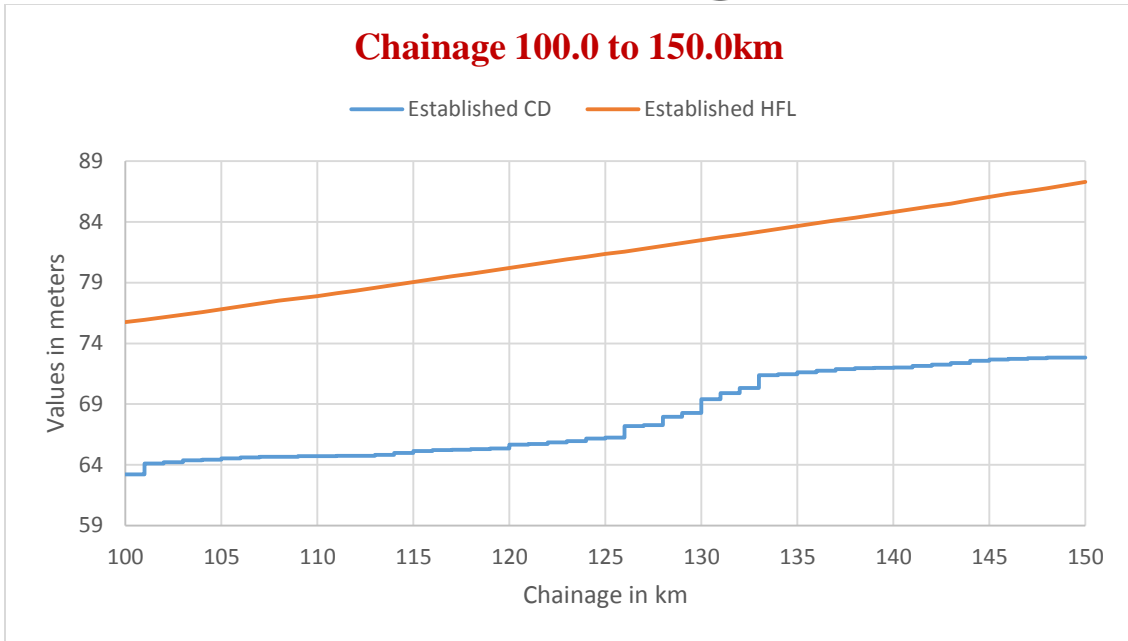
Sl. No.	Location and description of CWC gauge Barrages / Weirs / Anicut / Barrages / Aqueducts	Cross-Structure Details	Chainage (km)	Established HFL / FRL w.r.t. MSL (m)	Computed HFL at Cross-Structures w.r.t. MSL (m)
	A	B	C	D	E
99	Kopargaon Road Bridge	Bridge	1100.29	-	490.4
100	Kumbhari Road Bridge	Bridge	1111.29	-	496.785
101	Chass Road Bridge	Bridge	1128.55	-	506.769
102	Chass Sanko Bridge	Bridge	1128.56	-	506.769
103	Chass CWC Gauge	Gauge	1129.74	507.450	-
104	Khedalezunge Road Bridge	Bridge	1137.63	-	512.915
105	Dharangaon Road Bridge	Bridge	1146.71	-	519.360
106	Khangaon Thadi Bridge	Bridge	1149.20	-	521.182
107	Nandur-Madhyameshwar Dam	Dam	1149.29	-	535.474
108	Karanjgaon Road Bridge	Bridge	1157.08	-	535.474
109	Saikheda Road Bridge	Bridge	1171.96	-	536.315
110	Darnasangvi Old Bridge	Bridge	1180.64	-	543.181
111	Lakhalgaon Road Bridge	Bridge	1186.02	-	546.824
112	Odha Road Bridge	Bridge	1188.29	-	548.365
113	Odha Railway Bridge	Bridge	1188.61	-	548.645
114	Panchak Railway Bridge	Bridge	1192.18	-	551.027
115	Nandur Naka Road Bridge	Bridge	1195.92	-	553.690
116	Old Saikhed Road Bridge	Bridge	1198.00	-	555.231
117	Samta Nagar Road Bridge	Bridge	1198.77	-	555.651
118	Takli Road Bridge	Bridge	1200.82	-	557.193
119	Nashik CWC Gauge	Gauge	1201.60	557.71	-
120	Mumbai-Agra Highway Bridge	Bridge	1201.62	-	557.850

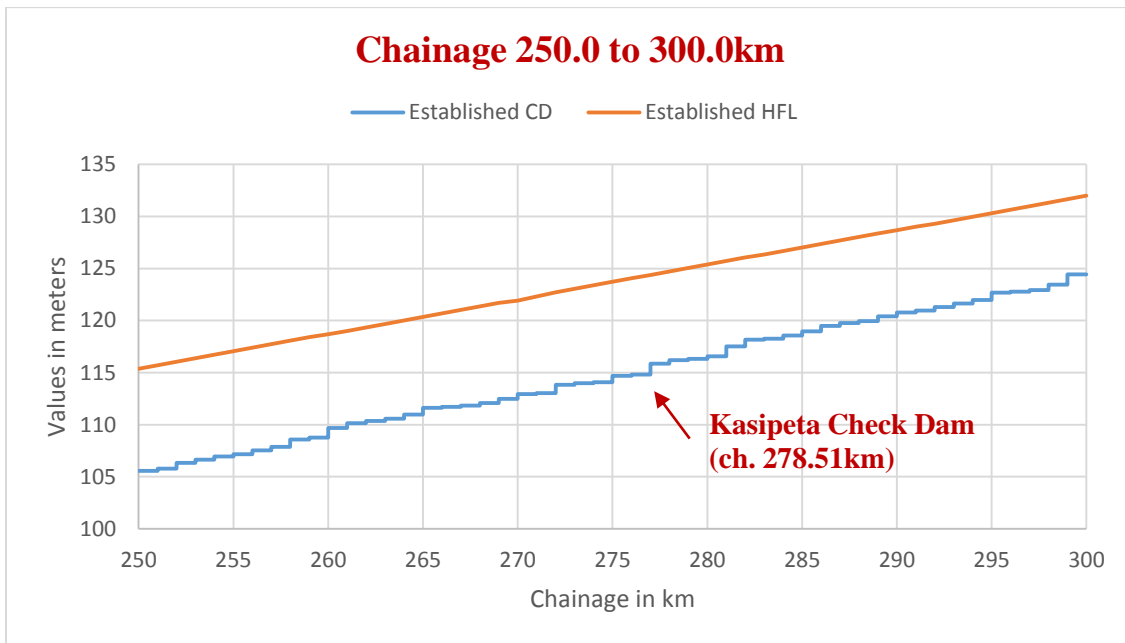
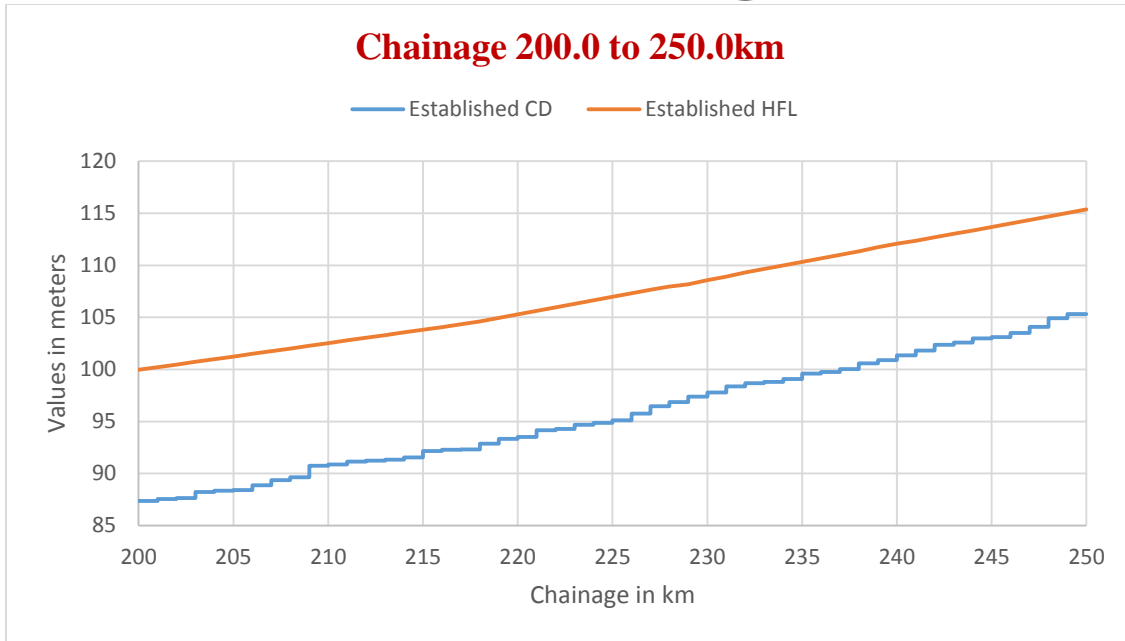
*Table 64 - HFL values of Bridges/Cross structures*

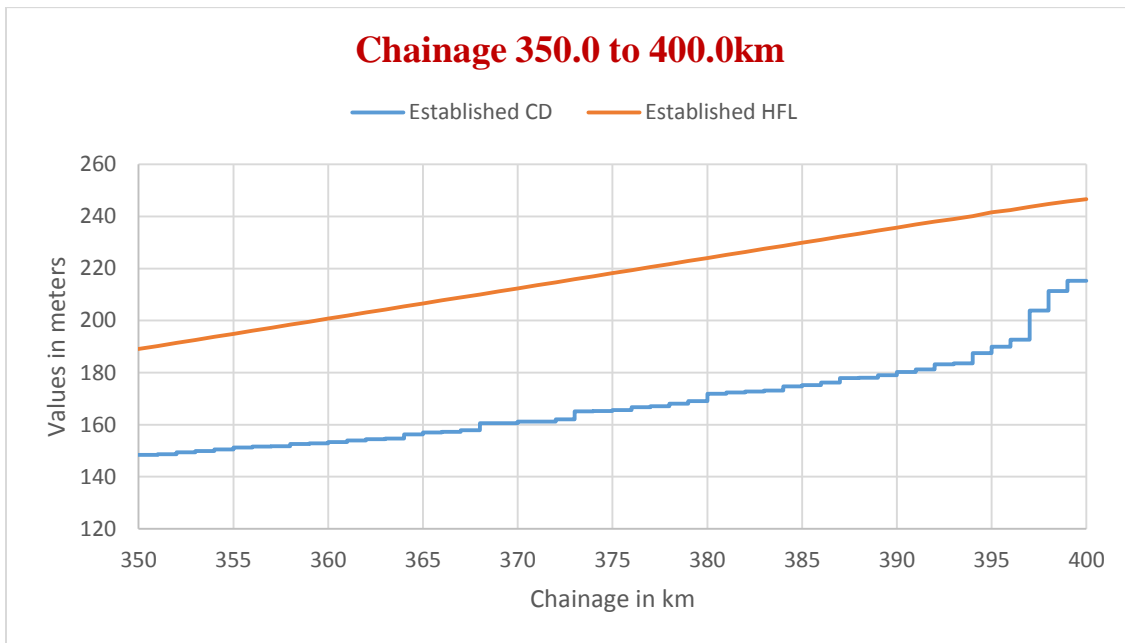
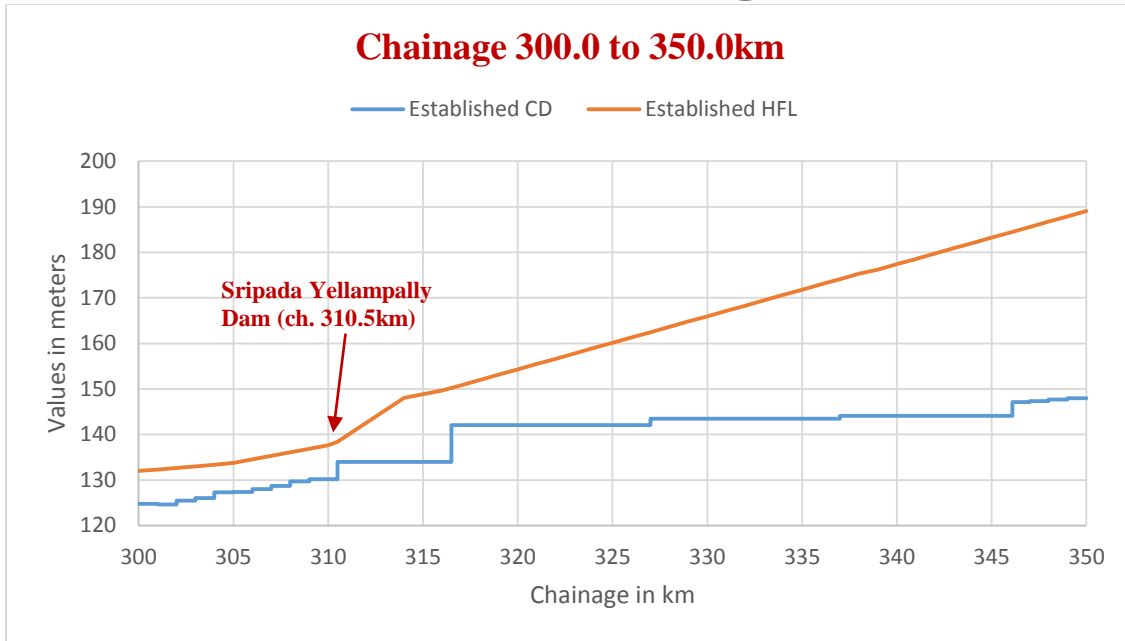


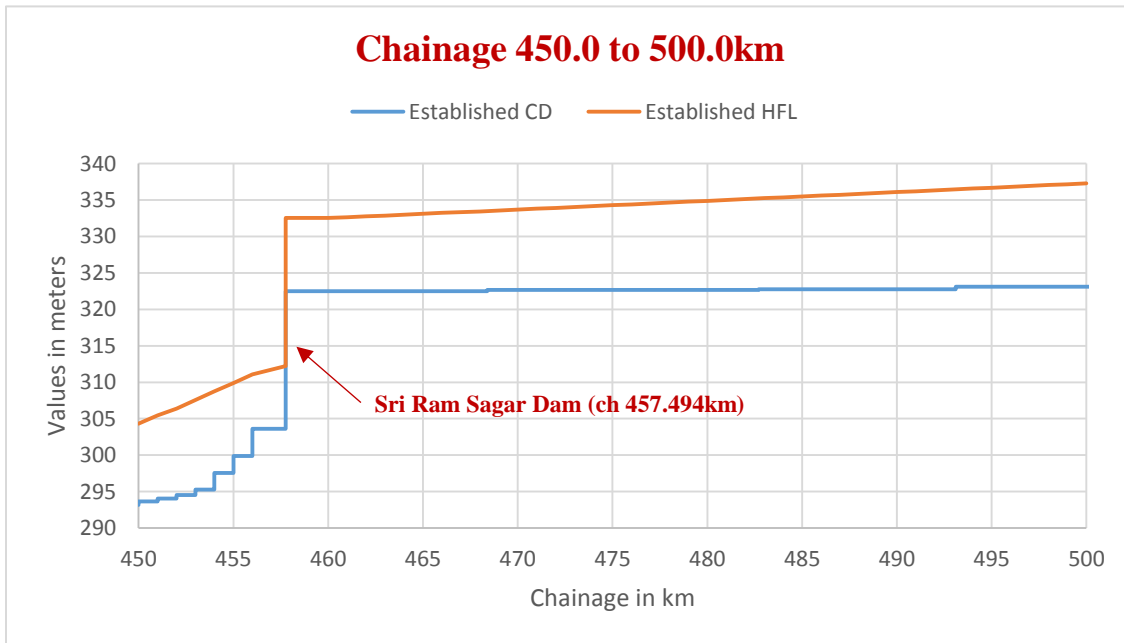
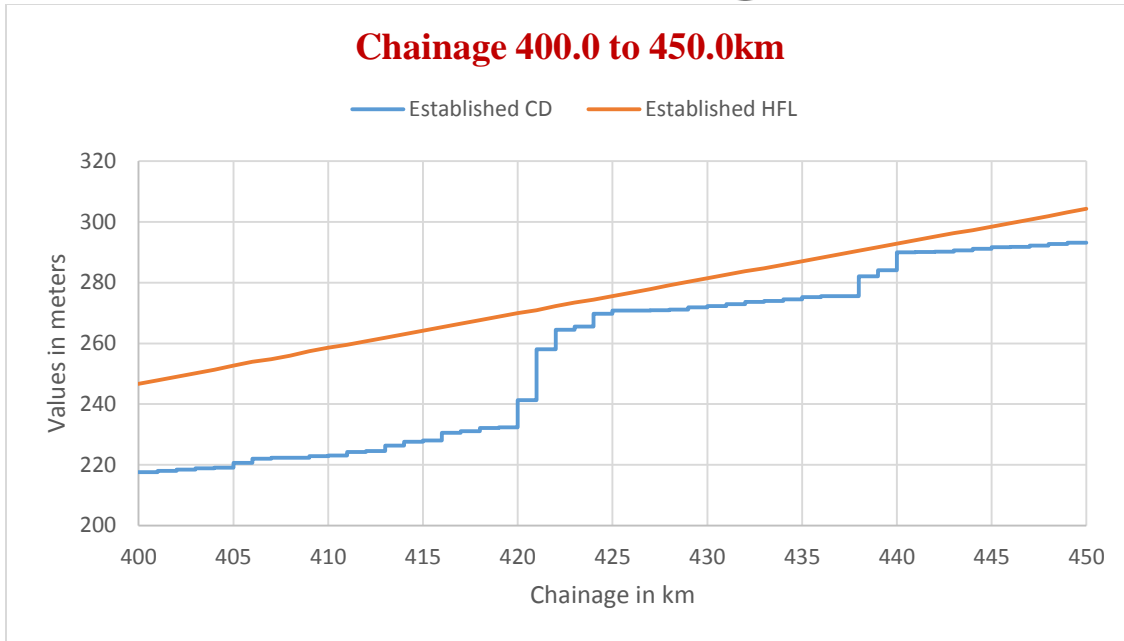
## 2.11 Graph: Sounding Datum and HFL vs Chainage

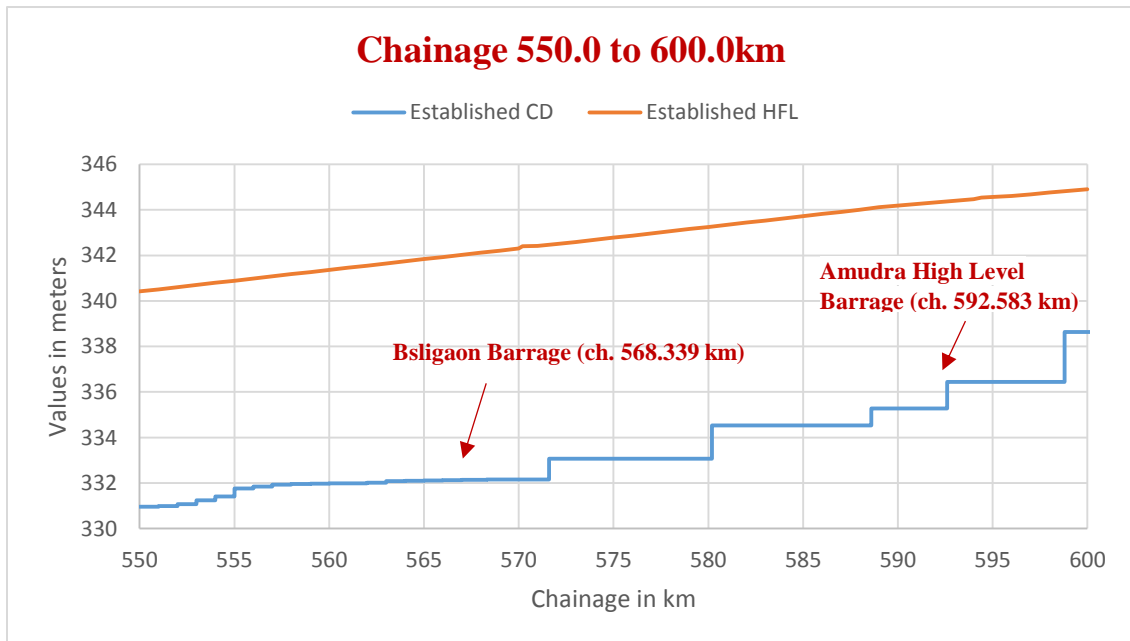
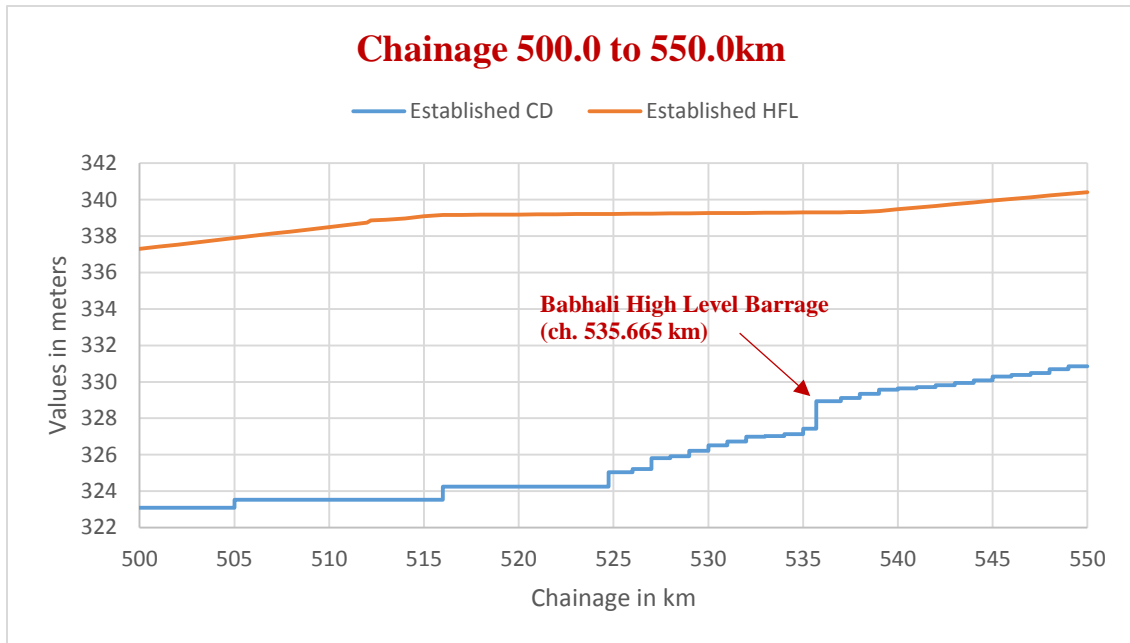




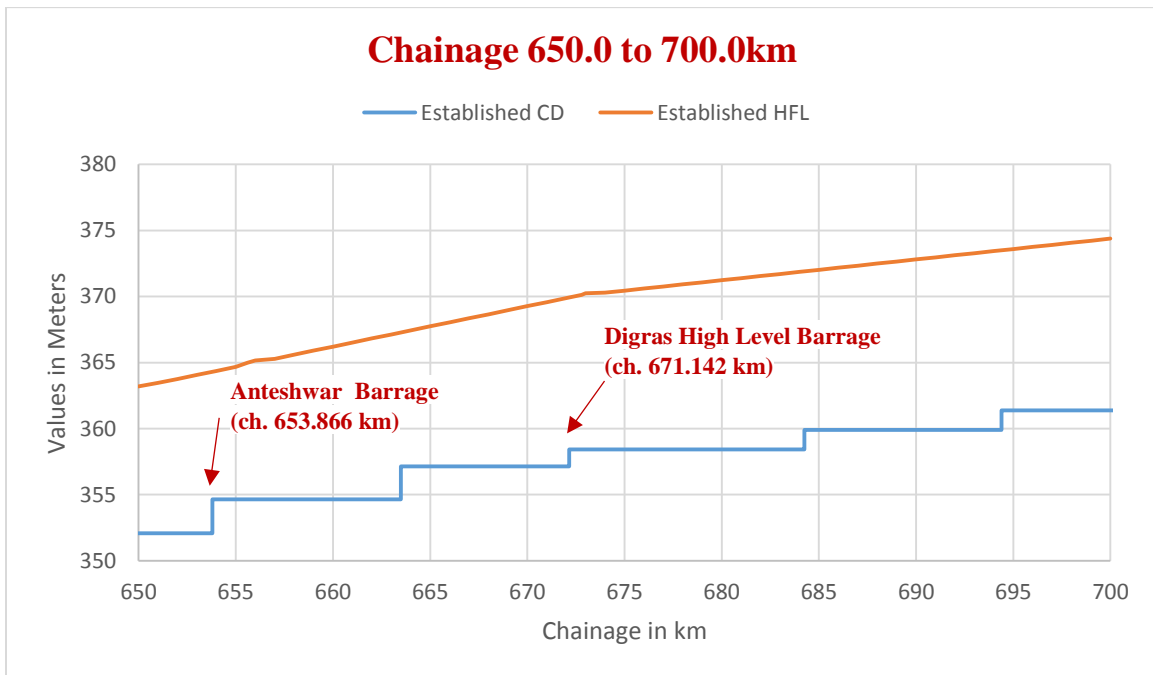
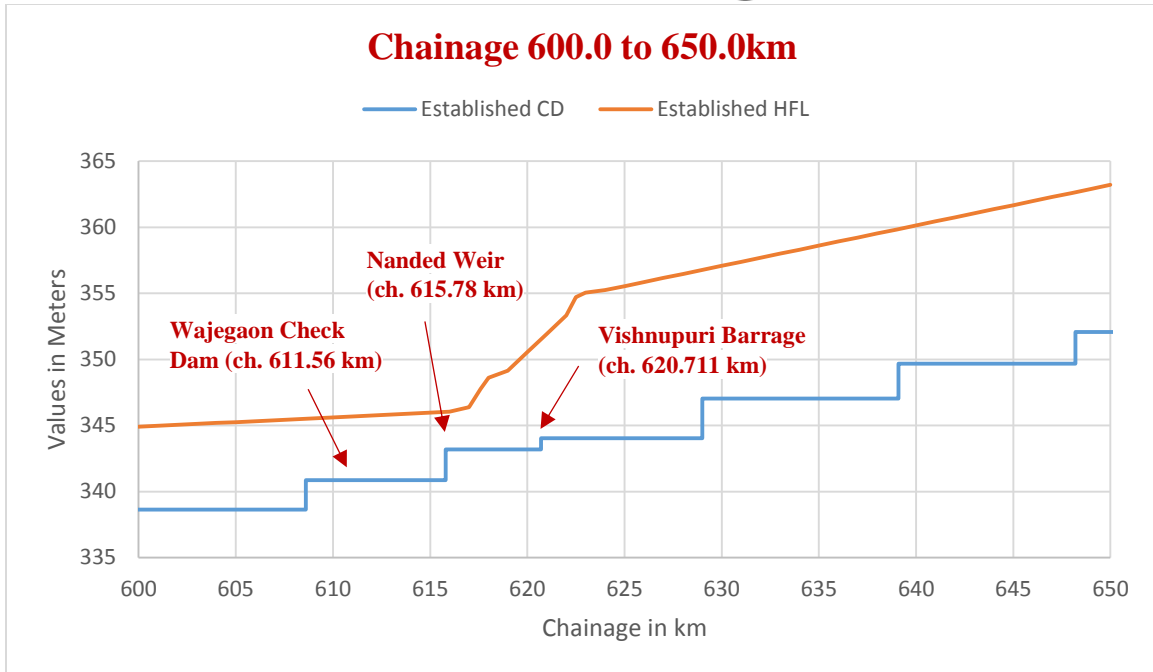


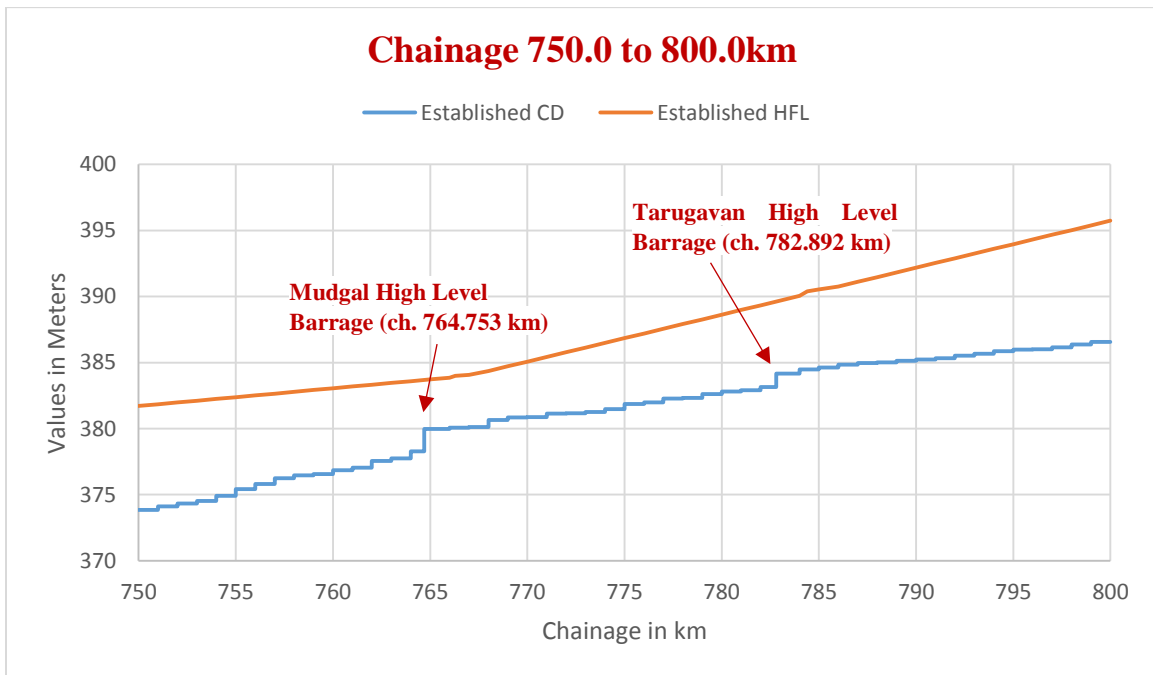
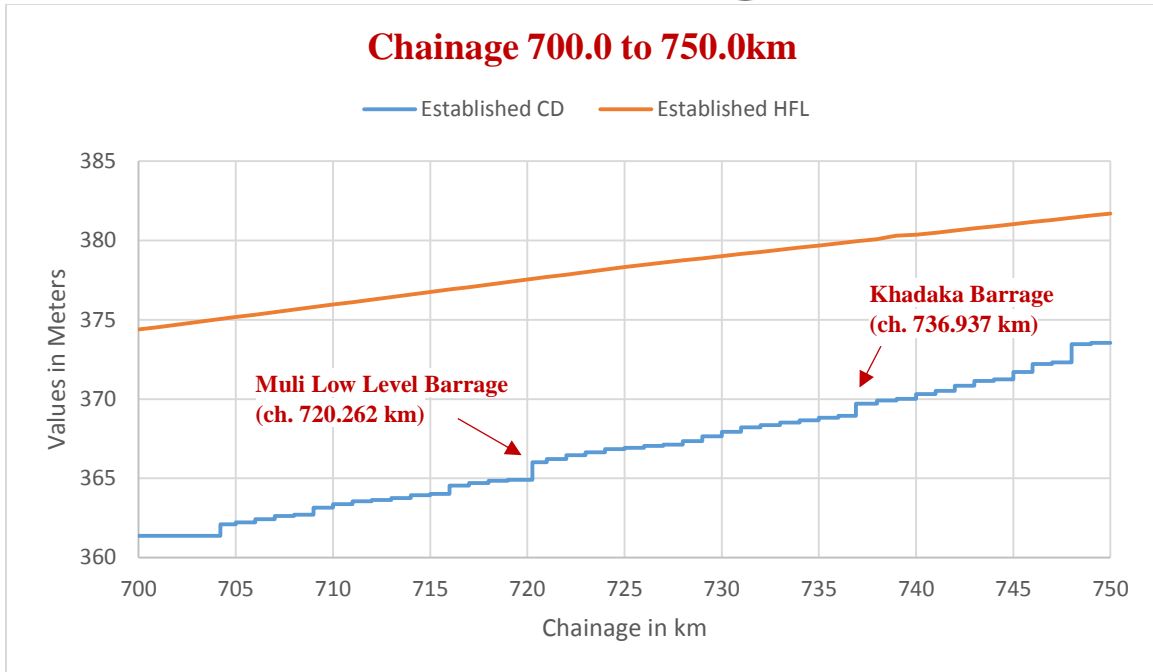


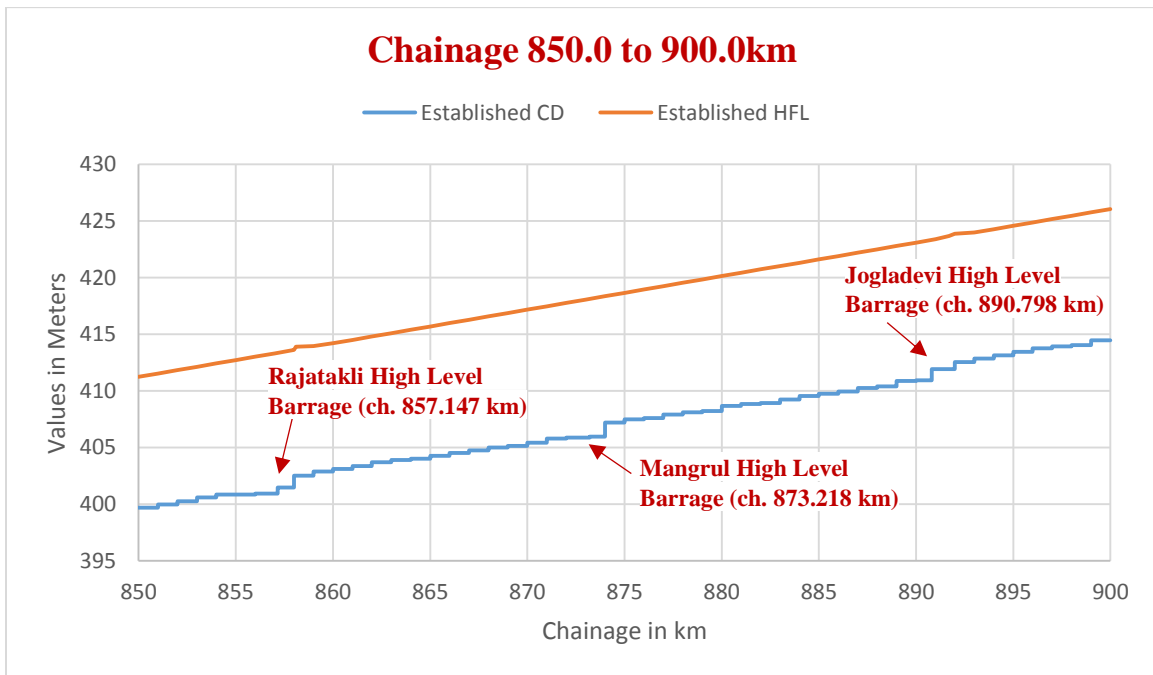
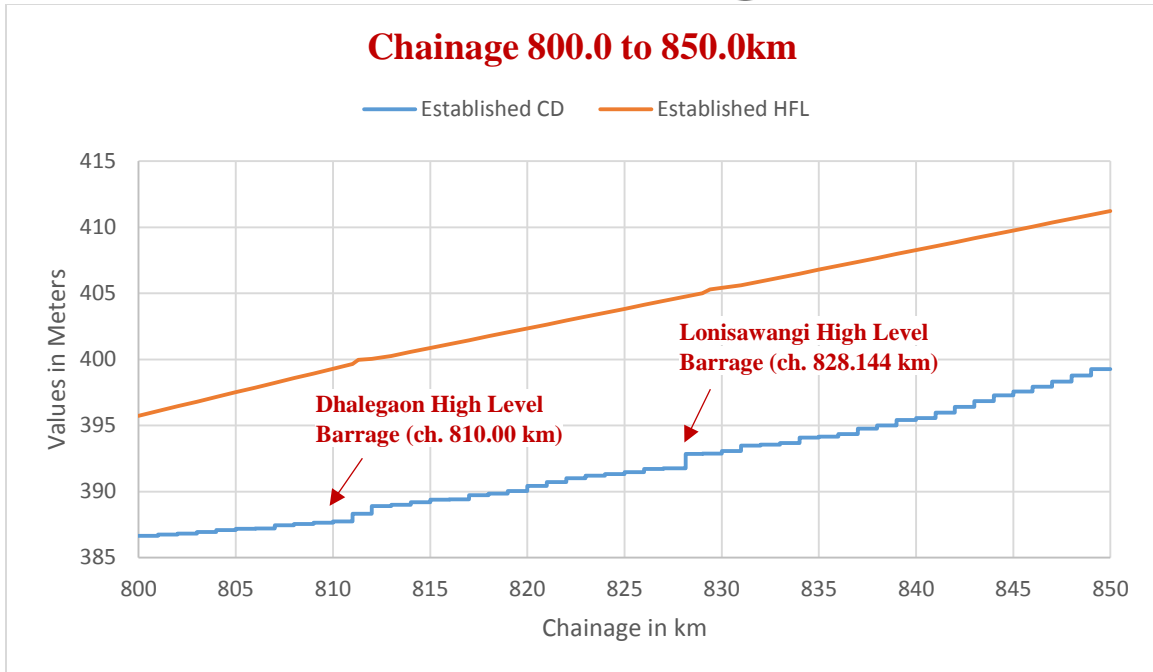


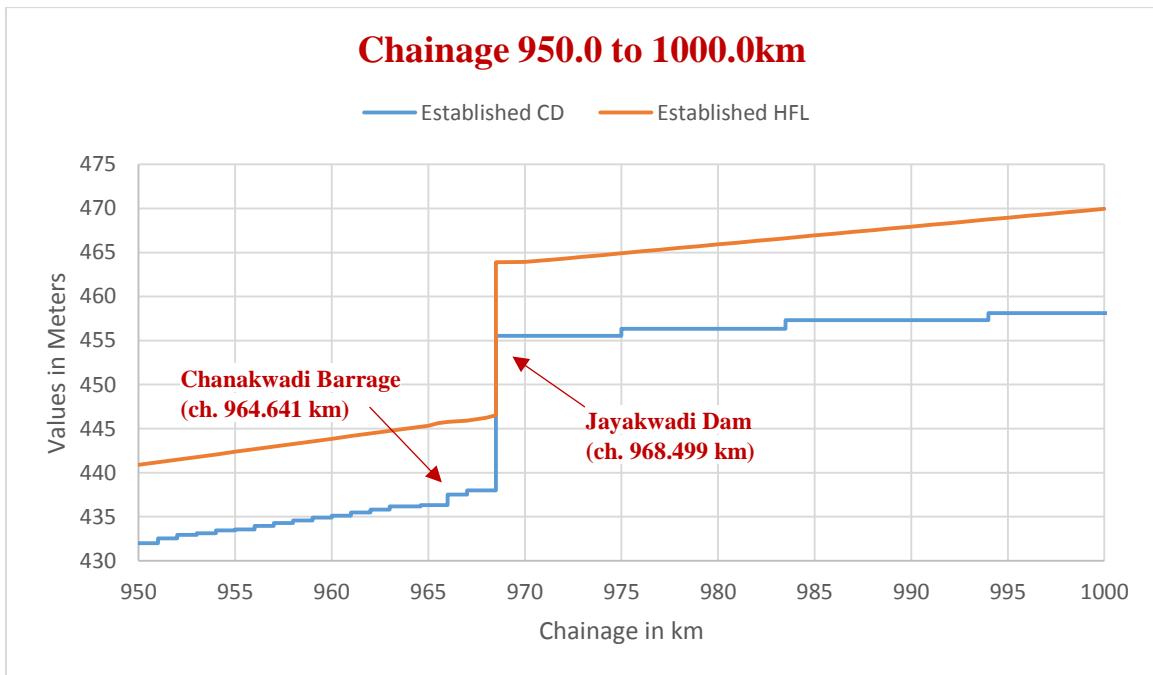
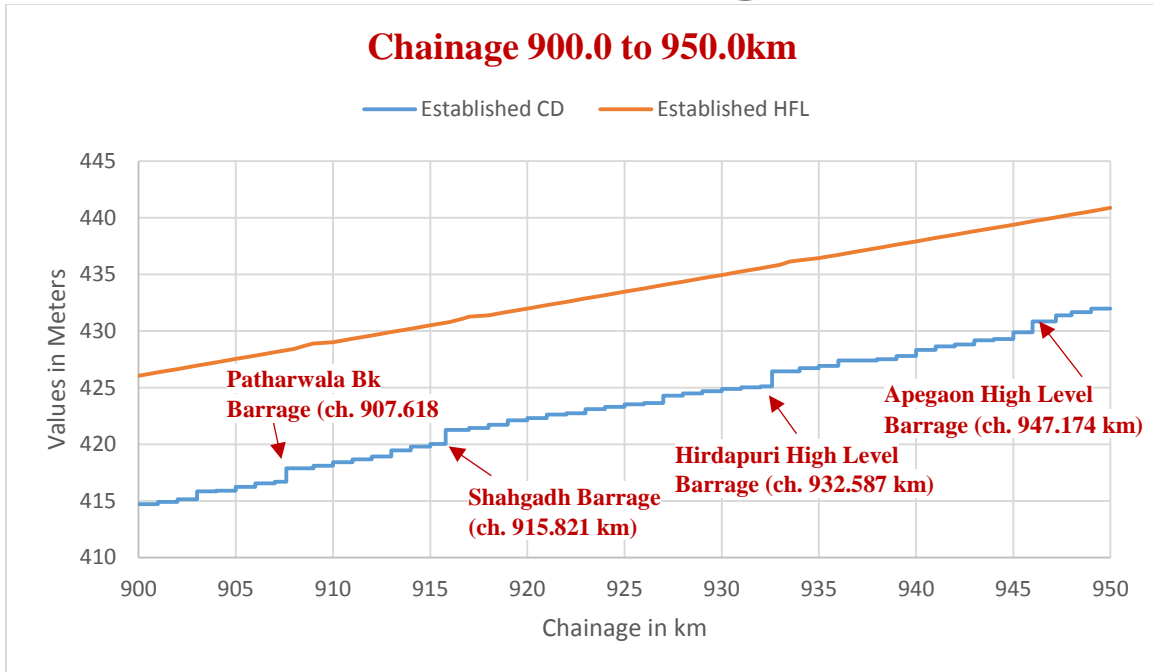


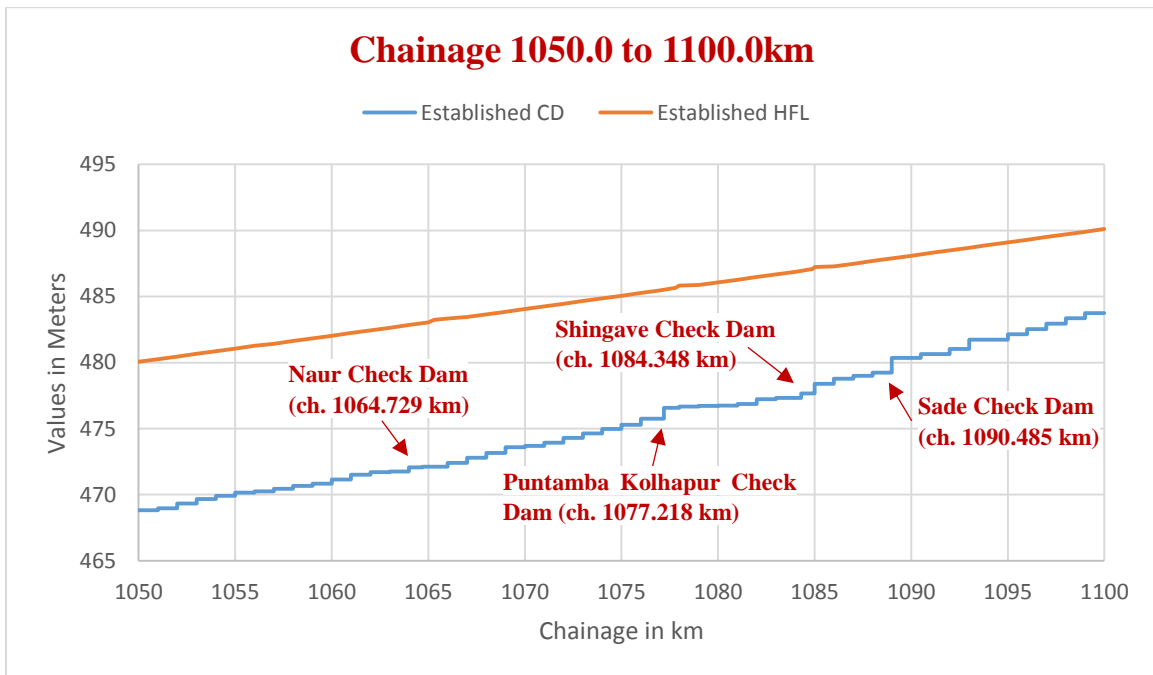
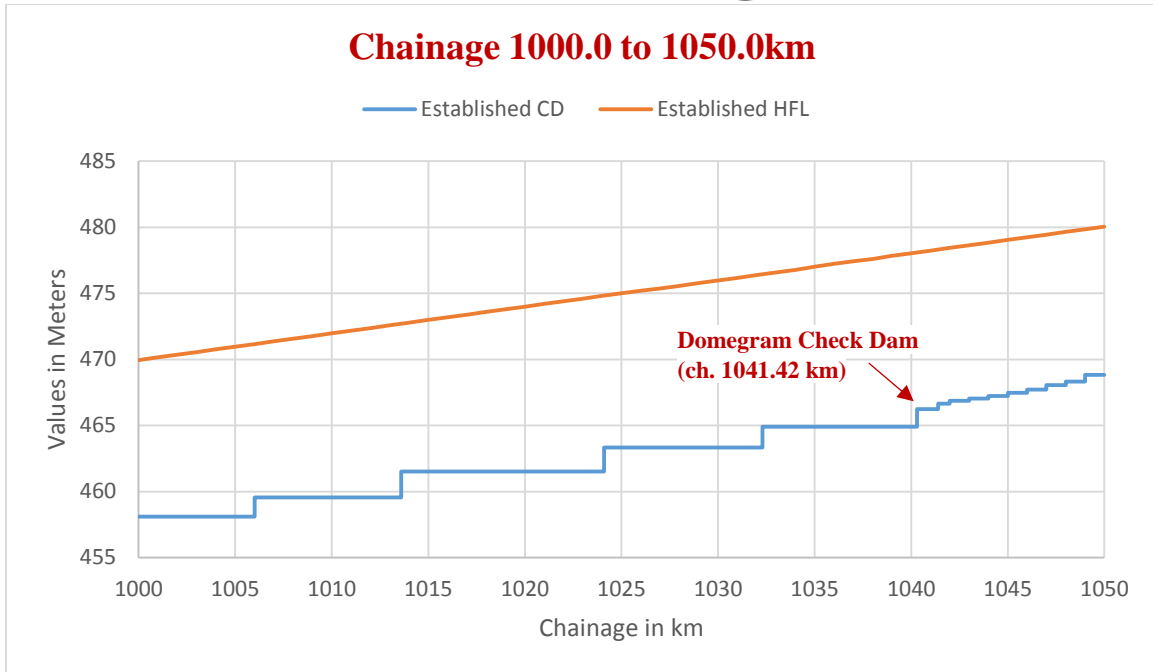


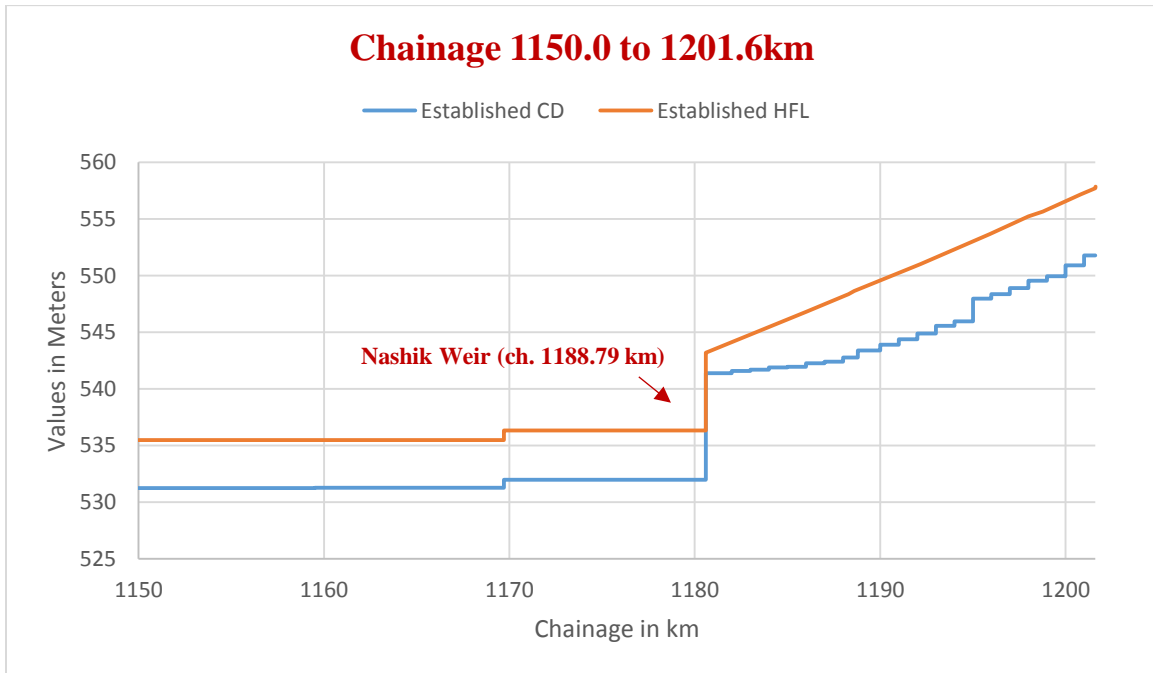
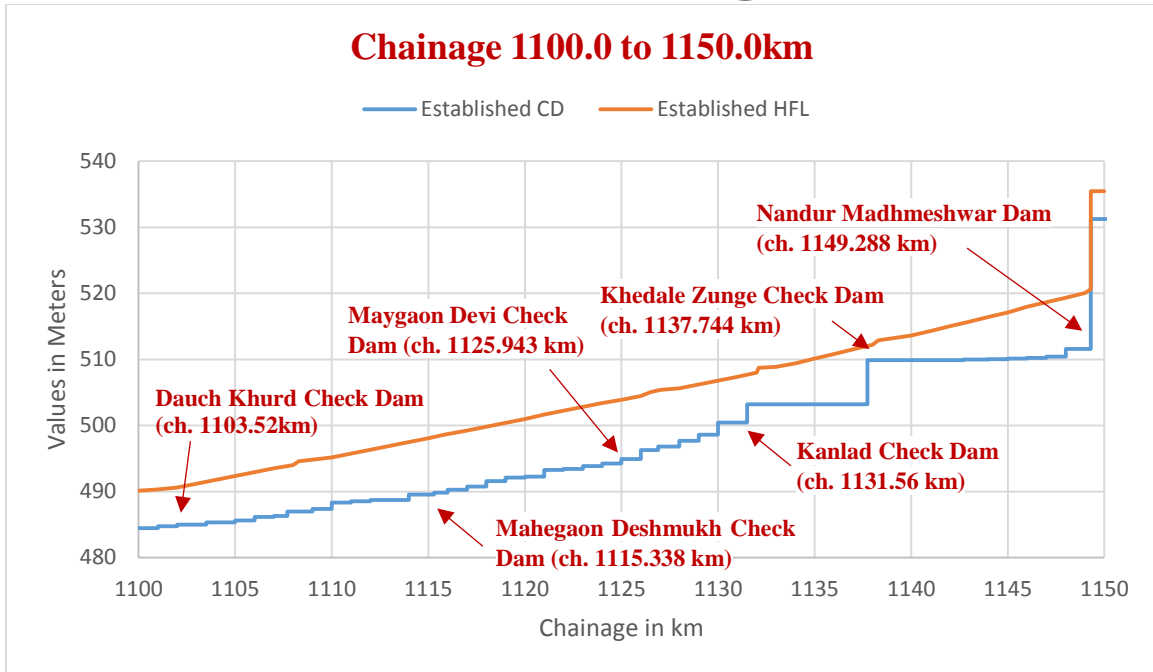












*Figure 12 - Sounding Datum and HFL vs Chainage*

## 2.12 Average Bed Slope

The average bed slope for the Godavari River is as follows:

Reach and River-bed Level (RBL)		River-bed Level Change (m)	Distance (km) (B)	Slope (A/B)
From	To			
Ch. 0 - RBL_34.252	Ch. 30 - RBL_47.086	12.834	30	1 : 0.428
Ch. 30 - RBL_47.086	Ch. 60 - RBL_55.528	8.442	30	1 : 0.281
Ch. 60 - RBL_55.528	Ch. 90 - RBL_65.667	10.139	30	1 : 0.338
Ch. 90 - RBL_65.667	Ch. 120 - RBL_67.253	1.586	30	1 : 0.053
Ch. 120 - RBL_67.253	Ch. 150 - RBL_75.125	7.872	30	1 : 0.262
Ch. 150 - RBL_75.125	Ch. 180 - RBL_90.509	15.384	30	1 : 0.513
Ch. 180 - RBL_90.509	Ch. 210 - RBL_99.6	9.091	30	1 : 0.303
Ch. 210 - RBL_99.6	Ch. 240 - RBL_103.815	4.215	30	1 : 0.141
Ch. 240 - RBL_103.815	Ch. 270 - RBL_117.713	13.898	30	1 : 0.463
Ch. 270 - RBL_117.713	Ch. 300 - RBL_132.997	15.284	30	1 : 0.509
Ch. 300 - RBL_132.997	Ch. 330 - RBL_136.69	3.693	30	1 : 0.123
Ch. 330 - RBL_136.69	Ch. 360 - RBL_157.607	20.917	30	1 : 0.697
Ch. 360 - RBL_157.607	Ch. 390 - RBL_187.756	30.149	30	1 : 1.005
Ch. 390 - RBL_187.756	Ch. 420 - RBL_243.181	55.425	30	1 : 1.848
Ch. 420 - RBL_243.181	Ch. 450 - RBL_294.933	51.752	30	1 : 1.725
Ch. 450 - RBL_294.933	Ch. 480 - RBL_322.868	27.935	30	1 : 0.931
Ch. 480 - RBL_322.868	Ch. 510 - RBL_326.043	3.175	30	1 : 0.106
Ch. 510 - RBL_326.043	Ch. 540 - RBL_335.464	9.421	30	1 : 0.314
Ch. 540 - RBL_335.464	Ch. 570 - RBL_332.341	3.123	30	1 : 0.104
Ch. 570 - RBL_332.341	Ch. 600 - RBL_336.706	4.365	30	1 : 0.146
Ch. 600 - RBL_336.706	Ch. 630 - RBL_351.442	14.736	30	1 : 0.491
Ch. 630 - RBL_351.442	Ch. 660 - RBL_355.65	4.208	30	1 : 0.14
Ch. 660 - RBL_355.65	Ch. 690 - RBL_362.167	6.517	30	1 : 0.217
Ch. 690 - RBL_362.167	Ch. 720 - RBL_369.53	7.363	30	1 : 0.245
Ch. 720 - RBL_369.53	Ch. 750 - RBL_375.487	5.957	30	1 : 0.199
Ch. 750 - RBL_375.487	Ch. 780 - RBL_385.939	10.452	30	1 : 0.348
Ch. 780 - RBL_385.939	Ch. 810 - RBL_390.577	4.638	30	1 : 0.155
Ch. 810 - RBL_390.577	Ch. 840 - RBL_399.438	8.861	30	1 : 0.295
Ch. 840 - RBL_399.438	Ch. 870 - RBL_408.382	8.944	30	1 : 0.298
Ch. 870 - RBL_408.382	Ch. 900 - RBL_416.891	8.509	30	1 : 0.284
Ch. 900 - RBL_416.891	Ch. 930 - RBL_427.298	10.407	30	1 : 0.347
Ch. 930 - RBL_427.298	Ch. 960 - RBL_438.347	11.049	30	1 : 0.368
Ch. 960 - RBL_438.347	Ch. 990 - RBL_453.452	15.105	30	1 : 0.504
Ch. 990 - RBL_453.452	Ch. 1020 - RBL_455.414	1.962	30	1 : 0.065
Ch. 1020 - RBL_455.414	Ch. 1050 - RBL_470.963	15.549	30	1 : 0.518
Ch. 1050 - RBL_470.963	Ch. 1080 - RBL_486.922	15.959	30	1 : 0.532
Ch. 1080 - RBL_486.922	Ch. 1110 - RBL_492.172	5.25	30	1 : 0.175
Ch. 1110 - RBL_492.172	Ch. 1140 - RBL_505.63	13.458	30	1 : 0.449
Ch. 1140 - RBL_505.63	Ch. 1170 - RBL_528.402	22.772	30	1 : 0.759
Ch. 1170 - RBL_528.402	Ch. 1201.6 - RBL_557.281	28.879	31.6	1 : 0.914
Ch. 0 - RBL_34.252	Ch. 30 - RBL_47.086	12.834	30	1 : 0.428
Ch. 30 - RBL_47.086	Ch. 60 - RBL_55.528	8.442	30	1 : 0.281
Ch. 60 - RBL_55.528	Ch. 90 - RBL_65.667	10.139	30	1 : 0.338
Ch. 90 - RBL_65.667	Ch. 120 - RBL_67.253	1.586	30	1 : 0.053
Ch. 120 - RBL_67.253	Ch. 150 - RBL_75.125	7.872	30	1 : 0.262
Ch. 150 - RBL_75.125	Ch. 180 - RBL_90.509	15.384	30	1 : 0.513
Ch. 180 - RBL_90.509	Ch. 210 - RBL_99.6	9.091	30	1 : 0.303
Ch. 210 - RBL_99.6	Ch. 240 - RBL_103.815	4.215	30	1 : 0.141
Ch. 240 - RBL_103.815	Ch. 270 - RBL_117.713	13.898	30	1 : 0.463
Ch. 270 - RBL_117.713	Ch. 300 - RBL_132.997	15.284	30	1 : 0.509



Reach and River-bed Level (RBL)		River-bed Level Change (m)	Distance (km) (B)	Slope (A/B)
From	To			
Ch. 300 - RBL_132.997	Ch. 330 - RBL_136.69	3.693	30	1 : 0.123
Ch. 330 - RBL_136.69	Ch. 360 - RBL_157.607	20.917	30	1 : 0.697
Ch. 360 - RBL_157.607	Ch. 390 - RBL_187.756	30.149	30	1 : 1.005
Ch. 390 - RBL_187.756	Ch. 420 - RBL_243.181	55.425	30	1 : 1.848
Ch. 420 - RBL_243.181	Ch. 450 - RBL_294.933	51.752	30	1 : 1.725
Ch. 450 - RBL_294.933	Ch. 480 - RBL_322.868	27.935	30	1 : 0.931
Ch. 480 - RBL_322.868	Ch. 510 - RBL_326.043	3.175	30	1 : 0.106
Ch. 510 - RBL_326.043	Ch. 540 - RBL_335.464	9.421	30	1 : 0.314
Ch. 540 - RBL_335.464	Ch. 570 - RBL_332.341	3.123	30	1 : 0.104
Ch. 570 - RBL_332.341	Ch. 600 - RBL_336.706	4.365	30	1 : 0.146
Ch. 600 - RBL_336.706	Ch. 630 - RBL_351.442	14.736	30	1 : 0.491
Ch. 630 - RBL_351.442	Ch. 660 - RBL_355.65	4.208	30	1 : 0.14
Ch. 660 - RBL_355.65	Ch. 690 - RBL_362.167	6.517	30	1 : 0.217

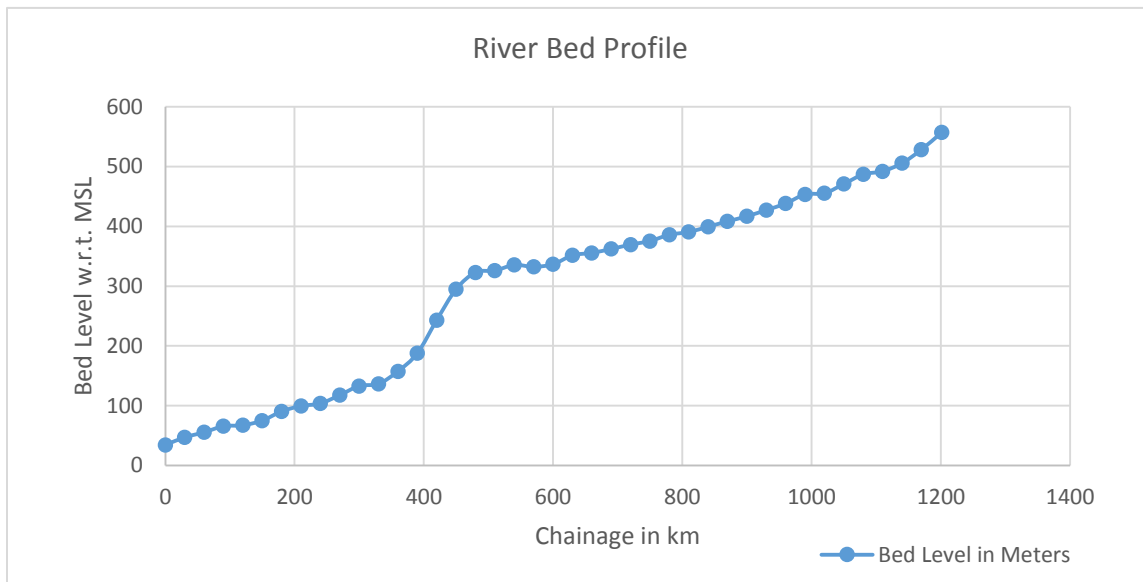


Table 65 - Average Bed Slope

## 2.13 Details of Dam, Barrages, Weirs, Anicut, etc.

Sl. No	Structure Name	Ch. (km)	Location	Position (Lat Long)	Position (UTM)	Length (m)	Width (m)	Height w.r.t Least MSL (m)	Present Condition
				Left Bank / Right Bank	Left Bank / Right Bank				
1	Dummugudam Power Plant Barrage	21.912	Dummugudam	<b>Left Bank :</b> 17°51'19.7219"N 80°53'04.9550"E	<b>Left Bank :</b> 487785.160 1974200.110	41.573	30.234	10.216	Operational
				<b>Right Bank :</b> 17°51'17.4829"N 80°53'07.2042"E	<b>Right Bank :</b> 487851.310 1974131.260				
2	Dummugudem Weir	24.043	Dummugudem	<b>Left Bank :</b> 17°52'35.6111"N 80°52'41.8775"E	<b>Left Bank :</b> 487107.5032 1976532.7591	1552	1.8	1.2	Unbroken
				<b>Right Bank :</b> 17°52'15.7901"N 80°53'30.4511"E	<b>Right Bank :</b> 488536.5120 1975922.7418				

Sl. No	Structure Name	Ch. (km)	Location	Position (Lat Long)	Position (UTM)	Length (m)	Width (m)	Height w.r.t Least MSL (m)	Present Condition
				Left Bank / Right Bank	Left Bank / Right Bank				
3	Kasipeta Check Dam	278.51	Kasipeta	<b>Left Bank :</b> 18°43'51.78"N 79°36'29.88"E	<b>Left Bank :</b> 353278.47 2071641.46	1474.83	94.25	-	Under Construction
				<b>Right Bank :</b> 18°44'32.71"N 79°36'55.17"E	<b>Right Bank :</b> 354029.53 2072894.75				
4	Sripada Yellampally Dam	310.499	Yellampalli	<b>Left Bank :</b> 18°50'38.3350"N 79°22'24.9147"E	<b>Left Bank :</b> 328643.008 2084350.23	1180.7	21.528	24.601	Operational
				<b>Right Bank:</b> 18°50'59.4063"N 79°21'50.9901"E	<b>Right Bank:</b> 327655.921 2085007.2				
5	Sri Ram Sagar Dam	457.494	Pochampadu	<b>Left Bank :</b> 18°57'57.4490"N 78°20'42.6430"E	<b>Left Bank :</b> 220444.121 2099166.81	15600	5.742	42.672	Operational
				<b>Right Bank :</b> 18°58'15.0261"N 78°20'15.8821"E	<b>Right Bank :</b> 219669.082 2099719.337				
6	Babhali High Level Barrage	535.665	Babhali	<b>Left Bank :</b> 18°51'07.7139"N 77°49'13.9906"E	<b>Left Bank :</b> 797219.744 2086832.774	257	5.652	30.245	Operational
				<b>Right Bank :</b> 18°51'18.3751"N 77°49'12.7959"E	<b>Right Bank :</b> 797179.529 2087160.205				
7	Baligon Barrage	568.339	Baligon	<b>Left Bank :</b> 18°58'08.2594"N 77°35'16.3571"E	<b>Left Bank :</b> 772497.810 2099394.394	285	6.881	22.236	Operational
				<b>Right Bank :</b> 18°58'13.2558"N 77°35'24.6469"E	<b>Right Bank :</b> 772738.152 2099551.651				
8	Amudra High Level Barrage	592.583	Devapur	<b>Left Bank :</b> 19°04'32.2254"N 77°24'41.7916"E	<b>Left Bank :</b> 753766.014 2110940.581	277.5	6.234	19.369	Operational
				<b>Right Bank :</b> 19°04'37.3887"N 77°24'51.7117"E	<b>Right Bank :</b> 754053.923 2111103.384				
9	Wajegaon Check Dam	611.56	Wajegaon	<b>Left Bank :</b> 19° 8'46.88"N 77°20'35.61"E	<b>Left Bank :</b> 746462.76 2118675.87	253.0	10.00	-	Operational
				<b>Right Bank :</b> 19° 8'54.85"N 77°20'33.48"E	<b>Right Bank :</b> 746396.50 2118919.40				
10	Nanded Weir	615.78	Nanded	<b>Left Bank :</b> 19°08'46.3711"N 77°18'26.2675"E	<b>Left Bank :</b> 742681.6494 2118609.1059	260	1.1	2.5	Unbroken
				<b>Right Bank :</b> 19°8'54.8437"N 77°18'26.7285"E	<b>Right Bank :</b> 742691.6801 2118869.8647				
11	Vishnupuri Barrage	620.711	Asarjan	<b>Left Bank :</b> 19°07'37.1981"N 77°16'46.0908"E	<b>Left Bank :</b> 739781.352 2116443.217	339	5.997	21.032	Operational
				<b>Right Bank :</b> 19°07'39.3151"N 77°16'57.6596"E	<b>Right Bank :</b> 740118.680 2116512.739				

Sl. No	Structure Name	Ch. (km)	Location	Position (Lat Long)	Position (UTM)	Length (m)	Width (m)	Height w.r.t Least MSL (m)	Present Condition
				Left Bank / Right Bank	Left Bank / Right Bank				
12	Anteshwar Barrage	653.866	Anteshwar	<b>Left Bank :</b> 19°06'23.2478"N 77°06'00.3366"E	<b>Left Bank :</b> 720932.805 2113932.582	254	11.847	5.521	Operational
				<b>Right Bank :</b> 19°06'26.1337"N 77°06'08.4840"E	<b>Right Bank :</b> 721169.912 2114024.192				
13	Digras High level barrage	671.142	Digras	<b>Left Bank :</b> 19°05'34.4083"N 77°00'41.9505"E	<b>Left Bank :</b> 711642.900 2112321.368	282.5	5.886	18.529	Operational
				<b>Right Bank :</b> 19°05'42.7753"N 77°00'41.0039"E	<b>Right Bank :</b> 711612.272 2112578.342				
14	Muli low level Barrage	720.262	Muli	<b>Left Bank :</b> 19°00'47.4034"N 76°44'45.6830"E	<b>Left Bank :</b> 683776.839 2103196.881	231.5	5.116	12.369	Operational
				<b>Right Bank :</b> 19°00'47.5628"N 76°44'53.6050"E	<b>Right Bank :</b> 684008.465 2103204.085				
15	Khadaka Barrage	736.937	Khadaka	<b>Left Bank :</b> 19°00'51.4793"N 76°37'35.9347"E	<b>Left Bank :</b> 671208.194 2103201.658	312	2.839	18.236	Operational
				<b>Right Bank :</b> 19°01'00.5277"N 76°37'40.7789"E	<b>Right Bank :</b> 671347.274 2103481.164				
16	Mudgal High Level Barrage	764.753	Mudgal	<b>Left Bank :</b> 19°05'11.9370"N 76°29'14.7474"E	<b>Left Bank :</b> 656484.530 2111079.342	282.5	6.114	23.145	Operational
				<b>Right Bank :</b> 19°05'21.1653"N 76°29'14.1570"E	<b>Right Bank :</b> 656464.865 2111362.911				
17	Tarugavan High Level Barrage	782.892	Pohner	<b>Left Bank :</b> 19°06'36.4363"N 76°23'36.1497"E	<b>Left Bank :</b> 646567.246 2113595.733	300	6.034	25.336	Operational
				<b>Right Bank :</b> 19°06'42.4025"N 76°23'44.1939"E	<b>Right Bank :</b> 646800.865 2113781.024				
18	Dhalegaon High Level Barrage	810.000	Dhalegaon	<b>Left Bank :</b> 19°13'26.5532"N 76°21'42.3779"E	<b>Left Bank :</b> 643144.033 2126177.745	282.5	5.595	25.366	Operational
				<b>Right Bank :</b> 19°13'25.8626"N 76°21'52.0311"E	<b>Right Bank :</b> 643426.104 2126158.721				
19	Lonisawangi High Level Barrage	828.144	Manjarath	<b>Left Bank :</b> 19°14'34.7533"N 76°13'46.0293"E	<b>Left Bank :</b> 629218.582 2128170.752	174.5	7.975	22.014	Operational
				<b>Right Bank :</b> 19°14'40.2255"N 76°13'43.9412"E	<b>Right Bank :</b> 629156.423 2128338.546				
20	Rajatakli High Level Barrage	857.147	Shivangaon	<b>Left Bank :</b> 19°16'56.5837"N 76°02'51.3149"E	<b>Left Bank :</b> 610075.972 2132405.470	282.5	5.625	21.254	Operational
				<b>Right Bank :</b> 19°17'05.7504"N 76°02'50.5235"E	<b>Right Bank :</b> 610051.170 2132687.120				

Sl. No	Structure Name	Ch. (km)	Location	Position (Lat Long)	Position (UTM)	Length (m)	Width (m)	Height w.r.t Least MSL (m)	Present Condition
				Left Bank / Right Bank	Left Bank / Right Bank				
21	Mangrul High Level Barrage	873.218	Mangrul	<b>Left Bank :</b> 19°17'54.8710"N 75°57'35.3090"E	<b>Left Bank :</b> 600841.862 2134143.848	365	5.531	17.854	Operational
				<b>Right Bank :</b> 19°18'05.9895"N 75°57'30.5940"E	<b>Right Bank :</b> 600702.356 2134484.866				
22	Jogladevi High Level Barrage	890.798	Jogladevi	<b>Left Bank :</b> 19°23'17.5311"N 75°54'11.4828"E	<b>Left Bank :</b> 594841.082 2144030.339	347.5	5.526	21.035	Operational
				<b>Right Bank :</b> 19°23'26.0823"N 75°54'03.5480"E	<b>Right Bank :</b> 594608.247 2144291.990				
23	Patharwala Bk Barrage	907.618	Patharwala Bk	<b>Left Bank :</b> 19°23'24.8244"N 75°45'43.3253"E	<b>Left Bank :</b> 580017.118 2144183.014	220	4.091	12.033	Operational
				<b>Right Bank :</b> 19°23'31.2783"N 75°45'40.0945"E	<b>Right Bank :</b> 579922.002 2144380.984				
24	Shahgadhd Barrage	915.821	Shahgadhd	<b>Left Bank :</b> 19°21'15.4169"N 75°43'01.3057"E	<b>Left Bank :</b> 575307.655 2140184.951	261	4.314	5.432	Operational
				<b>Right Bank :</b> 19°21'23.7052"N 75°42'59.3125"E	<b>Right Bank :</b> 575248.447 2140439.481				
25	Hirdapuri High Level Barrage	932.587	Gulaj	<b>Left Bank :</b> 19°22'37.0658"N 75°35'04.7243"E	<b>Left Bank :</b> 561394.836 2142642.329	286	5.421	19.214	Operational
				<b>Right Bank :</b> 19°22'46.2964"N 75°35'06.1415"E	<b>Right Bank :</b> 561435.217 2142926.198				
26	Apegaon High Level Barrage	947.174	Apegaon	<b>Left Bank :</b> 19°26'25.9519"N 75°29'02.1676"E	<b>Left Bank :</b> 550799.086 2149645.043	277.5	6.427	22.036	Operational
				<b>Right Bank :</b> 19°26'34.4771"N 75°28'58.0882"E	<b>Right Bank :</b> 550679.400 2149906.757				
27	Chanakwadi Barrage	964.641	Paithan	<b>Left Bank :</b> 19°27'33.5342"N 75°23'07.6964"E	<b>Left Bank :</b> 540458.429 2151696.257	281	3.891	6.121	Operational
				<b>Right Bank :</b> 19°27'41.4731"N 75°23'03.7514"E	<b>Right Bank :</b> 540342.865 2151940.024				
28	Jayakwadi Dam	968.499	Paithan	<b>Left Bank :</b> 19°28'58.2086"N 75°22'07.5146"E	<b>Left Bank :</b> 538698.204 2154301.873	6488	5.672	35.547	Operational
				<b>Right Bank :</b> 19°29'15.3248"N 75°22'16.5835"E	<b>Right Bank :</b> 538961.452 2154821.778				
29	Domegram Check Dam	1041.42	Domegram	<b>Left Bank :</b> 19°40'09.5611"N 74°49'16.6875"E	<b>Left Bank :</b> 481268.517 2174899.047	200	4.064	3.851	Operational
				<b>Right Bank :</b> 19°40'12.3837"N 74°49'22.9385"E	<b>Right Bank :</b> 481450.62 2174985.617				

Sl. No	Structure Name	Ch. (km)	Location	Position (Lat Long)	Position (UTM)	Length (m)	Width (m)	Height w.r.t Least MSL (m)	Present Condition
				Left Bank / Right Bank	Left Bank / Right Bank				
30	Humrapur Dam	1046.832	Humrapur	Left Bank : 19°42'6.52"N 74°48'15.36"E	Left Bank : 479487.79 2178496.01	226	7.95	-	Operational
				Right Bank : 19°42'13.61"N 74°48'17.41"E	Right Bank : 479547.18 2178714.15				
31	Wanjargaon Check Dam	1059.332	Wanjargaon	Left Bank : 19°45'48.41"N 74°44'8.63"E	Right Bank : 472314.90 2185326.31	213.0	7.59	-	Operational
				Right Bank : 19°45'55.16"N 74°44'10.89"E	Right Bank : 472380.99 2185533.69				
32	Naur Check Dam	1064.729	Naur	Left Bank : 19°45'26.2743"N 74°41'58.8431"E	Left Bank : 468536.838 2184652.188	222	4.212	7.121	Operational
				Right Bank : 19°45'31.4741"N 74°41'53.5317"E	Right Bank : 468382.55 2184812.297				
33	Puntamba Kolhapur Check Dam	1077.218	Dongaon	Left Bank : 19°46'31.3815"N 74°36'56.0259"E	Left Bank : 459728.888 2186671.297	300	3.971	2.814	Operational
				Right Bank : 19°46'34.9568"N 74°36'46.5004"E	Right Bank : 459451.96 2186781.829				
34	Shingave Check Dam	1084.348	Shingave	Left Bank : 19°47'51.3599"N 74°33'53.2671"E	Left Bank : 454417.188 2189142.611	245	2.034	3.012	Operational
				Right Bank : 19°47'59.1028"N 74°33'51.4118"E	Right Bank : 454363.82 2189380.758				
35	Sade Check Dam	1090.485	Sade	Left Bank : 19°50'10.81"N 74°32'34.10"E	Left Bank : 452125.56 2193435.27	267.89	6.22	-	Operational
				Right Bank : 19°50'17.88"N 74°32'39.43"E	Right Bank : 452280.98 2193652.09				
36	Dauch Khurd Check Dam	1103.52	Dauch Khurd	Left Bank : 19°51'42.71"N 74°27'23.16"E	Left Bank : 443090.03 2196287.40	284.53	2.005	5.124	Operational
				Right Bank : 19°51'50.25"N 74°27'17.50"E	Right Bank : 442926.13 2196519.31				
37	Chandgavhan Check Dam	1107.705	Chandgavhan	Left Bank : 19°53'03.5411"N 74°25'51.3566"E	Left Bank : 440428.43 2198780.528	235	4.363	4.129	Operational
				Right Bank : 19°53'04.2149"N 74°25'59.3544"E	Right Bank : 440661.071 2198800.456				
38	Mahegaon Deshmukh Check Dam	1115.338	Mahegaon Deshmukh	Left Bank : 19°54'57.1674"N 74°23'27.2822"E	Left Bank : 436251.476 2202288.039	200	3.652	5.148	Operational
				Right Bank : 19°55'03.6389"N 74°23'27.6997"E	Right Bank : 436264.335 2202486.931				

Sl. No	Structure Name	Ch. (km)	Location	Position (Lat Long)	Position (UTM)	Length (m)	Width (m)	Height w.r.t Least MSL (m)	Present Condition
				Left Bank / Right Bank	Left Bank / Right Bank				
39	Maygaon Devi Check Dam	1125.943	Maygaon Devi	<b>Left Bank :</b> 19°56'34.4956"N 74°19'05.8136"E	<b>Left Bank :</b> 428661.716 2205309.111	235	4.383	6.012	Operational
				<b>Right Bank :</b> 19°56'40.1573"N 74°19'11.2653"E	<b>Right Bank :</b> 428820.897 2205482.513				
40	Kanlad Check Dam	1131.56	Kanlad	<b>Left Bank :</b> 19°57'40.8266"N 74°16'14.6931"E	<b>Left Bank :</b> 423696.241 2207369.061	220	4.098	5.012	Operational
				<b>Right Bank :</b> 19°57'47.8333"N 74°16'16.2594"E	<b>Right Bank :</b> 423742.703 2207584.254				
41	Khedale Zunge Check Dam	1137.744	Khedale Zunge	<b>Left Bank :</b> 19°58'21.0800"N 74°12'52.4900"E	<b>Left Bank :</b> 417824.78695 2208633.013	271	4.231	4.854	Operational
				<b>Right Bank :</b> 19°58'28.0161"N 74°12'57.2458"E	<b>Right Bank :</b> 417964.008 2208845.59				
42	Nandur Madhmeshwar Dam	1149.288	Khangaon Thadi	<b>Left Bank :</b> 20°00'30.1827"N 74°07'57.0407"E	<b>Left Bank :</b> 409258.279 2212644.145	1103	4.789	9.021	Operational
				<b>Right Bank :</b> 20°01'02.0961"N 74°07'55.8271"E	<b>Right Bank :</b> 409228.101 2213625.399				
43	Nashik Weir	1188.79	Nashik	<b>Left Bank :</b> 19°59'36.3111"N 73°54'11.3175"E	<b>Left Bank :</b> 385252.9285 2211128.7071	140	3.8	3	Unbroken
				<b>Right Bank :</b> 19°59'40.3225"N 73°54'13.5247"E	<b>Right Bank :</b> 385317.8817 2211251.610				

*Table 66 - Details of Dam, Barrages, Weirs*

## 2.14 Details of Locks

There are no Locks present in the entire survey stretch of Godavari River.

## 2.15 Details of Aqueducts

There are no Aqueducts present in the survey stretch of Godavari River.

## 2.16 Details of Bridges and Crossings over waterway

Sl. No	Structure Names	Chainage (km)	Type of Structure (RCC/ Iron/ Wood en)	Location	Position (Lat/Lon)	Position (UTM)	Length (m)	Width (m)	No. of Piers	H. Clearance (dist. between piers)	V. Clearance w.r.t. HFL	Remarks (complete/Under construction)	UTM Zone
					Left Bank / Right Bank	Left Bank / Right Bank							
1	Bhadrahalam Road Bridge (NH-221)	0.00	RCC	Ashok Nagar Colony, Bhadrachalam	<b>Left Bank :</b> 17°40'56.635"N 80°52'33.501"E	<b>Left Bank :</b> 486846.829 1955052.278	12 17	7.1 33	3 6	30.76 9	3.449	Complete	44N
					<b>Right Bank :</b> 17°40'29.660"N 80°53'03.722"E	<b>Right Bank :</b> 487736.58019 54222.712							
2	Venkatapuram Road Bridge (NH-163)	112.00	RCC	Near Pusur Patch-I	<b>Left Bank :</b> 18°24'58.283"N 80°27'12.674"E	<b>Left Bank :</b> 442284.781 2036319.131	18 15	14. 16 2	4 4	37.71 5	3.222	Complete	44N
					<b>Right Bank :</b> 18°24'56.005"N 80°28'15.441"E	<b>Right Bank :</b> 444126.022 2036243.639							
3	Sironcha Road Bridge (NH-16)	213.495	RCC	Near Sironcha	<b>Left Bank :</b> 18°48'03.608"N 79°55'16.174"E	<b>Left Bank :</b> 386312.510 2079154.025	16 41	14. 05 9	3 5	40.88 9	5.552	Complete	44N
					<b>Right Bank :</b> 18°48'41.769"N 79°55'55.377"E	<b>Right Bank :</b> 387467.214 2080320.11							
4	New Sironcha Bridge	216.00	RCC	Near Sironcha	<b>Left Bank :</b> 18°50'59.38"N 79°56'32.25"E	<b>Left Bank :</b> 388571.85 2084543.82	90 1.7 4	-	-	-	-	under construction	44N
					<b>Right Bank :</b> 18°50'34.09"N 79°56'46.71"E	<b>Right Bank :</b> 388990.36 2083763.76							
5	Hyderabad-Mancheerial Road Bridge (NH-1)	290.040	RCC	Near Indaram	<b>Left Bank :</b> 18°46'53.593"N 79°31'13.585"E	<b>Left Bank :</b> 344060.614 2077305.499	11 48	9.6 99	3 4	28.57 8	2.618	Complete	44N
					<b>Right Bank :</b> 18°47'27.535"N 79°31'10.168"E	<b>Right Bank :</b> 343969.244 2078349.807							
6	Hyderabad-Mancheerial Road Bridge (NH-1)	290.054	RCC	Near Indaram	<b>Left Bank :</b> 18°46'53.588"N 79°31'14.081"E	<b>Left Bank :</b> 344075.114 2077305.22	11 48	12. 91 8	3 4	28.57 9	2.617	Complete	44N
					<b>Right Bank :</b> 18°47'27.608"N 79°31'10.677"E	<b>Right Bank :</b> 343984.144 2078351.92							



Sl. No	Structure Names	Chainage (km)	Type of Structure (RCC/Iron/Wooden)	Location	Position (Lat/Lon)	Position (UTM)	Length (m)	Width (m)	No. of Piers	H. Clearance (dist. between piers)	V. Clearance w.r.t. HFL	Remarks (complete/Under construction)	UTM Zone
					Left Bank / Right Bank	Left Bank / Right Bank							
7	Manche rial Railway Bridge	30 1.2 31	RCC	Near Ma nche rial	Left Bank : 18°50'16.867"N 79°26'27.874"E	Left Bank : 335749.188 2083626.368	11 75	10. 98 7	4 3	19.97 3	1.621	Complete	44N
					Right Bank : 18°50'47.363"N 79°26'51.741"E	Right Bank : 336456.054 2084557.799							
8	Manche rial Railway Bridge (Kashm ir→Kanyakum ari)	30 1.7 76	RCC	Near Ma nche rial	Left Bank : 18°50'17.535"N 79°26'26.797"E	Left Bank : 335717.844 2083647.188	11 75	8.5 9	4 3	24.13 5	1.507	Complete	44N
					Right Bank : 18°50'48.178"N 79°26'50.776"E	Right Bank : 336428.001 2084583.111							
9	Nizama bad-Manche rial Road Bridge (NH-16)	33 8.3 33	RCC	Near Ray apat nam	Left Bank : 18°53'50.862"N 79°09'08.084"E	Left Bank : 305378.413 2090498.519	11 20	11. 10 8	2 7	37.72 7	3.525	Complete	44N
					Right Bank : 18°54'10.616"N 79°09'40.259"E	Right Bank : 306326.355 2091096.111							
10	Nizama bad-Manche rial Road Bridge (NH-16)	33 8.3 89	RCC	Near Ray apat nam	Left Bank : 18°53'55.433"N 79°09'12.299"E	Left Bank : 305503.233 2090637.799	48 8	6.8 45	4 7	9.417	2.745	Complete	44N
					Right Bank : 18°54'04.055"N 79°09'26.306"E	Right Bank : 305915.911 2090898.63							
11	Kalmad ugu-Kamma nur Road Bridge	37 2.1 43	RCC	Near Kal mad ugu	Left Bank : 19°04'18.5020"N 78°57'05.2151"E	Left Bank : 284446.478 2110032.175	95 0	7.4 17	3 9	24.12 9	2.051	Complete	44N
					Right Bank : 19°04'46.4396"N 78°56'51.4411"E	Right Bank : 284053.811 2110896.005							
12	Khanapu r Road Bridge	41 1.4 79	RCC	Obu lapu r	Left Bank : 19°00'38.1306"N 78°39'54.8960"E	Left Bank : 254229.299 2103631.199	54 5	10. 45	2 0	23.31 2	3.761	Complete	44N
					Right Bank : 19°00'48.9605"N 78°39'40.0827"E	Right Bank : 253800.391 2103970.045							
13	Khanapu r Road Bridge	41 1.6 80	RCC	Bad ank urti	Left Bank : 19°01'03.2540"N 78°39'12.5238"E	Left Bank : 253000.078 2104420.400	24 2	10. 18 1	8	23.06 9	2.944	Complete	44N

Sl. No	Structure Names	Chainage (km)	Type of Structure (RCC/ Iron/ Wooden)	Location	Position (Lat/Lon)	Position (UTM)	Length (m)	Width (m)	No. of Piers	H. Clearance (dist. between piers)	V. Clearance w.r.t. HFL	Remarks (complete/Under construction)	UTM Zone
					Left Bank / Right Bank	Left Bank / Right Bank							
					<b>Right Bank :</b> 19°01'04.4773"N 78°39'09.9898"E	<b>Right Bank :</b> 252926.454 2104459.015							
14	Kamlapur Road Bridge	43 4.7 30	RCC	Adarsa Nagar	<b>Left Bank :</b> 18°57'53.3953"N 78°30'42.0669"E <b>Right Bank :</b> 18°58'06.087"N 78°30'54.778"E	<b>Left Bank :</b> 237984.758 2098786.061 <b>Right Bank :</b> 238362.266 2099171.209	54 0	10. 50 2	2 0	23.55 4	1.223	Complete	44N
15	Soan Bridge (NH-7)	45 2.0 72	RCC	Soan	<b>Left Bank :</b> 18°59'41.045"N 78°22'52.093"E <b>Right Bank :</b> 19°00'05.550"N 78°22'49.315"E	<b>Left Bank :</b> 224280.118 2102296.842 <b>Right Bank :</b> 224210.060 2103051.836	76 0	6.6 6	3 5	18.20 4	4.974	Complete	44N
16	Soan Bridge (AH-43)	45 2.1 00	RCC		<b>Left Bank :</b> 18°59'40.570"N 78°22'51.131"E <b>Right Bank :</b> 19°00'05.910"N 78°22'48.312"E	<b>Left Bank :</b> 224251.744 2102282.644 <b>Right Bank :</b> 224180.873 2103063.356	78 4	11. 57 1	3 5	20.02 9	4.116	Complete	44N
17	Soan Bridge (AH-43)	45 2.1 26	RCC		<b>Left Bank :</b> 18°59'40.477"N 78°22'50.279"E <b>Right Bank :</b> 19°00'05.822"N 78°22'47.457"E	<b>Left Bank :</b> 224226.768 2102280.162 <b>Right Bank :</b> 224155.800 2103061.006	78 4	11. 54 9	3 5	20.02 4	4.176	Complete	44N
18	Basara Road Bridge	51 5.5 04	RCC		Basara	<b>Left Bank :</b> 18°51'43.6092"N 77°57'39.4921"E <b>Right Bank :</b> 18°51'50.0455"N 77°57'24.8043"E	<b>Left Bank :</b> 812008.176 2088178.796 <b>Right Bank :</b> 811574.645 2088369.636	47 5	7.0 02	1 1	38.12 9	3.175	Complete
19	Basara Railway Bridge	51 5.8 33	RCC	<b>Left Bank :</b> 18°51'33.7643"N 77°57'35.0780"E <b>Right Bank :</b> 18°51'40.0914"N 77°57'20.0683"E		<b>Left Bank :</b> 811883.943 2087873.727 <b>Right Bank :</b> 811441.038 2088061.056	48 0	6.7 44	2 2	29.81 2	2.303	Complete	43N
20	Khandhakurti	52 7.3 55	RCC	Khandh	<b>Left Bank :</b> 18°49'01.1648"N 77°52'45.2497"E	<b>Left Bank :</b> 803470.879 2083038.915	49 5	7.6 29	1 4	30.62 5	4.194	Complete	43N

Sl. No	Structure Names	Chainage (km)	Type of Structure (RCC/Iron/Wooden)	Location	Position (Lat/Lon)	Position (UTM)	Length (m)	Width (m)	No. of Piers	H. Clearance (dist. between piers)	V. Clearance w.r.t. HFL	Remarks (complete/Under construction)	UTM Zone
					Left Bank / Right Bank	Left Bank / Right Bank							
	Road Bridge			akurti	Right Bank : 18°49'16.5156"N 77°52'40.1286"E	Right Bank : 803313.186 2083508.763							
21	Sirajkherd Road Bridge	53 2.7 41	RCC	Bhokor	Left Bank : 18°50'57.3768"N 77°50'31.0210"E Right Bank : 18°51'07.1418"N 77°50'39.4314"E	Left Bank : 799481.086 2086550.808 Right Bank : 799722.613 2086855.182	42 0	7.9 1	1 1	21.50 1	1.659	Complete	43N
22	Babli Road Bridge	53 7.9 68	RCC	Babli	Left Bank : 18°51'14.3721"N 77°47'59.4912"E Right Bank : 18°51'24.4215"N 77°48'03.9412"E	Left Bank : 795032.141 2087003.482 Right Bank : 795159.751 2087314.173	34 0	7.6 51	1 1	23.50 5	3.724	Complete	43N
23	Kundalwadi-Jarikot Road Bridge	54 5.5 90	RCC	Digras	Left Bank : 18°51'54.5951"N 77°43'47.2315"E Right Bank : 18°52'05.3001"N 77°43'53.1077"E	Left Bank : 787627.014 2088125.066 Right Bank : 787794.023 2088457.036	37 0	7.2 14	9	27.01	1.173	Complete	43N
24	Raher Road Bridge	55 3.5 50	RCC	Raher	Left Bank : 18°53'45.0914"N 77°40'38.6833"E Right Bank : 18°53'54.0718"N 77°40'37.5655"E	Left Bank : 782053.847 2091439.824 Right Bank : 782016.934 2091715.583	27 5	7.6 6	1 4	17.50 1	4.312	Complete	43N
25	Baligon Road Bridge	56 7.5 19	RCC	Baligon	Left Bank : 18°57'44.4968"N 77°35'22.2806"E Right Bank : 18°57'44.9983"N 77°35'31.5619"E	Left Bank : 772681.907 2098665.997 Right Bank : 772953.310 2098685.418	24 7	7.3 96	9	24.85 1	3.098	Complete	43N
26	Mahati-Yeli Road Bridge	58 5.5 45	RCC	Mahati	Left Bank : 19°02'15.2697"N 77°27'43.2209"E Right Bank : 19°02'21.0641"N 77°27'50.0430"E	Left Bank : 759130.832 2106801.866 Right Bank : 759327.884 2106982.890	26 7	10. 33 7	1 1	20.36 1	4.650	Complete	43N
27	Malkautha-Kamlaj	60 0.9 51	RCC	Amadura	Left Bank : 19°07'49.5068"N 77°24'21.6811"E	Left Bank : 753094.477 2117000.337	28 5	7.4 37	1 4	18.36 9	4.577	Complete	43N

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					Left Bank / Right Bank	Left Bank / Right Bank							
	Road Bridge				<b>Right Bank :</b> 19°07'45.2647"N 77°24'30.3441"E	<b>Right Bank :</b> 753349.526 2116873.349							
28	Wajega on Road Bridge (NH-204)	61 0.4 48	RCC	Wajega on	<b>Left Bank :</b> 19°08'57.8445"N 77°21'13.0358"E	<b>Left Bank :</b> 747551.456 2119027.053	37 4	10. 82 4	1 6	15.02 3	1.434	Complete	43N
			<b>Right Bank :</b> 19°09'08.9526"N 77°21'07.8134"E		<b>Right Bank :</b> 747394.203 2119366.640								
29	Eidgah - Wajega on Road Bridge	61 1.5 54	RCC		<b>Left Bank :</b> 19°08'46.8300"N 77°20'35.5000"E	<b>Left Bank :</b> 746458.86 2118673.53	25 7	9.6 5	6 4	-	-	Complete	43N
			<b>Right Bank :</b> 19°08'54.9000"N 77°20'33.3500"E		<b>Right Bank :</b> 746392.74 2118920.91								
30	Degloor Naka Road Bridge	61 1.8 78	RCC	<b>Left Bank :</b> 19°08'40.5827"N 77°20'30.9961"E	<b>Left Bank :</b> 746329.788 2118479.618	45 7	10. 37 9	1 9	18.20 4	2.182	Complete	43N	
			<b>Right Bank:</b> 19°08'50.9358"N 77°20'19.8011"E	<b>Right Bank:</b> 745998.292 2118793.652									
31	Wajega on Road Bridge	61 2.4 66	RCC	<b>Left Bank :</b> 19°08'46.9254"N 77°20'5.4976"E	<b>Left Bank :</b> 746458.749 2118676.459	25 2	8.0 77	6 2	3.023	0.041	Complete	43N	
			<b>Right Bank :</b> 19°08'54.9225" N 77°20'33.6010" E	<b>Right Bank :</b> 746400.01 2118921.678									
32	Navghat Bridge	61 3.4 93	RCC	Muj aam peth	<b>Left Bank :</b> 19°08'15.5723"N 77°19'37.6564"E	<b>Left Bank :</b> 744780.922 2117689.552	32 8	10. 39	1 4	20.36 9	5.659	Complete	43N
			<b>Right Bank :</b> 19°08'26.2050"N 77°19'38.8513"E	<b>Right Bank :</b> 744811.493 2118017.037									
33	Mondha Road Bridge	61 4.6 41	RCC	Vik as Nag ar	<b>Left Bank :</b> 19°08'31.4202"N 77°19'00.7893"E	<b>Left Bank :</b> 743696.796 2118162.640	49 6	9.8 84	1 2	24.95 6	6.485	Complete	43N
			<b>Right Bank :</b> 19°08'46.2550"N 77°19'07.4758"E	<b>Right Bank :</b> 743886.186 2118621.493									
34	Goverdhan Ghat	61 5.6 39	RCC	Old Kau tha	<b>Left Bank :</b> 19°08'39.9773"N 77°18'29.3794"E	<b>Left Bank :</b> 742775.208 2118413.661	56 5	8.4 01	1 4	24.49 5	7.322	Complete	43N

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					Left Bank / Right Bank	Left Bank / Right Bank							
	Bridge-1				<b>Right Bank :</b> 19°08'57.8936"N 77°18'31.8674"E	<b>Right Bank :</b> 742840.644 2118965.652							
35	Goverdhan Ghat Bridge	61 5.6 42	RCC		<b>Left Bank :</b> 19°08'39.9797"N 77°18'29.2488"E <b>Right Bank :</b> 19°08'58.1972"N 77°18'31.2298"E	<b>Left Bank :</b> 742771.390 2118413.687 <b>Right Bank :</b> 742821.884 2118974.743	56 5	8.4 01	1 4	24.49 5	7.322	Complete	43N
36	Hsapur Road Bridge	61 7.4 71	RCC	New Hsapur	<b>Left Bank :</b> 19°08'40.0840"N 77°17'29.2804"E <b>Right Bank :</b> 19°08'50.7444"N 77°17'30.5839"E	<b>Left Bank :</b> 741018.509 2118393.806 <b>Right Bank :</b> 741052.305 2118722.171	33 0	8.9 26	7	21.03 2	1.196	Complete	43N
37	Penur Road Bridge	64 7.1 94	RCC	Penur	<b>Left Bank :</b> 19°04'04.9557"N 77°06'05.3546"E <b>Right Bank :</b> 19°04'13.1674"N 77°06'00.9742"E	<b>Left Bank :</b> 721130.528 2109681.562 <b>Right Bank :</b> 720999.419 2109932.555	28 3	7.4 39	6	39.31 2	1.520	Complete	43N
38	Purna-Loha Road Bridge	66 5.7 62	RCC	Pimpalgaon	<b>Left Bank :</b> 19°05'31.7838"N 77°02'52.9149"E <b>Right Bank :</b> 19°05'40.3060"N 77°02'57.3381"E	<b>Left Bank :</b> 715472.501 2112285.048 <b>Right Bank :</b> 715598.744 2112548.630	29 2	8.6 75	7	35.110	1.449	Complete	43N
39	Dhanura Kali Road Bridge	67 9.6 80	RCC	Dhanura Kali	<b>Left Bank :</b> 19°04'27.8894"N 76°57'34.8786"E <b>Right Bank :</b> 19°04'33.4720"N 76°57'31.6699"E	<b>Left Bank :</b> 706196.977 2110213.890 <b>Right Bank :</b> 706101.247 2110384.505	19 5	8.6 01	8	20.01 2	0.179	Complete	43N
40	Gangakhed Railway Bridge	71 5.1 07	RCC	Gangakhed	<b>Left Bank :</b> 18°58'42.6463"N 76°45'18.3331"E <b>Right Bank :</b> 18°58'52.2981"N 76°45'16.9950"E	<b>Left Bank :</b> 684769.937 2099370.491 <b>Right Bank :</b> 684727.839 2099666.863	30 0	4.3 78	1 4	16.02 3	2.512	Complete	43N
41	Dusalgaon Road Bridge	72 3.0 31	RCC	Dusalgaon	<b>Left Bank :</b> 19°01'10.4952"N 76°43'33.9521"E	<b>Left Bank :</b> 681672.138 2103886.163	23 4	6.5 43	1 0	16.02 3	2.055	Complete	43N

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					Left Bank / Right Bank	Left Bank / Right Bank							
					Right Bank : 19°01'18.1072"N 76°43'33.3557"E	Right Bank : 681652.398 2104120.036							
42	Shelgao n-Shirshi Road Bridge	74 8.2 81	RCC	Shirshi	Left Bank : 19°04'38.9107"N 76°36'20.5489"E Right Bank : 19°04'43.1817"N 76°36'27.6662"E	Left Bank : 668939.735 2110173.820 Right Bank : 669146.582 2110307.040	24 6	8.0 97	9	26.21 2	1.384	Complete	43N
43	Sonpeth-Pathari Road Bridge	76 7.0 25	RCC	Vita	Left Bank : 19°04'17.6168"N 76°28'46.5392"E Right Bank : 19°04'27.9451"N 76°28'45.4451"E	Left Bank : 655674.142 2109402.348 Right Bank : 655639.481 2109719.609	32 0	8.0 33	7	31.15 1	4.565	Complete	43N
44	Pohner Road Bridge	78 2.2 92	RCC	Pohner	Left Bank : 19°06'22.7351"N 76°23'52.3600"E Right Bank : 19°06'29.1748"N 76°23'58.3270"E	Left Bank : 647044.336 2113178.294 Right Bank : 647217.132 2113377.664	27 0	7.3 54	1 2	17.511	1.099	Complete	43N
45	Dhalega on Bridge - NH222	81 0.1 65	RCC	Dhalega on	Left Bank : 19°13'32.0848"N 76°21'43.2823"E Right Bank : 19°13'30.8539"N 76°21'52.1486"E	Left Bank : 643169.112 2126348.009 Right Bank : 643428.332 2126312.198	26 5	NI L	6	35.02 5	1.388	Complete	43N
46	Dhalega on Bridge - NH222	81 0.1 72	RCC		Left Bank : 19°13'32.3127"N 76°21'43.3331"E Right Bank : 19°13'31.2980"N 76°21'52.2974"E	Left Bank : 643170.541 2126355.026 Right Bank : 643432.569 2126325.883	26 5	5.9 1	1 3	18.35 1	1.388	Complete	43N
47	Sadola-Ashti Road Bridge	83 4.4 69	RCC	Sabongi	Left Bank : 19°16'46.9867"N 76°12'06.5916"E Right Bank : 19°16'53.3234"N 76°12'11.3585"E	Left Bank : 626287.012 2132215.525 Right Bank : 626424.815 2132411.291	24 0	6.6 04	1 0	24.21 5	2.064	Complete	43N
48	NewShahgadhd Bridge	91 6.2 82	RCC	Shahgadhd	Left Bank : 19°21'12.76"N 75°42'42.83"E	Left Bank : 574769.00 2140101.00	35 8.5 8	25. 23	-	-	-	Under Construction	43N

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					Left Bank / Right Bank	Left Bank / Right Bank							
					Right Bank : 19°21'23.94"N 75°42'46.20"E	Right Bank : 574866.00 2140445.00							
49	Shahga dh Old Bridge (NH211 )	91 6.6 40	RCC	Sha hga dh	Left Bank : 19°21'15.9700"N 75°42'30.6196"E	Left Bank : 574412.305 2140198.262	36 5	6.5 91	1 6	18.112	3.931	Complete	43N
					Right Bank : 19°21'27.3732"N 75°42'34.2282"E	Right Bank : 574516.150 2140549.210							
50	Shahga dh New Bridge (NH211 )	91 6.6 61	RCC	Sha hga dh	Left Bank : 19°21'16.0194"N 75°42'29.9100"E	Left Bank : 574391.597 2140199.696	37 0	7.2 83	9	35.65 8	3.976	Complete	43N
					Right Bank : 19°21'27.5300"N 75°42'33.5449"E	Right Bank : 574496.195 2140553.949							
51	Apegao n Road Bridge	94 6.7 74	RCC	Ape gao n	Left Bank : 19°26'28.0322"N 75°29'13.2134"E	Left Bank : 551120.992 2149709.895	28 5	7.6 54	1 2 4	1.205	0.944	Complete	43N
				Right Bank : 19°26'37.3283"N 75°29'12.7968"E	Right Bank : 551108.037 2149995.605								
52	Paithan Road Bridge	96 3.1 36	RCC	Pait han	Left Bank : 19°27'53.9017"N 75°23'51.6555"E	Left Bank : 541738.627 2152325.223	29 5	6.8 61	1 2	16.89 4	1.021	Complete	43N
					Right Bank : 19°28'03.5011"N 75°23'50.5776"E	Right Bank : 541706.522 2152620.215							
53	Jayakw adi Road Bridge	96 8.0 95	RCC	Pait han	Left Bank : 19°28'58.2086"N 75°22'22.2337"E	Left Bank : 539127.299 2154296.023	22 0	3.7 09	3 6	5.211	0.833	Complete	43N
					Right Bank : 19°29'04.3657"N 75°22'26.0513"E	Right Bank : 539238.175 2154485.519							
54	Old Pravara sangam Bridge	10 13. 79 7	RCC	Pra vara san gam	Left Bank : 19°37'18.7313"N 75°01'29.2530"E	Left Bank : 502599.562 2169638.494	31 2	7.0 02	1 0	18.14 5	1.169	Complete	43N
					Right Bank : 19°37'28.8904"N 75°01'29.4108"E	Right Bank : 502604.113 2169950.760							
55	New Pravara sangam	10 14.	RCC	Pra vara san gam	Left Bank : 19°37'19.2764"N 75°01'18.3905"E	Left Bank : 502283.182 2169655.205	39 0	9.6 21	9	30.05 6	1.78	Complete	43N



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					Left Bank / Right Bank	Left Bank / Right Bank							
	Bridge-1	018			<b>Right Bank :</b> 19°37'31.0912"N 75°01'23.2651"E	<b>Right Bank :</b> 502425.107 2170018.384							
56	New Pravara sangam Bridge-2	1014.120	RCC		<b>Left Bank :</b> 19°37'30.9303"N 75°01'22.4192"E	<b>Left Bank :</b> 502400.471 2170013.433	390	9.621	9	30.056	1.78	Complete	43N
				<b>Right Bank :</b> 19°37'31.2127"N 75°01'22.8906"E	<b>Right Bank :</b> 502414.199 2170022.116								
57	Wanjargon Bridge	1059.500	RCC	Wanjargon	<b>Left Bank :</b> 19°46'09.7181"N 74°43'53.5513"E	<b>Left Bank :</b> 471877.140 2185981.977	130	4.48	10	9.121	0.251	Complete	43N
				<b>Right Bank :</b> 19°46'13.8515"N 74°43'54.0726"E	<b>Right Bank :</b> 471892.511 2186109.008								
58	Naur Road Bridge	1064.338	RCC	Naur	<b>Left Bank :</b> 19°45'32.7602"N 74°42'08.8324"E	<b>Left Bank :</b> 468827.890 2184851.043	206	7.341	5	29.512	1.984	Complete	43N
				<b>Right Bank :</b> 19°45'39.0401"N 74°42'06.3066"E	<b>Right Bank :</b> 468754.727 2185044.205								
59	Dongaron Railway Bridge	1077.010	RCC	Dongaron	<b>Left Bank :</b> 19°46'36.4555"N 74°37'00.9622"E	<b>Left Bank :</b> 459872.877 2186826.940	375	5.217	20	15.547	6.945	Complete	43N
				<b>Right Bank :</b> 19°46'42.9049"N 74°36'50.0207"E	<b>Right Bank :</b> 459554.952 2187025.908	43N							
60	Vari Road Bridge	1086.718	RCC	Vari	<b>Left Bank :</b> 19°48'55.0549"N 74°33'47.2261"E	<b>Left Bank :</b> 454246.485 2191100.584	230	4.116	42	5.102	0.951	Complete	43N
				<b>Right Bank :</b> 19°48'55.0742"N 74°33'55.1122"E	<b>Right Bank :</b> 454475.905 2191100.979								
61	Udapur-Muthalane Road Bridge	1095.747	RCC	Sanvatar	<b>Left Bank :</b> 19°52'28.0261"N 74°30'54.5128"E	<b>Left Bank :</b> 449240.806 2197661.244	320	10.611	10	25.814	4.095	Complete	43N
				<b>Right Bank :</b> 19°52'35.4700"N 74°31'02.1156"E	<b>Right Bank :</b> 449462.558 2197889.430								
62	Sangamer-Koparg	1099.	RCC	Kopargon	<b>Left Bank :</b> 19°53'03.9465"N 74°29'11.1290"E	<b>Left Bank :</b> 446237.685 2198774.322	330	9.577	10	25.025	6.616	Complete	43N

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					Left Bank / Right Bank	Left Bank / Right Bank							
	aon Road Bridge-1	287			<b>Right Bank :</b> 19°53'13.1385"N 74°29'05.1982"E	<b>Right Bank :</b> 446066.087 2199057.406							
63	Sangamner-Kopargon Road Bridge-2	1099.304	RCC		<b>Left Bank :</b> 19°53'03.8000"N 74°29'10.2859"E	<b>Left Bank :</b> 446213.154 2198769.895	310	6.775	10	25.025	6.345	Complete	43N
					<b>Right Bank :</b> 19°53'12.4691"N 74°29'04.7169"E	<b>Right Bank :</b> 446052.029 2199036.871							
64	Kopargon Road Bridge	1100.293	RCC		<b>Left Bank :</b> 19°52'35.3141"N 74°28'53.8282"E	<b>Left Bank :</b> 445731.885 2197895.719	222	7.161	22	8.517	2.112	Complete	43N
					<b>Right Bank :</b> 19°52'42.2474"N 74°28'51.6127"E	<b>Right Bank :</b> 445668.115 2198109.045							
65	Kumbhari Road Bridge	1111.293	RCC	Kumbhari	<b>Left Bank :</b> 19°54'15.3436"N 74°24'51.4278"E	<b>Left Bank :</b> 438693.418 2200993.693	265	7.577	24	9.514	2.133	Complete	43N
					<b>Right Bank :</b> 19°54'15.9388"N 74°25'00.4535"E	<b>Right Bank :</b> 438955.910 2201011.079							
66	Chas Road Bridge	1128.553	RCC	Chas	<b>Left Bank :</b> 19°57'02.1614"N 74°17'43.0847"E	<b>Left Bank :</b> 426260.427 2206169.495	378	9.391	16	19.511	4.921	Complete	43N
					<b>Right Bank :</b> 19°57'12.9061"N 74°17'49.4814"E	<b>Right Bank :</b> 426447.749 2206499.014							
67	Chas Sanko Bridge	1128.561	RCC	Chas	<b>Left Bank :</b> 19°57'02.9867"N 74°17'42.8693"E	<b>Left Bank :</b> 426254.273 2206194.894	285	5.931	8	4.611	2.585	Complete	43N
					<b>Right Bank :</b> 19°57'11.3326"N 74°17'47.6793"E	<b>Right Bank :</b> 426395.164 2206450.863							
68	Khedale Zunge Road Bridge	1137.634	RCC	Khedale Zunge	<b>Left Bank :</b> 19°58'18.3991"N 74°12'55.0868"E	<b>Left Bank :</b> 417899.874 2208550.246	271	7.001	14	16.501	1.931	Complete	43N
					<b>Right Bank :</b> 19°58'25.7510"N 74°13'00.2454"E	<b>Right Bank :</b> 418050.861 2208775.550							
69	Dharaogaon	1146.	RCC	NandurMa	<b>Left Bank :</b> 20°00'09.5014"N 74°08'54.9847"E	<b>Left Bank :</b> 410938.783 2211999.727	185	7.907	11	14.538	0.344	Complete	43N

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					Left Bank / Right Bank	Left Bank / Right Bank							
	Road Bridge	714		dhy mes hwar	<b>Right Bank :</b> 20°00'09.5614"N 74°09'01.3182"E	<b>Right Bank :</b> 411122.839 2212000.637							
70	Khanga on Thadi Bridge	1149.195	RCC	Khanga on Thadi	<b>Left Bank :</b> 20°00'33.7079"N 74°08'00.1421"E <b>Right Bank :</b> 20°00'36.4602"N 74°07'59.8740"E	<b>Left Bank :</b> 409348.960 2212752.050 <b>Right Bank :</b> 409341.610 2212836.700	85	NIL	NIL	NIL	-	Damaged	43N
71	Karanj aon Road Bridge	1157.081	RCC	Kar anj aon	<b>Left Bank :</b> 20°01'15.9089"N 74°04'19.3732"E <b>Right Bank :</b> 20°01'20.1809"N 74°04'19.3572"E	<b>Left Bank :</b> 402941.043 2214083.773 <b>Right Bank :</b> 402941.307 2214215.106	126	7.864	5	18.511	-1.031	Complete	43N
72	Saikhed a Road Bridge	1170.957	RCC	Saik hed a	<b>Left Bank :</b> 20°00'41.1901"N 74°00'19.4795"E <b>Right Bank :</b> 20°00'41.1395"N 74°00'14.2772"E	<b>Left Bank :</b> 395964.279 2213056.473 <b>Right Bank :</b> 395813.099 2213055.814	120	6.407	8	15.821	1.024	Complete	43N
73	Darnasa ngvi Old Bridge	1180.638	RCC	Dar nasa ngvi	<b>Left Bank :</b> 19°58'36.7331"N 73°56'59.2637"E <b>Right Bank :</b> 19°58'37.9757"N 73°57'01.8593"E	<b>Left Bank :</b> 390122.332 2209265.840 <b>Right Bank :</b> 390198.010 2209303.568	85	5.173	9	4.967	-2.269	Complete	43N
74	Lakhalg aon Road Bridge	1186.016	RCC	Lak halg aon	<b>Left Bank :</b> 19°59'45.2229"N 73°55'30.0496"E <b>Right Bank :</b> 19°59'52.5366"N 73°55'28.7974"E	<b>Left Bank :</b> 387542.818 2211387.853 <b>Right Bank :</b> 387507.869 2211612.932	230	11.132	7	25.577	1.825	Complete	43N
75	Odha Road Bridge	1188.294	RCC	Odh a	<b>Left Bank :</b> 19°59'38.4698"N 73°54'28.9253"E <b>Right Bank :</b> 19°59'41.6748"N 73°54'28.0536"E	<b>Left Bank :</b> 385765.083 2211191.731 <b>Right Bank :</b> 385740.392 2211290.426	100	8.176	11	5.002	-1.546	Complete	43N
76	Odha Railway Bridge	1188.	RCC		<b>Left Bank :</b> 19°59'34.9458"N 73°54'18.9633"E	<b>Left Bank :</b> 385474.858 2211085.280	173	5.632	7	17.024	7.753	Complete	43N

Sl. No	Structure Names	Chainage (km)	Type of Structure (RCC/Iron/Wooden)	Location	Position (Lat/Lon)	Position (UTM)	Length (m)	Width (m)	No. of Piers	H. Clearance (dist. between piers)	V. Clearance w.r.t. HFL	Remarks (complete/Under construction)	UTM Zone
					Left Bank / Right Bank	Left Bank / Right Bank							
		608			<b>Right Bank :</b> 19°59'40.5742"N 73°54'18.8142"E	<b>Right Bank :</b> 385471.657 2211258.345							
77	Panchak Railway Bridge	1192.181	RCC	Panchak	<b>Left Bank :</b> 19°59'11.6613"N 73°52'32.3325"E <b>Right Bank :</b> 19°59'15.8677"N 73°52'32.4197"E	<b>Left Bank :</b> 382371.100 2210389.956 <b>Right Bank :</b> 382374.503 2210519.258	130	8.961	4	23.091	6.562	Complete	43N
78	Nandur Naka Road Bridge	1195.923	RCC	Nandur	<b>Left Bank :</b> 19°59'20.3501"N 73°50'44.2321"E <b>Right Bank :</b> 19°59'25.1105"N 73°50'44.8729"E	<b>Left Bank :</b> 379231.119 2210678.440 <b>Right Bank :</b> 379250.753 2210824.664	147	20.421	5	20.121	3.775	Complete	43N
79	Old Saikhed Road Bridge	1198.000	RCC	Samtanager	<b>Left Bank :</b> 19°59'13.3225"N 73°49'46.0409"E <b>Right Bank :</b> 19°59'17.4801"N 73°49'46.9551"E	<b>Left Bank :</b> 377538.362 2210474.116 <b>Right Bank :</b> 377565.825 2210601.749	130	11.584	3	28.511	5.961	Complete	43N
80	Samtanager Road Bridge	1198.765	RCC		<b>Left Bank :</b> 19°59'18.5881"N 73°49'20.1672"E <b>Right Bank :</b> 19°59'23.9750"N 73°49'22.4690"E	<b>Left Bank :</b> 376787.506 2210641.267 <b>Right Bank :</b> 376855.566 2210806.413	180	8.01	14	7.911	2.861	Complete	43N
81	Takli Road Bridge	1200.820	RCC	Nashik	<b>Left Bank :</b> 19°59'57.9699"N 73°48'36.4225"E <b>Right Bank :</b> 20°00'04.4617"N 73°48'41.1952"E	<b>Left Bank :</b> 375524.712 2211861.002 <b>Right Bank :</b> 375664.832 2212059.603	242	7.647	5	38.512	6.278	Complete	43N
82	Mumbai-Agra Highway Bridge-1	1201.622	RCC		<b>Left Bank :</b> 20°00'03.6589"N 73°48'12.1897"E <b>Right Bank :</b> 20°00'08.4585"N 73°48'11.5386"E	<b>Left Bank :</b> 374821.707 2212040.922 <b>Right Bank :</b> 374803.841 2212188.617	150	9.907	5	38.421	7.226	Complete	43N
83	Mumbai-Agra Highway	1201.	RCC		<b>Left Bank :</b> 20°00'03.6835"N 73°48'11.3261"E	<b>Left Bank :</b> 374796.617 2212041.859	150	6.591	5	38.421	7.226	Complete	43N

Sl. No	Structure Names	Chainage (km)	Type of Structure (RCC/ Iron/ Wooden)	Location	Position (Lat/Lon)	Position (UTM)	Length (m)	Width (m)	No. of Piers	H. Clearance (dist. between piers)	V. Clearance w.r.t. HFL	Remarks (complete/Under construction)	UTM Zone
					Left Bank / Right Bank	Left Bank / Right Bank							
	y Bridge-2	648			<b>Right Bank :</b> 20°00'08.4528"N 73°48'11.0638"E	<b>Right Bank :</b> 374790.041 2212188.541							

Table 67 - Bridges crossing over waterway Zone 44 & 43N

### 2.17 Details of other Cross structures, pipelines, underwater cables

There is numerous small pipeline connection for drinking water well and shore pump houses in the Godavari River, however, no major pipelines or underwater cables were found cross-through the Godavari River.

### 2.18 High Tension Lines / Electric lines / Tele-communication lines

Sl. No.	Type of Line	Chainage (km)	Location	Position (Lat/Lon)	Position (UTM)	No. of Piers	H. Clearance (dist. between piers)	V. Clearance w.r.t. HFL (m)	Remarks (complete/Under construction)	UTM Zone
				Left Bank / Right Bank	Left Bank / Right Bank					
1	HTL	4.276	Chennabada	<b>Left Bank :</b> 17°42'43.7299"N 80°53'42.6803"E	<b>Left Bank :</b> 488886.562 1958342.188	-	-	20.563	Complete	44N
				<b>Right Bank:</b> 17°42'43.4485"N 80°54'06.9251"E	<b>Right Bank :</b> 489600.655 1958333.155					
2	HTL	4.596	Chennabada	<b>Left Bank :</b> 17°42'43.5625"N 80°53'13.5532"E	<b>Left Bank :</b> 488028.658 1958337.541	-	-	14.592	Complete	44N
				<b>Right Bank:</b> 17°42'43.7299"N 80°53'42.6803"E	<b>Right Bank :</b> 488886.562 1958342.188					
3	HTL	290.721	Chennabada	<b>Left Bank :</b> 18°46'50.1095"N 79°30'49.6709"E	<b>Left Bank :</b> 343359.444 2077204.216	-	-	18.129	Complete	44N
				<b>Right Bank:</b> 18°47'19.1009"N 79°30'55.4931"E	<b>Right Bank:</b> 343537.369 2078094.075					
4	HTL	292.045	Chennabada	<b>Left Bank :</b> 18°47'12.4260"N 79°30'01.1337"E	<b>Left Bank :</b> 341814.214 2077742.12	-	-	23.252	Complete	44N
				<b>Right Bank:</b> 18°47'12.4260"N 79°30'01.1337"E	<b>Right Bank:</b> 342071.229 2078070.237					
5	HTL	292.245	Chennabada	<b>Left Bank :</b> 18°47'12.4260"N 79°30'01.1337"E	<b>Left Bank :</b> 342071.229 2078070.237	-	-	24.211	Complete	44N

Sl. No.	Type of Line	Chainage (km)	Location	Position (Lat/Lon)	Position (UTM)	No. of Piers	H. Clearance (dist. between piers)	V. Clearance w.r.t. HFL (m)	Remarks (complete/ Underconstruction)	UT M Zone
				Left Bank / Right Bank	Left Bank / Right Bank					
6	HTL	292.245		<b>Right Bank:</b> 18°47'28.0227"N 79°30'14.6936"E	<b>Right Bank:</b> 342345.036 2078378.369	-	-	25.119	Complete	44N
				<b>Left Bank :</b> 18°47'28.0227"N 79°30'14.6936"E	<b>Left Bank :</b> 342345.036 2078378.369					
				<b>Right Bank :</b> 18°47'38.5509"N 79°30'22.8996"E	<b>Right Bank :</b> 342588.03 2078700.02					
7	HTL	298.584	Setarampalle Rural	<b>Left Bank :</b> 18°49'19.3500"N 79°27'32.3100"E	<b>Left Bank :</b> 337620.16 2081841.55	-	-	18.301	Complete	44N
				<b>Right Bank :</b> 18°49'32.7509"N 79°27'45.7933"E	<b>Right Bank :</b> 338018.333 2082250.156					
8	HTL	298.773		<b>Left Bank :</b> 18°49'32.7509"N 79°27'45.7933"E	<b>Left Bank :</b> 338018.333 2082250.156	-	-	18.292	Complete	44N
				<b>Right Bank :</b> 18°49'48.8129"N 79°28'1.1836"E	<b>Right Bank :</b> 338473.144 2082740.066					
9	HTL	310.924		<b>Left Bank :</b> 18°51'00.3613"N 79°22'42.4713"E	<b>Left Bank :</b> 329465.333 2084845.888	-	-	13.012	Complete	44N
				<b>Right Bank :</b> 18°51'11.6596"N 79°22'37.7730"E	<b>Right Bank :</b> 329028.782 2085371.349					
10	HTL	309.552	Yellampally	<b>Left Bank :</b> 18°51'11.6596"N 79°22'37.7730"E	<b>Left Bank :</b> 329028.782 2085371.349	-	-	13.025	Complete	44N
				<b>Right Bank :</b> 18°51'15.9554"N 79°22'28.0443"E	<b>Right Bank :</b> 328628.166 2085835.015					
11	HTL	309.214		<b>Left Bank :</b> 18°51'26.6199"N 79°22'23.9423"E	<b>Left Bank :</b> 328943.015 2085284.302	-	-	13.167	Complete	44N
				<b>Right Bank :</b> 18°51'20.2339"N 79°22'29.6417"E	<b>Right Bank :</b> 328523.325 2085764.112					
12	HTL	309.812		<b>Left Bank :</b> 18°50'53.6288"N 79°22'48.9580"E	<b>Left Bank :</b> 329351.114 2084814.001	-	-	13.729	Complete	44N
				<b>Right Bank :</b> 18°51'26.6199"N 79°22'23.9423"E	<b>Right Bank :</b> 328943.015 2085284.302					
13	HTL	428.48	Kamalkote	<b>Left Bank :</b> 18°57'12.8049"N 78°33'19.1320"E	<b>Left Bank :</b> 242563.755 2097473.256	-	-	24.098	Complete	44N
				<b>Right Bank :</b> 18°57'24.3069"N 78°32'54.2412"E	<b>Right Bank :</b> 241840.236 2097837.145					

Sl. No.	Type of Line	Chainage (km)	Location	Position (Lat/Lon)	Position (UTM)	No. of Piers	H. Clearance (dist. between piers)	V. Clearance w.r.t. HFL (m)	Remarks (complete/ Underconstruction)	UTM Zone
				Left Bank / Right Bank	Left Bank / Right Bank					
14	HTL	452.454	Soan	<b>Left Bank :</b> 18°59'38.1576"N 78°22'40.5634"E	<b>Left Bank :</b> 223941.398 2102213.024	-	-	-	Under Construction	44N
				<b>Right Bank :</b> 19°00'13.7308"N 78°22'35.3681"E	<b>Right Bank :</b> 223805.699 2103309.559					
15	EP	537.919	Babli	<b>Left Bank :</b> 18°51'15.9714"N 77°47'55.1548"E	<b>Left Bank :</b> 794906.640 2087050.191	-	-	6.569	Complete	43N
				<b>Right Bank :</b> 18°51'23.9504"N 77°48'03.7755"E	<b>Right Bank :</b> 795155.253 2087299.651					
16	HTL	545.156	Digras	<b>Left Bank :</b> 18°51'48.2493"N 77°44'01.1655"E	<b>Left Bank :</b> 788038.099 2087936.148	-	-	15.112	Complete	43N
				<b>Right Bank :</b> 18°51'59.9759"N 77°44'04.0924"E	<b>Right Bank :</b> 788118.246 2088298.214					
17	EP	553.166	Raher	<b>Left Bank :</b> 18°53'43.3638"N 77°40'34.9733"E	<b>Left Bank :</b> 781946.025 2091385.033	-	-	12.234	Complete	43N
				<b>Right Bank :</b> 18°53'54.4835"N 77°40'35.0844"E	<b>Right Bank :</b> 781944.099 2091727.145					
18	HTL	585.35	Mahit Gaon	<b>Left Bank :</b> 19°02'08.6967"N 77°27'46.2767"E	<b>Left Bank :</b> 759223.055 2106600.946	-	-	12.036	Complete	43N
				<b>Right Bank :</b> 19°02'18.0413"N 77°27'55.4742"E	<b>Right Bank :</b> 759488.056 2106892.145					
19	HTL	590.265	Kamlaj	<b>Left Bank :</b> 19°03'23.3442"N 77°25'22.4595"E	<b>Left Bank :</b> 754984.567 2108838.376	-	-	14.369	Complete	43N
				<b>Right Bank :</b> 19°03'40.4489"N 77°25'31.8918"E	<b>Right Bank :</b> 755253.156 2109368.285					
20	HTL	590.355	Kamlaj	<b>Left Bank :</b> 19°03'23.2455"N 77°25'19.1634"E	<b>Left Bank :</b> 754888.209 2108834.009	-	-	14.699	Complete	43N
				<b>Right Bank :</b> 19°03'41.3611"N 77°25'29.6509"E	<b>Right Bank :</b> 755187.231 2109395.437					
21	EP	610.473	Wajegaon	<b>Left Bank :</b> 19°08'57.5151"N 77°21'12.2733"E	<b>Left Bank :</b> 747529.305 2119016.62	-	-	7.023	Complete	43N



Sl. No.	Type of Line	Chainage (km)	Location	Position (Lat/Lon)	Position (UTM)	No. of Piers	H. Clearance (dist. between piers)	V. Clearance w.r.t. HFL (m)	Remarks (complete/ Underconstruction)	UTM Zone
				Left Bank / Right Bank	Left Bank / Right Bank					
				<b>Right Bank :</b> 19°09'08.2009"N 77°21'06.5621"E	<b>Right Bank :</b> 747357.940 2119343.028					
22	HTL	619.356	Kotitirth	<b>Left Bank :</b> 19°08'21.5454"N 77°16'51.0056"E	<b>Left Bank :</b> 739907.214 2117809.002	-	-	11.487	Complete	43N
				<b>Right Bank :</b> 19°08'23.2468"N 77°16'34.4774"E	<b>Right Bank :</b> 739423.415 2117855.026					
23	HTL	722.373		<b>Left Bank :</b> 19°01'08.0969"N 76°43'57.9653"E	<b>Left Bank :</b> 682375.088 2103819.332	-	-	11.098	Complete	43N
				<b>Right Bank :</b> 19°01'24.4663"N 76°43'59.2514"E	<b>Right Bank :</b> 682407.733 2104323.008					
24	EP	723.069	Dusalgao n	<b>Left Bank :</b> 19°01'09.7002"N 76°43'32.6802"E	<b>Left Bank :</b> 681635.183 2103861.353	-	-	7.035	Complete	43N
				<b>Right Bank :</b> 19°01'17.6762"N 76°43'31.9432"E	<b>Right Bank :</b> 681611.223 2104106.377					
25	HTL	723.547		<b>Left Bank :</b> 19°01'07.6907"N 76°43'17.2778"E	<b>Left Bank :</b> 681185.374 2103795.152	-	-	15.077	Complete	43N
				<b>Right Bank :</b> 19°01'19.1210"N 76°43'25.9034"E	<b>Right Bank :</b> 681434.167 2104149.066					
26	HTL	733.086	Gaowdg aon	<b>Left Bank :</b> 18°59'49.9568"N 76°39'26.4954"E	<b>Left Bank :</b> 674459.154 2101340.301	-	-	15.145	Complete	43N
				<b>Right Bank :</b> 19°00'00.1175"N 76°39'39.2425"E	<b>Right Bank :</b> 674829.012 2101656.214					
27	HTL	930.316	Hiradpur i	<b>Left Bank :</b> 19°22'56.9170"N 75°36'10.7992"E	<b>Left Bank :</b> 563320.166 2143259.145	-	-	14.369	Complete	43N
				<b>Right Bank :</b> 19°23'11.3477"N 75°36'13.8786"E	<b>Right Bank :</b> 563408.441 2143703.032					
28	EP	963.129	Paithan	<b>Left Bank :</b> 19°27'53.2373"N 75°23'51.9885"E	<b>Left Bank :</b> 541748.383 2152304.826	-	-	8.225	Complete	43N
				<b>Right Bank :</b> 19°28'04.7086"N 75°23'50.5378"E	<b>Right Bank :</b> 541705.275 2152657.326					

Sl. No.	Type of Line	Chainage (km)	Location	Position (Lat/Lon)	Position (UTM)	No. of Piers	H. Clearance (dist. between piers)	V. Clearance w.r.t. HFL (m)	Remarks (complete/ Underconstruction)	UTM Zone
				Left Bank / Right Bank	Left Bank / Right Bank					
29	EP	963.15		<b>Left Bank :</b> 19°27'52.9979"N 75°23'51.3160"E	<b>Left Bank :</b> 541728.794 2152297.421	-	-	8.365	Complete	43N
				<b>Right Bank :</b> 19°28'04.6526"N 75°23'50.1368"E	<b>Right Bank :</b> 541693.588 2152655.580					
30	EP	968.193	Paithan	<b>Left Bank :</b> 19°28'57.8601"N 75°22'18.6811"E	<b>Left Bank :</b> 539023.76 2154285.085	-	-	6.258	Complete	43N
				<b>Right Bank :</b> 19°29'08.0998"N 75°22'24.7180"E	<b>Right Bank :</b> 539199.057 2154600.212					
31	HTL	968.252	Paithan	<b>Left Bank :</b> 19°28'58.2023"N 75°22'16.5562"E	<b>Left Bank :</b> 538961.793 2154295.471	-	-	10.555	Complete	43N
				<b>Right Bank :</b> 19°29'10.5624"N 75°22'21.7001"E	<b>Right Bank :</b> 539110.918 2154675.716					
32	HTL	1040.137	Deogaon Shani	<b>Left Bank :</b> 19°39'47.2297"N 74°49'56.4002"E	<b>Left Bank :</b> 482424.166 2174211.452	-	-	16.354	Complete	43N
				<b>Right Bank :</b> 19°39'58.6219"N 74°50'07.0298"E	<b>Right Bank :</b> 482734.022 2174561.321					
33	HTL	1049.557	Nagamthan	<b>Left Bank :</b> 19°43'06.8812"N 74°47'00.4300"E	<b>Left Bank :</b> 477308.002 2180354.119	-	-	11.369	Complete	43N
				<b>Right Bank :</b> 19°43'11.9399"N 74°47'14.0703"E	<b>Right Bank :</b> 477705.245 2180509.114					
34	HTL	1050.398	Nagamthan	<b>Left Bank :</b> 19°43'34.4010"N 74°46'58.0914"E	<b>Left Bank :</b> 477241.011 2181200.114	-	-	11.017	Complete	43N
				<b>Right Bank :</b> 19°43'32.0847"N 74°47'19.8070"E	<b>Right Bank :</b> 477873.001 2181128.117					
35	HTL	1053.588	Dagpimpalgaon	<b>Left Bank :</b> 19°44'22.8881"N 74°45'52.6113"E	<b>Left Bank :</b> 475337.144 2182693.058	-	-	12.145	Complete	43N
				<b>Right Bank :</b> 19°44'25.8328"N 74°46'06.4183"E	<b>Right Bank :</b> 475739.115 2182783.022					
36	HTL	1090.189	Sade	<b>Left Bank :</b> 19°50'01.5854"N 74°32'41.4001"E	<b>Left Bank :</b> 452337.021 2193151.114	-	-	20.658	Complete	43N

Sl. No.	Type of Line	Chainage (km)	Location	Position (Lat/Lon)	Position (UTM)	No. of Piers	H. Clearance (dist. between piers)	V. Clearance w.r.t. HFL (m)	Remarks (complete/ Underconstruction)	UTM Zone
				Left Bank / Right Bank	Left Bank / Right Bank					
37	HTL	1090.252		<b>Right Bank :</b> 19°50'18.8357"N 74°32'44.6056"E	<b>Right Bank :</b> 452431.691 2193681.122	-	-	20.611	Complete	43N
				<b>Left Bank :</b> 19°50'02.7242"N 74°32'39.6887"E	<b>Left Bank :</b> 452287.336 2193186.256					
38	HTL	1090.606		<b>Right Bank :</b> 19°50'20.6019"N 74°32'42.9477"E	<b>Right Bank :</b> 452383.614 2193735.544	-	-	18.365	Complete	43N
				<b>Left Bank :</b> 19°50'12.3591"N 74°32'30.5056"E	<b>Left Bank :</b> 452021.021 2193483.145					
39	HTL	1092.35		<b>Right Bank :</b> 19°50'25.7378"N 74°32'33.6764"E	<b>Right Bank :</b> 452114.364 2193894.145	-	-	17.224	Complete	43N
				<b>Left Bank :</b> 19°50'46.6950"N 74°31'42.1356"E	<b>Left Bank :</b> 450617.002 2194542.477					
40	HTL	1098.355	Kopargon	<b>Right Bank :</b> 19°50'20.6019"N 74°32'42.9477"E	<b>Right Bank :</b> 452383.614 2193735.544	-	-	12.658	Complete	43N
				<b>Left Bank :</b> 19°53'05.0727"N 74°29'39.1642"E	<b>Left Bank :</b> 447053.026 2198806.474					
41	HTL	1107.427	Hingani	<b>Right Bank :</b> 19°53'16.0212"N 74°29'36.6334"E	<b>Right Bank :</b> 446980.444 2199143.247	-	-	13.311	Complete	43N
				<b>Left Bank :</b> 19°52'54.7854"N 74°25'50.6860"E	<b>Left Bank :</b> 440408.019 2198511.447					
42	EP	1157.101	Karanjgaon	<b>Right Bank :</b> 19°52'46.6056"N 74°26'00.9047"E	<b>Right Bank :</b> 440704.332 2198259.002	-	-	7.022	Complete	43N
				<b>Left Bank :</b> 20°01'15.0063"N 74°04'18.8464"E	<b>Left Bank :</b> 402925.583 2214056.109					
43	EP	1192.121	Panchak	<b>Right Bank :</b> 20°01'20.3218"N 74°04'19.0742"E	<b>Right Bank :</b> 402933.108 2214219.483	-	-	6.088	Complete	43N
				<b>Left Bank :</b> 19°59'12.2318"N 73°52'34.3600"E	<b>Left Bank :</b> 382430.144 2210407.099					
				<b>Right Bank :</b> 19°59'17.2480"N 73°52'34.7325"E	<b>Right Bank :</b> 382442.005 2210561.241					

Sl. No.	Type of Line	Chainage (km)	Location	Position (Lat/Lon)	Position (UTM)	No. of Piers	H. Clearance (dist. between piers)	V. Clearance w.r.t. HFL (m)	Remarks (complete/ Underconstruction)	UTM Zone
				Left Bank / Right Bank	Left Bank / Right Bank					
44	HTL	1192.742		Left Bank : 19°59'11.3756"N 73°52'12.5852"E	Left Bank : 381797.110 2210385.032	-	-	14.258	Complete	43N
				Right Bank : 19°59'21.8977"N 73°52'07.7976"E	Right Bank : 381660.147 2210709.457					

Table 68 - High Transmission Lines – Zone 44 & 43N

## 2.19 Current Meter and Discharge details

The Valeport801 Velocity meter was used to log the flow rates of the river. The observations were undertaken on the cross section near the BM/ Tide Gauge established during Hydrographic survey as per RFP. The locations of current meter deployment are as follows:

Sample No.	Chainage (km)	Position		Observed Depth (m)	Velocity (m/s)	Average Velocity (m/s)	X-Sectional area (sq. m.)	Discharge (Cu.m)
		Lat/Long	Easting/Northing (m)					
GDV-CM 31	310.813	18°50'38.058"N 79°22'09.000"E	328177.065 2084346.001	1	0.106	0.106	2586.736	273.293
GDV-CM 32	322.220	18°49'34.735"N 79°16'36.908"E	318436.752 2082490.998	1	0.063	0.063	2752.330	172.749
GDV-CM 33	331.845	18°51'57.530"N 79°12'01.168"E	310408.39 2086961.638	1	0.117	0.117	3808.260	443.789
GDV-CM 34	343.261	18°55'46.924"N 79°07'22.261"E	302319.262 2094099.844	1	0.091	0.091	718.085	65.312
GDV-CM 46	459.062	18°57'42.862"N 78°19'44.773"E	218743.63 2098743.692	1	0.063	0.063	2701.540	171.045
GDV-CM 47	474.951	19°00'69.290"N 78°14'31.675"E	209679.174 2105235.367	1	0.028	0.028	1514.803	42.333
GDV-CM 48	488.810	18°57'39.698"N 78°08'14.163"E	198528.009 2098963.785	1	0.017	0.017	1690.063	27.928
GDV-CM 49	498.967	18°56'26.433"N 78°03'02.607"E	189370.183 2096860.02	1	0.053	0.053	970.259	51.715
GDV-CM 50	510.769	18°52'55.259"N 77°59'52.876"E	815877.858 2090449.103	1	0.022	0.022	658.377	14.704

Sample No.	Chainage (km)	Position		Observed Depth (m)	Velocity (m/s)	Average Velocity (m/s)	X-Sectional area (sq. m.)	Discharge (Cu.m)
		Lat/Long	Easting/Northing (m)					
GDV-CM 51	520.761	18°49'28.698"N 77°56'20.012"E	809748.953 2083989.167	1	0.010	0.010	632.846	6.012
GDV-CM 56	574.536	18°59'39.282"N 77°32'32.841"E	767672.109 2102124.514	1	0.013	0.013	1124.839	14.433
GDV-CM 57	584.741	19°01'57.538"N 77°28'03.325"E	759726.562 2106264.726	1	0.025	0.025	584.090	14.573
GDV-CM 58	593.763	19°04'56.807"N 77°24'14.538"E	752958.655 2111685.689	1	0.012	0.012	1392.422	16.254
GDV-CM 59	603.561	19°09'09.631"N 77°24'25.928"E	753184.659 2119466.46	1	0.012	0.012	1302.504	15.522
GDV-CM 60	613.737	19°08'23.247"N 77°19'30.433"E	744566.633 2117922.782	1	0.001	0.001	462.999	0.534
GDV-CM 61	623.390	19°07'18.799"N 77°15'59.286"E	738420.49 2115859.559	1	0.007	0.007	2325.406	15.239
GDV-CM 62	634.416	19°07'12.085"N 77°10'27.716"E	728730.576 2115529.974	1	0.002	0.002	1543.691	3.649
GDV-CM 63	643.784	19°04'30.333"N 77°07'47.324"E	724102.625 2110497.964	1	0.021	0.021	999.282	21.358
GDV-CM 64	652.456	19°05'42.907"N 77°06'07.562"E	721158.926 2112694.55	1	0.004	0.004	1115.626	4.222
GDV-CM 65	661.365	19°06'44.140"N 77°03'50.050"E	717116.596 2114529.731	1	0.003	0.003	94.136	0.326
GDV-CM 66	671.409	19°05'40.333"N 77°00'32.855"E	711374.911 2112500.504	1	0.027	0.027	1368.496	37.238
GDV-CM 67	679.550	19°04'32.014"N 76°57'37.480"E	706271.614 2110341.572	1	0.025	0.025	808.128	19.863
GDV-CM 68	689.597	19°03'40.802"N 76°53'09.810"E	698462.982 2108680.978	1	0.455	0.455	584.539	266.229
GDV-CM 69	699.366	19°02'28.372"N 76°49'36.873"E	692260.422 2106387.994	1	0.098	0.098	244.277	23.925
GDV-CM 97	969.687	19°29'25.493"N 75°21'36.056"E	537779.406 2155131.808	1	0.046	0.046	3948.533	182.715
GDV-CM 98	980.682	19°31'10.956"N 75°15'44.269"E	527519.963 2158354.89	1	0.044	0.044	4085.732	179.695

Sample No.	Chainage (km)	Position		Observed Depth (m)	Velocity (m/s)	Average Velocity (m/s)	X-Sectional area (sq. m.)	Discharge (Cu.m)
		Lat/Long	Easting/Northing (m)					
GDV-CM 99	989.344	19°34'11.304"N 75°12'16.890"E	521469.42 2163890.104	1	1.150	1.150	2472.913	2843.232
GDV-CM 100	998.200	19°35'41.279"N 75°08'39.119"E	515122.278 2166649.243	1	0.008	0.008	1727.916	13.153
GDV-CM 101	1009.058	19°36'30.690"N 75°03'13.089"E	505624.329 2168162.516	1	0.009	0.009	1640.075	15.295
GDV-CM 102	1018.574	19°38'09.074"N 74°59'08.028"E	498486.407 2171185.784	1	0.031	0.031	825.531	25.623
GDV-CM 103	1027.819	19°38'53.861"N 74°54'58.489"E	491219.697 2172564.525	1	0.036	0.036	637.077	23.168
GDV-CM 104	1037.600	19°38'50.451"N 74°50'44.337"E	483818.429 2172464.88	1	0.035	0.035	297.673	10.459
GDV-CM 113	1132.842	19°57'44.434"N 74°15'31.357"E	422437.126 2207485.474	1	0.006	0.006	574.518	3.537
GDV-CM 114	1142.594	19°59'35.807"N 74°10'30.928"E	413721.693 2210949.966	1	0.008	0.008	157.140	1.295
GDV-CM 115	1154.623	20°02'01.756"N 74°05'27.915"E	404940.252 2215482.273	1	0.006	0.006	377.295	2.358
GDV-CM 116	1164.803	20°02'06.391"N 74°02'03.586"E	399004.542 2215658.036	1	0.006	0.006	179.906	1.084
GDV-CM 117	1176.027	19°59'09.402"N 73°58'49.772"E	393340.352 2210250.344	1	0.035	0.035	347.354	12.277

*Table 69 - Current Meter Deployment Locations*

## 2.20 Soil samples and Water Samples

The soil and water samples were collected near the BM/ Tide Gauge established during hydrographic survey as per RFP.



*Figure 13 - Soil samples and Water Samples*

### 2.20.1 Soil samples

River bed sampling was undertaken using Vanveen Grab at respective locations. The samples were sent for analysis purpose to the lab.

Sample No.	Chainage (km)	Latitude/ Longitude	Easting/ Northing (m)	Depth (m)
GDV-31B	310.813	18°50'38.058"N 79°22'09.000"E	328177.065 2084346.001	12.7
GDV-32B	322.220	18°49'34.735"N 79°16'36.908"E	318436.752 2082490.998	13.3
GDV-33B	331.845	18°51'57.530"N 79°12'01.168"E	310408.39 2086961.638	10.5
GDV-34B	343.261	18°55'46.924"N 79°07'22.261"E	302319.262 2094099.844	6.3
GDV-46B	459.062	18°57'42.862"N 78°19'44.773"E	218743.63 2098743.692	13.1
GDV-47B	474.951	19°00'69.290"N 78°14'31.675"E	209679.174 2105235.367	6.3
GDV-48B	488.810	18°57'39.698"N 78°08'14.163"E	198528.009 2098963.785	5.8
GDV-49B	498.967	18°56'26.433"N 78°03'02.607"E	189370.183 2096860.02	6.3
GDV-50B	510.769	18°52'55.259"N 77°59'52.876"E	815877.858 2090449.103	3.6
GDV-51B	520.761	18°49'28.698"N 77°56'20.012"E	809748.953 2083989.167	5.2
GDV-56B	574.536	18°59'39.282"N 77°32'32.841"E	767672.109 2102124.514	7.6
GDV-57B	584.741	19°01'57.538"N 77°28'03.325"E	759726.562 2106264.726	5.7
GDV-58B	593.763	19°04'56.807"N 77°24'14.538"E	752958.655 2111685.689	9.6
GDV-59B	603.561	19°09'09.631"N 77°24'25.928"E	753184.659 2119466.46	5.9



Sample No.	Chainage (km)	Latitude/ Longitude	Easting/ Northing (m)	Depth (m)
GDV-60B	613.737	19°08'23.247"N 77°19'30.433"E	744566.633 2117922.782	3.9
GDV-61B	623.390	19°07'18.799"N 77°15'59.286"E	738420.49 2115859.559	12.4
GDV-62B	634.416	19°07'12.085"N 77°10'27.716"E	728730.576 2115529.974	8.1
GDV-63B	643.784	19°04'30.333"N 77°07'47.324"E	724102.625 2110497.964	4.5
GDV-64B	652.456	19°05'42.907"N 77°06'07.562"E	721158.926 2112694.55	5.4
GDV-65B	661.365	19°06'44.140"N 77°03'50.050"E	717116.596 2114529.731	2.9
GDV-66B	671.409	19°05'40.333"N 77°00'32.855"E	711374.911 2112500.504	8.2
GDV-67B	679.550	19°04'32.014"N 76°57'37.480"E	706271.614 2110341.572	6.6
GDV-68B	689.597	19°03'40.802"N 76°53'09.810"E	698462.982 2108680.978	6.8
GDV-69B	699.366	19°02'28.372"N 76°49'36.873"E	692260.422 2106387.994	2.9
GDV-97B	969.687	19°29'25.493"N 75°21'36.056"E	537779.406 2155131.808	23.9
GDV-98B	980.682	19°31'10.956"N 75°15'44.269"E	527519.963 2158354.89	20.1
GDV-99B	989.344	19°34'11.304"N 75°12'16.890"E	521469.42 2163890.104	12.8
GDV-100B	998.200	19°35'41.279"N 75°08'39.119"E	515122.278 2166649.243	6.4
GDV-101B	1009.058	19°36'30.690"N 75°03'13.089"E	505624.329 2168162.516	7.5
GDV-102B	1018.574	19°38'09.074"N 74°59'08.028"E	498486.407 2171185.784	8.4
GDV-103B	1027.819	19°38'53.861"N 74°54'58.489"E	491219.697 2172564.525	6.8
GDV-104B	1037.600	19°38'50.451"N 74°50'44.337"E	483818.429 2172464.88	4.6
GDV-113B	1132.842	19°57'44.434"N 74°15'31.357"E	422437.126 2207485.474	5.2
GDV-114B	1142.594	19°59'35.807"N 74°10'30.928"E	413721.693 2210949.966	2.5
GDV-115B	1154.623	20°02'01.756"N 74°05'27.915"E	404940.252 2215482.273	10
GDV-116B	1164.803	20°02'06.391"N 74°02'03.586"E	399004.542 2215658.036	5.9
GDV-117B	1176.027	19°59'09.402"N 73°58'49.772"E	393340.352 2210250.344	5.4

*Table 70 - Soil Sample collection Locations*

## 2.20.2 Water Samples

Water sampling was undertaken using Niskin Water Samplers at respective locations. The samples were sent for analysis purpose to the lab.

Sample No.	Chainage (km)	Latitude/ Longitude	Easting/ Northing (m)	Total Depth (d) (m)	Mid-Depth (0.5d) (m)
GDV-31W	310.813	18°50'38.058"N 79°22'09.000"E	328177.065 2084346.001	12.7	6.35
GDV-32W	322.220	18°49'34.735"N 79°16'36.908"E	318436.752 2082490.998	13.3	6.65
GDV-33W	331.845	18°51'57.530"N 79°12'01.168"E	310408.39 2086961.638	10.5	5.25
GDV-34W	343.261	18°55'46.924"N 79°07'22.261"E	302319.262 2094099.844	6.3	3.15
GDV-46W	459.062	18°57'42.862"N 78°19'44.773"E	218743.63 2098743.692	13.1	6.55
GDV-47W	474.951	19°00'69.290"N 78°14'31.675"E	209679.174 2105235.367	6.3	3.15
GDV-48W	488.810	18°57'39.698"N 78°08'14.163"E	198528.009 2098963.785	5.8	2.9
GDV-49W	498.967	18°56'26.433"N 78°03'02.607"E	189370.183 2096860.02	6.3	3.15
GDV-50W	510.769	18°52'55.259"N 77°59'52.876"E	815877.858 2090449.103	3.6	1.8
GDV-51W	520.761	18°49'28.698"N 77°56'20.012"E	809748.953 2083989.167	5.2	2.6
GDV-56W	574.536	18°59'39.282"N 77°32'32.841"E	767672.109 2102124.514	7.6	3.8
GDV-57W	584.741	19°01'57.538"N 77°28'03.325"E	759726.562 2106264.726	5.7	2.85
GDV-58W	593.763	19°04'56.807"N 77°24'14.538"E	752958.655 2111685.689	9.6	4.8
GDV-59W	603.561	19°09'09.631"N 77°24'25.928"E	753184.659 2119466.46	5.9	2.95
GDV-60W	613.737	19°08'23.247"N 77°19'30.433"E	744566.633 2117922.782	3.9	1.95
GDV-61W	623.390	19°07'18.799"N 77°15'59.286"E	738420.49 2115859.559	12.4	6.2
GDV-62W	634.416	19°07'12.085"N 77°10'27.716"E	728730.576 2115529.974	8.1	4.05
GDV-63W	643.784	19°04'30.333"N 77°07'47.324"E	724102.625 2110497.964	4.5	2.25
GDV-64W	652.456	19°05'42.907"N 77°06'07.562"E	721158.926 2112694.55	5.4	2.7
GDV-65W	661.365	19°06'44.140"N 77°03'50.050"E	717116.596 2114529.731	2.9	1.45
GDV-66W	671.409	19°05'40.333"N 77°00'32.855"E	711374.911 2112500.504	8.2	4.1
GDV-67W	679.550	19°04'32.014"N 76°57'37.480"E	706271.614 2110341.572	6.6	3.3
GDV-68W	689.597	19°03'40.802"N 76°53'09.810"E	698462.982 2108680.978	6.8	3.4

Sample No.	Chainage (km)	Latitude/ Longitude	Easting/ Northing (m)	Total Depth (d) (m)	Mid-Depth (0.5d) (m)
GDV-69W	699.366	19°02'28.372"N 76°49'36.873"E	692260.422 2106387.994	2.9	1.45
GDV-97W	969.687	19°29'25.493"N 75°21'36.056"E	537779.406 2155131.808	23.9	11.95
GDV-98W	980.682	19°31'10.956"N 75°15'44.269"E	527519.963 2158354.89	20.1	10.05
GDV-99W	989.344	19°34'11.304"N 75°12'16.890"E	521469.42 2163890.104	12.8	6.4
GDV-100W	998.200	19°35'41.279"N 75°08'39.119"E	515122.278 2166649.243	6.4	3.2
GDV-101W	1009.058	19°36'30.690"N 75°03'13.089"E	505624.329 2168162.516	7.5	3.75
GDV-102W	1018.574	19°38'09.074"N 74°59'08.028"E	498486.407 2171185.784	8.4	4.2
GDV-103W	1027.819	19°38'53.861"N 74°54'58.489"E	491219.697 2172564.525	6.8	3.4
GDV-104W	1037.600	19°38'50.451"N 74°50'44.337"E	483818.429 2172464.88	4.6	2.3
GDV-113W	1132.842	19°57'44.434"N 74°15'31.357"E	422437.126 2207485.474	5.2	2.6
GDV-114W	1142.594	19°59'35.807"N 74°10'30.928"E	413721.693 2210949.966	2.5	1.25
GDV-115W	1154.623	20°02'01.756"N 74°05'27.915"E	404940.252 2215482.273	10	5
GDV-116W	1164.803	20°02'06.391"N 74°02'03.586"E	399004.542 2215658.036	5.9	2.95
GDV-117W	1176.027	19°59'09.402"N 73°58'49.772"E	393340.352 2210250.344	5.4	2.7

*Table 71 - Water Sample collection Locations*

### 2.20.3 Analysis

The collected samples were analyzed for following properties:-

#### Soil Samples

- Grain size Specific gravity
- PH Value
- Cu, Cc
- Clay Silt percentage

#### Water samples

- Sediment Concentration

A detailed report on sample analysis is placed at Annexure – 12 and 13 to this report.

### 3 Description of waterway

The waterway of Godavari River falling within survey limits is divided into forty stretches in accordance with the topographic feature and nature of river stream. The details are as follows:

#### 3.1 Sub Stretch 1: Bhadrachalam to Parnasala (ch.0.00km to 30.00km)

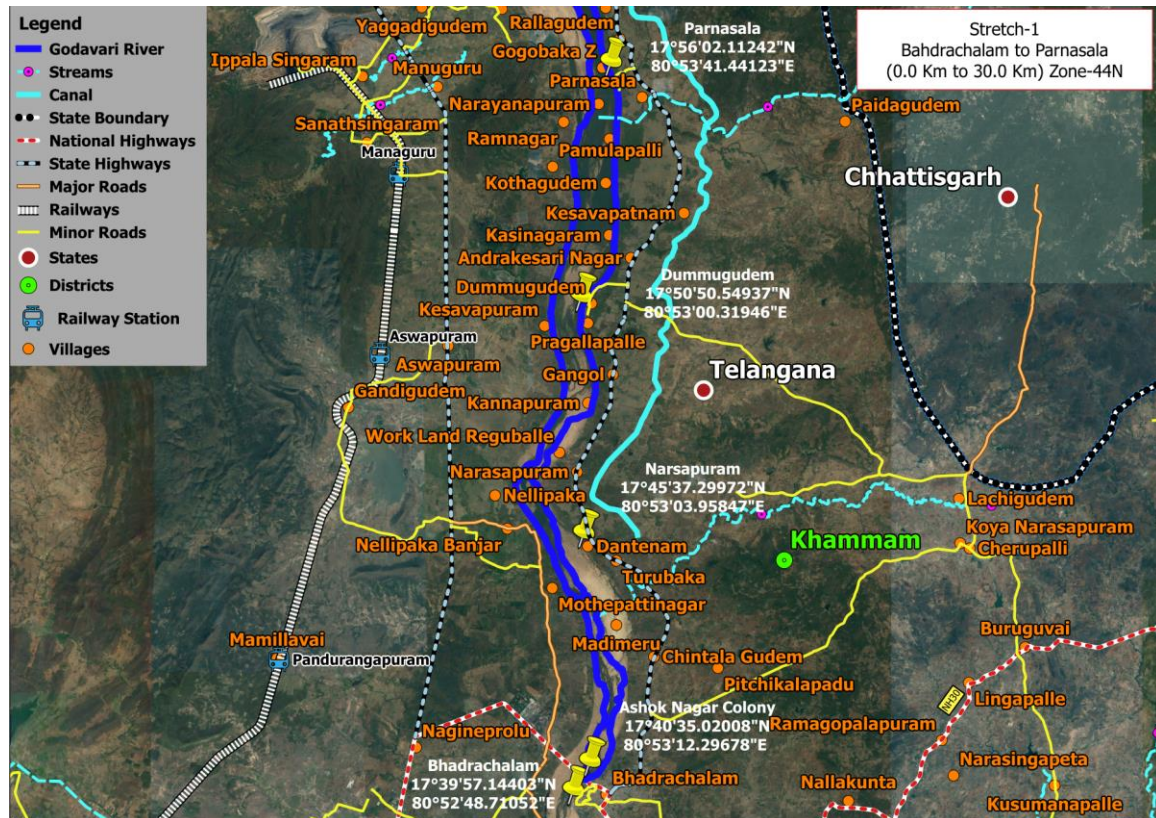


Figure 14 - Stretch-1 Bhadrachalam to Parnasala

- **Bathymetry Survey**
  - a) No bathymetric survey is conducted due to the unavailability of water
- **Topographic Survey**
  - b) 30km length of the stretch for which the topographic survey has been carried out.

Stretch-1 is covered 30.00km i.e. from 0.0km to 30.00km from Bhadrachalam to Parnasala village.

The survey commenced from Bhadrachalam Bridge named Kthothagudem-Bhadrachalam Road at Bhadrachalam Khammam district. The flow of the river is south east in this stretch “IWAI BM” pillars are on the right bank of the river.

Bhadrachalam town is located in Bhadrachalam District of Telangana. It is an important Hindu pilgrimage town with an existence of the Bhadrachalam Temple of Lord Rama, situated on the banks of Godavari River. The nearest railway station, Bhadrachalam Road at 40km from the town.

Manuguru is a town and Mandal in Bhadrachalam District in Telangana. Manuguru is situated on the left bank of Godavari River. Town is famous for Singareni coal mines.

Heavy Water Plant- one and only in Telangana the Heavy Water Plant at Manuguru, Telangana is based on the Bithermal Hydrogen Sulphide-Water ( $H_2S-H_2O$ ) Exchange Process. This plant with a capacity of 185 Metric Tons per Year is the second in India based on this process. The Manuguru site was chosen because of its proximity to Singareni coal fields and Godavari River which provide respectively large quantities of coal and water required for the plant. The nearest railway station is 10km from the plant site.

The captive power plant consists of 3 pulverized coal-fired boilers and 3 nos. of extraction condensing turbines each capable of supplying 30 MW power and the required process steam at 32 and 8 atm. pressure. The main plant consists of two streams, each designed to produce 92.5 MT/Y of nuclear grade heavy water and the processes namely isotopic exchange reaction between  $H_2S$  and  $H_2O$  followed by vacuum distillation.

At the time of initial reconnaissance to the survey area, the presence of water in scattered flow of water in small non-navigable streams and area was fully sandy and shallow in the vicinity. The depths noted were less than half a meter and hence could not be surveyed using survey boat. Instead, the spot levels were measured using Trimble R4 GPS.

In this stretch along the right bank of the river, State Highway No-12 is parallel to the river. Meduvai, Yatapaka, Chintala Gudem, Seetampeta, Kanyaegudam villages are located in Andhra Pradesh state these villages are on the border of Telangana and Andhra Pradesh. Turubaka, Venkata Ramapuram, Narsapuram, Reguballi, Gangol, Lakshminagar, Dummagudem and Bamdirevu villages are located in Telangana state. On left bank of the river Burgampadu – Eturnagram Road is parallel to the river, Mothey Patti, Irvendi, Ammagaripalli, Pamullapalli and Ramnagar villages are located on left the bank in Kothagudem District Telangana. The river in this stretch on the right bank is the boundary between two states i.e. Telangana and Andhra Pradesh from Meduvi village to Kanyaegudam village.



At chainage 0.0km Bhadrachalam Road Bridge (NH-30) is constructed across the Godavari River. It is connecting Kothgudem and Bhadrachalam.



*Figure 15 - Bhadrachalam Road Bridge -NH-30 (ch.0.00km)*

At Chainage 4.38km Birabhadra Swami Temple is located in the center of river stretch near Chandrampalem village.



*Figure 16 - Birabhadra Swami Temple (ch.4.380km)*

At chainage 8.48km Irvendi Temple on left bank of the river near Irvendi village.

At chainage 21.903km Dummagudem Hydro Power plant barrage is constructed its capacity is 6X24MW.



*Figure 17 - Hydro Power Plant Barrage Dummugudem 24 MW (ch. 21.903km)*

At chainage 24.043km Check Dam is constructed across the river for diverting the water towards a narrow channel towards the Hydro Power Plant Barrage.



*Figure 18 - Check Dam near Kasinagram (Dummagudem-ch24.043km)*

At chainage 29.20km on the right bank, a stream Pedha Bamdirevu joins Godavari River near Parnasala.

At chainage 29.90km on the right bank, a narrow stream Seethamma Vagu joins Godavari River near Parnasala.

Both sides of river banks having good cultivable land. Cotton, Maize, Chilli, Ground Nut, Paddy, Wheat, Sugarcane, Turmeric, Pulses are the major crops that are cultivated mostly in the area.

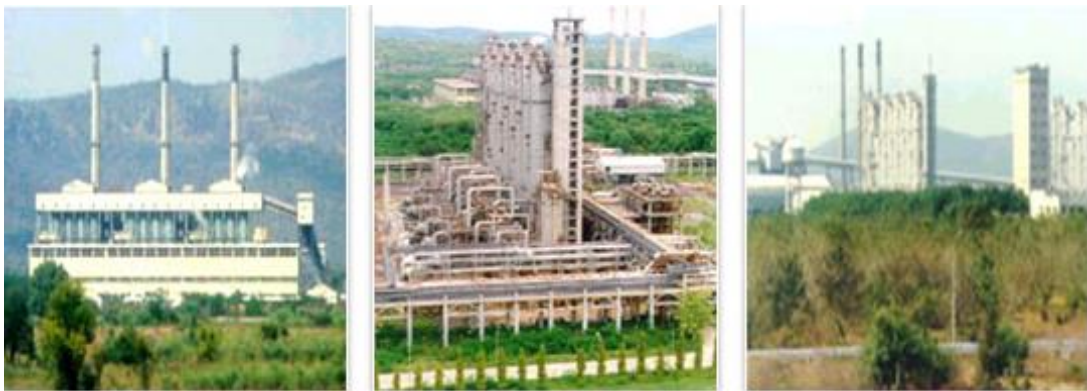


In this river's stretch area found sandy/rocky and scattered flow of water. In this stretch, the partial flow of water non-navigable streams is there. The bottom of the ground water portion containing fine sand.

There are 01 Bridge and 03 High Transmission line crossing the river. In addition 01 ITC paper mill, 01 Check Dam, 01 Heavy water plant (Manuguru), 01 Hydro Power plant Barrage (Dummugudem), 02 Temple and 03 Pump House found along the river.



*Figure 19 - ITC paper mill near Sarapaka, Bhadrachalam (ch.2.0km)*



*Figure 20 - Heavy Water plant near Manuguru (Left bank) (ch.23.759km)*



*Figure 21 - Singareni open cast coal mines at Manuguru (Left bank) (ch.42.428km)*

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	0	30	0	0	30,000	1,298,819.46	1,298,819.46	-0.30	0.00	30,000	1,641,474.24	1,641,474.24
II	0	30	0	0	30,000	1,978,392.65	1,978,392.65	-0.30	0.00	30,000	2,418,902.62	2,418,902.62
III	0	30	0	0	30,000	2,990,226.98	2,990,226.98	-0.30	0.00	30,000	3,536,514.14	3,536,514.14
IV	0	30	0	0	30,000	3,608,125.36	3,608,125.36	-0.30	0.00	30,000	4,178,808.70	4,178,808.70

Table 72 - Dredging Quantity Details

### 3.1.1 Observed and reduced Bed Profile of the stretch

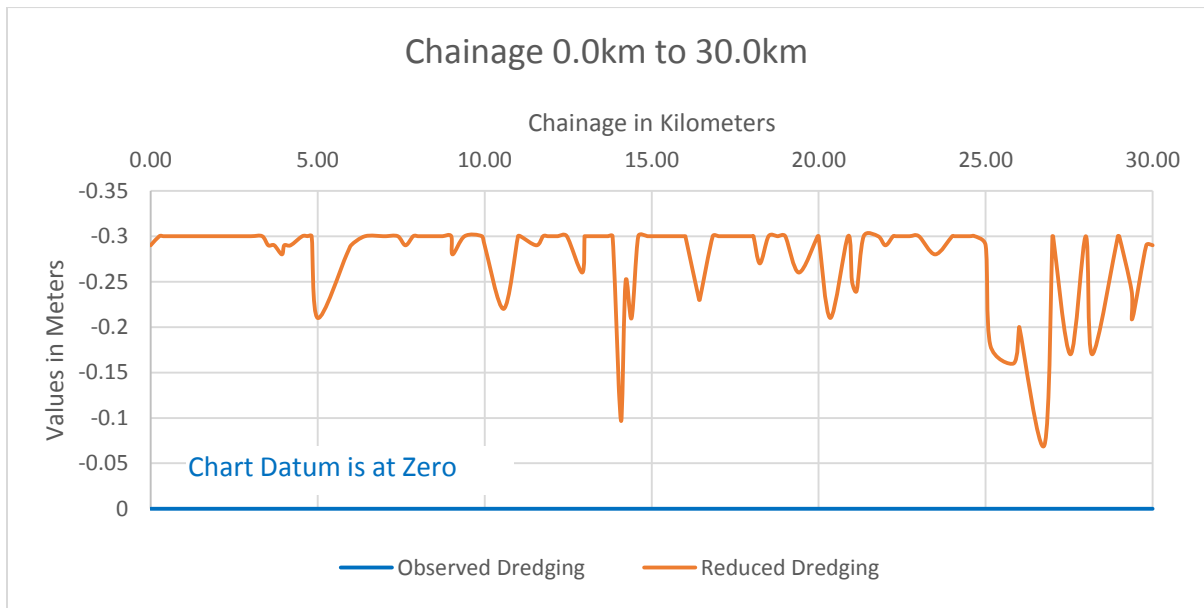


Figure 22 - River Bed Profile

### 3.2 Sub-Stretch-2: Parnasala to Bandarugudem (ch.30.0km to 60.0km)

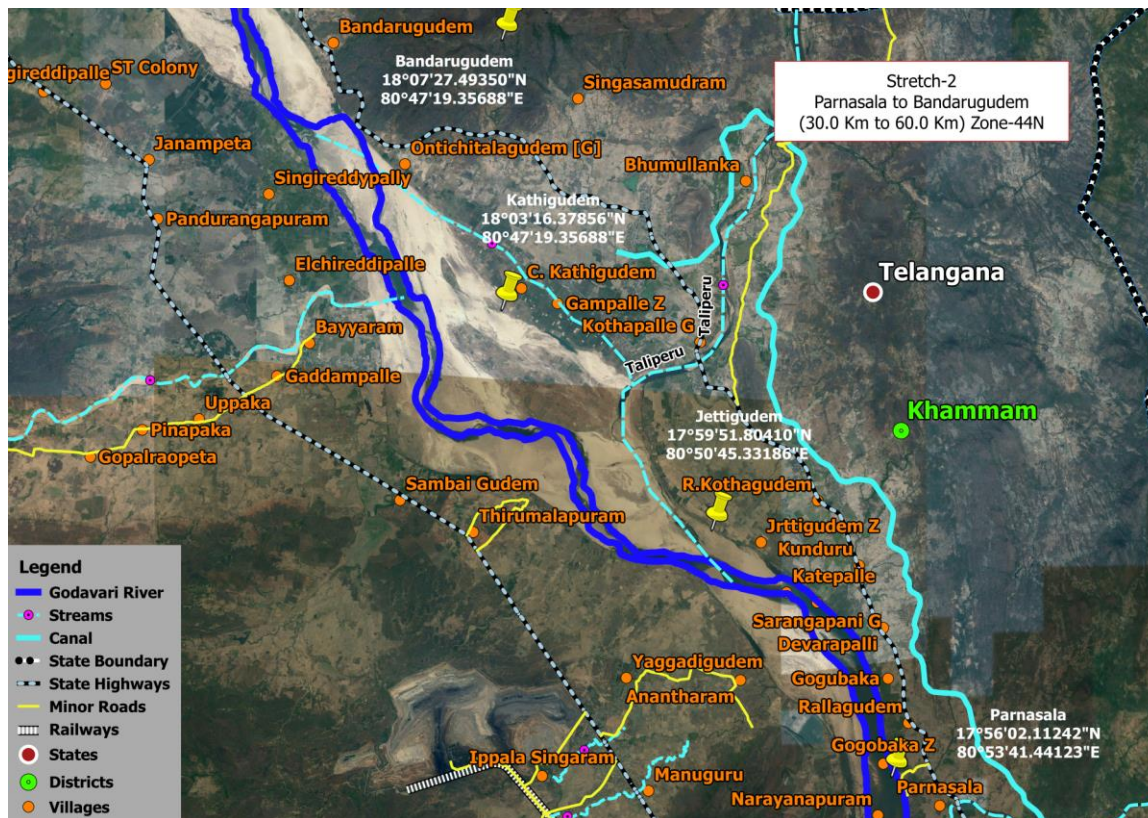


Figure 23 - Stretch-02 Parnasala to Bandarugudem

- **Bathymetry Survey**
  - a) No bathymetric survey is conducted due to the unavailability of water
- **Topographic Survey**
  - a) 30km length of the stretch for which the topographic survey has been carried out.

Stretch-2 has covered 30.0km, i.e. from 30.0km to 60.0km from Parnasala to Bandarugudem village.

In this stretch of river is having scattered flow of water and not possible to navigate, the depths noted were less than half a meter and hence could not be surveyed using survey boat. Instead, the spot levels were measured using Trimble R4 GPS.

Parnasala village is located in Dummugudem Mandal in the Khammam district of Telangana. It is 35 km north of Bhadrachalam and believed to mark the hermitage place, as it is locally said "Lord Sri Rama" spent some of the 14 years of exile at this location. The locals believe that Sita, the beloved consort of "Lord Sri Rama" bathed in the stream here and dried her clothes on "Radhagutta" where the imprints are



seen even today. The demon king "Ravana" parked his Pushpaka on the hillock on the opposite side of the river and abducted her. An earthen ditch reportedly caused when Ravana removed earth to carry off Sita to Lanka can be seen here. Another Hindu myth names Parnashala as the location where Rama killed Maricha, who came in disguise of a golden deer to deceive Sita.

Cherla is a Mandal in Khammam District of Telangana State, India. Cherla Mandal Headquarters is Cherla town. Cherla belongs to Khammam revenue division. It is located 135km towards north from district head quarter Khammam.

Cherla Mandal is bounded by Manuguru Mandal towards the south, Pinapaka Mandal towards west, Aswapuram Mandal towards the south, Dummugudem Mandal towards the south. Manuguru City, Bhadrachalam City, Kothagudem City, Yellandu City are the nearby cities.

There is no railway station near to Cherla Mandal in less than 10km. Warangal Railway Station is major railway station 148km from Cherla.

Bhadrachalam, Medaram, Papi Kondalu (Papi Hills), Dantewada (Dantewara), Khammam are the near by Important tourist destinations to see.

In this stretch the bottom of ground water portion containing fine sand. Between the stretch right of the river bank, SH-12 is parallel to the river. Along with right bank of the river Rallgudem, Devarapalle Z, Devarapalli Kudunuru, Satyanarayanpuram, Tegada, Ricepeta, Cherla and Regunta G villages are located and on the left bank of the river Burgampadu–Eturnagram Road is parallel to the river, Anantharam, Yaggadigudem, Sambaigudem, Bayyaram and Singrieddyapally villages are located on left bank.

At chainage 45.80km a tributary Taliperu River joins Godavari River near Tegada village, Cherala.

Taliperu River is originating from the Bijapur District of Chhattisgarh. It is a left-bank tributary of Godavari River, draining into it through a confluence located near Cherla in the Khammam District in Telangana.

The river has been harnessed for agricultural purposes through extensive canal systems developed in that region. A dam known as the Taliperu Project has been built on the river for this purpose. The water impounded by it is known as the Taliperu Reservoir, which is a medium irrigation project located at Cherla Village and Mandal, Khammam

District, Telangana. This project utilizes about 5.0 TMC of water and creates 24500 Acres of Ayacut in both Cherla and Dummugudem Mandal, Khammam District.

Both sides of river banks having well cultivable land. Cotton, Maize, Chilli, Ground Nut, Paddy, Wheat, Sugarcane, Turmeric, Pulses are the major crops that are cultivated mostly in the area.

Along the river, there is 02 Temple and 01 Pump House along the river. There are no features across the river.

At chainage 30.6km Ram Sita Temple is located near Parnasala village.



*Figure 24 - Ram Sita Temple and under construction pump house, Parnasala (ch.30.600km)*

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	30	60	0	0	30,000	1,299,017.55	2,597,837.01	-0.30	0.00	30,000	1,643,775.49	3,285,249.73
II	30	60	0	0	30,000	1,978,589.05	3,956,981.70	-0.30	0.00	30,000	2,421,988.46	4,840,891.08
III	30	60	0	0	30,000	2,990,439.20	5,980,666.18	-0.30	0.00	30,000	3,540,672.95	7,077,187.09
IV	30	60	0	0	30,000	3,608,368.30	7,216,493.66	-0.30	0.00	30,000	4,183,320.64	8,362,129.34

*Table 73 - Dredging Quantity Details*

### 3.2.1 Observed and reduced Bed Profile of the stretch

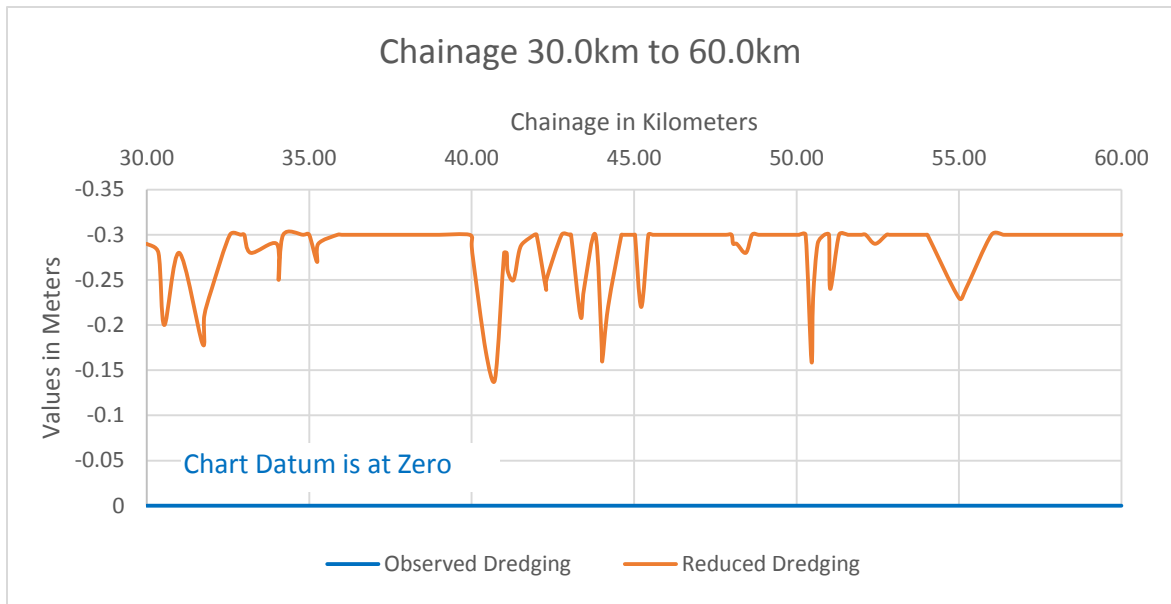


Figure 25 - River bed Profile

### 3.3 Sub-Stretch-3: Bandarugudem to Venkatapuram (ch.60.0km to 90.0km)

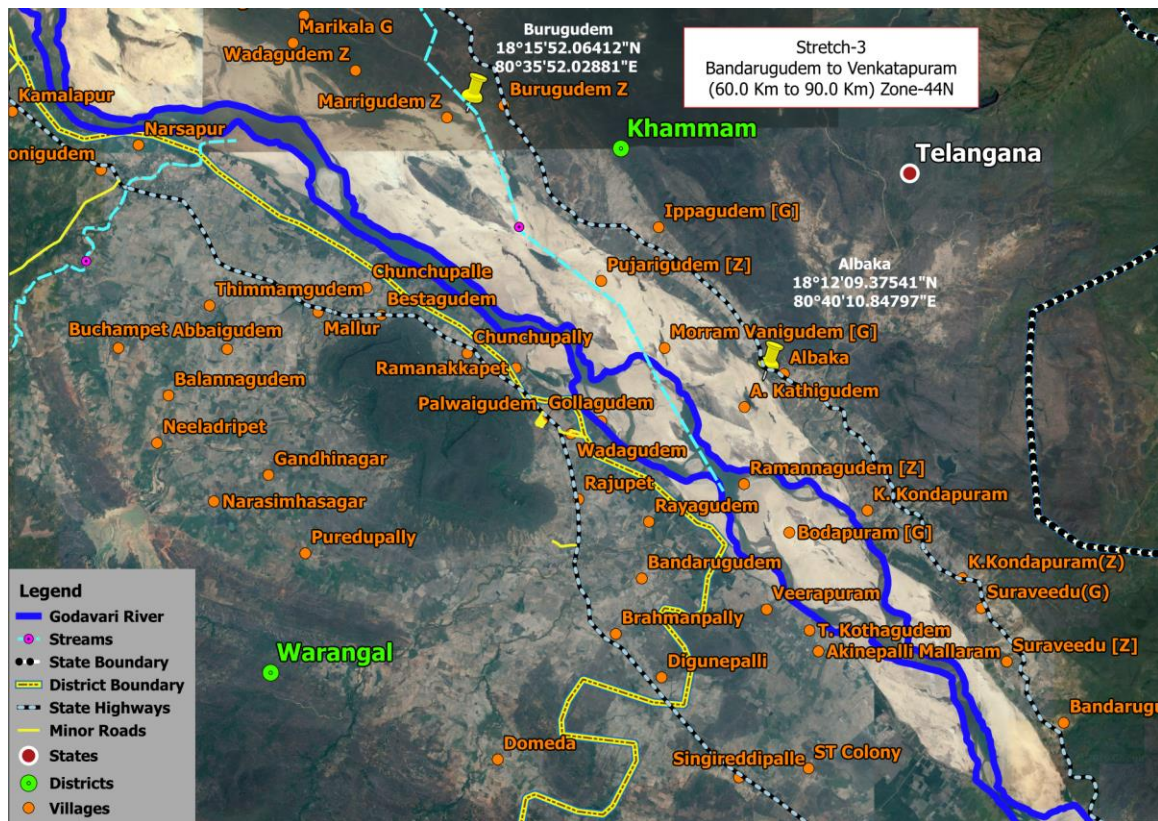


Figure 26 - Stretch-03 Bandarugudem to Venkatapuram

- **Bathymetry Survey**
  - a) No bathymetric survey is conducted due to the unavailability of water
- **Topographic Survey**
  - b) 30km length of the stretch for which the topographic survey has been carried out.

Stretch-3 is covered 30.0km i.e. from 60.0km to 90.0km from Bandarugudem to Venkatapuram. The river in this stretch presence of water in pockets and was very shallow in the vicinity, having scattered flow of water. The depths noted were less than half a meter and hence could not be surveyed using survey boat. Instead, the spot levels were measured using Trimble R4 GPS.

In this stretch the bottom of ground water portion containing fine sand. On the right bank of the river, SH-12 is parallel to the river. Along with right bank of the river Suraveedu Z, Albaka, Narsireddigudem G, Burugudem Z, Veerapuram and Venkatapuram villages are located and on the left bank of the river Burgampadu – Eturnagram Road is parallel



to the river, Janampeta, Duginepalli, Brahmanpally, Bandarugudem, Rajupet, Mallur and Narsapur villages are located on left bank.

Albaka is a village in Venkatapuram Mandal in Khammam District of Telangana State. It is located 143km towards north from district head quarter Khammam. 14 km from Venkatapuram.

Sarakalanka, Palem Z, Burugudem Z, Palem G, Chalamala G are the nearby villages to Albaka. Albaka is surrounded by Mangapet Mandal towards west, Pinapaka Mandal towards south, Cherla Mandal towards south and Manugur Mandal towards south.

Manuguru, Bhadrachalam, Kothagudem, Bade Bacheli are the nearby cities to Albaka.

This place is in the border of the Khammam District and Warangal District. Warangal District Mangapet is west towards this place.

There is no railway station near to Albaka in less than 10km. Warangal Railway Station is major railway station 132km near to Albaka.

Mallur is a village in Mangapet Mandal in Warangal District of Telangana State. It is located 125km towards east from district head quarter Warangal. 2km from Mangapet.

Manuguru, Bhadrachalam, Yellandu, Kothagudem are the nearby cities to Mallur. Abbaigudem, Cherupally, Chunchupally, Balannagudem, Thimmampet are the nearby villages to Mallur. Mallur is surrounded by Venkatapuram Mandal towards north, Pinapaka Mandal towards the south, Eturnagaram Mandal towards west, Wazeed Mandal towards the north.

This place is in the border of the Warangal District and Khammam District. Khammam District Venkatapuram is north towards this place.

Venkatapuram is a City in Venkatapuram Mandal in Khammam District of Telangana State. It is located 146km towards north from district head quarters Khammam. It is a Mandal head quarter.

Venkatapuram is surrounded by Mangapet Mandal towards south, Wazeed Mandal towards north, Eturnagaram Mandal towards west, Pinapaka Mandal towards the south.

Manuguru, Bhadrachalam, Bade Bacheli, Yellandu are the nearby cities to Venkatapuram.

This place is in the border of the Khammam District and Warangal District. Warangal District Mangapet is south towards this place.

There is no railway station near to Venkatapuram in less than 10 km Warangal Railway Station is major railway station 124km near to Venkatapuram.

Narsapur is a village in Mangapet Mandal in Warangal District of Telangana State. It is located 121km towards east from district head quarter Warangal. 8km from Mangapet.

Gamponigudem, Kamalapur, Cherupally, Jabbonigudem, Thimmampet are the nearby villages to Narsapur. Narsapur is surrounded by Venkatapuram Mandal towards the east, Eturnagaram Mandal towards west, Wazeed Mandal towards the north, Tadvai Mandal towards west.

Manuguru, Yellandu, Bhadrachalam, Kothagudem are the nearby cities to Narsapur.

This place is in the border of the Warangal District and Khammam District. Khammam District Venkatapuram is east towards this place.

Warangal is the nearest town to Narsapur. Warangal is 128 km from Narsapur. Road connectivity is there from Warangal to Narsapur.

Narsapur's economy is predominantly agricultural. This is a rice-growing region and most farmers grow rice for both subsistence and the commerce. Telugu is the language spoken by the majority in Narsapur village.

Ramalayam is located in this village and it is a very famous temple in Mangapet mandal and Laxmi Narasimha Swamy Temple in Mallur (5km away from Narsapuram) this located in deep forest hill area.

The Hindu festivals such as Bathukamma festival, Dassera, Deepavali, Sankranti are celebrated here and Sankranti festival is celebrated at the beginning of harvest season, generally, on January 14 every year.

There is no railway station near to Narsapur in less than 10 km. However, the nearest railway station is at Warangal.

Both sides of river banks having well cultivable land. Cotton, Maize, Chilli, Ground Nut, Paddy, Wheat, Sugarcane, Turmeric, Pulses are the major crops that are cultivated mostly in the area.

At chainage 82.807km Malluruvagu River a tributary of Godavari River join near Mallur on the left bank.

At chainage 85.00km a stream Kukkatogu Vagu near Marrigudem Z joins Godavari River on the right bank.

At chainage 88.00km a stream Kankala Vagu near Bandagudem joins Godavari River on the right bank.

There are no features along and across the river.

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	60	90	0	0	30,000	1,297,716.37	3,895,553.38	-0.30	0.00	30,000	1,633,109.19	4,918,358.92
II	60	90	0	0	30,000	1,976,616.46	5,933,598.16	-0.30	0.00	30,000	2,408,861.44	7,249,752.52
III	60	90	0	0	30,000	2,987,444.57	8,968,110.75	-0.30	0.00	30,000	3,525,073.60	10,602,260.69
IV	60	90	0	0	30,000	3,604,752.68	10,821,246.34	-0.30	0.00	30,000	4,166,753.58	12,528,882.92

Table 74 - Dredging Quantity Details

### 3.3.1 Observed and reduced Bed Profile of the stretch

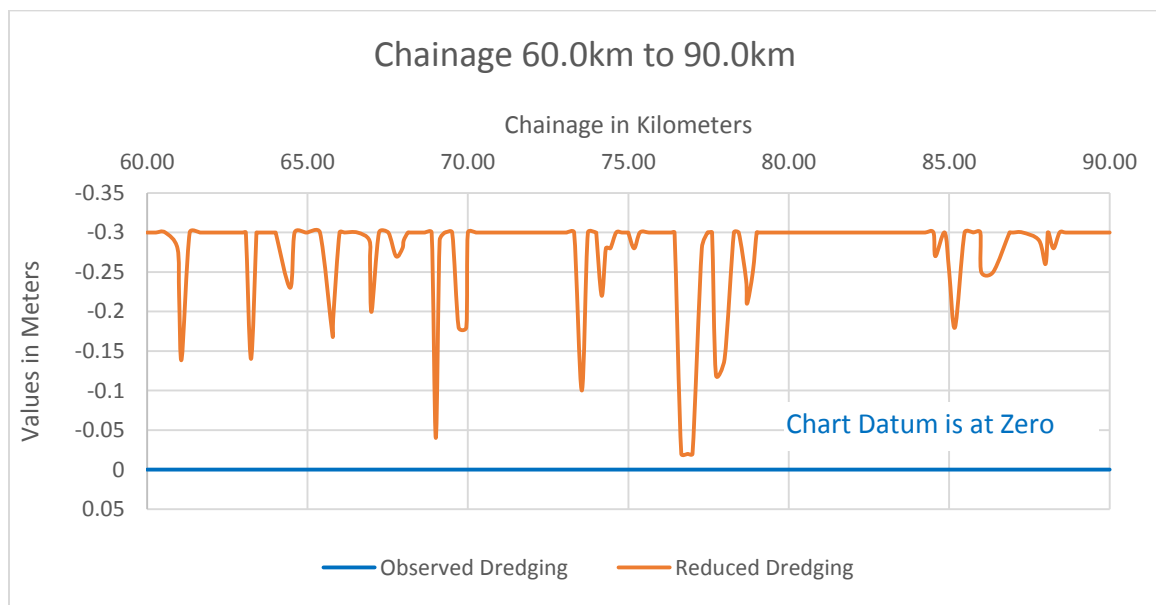


Figure 27 - River bed Profile

### 3.4 Sub-Stretch-4: Venkatapuram to Arlagudem G (ch.90.0km to 120.0km)

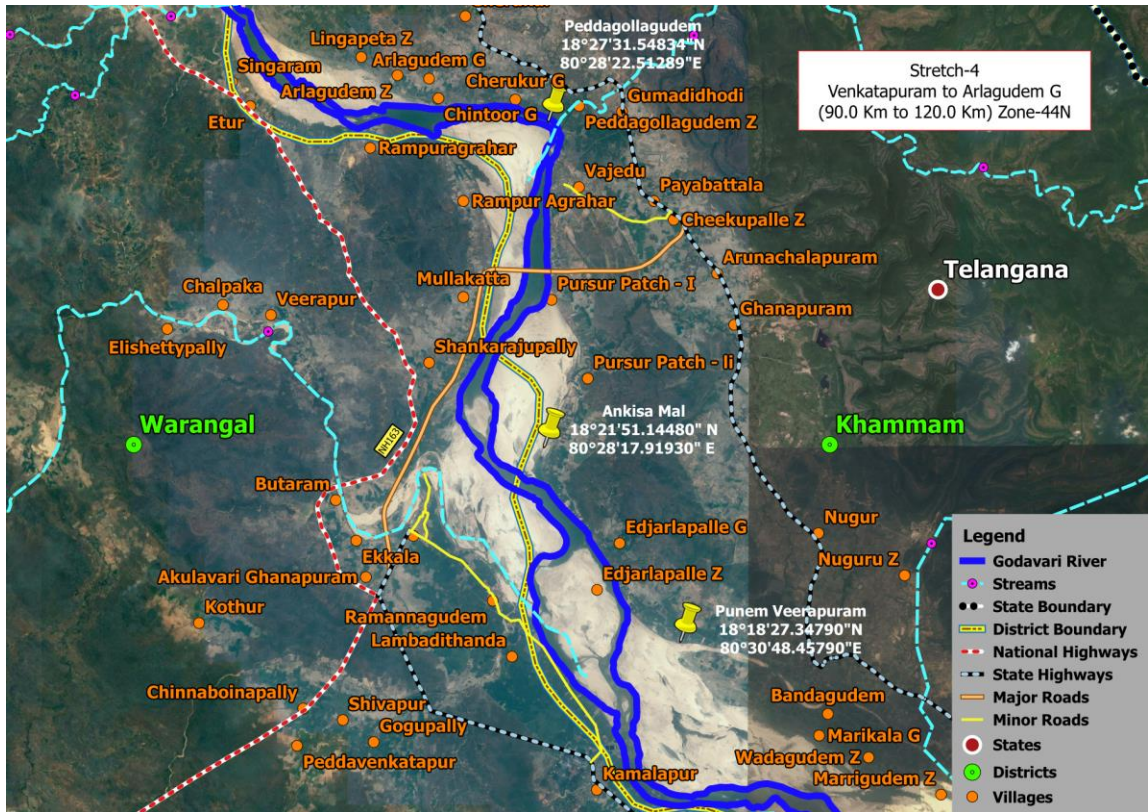


Figure 28 - Stretch-04 Venkatapuram to Arlagudem G

- **Bathymetry Survey**
  - a) No bathymetric survey is conducted due to the unavailability of water
- **Topographic Survey**
  - b) 30km length of the stretch for which the topographic survey has been carried out.

Stretch-4 is covered 30.0km i.e. from 90.0km to 120.0km from Venkatapuram to Arlagudem G village. In this stretch water level was very shallow in the vicinity, having scattered flow of water. The depths noted were less than half a meter and hence could not be surveyed using survey boat. Instead, the spot levels were measured using Trimble R4 GPS.

In this stretch the bottom of ground water portion containing fine sand. Between the stretch right of the river bank, SH-12 is parallel to the river. Along with right bank of the river Chirtapalle Z, Punem Veerapuram G, Educberlapalle, Pusur Z, Vajedu, Peddagollagudem and Arlagudem G villages are located and on the left bank of the river Burgampadu-Eturnagram Road is parallel to the river which is meeting NH-163 near

Eturnagram from here the name of road changes to Eturnagaram- Devadula Road. NH-163 crosses over from left bank to right bank and meet SH-12 near Jagannadhpuram village and follow along parallel to the river on the right bank. Gamponigudem, Kamalpur, Lambadithanda, Ramnagar, Ramannagudem, Eturnagram, Shankarajupaly, Mullakatta and Rampuragrahar villages are located on left bank.

Ramannagudem is a village in Eturnagaram Mandal in Warangal District of Telangana. It is located 111km towards east from district head quarter Warangal.

Ramannagudem is surrounded by Wazeed Mandal towards the east, Venkatapuram Mandal towards the east, Tadvai Mandal towards the south, Mangapet Mandal towards south.

Manuguru, Yellandu, Warangal, Kothagudem are the nearby cities to Ramannagudem.

This place is in the border of the Warangal District and Khammam District. Khammam District Venkatapuram is east towards this place.

Warangal is the nearest town to Ramannagudem. Warangal is 112km from Ramannagudem. Road connectivity is there from Warangal to Ramannagudem

There is no railway station near to Ramannagudem in less than 10km. The railway station is nearby Warangal town.

At Chainage 104.0km a tributary Jampanna Vagu joins Godavari River near Eturnagaram on the right bank of the river.

Jampanna vagu is a tributary of Godavari River. According to the history, Jampanna is the tribal warrior and the son of tribal Goddess Sammakka. The Jampanna vagu took his name as he died in a battle fighting against Kakatiyan Army in that stream.

The Jampanna vagu is still red in colour marked with the blood of Jampanna (Scientifically the red colour of the water is attributed to the soil composition). Tribals believe that taking a holy dip in the red water of Jampanna Vagu reminds them the sacrifice of their gods who save them and also induces courage into their souls. There is a bridge constructed on top of Jampanna Vagu, known as Jampanna Vagu Bridge.

Eturnagaram is a village and a Mandal in Warangal District of Telangana State, Eturnagaram Mandal Headquarters is Eturnagaram town. It is located 111km towards east from district head quarter Warangal. The Mandal area is surrounded by a deep forest.



Eturnagaram Mandal is bounded by Wazeed Mandal towards east, Venkatapuram Mandal towards the east, Tadvai Mandal towards the south, Mangapet Mandal towards the south. Manuguru, Yellandu, Warangal and Kothagudem city are the nearby cities to Eturnagaram.

Eturnagaram consists of 73 villages and 19 panchayats. Sarvai is the smallest village and Eturnagaram is the biggest village. This place is in the border of the Warangal District and Khammam District. Medaram, Warangal (Orugallu), Bhadrachalam, Bhamragarh Wildlife Sanctuary, Dantewada (Dantewara) are the near by important tourist destinations.

Eturnagaram Wildlife Sanctuary is a wildlife sanctuary located in Eturnagaram village in Warangal district in Telangana.

Telangana has splendid wildlife reserves, one of such is the Eturnagaram wildlife sanctuary, which is 100km from Warangal. The sanctuary is located near the Maharashtra, Chhattisgarh, and Telangana border. It is one of the oldest sanctuaries of Telangana. In the year 1952 on 30 January, the erstwhile Hyderabad Government because of its rich bio-diversity declared it as a sanctuary.

The land is undulating from steep slopes to gentle slopes from west to east. Three-quarters of the area consist of a plain while the rest is hilly with many streams and springs. Godavari River passes through the sanctuary. The vegetation here is tropical dry deciduous with teak and other trees of good quality standing 60 ft. (18 m) and above.

Flora: The sanctuary has the southern tropical dry deciduous type of teak and its associates like thiruman, maddi, and bamboo, madhuca, terminalia, pterocarpus.

Fauna: A perennial water source called "Dayyam Vagu", divides the sanctuary into almost two halves. It is home to Tiger, Leopard, Wolf, Dhols, Golden jackals, Sloth bear, Chousingha, Blackbuck, Nilgai, Sambar, Spotted deer, Chinkara, Indian giant squirrels and many kinds of birds. Reptiles like Mugger crocodile, Python, Cobra, Kraite, and Star.

Bogatha Waterfall is located in Koyaveerapuram G, Wazeedu Mandal, Khammam district, Telangana. It is located 120km from Bhadrachalam, 140km away from Warangal and 329km from Hyderabad. As the newly constructed Eturnagaram bridge on NH 202 reduced the distance to 329km from 440km. A beautiful waterfall in the dense forest. The most beautiful and attractive waterfall.

Arlagudem G is a village located in Wazeed Block of Khammam district in Telangana. Positioned in a rural part of Khammam district of Telangana.

Both sides of river banks having good cultivable land. Cotton, Maize, Chilli, Ground Nut, Paddy, Wheat, Sugarcane, Turmeric, Pulses are the major crops that are cultivated mostly in the area.

There is 01 Bridge crossing the river and a Pushkar Ghat near Ramannagudem village along right bank of the river.



*Figure 29 - Eturnagaram Wildlife Sanctuary Animals (Ch.105.0km)*

A chainage 112.184km Venkatapuram Road Bridge (NH-163) is crossing over the Godavari River near Mullakatta village, Eturnagaram.



*Figure 30 - Venkatapuram Road Bridge - NH-163 (Ch.112.184km)*





Figure 31 - Bogatha Waterfall near chekupelli, Koyaveerapuram G (Ch.116.841km)

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	90	120	0	0	30,000	1,298,589.37	5,194,142.75	-0.30	0.00	30,000	1,551,270.56	6,469,629.48
II	90	120	0	0	30,000	1,977,949.42	7,911,547.58	-0.30	0.00	30,000	2,295,798.69	9,545,551.21
III	90	120	0	0	30,000	2,989,463.34	11,957,574.09	-0.30	0.00	30,000	3,376,142.04	13,978,402.73
IV	90	120	0	0	30,000	3,607,196.82	14,428,443.16	-0.30	0.00	30,000	4,008,954.30	16,537,837.22

Table 75 - Dredging Quantity Details

### 3.4.1 Observed and reduced Bed Profile of the stretch

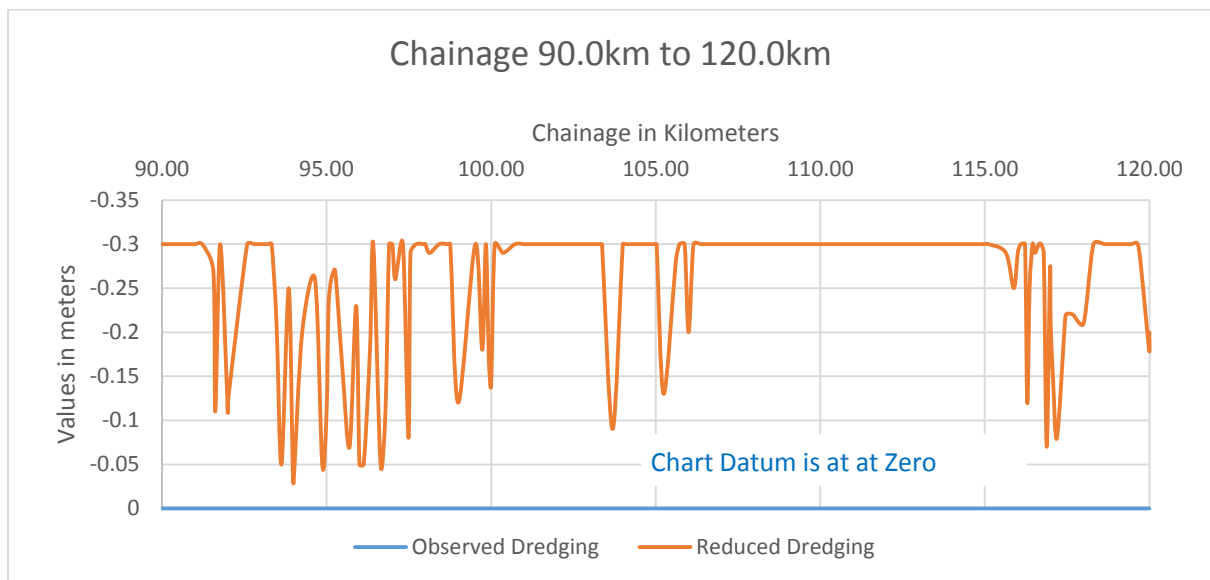


Figure 32 - River bed Profile

### 3.5 Sub-Stretch-5: Arlagudem G to Tarlaguda (ch.120.0km to 150.0km)

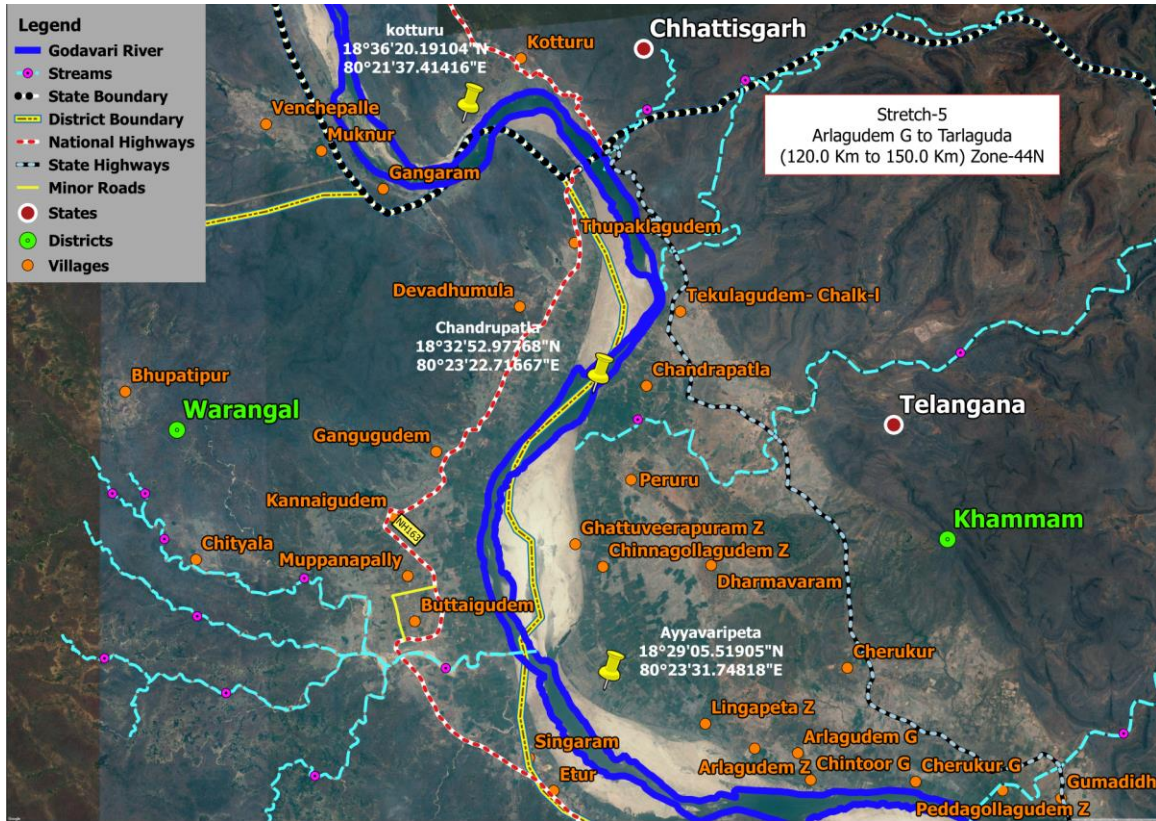


Figure 33 - Stretch-05 Arlagudem G to Tarlaguda

- **Bathymetry Survey**
  - a) No bathymetric survey is conducted due to the unavailability of water
- **Topographic Survey**
  - a) 30km length of the stretch for which the topographic survey has been carried out.

Stretch-5 is covered 30.0km i.e. from 120.0km to 150.km from Arlagudem G to Tarlaguda village.

In this stretch water level was very shallow in the vicinity, having scattered flow of water. The depths noted were less than half a meter and hence could not be surveyed using survey boat. Instead, the spot levels were measured using Trimble R4 GPS.

In this stretch the bottom of ground water portion containing fine sand. Between the stretch right of the river bank, NH-163/SH-12 is parallel to the river and river is flowing boundary of two states i.e. Telangana and Chhattisgarh. Along with right bank of the river Dharmavaram, Peruru and Chandrupatla villages are in Telangana state, Kotturu and Tarlaguda village is in Chhattisgarh state. On left bank of the river Eturnagram –

Devadula Road is parallel to the river follow along parallel to the river on left bank. Etur, Singaram, Chinthagudem, Buttai Gudem, Muppanapally, Kannaigudem, Rajannapetha, Laxmipuram, Devadhula and Thupalagudem villages are located on left bank.

Etur is a village in Eturnagaram Mandal in Warangal District of Telangana State. It is located 116km towards east from district head quarter Warangal and 10km from Eturnagaram.

Buttaigudem, Borugudem, Sarvai, Chalpaka, Rampur Agrahar are the nearby villages to Etur. Etur is surrounded by Wazeed Mandal towards east, Venkatapuram Mandal towards east, Tadvai Mandal towards south, Mutharam (Mahadevpur) Mandal towards west. Manuguru, Bade Bacheli, Yellandu, Warangal are the nearby cities to Etur. This place is in the border of the Warangal District and Khammam District. Khammam District Venkatapuram village is east towards this place.

Warangal is the nearest town to Etur. Warangal is 127km from Etur. Road connectivity is there from Warangal to Etur.

There is no railway station near to Etur in less than 10km. The nearest railway station is Warangal.

Peruru is a village in Wazeed Mandal in Khammam District of Telangana State. It is located 169km towards north from district head quarters Khammam 13km from Wazeed.

Peddagangaram Z, Ghattuveerapuram Z, Chinnagollagudem Z, Krishnapuram, and Dharmavaram are the nearby villages to Peruru. Peruru is surrounded by Eturnagaram Mandal towards south, Bhopal Patnam Mandal towards north, Venkatapuram Mandal towards south, Mutharam (Mahadevpur) Mandal towards west.

Manuguru, Bade Bacheli, and Ramagundam Warangal are the nearby cities to Peruru. This place is in the border of the Khammam District and Warangal District. Warangal District Eturnagaram is south towards this place.

There is no railway station near to Peruru in less than 10km. Nearest railway station is Warangal 116km from Peruru village. Palwancha is the nearby town to Peruru having road connectivity to Peruru.

Both sides of river banks having good cultivable land. Cotton, Maize, Chilli, Ground Nut, Paddy, Wheat, Sugarcane, Turmeric, Pulses are the major crops that are cultivated mostly in the area.

In this stretch, the river was completely dry and sandy with vegetation growth on both banks of the river. There are no features along and across the river. At chainage, 147.600km Devadula lifts irrigation scheme is located near Gangaram village on left bank.

The Devadula lift irrigation scheme is a lift irrigation scheme in India. It is the second biggest of its kind in Asia. Devadula is the place in Warangal District, Telangana, where the scheme's intake well is located.

The project is specially designed to lift water from the River Godavari to irrigate more than 600,000 acres (2,400 km<sup>2</sup>) in the drought prone Telangana state, India. Later it was named after the politician J. Chokkarao as the 'J. Chokkarao Devadula lifts irrigation scheme'. The total work was divided into three phases for execution convenience in the year 2003.

The minimum river water level required is 73 m MSL in the river to pump the water whereas the non-monsoon / lean season river water level is below 71 m MSL. No downstream Weir is yet constructed to build up the river minimum water level at this location of the river.

The maximum water lift is by 510 meters. The project operational requirement is 484 MW power and 1.4 billion kWh of electrical energy annually for pumping 38 Tmcft water. This lift canal is an inter-river basin transfer link by feeding Godavari River water to Krishna River basin in Warangal and Nalgonda districts.

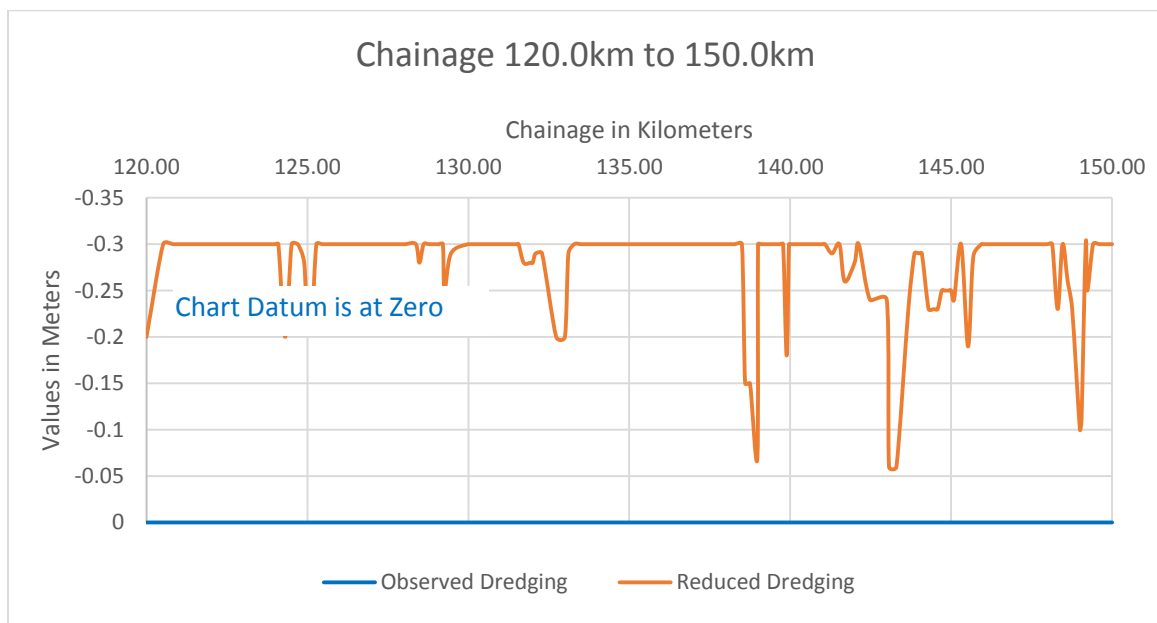


*Figure 34 - JCR- Devadula Lift Irrigation Scheme (ch.148.29km)*

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	120	150	0	0	30,000	1,298,083.91	6,492,226.66	-0.30	0.00	30,000	1,590,848.47	8,060,477.95
II	120	150	0	0	30,000	1,977,179.59	9,888,727.17	-0.30	0.00	30,000	2,351,997.39	11,897,548.60
III	120	150	0	0	30,000	2,988,302.15	14,945,876.24	-0.30	0.00	30,000	3,454,053.72	17,432,456.45
IV	120	150	0	0	30,000	3,605,792.61	18,034,235.77	-0.30	0.00	30,000	4,092,651.09	20,630,488.31

*Table 76 - Dredging Quantity Details*

### 3.5.1 Observed and reduced Bed Profile of the stretch



*Figure 35 - River bed Profile*



### 3.6 Sub-Stretch-6: Tarlaguda to Kambalpeta (ch.150.0 km to 180.0km)

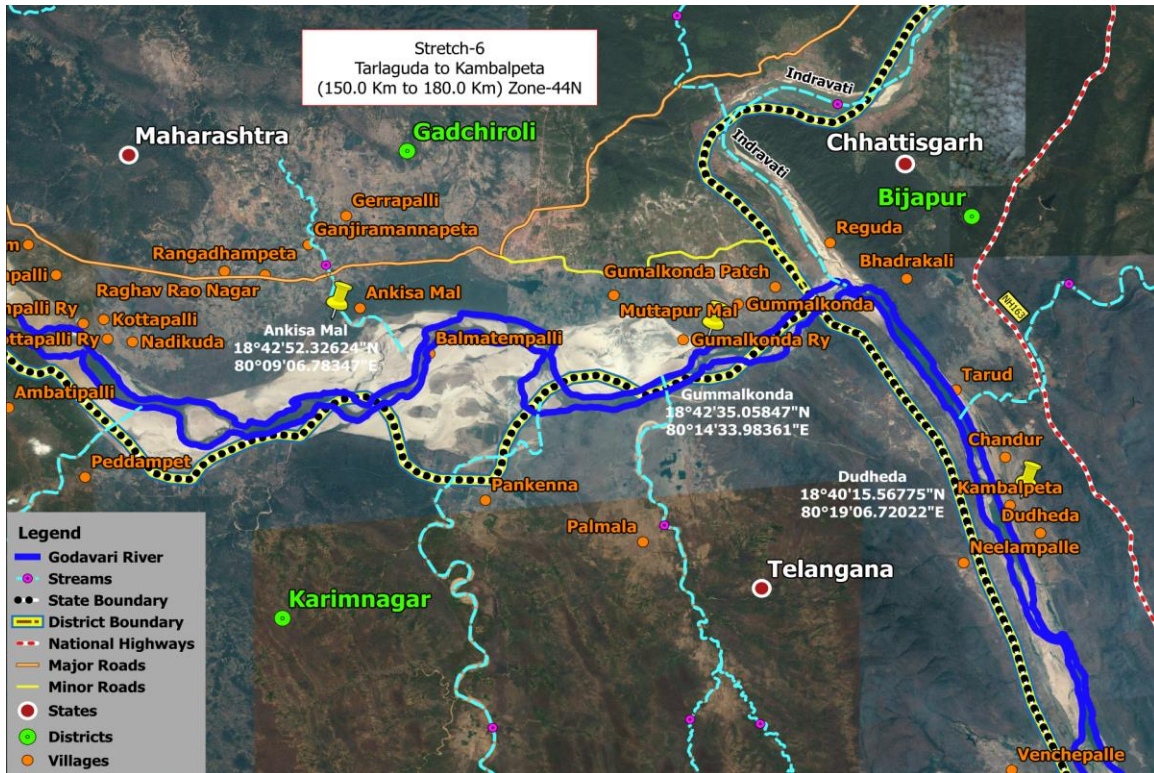


Figure 36 - Stretch-06 Tarlaguda to Kambalpeta

- **Bathymetry Survey**
  - a) No bathymetric survey is conducted due to the unavailability of water
- **Topographic Survey**
  - b) 30km length of the stretch for which the topographic survey has been carried out.

Stretch-6 is covered 30.0km i.e. from 150.0km to 180.0km from Tarlaguda to Kambalpeta village.

In this stretch water level was very shallow in the vicinity, having scattered flow of water. The depths noted were less than half a meter and hence could not be surveyed using survey boat. Instead, the spot levels were measured using Trimble R4 GPS.

In this stretch on the right bank of the river, NH-163/SH-12 is parallel to the river, the river is flowing between borders of three state i.e Telangana, Chhattisgarh and Maharashtra from Tarlguda village to near Sangam of Indravati river in Godavari river near Bhadrakali villages on right bank comes in Chhattisgarh state. Kumharnila, Dudheda, Chandur, Tarud and Bhadrakali villages are located in Chhattisgarh state.



Somnoor, Gummalkhonda, Muttapur, Asaralli, Ankisa Mal and Kambalpeta villages on the right bank are located in Maharashtra state. On left bank Eturnagram – Devadula Road is parallel to the river and following villages on left bank are Muknur, Venchepalle, Neelampalle, Burgugudem, Dammur, Meddigadda, Boipalmela, Pankena and Balmatempalli villages are located in Telangana state.

Muknur is a village in Mahadevpur Mandal in Karimnagar District of Telangana. As part of Telangana District's re-organisation, Muknur village Mahadevpur Mandal reorganized from Karimnagar District to Jaya Shankar district. It is located 116km towards east from district head quarter Karimnagar.

Ramagundam, Mancheri, Mandamarri, Bellampalle are the nearby cities to Muknur. Muknur is surrounded by Kataram Mandal towards west, Sironcha Mandal towards north, Mutharam (Mahadevpur) Mandal towards the south, Malhar Rao Mandal towards west.

This place is in the border of the Karimnagar District and Gadchiroli District. Gadchiroli District Sironcha is north towards this place. It is near to the Maharashtra State Border.

Ramagundam is the Nearest Town to Muknur. Ramagundam is 98 km from Muknur. Road connectivity is there from Ramagundam to Muknur.

There is no railway station near to Muknur in less than 10 km. Nearby railway station is Warangal 104km from Muknur.

Chandur village is located in Bhopalpattnam Tehsil of Bijapur district in Chhattisgarh, India. It is situated 28km away from sub-district head quarter Bhopalpattnam and 80km away from district head quarter Bijapur. Chandur village is also a gram panchayat. Nearby villages are Chandur, Dudheda, Kambalpeta, Sitanagaram, and Tarud.

Asaralli is a village in Sironcha Taluka in Gadchiroli District of Maharashtra State, It belongs to Nagpur Division. It is located 190km towards south from District headquarters Gadchiroli. 29km from Sironcha. 903km from state capital Mumbai. Ramagundam, Mancheri, Mandamarri, Bellampalle are the nearby cities to Asaralli.

Ankisa Mal, Nadikuda, Pochampalli, Wadadam, and Kopela are the nearby villages to Asaralli. Asaralli is surrounded by Bhopal Patnam Taluka towards east, Sironcha Taluka towards west, Mutharam (Mahadevpur) Taluka towards south, Kataram Taluka towards west. This place is in the border of the Gadchiroli District and Karimnagar District.

Karimnagar District Mahadevpur is west towards this place. It is near to the Telangana State Border.

There is no railway station near to Asaralli in less than 10 km. Kazipet Town Railway Station (near to Warangal), Mancheral Railway Station (near to Mancherial), Ravindrakhani railway station (near to Mancherial), Warangal railway station (near to Warangal) are the railway stations reachable from near by towns. Mancherial, Warangal, Ballarpur, Gadchiroli are nearby by towns to Asaralli having road connectivity to Asaralli.

At chainage 165.0km Indravati River confluence with Godavari River near to boundary junction of three states Chhattisgarh, Telangana and Maharashtra knew as Somnoor Sangam.

Indravati River is a tributary of Godavari River, Its starting point is found to be the Ghats of Dandakaranya range from a hilltop village Mardiguda of Thuamula Rampur Block in the Kalahandi district of the state of Odisha due to the amalgamation of three streams, The river follows a westerly path and enters Jagadalpur in the state of Chhattisgarh. The river moves from here in a southern route, before eventually uniting with the Godavari at the borders of three states. They are the state of Chhattisgarh, Maharashtra, and Telangana. The river at a variety of stages of its course forms the boundary between Chhattisgarh and Maharashtra. The river Indravati is also known as the oxygen of the Bastar district of the state of Chhattisgarh. This district is one of the greenest and eco-friendly districts, found in the whole of India. A total number of five hydroelectric projects were planned on the river Indravati. They were namely the Kutru I, the Kutro II, the Nugru I, Nugru II and the Bhopalpatnam. However, the plan misfired. It did not see the light of the day, due to ecological reasons. The Indravati is sometimes known as the "lifeline" of the Kalahandi, Nabarangapur, of Odisha and Bastar district of Chhattisgarh, one of the greenest districts in India.

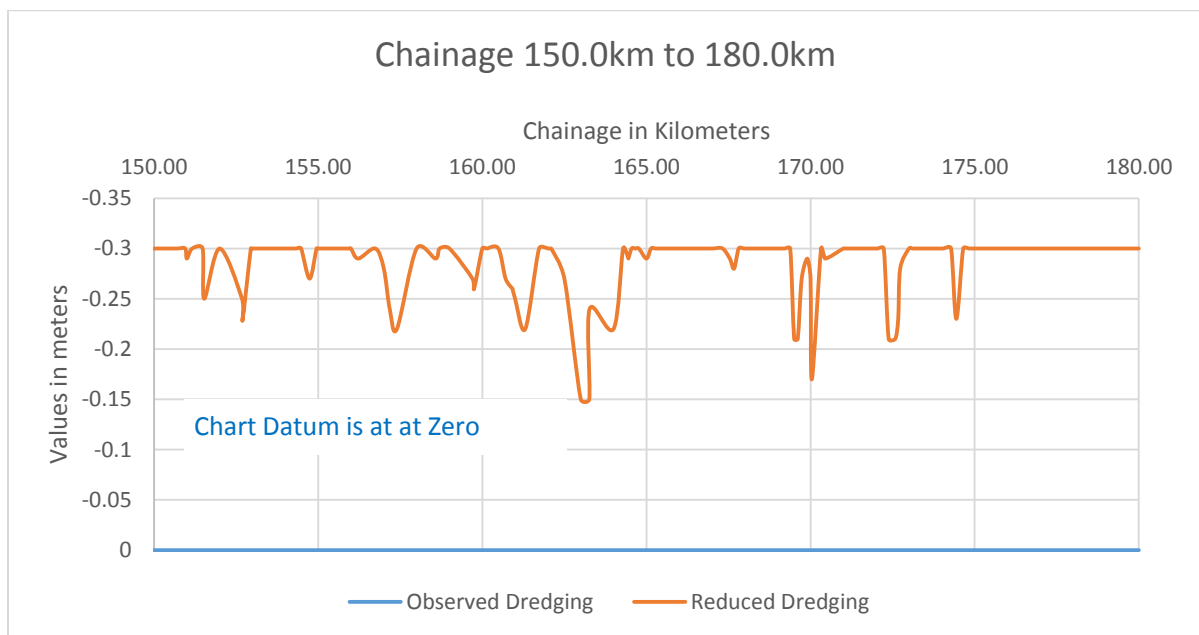
In this stretch water level was very shallow in the vicinity, having scattered flow of water with dense forest area on both the banks. There are no features crossing the river in this stretch. In addition, 03 Temples were found along the stretch.

At chainage 165.6km Shiv Mandir is located near Somnoor village on right bank in Maharashtra. At chainage 167.5km Hanuman temple is located near Gummalkoda village on the right bank in Maharashtra. At chainage 179.9km Sriram and Hanuman Temple are located near Ankisa village on the right bank in Maharashtra.

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	150	180	0	0	30,000	1,296,552.16	7,788,778.82	-0.30	0.00	30,000	1,642,640.27	9,703,118.22
II	150	180	0	0	30,000	1,974,840.28	11,863,567.45	-0.30	0.00	30,000	2,420,525.60	14,318,074.20
III	150	180	0	0	30,000	2,984,748.31	17,930,624.55	-0.30	0.00	30,000	3,538,429.99	20,970,886.44
IV	150	180	0	0	30,000	3,601,511.07	21,635,746.84	-0.30	0.00	30,000	4,180,102.06	24,810,590.37

*Table 77 - Dredging Quantity Details*

### 3.6.1 Observed and reduced Bed Profile of the stretch



*Figure 37 - River bed Profile*

### 3.7 Sub-Stretch-7: Kambalpeta to Maddikunta (ch.180.0km to 210.0km)



Figure 38 - Stretch-07 Kambalpeta to Maddikunta

- **Bathymetry Survey**
  - a) No bathymetric survey is conducted due to the unavailability of water
- **Topographic Survey**
  - b) 30km length of the stretch for which the topographic survey has been carried out.

Stretch-7 is covered 30.0km i.e. from 180.0km to 210.0km from Kambalpeta to Maddikunta village.

In this stretch water level was very shallow in the vicinity, having scattered flow of water. The depths noted were less than half a meter and hence could not be surveyed using survey boat. Instead, the spot levels were measured using Trimble R4 GPS.

In this stretch, the river is flowing between two states border i.e. Telangana and Maharashtra. Along with right bank of the river Chintarevala, Nadikuda, Kottapalli, Pochampalli, Wadadam, Tumnoor, Mugapur, Arda, Janampalli and Madikunta villages are located in Maharashtra. Left bank of the river Peddampet, Ambatipalli, Medigadda,

Suraram, Beglur, Elkeswaram, Mahadevpur, Kudurupalli, and Metpalle villages are located in Telangana state.

Arda village is located in Sironcha Tehsil of Gadchiroli district in Maharashtra. It is situated 8km away from sub-district head quarter Sironcha and 208km away from district head quarter Gadchiroli. Arda village is also a gram panchayat. Mancherial is the nearest town to Arda which is approximately 61km away.

Mahadevpur is a Mandal in Karimnagar District of Telangana State. Mahadevpur belongs to Jaya Shankar revenue division. As part Telangana District's re-organisation, Mahadevpur Mandal reorganized from Karimnagar District to Jaya Shankar district. It is located 116km towards east from district head quarter Karimnagar.

Mahadevpur Mandal is bounded by Kataram Mandal towards west, Sironcha Mandal towards north, Mutharam (Mahadevpur) Mandal towards the south, Malhar Rao Mandal towards west. Ramagundam, Mancherial, Mandamarri and Bellampalle City are the nearby cities to Mahadevpur.

Medaram, Warangal (Orugallu), Bhamragarh Wildlife Sanctuary, Sirpur, and Dantewada (Dantewara) are the near by Important tourist destinations to see.

There is no railway station near to Mahadevpur Mandal in less than 10km. Peddempet Railway Station (near to Ramagundam), Ramagundam Railway Station (near to Ramagundam) are the railway stations reachable from near by towns. However, Warangal Railway Station is major railway station 104km near to Mahadevpur

Both sides of river banks having good cultivable land. Rice, Jowar, Bajra, Wheat, Tur, Mung, Urad, Gram, Pulses, Oilseeds. Groundnut, Sunflower, Soya bean, Cotton, Sugarcane are the major crops that are cultivated mostly in the area.

In this stretch 02 Temple, Mallikarjun Temple Arda near Arda village and Hanuman Temple near Pentipaka village is located on the right bank. No prominent features across the river.

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	180	210	0	0	30,000	1,294,418.71	9,083,197.53	-0.30	0.00	30,000	1,653,594.93	11,356,713.15
II	180	210	0	0	30,000	1,971,580.11	13,835,147.56	-0.30	0.00	30,000	2,432,635.42	16,750,709.62
III	180	210	0	0	30,000	2,979,869.55	20,910,494.10	-0.30	0.00	30,000	3,550,999.90	24,521,886.34
IV	180	210	0	0	30,000	3,595,610.73	25,231,357.57	-0.30	0.00	30,000	4,192,044.21	29,002,634.58

Table 78 - Dredging Quantity Details

### 3.7.1 Observed and reduced Bed Profile of the stretch

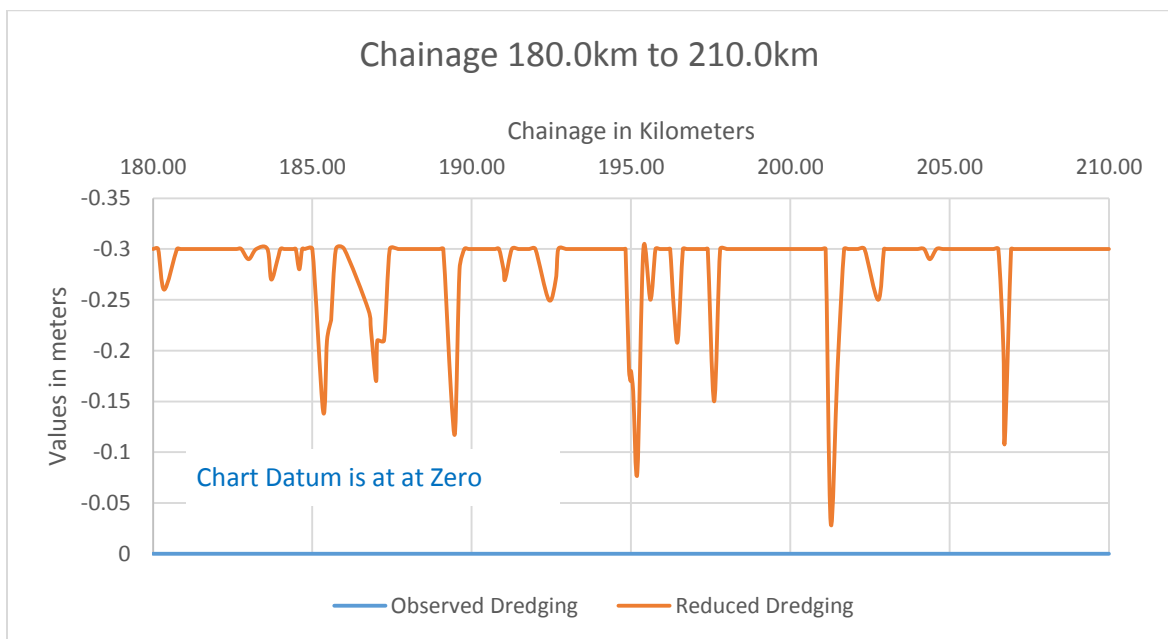


Figure 39 - River bed Profile



### 3.8 Sub-Stretch-8: Maddikunta to Chendrupalli (ch.210.0km to 240.0km)

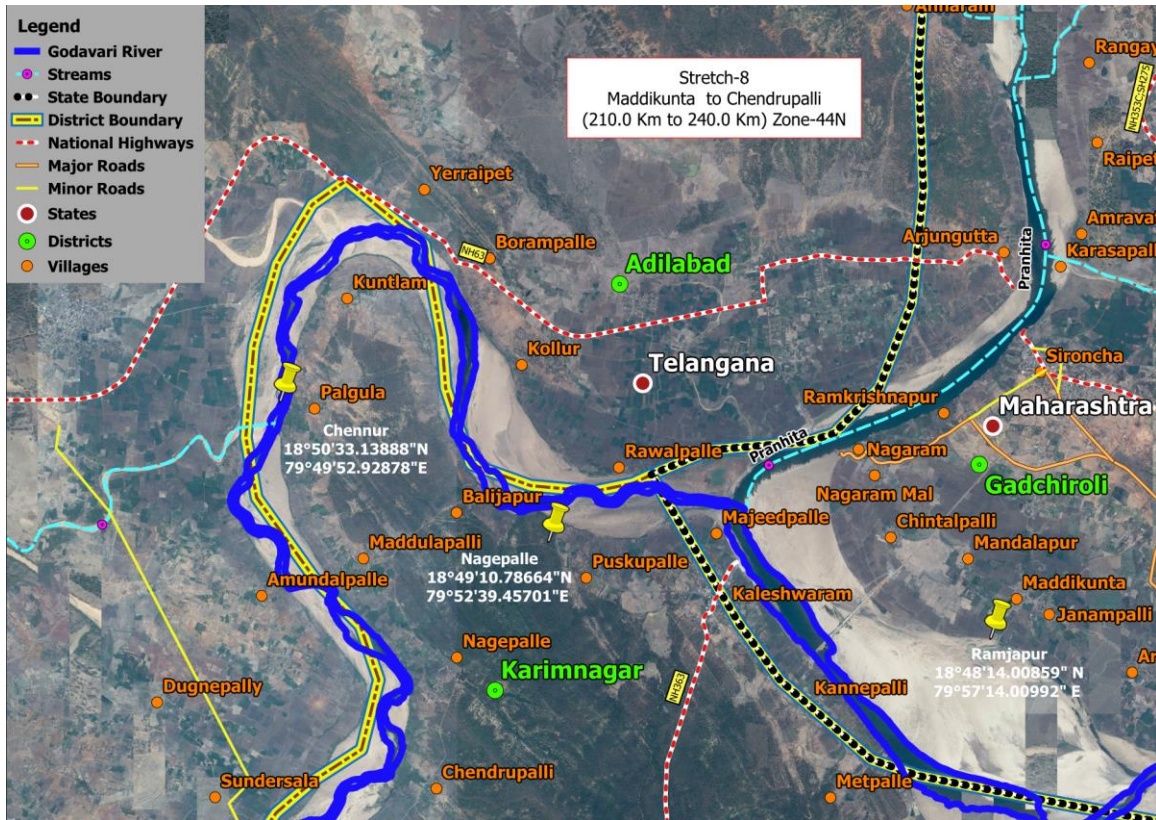


Figure 40 - Stretch-08 Maddikunta to Chendrupalli

- **Bathymetry Survey**
  - a) No bathymetric survey is conducted due to the unavailability of water
- **Topographic Survey**
  - b) 30km length of the stretch for which the topographic survey has been carried out.

Stretch-8 is covered 30.0km i.e. from 210.0km to 240.0km from Maddikunta to Chendrupalli. In this stretch water level was very shallow in the vicinity, having scattered flow of water. The depths noted were less than half a meter and hence could not be surveyed using survey boat. Instead, the spot levels were measured using Trimble R4 GPS.

In this stretch along the right bank of the river Mandalpur, Chintapalli and Nagaram Mal villages are located in Maharashtra, Kollur, Yerraipet and Dugnepally villages are located in Telangana. and left bank of the river Kannepalli, Kaleshwaram, Majeedpalle, Puskupalle, Balijapur, Kuntlam, Paigula, Maddulapalli, Nagepalle and Chendrupalli villages are located.

Both sides of river banks having good cultivable land. Rice, Jowar, Bajra, Wheat, Tur, Mung, Urad, Gram, Pulses, Oilseeds. Groundnut, Sunflower, Soyabean, Cotton, Sugarcane are the major crops that are cultivated mostly in the area.

Mandalpur is village located in Sironcha Taluka, Gadchiroli district of Maharashtra.

Nagram is a village in Sironcha Taluka in Gadchiroli District of Maharashtra State. It is located 176km towards south from district headquarter Gadchiroli and 7km from Sironcha. 870km from state capital Mumbai.

Ramanjapur (vl), Sironcha, Sironcha (ryt), Maddikuntha and Janampalli Chek are the nearby villages to Nagram. Nagram is surrounded by Kotapally Taluka towards the north, Chennur Taluka towards west, Mahadevpur Taluka towards the south, Kataram Taluka towards the south. Ramagundam, Mandamarri, Mancherial, and Bellampalle are the nearby cities to Nagram.

This place is in the border of the Gadchiroli District and Karimnagar District. Karimnagar District Mahadevpur is south towards this place. It is near to the Telangana State Border.

There is no railway station near to Nagram in less than 10 km. Kazipet Town Railway Station (near to Warangal), Mancherial Railway Station (near to Mancherial), Ravindrakhani Railway Station (near to Mancherial), Warangal Railway Station (near to Warangal) are the railway stations reachable from near by towns. Mancherial, Warangal, Ballarpur, and Gadchiroli are nearby towns to Nagram having road connectivity to Nagram.

Kaleshwaram is a village in Mahadevpur Mandal in Karimnagar district in the Indian state of Telangana. Kaleshwaram is at the juncture of the rivers the Godavari and its tributary Pranhita.

It is the site of a temple of the Hindu god Lord Shiva. The temple is significant because of the two Shiva Lingas that are found on a single pedestal. These linga are named after Lord Shiva and Lord Yama. Collectively, they are known as Kaleshwara Mukteswara Swamy. Kaleshwaram is one of three Shiva temples mentioned in Trilinga Desham, or "Land of Three Lingas."

Kaleshwaram is located exactly at the merging point of the Godavari River and its tributary, the river Pranhita. People believe that there is another river named Saraswathi

flowing under Godavari and Pranhita, therefore calling the meeting point as "Triveni Sangamam", with Triveni meaning "Three" and Sangamam meaning "confluence."

At chainage 213.495km Sironcha Road bridge is constructed across Godavari river. It is connecting between two states i.e near Kaleswaram Telangana and Nagaram village Maharashtra.



*Figure 41 - Sironcha Road Bridge (ch.213.495km)*

At chainage 216.400km Pranhita/Wainganga confluence with Godavari river.

Pranhita is the largest tributary of Godavari River covering about 34 percent of its drainage basin conveying the combined waters of the Penganga River, Wardha River, and Wainganga River. By virtue of its extensive network of tributaries, the river drains all of Vidharba region as well as the southern slopes of the Satpura Ranges. It flows along the border of Gadchiroli district in Maharashtra and Adilabad district in Telangana. The Pranhita sub-basin is the 7th largest in India.

In this stretch, the river is sandy/rocky scattered flow of water in small non-navigable streams and the basal portion containing a fine sand bank of the river. There is 01 Bridge across and 05 Temple along the river in this stretch.

At chainage 215.60km Kaleshwara Muktheswara Swamy Temple, Adimuktheswar Swami Temple, Saraswati Temple and Sri Hanuman Sevasamstha Temple is located in Kaleshwaram on left bank of the river.



*Figure 42 - Sri Kaleshwara Mukteswara Swamy Temple (ch. 215.60km)*

At chainage 215.700km Hanuman Temple and Samakka Sarakka Temple near Nagaram village on the Right bank of the river.

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	210	240	0	0	30,000	1,284,849.72	10,368,047.25	-0.30	0.00	30,000	1,633,208.79	12,989,921.94
II	210	240	0	0	30,000	1,955,009.91	15,790,157.47	-0.30	0.00	30,000	2,403,116.86	19,153,826.48
III	210	240	0	0	30,000	2,950,895.78	23,861,389.88	-0.30	0.00	30,000	3,506,140.95	28,028,027.29
IV	210	240	0	0	30,000	3,559,673.95	28,791,031.52	-0.30	0.00	30,000	4,139,438.79	33,142,073.37

*Table 79 - Dredging Quantity Details*

### 3.8.1 Observed and reduced Bed Profile of the stretch

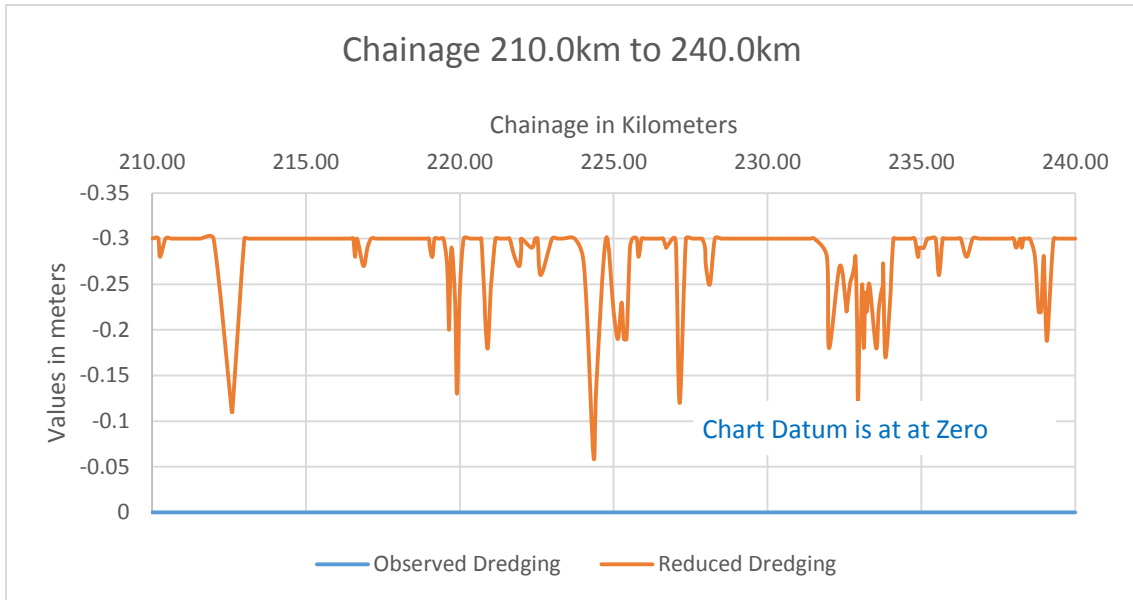


Figure 43 - River bed Profile



### 3.9 Sub-Stretch-9: Chendrupalli to Vilochavaram (ch.240.0km to 270.0km)

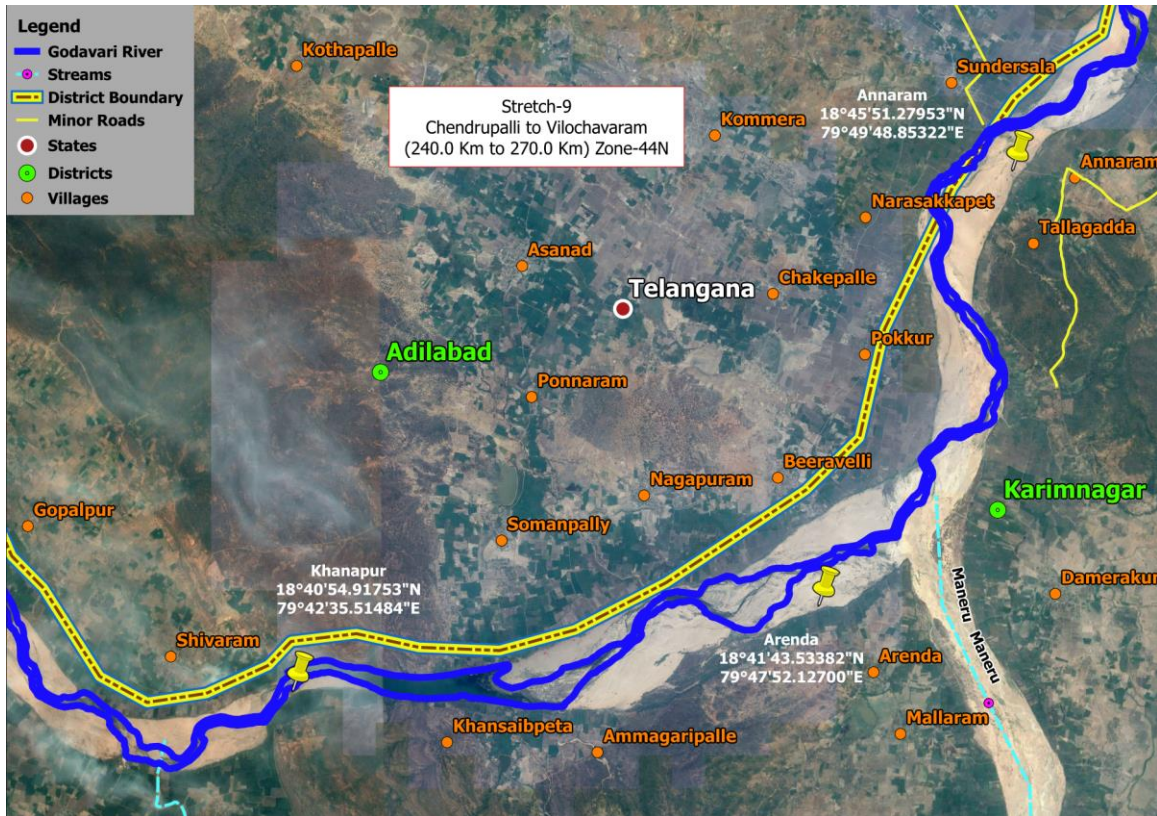


Figure 44 - Stretch-09 Chendrupalli to Vilochavaram

- **Bathymetry Survey**
  - a) No bathymetric survey is conducted due to the unavailability of water.
- **Topographic Survey**
  - b) 30km length of the stretch for which the topographic survey has been carried out.

Stretch-9 is covered 30.0km i.e. from 240.0km to 270.0km from Chendrupalli to Vilochavaram village. In this stretch river scattered flow of water in small non-navigable streams and the basal portion containing fine Lithic sand and bushes growth both bank of the river. The depths noted were less than half a meter and hence could not be surveyed using survey boat. Instead, the spot levels were measured using Trimble R4 GPS.

In this stretch along the right bank of the river Sundersala, Narsakkapet, Pokkur, Beeravalli, Nagapuram Somanpally, and Shivaram villages are located and left bank of the rivers Annaram, Damerakunta, Arenda, Khanapur, Manthani and Vilochavarm villages are located.



Both sides of river banks having cultivable land. Rice, Jowar, Bajra, Wheat, Tur, Mung, Urad, Gram, Pulses, Oilseeds. Groundnut, Sunflower, Soyabean, Cotton, Sugarcane are the major crops that are cultivated mostly in the area.

Narsakkapet is a village in Ellanthakunta Mandal in Karimnagar District of Telangana State, India. It belongs to Telangana region. As part Telangana District's re-organisation, Narsakkapet village Ellanthakunta Mandal reorganized from Karimnagar District to Hanamkonda district. It is located 18km towards west from district head quarter Karimnagar. 6 km from Ellanthakunta.

Jawaharpet, Galipally, Kandikatkoor, Parvella, and Vanthadupula are the nearby villages to Narsakkapet. Narsakkapet is surrounded by Bejanki Mandal towards south, Boinpalli Mandal towards north, Karimnagar Mandal towards east, Vemulawada Mandal towards west. Karimnagar, Sircilla, Siddipet, Jagtial are the nearby cities to Narsakkapet. This place is in the border of the Karimnagar District and Medak District. Medak District Chinnakodur is south towards this place.

There is no railway station near to Narsakkapet in less than 10km. Karimnagar Railway Station (near to Karimnagar), Kothapalli Railway Station (near to Karimnagar) are the railway stations reachable from near by towns. However, Kazipet Jn Railway Station is major railway station 78km near to Narsakkapet.

Pokkur village is located in Chennur Tehsil of Adilabad district in Telangana, India. It is situated 19km away from sub-district head quarter Chennur and 229km away from district head quarter Adilabad. Mancherial is the nearest town to Pokkur which is approximately 58km away.

Damarakunta is a village in Mulug Mandal in Medak District of Telangana State. It is located 84km towards east from district head quarter Sangareddi. 16km from Mulug. Vardarajpur, Karkapatla, Markook, Peerlapalle, Cheberthy are the nearby villages to Damarakunta. Damarakunta is surrounded by Jagdevpur Mandal towards the north, Mulug Mandal towards west, Bommala Ramaram Mandal towards the south, Gajwel Mandal towards the north. Bhongir, Jangaon, Siddipet, Hyderabad are the nearby cities to Damarakunta. This place is in the border of the Medak District and Rangareddi District. Rangareddi District Medchal is west towards this place.

Initially, Damarakunta was known as Tamarakunta which means lotus pond, as days pass it became today's Damarakunta. It's a small peaceful village which is 5km far from Kalvakuntla Chandrashekar Rao (Telangana Chief Minister) on another side there are biotechnology parks around the village. Damarakunta is the center of many villages and

connects them. Many archaeological items were found in this village. Which is other reason for its land value the main reason for land value is its fertility.

At chainage 252.0km Manair River a tributary joins Godavari River near Damerkunta village. The Manair River is a tributary of the Godavari River in India. The Lower Maner Dam built across this river provides drinking water to Karimnagar, Telangana and also to the NTPC power plant at Ramagundam.

Arenda village is located in Manthani Tehsil of Karimnagar district in Telangana. It is situated 23km away from sub-district head quarter Manthani and 88km away from district head quarter Karimnagar. Arenda village is also a gram panchayat. Ramagundam is the nearest town to Arenda which is approximately 45km away. There are Hanuman Temple and Pochamma Gudi Temple near Venkatapur- Mallaram Road, Arenda village.

Manthani is a village in Peddapalli district of the Indian state of Telangana. It is located in Manthani mandal. It is situated on the banks of the river Godavari. It is a very ancient center of Vedic learning, and even today houses many scholars well versed in the ancient knowledge of the Vedas and Shastras.

The Manthani village is surrounded by the sacred Godavari River on the northern side, Bokkala Vaagu in the south, a lush green reserve forest in the east and Ravula Cheruvu, a small lake on the western side. Manthani is blessed with several ancient temples. Some of them are Lord Saileshwara Temple, Laxmi Narayana Swamy Temple, Mahalaxmi Temple, Gautameswara Temple, Vinayaka Temple, Dattatreya Temple, Saraswati Temple, Ramalayam Temple, Panchayatanam Temple and the Omkeshwara Temple. Most of the temples in Manthani were built during the Kakatiya period.

According to an inscription of Sri Jagadguru Shankaracharya at Dwarakapeetam and Pushpagiri Peetam, Adi Shankara had visited Mantrakootam, now known as Manthani, during early sixth century AD and praised the vedic customs and vedic literacy of the people of this place.

At chainage 267.482km 02 temples namely Lord Shiva Temple and Sri Gowthameeshwara Temple near Ganga Road, Khanpur village.



Figure 45 - Sri Gowthameswaram Temple (ch.267.482km)

There is no prominent feature across the river. Banks are unprotected in nature.

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	240	270	0	0	30,000	1,288,711.53	11,656,758.78	-0.30	0.00	30,000	1,636,374.93	14,626,296.87
II	240	270	0	0	30,000	1,962,153.74	17,752,311.21	-0.30	0.00	30,000	2,408,587.04	21,562,413.52
III	240	270	0	0	30,000	2,964,088.74	26,825,478.62	-0.30	0.00	30,000	3,517,992.04	31,546,019.33
IV	240	270	0	0	30,000	3,576,337.72	32,367,369.24	-0.30	0.00	30,000	4,154,999.06	37,297,072.43

Table 80 - Dredging Quantity Details

### 3.9.1 Observed and reduced Bed Profile of the stretch

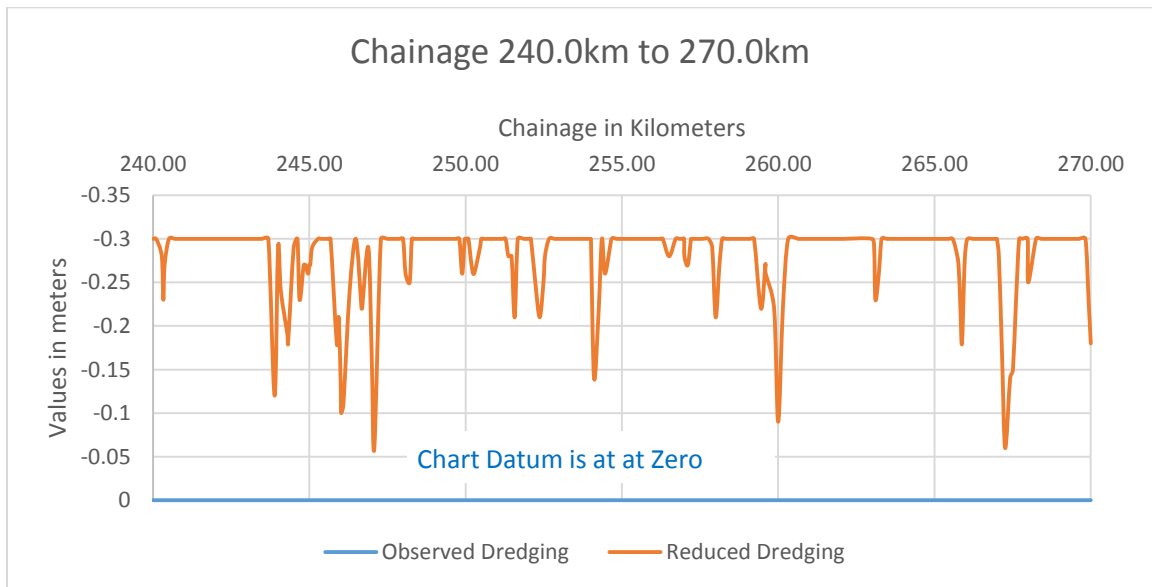


Figure 46 - River bed Profile

### 3.10 Sub-Stretch-10: Vilochavaram to Seetharampally (ch.270.0km to 300.0km)

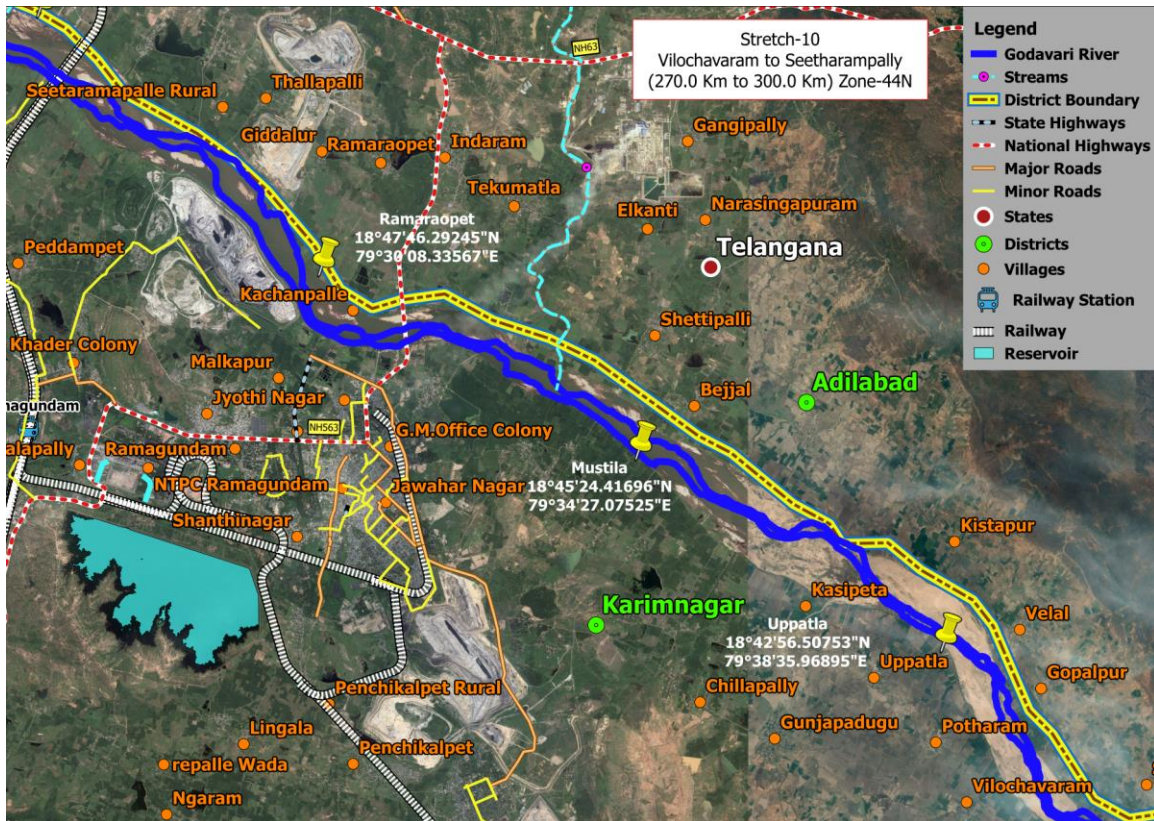


Figure 47 - Stretch-10 Vilochavaram to Seetharampally

- **Bathymetry Survey**
  - a) No bathymetric survey is conducted due to the unavailability of water
- **Topographic Survey**
  - b) 30km length of the stretch for which the topographic survey has been carried out.

Stretch-10 is covered 30.0 km i.e. from 240.0km to 270.0km from Vilochavaram to Seetharampally. In this stretch river scattered flow of water in small non-navigable streams and the basal portion containing fine Lithic sand and bushes growth both bank of the river. The depths noted were less than half a meter and hence could not be surveyed using survey boat. Instead, the spot levels were measured using Trimble R4 GPS.

In this stretch along the right bank of the river Gopalpur, Velal, Kistapur, Kundaram, Bejjal, Shettipalli, Tekumatala, Indaram, Ramaraopet and Seetharampally villages are



located and left bank of the river Potharam, Uppatla, Mustyala, Sundilla, and Janagam villages are located.

Both sides of river banks having cultivable land. Rice, Jowar, Bajra, Wheat, Tur, Mung, Urad, Gram, Pulses, Oilseeds. Groundnut, Sunflower, Soyabean, Cotton, Sugarcane are the major crops that are cultivated mostly in the area.

Velal village is located in Jaipur Tehsil of Adilabad district in Telangana, India. It is situated 20km away from sub-district head quarter Jaipur and 198km away from district head quarter Adilabad. Velal village is also a gram panchayat.

Velal is the famous for the temple on hills of lord Mallana on Shivarathri festival nearby Godavari River on the excellent environment at the time of the festival.

Settipalli is a village in Gundala Mandal in Khammam District of Telangana State, It is located 87km towards north from district head quarter Khammam.

Settipalli is surrounded by Yellandu Mandal towards the south, Kothagudem Mandal towards west, Tekulapally Mandal towards the south, Pinapaka Mandal towards east.

Yellandu, Kothagudem, Manuguru, and Palwancha are the nearby cities to Settipalli.

Yellandu is the Nearest Town to Settipalli. Yellandu is 40km from Settipalli. Road connectivity is there from Yellandu to Settipalli.

There is no railway station near to Settipalli in less than 10km. However, Warangal Railway Station is major railway station 94km near to Settipalli.

Indaram village is located in Jaipur Tehsil of Adilabad district in Telangana, India. It is situated 7km away from sub-district head quarter Jaipur and 170km away from district head quarter Adilabad. Indaram village is also a gram panchayat. Mancherial is the nearest town to Indaram which is approximately 13km away.

Indaram is on the border of the Adilabad District and Karimnagar District. Karimnagar District Kamanpur is South towards this place.

Ramagundam, Mancherial, Mandamarri, and Bellampalle are the nearby cities to Indaram.

In the stretch 01 Mancherial Road Bridge and 04 High Transmission line are crossing the river, In addition, 01 National Thermal Power Corporation along with the river near Rammagundam and 01 Temple name Sri Laxmi Narasimha Swamy Temple Sundilla near Sundilla village.

At chainage 285.89km Sri Laxmi Narasimha Temple is located near Sundhilla village.



*Figure 48 - Sri Laxmi Narasimha Temple (ch.285.89km)*

At chainage 290.04km Mancherial Road Bridge is constructed over Godavari River. It is connecting between Ramagundem and Indaram villages, also connecting State Highway-01 to NH- 63.



*Figure 49 - Mancherial Road Bridge (ch.290.04km)*

At chainage 293.2km NTPC Ramagundam is located near to Rammagundam village on the left bank of the river.



Ramagundam is a city is in the Peddapalli district of the Indian state of Telangana. It is the biggest and most populous city in the Peddapalli district. It is located on the banks of the Godavari River.

NTPC Ramagundam, a part of National Thermal Power Corporation, is a 2600 MW Power station situated at Ramagundam in Peddapalli district in the Indian state of Telangana, India. It is the current largest power station in South India. It is the first ISO 14001 certified "Super Thermal Power Station" in India.

The power station gets its water periodically released from the SRSP- Sriram Sagar project. This water is stored in the balancing reservoir. The water level in the balancing reservoir is monitored daily.

NTPC Ramagundam is a Thermal Power Station and hence uses coal. This coal is available at a large scale from the Singareni Coal mining company nearby and is transported using the MGR(Merry-go-round) system wherein, a train comes on one rail route, delivers coal and returns on another route.

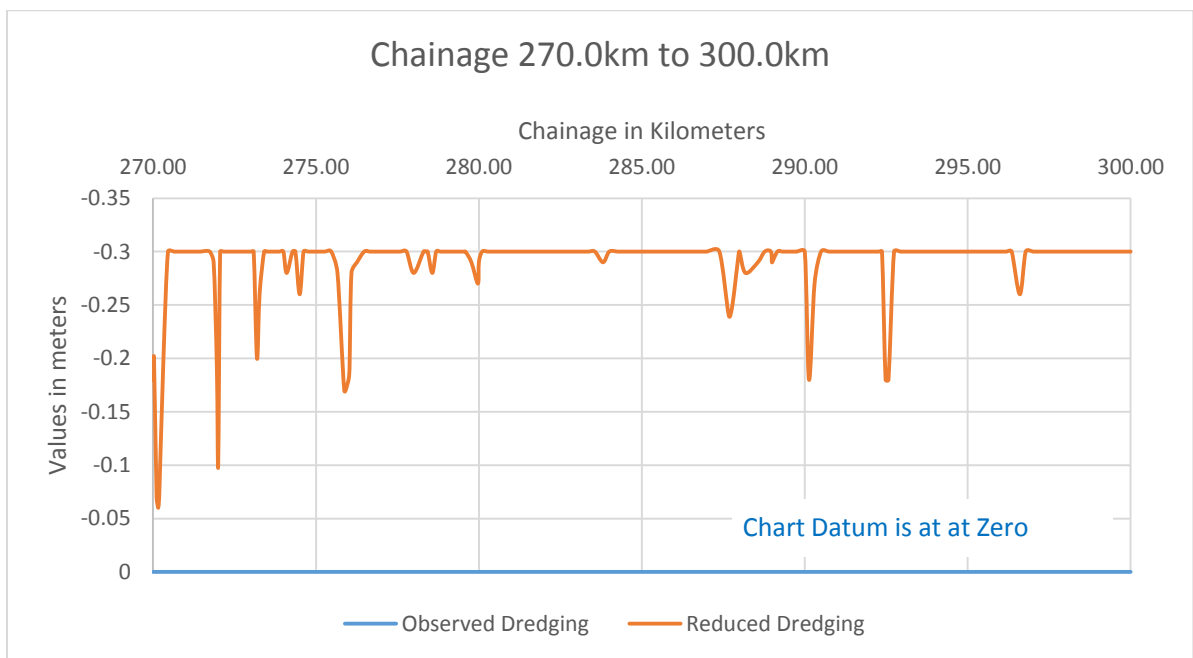


*Figure 50 - NTPC Ramagundam (ch.293.20km)*

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	270	300	0	0	30,000	1,294,953.66	12,951,712.44	-0.30	0.00	30,000	1,642,123.97	16,268,420.84
II	270	300	0	0	30,000	1,972,344.77	19,724,655.98	-0.30	0.00	30,000	2,418,084.78	23,980,498.30
III	270	300	0	0	30,000	2,979,724.49	29,805,203.11	-0.30	0.00	30,000	3,531,459.88	35,077,479.21
IV	270	300	0	0	30,000	3,595,146.57	35,962,515.81	-0.30	0.00	30,000	4,171,214.00	41,468,286.43

*Table 81 - Dredging Quantity Details*

### 3.10.1 Observed and reduced Bed Profile of the stretch



*Figure 51 - River bed Profile*

### 3.11 Sub-Stretch-11: Seetharampally to Luxettipet (ch.300.0km to 330.0km)

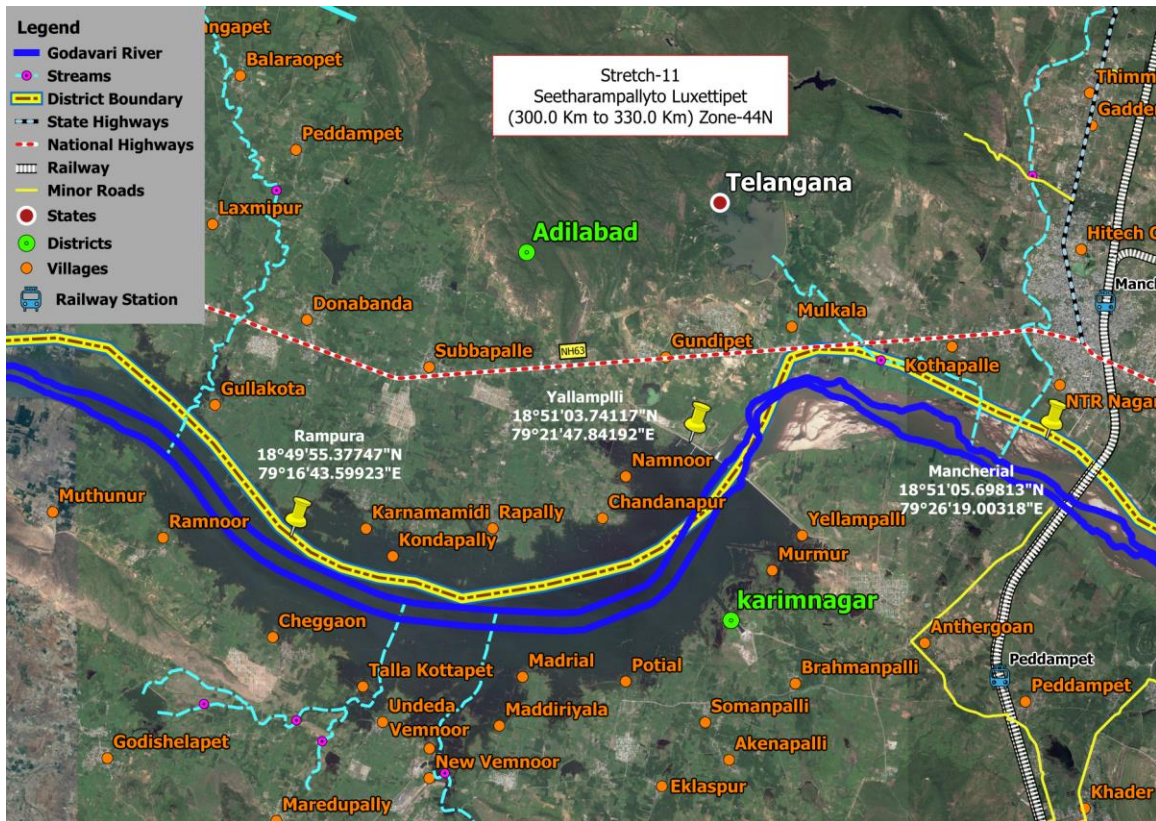


Figure 52 - Stretch-11 Seetharampally to Luxettipet

- **Bathymetry Survey**
  - a) 19.80km length of the stretch for which the bathymetric survey has been carried out.
- **Topographic Survey**
  - a) 11.20km the length of the stretch for which the topographic survey has been carried out.

Stretch-11 is covered 30.0km i.e. from 300.0km to 330.0km Seetharampally to Luxettipet. In this stretch, the river is non-navigable/dry from chainage 300.0km to 311.1km and navigable from chainage 311.20km to 330.0km.

In this stretch along the right bank of the river Manchiryal, Kothapalle, Gangoddu Palle, Chandanpur, Rappally, Padthanpally and Luxettipet villages are located and left bank of the river Peddampet, Goilwada, Yellampali, Murmur, Potial, Madrial, Undeda, Cheggam, Muttunur and Mukkatrapet villages are located.

Both sides of river banks having cultivable land. Rice, Jowar, Bajra, Wheat, Tur, Mung, Urad, Gram, Pulses, Oilseeds. Groundnut, Sunflower, Soyabean, Cotton, Sugarcane are the major crops that are cultivated mostly in the area.

Mancherial is a town and district head quarters of Mancherial district of the Indian state of Telangana. It is the administrative head quarters of Mancherial Mandal in Mancherial revenue division, situated on the north banks of Godavari River.

Mancherial is well connected by road from major parts of India. By Hyderabad-Karimnagar-Ramagundam Hwy. State-run TSRTC buses run to various towns and cities. It is connected with SH-1, NH63 and Nagpur highway. Mancherial is one of the A category stations of Secunderabad division. There is an unused airstrip at Basant Nagar Kesoram cement factory at Ramagundem which is about 25 km from Mancherial.

At chainage 300.1km a stream Tholla Vagu joins Godavari River near Manchiryal.

At chainage 301.231km a railway line bridge is crossing over Godavari river near Goilwada village. It is connecting Peddampet and Manchiryal. A new railway bridge was under construction during the course of the survey.



*Figure 53 - Manchiryal Railway Bridge (ch.301.231km)*

At chainage 303.293km a stream Ralla Vagu is joining Godavari River near NTR Nagar, Machiriyal.

Peddampet village is located in Srirampur Tehsil of Karimnagar district in Telangana, India. It is situated 7km away from sub-district head quarter Srirampur and 48km away from district head quarter Karimnagar. Karimnagar is the nearest town to Peddampet which is approximately 48km away.



Yellampalli is a village in Saidapur Mandal in Karimnagar District of Telangana. It is located 36km towards south from district head quarter Karimnagar.

Yellampalli is surrounded by Shankarapatnam Mandal towards the north, Chigurumamidi Mandal towards west, Huzurabad Mandal towards east, Elkathurthi Mandal towards east. Karimnagar, Warangal, Siddipet, and Jangaon are the nearby cities to Yellampalli.

At chainage 310.5km Yellampally Dam is constructed across Godavari River near Yellampally village.

Sripada Yellampalli project is an irrigation project located at Yellampalli village, Ramagundam Mandal, between Karimnagar-Adilabad districts in Telangana, The project is fourth largest on the Godavari River in Telangana region.



*Figure 54 - Yellampally Dam (ch.310.5km)*

Luxettipet is a City in Luxettipet Mandal in Adilabad District of Telangana. It is located 132km towards south from district head quarter Adilabad. It is a Mandal head quarter. Mancherial, Ramagundam, Jagtial, Mandamarri are the nearby cities to Luxettipet. This place is in the border of the Adilabad District and Karimnagar District. Karimnagar District Velgatoor is South towards this place.

In this stretch 01 Railway Line Bridge, 05 High Tension transmission line, and 01 Dam features across the river. In addition to this 01 Temple and Pushkar Ghat near Manchiryal are along river prominent features.

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	300	330	0	14.77	10,250	451,093.24	13,402,805.68	-0.30	10.01	15,050	675,555.48	16,943,976.32
II	300	330	0	14.77	10,300	687,075.66	20,411,731.64	-0.30	10.01	15,600	1,012,389.60	24,992,887.90
III	300	330	0	14.77	11,000	1,038,450.69	30,843,653.80	-0.30	10.01	15,900	1,503,018.01	36,580,497.22
IV	300	330	0	14.79	11,135	1,253,100.31	37,215,616.12	-0.30	10.04	16,000	1,792,134.59	43,260,421.02

Table 82 - Dredging Quantity Details

### 3.11.1 Observed and reduced Bed Profile of the stretch

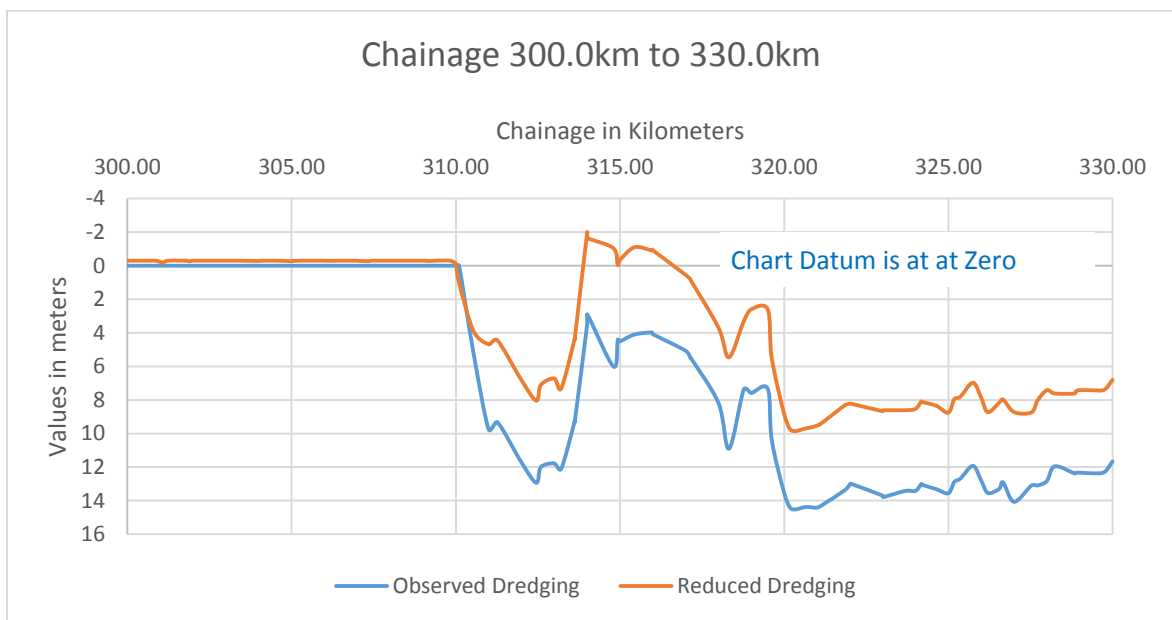


Figure 55 - River bed Profile





Both sides of river banks having cultivable land. Rice, Jowar, Bajra, Wheat, Tur, Mung, Urad, Gram, Pulses, Oilseeds. Groundnut, Sunflower, Soyabean, Cotton, Sugarcane are the major crops that are cultivated mostly in the area.

Nambal village is located in Dandepalle Tehsil of Adilabad district in Telangana, India. It is situated 14km away from sub-district head quarter Dandepalle and 140km away from district head quarter Adilabad. Kagaznagar, Bellampalle, Mandamarri, and Mancherial are the nearby cities to Nambal.

At chainage 338.333km and 338.389km two bridges are across Godavari River namely Rayapatnam Road Bridges old and new respectively. It is connecting Nizamabad and Mancherial and NH-63 is crossing over the new bridge connecting to SH-7 on left bank.



*Figure 57 - Rayapatnam Road Bridge (Old – ch.338.333km & New – ch.338.389km)*

Dharmapuri is a town and Mandal head quarters in Karimnagar district of Telangana. It is situated at a distance of about 28–30km from Jagityal town and 42km from Mancherial railway station on the Kazipet–Balharsha section of the South Central Railway on the Bank of River Godavari. This river flows west to east except in Dharmapuri where it flows north to south hence the river is termed as Dakshina Vahini.

Jaina village is located in Dharmapuri Tehsil of Karimnagar district in Telangana, India. It is situated 10km away from sub-district head quarter Dharmapuri and 80km away from district head quarter Karimnagar. Jagtial is the nearest town to Jaina which is approximately 40km away.

Tapalpur is a small village/hamlet in Jannaram Mandal in Adilabad District of Telangana State. It comes under Singaraipet Panchayath. It is located 103km towards south from district head quarter Adilabad. 10.0km from Jannaram.

Thimmapur, Rampur, Singaraipet, Papammaguda, and Gudirevu are the nearby villages to Tapalpur. Tapalpur is surrounded by Dandepally Mandal towards the east, Dharmapuri Mandal towards the south, Sarangapur Mandal towards west, Luxettipet Mandal towards the east. Jagtial, Bellampalle, Mandamarri, and Koratla are the nearby cities to Tapalpur. Mancherial is the Nearest Town to Tapalpur. Mancherial is 50km from Tapalpur. Road connectivity is there from Mancherial to Tapalpur.

There is no railway station near to Tapalpur in less than 10km. There is railway station nearby town Mancherial. However, Kazipet Jn Railway station is major railway station 144km near to Tapalpur.

In this stretch features 02 Road Bridge across the river. In addition to this 03 Temple Ayappa Swamy Temple, Sri Satyanarayana Swamy Temple and Shirdi Sai baba Temple near to Gudem Gutta village along NH-563 on the right bank. On left bank near Dharmapuri town 01 Pushkar Ghat, 02 Temple Sri Santoshi Mata Temple and Pochamma Temple.



*Figure 58 - Ayyappa Swamy Temple near Gudem Gutta (ch.337.583km)*





Figure 59 - Pushkar Ghat at Dharmapuri (ch.346.0km)

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	330	360	0	14.8	13,600	595,547.47	13,998,353.15	-0.30	11.82	16,100	843,806.83	17,787,783.15
II	330	360	0	16.1	14,000	907,661.28	21,319,392.92	-0.30	11.82	17,250	1,255,634.25	26,248,522.15
III	330	360	0	16.1	14,000	1,372,830.37	32,216,484.17	-0.30	11.82	18,100	1,869,464.88	38,449,962.10
IV	330	360	0	16.1	14,000	1,657,369.22	38,872,985.34	-0.30	11.82	18,550	2,249,361.64	45,509,782.66

Table 83 - Dredging Quantity Details

### 3.12.1 Observed and reduced Bed Profile of the stretch

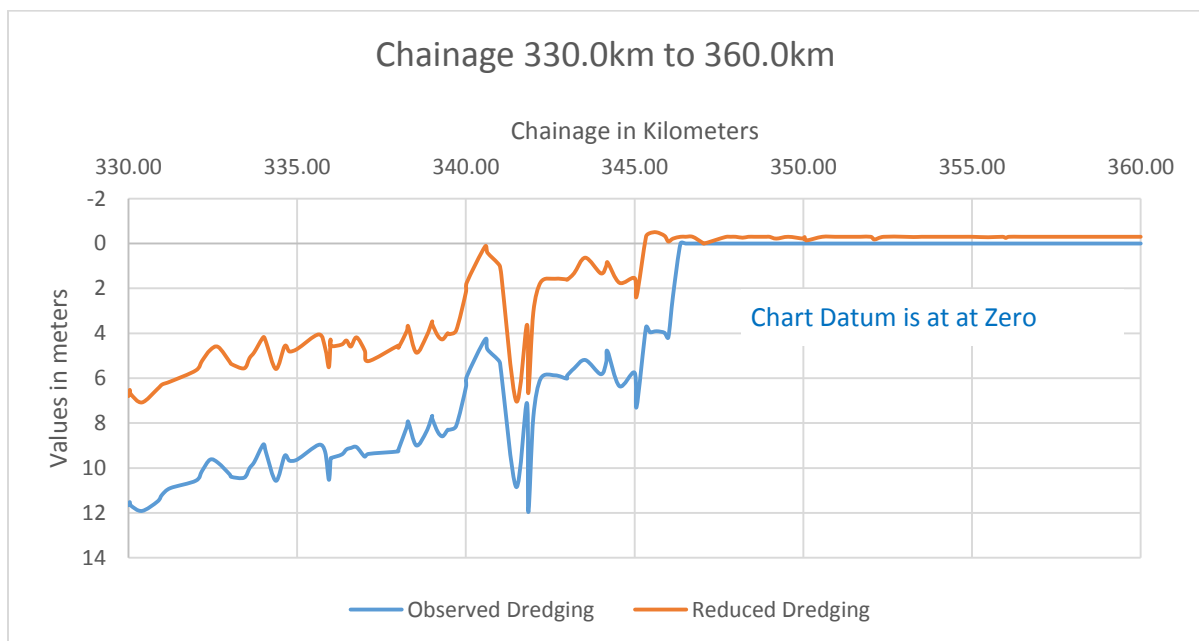


Figure 60 - River bed Profile

### 3.13 Sub-Stretch-13: Tapalpur to Narsingapur (ch.360.0km to 390.0km)

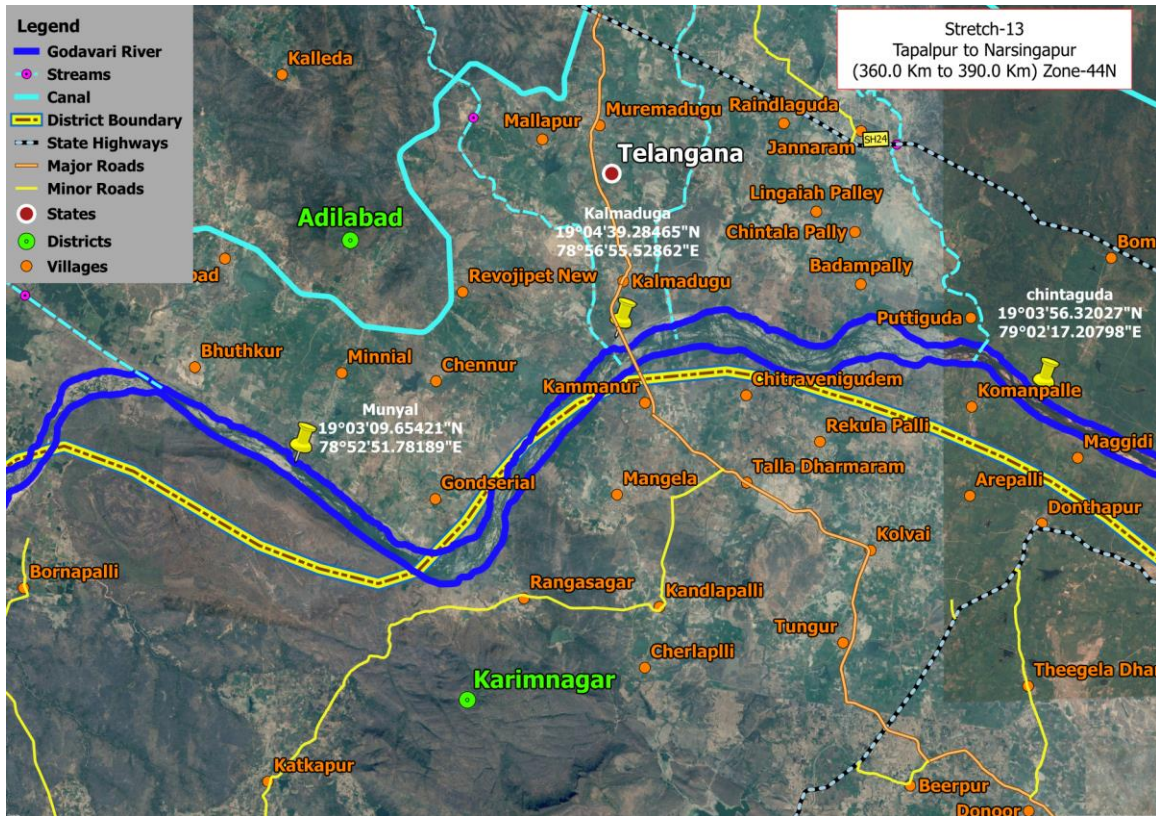


Figure 61 - Stretch-13 Tapalpur to Narsingapur

- **Bathymetry Survey**
  - a) No bathymetric survey is conducted due to the unavailability of water
- **Topographic Survey**
  - b) 30.0km length of the stretch for which the topographic survey has been carried out.

Stretch-13 is covered 30.0km i.e. from 360.0km to 390.0km Tapalpur to Narsingapur village. In this stretch, the river is non-navigable/dry and fully rocky. The depths noted were less than half a meter and hence could not be surveyed using survey boat. Instead, the spot levels were measured using Trimble R4 GPS.

In this stretch along the right bank of the river Chintaguda, Badampally, Dharmaram, Kalmadugu, Revojjpet, Gondserial and Narsingapur villages are located and left bank of the river Donthapur, Komanpalle, Chitravenigudem, Kammanur, Mangela, Rangasagar and Devanpally villages are located.

Both sides of river banks having well cultivable land. Cotton, Maize, Chilli, Ground Nut, Paddy, Wheat, Sugarcane, Turmeric, Pulses are the major crops that are cultivated mostly in the area.

Donthapur village is located in Dharmapuri Tehsil of Karimnagar district in Telangana, India. It is situated 12km away from sub-district head quarter Dharmapuri and 77km away from district head quarter Karimnagar. Jagtial is the nearest town to Donthapur which is approximately 43km away.

Chitravenigudem is a small village/hamlet in Sarangapur Mandal in Karimnagar District of Telangana State, India. It comes under Thalladharmaram Panchayath. It belongs to Telangana region. It is located 85km towards north from district head quarter Karimnagar. 9km from Sarangapur.

Mangela, Mothinagar, Kolvai, Arpapalle, and Kandlapalle are the nearby villages to Chitravenigudem. Chitravenigudem is surrounded by Sarangapur Mandal towards south, Kaddam (Peddur) Mandal towards west, Dharmapuri Mandal towards south, Dandepally Mandal towards east. Jagtial, Koratla, Bellampalle, and Mandamarri are the nearby cities to Chitravenigudem.

Dharmaram is a Mandal in Karimnagar District of Telangana State. Dharmaram Mandal Headquarters is Dharmaram town. It is located 36km towards north from district head quarter Karimnagar. Dharmaram Mandal is bounded by Velgatoor Mandal towards the north, Julapalli Mandal towards the south, Pegadapalli Mandal towards west, Choppadandi Mandal towards the south. Ramagundam City, Karimnagar City, Mancherial City, Jagtial City are the nearby cities to Dharmaram.

Kalmaidugu is a village in Jannaram Mandal in Adilabad District of Telangana State. It is located 91km towards south from district head quarter Adilabad, 6km from Jannaram. Jagtial, Koratla, Bellampalle, and Mandamarri are the nearby cities to Kalmaidugu.

Narsingapur is a village in Jagtial Mandal in Karimnagar District of Telangana State. It is located 55km towards north from district head quarter Karimnagar. Narsingapur is surrounded by Mallial Mandal towards the south, Raikal Mandal towards the north, Medipalli Mandal towards west, Gollapalli Mandal towards east.

Jagtial, Koratla, Karimnagar, Sircilla are the nearby cities to Narsingapur. Jagtial is the nearest town to Narsingapur. Road connectivity is there from Jagtial to Narsingapur. Jagtial Lingampet Railway Station is the very nearby railway stations to Narsingapur.



Kawal Tiger Reserve is located at Jannaram Mandal of Adilabad district in Telangana state. Govt of India declared Kawal wildlife sanctuary as Tiger Reserve in 2012.

It is surrounded by Yavotmal and Chandrapur on the north, Karimnagar, and Nizamabad on the south and Nanded district on the west. The KWS was established in 1965 and later declared as the Protected Area (PA) in 1999 under the WPA, 1972. It is located in the schedule area of Adilabad district at a distance of 100 km from its district head quarters. It extended from the Sahyadri hill ranges to the Tadoba forest in Maharashtra. It is spread over an area of 893 km<sup>2</sup>.

The sanctuary is one of the richest Teak forests in the State with dense pristine areas free of human disturbance. The River Kadam flows through this area. Dry Deciduous Teak Forests mixed with Bamboo, Terminalia, Pterocarpus, Anogeisus, and Cassias.

Mammal species that have been sighted include tiger, leopard, gaur, cheetal, sambar, nilgai, barking deer, chowsingha and sloth bear. Several species of birds & reptiles are also found in the sanctuary.

Accessible from Mancherial 50km. And from Hyderabad 270km by road. Nearest Airport is Hyderabad.



*Figure 62 - Kawal wildlife Sanctuary (Ch. 366.428km)*

At chainage 372.143km Kalamadugu- Kammanur Road Bridge is crossing over Godavari River. It is connecting Kammanur and Kalamadugu villages.



*Figure 63 - Kalamadugu- Kammanur Road Bridge (ch.372.143km)*

At chainage 387.0km confluence of Kadam and Godavari a tributary of Godavari River. Kadam is a minor tributary of the Godavari located in the Adilabad District of Telangana. The river rises near Bazarhatnoor in the Adilabad District and flows southeastwards. The Kuntala Waterfall are formed on this river at Kuntala. The Kaddam Project is a Major Reservoir across river Kadem, a tributary river of the Godavari near Kaddam Mandal, Adilabad District state Telangana. This project also called as Kaddam Narayana Reddy Project. Beyond the project, the river flows in a linear fashion into the Godavari.

In this stretch features 01 Road Bridge across the river. In addition to this 02 Temple Hanuman Temple and Hanuman & Nara Narayana Swamy Temple near Kalamadugu village along the river.

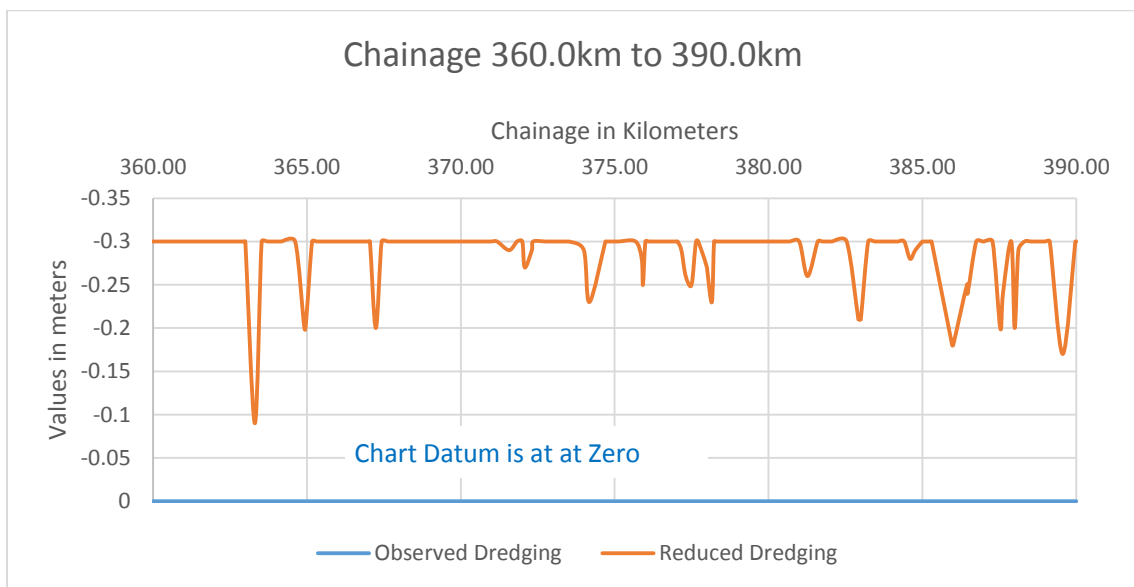


*Figure 64 - Hanuman Temple and Nara Narayan Swamy Temple (ch.371.79km)*

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	360	390	0	0	30,000	1,295,770.40	15,294,123.55	-0.30	0.00	30,000	1,655,598.54	19,443,381.69
II	360	390	0	0	30,000	1,973,639.90	23,293,032.82	-0.30	0.00	30,000	2,436,819.16	28,685,341.31
III	360	390	0	0	30,000	2,982,950.15	35,199,434.32	-0.30	0.00	30,000	3,557,943.95	42,007,906.05
IV	360	390	0	0	30,000	3,599,333.16	42,472,318.50	-0.30	0.00	30,000	4,200,070.17	49,709,852.83

*Table 84 - Dredging Quantity Details*

### 3.13.1 Observed and reduced Bed Profile of the stretch



*Figure 65 - River bed Profile*



### 3.14 Sub-Stretch-14: Narsingapur to Kristapuram (ch.390.0km to 420.0km)

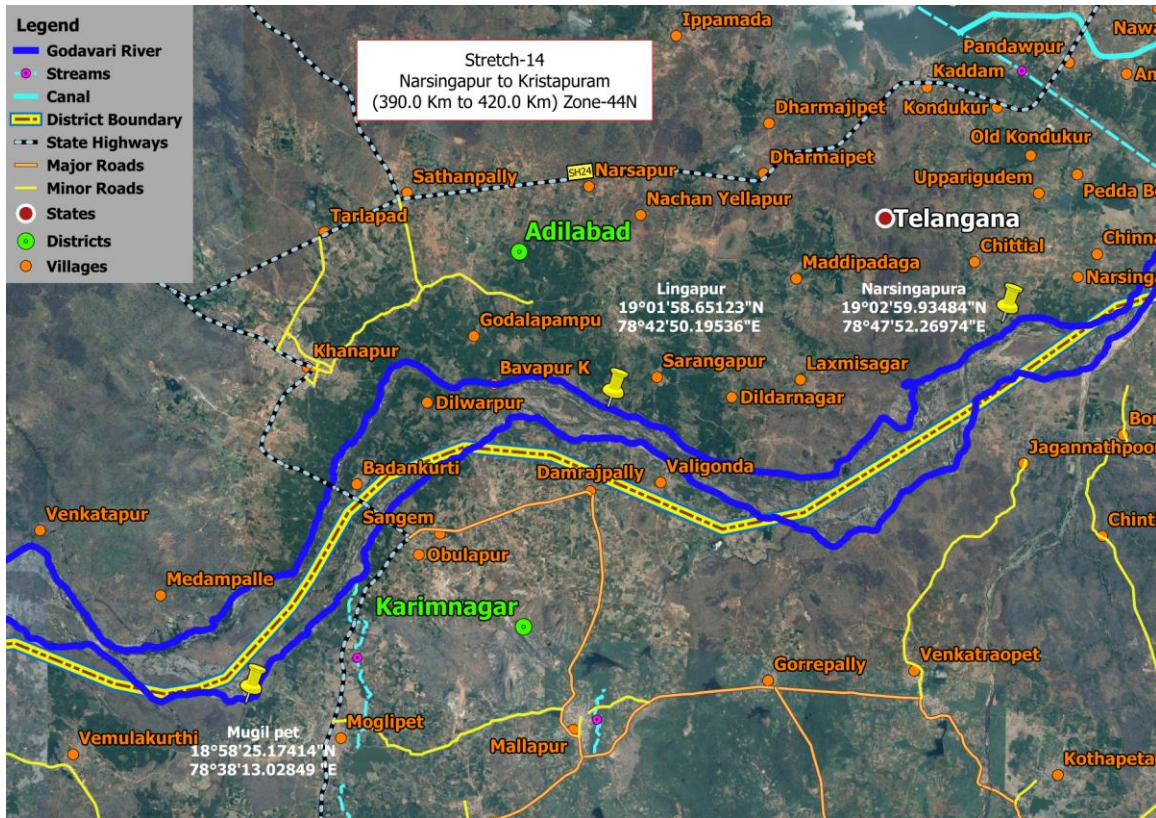


Figure 66 - Stretch-14 Narsingapur to Kristapuram

- **Bathymetry Survey**
  - a) No bathymetric survey is conducted due to the unavailability of water
- **Topographic Survey**
  - b) 30.0km length of the stretch for which the topographic survey has been carried out.

Stretch-14 is covered 30.0km i.e. from chainage 360.0km to 390.0km Narsingapur to Kristapuram village. In this stretch, the river is non-navigable/dry and fully rocky. River flow is divided into multiple streams because of Island structures present in the stretch. The depths noted were less than half a meter and hence could not be surveyed using survey boat. Instead, the spot levels were measured using Trimble R4 GPS.

In this stretch along the right bank of the river Laxmisagar, Dildarnagar, Sarangpur, Godalapampu, Khanapur, Surjapur and Venkatapur villages are located and left bank of the river Bornapalli, Jagannathpur, VenkataraoPET, Gorrepally, Valligonda, Ramrajupalli, Obulapur, Moglipet, Vemulakurthi and Kristapuram villages are located.

Both sides of river banks having well cultivable land. Cotton, Maize, Chilli, Ground Nut, Paddy, Wheat, Sugarcane, Turmeric, Pulses are the major crops that are cultivated mostly in the area.

Dildarnagar village is located in Kaddam Tehsil of Adilabad district in Telangana, India. It is situated 15km away from sub-district head quarter Kaddam and 125km away from district head quarter Adilabad. Yelagadapa is the gram panchayat of Dildarnagar village.

Laxmisagar, Masaipet, Lingapur, Maddipadga, Chittial are the nearby villages to Dildarnagar. Dildarnagar is surrounded by Mallapur Mandal towards the south, Khanapur Mandal towards west, Raikal Mandal towards the south, Ibrahimpatnam Mandal towards west. Koratla, Jagtial, Nirmal, Sircilla are the nearby cities to Dildarnagar. This place is in the border of the Adilabad District and Karimnagar District. Karimnagar District Raikal is south towards this place.

Nirmal is the nearest town to Dildarnagar which is approximately 45km away.

Bornapally is a village in Raikal Mandal in Karimnagar District of Telangana State. As part of Telangana districts re-organisation, Bornapally village Raikal Mandal reorganized from Karimnagar District to Jagtial district. It is located 71km towards north from district head quarter Karimnagar. Bornapally is surrounded by Jagtial Mandal towards the south, Sarangapur Mandal towards the east, Korutla Mandal towards west, Mallapur Mandal towards west. Jagtial, Koratla, Sircilla, and Nirmal are the nearby cities to Bornapally. This place is in the border of the Karimnagar District and Adilabad District. Adilabad District Kaddam (peddur) is north towards this place.

Koratla is the nearest town to Bornapally. Koratla is 36km from Bornapally. Road connectivity is there from Koratla to Bornapally.

Obulapuram village is located in Ellanthakunta Tehsil of Karimnagar district in Telangana, India. It is situated 9km away from sub-district head quarter Ellanthakunta and 35km away from district head quarter Karimnagar. Obulapuram village is also a gram panchayat. Karimnagar is the nearest town to Obulapuram which is approximately 35km away.

Khanapur village is located in Khanapur Tehsil of Adilabad district in Telangana, India. It is situated 115km away from district head quarter Khanapur. Khanapur is the sub-district head quarter of Khanapur village. Khanapur village is also a gram panchayat. Nirmal is the nearest town to Khanapur which is approximately 49km away.

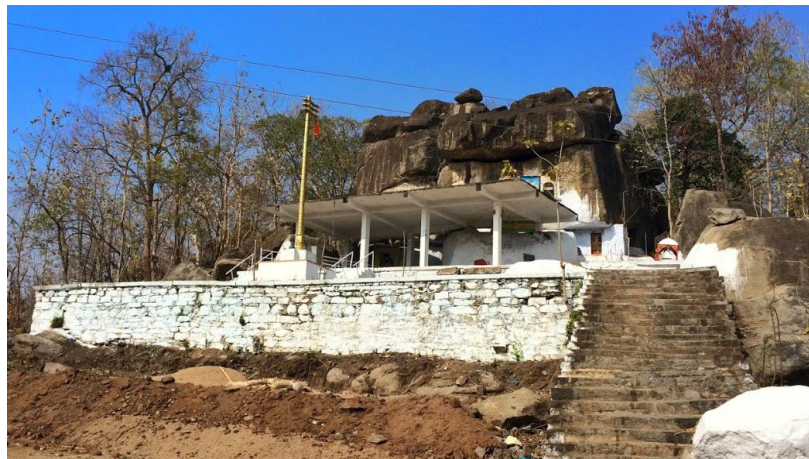
At chainage 411.479km Khanapur Road Bridge is constructed across Godavari River near Obulapur village. It is connecting between Obulapur and Khanapur villages.



*Figure 67 - Khanapur Road Bridge (ch.411.479km)*

Vemulakurthi village is located in Ibrahimpatnam Tehsil of Karimnagar district in Telangana, India. It is situated 12km away from sub-district head quarter Ibrahimpatnam and 98km away from district head quarter Karimnagar. Varshakonda is the gram panchayat of Vemulakurthi village. Metpalle is the nearest town to Vemulakurthi which is approximately 18km away.

Laxmi Narsimha Swamy Temple near Dildarnagar village on the right bank of the river.



*Figure 68 - Laxmi Narsimha Swamy Temple (ch.399.706km)*

Sri Ram Temple near Valigonda village on the left bank of the river along the river.





Figure 69 - Sri Ram Temple near Valigonda village (ch.403.443km)

In this stretch features 01 Road Bridge across the river. In addition to this 02 Temple.

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	390	420	0	0	30,000	1,294,031.48	16,588,155.03	-0.30	0.00	30,000	1,653,053.80	21,096,435.49
II	390	420	0	0	30,000	1,970,987.68	25,264,020.50	-0.30	0.00	30,000	2,432,914.53	31,118,255.84
III	390	420	0	0	30,000	2,978,976.27	38,178,410.59	-0.30	0.00	30,000	3,552,111.62	45,560,017.67
IV	390	420	0	0	30,000	3,594,544.54	46,066,863.04	-0.30	0.00	30,000	4,193,332.57	53,903,185.40

Table 85 - Dredging Quantity Details

### 3.14.1 Observed and reduced Bed Profile of the stretch

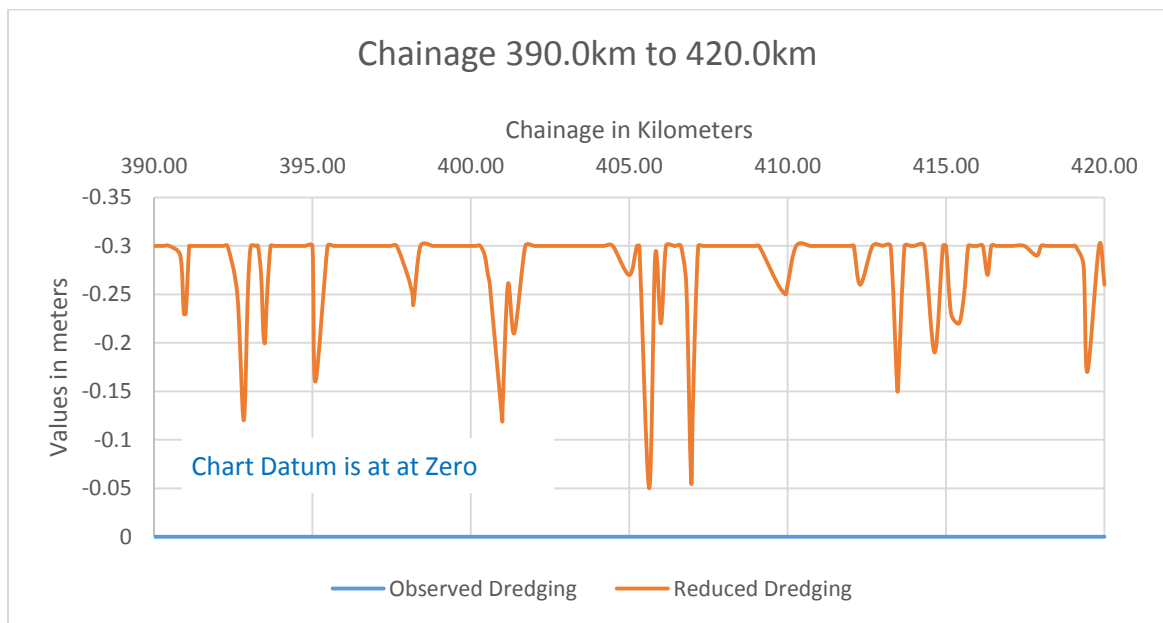


Figure 70 - River bed Profile

### 3.15 Sub-Stretch-15: Kristapuram to Doodhgaon (420.0km to 450.0km)

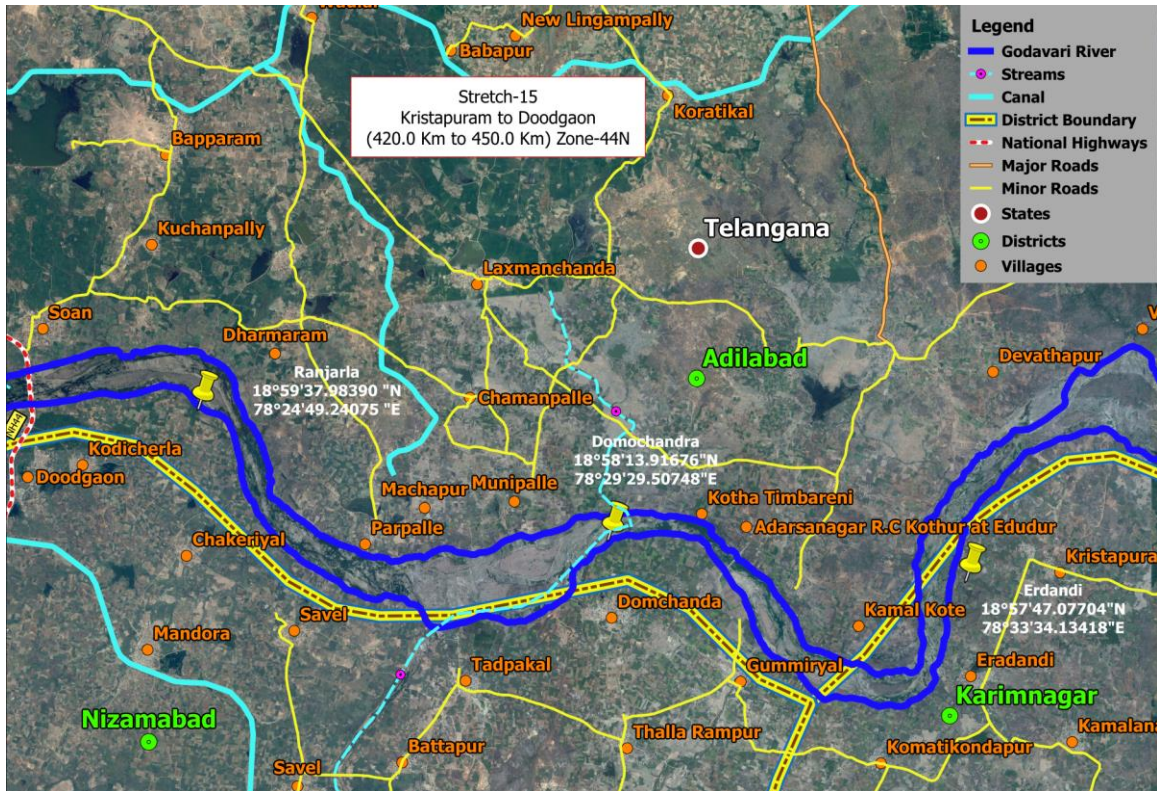


Figure 71 - Stretch-15 Kristapuram to Doodhgaon

- **Bathymetry Survey**
  - a) No bathymetric survey is conducted due to the unavailability of water
- **Topographic Survey**
  - b) 30.0km length of the stretch for which the topographic survey has been carried out.

Stretch-15 is covered 30.0km i.e. from chainage 360.0km to 390.0km Kristapuram to Doodhgaon village. In this stretch, the river is non-navigable/dry and fully rocky. River flow is divided into multiple streams because of Island formations present in the stretch. The depths noted were less than half a meter and hence could not be surveyed using survey boat. Instead, the spot levels were measured using Trimble R4 GPS.

In this stretch along the right bank of the river Chintalchanda, Parpalle, Dharmaram, and Soan villages are located. On the left bank of the river Eradandi, Gummiryal, Domchanda, Tadpakal, Savel, Doodgaon villages are located.

Erdandi village is located in Ibrahimpatnam Tehsil of Karimnagar district in Telangana. It is situated 6km away from sub-district head quarter Ibrahimpatnam and 100km away from district head quarter Karimnagar. Eradandi is the gram panchayat of Eradandi

village. Metpalle is the nearest town to Erdandi which is approximately 18km away. Koratla is the Nearest Town to Eradandi. Koratla is 28km from Eradandi. Road connectivity is there from Koratla to Eradandi.

At chainage 434.73km Gummiryal Godavari Road Bridge is crossing over Godavari River. It is connecting between Gummiryal and Thruka village.



*Figure 72 - Gummiryal Godavari Road Bridge (ch.434.730km)*

At chainage 441.339km Pedda Vagu River joins Godavari River near Tadpakal village. It is a minor Tributary of Godavari River.

At chainage 441.229km and 441.343km 02 Temple, Saraswathi Temple and Ram Mandir are located near Tadpakal village on the left bank of the river.

Soan is a village in Nirmal Mandal in Adilabad District of Telangana State. It is located 89km towards south from district head quarter Adilabad. 11km from Nirmal.

Ganjal, Kuchanpalle, Peechara, Madhapur, and Sangampet are the nearby villages to Soan. Soan is surrounded by Nirmal Mandal towards the north, Balkonda Mandal towards the south, Mamda Mandal towards the east, Mortad Mandal towards the south.

Nirmal, Koratla, Bhainsa, and Nizamabad are the nearby cities to Soan.

Both sides of river banks having well cultivable land. Cotton, Maize, Chilli, Ground Nut, Paddy, Wheat, Sugarcane, Turmeric, Pulses are the major crops that are cultivated mostly in the area.

In this stretch features 01 Road Bridge and 01 High Tension transmission line across the river. In addition to this 02 Temple along the river.

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	420	450	0	0	30,000	1,293,157.18	17,881,312.21	-0.30	0.00	30,000	1,657,245.48	22,753,680.97
II	420	450	0	0	30,000	1,969,662.14	27,233,682.64	-0.30	0.00	30,000	2,437,806.46	33,556,062.30
III	420	450	0	0	30,000	2,976,979.92	41,155,390.51	-0.30	0.00	30,000	3,557,902.08	49,117,919.75
IV	420	450	0	0	30,000	3,592,147.93	49,659,010.97	-0.30	0.00	30,000	4,199,138.84	58,102,324.24

Table 86 - Dredging Quantity Details

### 3.15.1 Observed and reduced Bed Profile of the stretch

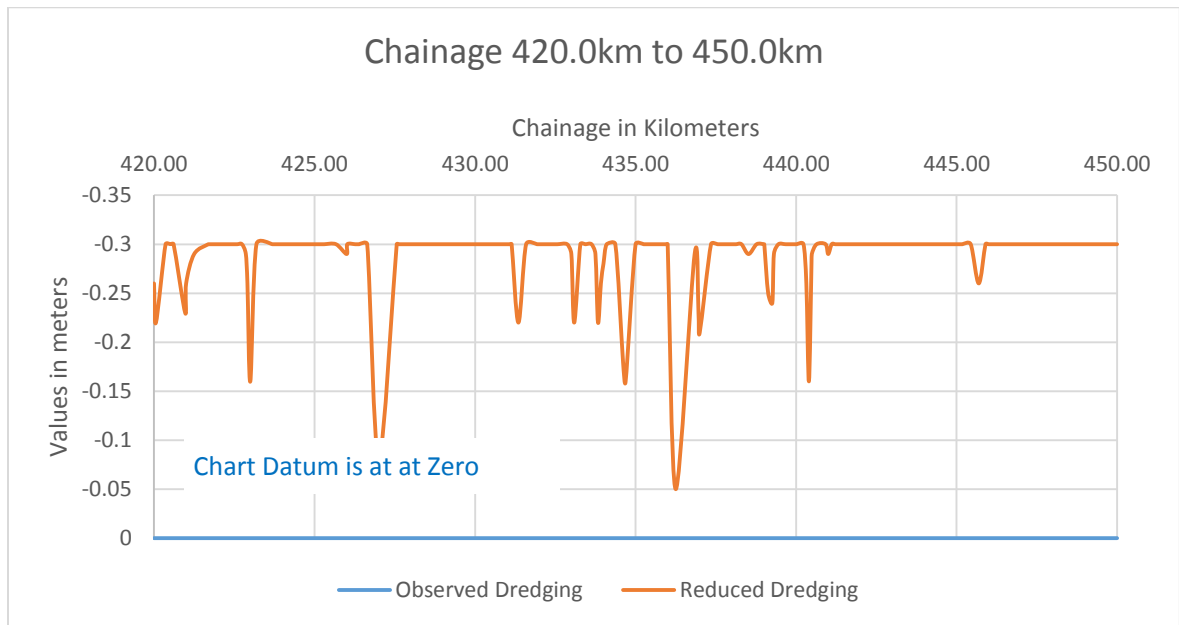


Figure 73 - River bed Profile



### 3.16 Sub-Stretch-16: Doodgaon to Gadchanda (ch.450.0km to 480.0km)

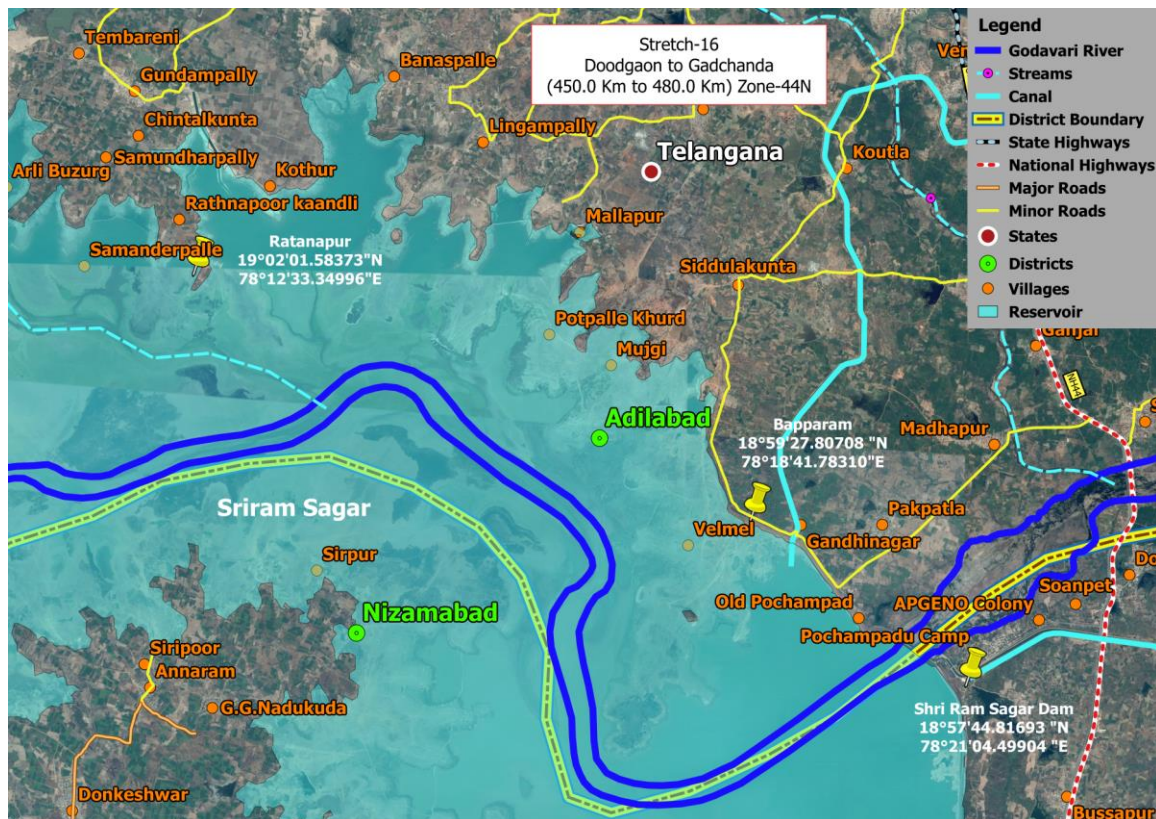


Figure 74 - Stretch-16 Doodgaon to Gadchanda

- **Bathymetry Survey**
  - a) 24.5km length of the stretch for which the bathymetric survey has been carried out.
- **Topographic Survey**
  - b) 5.5km the length of the stretch for which the topographic survey has been carried out.

Stretch-16 is covered 30.0km i.e. from 450.0km to 480.0km Doodgaon to Gadchanda. In this stretch, the river is non-navigable/dry from chainage 450.0km to 455.50km. Non-navigable stretch is fully rocky. The stretch is navigable from chainage 455.6km to 480.0km.

In this stretch along the right bank of the river Madhapur, Pakpatla, Velmel, Sangvi, Raipur and Gadchanda villages are located and left bank of the river Soanpet, Nallur, Jalalpur, and Siripoor villages are located.

Both sides of river banks having cultivable land. Rice, Jowar, Bajra, Wheat, Tur, Mung, Urad, Gram, Pulses, Oilseeds. Groundnut, Sunflower, Soyabean, Cotton, Sugarcane are the major crops that are cultivated mostly in the area.

Madhapur village in Nirmal town of Adilabad district. It is near to Godavari River in the Telangana State of India. Sriram Sagar Project on river Godavari is two kilometers from Madhapur village.

Gadchanda village is located in Lokeswaram Tehsil of Adilabad district in Telangana, India. It is situated 6km away from sub-district head quarter Lokeswaram and 121km away from district head quarter Adilabad. Gadchanda village is also a gram panchayat. Bhainsa is the nearest town to Gadchanda which is approximately 30km away.

Nagar, Manmad, Dharmara, Panchgudi, and Temborni are the nearby villages to Gadchanda. Gadchanda is surrounded by Nandipet Mandal towards the south, Dilawarpur Mandal towards the north, Kuntala Mandal towards the north, Mudhole Mandal towards west. Bhainsa, Nirmal, Nizamabad, Bodhan are the nearby cities to Gadchanda. This place is in the border of the Adilabad District and Nizamabad District. Nizamabad District Nandipet is south towards this place.

Bhainsa is the Nearest Town to Gadchanda. Bhainsa is 34 km from Gadchanda. Road connectivity is there from Bhainsa to Gadchanda. There is no railway station near to Gadchanda in less than 10 km. However, Nanded Railway Station is major railway station 100km near to Gadchanda.

At chainage 452.072km, Soan Road Bridge is constructed across the Godavari River. It is connecting between Doodgaon and Soan villages. At chainage 452.10km and 452.126 two bridges are across Godavari River, Srinagar- Kanyakumari (NH-44) Road Bridges respectively. It is connecting Bussapur and Ganjal villages. National Highway-44 is crossing over the bridge.





*Figure 75 - Srinagar- Kanyakumari (NH-44) Road Bridge (ch.452.10km)*

At chainage 452.698km Swarna Canal is joining Godavari River near Madhapur village.

At chainage 457.49km Sri Ram Sagar Dam is constructed across the Godavari River near Pochampally village.

The Sri Ram Sagar Project also known as the Pochampadu Project is an Indian flood-flow project on the Godavari River. The Project is located in Nizamabad district, 3km away from National Highway-44.

Sri Ram Sagar is an irrigation project across river Godavari in Telangana to serve irrigational needs in Karimnagar, Warangal, Adilabad, Nalgonda, and Khammam districts. It also provides drinking water to Warangal city. There is a hydroelectric plant working at the dam site, with 4 turbines each with 9 MW capacity generating 36 MW.



*Figure 76 - Sri Ram Sagar Hydro Power Plant (ch.457.49km)*

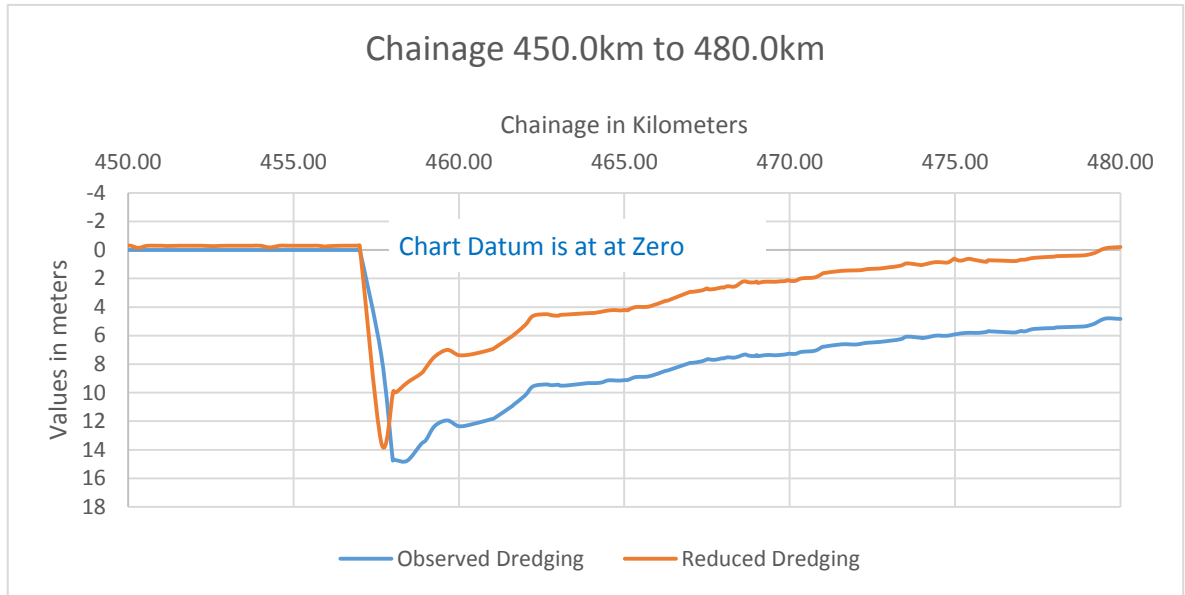
Sri Ram Sagar Hydro Power Plant	
Hydro Electric Project	Pochampad Hydroelectric Project
State Name	Telangana
Basin Name	Godavari
Hydroelectric Basin	East Flowing Rivers
Seismic Zone	Seismic Zone-II
Type of Development	Storage
Structure Type	DAM
Position of Power House	Dam Toe
Type	-
Powerhouse Status	Operational
Year Commissioned	1987
Operating & Maintenance Agency	-
Hydraulic head (m)	1360
MDDL for Powerhouse (m)	-
Annual Design energy (MU)	91
Firm Power (MW)	19
No. of Turbines/Units (MW)	4
Capacity per turbine (MW)	9
Total Installed Capacity (MW) Sum of IC of all turbines	36

In this stretch features, 01 Dam/ Reservoir and 03 Road Bridge across the river. In addition to this 02 Temple, Sri Mahakali Temple and Ramalyam Temple along the left bank of the river.

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	450	480	0	15.21	8,000	321,655.84	18,202,968.05	-0.30	10.37	12,420	513,676.18	23,267,357.15
II	450	480	0	15.21	7,200	490,018.19	27,723,700.83	-0.30	11.59	21,100	801,799.01	34,357,861.31
III	450	480	0	15.42	8,000	742,076.96	41,897,467.47	-0.30	10.51	14,350	1,263,325.01	50,381,244.76
IV	450	480	0	15.42	8,000	896,724.78	50,555,735.75	-0.30	10.51	15,100	1,578,145.64	59,680,469.88

*Table 87 - Dredging Quantity Details*

### 3.16.1 Observed and reduced Bed Profile of the stretch



*Figure 77 - River bed Profile*

### 3.17 Sub-Stretch-17: Gadchanda to Voni (ch.480.0km to 510.0km)

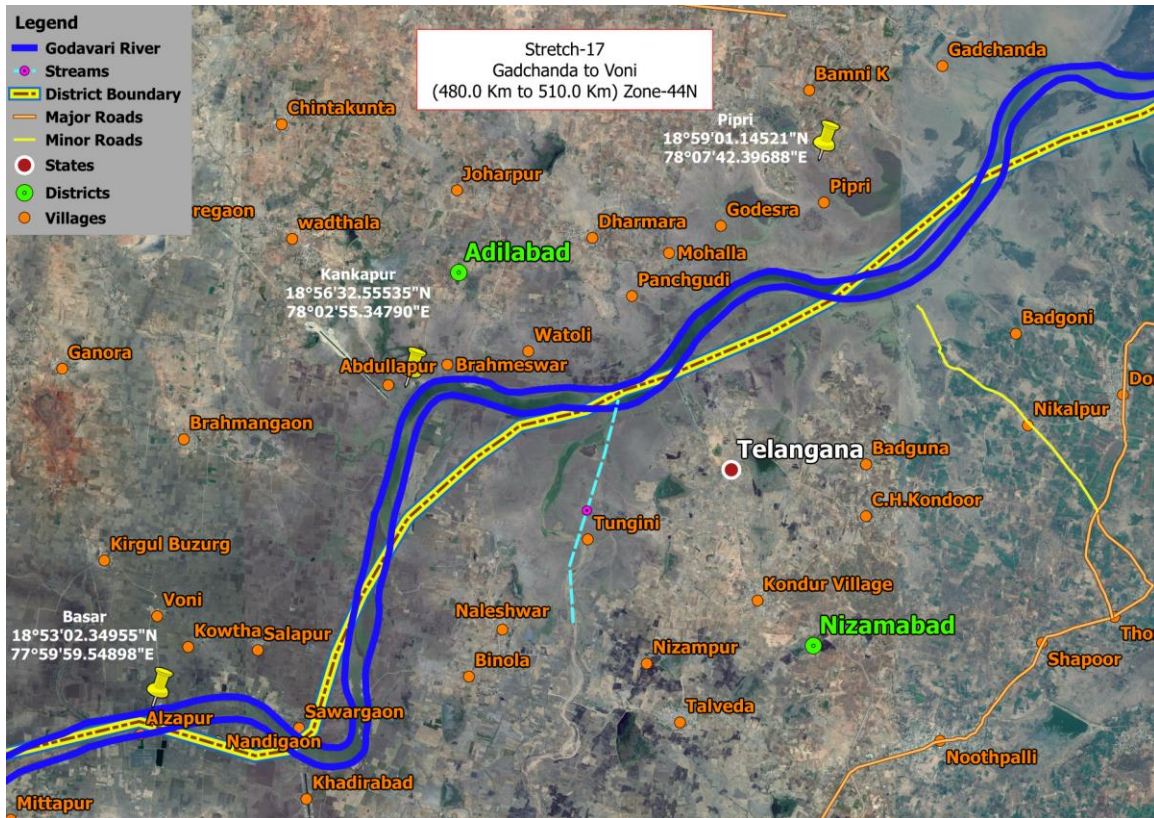


Figure 78 - Stretch-17 Gadchanda to Voni

- **Bathymetry Survey**
  - a) 30.0km length of the stretch for which the bathymetric survey has been carried out
- **Topographic Survey**
  - b) 0.0km the length of the stretch for which the topographic survey has been carried out.

Stretch-17 is covered 30.0km i.e. from 480.0km to 510.0km Gadchanda to Voni village. In this stretch, the river is navigable and bathymetric survey was undertaken.

In this stretch along the right bank of the river Dhamara, Wadthala, Ashta, Sawargaon, Kowtha and Voni villages are located and left bank of the river Donkeswar, Nikalpur, Badguna, Naleshwar, Binola and Kandepalle villages are located.

Both sides of river banks having cultivable land. Rice, Jowar, Bajra, Wheat, Tur, Mung, Urad, Gram, Pulses, Oilseeds. Groundnut, Sunflower, Soyabean, Cotton, Sugarcane are the major crops that are cultivated mostly in the area.

Dharmara village is located in Lokeswaram Tehsil of Adilabad district in Telangana, India. It is situated 7km away from sub-district head quarter Lokeswaram and 121km away from district head quarter Adilabad, Dharmara village is also a gram panchayat. Bhainsa is the nearest town to Dharmara which is approximately 31km away.

Naleshwar village is located in Navipet Tehsil of Nizamabad district in Telangana, India. It is situated 20km away from sub-district head quarter Navipet and 35km away from district head quarter Nizamabad. Naleshwar village is also a gram panchayat. Nizamabad is the nearest town to Naleshwar which is approximately 35km away.

Tungini, Nizampur, Talveda, Lakkampall, and Kamtam are the nearby villages to Naleshwar. Naleshwar is surrounded by Nandipet Mandal towards the east, Lokeswaram Mandal towards the north, Mudhole Mandal towards west, Makloor Mandal towards the south. Bhainsa, Nizamabad, Bodhan, and Nirmal are the nearby cities to Naleshwar.

Voni village is located in Mudhole Tehsil of Adilabad district in Telangana, India. It is situated 15km away from sub-district head quarter Mudhole and 160km away from district head quarter Adilabad. Voni village is also a gram panchayat. Bhainsa is the nearest town to Voni which is approximately 30km away.

Voni is surrounded by Tanur Mandal towards west, Dharmabad Mandal towards the south, Bhainsa Mandal towards the north, Lokeswaram Mandal towards the east. Bhainsa, Bodhan, Nizamabad, and Nirmal are the nearby cities to Voni.

This place is in the border of the Adilabad District and Nanded District. Nanded District Dharmabad is south towards this place. It is near to the Maharashtra State Border.

At chainage 493.525km 01 Temple, Umamaheswara Temple is located near Naleshwar village on the left bank of the river.





*Figure 79 - Umamaheswara Temple (ch.493.525km)*

At chainage 493.964km Water pumping station is located near Naleshwar village on the left bank of the river.

At chainage 498.879km 01 Temple, Brahmeswar Temple is located near Brahmeswar village.



*Figure 80 - Brhameswar Temple (ch. 498.879km)*

At chainage 505.128km and 506.831km 02 Temples, Anjaneya Swamy Temple, Tungini near Tungini village and Gowthameswara Temple near Khadribad village are located on left bank of the river.

In this stretch no prominent features across the river are available. In addition to this 04 Temple, Umamaheswara Temple, Brahmeswar Temple, Anjaneya Swamy Temple and



Gowthameswara Temple and 01 Water pump house on left bank of the river along the left bank of the river.

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	480	510	2.11	8.97	0	0.00	18,202,968.05	-0.30	4.04	25,150	875,202.73	24,142,559.88
II	480	510	0	8.97	20	26.56	27,723,727.39	-0.30	4.04	25,500	1,378,421.64	35,736,282.95
III	480	510	0	8.97	100	694.26	41,898,161.73	-0.30	4.04	26,410	2,183,824.06	52,565,068.82
IV	480	510	0	8.97	100	1,116.15	50,556,851.90	-0.30	4.04	28,100	2,732,642.09	62,413,111.97

Table 88 - Dredging Quantity Details

### 3.17.1 Observed and reduced Bed Profile of the stretch

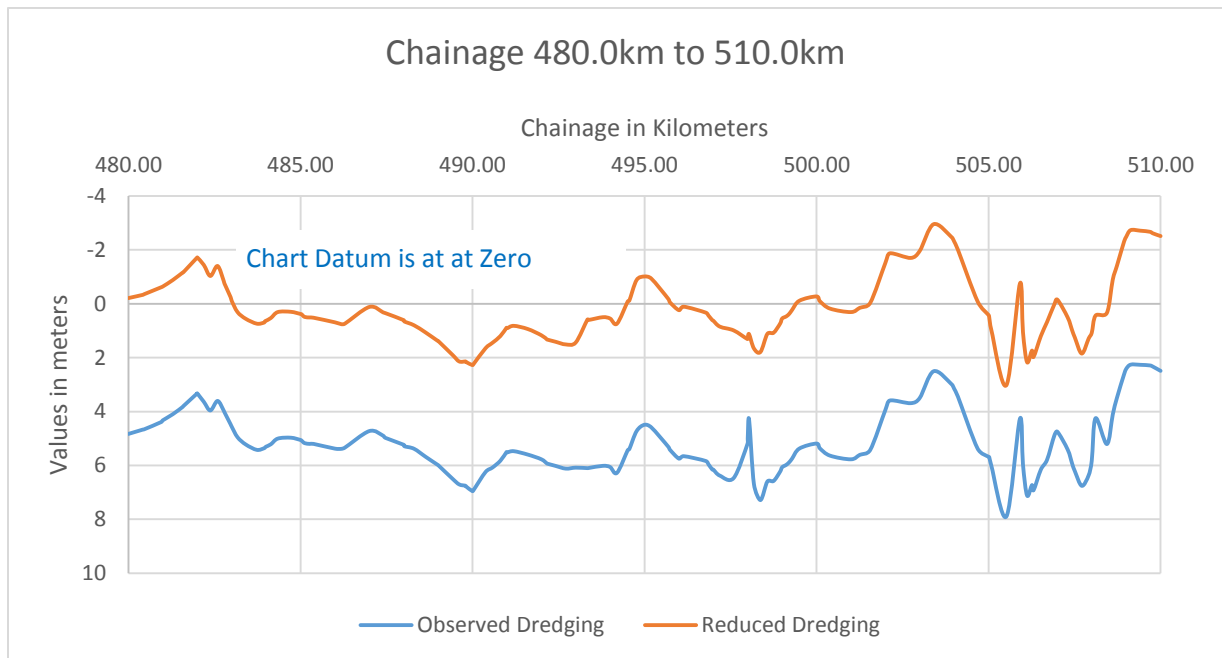


Figure 81 - River bed Profile

### 3.18 Sub-Stretch-18: Voni to Roshangaon (ch.510.0km to 540.0km)

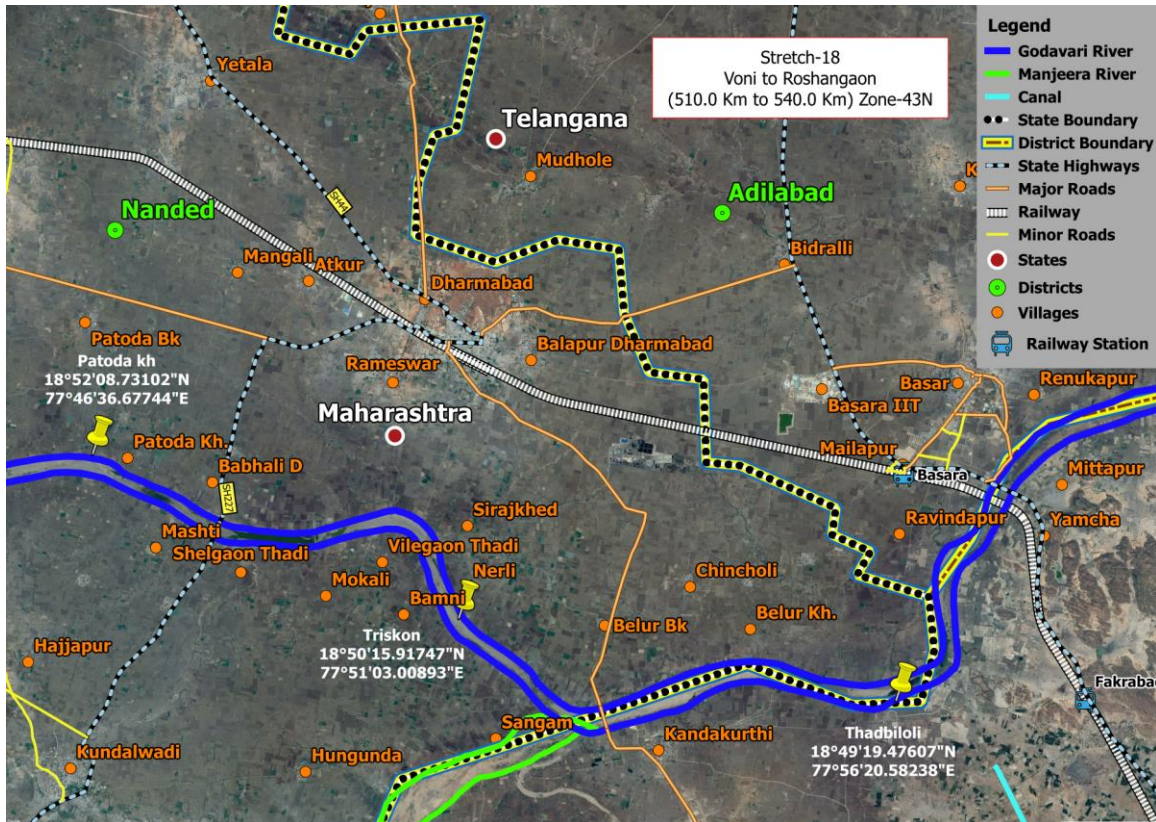


Figure 82 - Stretch-18 Voni to Roshangaon

- **Bathymetry Survey**
  - a) 12.2km length of the stretch for which the bathymetric survey has been carried out
- **Topographic Survey**
  - b) 17.8km length of the stretch for which the topographic survey has been carried out.

Stretch-18 is covered 30.0km i.e. from 510.0km to 540.0km Voni to Roshangaon village. In this stretch river is navigable and bathymetric survey was undertaken from chainage 510.0km to 512.20km. From 512.3km to 540.0km is non-navigable as the depths noted were less than half a meter and hence could not be surveyed using survey boat. Instead, the spot levels were measured using Trimble R4 GPS.

In this stretch from chainage 515.80km to 525.3km river is flowing between borders of two state i.e. Telangana and Maharashtra. From chainage 525.3km the Godavari is flowing in Maharashtra state, along right bank of the river Basar village is located in Telangana, Naigaon D, Chincholi, Nerli, Srijakhed, Babhali D and Roshangaon villages

are located in Maharashtra and left bank of the river Kandepalle, Yamcha, Kosli and Kadakurthi villages are located in Telangana state. Bamini, Mokali, Mashti are located in Maharashtra state.

Both sides of river banks having cultivable land. Rice, Jowar, Bajra, Wheat, Tur, Mung, Urad, Gram, Pulses, Oilseeds. Groundnut, Sunflower, Soyabean, Cotton, Sugarcane are the major crops that are cultivated mostly in the area.

Basara is a town located in Nirmal district in the state of Telangana. Basara is popular in India because of Saraswathi temple, which is only such temple in entire India.

Voni, Ratnapur, Bidralli, Kirgul, and Brahmangaon are the nearby villages to Basar. Basar is surrounded by Navipet Mandal towards the south, Renjal Mandal towards the south, Dharmabad Mandal towards west, Lokeswaram Mandal towards the north. Bodhan, Bhainsa, Nizamabad, and Nirmal are the nearby cities to Basar.

This place is in the border of the Adilabad District and Nanded District. Nanded District Dharmabad is west towards this place. It is near to the Maharashtra State Border.



*Figure 83 - Saraswathi temple at Basar (ch.515.704km)*

At chainage 515.113km to 515.450km bathing Ghat is located near Basar village on the right bank of Godavari River.



*Figure 84 - Bathing Ghat near Basar village (ch.515.113km)*

At chainage 515.30km Boating point Ferry service is available on the right bank of the river near Basar village.



*Figure 85 - Boating Pont Ferry service near Basar village (ch.515.30km)*

At chainage 515.504km Basar Road Bridge is crossing across Godavari River. It is connecting between Yamcha and Basar village.





*Figure 86 - Basar Road Bridge (ch.515.504km)*

At chainage 515.833km Basar Railway Bridge is crossing across Godavari River. It is connecting between Fakhrabad and Basra Railway station.



*Figure 87 - Basra Railway line Bridge (ch.515.833km)*

At chainage 519.612km Ali Sagar Lift Irrigation site is located near Kosli village at the left bank of the river.

Alisagar lift irrigation project is a lift irrigation project located in Nizamabad district in Telangana, India. The lift canal originates from the backwaters of Pochampadu Dam.

Alisagar Lift irrigation scheme is intended to stabilize the gap ayacut of 53,793 acres from distributor 50 to 73 of Nizamsagar Project. The foreshore water of Sriram Sagar Project at Kosli (Village) will be lifted in three stages to feed the Alisagar balancing Reservoir at Mile 54 to Mile 56 on Main Canal of Nizamsagar Project.



*Figure 88 - Ali Sagar Lift Irrigation (ch.519.612km)*

At chainage 527.355km Kandakurthi Road Bridge is constructed over Godavari River near Kandakurthi village. It is connecting between Kandakurthi village in Telangana and Belur B.k. village in Maharashtra.



*Figure 89 - Kandakurthi Road Bridge (ch.527.355km)*

At chainage 528.00km Manjeera River a tributary of Godavari River joins near Sangameswar Mandir, Sangam village on left bank.

The Manjeera is a tributary of the river Godavari. It passes through the states of Maharashtra, Karnataka, and Telangana. It originates in the Balaghat range of hills near Ahmednagar district and empties into the Godavari River.

At chainage 528.507km 01 Temple, Sangameswar Mandir near Sangam village is located on left bank of the river.





*Figure 90 - Sangameswar Mandir (ch.528.507km)*

At chainage 532.741km Sirjakhed Road Bridge is constructed over Godavari River near Sirjakhed village. It is connecting between Bamni and Sirjakhed village.



*Figure 91 - Sirjakhed Road Bridge (ch.532.741km)*

Babhali is a village in Dharmabad Taluka in Nanded District of Maharashtra State, India. It belongs to Marathwada region. It belongs to Aurangabad Division. It is located 66 km towards east from district head quarter Nanded. 606 km from state capital Mumbai. Babli is surrounded by Tanur Taluka towards north, Biloli Taluka towards south, Mudhole Taluka towards east, Umri Taluka towards west.

Bhainsa, Bodhan, Nizamabad, Mukhed are the nearby cities to Babhali.

This place is in the border of the Nanded District and Adilabad District. Adilabad District Mudhole is east towards this place. Also, it is in the Border of another district Nizamabad. It is near to the Telangana State Border.

At chainage 535.665km Babhali Barrage is constructed across the Godavari River. It is near to Babhali village.



*Figure 92 - Babhali Barrage (ch. 535.665km)*

At chainage 537.968km Babhali Road Bridge near Babhali village is crossing over Godavari River.



*Figure 93 - Babhali Road Bridge (ch.537.968km)*

In this stretch features across the river are 04 Road Bridges, 01 Railway Line Bridge, and 01 Barrage. In addition to this 04 Temple and 01 Ali Sagar lift irrigation on left bank of the river along the river.

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	510	540	0	9.54	17,000	659,904.98	18,862,873.03	-0.30	4.41	30,000	1,570,269.47	25,712,829.35
II	510	540	0	9.54	16,200	1,010,383.82	28,734,111.21	-0.30	4.41	30,000	2,318,939.30	38,055,222.25
III	510	540	0	9.54	16,300	1,539,573.10	43,437,734.83	-0.30	4.41	30,000	3,403,720.29	55,968,789.11
IV	510	540	0	9.54	16,800	1,871,526.21	52,428,378.11	-0.30	4.41	30,000	4,031,490.10	66,444,602.07

*Table 89 - Dredging Quantity Details*

### 3.18.1 Observed and reduced Bed Profile of the stretch

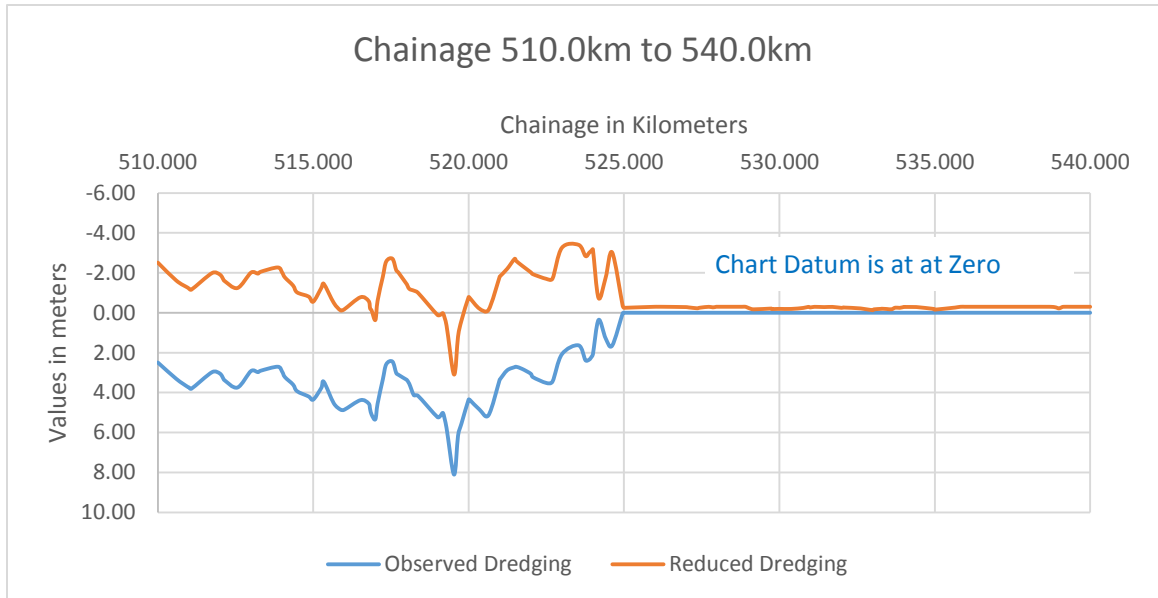


Figure 94 - River bed Profile

### 3.19 Sub-Stretch-19: Roshangaon to Manur (ch.540.0km to 570.0km)

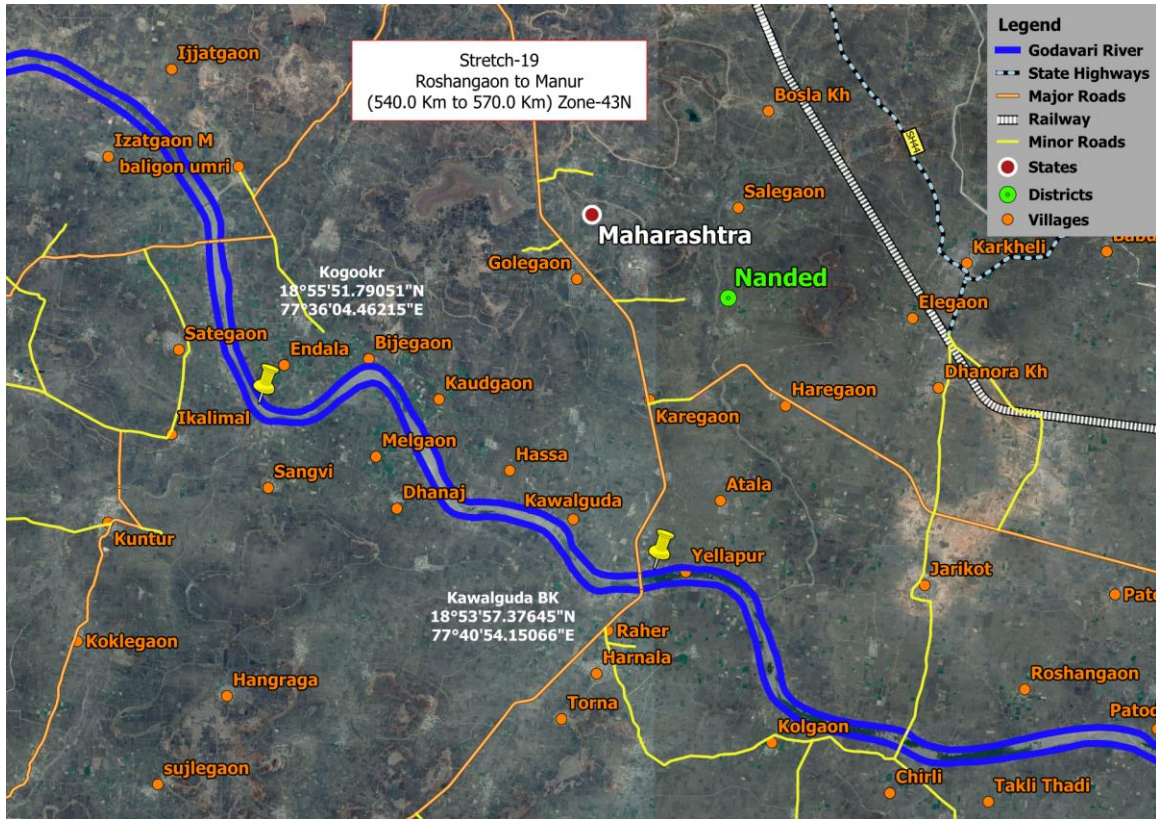


Figure 95 - Stretch-19 Roshangaon to Manur

- **Bathymetry Survey**
  - a) 3.7km length of the stretch for which the bathymetric survey has been carried out.
- **Topographic Survey**
  - b) 16.3km length of the stretch for which the topographic survey has been carried out.

Stretch-19 is covered 30.0km i.e. from 540.0km to 570.0km Roshangaon to Manur village. From chainage 540.0km to 566.2km is non-navigable as the depths noted were less than half a meter and hence could not be surveyed using survey boat. Instead, the spot levels were measured using Trimble R4 GPS. From chainage 566.30km to 570.0km river is navigable.

In this stretch along right bank of the river Jarikot, Atala, Kawalguda Bk., Bijegaon, Baligaon umri and Manur village is located in Telangana, Naigaon D, Chincholi, Nerli, Srijakhed, Babhali D and Roshangaon villages are located and left bank of the a river Chirli, Raheer, Hussa, Ikalimal and Baligon villages are located.

Both sides the of river banks having cultivable land. Rice, Jowar, Bajra, Wheat, Tur, Mung, Urad, Gram, Pulses, Oilseeds. Groundnut, Sunflower, Soyabean, Cotton, Sugarcane are the major crops that are cultivated mostly in the area.

Jarikot is a village in Dharmabad Taluka in Nanded District of Maharashtra State. It belongs to Aurangabad Division. It is located 62km towards east from district head quarter Nanded. 6km from Dharmabad. 600km from state capital Mumbai

Cholakha, Roshangaon, Chikna, Atala, Takli Thadi are the nearby villages to Jarikot. Jarikot is surrounded by Biloli Taluka towards south, Umri Taluka towards north, Tanur Taluka towards north, Naigaon (Kh) Taluka towards west. Bodhan, Bhainsa, Nizamabad, and Mukhed are the nearby cities to Jarikot.

This place is in the border of the Nanded District and Adilabad District. Adilabad District Mudhole is east towards this place. Also, it is in the Border of another district Nizamabad. It is near to the Telangana State Border.

Karkheli Railway Station, Samrta Railway Station are the very nearby railway stations to Jarikot. Umri Railway Station (near to Peth Umri), Shelgoan H Railway Station (near to Peth Umri), Samrta Railway Station (near to Dharmabad), Dharmabad Railway Station (near to Dharmabad) are the railway stations reachable from near by towns. However, Nanded Railway Station is major railway station 59km near to Jarikot.

Kundalwadi, Dharmabad, Peth Umri and Mukhed are nearby towns to Jarikot having road connectivity to Jarikot.

At chainage 545.590km Kundalwadi-Jarikot Road Bridge is constructed across Godavari River near Digras village. It is connecting between Kundalwadi and Jarikot villages.





*Figure 96 - Kundalwadi- Jarikot Road Bridge (ch.545.590km)*

Atala village is located in Dharmabad Tehsil of Nanded district in Maharashtra, India. It is situated 25km away from sub-district head quarter Dharmabad and 75km away from district head quarter Nanded. Atala village is also a gram panchayat. Dharmabad is the nearest town to Atala which is approximately 25km away.

Belgajari, Haregaon, Karegaon, Cholakha, and Singapur are the nearby villages to Atala. Atala is surrounded by Biloli Taluka towards south, Umri Taluka towards north, Naigaon (Kh) Taluka towards west, Tanur Taluka towards east. Bodhan, Bhainsa, Mukhed, and Nanded-Waghala are the nearby cities to Atala.

Karkheli Railway Station, Bolsa Railway Station are the very nearby railway stations to Atala. Umri Railway Station (near to Peth Umri), Shelgoan H Railway Station (near to Peth Umri), Samrla Railway Station (near to Dharmabad), Dharmabad Railway Station (near to Dharmabad) are the railway stations reachable from near by towns. However, Nanded Railway Station is major railway station 54km near to Atala. Kundalwadi, Dharmabad, Peth Umri and Mukhed are nearby by towns having road connectivity to Atala.

At chainage 553.55km Narsi-Umri Road Bridge is crossing the Godavari River near Raheer village. It is connecting between Raheer and Karegaon villages.





*Figure 97 - Narsi-Umri Road Bridge (ch.553.55km)*

Raher village is located in Naigaon Tehsil of Nanded district in Maharashtra, India. It is situated 30km away from sub-district head quarter Naigaon (Khairgaon) and 80km away from district head quarter Nanded. Raher village is also a gram panchayat. Dharmabad is the nearest town to Raher which is approximately 35km away.

At chainage 553.486km 03 Temple, Raher Temple, Mahnubahv Mandir Raher and Mahanubhav Panth Raher Narsihi Avasthan is located near Raher village at the left bank of the river.



*Figure 98 - Raher Temple (ch.553.486km)*

At chainage 567.519km Baligon Road Bridge is crossing near Baligon village. It is connecting between Baligon village and Baligon umri village.



*Figure 99 - Baligon Road Bridge (ch.567.519km)*

At chainage 568.339km Baligon Barrage is constructed across Godavari River near Baligon Umri village.



*Figure 100 - Baligon Barrage (ch. 568.339km)*

Manur village is located in Dharmabad Tehsil of Nanded district in Maharashtra, India. It is situated 15km away from sub-district head quarter Dharmabad and 90km away from district head quarter Nanded. Manur is the gram panchayat of Manur village. Dharmabad is the nearest town to Manur which is approximately 15km away.

In this stretch features across the river are 03 Road Bridges and 01 Barrage and 02 High Tension transmission line. In addition to this 03 Temple on the left bank of the river.

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	540	570	0	7.48	28,300	1,214,518.45	20,077,391.48	-0.30	1.09	30,000	1,634,339.94	27,347,169.29
II	540	570	0	7.71	28,450	1,850,678.06	30,584,789.27	-0.30	1.09	30,000	2,409,216.60	40,464,438.85
III	540	570	0	7.71	28,700	2,799,104.15	46,236,838.98	-0.30	1.09	30,000	3,523,611.20	59,492,400.31
IV	540	570	0	7.71	28,800	3,379,522.85	55,807,900.96	-0.30	1.09	30,000	4,163,901.03	70,608,503.10

Table 90 - Dredging Quantity Details

### 3.19.1 Observed and reduced Bed Profile of the stretch

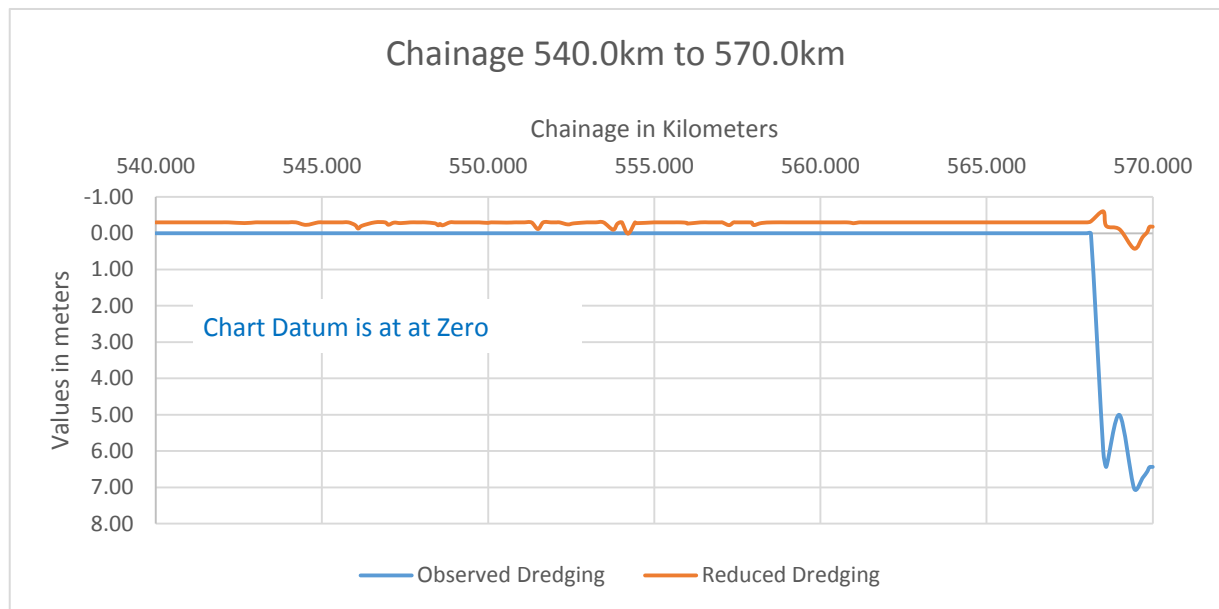


Figure 101 - River bed Profile



### 3.20 Sub-Stretch-20: Manur to Mugat (ch.570.0km to 600.0km)

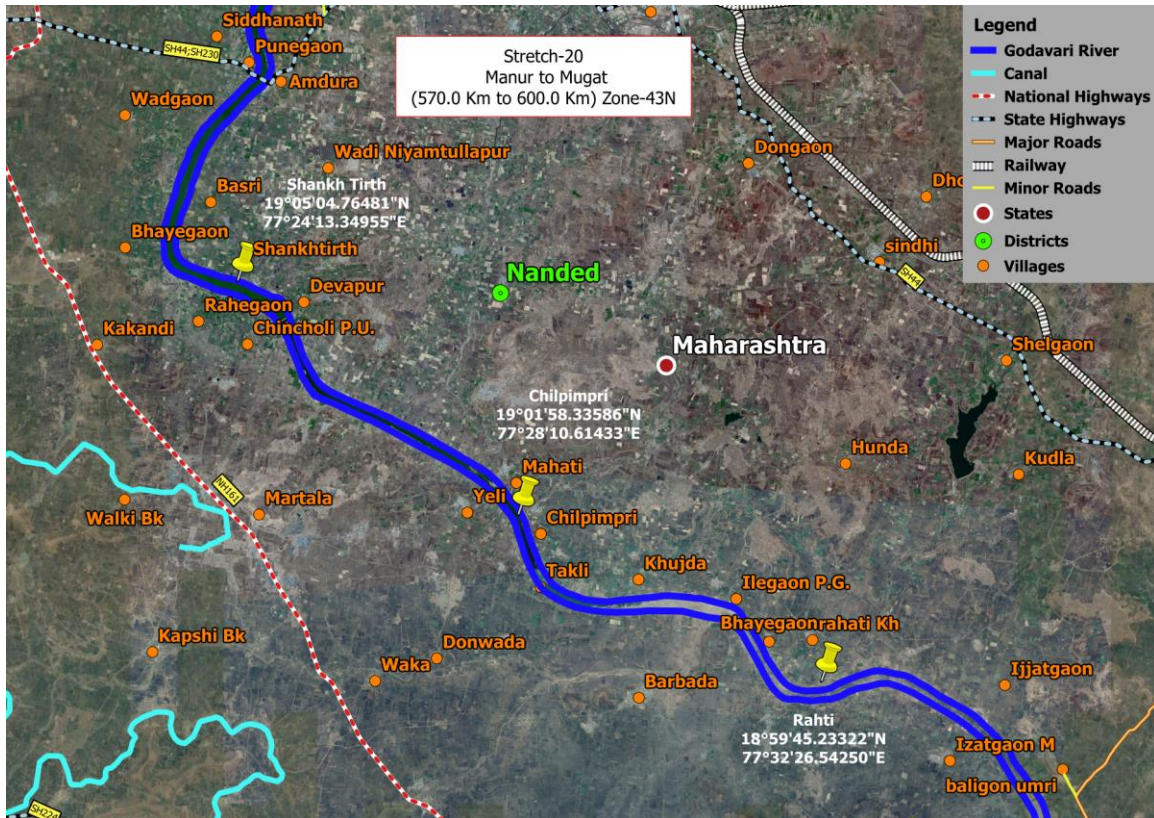


Figure 102 - Stretch-20 Manur to Mugat

- **Bathymetry Survey**
  - a) 30.0km length of the stretch for which the bathymetric survey has been carried out.
- **Topographic Survey**
  - b) 0.0km length of the stretch for which the topographic survey has been carried out.

Stretch-20 is covered 30.0km i.e. from 570.0km to 600.0km Manur to Mugat village. From chainage 570.0km to 600.0km river is navigable.

In this stretch along the right bank of the river Baayegaon, Mahati, Kamlaj, Devpur, Basri, and Mugat village is located. On left bank Barbada, Yelli, Kaudgaon, Wadgaon and Puneagaon villages are located.

Both sides of river banks having cultivable land. Rice, Jowar, Bajra, Wheat, Tur, Mung, Urad, Gram, Pulses, Oilseeds. Groundnut, Sunflower, Soyabean, Cotton, Sugarcane are the major crops that are cultivated mostly in the area.

Mahati village is located in Mudkhed Tehsil of Nanded district in Maharashtra, India. It is situated 17km away from sub-district head quarter Mudkhed and 34km away from district head quarter Nanded. Nanded is the nearest town to Mahati which is approximately 34km away.

At chainage 585.545km Mahati- Eli Gaon River Bridge is crossing over Godavari River near Mahati village. It is connecting between Mahati and Eli villages.



*Figure 103 - Mahati- Eli Gaon River Bridge (ch. 585.545km)*

At chainage 586.446km small tributary Sita Nadi joins Godavari River.

Amdura is a village in Modkhed Taluka in Nanded District of Maharashtra State. It belongs to Aurangabad Division. It is located 13km towards east from district head quarter Nanded. 7km from Modkhed. 560km from state capital Mumbai

Wadi Niyam Tullapur, Nagapur, Mugat, Basri, and Wadgaon are the nearby villages to Amdura. Amdura is surrounded by Nanded Taluka towards west, Ardhapur Taluka towards north, Umri Taluka towards east, Naigaon (Kh) Taluka towards the south. Nanded-Waghala, Loha, Purna, and Mukhed are the nearby cities to Amdura.

Mugat Railway station, Pathrad Railway station are the very nearby railway stations to Amdura. Wanegaon Railway station (near to Nanded-Waghala), Nanded Railway Station (near to Nanded-Waghala) are the railway stations reachable from near by towns. Nanded-Waghala, Mukhed, and Mukhed are nearby towns to Amdura having road connectivity to Amdura.

At chainage 592.583km Amdura Barrage is constructed across Godavari River near Devapur village.



*Figure 104 - Amdura Barrage (ch. 592.583km)*

At chainage 600.951km Amdura Road Bridge (SH-3) is constructed across the Godavari River near Amdura village. It is connecting between Punegaon and Amdura villages.



*Figure 105- Amdura Road Bridge (ch. 600.951km)*

In this stretch features across the river are 01 Road Bridges and 01 Barrage and 03 High Tension transmission line. In addition to this 03 Temple on the left bank of the river along the river.

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	570	600	2.86	10.66	0	0.00	20,077,391.48	-0.30	5.04	12,725	431,664.83	27,778,834.12
II	570	600	2.86	10.96	0	0.00	30,584,789.27	-0.30	5.04	14,405	683,923.70	41,148,362.55
III	570	600	2.86	10.96	0	0.00	46,236,838.98	-0.30	5.08	15,435	1,113,737.21	60,606,137.52
IV	570	600	2.86	10.96	0	0.00	55,807,900.96	-0.30	5.08	16,870	1,457,903.20	72,066,406.30

*Table 91 - Dredging Quantity Details*



### 3.20.1 Observed and reduced Bed Profile of the stretch

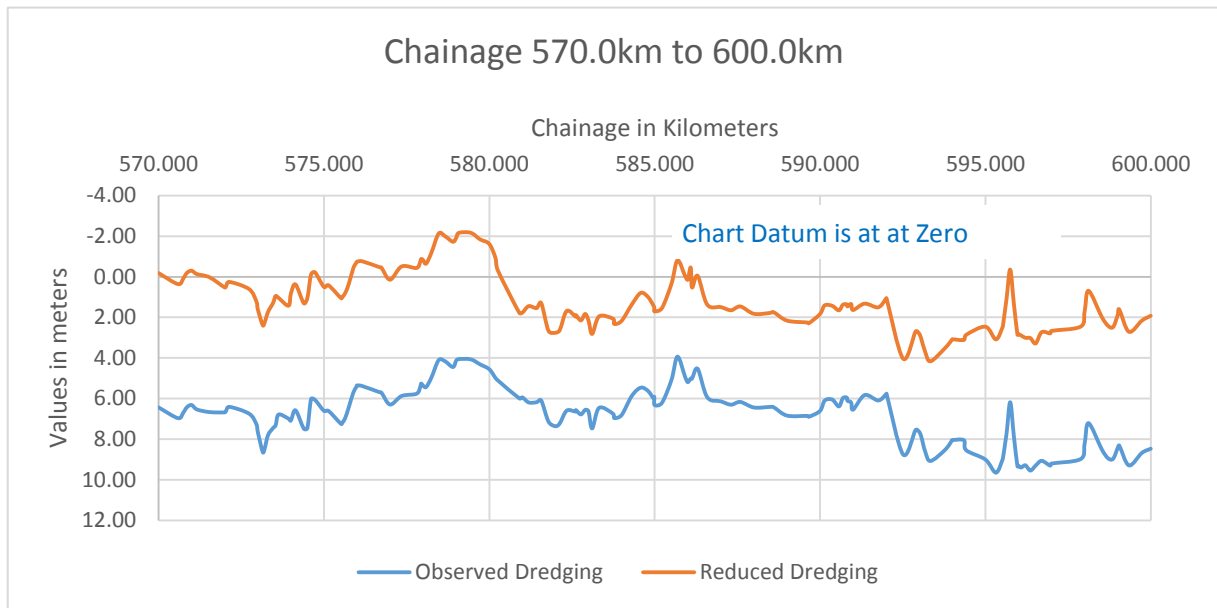


Figure 106 - River bed Profile

### 3.21 Sub-Stretch-21: Mugat to Rahathi (ch.600.0km to 630.0km)

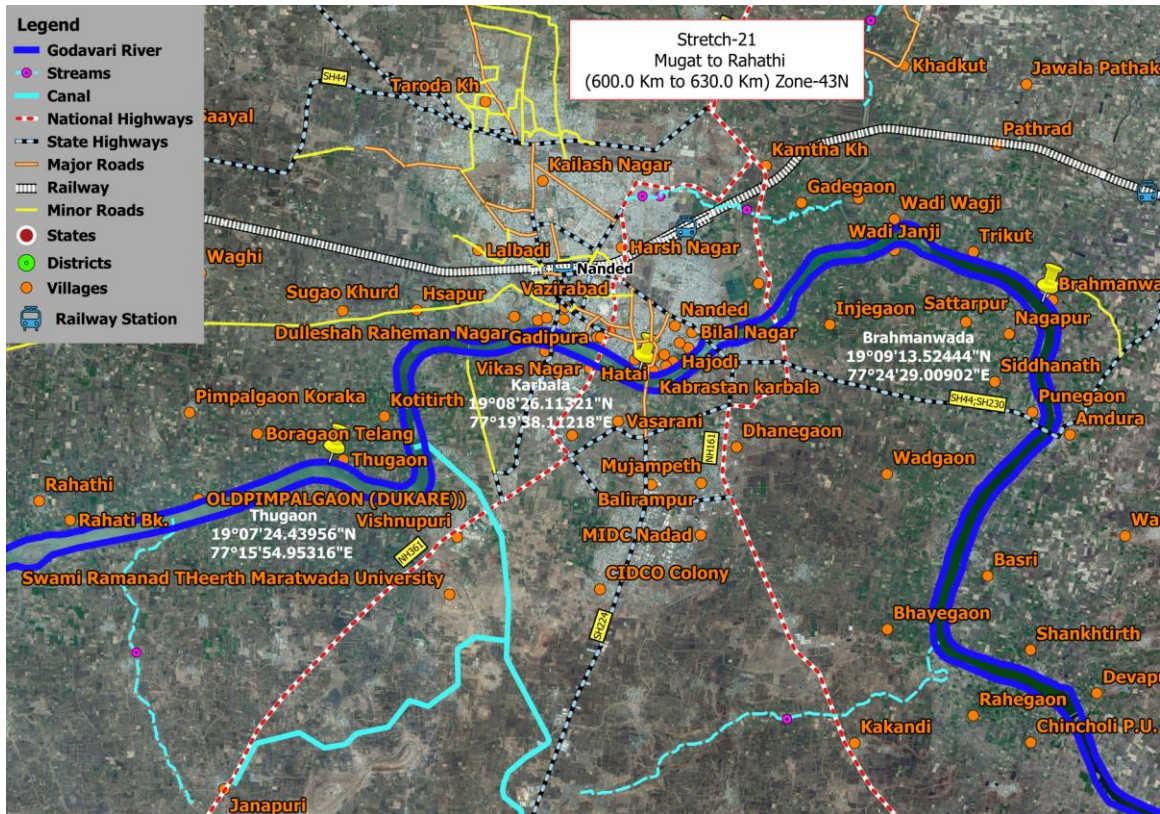


Figure 107 - Stretch-21 Mugat to Rahathi

- **Bathymetry Survey**
  - a) 30.0km length of the stretch for which the bathymetric survey has been carried out.
- **Topographic Survey**
  - b) 0.0km length of the stretch for which the topographic survey has been carried out.

Stretch-21 is covered 30.0km i.e. from 600.0km to 630.0km Mugat to Rahathi village. From chainage 600.0km to 630.0km river is navigable.

In this stretch along the right bank of the river Brahmanwada, Trikut, Wadi, and Wagji village are located. Nanded is one of the major cities of Maharashtra situated on right bank of Godavari River. On left bank Satarpur, Injegaon, Vasarani, and Vishnupuri villages are located.

Both sides of river banks having cultivable land. Cotton, Banana, Sugarcane, Mango, Soyabean, Sweet Lime and Jawar (Sorghum) are the essential crops grown mostly in the area.

Brahmanwada village is located in Nanded Tehsil of Nanded district in Maharashtra, India. It is situated 10km away from sub-district head quarter Nanded and 10km away from district head quarter Nanded. Brahamanwada is the gram panchayat of Brahmanwada village.

At chainage 603.878km and 604.654km 02 Gurudwaras, Gurudwara Mata Sahib Dewan and Gurudwara Hira Ghat Saheb on the right bank of Godavari River.

Trikut village is located in Nanded Tehsil of Nanded district in Maharashtra, India. It is situated 10km away from sub-district head quarter Nanded and 10km away from district head quarter Nanded. Trikut village is also a gram panchayat. Nanded Waghala is the nearest town to Trikut which is approximately 10km away.

At chainage 606.402km 01 temple, Tirkut Temple near Tirkut village is a partially submerged temple in Godavari River on right bank.

Temple buildings in Trikut village is the Nabhishtan (center point) of the River Godavari, is believed to be very sacred for Hindus.



*Figure 108 - Tirkut Temple (ch.606.402km)*

At chainage 606.772km Asna River a small tributary joins Godavari River near Tirkut village.

At chainage 610.448km Prabhani-Nanded Road (Bypass Road NH-361) is crossing over Godavari River near Wajegaon village. It is connecting between Nanded and Prabhani.



*Figure 109 - Parbhani Nanded Bypass Road-(NH-204 (ch.610.448km)*

At chainage 611.544km Eidgah-Wajegaon Road Bridge is constructed across the Godavari River. It is connecting between Eidgah and Wajgaon villages.



*Figure 110 - Eidgah-Wajegaon Road Bridge (ch. 611.544 km)*

At chainage 611.600km Mahanubhav Panth Govardhan Stahn, Eidgah is located on right bank Dargah is located on left of Godavari River near Eidgah-Wajegaon Road Bridge

At chainage 611.878km Degloor-Naka Road Bridge is constructed across Godavari Bridge. It is connecting between Degloor and Naka villages.





*Figure 111 - Degloor- Naka Road (ch.611.878km)*

Nanded is a city located in Maharashtra state, the 8th largest urban agglomeration of Maharashtra, and the 81st most populous city in India. It is also head quarters of Nanded district and second largest city in Marathwada region after Aurangabad. Nanded has been a major place of Sikh pilgrimage. 10th Sikh Guru, Guru Gobind Singh made Nanded as his permanent abode and passed Guruship to Guru Granth Sahib before his death in 1708 in Nanded. Nanded is located on the banks of Godavari River. Nanded was famous for its Vedic rituals on the sacred banks of river Godavari. Urvashi Ghat, Ram Ghat, Govardhan Ghat are some of them. Nanded has been the regional education hub which has Swami Ramanand Teerth Marathwada University at Vishnupuri. Nanded is also known for its health services.

NH-61 (New Number) Kalyan-Ahmednagar-Parbhani-Nanded-Nirmal, NH-361 Nagpur-Wardha-Nanded-Latur-Solapur-Sangli-Kolhapur-Ratnagiri and NH-161 Akola-Washim-Hingoli-Nanded-Degloor-Sangareddy passes through the city. State Road Transport Bus service operates to every major city in Maharashtra.

Agriculture is the main occupation of the people in rural parts of the region. Cotton, Banana, Sugarcane, Mango, Soyabean, Sweet Lime and Jawar (Sorghum) are the essential crops grown in the cities nearby area. Nanded is a second largest banana-producing district in the state after Jalgoan. Nanded has Regional Cotton Research Center. To support the cotton-growing industry, textile mills need to start. An agricultural school is operational under the aegis of Krishi Vidyapeeth, Parbhani.

At chainage 613.493km Navghat Road Bridge is constructed across Godavari River. It is connecting between Kautha and Karbala towns.



*Figure 112 - Navghat Road Bridge (ch. 613.493km)*

From chainage 614.30 to 615.80km Ghats are located namely Ram Ghat, Gowerdhan Ghat and Gurudwara Nagina Ghat is located on right Bank of Godavari River.



*Figure 113 - Ghats near Nanded on Godavari River (ch.614.30km)*

At chainage 614.629km, Ram Ghat- Shani Mandir is located on Right bank and Parnekar Maharaj Mandir is located on left bank of Godavari River near Vikas Nagar-Old Mondha Road Bridge

At chainage 614.664km, Santoshi Mata Mandir on left bank of Godavari River near Vikas Nagar-Old Mondha Road Bridge is located.

At chainage 614.641km Vikas Nagar-Old Mondha Road Bridge is constructed across Godavari River near Vikas Nagar. It is connecting between Vikas Nagar and Old Mondha towns.





*Figure 114 - Vikas Nagar-Old Mondha Road Bridge (ch. 614.641km)*

At chainage 615.175km Gurudwara Nagina Ghat is located on Godavari River near Gowardhan Ghat.



*Figure 115 - Gurudwara Nagina Ghat (ch.615.175km)*

At chainage 615.362km Sikh Museum is located on right bank of Godavari River near Gowerdhan Ghat Road Bridge.

At chainage 615.478km Gurudwara Bandh Ghat Saheb is located on right bank of Godavari River near Gowerdhan Ghat Road Bridge.



*Figure 116 - Gurudwara Bandh Ghat Saheb (ch. 615.478km)*

At chainage 615.639km Gowardhan Ghat Road Bridge is crossing across Godavari Bridge near Gowardhan Ghat.



*Figure 117 - Gowerdhan Ghat Road Bridge (ch. 615.639km)*

At chainage 615.793 a submerged Check Dam across the Godavari River near the Gowardhan Ghat Road Bridge.



*Figure 118 - Check Dam (ch.615.793km)*

At chainage 617.471km Hsapur-Asarjan Road Bridge is constructed across the Godavari River.



*Figure 119 - Hsapur-Asarjan Road Bridge (ch. 617.471km)*

At chainage 620.711km Vishnupuri Barrage is constructed across the Godavari River near Vishnupuri village.



*Figure 120 - Vishnupuri Barrage (ch.620.711km)*

At chainage 621.524km Kaleshwar Temple and Ghat is located on left bank of Godavari River near Vishnupuri Barrage.



*Figure 121 - Kaleshwar Temple and Ghat (ch.621.524km)*

Rahati is a village in Nanded Taluka in Nanded District of Maharashtra State. It belongs to Aurangabad Division. It is located 13km towards west from district head quarter Nanded. 12km from Nanded. 534km from state capital Mumbai.

Jaitapur, Wahegaon, Naleshwar, Markand, and Kalhal are the nearby villages to Rahati. Rahati is surrounded by Loha Taluka towards the south, Purna Taluka towards west, Ardhapur Taluka towards the east, Basmat Taluka towards the north. Nanded-Waghala, Purna, Loha, and Parbhani are the nearby cities to Rahati.

Limbgaon Railway Station, Wanegaon Railway Station are the very nearby railway stations to Rahati. Wanegaon Railway station (near to Nanded-Waghala), Nanded Railway Station (near to Nanded-Waghala) are the railway stations reachable from near by towns. Nanded-Waghala is the nearby towns to Rahati having road connectivity to Rahati.

In this stretch features across the river are 06 Road Bridges and 01 Barrage and 01 High Tension transmission line. In addition to this 09 Temple/Gurudwara along the river.

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	600	630	0	13.71	400	4,276.57	20,081,668.05	-0.30	5.09	26,405	1,210,772.41	28,989,606.53
II	600	630	0	13.71	530	9,778.83	30,594,568.10	-0.30	5.09	26,600	1,822,281.08	42,970,643.63
III	600	630	0	13.71	1,030	27,345.34	46,264,184.32	-0.30	5.09	28,205	2,741,502.28	63,347,639.80
IV	600	630	0	13.71	2,020	60,007.74	55,867,908.70	-0.30	5.09	28,600	3,310,750.89	75,377,157.19

Table 92 - Dredging Quantity Details

### 3.21.1 Observed and reduced Bed Profile of the stretch

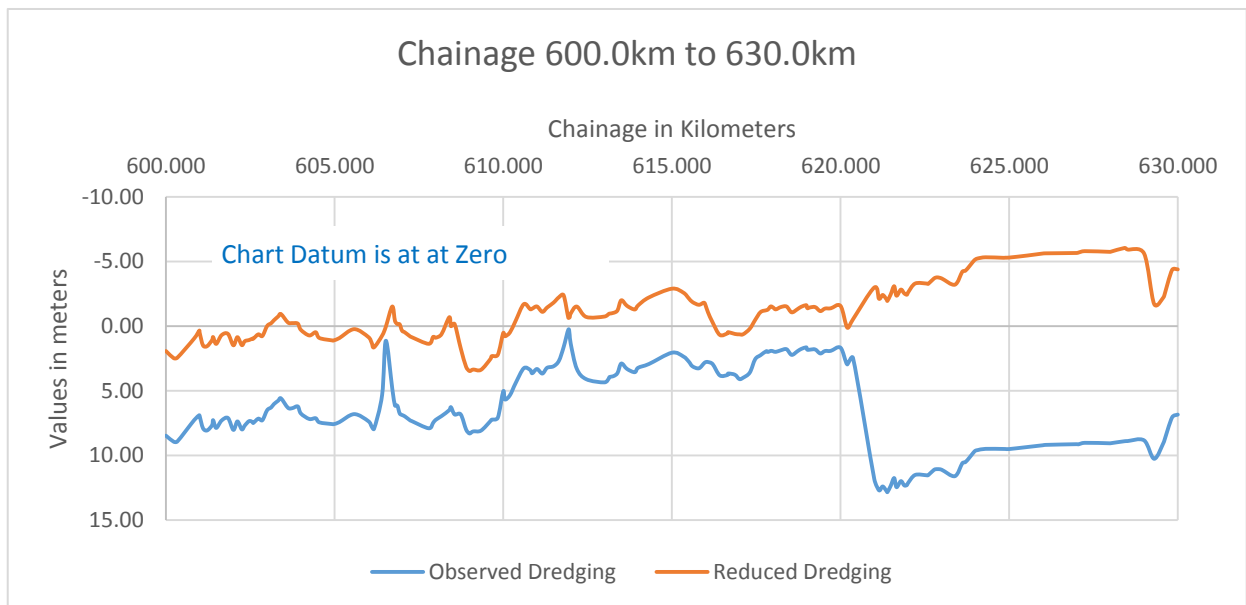


Figure 122 - River bed Profile



### 3.22 Sub-Stretch-22: Rahathi to Sarangi (ch.630.0km to 660.0km)

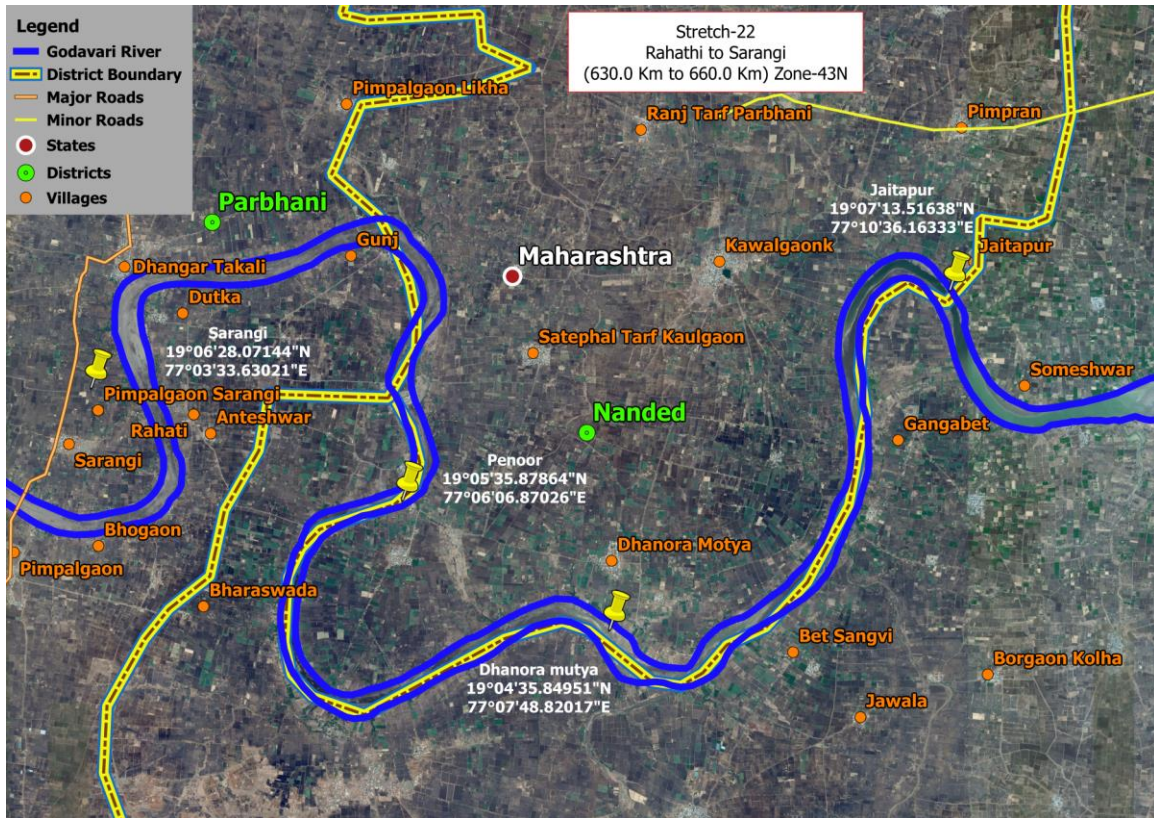


Figure 123 - Stretch-22 Rahathi to Sarangi

- **Bathymetry Survey**
  - a) 30.0km length of the stretch for which the bathymetric survey has been carried out.
- **Topographic Survey**
  - a) 0.0km length of the stretch for which the topographic survey has been carried out.

Stretch-22 is covered 30.0km i.e. from 630.0km to 660.0km Rahathi to Sarangi village. From chainage 630.0km to 660.0km river is navigable.

In this stretch along the right bank of the river Someshwar, Jaitapur, Dhanora Motaya, Dhangar Takali and Sarangi village is located. On left bank Gangabet, Bet Sangavi, Perur, Anteswar, Gunj, Dutka, Rahati and Bhogan villages are located.

Both sides of river banks having cultivable land. Cotton, Banana, Sugarcane, Mango, Soyabean, Sweet Lime and Jawar (Sorghum) are the essential crops grown mostly in the area.



Someshwar is a village in Nanded Taluka in Nanded District of Maharashtra State. It belongs to Aurangabad Division. It is located 16km towards west from district head quarter Nanded. 532km from state capital Mumbai.

Wahegaon, Rahati, Dagadgaon, Naleshwar, and Betsangvi are the nearby villages to Someshwar. Someshwar is surrounded by Loha Taluka towards the south, Purna Taluka towards west, Ardhapur Taluka towards east, Basmat Taluka towards the north. Nanded-Waghala, Loha, Purna, and Parbhani are the nearby cities to Someshwar.

Limbgaon Railway station, Wanegaon Railway Station are the very nearby railway stations to Someshwar. Wanegaon Railway Station (near to Nanded-Waghala), Nanded Railway Station (near to Nanded-Waghala) are the Railway stations reachable from near by towns.

Nanded-Waghala is nearby towns to Someshwar having road connectivity to Someshwar.

Jaitapur village is located in Nanded Tehsil of Nanded district in Maharashtra, India. It is situated 18km away from sub-district head quarter Nanded and 18km away from district head quarter Nanded. Jaitapur village is also a gram panchayat. Nanded is the nearest town to Jaitapur which is approximately 18km away.

Rahati, Wahegaon, Naleshwar, Dhoki, and Betsangvi are the nearby villages to Jaitapur. Jaitapur is surrounded by Loha Taluka towards the south, Purna Taluka towards west, Ardhapur Taluka towards east, Basmat Taluka towards the north. Nanded-Waghala, Purna, Loha, and Parbhani are the nearby cities to Jaitapur.

Gangabet village is located in Nanded Tehsil of Nanded district in Maharashtra, India. It is situated 31km away from sub-district head quarter Nanded and 31km away from district head quarter Nanded. Gangabet village is also a gram panchayat. Nanded is the nearest town to Gangabet which is approximately 31km away. Nanded-Waghala, Purna, Loha, and Mukhed are the nearby cities to Gangabeth.

Gangabeth is surrounded by Ardhapur Taluka towards the north, Modkhed Taluka towards the east, Loha Taluka towards the south, Basmat Taluka towards the north. Nanded Railway station, Wanegaon Railway station are the very nearby railway stations to Gangabeth.

At chainage 642.287km Kapileshwar Mandir is located on left bank of Godavari River near Bet Sangavi village.

Penur village is located in Loha Tehsil of Nanded district in Maharashtra, India. It is situated 15km away from sub-district head quarter Loha and 55km away from district head quarter Nanded. Penur village is also a gram panchayat. Loha is the nearest town to Penur which is approximately 15km away.

Shewadi, Betsangvi, Adgaon, Khadakmanjri, and Sonmanjri are the nearby villages to Penur. Penur is surrounded by Purna Taluka towards the north, Palam Taluka towards west, Nanded Taluka towards east, Kandhar Taluka towards the south. Loha, Purna, Nanded-Waghala, and Parbhani are the nearby cities to Penur. This place is in the border of the Nanded District and Parbhani District. Parbhani District Palam is west towards this place.

There is no railway station near to Penur in less than 10km. Wanegaon Railway Station (near to Nanded-Waghala), Nanded Railway Station (near to Nanded-Waghala) are the Railway stations reachable from near by towns. Loha, Nanded-Waghala are nearby towns to Penur having road connectivity to Penur.

At chainage 647.194km Penur Road Bridge is constructed across Godavari River near Penur village.



*Figure 124 - Penur Road Bridge (ch. 647.194km)*

Anteshwer is a village in Loha Taluka in Nanded District of Maharashtra State. It belongs to Aurangabad Division. It is located 30km towards south from district head quarter Nanded. 527km from state capital Mumbai. Anteshwer is surrounded by Kandhar Taluka towards the south, Palam Taluka towards west, Purna Taluka towards the north, Nanded Taluka towards north. Loha, Nanded-Waghala, Purna, and Mukhed are the nearby cities to Anteshwer.

This place is in the border of the Nanded District and Parbhani District. Parbhani District Palam is west towards this place.

At chainage 653.866km Anteshwar Barrage is under construction across Godavari River near Anteshwar village.



*Figure 125 - Anteshwar Barrage (ch. 653.866km)*

Sarangi is a village in Purna Taluka in Parbhani District of Maharashtra State. It belongs to Aurangabad Division. It is located 39km towards east from district head quarters Parbhani. 9km from Purna. 516km from state capital Mumbai

Mithapur, Dutka, Sawangi Thadi, Dhangar Takali are Sategaon are the nearby villages to Sarangi. Sarangi is surrounded by Loha Taluka towards the south, Palam Taluka towards the south, Nanded Taluka towards the east, Basmat Taluka towards the north. Purna, Loha, Nanded-Waghala, and Parbhani are the nearby cities to Sarangi.

Purna Jn Railway station is the very nearby railway stations to Sarangi. Pingli Railway station (near to Parbhani), Chudawa Railway Station (near to Purna), Purna Jn Railway Station (near to Purna), Gangakher Railway Station (near to Gangakhed), Parbhani Jn Railway station (near to Parbhani) are the Railway stations reachable from near by towns. However, Nanded Railway station is major railway station 30km near to Sarangi. Purna, Parbhani, and Gangakhed are nearby towns to Sarangi having road connectivity to Sarangi.

In this stretch features across the river are 01 Road Bridge and 01 Barrage. In addition to this 01 Temple along the river.

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	630	660	3.71	10.99	0	0.00	20,081,668.05	-0.30	3.62	26,700	1,181,842.63	30,171,449.16
II	630	660	3.71	11.15	0	0.00	30,594,568.10	-0.30	3.62	27,000	1,776,963.56	44,747,607.19
III	630	660	3.71	11.15	0	0.00	46,264,184.32	-0.30	3.62	27,285	2,678,497.81	66,026,137.61
IV	630	660	3.71	11.15	0	0.00	55,867,908.70	-0.30	3.62	28,800	3,246,528.26	78,623,685.45

Table 93 - Dredging Quantity Details

### 3.22.1 Observed and reduced Bed Profile of the stretch

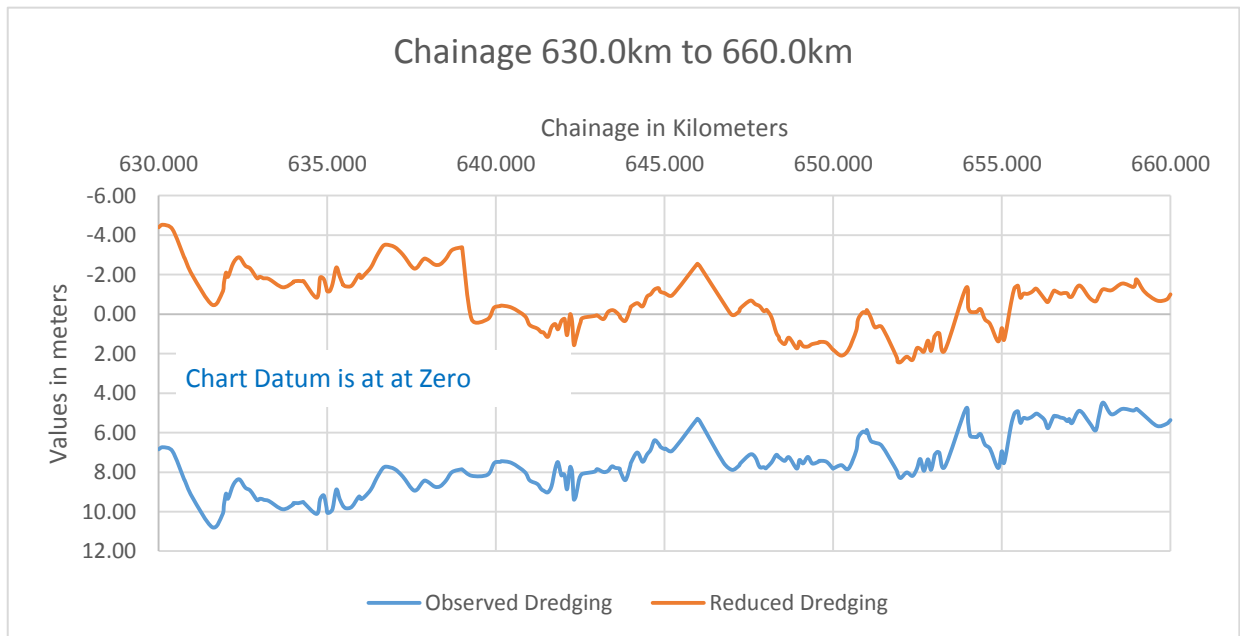


Figure 126 - River bed Profile

### 3.23 Sub-Stretch-23: Sarangi to Devthana (ch.660.0km to 690.0km)

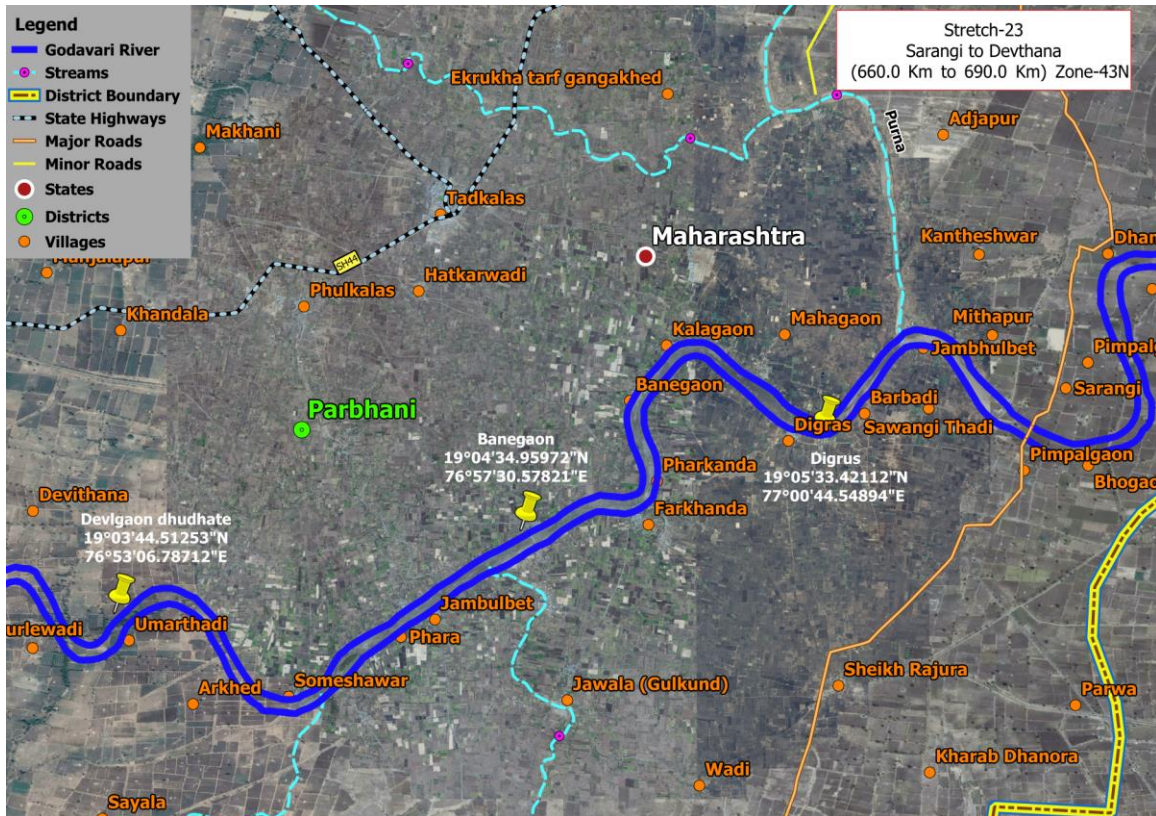


Figure 127 - Stretch-23 Sarangi to Devthana

- **Bathymetry Survey**
  - a) 30.0km length of the stretch for which the bathymetric survey has been carried out
- **Topographic Survey**
  - a) 0.0km length of the stretch for which the topographic survey has been carried out.

Stretch-23 is covered 30.0km i.e. from 660.0km to 690.0km Sarangi to Devthana village. From chainage 660.0km to 690.0km river is navigable.

In this stretch along the right bank of the river Mithapur, Mahagaon, Kalagaon, Banegaon, Someshawar and Devthana village is located. On left bank Pimpalgaon, Jambulbet, Barbadi, Digras, Farkhanda, Jambulbet, Phala and Bhogan villages are located.

Both sides of river banks having cultivable land. Cotton, Banana, Sugarcane, Mango, Soyabean, Sweet Lime and Jawar (Sorghum) are the main crops grown mostly in the area.



At chainage 665.762km Purna - Loha Road Bridge is crossing the Godavari River near Pimpalgaon village. It is connecting between Pimpalgaon and Sarangi villages.



*Figure 128 - Purna - Loha Road Bridge (ch. 665.762km)*

Mithapur village is located in Purna Tehsil of Parbhani district in Maharashtra, India. It is situated 13km away from sub-district head quarter Purna and 54km away from district head quarter Parbhani. Sarangi is the gram panchayat of Mithapur village. Purna is the nearest town to Mithapur which is approximately 13km away.

At chainage 668.815km Purna River a tributary of Godavari River joins near Jambhulpet village. The Purna River is a major left-bank tributary of Godavari River originating in the Ajanta Range of hills in Aurangabad District, Maharashtra. The river lies in the rain shadow region of Maharashtra, on the Deccan Plateau, flowing through the districts of Aurangabad, Buldana, Jalna, Hingoli and Parbhani with a large catchment area measuring about 15,579 km<sup>2</sup>. This enormous catchment area is often tagged as a sub-basin of Godavari River and along with its tributaries forms a dendritic drainage pattern. It is a prime river in the Marathwada region of Maharashtra running for about 373km before it confluences with Godavari River south of Purna city in the Parbhani district.

Digras is a village in Palam Taluka in Parbhani District of Maharashtra State, India. It belongs to Marathwada region. It belongs to Aurangabad Division. It is located 37km towards east from district head quarter Parbhani. 23km from Palam. 515km from state capital Mumbai.

Kantheshwar, Kantheshwar Old, Dhangar Takali, Mithapur and Ajdapur Kumbharwadi are the nearby villages to Digras. Digras is surrounded by Loha Taluka towards the south, Palam Taluka towards the south, Nanded Taluka towards the east, Basmat Taluka towards the north. Purna, Loha, Nanded-Waghala, and Parbhani are the nearby cities to Digras. This place is in the border of the Parbhani District and Nanded District. Nanded District Loha is south towards this place.

Purna Jn. Railway station, Chudawa Railway Station are the very nearby railway stations to Digras. Gangakher Railway Station (near to Gangakhed) are the Railway stations reachable from near by towns. However, Nanded Railway Station is major railway station 31km near to Digras. Gangakhed are the nearby by towns to Digras having road connectivity to Digras

At chainage 671.142km Digras Barrage is constructed across Godavari River near Digras village.



*Figure 129 - Digras Barrage (ch. 671.142km)*

At Chainage 675.598km Jai Hanuman Temple is located near Banegaon village on the right bank of the river.

At chainage 679.68km Palam - Tadkalas Raod Bridge is crossing over Godavari River near Farkhanda village.



*Figure 130 - Palam - Tadkalas Raod Bridge (ch. 679.68km)*

At chainage 680.654km Choti Godavari a tributary joins Godavari River near Jambulpet on left bank of the river.

At chainage 682.98km Gosavi Samaj Mandir and Shree Sant Motiram Maharaj Temple is located near Jambulpet village on the left bank of the river.

At chainage 684.417km Somnath Temple is located near Phala village on the left bank of the river.



*Figure 131 - Somnath Temple (ch.684.417km)*

At chainage 685.347km Shri Sant Damaji Aapa Maharaj Mandir is located near Ghoda village on the left bank of the river.

Devthana is a village in Purna Taluka in Parbhani District of Maharashtra State. It belongs to Aurangabad Division. It is located 31km towards east from district head quarter Parbhani. 512km from state capital Mumbai. Devthana is surrounded by Palam Taluka towards the south, Loha Taluka towards the south, Basmat Taluka towards the north, Parbhani Taluka towards west. Purna, Loha, Nanded-Waghala, and Parbhani are the nearby cities to Devthana.

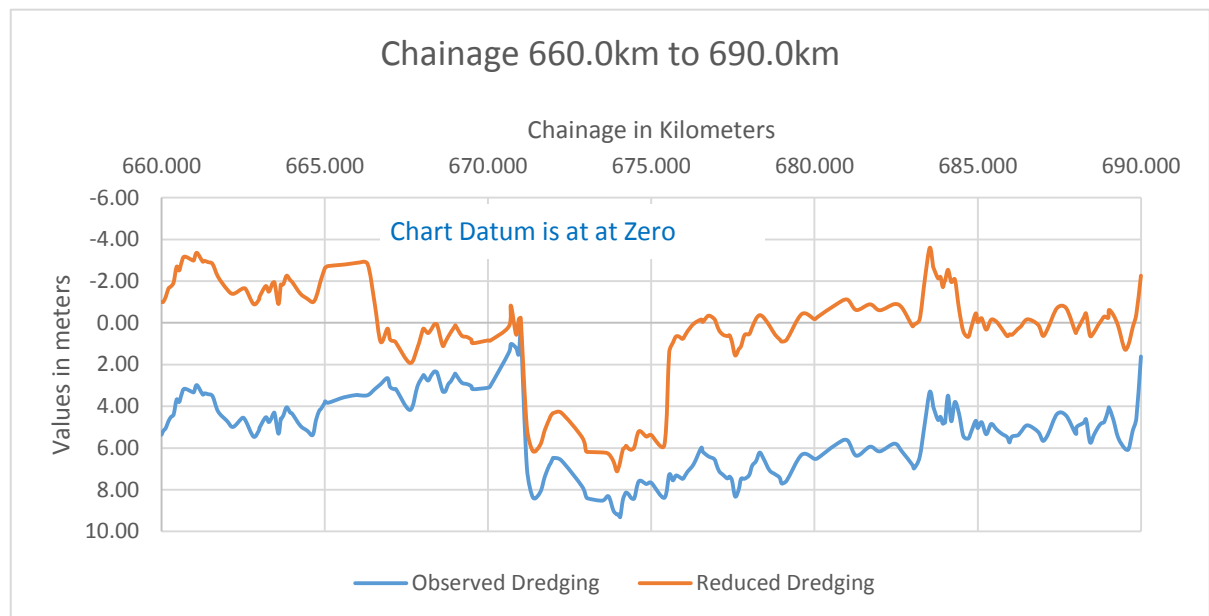
Purna Jn. Railway station, Chudawa Railway Station are the very nearby railway stations to Devthana. Pingli Railway Station (near to Parbhani), Chudawa Railway Station (near to Purna), Purna Jn Railway Station (near to Purna), Gangakher Railway Station (near to Gangakhed), Parbhani Jn. Railway Station (near to Parbhani) are the Railway stations reachable from near by towns. However, Nanded Railway Station is major railway station 34km near to Devthana. Purna, Parbhani, and Gangakhed are nearby by towns to Devthana having road connectivity to Devthana.

In this stretch features across the river are 02 Road Bridge and 01 Barrage. In addition to this 04 Temple along the river.

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	660	690	0.00	10.03	210	7,262.04	20,088,930.09	-0.30	7.78	24,950	959,679.31	31,131,128.47
II	660	690	0.00	10.03	800	13,042.65	30,607,610.75	-0.30	7.78	25,170	1,481,706.62	46,229,313.81
III	660	690	0.00	10.06	1,110	23,068.08	46,287,252.40	-0.30	7.81	25,270	2,285,446.14	68,311,583.75
IV	660	690	0.00	10.06	1,460	30,986.32	55,898,895.02	-0.30	7.81	25,550	2,793,928.21	81,417,613.66

*Table 94 - Dredging Quantity Details*

### 3.23.1 Observed and reduced Bed Profile of the stretch



*Figure 132 - River bed Profile*



### 3.24 Sub-Stretch-24: Devthana to Dusalgaon (ch.690.0km to 720.0km)

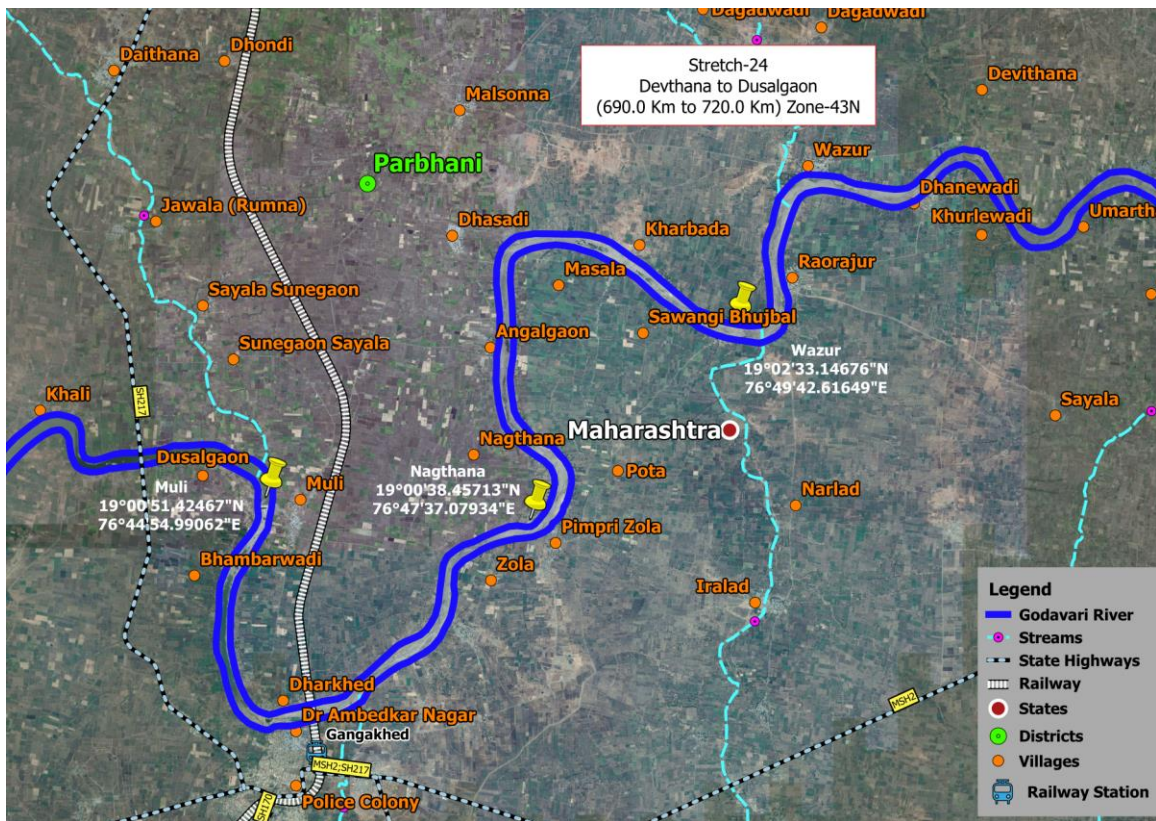


Figure 133 - Stretch-24 Devthana to Dusalgaon

- **Bathymetry Survey**
  - a) 11.90km length of the stretch for which the bathymetric survey has been carried out.
- **Topographic Survey**
  - b) 18.10km length of the stretch for which the topographic survey has been carried out.

Stretch-24 is covered 30.0km i.e. from 690.0km to 720.0km Devthana to Dusalgaon village. From chainage 690.0km to 701.90km river is navigable. From chainage 701.20km to 720.0km is non-navigable as the depths noted were less than half a meter and hence could not be surveyed using survey boat. Instead, the spot levels were measured using Trimble R4 GPS.

In this stretch along the right bank of the river Analgaon, Nagthana, Dharkhed, and Muli village are located. On left bank Dhanewadi, Raorajur, Zola, Khumbharwada, Bhamarvadi and Dusalgaon villages are located. Both sides of river banks having cultivable land. Cotton, Banana, Sugarcane, Mango, Soyabean, Sweet Lime and Jawar (Sorghum) are the essential crops grown mostly in the area.



Raorajur is a village in Palam Taluka in Parbhani District of Maharashtra State. It belongs to Aurangabad Division. It is located 28km towards south from district head quarter Parbhani. 14km from Palam. 489km from state capital Mumbai.

Rokadewadi, Sawangi Bhujbal, Wazur, Khurlewadi and Sayala (palam) are the nearby villages to Raorajur. Raorajur is surrounded by Gangakhed Taluka towards the south, Purna Taluka towards east, Parbhani Taluka towards the north, Sonpeth Taluka towards west. Parbhani, Purna, Loha, and Parli are the nearby cities to Raorajur.

This place is in the border of the Parbhani District and Nanded District. Nanded District Loha is east towards this place. Gangakhed is nearby by towns to Raorajur having road connectivity to Raorajur.

At chainage 698.909km Masuli River a tributary joins Godavari River near Raorajur village. At chainage 709.272km Pimpri Maharaj Mutt is located near Pimpari Zola village on the left bank of the river. At chainage 709.588km Nag Mandir is located near Nagthana village on the right bank of the river.

At chainage 715.107km Gangakhed Railway line Bridge is crossing over Godavari River near Gangakhed Town. It is in between Gangakhed Railway station and Dhondi Railway Station.



*Figure 134 - Gangakhed Railway Bridge (ch.715.107km)*

At chainage 715.11km CWC gauge station Gangakhed is located on left bank of the river near Railway Bridge.



*Figure 135 - CWC gauge station Gangakhed (ch.715.11km)*

At chainage 715.645km Balaji Mandir is located near Gangakher village on the left bank of the river.

Dharkhed village is located in Gangakhed Tehsil of Parbhani district in Maharashtra, India. It is situated 3km away from sub-district head quarter Gangakhed and 37km away from district head quarter Parbhani. Dharkhed village is also a gram panchayat. Gangakhed is the nearest town to Dharkhed which is approximately 3km away.

At Chainage 715.965km Shri Hanuman Mandir is located near Dharkhed village on the right bank of the river.



*Figure 136 - Shri Hanuman Mandir (ch.715.965km)*

Muli village is located in Gangakhed Tehsil of Parbhani district in Maharashtra. It is situated 8km away from sub-district head quarter Gangakhed and 30km away from district head quarter Parbhani. Muli village is also a gram panchayat. Gangakhed is the nearest town to Muli which is approximately 8km away.

At chainage 720.262km Muli Barrage is constructed across the Godavari River near Muli village.



*Figure 137 - Muli Barrage (ch. 720.262km)*

At chainage 720.823km Indrayani River tributary of Godavari River joins near Muli village.

Dusalgaon is a village in Gangakhed Taluka in Parbhani District of Maharashtra. It belongs to Aurangabad Division. It is located 32km towards south from district head quarter Parbhani. 15km from Gangakhed. 477km from state capital Mumbai

Khali, Dharkhed, Mahatpuri, Zola, and Gangakhed are the nearby villages to Dusalgaon. Dusalgaon is surrounded by Sonpeth Taluka towards west, Palam Taluka towards the east, Parbhani Taluka towards the north, Parali V. Taluka towards west.

Parbhani, Parli, Purna, and Manwath are the nearby cities to Dusalgaon.

Gangakher Railway Station, Dhondi Railway Station are the very nearby railway stations to Dusalgaon. Gangakher Railway Station (near to Gangakhed) are the railway stations reachable from near by towns. However, Nanded Railway Station is major railway station 69km near to Dusalgaon.

In this stretch features across the river are 01 Railway Bridge and 01 Barrage. In addition to this 04 Temple and 01 CWC gauge Gangakhed along the river.

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	690	720	0.00	6.78	15,750	675,432.38	20,764,362.47	-0.30	3.20	29,300	1,312,073.03	32,443,201.50
II	690	720	0.00	6.90	15,960	1,030,678.66	31,638,289.41	-0.30	3.20	29,300	1,981,771.75	48,211,085.56
III	690	720	0.00	6.90	17,175	1,564,065.55	47,851,317.95	-0.30	3.20	29,300	2,979,839.90	71,291,423.65
IV	690	720	0.00	6.90	17,665	1,896,194.86	57,795,089.88	-0.30	3.20	29,950	3,582,177.87	84,999,791.53

Table 95 - Dredging Quantity Details

### 3.24.1 Observed and reduced Bed Profile of the stretch

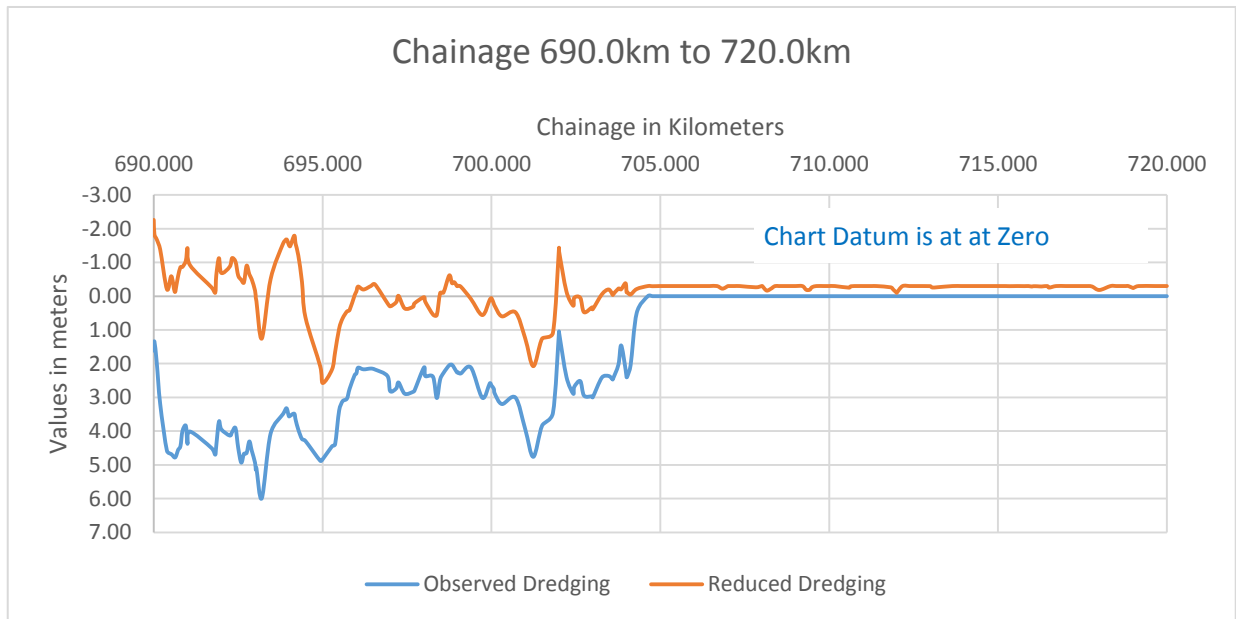


Figure 138 - River bed Profile



### 3.25 Sub-Stretch-25: Dusalgaon to Rampuri (ch.720.0km to 750.0km)

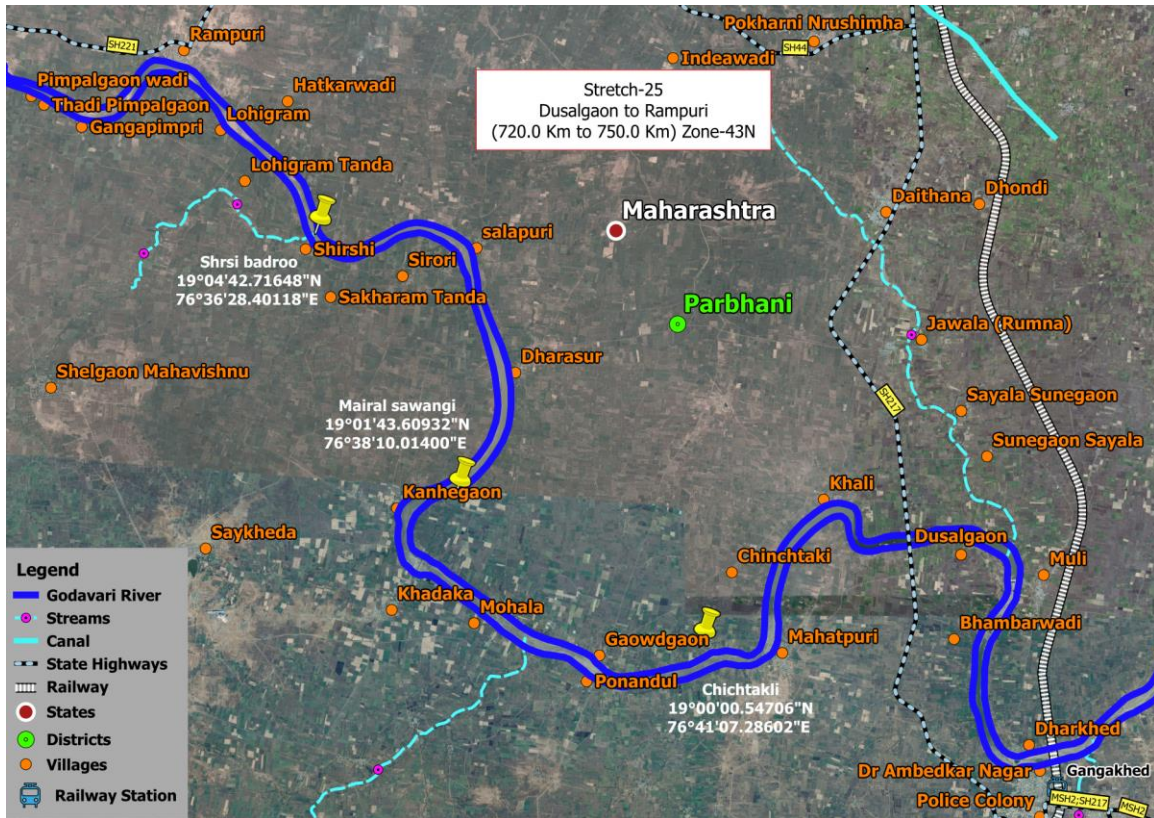


Figure 139 - Stretch-25 Dusalgaon to Rampuri

- **Bathymetry Survey**
  - a) 0.0km length of the stretch for which the bathymetric survey has been carried out.
- **Topographic Survey**
  - b) 30.0km length of the stretch for which the topographic survey has been carried out.

Stretch-25 is covered 30.0km i.e. from 720.0km to 750.0km Dusalgaon to Rampuri village is non-navigable as the depths noted were less than half a meter and hence could not be surveyed using survey boat. Instead, the spot levels were measured using Trimble R4 GPS.

In this stretch along the right bank of the River Khali, Gaowdgaon, Sawangi, Dharasur and Rampuri village is located. On left bank Mahatpuri, Pohandul, Khadaka, Kanhegaon, Shirshi Lohigram and Golegaon villages are located.



Both sides of river banks having cultivable land. Cotton, Banana, Sugarcane, Mango, Soyabean, Sweet Lime and Jawar (Sorghum) are the essential crops grown mostly in the area.

At chainage 722.7km G.R. Bridge CWC gauge is located on right bank of the river near Parbhani-Gangakhed State Highway Road Bridge.

At chainage 723.031km Parbhani-Gangakhed State Highway Road Bridge is constructed across Godavari River near Dusalgaon village. It is connecting between Parbhani and Gangakhed.



*Figure 140 - Parbhani-Gangakhed State Highway Road Bridge (ch.723.031km)*

Mahatpuri village is located in Purna Tehsil of Parbhani district in Maharashtra, India. It is situated 22km away from sub-district head quarter Purna and 20km away from district head quarter Parbhani. Khambegaon is the gram panchayat of Mahatpuri village. Parbhani is the nearest town to Mahatpuri which is approximately 22km away.

Khadka village is located in Sonpeth Tehsil of Parbhani district in Maharashtra, India. It is situated 20km away from sub-district head quarter Sonpeth and 55km away from district head quarter Parbhani. Khadaka is the gram panchayat of Khadka village. Gangakhed is the nearest town to Khadka which is approximately 20km away.

Kanhegaon village is located in Sonpeth Tehsil of Parbhani district in Maharashtra, India. It is situated 25km away from sub-district head quarter Sonpeth and 60km away from district head quarter Parbhani. Kanhegaon village is also a gram panchayat. Gangakhed is the nearest town to Kanhegaon which is approximately 23km away.

At chainage 736.728km Madhavasharam Swami Temple near Kanhegaon village on the left bank of the river.

At chainage 736.937km Khadaka Barrage is constructed across Godavari River near Khadaka village.



*Figure 141 - Khadaka Barrage (ch.736.937km)*

Dharasur village is located in Gangakhed Tehsil of Parbhani district in Maharashtra, India. It is situated 22km away from sub-district head quarter Gangakhed and 20km away from district head quarter Parbhani. Dharasur village is also a gram panchayat. Gangakhed is the nearest town to Dharasur which is approximately 22km away.

At chainage 748.281km Shelgaon- Shirshi Road Bride is constructed across Godavari River near Shirshi village. It is joining between Shelgaon to Shirshi village.



*Figure 142 - Shelgaon- Shirshi Road Bride (ch.748.281km)*

At chainage 748.380km Falguna River a tributary of Godavari River joins near Shirshi village on the left bank of the river.

Rampuri is a small village/hamlet in Pathri Taluka in Parbhani District of Maharashtra State. It comes under Rampuri Panchayath. It belongs to Aurangabad Division. It is

located 31km towards west from district head quarter Parbhani. 29km from Pathri. 458km from state capital Mumbai.

Ganga Pimpri, Lohigram Tanda, Thadi Pimpalgaon, Shrisi Budruk and Wadi Pimpalgaon are the nearby villages to Rampuri. Rampuri is surrounded by Manwat Taluka towards the north, Pathri Taluka towards west, Parbhani Taluka towards east, Parali V. Taluka towards the south. Pathri, Manwath, Parbhani, and Parli are the nearby cities to Rampuri.

There is no railway station near to Rampuri in less than 10km. Manwath Road Railway station (near to Manwath) are the Railway stations reachable from near by towns. However, Nanded Railway Station is major railway station 86km near to Rampuri. Pathri, Manwath, Manjlegaon, and Sonpeth are the nearby by towns to Rampuri having road connectivity to Rampuri

In this stretch features across the river are 02 Road Bridge, 02 High Tension transmission line and 01 Barrage. In addition to this 01 Temple and 01 CWC gauge along the river.

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	720	750	0.00	0.00	30,000	1,291,385.95	22,055,748.42	-0.30	0.00	30,000	1,652,243.74	34,095,445.24
II	720	750	0.00	0.00	30,000	1,966,955.70	33,605,245.11	-0.30	0.00	30,000	2,431,181.28	50,642,266.84
III	720	750	0.00	0.00	30,000	2,972,811.59	50,824,129.54	-0.30	0.00	30,000	3,549,545.50	74,840,969.15
IV	720	750	0.00	0.00	30,000	3,587,097.16	61,382,187.04	-0.30	0.00	30,000	4,189,738.56	89,189,530.09

*Table 96 - Dredging Quantity Details*

### 3.25.1 Observed and reduced Bed Profile of the stretch

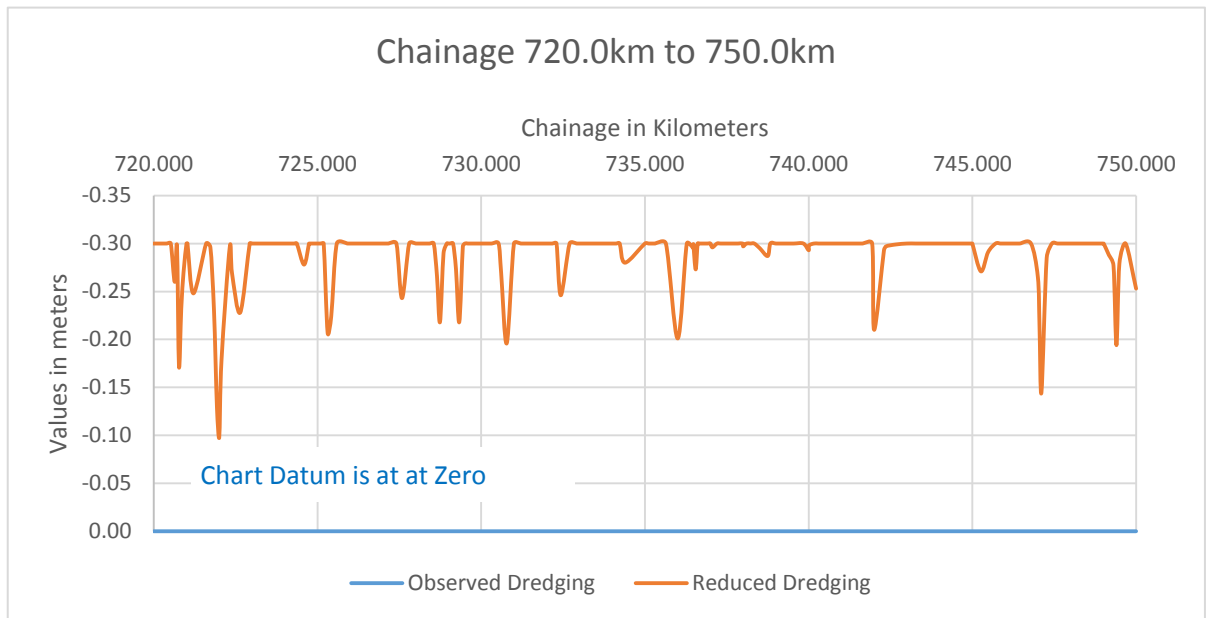


Figure 143 - River bed Profile

### 3.26 Sub-Stretch-26: Rampuri to Daku Pimpri (ch.750.0km to 780.0km)

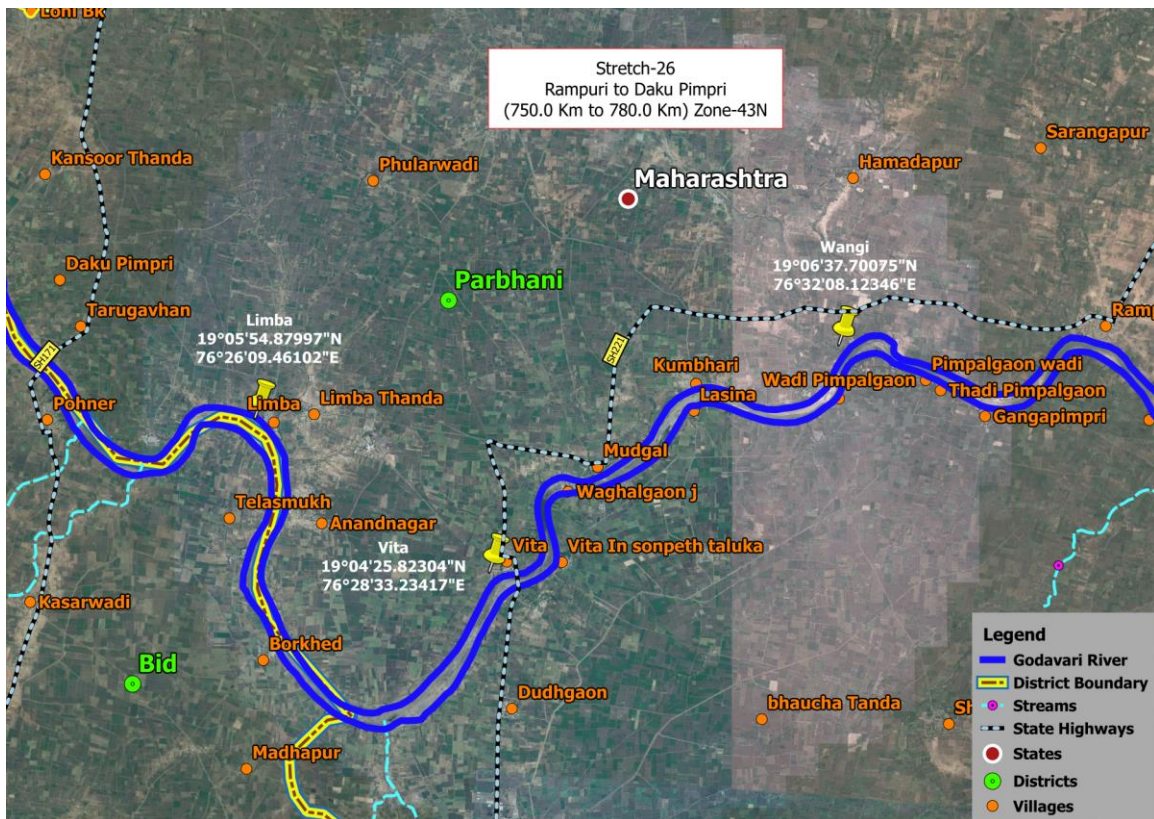


Figure 144 - Stretch-26 Rampuri to Daku Pimpri

- **Bathymetry Survey**
  - a) 0.0km length of the stretch for which the bathymetric survey has been carried out.
- **Topographic Survey**
  - b) 30.0km length of the stretch for which the topographic survey has been carried out.

Stretch-26 is covered 30.0km i.e. from 720.0km to 750.0km Rampuri to Daku Pimpri village is non-navigable as the depths noted were less than half a meter and hence could not be surveyed using survey boat. Instead, the spot levels were measured using Trimble R4 GPS.

In this stretch along the right bank of the river Kumbhari, Mudgal, Vita, Limba and Daku Pimpri village is located. On left bank Gangapimpri, Pimpalgaon wadi, Ukkadgaon, Lasina, Borkhed and Pohner villages are located.



Both sides of river banks having cultivable land. Cotton, Banana, Sugarcane, Mango, Soyabean, Sweet Lime and Jawar (Sorghum) are the essential crops grown mostly in the area.

At chainage 753.193km and 753.27km Narmadeshwar Temple and Motha Maruti Mandir (Hanumanji Temple) is located near Rampuri village on the right bank of the river.



*Figure 145- Motha Maruti Mandir (Hanumanji Temple) and Narmadeshwar Temple (ch.753.193km)*

Ganga Pimpri village is located in Sonpeth Tehsil of Parbhani district in Maharashtra, India. It is situated 15km away from sub-district head quarter Sonpeth and 80km away from district head quarter Parbhani. Ganga Pimpri village is also a gram panchayat. Sonpeth is the nearest town to Ganga Pimpri which is approximately 15km away.

Lasina village is located in Sonpeth Tehsil of Parbhani district in Maharashtra, India. It is situated 10km away from sub-district head quarter Sonpeth and 80km away from district head quarter Parbhani. Lasina village is also a gram panchayat. Sonpeth is the nearest town to Lasina which is approximately 10km away.

At chainage 761.955km Tuljabhani Mandir is located near Kumbhari village on the right bank of the river.



*Figure 146 - Tuljabhani Mandir (ch.761.955km)*

Mudgal village is located in Pathri Tehsil of Parbhani district in Maharashtra, India. It is situated 18km away from sub-district head quarter Pathri and 45km away from district head quarter Parbhani. As per 2009 stats, Mudgal village is also a gram panchayat. Sonpeth is the nearest town to Mudgal which is approximately 9km away.

At chainage 764.520km Sri Mudgaleshwar Temple is located inside river near Mudgal Barrage in Mudgal village.



*Figure 147 - Sri Mudgaleshwar Temple (ch.764.520km)*

At chainage 764.753km Mudgal Barrage is constructed across Godavari River near Mudgal village.



*Figure 148 - Mudgal Barrage (ch.764.753km)*

Vita village is located in Sonpeth Tehsil of Parbhani district in Maharashtra, India. It is situated 4km away from sub-district head quarter Sonpeth and 65km away from district head quarter Parbhani. Vita Khurd is the gram panchayat of Vita village. Sonpeth is the nearest town to Vita Kh which is approximately 4km away.

At chainage 766.277km Revanath Maharaj Mandir is located on left bank of the river near Vita Kh village.



*Figure 149 - Revanath Maharaj Mandir (ch.766.277km)*

At chainage 767.025km Sonpeth-Pathari Road Bridge is constructed across Godavari River near Vita village, it is connecting between Sonpeth and Pathari villages.



*Figure 150 - Sonpeth-Pathari Road Bridge (ch. 767.025km)*

Limba village is located in Pathri Tehsil of Parbhani district in Maharashtra, India. It is situated 18km away from sub-district head quarter Pathri and 55km away from district head quarter Parbhani. Limba village is also a gram panchayat. Sonpeth is the nearest town to Limba which is approximately 11km away.

Pohner is a village in Parali V. Taluka in Beed District of Maharashtra State. It belongs to Aurangabad Division. It is located 80km towards east from district head quarter, Beed. 30km from Parali V. 43km from state capital Mumbai. Pathri, Manjlegaon, Manwath, and Parli are the nearby cities to Pohner.

This place is in the border of the Beed District and Parbhani District. Parbhani District Sonpeth is east towards this place. Parli is nearby towns to Pohner having road connectivity to Pohner. At chainage 782.292km Pohner Road Bridge is constructed across Godavari River near Pohner village. It is connecting between Pohner and Daku Pimpri village.



*Figure 151 - Pohner Road Bridge (ch. 782.292 km)*

Daku Pimpri is a village in Pathri Taluka in Parbhani District of Maharashtra State. It belongs to Aurangabad Division. It is located 50km towards west from district head quarter Parbhani. 17km from Pathri. 436km from state capital Mumbai. Limba, Umara, Lonibk, Gaundgaon, and Phularwadi are the nearby villages to Daku Pimpri. Daku Pimpri is surrounded by Majalgaon Taluka towards west, Manwat Taluka towards the north, Sonpeth Taluka towards the east, Parali V. Taluka towards the south. Pathri, Manjlegaon, Manwath, and Parli are the nearby cities to Daku Pimpri.

There is no railway station near to Daku Pimpri in less than 10km. Manwath Road Railway Station (near to Manwath) are the railway stations reachable from near by towns. However, Nanded Railway Station is major railway station 107km near to Daku Pimpri. Pathri, Manwath, Manjlegaon, and Sonpeth are nearby by towns to Daku Pimpri having road connectivity to Daku Pimpri.

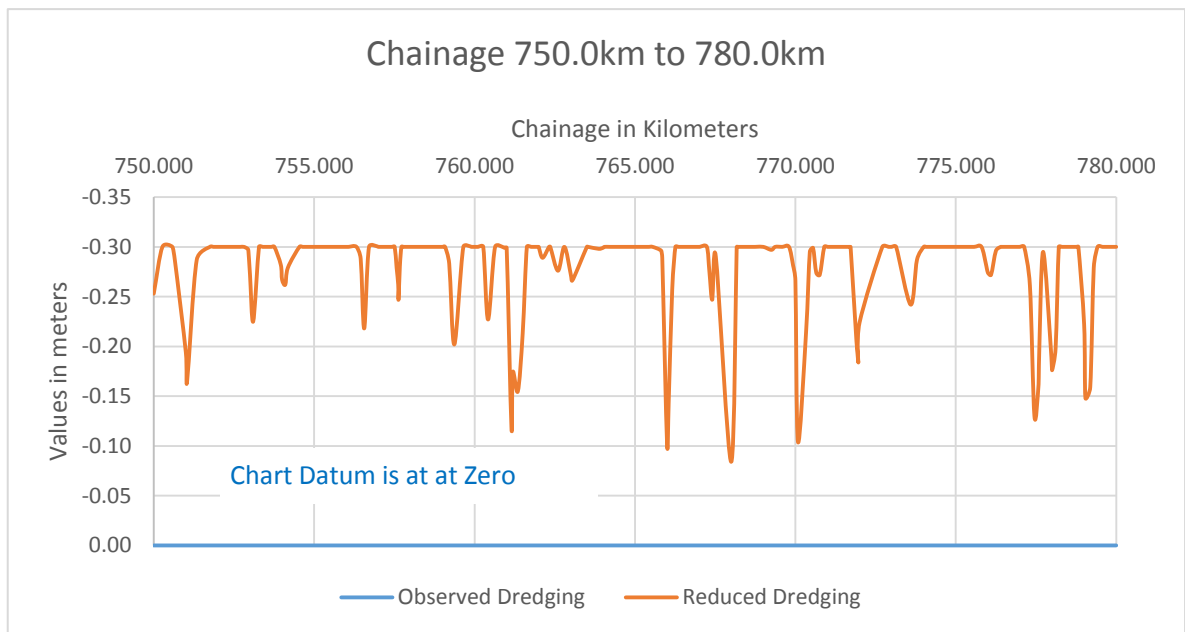
In this stretch features across the river are 02 Road Bridge and 01 Barrage. In addition to this 05 Temple along the river.



Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	750	780	0.00	0.00	30,000	1,290,518.56	23,346,266.98	-0.30	0.00	30,000	1,646,629.75	35,742,074.99
II	750	780	0.00	0.00	30,000	1,965,639.62	35,570,884.73	-0.30	0.00	30,000	2,423,609.78	53,065,876.62
III	750	780	0.00	0.00	30,000	2,970,877.19	53,795,006.73	-0.30	0.00	30,000	3,539,520.95	78,380,490.10
IV	750	780	0.00	0.00	30,000	3,584,779.02	64,966,966.06	-0.30	0.00	30,000	4,178,939.69	93,368,469.78

*Table 97 - Dredging Quantity Details*

### 3.26.1 Observed and reduced Bed Profile of the stretch



*Figure 152 - River bed Profile*

### 3.27 Sub-Stretch-27: Daku Pimpri to Rampuri (ch.780.0km to 810.0km)

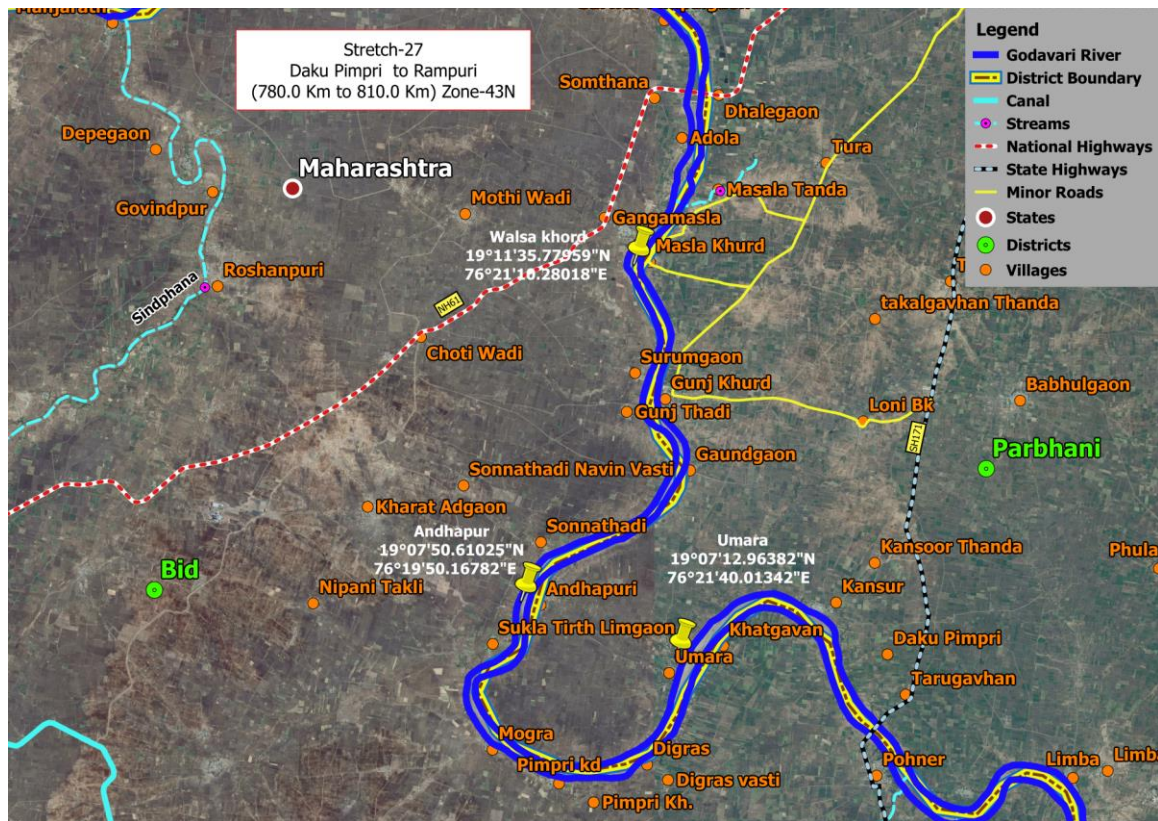


Figure 153 - Stretch-27 Daku Pimpri to Rampuri

- **Bathymetry Survey**
  - a) 0.0km length of the stretch for which the bathymetric survey has been carried out.
- **Topographic Survey**
  - b) 30.0km length of the stretch for which the topographic survey has been carried out.

Stretch-27 is covered 30.0km i.e. from 720.0km to 750.0km Daku Pimpri to Rampuri village is non-navigable as the depths noted were less than half a meter and hence could not be surveyed using survey boat. Instead, the spot levels were measured using Trimble R4 GPS.

In this stretch along the right bank of the river Umara, Andhapuri, Gaundgaon, Gunj Khurd, Masla Khurd, Dhalegaon and Rampuri village is located. On left bank Khat gavan, Mogra, Sonnathadi, Gunj Thadi, Surumgaon, Gangamasla, Somthana and Sarwar Pimpalgaon villages are located.

Both sides of river banks having cultivable land. Cotton, Banana, Sugarcane, Mango, Soyabean, Sweet Lime and Jawar (Sorghum) are the essential crops grown mostly in the area.

At chainage 782.300km Tarugavan High-Level Barrage is under construction across Godavari River near Daku Pimpri village.



*Figure 154 - Tarugavan High-Level Barrage (ch. 782.892km)*

Umara village is located in Pathri Tehsil of Parbhani district in Maharashtra, India. It is situated 22km away from sub-district head quarter Pathri and 62km away from district head quarter Parbhani. Umara village is also a gram panchayat. Pathri is the nearest town to Umara which is approximately 22km away.

At chainage 796.364km Rameshwar Mandir is located near Sukla Tirth Limgaon village on the left bank of the river.

At chainage 798.243km and 798.300km Laxmi Aai Mandir and Mahadev Mandir is located respectively near Sonnathadi village on the left bank of river. At chainage 801.86km Gaund Gaon Devi Temple is located near Gaundgaon village on the right bank of the river.

At chainage 803.286km Shri Yoganand Maharaj Sansthan Gunj, near Gunk Khurd village on the right bank of the river.



*Figure 155 - Shri Yoganand Maharaj Sansthan Gunj (ch. 803.286km)*

At chainage 803.713km Hanuman Mandir near Surumgaon village is located on left bank of the river. At chainage 807.864km Shri Moreshwar Mandir is located near village Gangamasala on left bank of the river.



*Figure 156 - Shri Moreshwar Mandir (ch. 807.864km)*

Dhalegaon village is located in Pathri Tehsil of Parbhani district in Maharashtra, India. It is situated 9km away from sub-district head quarter Pathri and 54km away from district head quarter Parbhani. Dhalegaon village is also a gram panchayat. Pathri is the nearest town to Dhalegaon which is approximately 9km away.

Tura, Jaitapurwadi, Niwali, Gunj Khurd, Lonibk are the nearby villages to Dhalegaon. Dhalegaon is surrounded by Majalgaon Taluka towards west, Manwat Taluka towards the east, Sailu Taluka towards north, Sonpeth Taluka towards the south. Pathri, Manwath, Manjlegaon, and Sailu are the nearby cities to Dhalegaon.

At chainage 809.605km CWC gauge, Dhalegaon is located inside river near to Dhalegaon barrage in Dahlegaon village. At chainage 810.0km Dhalegaon Barrage is constructed across Godavari River near Dahlegaon village.





*Figure 157 - Dhalegaon Barrage (ch. 810.0km)*

At chainage 810.165km an under construction Road Bridge is located near Dhalegaon village.



*Figure 158 - Under construction Road Bridge (ch. 810.165km)*

At chainage 810.172km Majalgaon-Pokharni Road Bridge (NH-61) is constructed near Dhalegaon village. It is connecting between Somthana and Dhalegaon villages.



*Figure 159 - Majalgaon-Pokharni Road Bridge NH-61 (ch. 810.172km)*



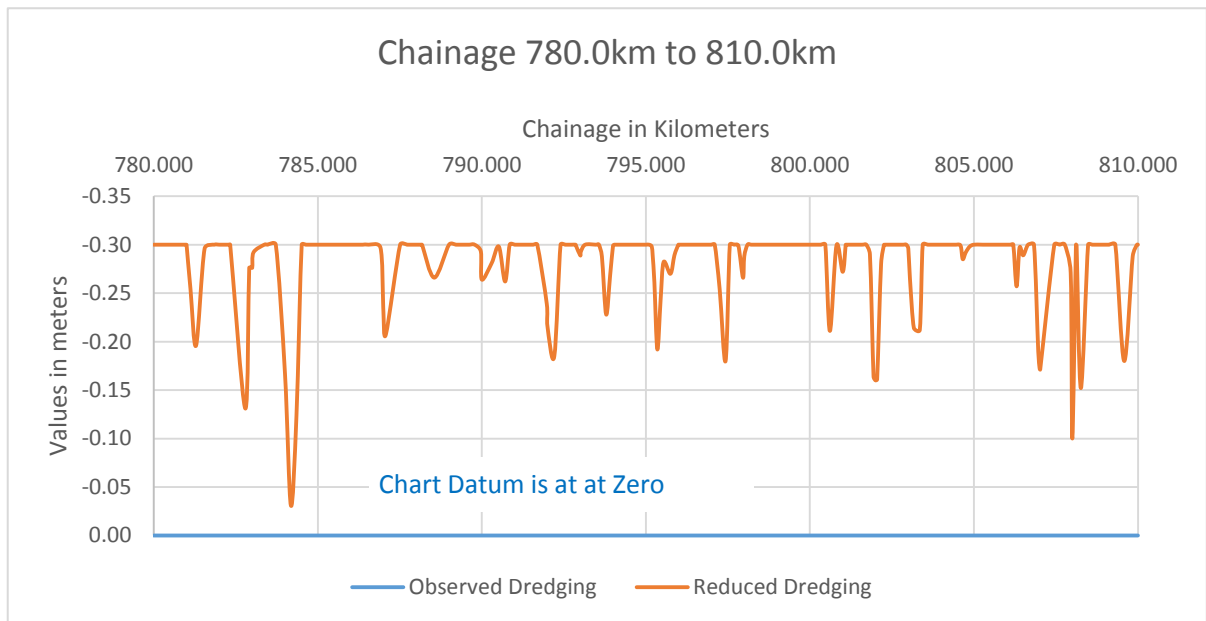
At chainage 811.84km Ratheshwar Mandir is located near Rampuri village.

In this stretch features across the river are 02 Road Bridge (01 under construction) and 01 Barrage. In addition to this 08 Temple and 01 CWC gauge along the river.

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	780	810	0.00	0.00	30,000	1,292,498.69	24,638,765.67	-0.30	0.00	30,000	1,643,687.82	37,385,762.81
II	780	810	0.00	0.00	30,000	1,968,652.15	37,539,536.88	-0.30	0.00	30,000	2,419,991.97	55,485,868.59
III	780	810	0.00	0.00	30,000	2,975,413.33	56,770,420.06	-0.30	0.00	30,000	3,535,306.36	81,915,796.46
IV	780	810	0.00	0.00	30,000	3,590,243.13	68,557,209.19	-0.30	0.00	30,000	4,175,246.74	97,543,716.52

*Table 98 - Dredging Quantity Details*

### 3.27.1 Observed and reduced Bed Profile of the stretch



*Figure 160 - River bed Profile*

### 3.28 Sub-Stretch-28: Rampuri to Changtpuri (ch.810.0km to 840.0km)

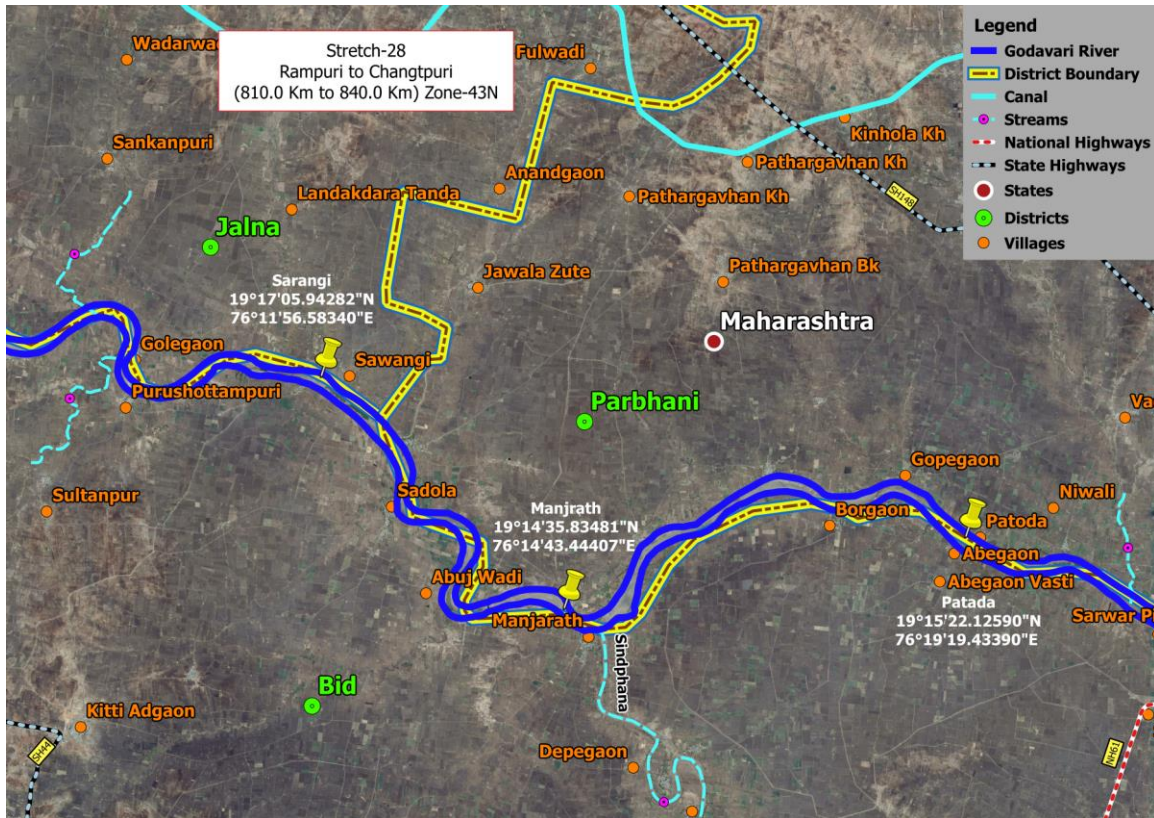


Figure 161 - Stretch-28 Rampuri to Changtpuri

- **Bathymetry Survey**
  - a) 0.0km length of the stretch for which the bathymetric survey has been carried out.
- **Topographic Survey**
  - b) 30.0km length of the stretch for which the topographic survey has been carried out.

Stretch-28 is covered 30.0km i.e. from 810.0km to 840.0km Rampuri to Changtpuri village is non-navigable as the depths noted were less than half a meter and hence could not be surveyed using survey boat. Instead, the spot levels were measured using Trimble R4 GPS.

In this stretch along the right bank of the river Patoda, Gopegaon, Golegaon, and Changtpuri village is located. On left bank Abegaon, Borgaon, Manj arath, Sadola and Mahatpuri villages are located.

Both sides of river banks having cultivable land. Cotton, Banana, Sugarcane, Mango, Soyabean, Sweet Lime and Jawar (Sorghum) are the essential crops grown mostly in the area.

At chainage 814.474km Maruti Mandir is located near Niwali village on the right bank of the river.

At chainage 820.158km Chatre Borgaon stream is located near Borgaon village on the left bank of the river.

Patoda Ganga Kinara village is located in Pathri Tehsil of Parbhani district in Maharashtra, India. It is situated 18km away from sub-district head quarter Pathri and 61km away from district head quarter Parbhani. Patoda Gangakinara is the gram panchayat of Patoda Ganga Kinara village.

At chainage 825.592km Sindhaphane River a tributary of Godavari River joining near Manjarath village.

Sindhaphana is a minor tributary of Godavari River that originates around the Chincholi hill in Patoda Taluka, Beed district, state Maharashtra. Crossing west to the east its drainage basin covers nearly 80% of Beed District, making it the most important river within the district.

From the site of origin the river flows in a northeasterly course past Amalner, a small village in the Patoda taluka. About a kilometer below Chavarwadi, it makes a right-angular turn to follow a north-westerly direction flowing to Sindphana village, where the Sindphana Dam sits across the river. Here, it resumes its north-easterly course once again. After the confluence of another tributary, the Kinha, the Sindphana has a fairly long easterly course flowing alongside the villages Yelamb, Pimpari, and Hirapur beyond which it is joined by one of its tributaries - Bindusara River. Its flow is interrupted by the Majalgaon Dam at Majalgaon, whereafter it flows north-eastwards and northwards to join the Godavari at Manjarath village, Pathri taluka, Parbhani District.

At chainage 825.737km Vithal Mandir is located on right bank of the river near Manjarath village. At chainage 828.144km Lonisawangi High-Level Barrage is constructed across Godavari River near Manjarath village.



*Figure 162 - Lonisawangi High-Level Barrage (ch 828.144km)*

At chainage 828.291 Gautam Rushi Temple is located near Lonisawangi High-Level Barrage, Manjarath on left bank of the river.

Sadola is a village in Majalgaon Taluka in Beed District of Maharashtra State. It belongs to Aurangabad Division. It is located 59km towards east from district head quarter, Beed.

Sadola is surrounded by Pathri Taluka towards the east, Wadwani Taluka towards the south, Sonpeth Taluka towards east, Dharur Taluka towards the south.

Manjlegaon, Pathri, Manwath, and Sailu are the nearby cities to Sadola.

At chainage 834.469km Sadola – Ashti Road Bridge is constructed across Godavari River near Sadola village. It is connecting between Sadola and Ashti villages.



*Figure 163 - Sadola-Ashti Road Bridge (ch. 834.469km)*

Changtpuri village is located in Partur Tehsil of Jalna district in Maharashtra, India. It is situated 40km away from sub-district head quarter Partur and 100km away from district IWAI, Region-V, Godavari River Final Feasibility Report

head quarter Jalna. Changatpuri is the gram panchayat of Changtpuri village. Manjlegaon is the nearest town to Changtpuri which is approximately 25km away.

In this stretch features across the river are 01 Road Bridge and 01 Barrage. In addition to this 02 Temple along the river.

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	810	840	0.00	0.00	30,000	1,290,121.01	25,928,886.68	-0.30	0.00	30,000	1,649,806.21	39,035,569.02
II	810	840	0.00	0.00	30,000	1,965,019.12	39,504,556.00	-0.30	0.00	30,000	2,427,709.40	57,913,577.99
III	810	840	0.00	0.00	30,000	2,969,849.29	59,740,269.35	-0.30	0.00	30,000	3,544,226.81	85,460,023.27
IV	810	840	0.00	0.00	30,000	3,583,512.15	72,140,721.34	-0.30	0.00	30,000	4,183,706.43	101,727,422.95

Table 99 - Dredging Quantity Details

### 3.28.1 Observed and reduced Bed Profile of the stretch

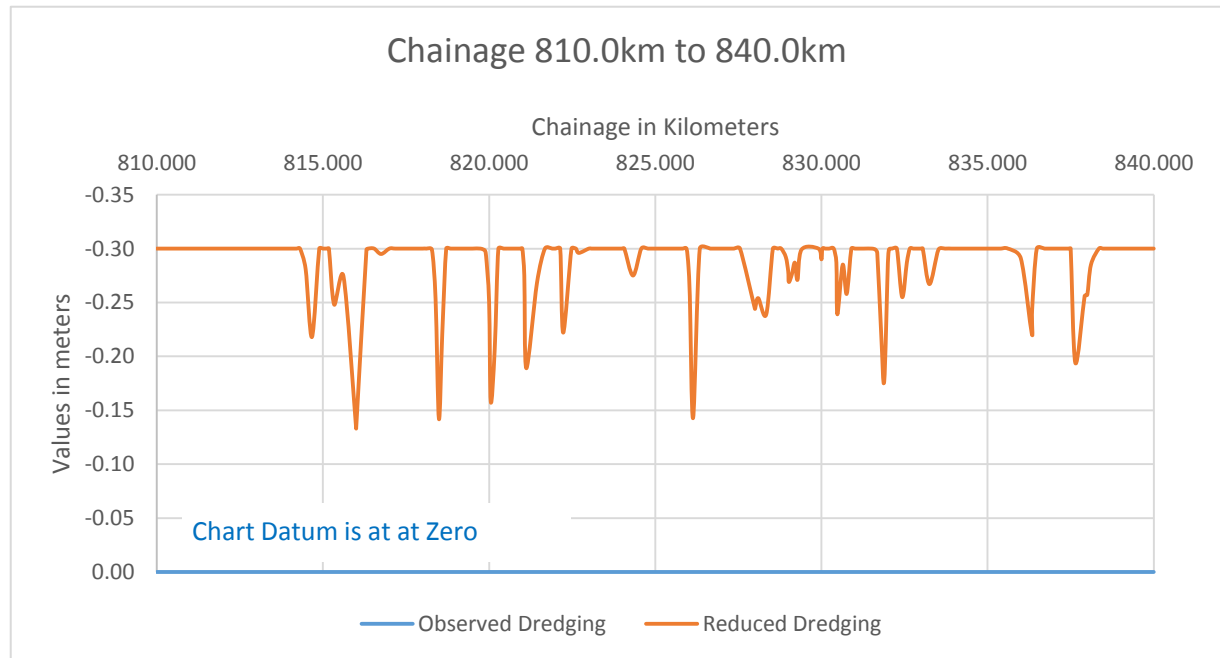


Figure 164 - River bed Profile



### 3.29 Sub-Stretch-29: Changtpuri to Mangrul (ch.840.0km to 870.0km)

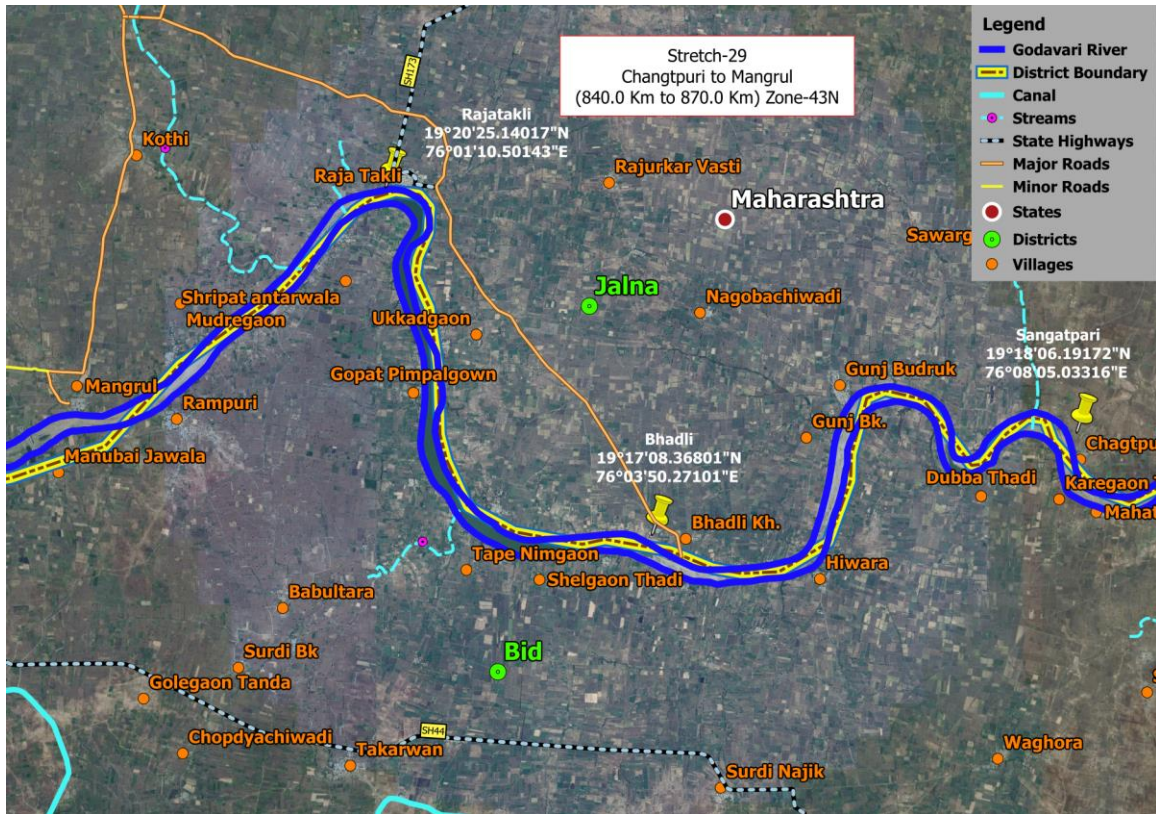


Figure 165 - Stretch-29 Changtpuri to Mangrul

- **Bathymetry Survey**
  - a) 0.0km length of the stretch for which the bathymetric survey has been carried out.
- **Topographic Survey**
  - b) 30.0km length of the stretch for which the topographic survey has been carried out.

Stretch-29 is covered 30.0km i.e. from 810.0km to 840.0km Changtpuri to Mangrul village is non-navigable as the depths noted were less than half a meter and hence could not be surveyed using survey boat. Instead, the spot levels were measured using Trimble R4 GPS.

In this stretch along the right bank of the river Gunj Budruk, Shivangaon, Raja Takli, and Mangrul village are located. On left bank, Hiwara, Gopat Pimpalgaon, and Rampuri villages are located.

Both sides of river banks having cultivable land. Cotton, Banana, Sugarcane, Mango, Soyabean, Sweet Lime and Jawar (Sorghum) are the essential crops grown mostly in the area.

Hiwara (Bk) is a village in Majalgaon Taluka in Beed District of Maharashtra State. It belongs to Aurangabad Division. It is located 60km towards east from district head quarter, Beed. 412km from state capital Mumbai.

Hiwara (Bk) is surrounded by Pathri Taluka towards the east, Wadwani Taluka towards south, Dharur Taluka towards the south, Manwat Taluka towards east.

Manjlegaon, Pathri, Manwath, and Sailu are the nearby cities to Hiwara (Bk).

Shivangaon village is located in Ghansawangi Tehsil of Jalna district in Maharashtra, India. It is situated 50km away from sub-district head quarter Ghansawangi and 80km away from district head quarter Jalna. Shivangaon village is also a gram panchayat. Manjlegaon is the nearest town to Shivangaon which is approximately 30km away.

At chainage 857.147km Rajatakli High-Level Barrage is constructed across Godavari River near Shivangaon village.



*Figure 166 - Rajatakli High-Level Barrage (ch.857.147km)*

Raja Takli village is located in Ghansawangi Tehsil of Jalna district in Maharashtra, India. It is situated 26km away from sub-district head quarter Ghansawangi and 78km away from district head quarter Jalna. Rajatakali is the gram panchayat of Raja Takli village. Ambad is the nearest town to Raja Takli which is approximately 48km away.

Rampuri is a village in Georai Taluka in Beed District of Maharashtra State. It belongs to Aurangabad Division. It is located 49km towards north from district head quarter Beed. 28km from Takalgaon T.Georai. 386km from state capital Mumbai.

Surdi Bk., Babultara, Golegaon Tanda, Tapenimgaon, and Chopdyachiwadi are the nearby villages to Rampuri. Rampuri is surrounded by Georai Taluka towards west, Majalgaon Taluka towards the east, Wadwani Taluka towards the south, Partur Taluka towards east. Manjlegaon, Partur, Pathri, and Sailu are the nearby cities to Rampuri.

Bid, Georai, and Manjlegaon are nearby by towns to Rampuri having road connectivity to Rampuri.

At chainage 870.79km Anandi Mata Mandir is located on right bank of the river near Mudergaon village.

Mangrul is a village in Ghansawangi Taluka in Jalna District of Maharashtra State. It belongs to Aurangabad Division. It is located 71km towards south from district head quarter Jalna. 26km from Ghansawangi. 384km from state capital Mumbai.

Manjlegaon, Partur, Pathri, and Sailu are the nearby cities to Mangrul.

In this stretch features across the river are 01 Road Bridge and 01 Barrage. In addition to this 02 Temple along the river.

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	840	870	0.00	0.00	30,000	1,290,985.59	27,219,872.27	-0.30	0.00	30,000	1,651,078.59	40,686,647.61
II	840	870	0.00	0.00	30,000	1,966,347.58	41,470,903.58	-0.30	0.00	30,000	2,428,897.83	60,342,475.82
III	840	870	0.00	0.00	30,000	2,971,937.92	62,712,207.27	-0.30	0.00	30,000	3,545,450.97	89,005,474.24
IV	840	870	0.00	0.00	30,000	3,586,047.12	75,726,768.46	-0.30	0.00	30,000	4,185,206.09	105,912,629.04

*Table 100 - Dredging Quantity Details*

### 3.29.1 Observed and reduced Bed Profile of the stretch

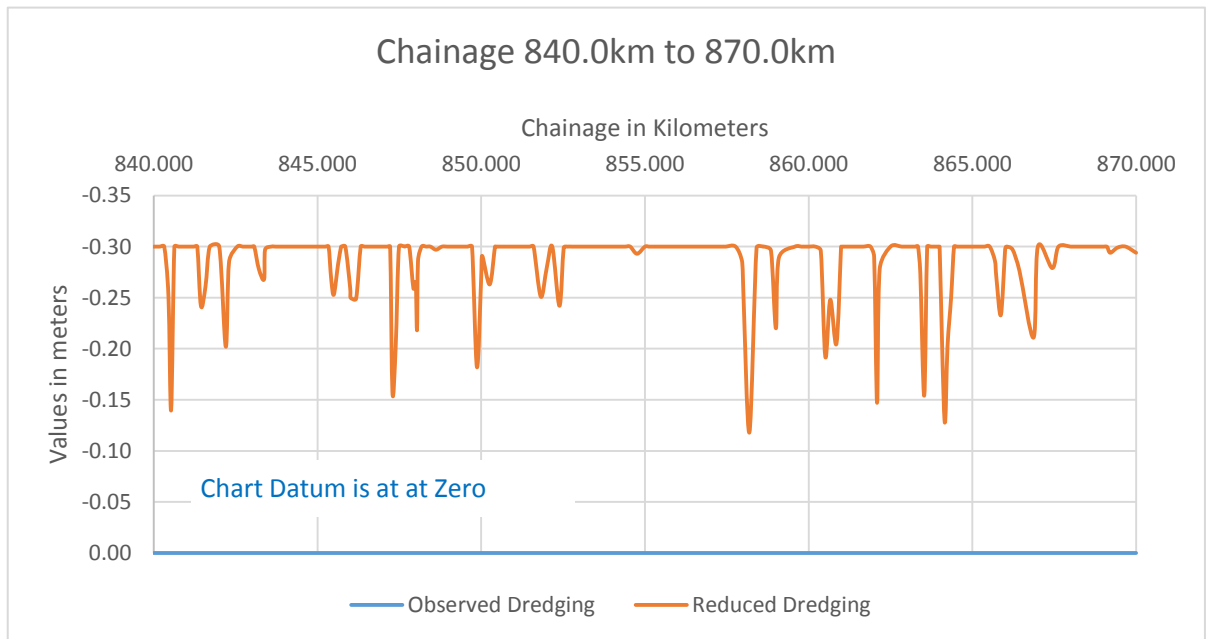


Figure 167 - River bed Profile



### 3.30 Sub-Stretch-30: Mangrul to Sadegaon (ch.870.0km to 900.0km)

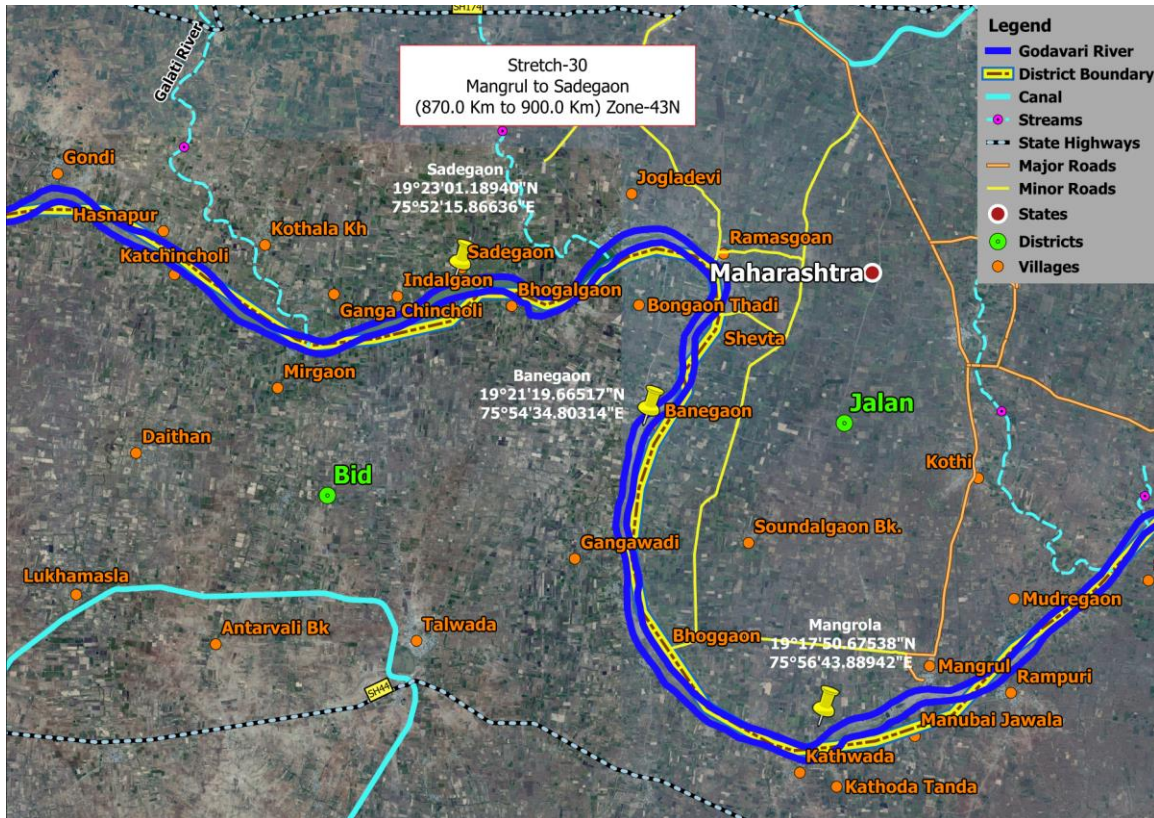


Figure 168 - Stretch-30 Mangrul to Sadegaon

- **Bathymetry Survey**
  - a) 0.0km length of the stretch for which the bathymetric survey has been carried out.
- **Topographic Survey**
  - b) 30.0km length of the stretch for which the topographic survey has been carried out.

Stretch-30 is covered 30.0km i.e. from 810.0km to 840.0km Mangrul to Sadegaon village is non-navigable as the depths noted were less than half a meter and hence could not be surveyed using survey boat. Instead, the spot levels were measured using Trimble R4 GPS.

In this stretch along the right bank of the river Bhoggaon, Ramasgaon, Jogladevi, and Sadegaon village are located. On left bank Kathwada, Rajapur and Bhogalgaon villages are located.



Both sides of river banks having cultivable land. Cotton, Banana, Sugarcane, Mango, Soyabean, Sweet Lime and Jawar (Sorghum) are the essential crops grown mostly in the area.

At chainage 873.218km Mangrul High-Level Barrage is constructed across Godavari River near Mangrul village.



*Figure 169 - Mangrul High-Level Barrage (ch. 873.218km)*

At chainage 877.548km a Nalla is located on left bank of the river near Rajapur village.

Ramasgaon is a village in Ghansawangi Taluka in Jalna District of Maharashtra. It belongs to Aurangabad Division. It is located 60km towards south from district head quarter Jalna. 19km from Ghansawangi. 380km from state capital Mumbai Tirthpuri, Khalapuri, Sadegaon, Antarwali Tembhi and Kothi are the nearby villages to Ramasgaon. Ramasgaon is surrounded by Georai Taluka towards west, Ambad Taluka towards west, Partur Taluka towards east, Majalgaon Taluka towards east.

Partur, Manjlegaon, Jalna, and Sailu are the nearby cities to Ramasgaon.

At chainage 888.178km Mahanubahv Panth Ramasgaon Rajmath is located on right bank of the river near Ramasgaon village.

At chainage 888.221km Ram Mandir Ramasgaon is located on right bank of the river near Ramasgaon village.

At chainage 888.498km Narsingh Temple is located on right bank of the river near Ramasgaon village.

Jogladevi village is located in Ghansawangi Tehsil of Jalna district in Maharashtra, India. It is situated 25km away from sub-district head quarter Ghansawangi and 70km away from district head quarter Jalna. Jogaladevi is the gram panchayat of Jogladevi village. Ambad is the nearest town to Jogladevi which is approximately 40km away.

At chainage 890.743km Mahanubhav Panth Jogladevi Sthan is located near Jogladevi village on the right bank of the river.

At chainage 890.798km Jogladevi Barrage is located across Godavari River near Jogladevi village.



*Figure 170 - Jogladevi Barrage (ch. 890.798km)*

Sadegaon village is located in Ambad Tehsil of Jalna district in Maharashtra, India. It is situated 38km away from sub-district head quarter Ambad and 65km away from district head quarter Jalna. Ambad is the nearest town to Sadegaon which is approximately 38km away.

In this stretch features across the river are 02 Barrage. In addition to this 04 Temple along the river.

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	870	900	0.00	0.00	30,000	1,292,544.35	28,512,416.62	-0.30	0.00	30,000	1,637,627.24	42,324,274.85
II	870	900	0.00	0.00	30,000	1,968,735.67	43,439,639.25	-0.30	0.00	30,000	2,413,353.52	62,755,829.34
III	870	900	0.00	0.00	30,000	2,975,516.00	65,687,723.27	-0.30	0.00	30,000	3,528,332.15	92,533,806.39
IV	870	900	0.00	0.00	30,000	3,590,355.57	79,317,124.03	-0.30	0.00	30,000	4,168,255.68	110,080,884.72

*Table 101 - Dredging Quantity Details*

### 3.30.1 Observed and reduced Bed Profile of the stretch

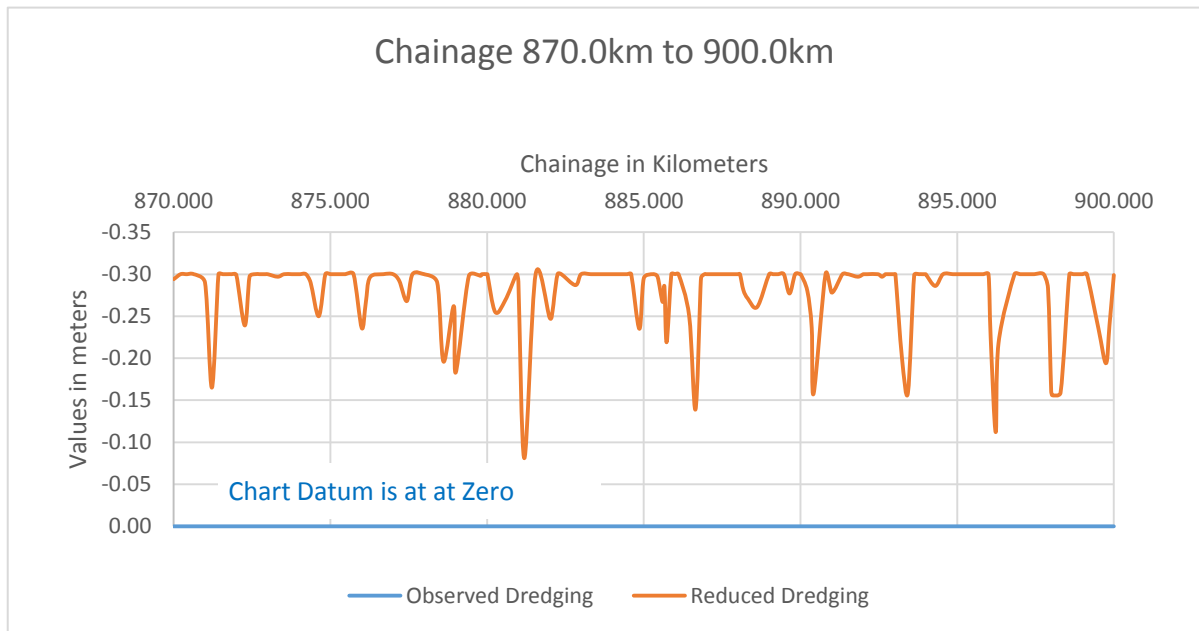


Figure 171 - River bed Profile

### 3.31 Sub-Stretch-31: Sadegaon to Hiradpuri (ch.900.0km to 930.0km)

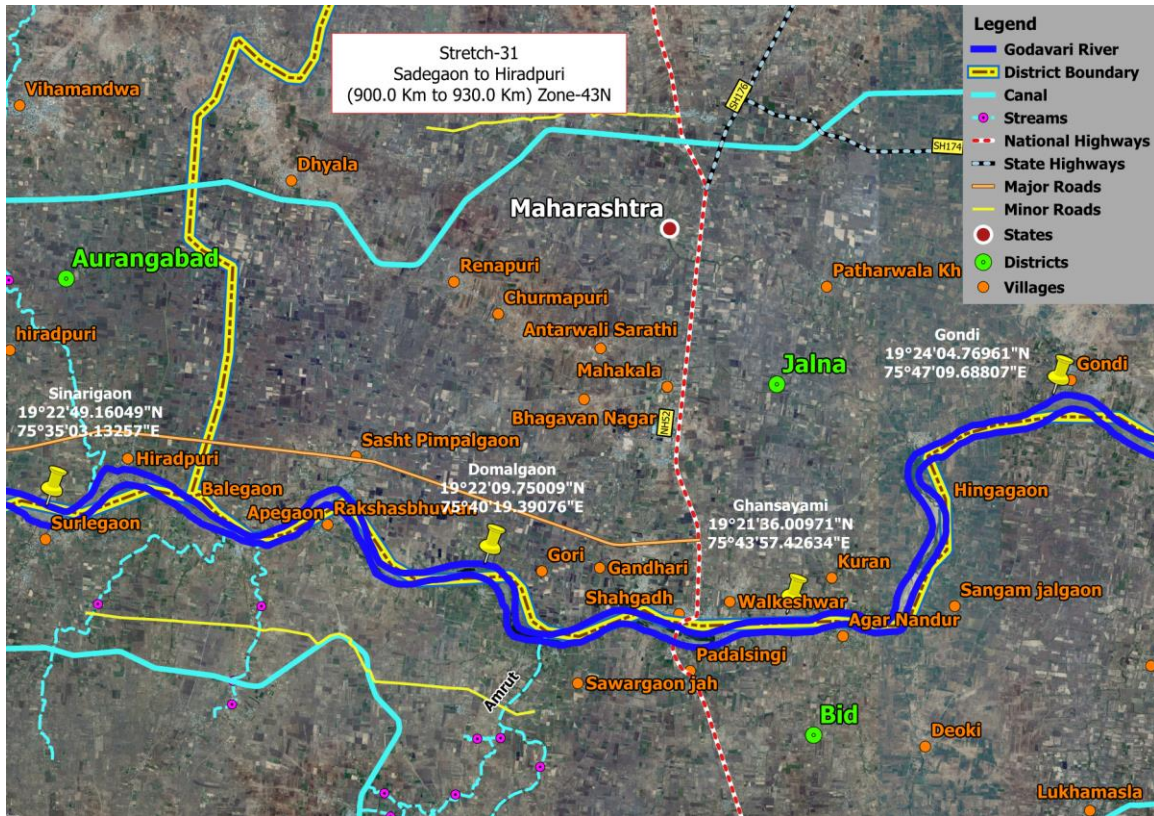


Figure 172 - Stretch-31 Sadegaon to Hiradpuri

- **Bathymetry Survey**
  - a) 0.0km length of the stretch for which the bathymetric survey has been carried out.
- **Topographic Survey**
  - b) 30.0km length of the stretch for which the topographic survey has been carried out.

Stretch-31 is covered 30.0km i.e. from 900.0km to 930.0km Sadegaon to Hiradpuri village is non-navigable as the depths noted were less than half a meter and hence could not be surveyed using survey boat. Instead, the spot levels were measured using Trimble R4 GPS.

In this stretch along the right bank of the river Indalgaon, Ganga Chincholi, Hasanapur, Gondi, Walkeswar, Domalgaon and Hiradpuri village is located. On left bank, Mirgaon, Sangam Jalgaon, and Rakshasbhuwan villages are located.



Both sides of river banks having cultivable land. Cotton, Banana, Sugarcane, Mango, Soyabean, Sweet Lime and Jawar (Sorghum) are the essential crops grown mostly in the area.

Gondi village is located in Ambad Tehsil of Jalna district in Maharashtra, India. It is situated 35km away from sub-district head quarter Ambad and 65km away from district head quarter Jalna. Ambad is the nearest town to Gondi which is approximately 35km away.

At chainage 907.618km Patharwala Barrage is located across Godavari River near Patharwala village.



*Figure 173 - Patharwala Barrage (ch. 907.618km)*

Shahagadh is a village in Ambad Taluka in Jalna District of Maharashtra State. It belongs to Aurangabad Division. It is located 66km towards south from district head quarter Jalna. 25km from Ambad. Paithan, Jalna, Partur, and Manjlegaon are the nearby cities to Shahagadh.

Georai are the nearby by towns to Shahagadh having road connectivity to Shahagadh

At chainage 915.821km Shahgadh Barrage is constructed across Godavari River near Shahgadh village.





*Figure 174 - Shahgadh Barrage (ch. 915.821km)*

At chainage 916.64km and 916.661km Jalna Beed Road Bridge (Old and New) (NH-52) are crossing over Godavari River near Shahgadh village.



*Figure 175 - Jalna Beed Road Bridge (ch. 916.64km)*

At chainage 926.491km Shani Mandir, Rakhasbhuwan is located near Rakshasbhuwan village on the left bank of the river.



*Figure 176 - Shani Mandir, Rakhasbhuwan (ch. 926.491km)*

At chainage 928.189km and 928.178km Mahanubhav Mandir Sthan- Panchaleshwar and Mahanubhav Ashram and Sthan-Datta Gunfa are located in the center and left bank of the river near Panchaleshwar village.



*Figure 177 - Mahanubhav Ashram and Sthan- Datta Gunfa, Mahanubhav Mandir Sthan- Panchaleshwar (ch.928.189km)*

Hiradpuri is a village in Paithan Taluka in Aurangabad District of Maharashtra. It belongs to Aurangabad Division. It is located 69km towards south from district head quarter Aurangabad. 30km from Paithan Kheda. Paithan, Pathardi, Jalna, and Aurangabad are the nearby cities to Hiradpuri.

At chainage 932.587km Hiradpuri Barrage is located across Godavari River near Hiradpuri village.



*Figure 178 - Hiradpuri Barrage (ch. 932.587km)*

In this stretch features across the river are 02 Road Bridge, 01 High Tension transmission line and 02 Barrage. In addition to this 03 Temple along the river.

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	900	930	0.00	0.00	30,000	1,290,874.58	29,803,291.20	-0.30	0.00	30,000	1,646,117.03	43,970,391.88
II	900	930	0.00	0.00	30,000	1,966,185.18	45,405,824.43	-0.30	0.00	30,000	2,423,252.79	65,179,082.13
III	900	930	0.00	0.00	30,000	2,971,690.42	68,659,413.69	-0.30	0.00	30,000	3,539,369.27	96,073,175.66
IV	900	930	0.00	0.00	30,000	3,585,755.60	82,902,879.63	-0.30	0.00	30,000	4,178,905.01	114,259,789.73

Table 102 - Dredging Quantity Details

### 3.31.1 Observed and reduced Bed Profile of the stretch

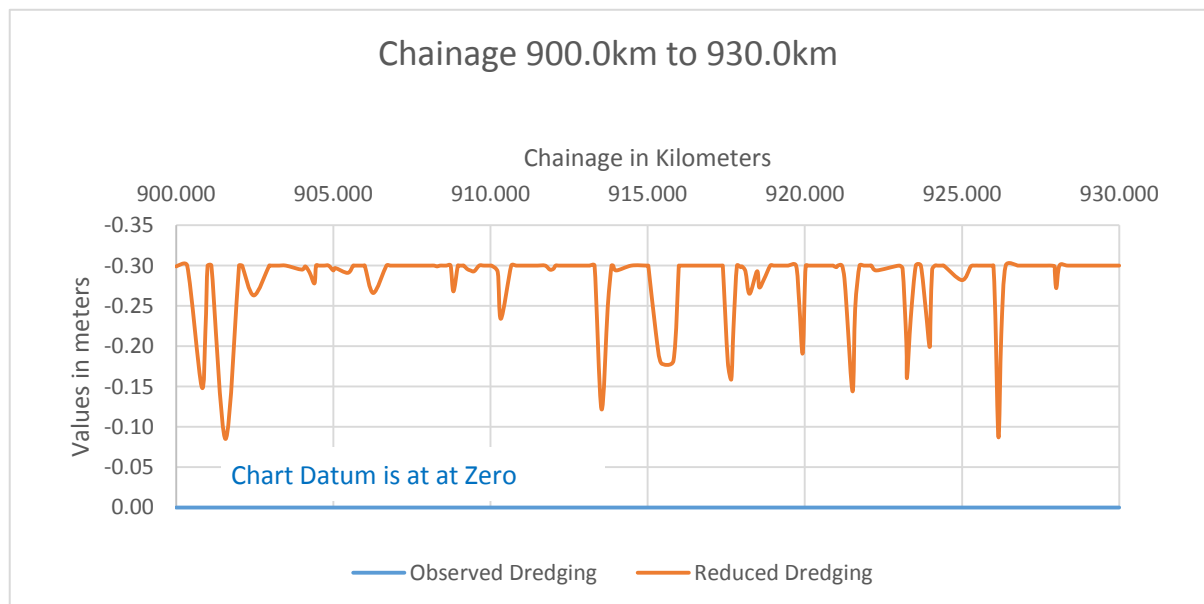


Figure 179 - River bed Profile

### 3.32 Sub-Stretch-32: Hiradpuri to Takali Ambad (ch.930.0km to 960.0km)

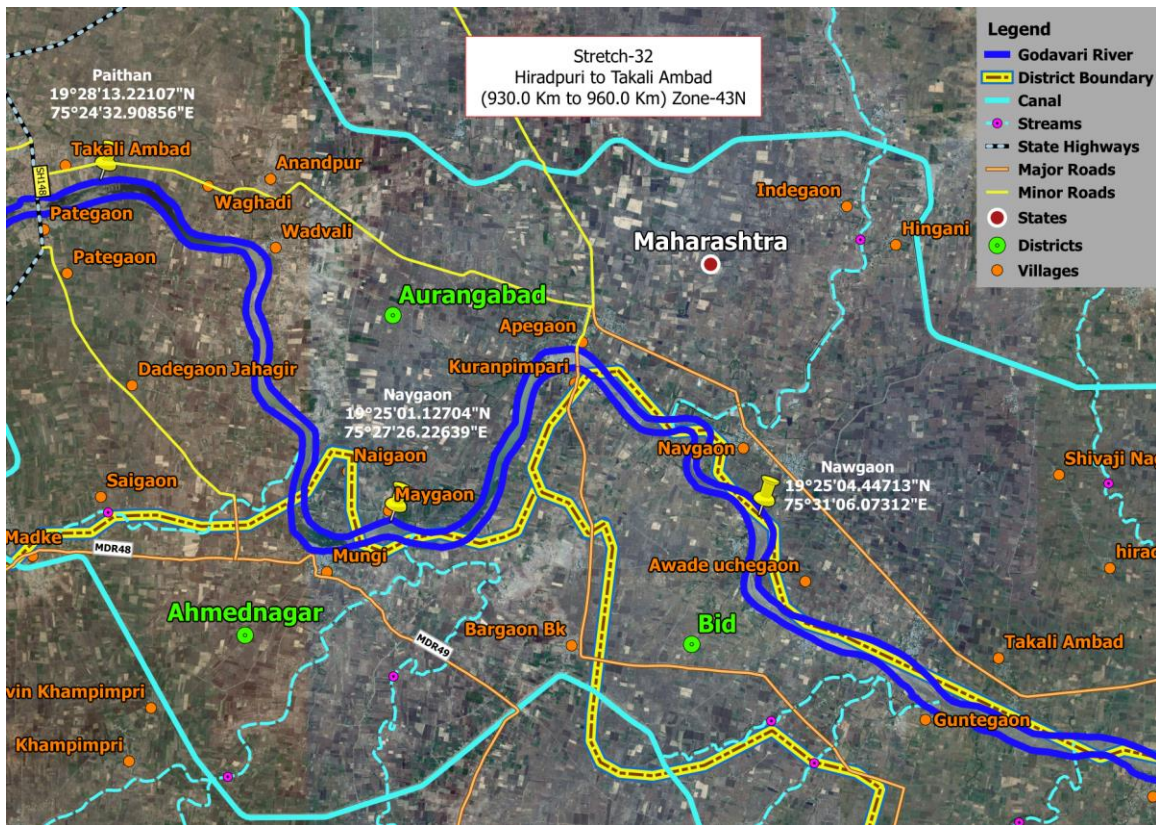


Figure 180 - Stretch-32 Hiradpuri to Takali Ambad

- **Bathymetry Survey**
  - a) 0.0km length of the stretch for which the bathymetric survey has been carried out.
- **Topographic Survey**
  - b) 30.0km length of the stretch for which the topographic survey has been carried out.

Stretch-32 is covered 30.0km i.e. from 930.0km to 960.0km. Hiradpuri to Takali Ambad village is non-navigable as the depths noted were less than half a meter and hence could not be surveyed using survey boat. Instead, the spot levels were measured using Trimble R4 GPS.

In this stretch along the right bank of the river Navgaon, Apegaon, Maygaon, Wadvali, and Takli Ambad village is located. On left bank Kuranpimpri, Mungi and Pategaon villages are located.



Both sides of river banks having cultivable land. Cotton, Banana, Sugarcane, Mango, Soyabean, Sweet Lime and Jawar (Sorghum) are the essential crops grown mostly in the area.

Navgaon village is located in Paithan Tehsil of Aurangabad district in Maharashtra, India. It is situated 17km away from sub-district head quarter Paithan and 70km away from district head quarter Aurangabad. Nawagaon is the gram panchayat of Navgaon village. Paithan is the nearest town to Navgaon which is approximately 17km away.

Apegaon, Hingani, Indegaon, Takali Ambad and Nandar are the nearby villages to Navgaon. Navgaon is surrounded by Shevgaon Taluka towards west, Ambad Taluka towards east, Georai Taluka towards east, Shirur (Ka) Taluka towards the south. Paithan, Pathardi, Aurangabad, and Jalna are the nearby cities to Navgaon.

Apegaon village is located in Paithan Tehsil of Aurangabad district in Maharashtra, India. It is situated 11km away from sub-district head quarter Paithan and 62km away from district head quarter Aurangabad. Apegaon village is also a gram panchayat. Paithan is the nearest town to Apegaon which is approximately 11km away.

At chainage 946.736km Sant Dyneshwar Mauli Jalambhumi is located on right bank of Godavari River near Apegaon village.



*Figure 181 - Sant Dyneshwar Mauli Jalambhumi (ch. 946.736km)*

At chainage 946.774km Apegaon-Kurnapimpri Road Bridge is constructed across Godavari River near Apegaon village. It is connecting between Apegaon and Kurnapimpri villages. The bridge is broken in the center but still in use for pedestrians to cross the river.





*Figure 182 - Apegaon- Kurnapimpri Road Bridge (ch. 946.774km)*

At chainage 947.174km Apegaon High-level Barrage is constructed across the Godavari River near Apegaon village.



*Figure 183 - Apegaon High-level Barrage (ch. 947.174km)*

Maygaon is a small village/hamlet in Paithan Taluka in Aurangabad District of Maharashtra State. It comes under Maygaon Panchayath. It belongs to Aurangabad Division. It is located 62km towards south from district head quarter Aurangabad. 20km from Paithan Kheda. 323km from state capital Mumbai.

Dadegaon Jahagir, Saigaon, Apegaon, Anandpur, and Navgaon are the nearby villages to Maygaon. Maygaon is surrounded by Paithan Taluka towards the north, Ambad Taluka towards the east, Georai Taluka towards east, Pathardi Taluka towards west. Paithan, Pathardi, Aurangabad, and Jalna are the nearby cities to Maygaon.

Mungi village is located in Shevgaon Tehsil of Ahmednagar district in Maharashtra, India. It is situated 27km away from sub-district head quarter Shevgaon and 90km away

from district head quarter Ahmadnagar. Ahmadnagar is the nearest town to Mungi which is approximately 90km away.

At chainage 953.38km Mungadevi Temple is located near Mungi village on the left bank of the river.



*Figure 184 - Mungadevi Temple (ch. 953.38km)*

At chainage 953.143km and 953.313km Rajeshwar temple and Nilkantheshwar temple respectively are located near Mungi village on the left bank of Godavari river.



*Figure 185 - Rajeshwar temple and Nilkantheshwar temple (ch. 953.143-953.313km)*

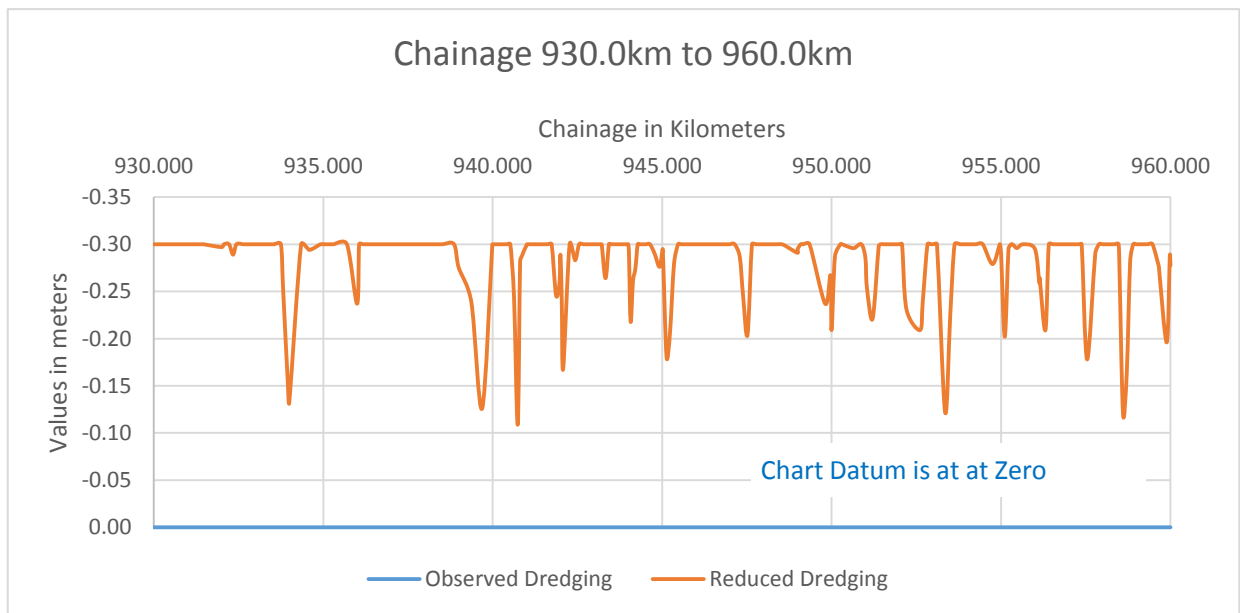
Takali Ambad is a village in Paithan Taluka in Aurangabad District of Maharashtra. It belongs to Aurangabad Division. It is located 68km towards south from district head quarter Aurangabad. 29km from Paithan Kheda. 335km from state capital Mumbai. Paithan, Pathardi, Aurangabad, and Jalna are the nearby cities to Takali Ambad.

In this stretch features across the river are 01 Road Bridge, 01 High Transmission line and 01 Barrage. In addition to this 04 Temple along the river.

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	930	960	0.00	0.00	30,000	1,289,373.75	31,092,664.95	-0.30	0.00	30,000	1,632,742.64	45,603,134.52
II	930	960	0.00	0.00	30,000	1,963,919.39	47,369,743.82	-0.30	0.00	30,000	2,407,528.05	67,586,610.18
III	930	960	0.00	0.00	30,000	2,968,223.84	71,627,637.53	-0.30	0.00	30,000	3,521,337.59	99,594,513.25
IV	930	960	0.00	0.00	30,000	3,581,566.47	86,484,446.10	-0.30	0.00	30,000	4,160,148.27	118,419,938.00

*Table 103 - Dredging Quantity Details*

### 3.32.1 Observed and reduced Bed Profile of the stretch



*Figure 186 - River bed Profile*

### 3.33 Sub-Stretch-33: Takali Ambad to Trimbalapur (ch.960.0km to 990.0km)

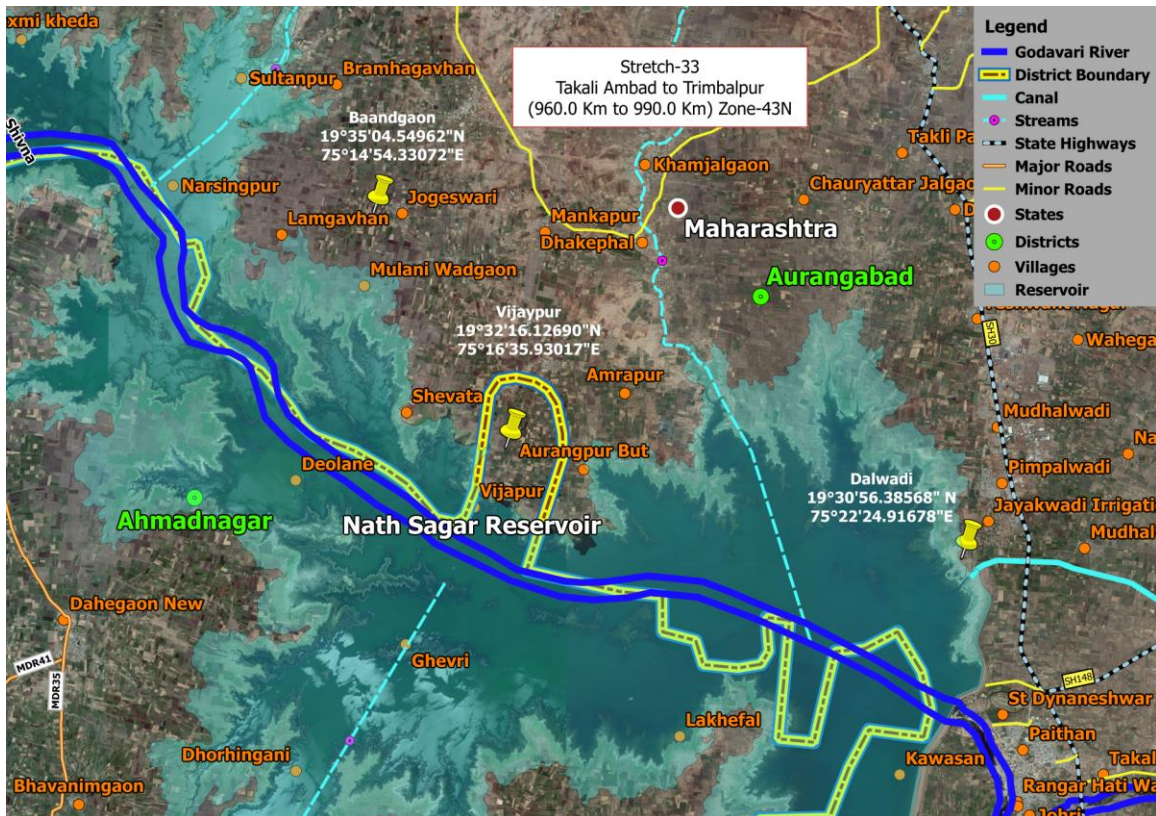


Figure 187 - Stretch-33 Takali Ambad to Trimbalapur

- **Bathymetry Survey**
  - a) 14.6km length of the stretch for which the bathymetric survey has been carried out.
- **Topographic Survey**
  - b) 5.4km length of the stretch for which the topographic survey has been carried out.

Stretch-33 is covered 30.0km i.e. from 960.0km to 990.0km Takali Ambad to Trimbalapur village. From chainage 960.0km to 965.4km is non-navigable as the depths noted were less than half a meter and hence could not be surveyed using survey boat. Instead, the spot levels were measured using Trimble R4 GPS. From chainage 965.5km to 990.0km river is navigable.

In this stretch along the right bank of the river Johri, Paithan, Vijaypur, Manakpur and Trimbalapur village is located. On left bank Lunawada, Karhetkali and Ramdoha villages are located.



Both sides of river banks having cultivable land. Cotton, Banana, Sugarcane, Mango, Soyabean, Sweet Lime and Jawar (Sorghum) are the essential crops grown mostly in the area.

Johri is a Locality in Paithan City in Maharashtra State. It belongs to Aurangabad Division. Rangar Hati Ward, Jama Masjid Ward, Pategaon, Chanakwadi, and Paithan Khed are the nearby localities to Johri. Paithan, Pathardi, Aurangabad, and Jalna are the nearby cities to Paithan.

At chainage 963.136km Paithan – Shevgaon Road Bridge (SH- 148) is crossing over Godavari River near Talaki Ambad village. It is connecting between Paithan and Shevgaon villages.



*Figure 188 - Paithan – Shevgaon Road Bridge-SH- 148 (ch. 963.136km)*

At chainage 964.641km Chanakwadi Barrage is constructed across Godavari River near Chanakwadi village.



*Figure 189 - Chanakwadi Barrage (ch. 964.641km)*



At chainage 965.775km Naag Ghat and Hanuman Temple are located on the right bank near Jama Masjid ward, Johri.



*Figure 190 - Naag Ghat and Hanuman Temple (ch. 965.775km)*

From chainage 965.740km to 965.820km bathing ghat is located on right bank of the river near Paithan Town.



*Figure 191 - Ghat near Paithan Town (ch.965.740-965.820km)*

At chainage 968.095km Jayakwadi Road Bridge is constructed across Godavari River near Jayakwadi Dam, Paithan.



*Figure 192 - Jayakwadi Road Bridge (ch968.095km)*

At chainage 968.499km Jayakwadi Dam is constructed across Godavari River near Paithan Town.



*Figure 193 - Jayakwadi Dam (ch. 968.499km)*

The Jayakwadi project is one of the largest irrigation projects in the Indian state of Maharashtra. It is a multipurpose project. The water is mainly used to irrigate agricultural land in the drought-prone areas. It also provides water for drinking and industrial usage to nearby towns and villages and to the municipalities of Aurangabad and Jalna district. The surrounding area of the dam has a garden and a bird sanctuary.

It is located on Godavari River at the site of Jayakwadi village in Paithan taluka of Aurangabad district in Maharashtra.

The Nath Sagar reservoir creates 30 islands of various sizes in the shallow waters, with trees for roosting, this provides an ideal shelter for migratory birds. Close to the dam a bird sanctuary has been created which is home to many species of resident and migrant

birds. Almost 200 species of birds can be found in this region, which includes more than 70 species of migratory birds. Out of these, 45 chief species are of international migration. Notable amongst migratory birds are cranes, flamingos, pintails, wigeons, shovelers, brahminy ducks, pochards, teals, godwits, shauces and glossy ibises.

Jayakwadi Dam houses a hydroelectric power plant with installed power generating a capacity of 12 MW. The water used for power generation is pumped back to the main reservoir using a pump house. The dam is also a primary source of water to the Parli Thermal Power Station.

<b>Jayakwadi Hydroelectric Project</b>	
Hydro Electric Project	Jayakwadi (Stage-I) Hydroelectric Project
State Name	Maharashtra
District	Aurangabad
River	Godavari
Basin Name	Godavari
Hydro Electric Region	Western HE Region
Total Installed Capacity (MW)	12
Type of Project	Small
Hydroelectric Project Status	Completed
Project Owner Type	State
Owner Name	GMIDC/MSEB
Inter-Basin Project	No
Project Sharing	None
Inter State Agreement (Ratio like 50:50)	-
International Sharing	None

*Table 104 - Jayakwadi Hydroelectric Project*

Trimbalpur is a village in Gangapur Taluka in Aurangabad District of Maharashtra. It belongs to Aurangabad Division. It is located 35km towards south from district head quarter Aurangabad.

Harsuli, Pandhar Ohal, Shankarapur, Zanzardi, Murshidabad are the nearby villages to Mangegaon. Mangegaon is surrounded by Paithan Taluka towards the east, Nevasa Taluka towards west, Aurangabad Taluka towards north, Shevgaon Taluka towards the south. Paithan, Aurangabad, Pathardi, and Shirampur are the nearby cities to

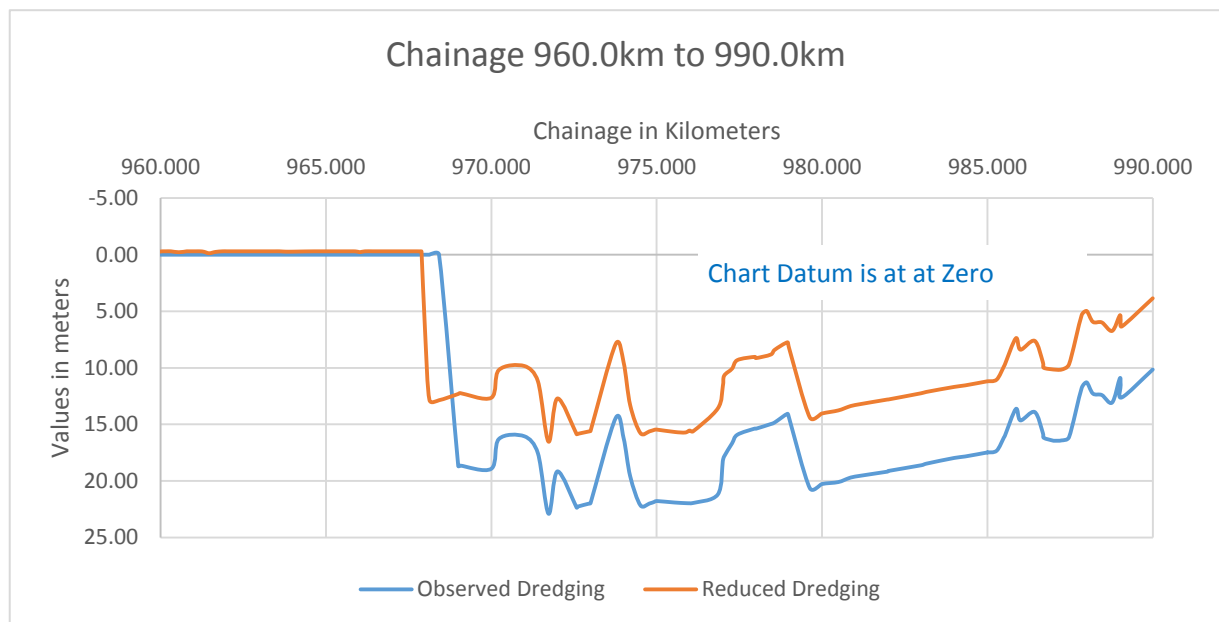
Trimbampur. This place is in the border of the Aurangabad District and Ahmednagar District. Ahmednagar District Nevasa is west towards this place.

In this stretch features across the river are 02 Road Bridge, 02 High Transmission line and 01 Barrage. In addition to this 02 Temple and 01 Ghat along the river.

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	960	990	0.00	23.70	8,300	363,299.04	31,455,963.99	-0.30	17.31	8,010	436,150.31	46,039,284.83
II	960	990	0.00	23.70	8,500	553,364.95	47,923,108.77	-0.30	17.31	8,100	642,411.06	68,229,021.24
III	960	990	0.00	23.70	8,750	836,353.57	72,463,991.10	-0.30	17.31	8,150	939,449.22	100,533,962.47
IV	960	990	0.00	23.70	9,000	1,009,170.33	87,493,616.43	-0.30	17.31	8,200	1,110,390.99	119,530,328.99

*Table 105 - Dredging Quantity Details*

### 3.33.1 Observed and reduced Bed Profile of the stretch



*Figure 194 - River bed Profile*



### 3.34 Sub-Stretch-34: Trimbalapur to Mamdapur (ch.990.0km to 1020.0km)

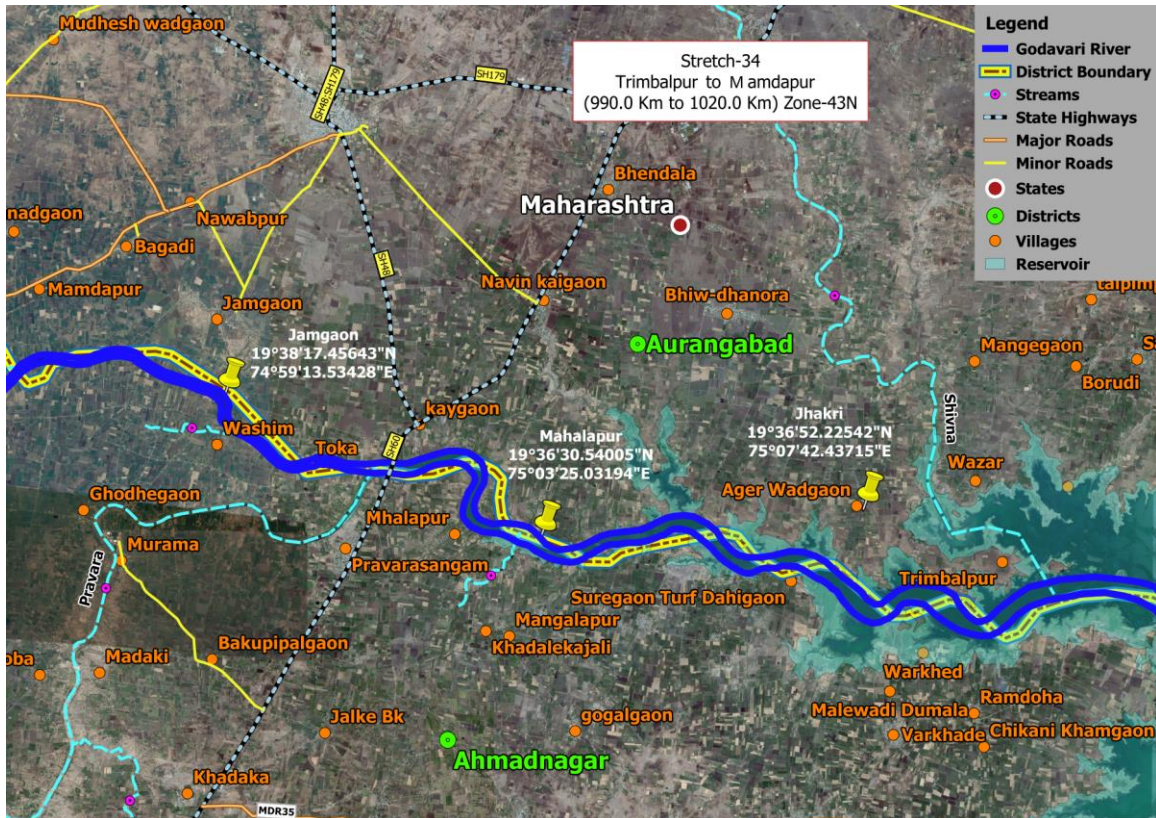


Figure 195 - Stretch-34 Trimbalapur to Mamdapur

- **Bathymetry Survey**
  - a) 30.0km length of the stretch for which the bathymetric survey has been carried out.
- **Topographic Survey**
  - b) 0.0km length of the stretch for which the topographic survey has been carried out.

Stretch-34 is covered 30.0km i.e. from 990.0km to 1020.0km Trimbalapur to Mamdapur village. From chainage 990.0km to 1020.0km river is navigable.

In this stretch along the right bank of the river Kaygaon, Jamgaon and Mamdapur village is located. On left bank Pravarasangam, Toka and Washim villages are located.

Both sides of river banks having cultivable land. Cotton, Banana, Sugarcane, Mango, Soyabean, Sweet Lime and Jawar (Sorghum) are the essential crops grown mostly in the area.



Kaygaon is a village in Gangapur Taluka in Aurangabad District of Maharashtra. It belongs to Aurangabad Division. It is located 49 km towards west from district head quarter Aurangabad. 20km from Gangapur.

Lakhamapur, Ganeshwadi, Jangaon, Antapur, and Bhendala are the nearby villages to Kaygaon. Kaygaon is surrounded by Gangapur Taluka towards the north, Shirampur Taluka towards west, Paithan Taluka towards the east, Vaijapur Taluka towards the north.

Shrirampur, Paithan, Aurangabad, and Vaijapur are the nearby cities to Kaygaon. This place is in the border of the Aurangabad District and Ahmednagar District. Ahmednagar District Nevasa is South towards this place.

At chainage 1013.797km Old Pravarasangam Road Bridge is crossing over Godavari River near Kaygaon village. It is connecting between Pravarasangam to Kaygaon village.



*Figure 196 - Old Pravarasangam Road Bridge (ch. 1013.797km)*

At chainage 1014.12km Ahmednagar-Aurangabad Road Bridge is constructed across Godavari River near Kaygaon village. It is connecting between Pravarasangam to Kaygaon village.



*Figure 197 - Ahmednagar- Aurangabad Road Bridge (ch. 1014.12km)*

Toka village is located in Nevasa Tehsil of Ahmednagar district in Maharashtra, India. It is situated 15km away from sub-district head quarter Nevasa and 65km away from district head quarter Ahmednagar. Ahmednagar is the nearest town to Toka which is approximately 65km away.

At chainage 1014.387km Gotheshwar Shiva Temple is located on left bank of Godavari River near Toka village.



*Figure 198 - Gotheshwar Shiva Temple (ch. 1014.387km)*

At chainage 1014.572km Pravara River a Tributary of Godavari River joins near Toka village on the left bank of the river.

Pravara River is the smallest of the major tributaries of Godavari River located in Maharashtra. Among the 7 major tributaries, it is the only tributary which originates in the Western Ghats akin to the Godavari. Also, it is the only major tributary of Godavari to have both its source and confluence located within the same district - Ahmednagar.

The Pravara River rises on the eastern slopes of the Sahayadris between Kulang and Ratangad mountains in the Ahmednagar District of Maharashtra. Close to its origin, the river flows into the town of Bhandardara. Here, the Bhandardara Dam is constructed

across the river forming the Arthur Lake. The gates of the dam are periodically opened, to allow the downstream flow of the Pravara, giving rise to the Umbrella Falls. From here on the river takes an eastward course and 58km downstream, reaches another city- Sangamner, where the river Mahalungi confluences with it. This is the second largest city within the Ahmednagar District. Continuing eastwards, the river is joined by another tributary, this time on its right bank of River Mula. The river then reaches the town Nevasa and flows 12km to the east where it finally empties itself into the Godavari River at Pravara Sangam located 208 km from its source of origin.

At chainage 1014.846km Sidheshwar Temple Toka is located on left bank of the river near Pravara river joining Godavari River in Toka village.



*Figure 199 - Sidheshwar Temple Toka (ch.1014.846km)*

Jamgaon is a village in Gangapur Taluka in Aurangabad District of Maharashtra. It belongs to Aurangabad Division. It is located 52km towards west from district head quarter Aurangabad. 21km from Gangapur.

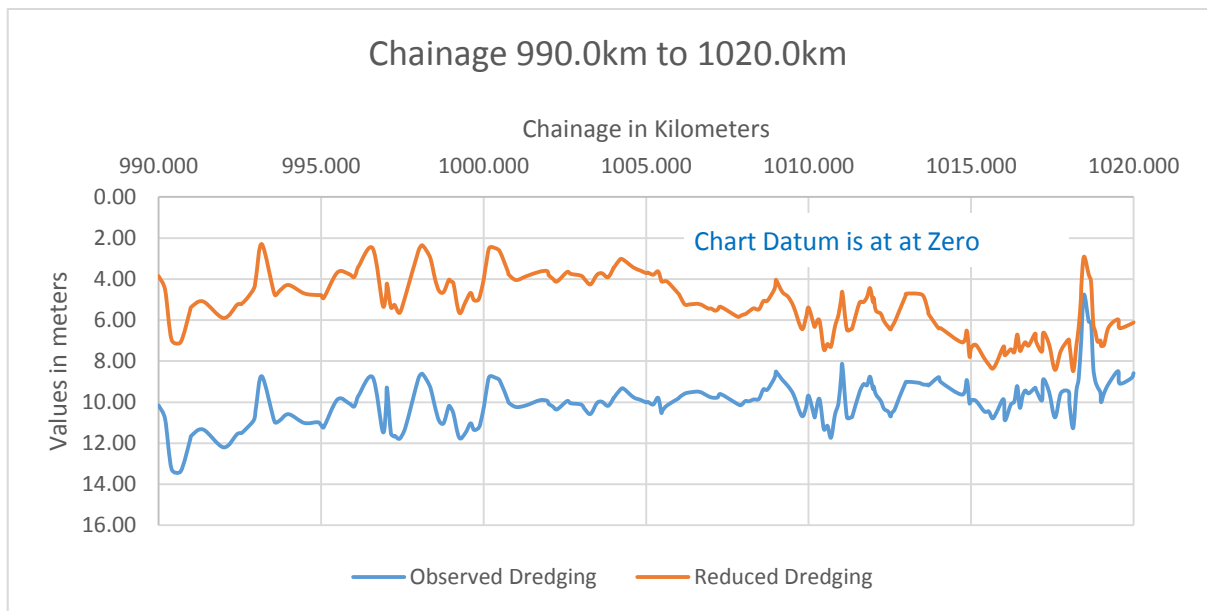
Bagadi, Mamdapur, Siddhapur, Agarkanadgaon, and Kaygaon are the nearby villages to Jamgaon. Jamgaon is surrounded by Gangapur Taluka towards the north, Shrirampur Taluka towards west, Vaijapur Taluka towards the north, Rahuri Taluka towards west. Shrirampur, Vaijapur, Rahuri, and Aurangabad are the nearby cities to Jamgaon. This place is in the border of the Aurangabad District and Ahmednagar District. Ahmednagar District Nevasa is South towards this place.

In this stretch features across the river are 02 Road Bridge. In addition to this 02 Temple and 01 Pravara River, a tributary joins Godavari River on left bank.

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	990	1020	7.58	14.54	0	0.00	31,455,963.99	1.29	11.61	0	0.00	46,039,284.83
II	990	1020	7.34	14.54	0	0.00	47,923,108.77	0.40	11.61	180	1,069.26	68,230,090.50
III	990	1020	1.43	14.54	10	55.61	72,464,046.71	0.40	11.61	560	5,374.33	100,539,336.80
IV	990	1020	1.43	14.54	100	247.86	87,493,864.29	0.40	11.61	1,075	13,065.57	119,543,394.56

*Table 106 - Dredging Quantity Details*

### 3.34.1 Observed and reduced Bed Profile of the stretch



*Figure 200 - River bed Profile*



### 3.35 Sub-Stretch-35: Mamdapur to Dagpimpalgaon (ch.1020.0km to 1050.0km)

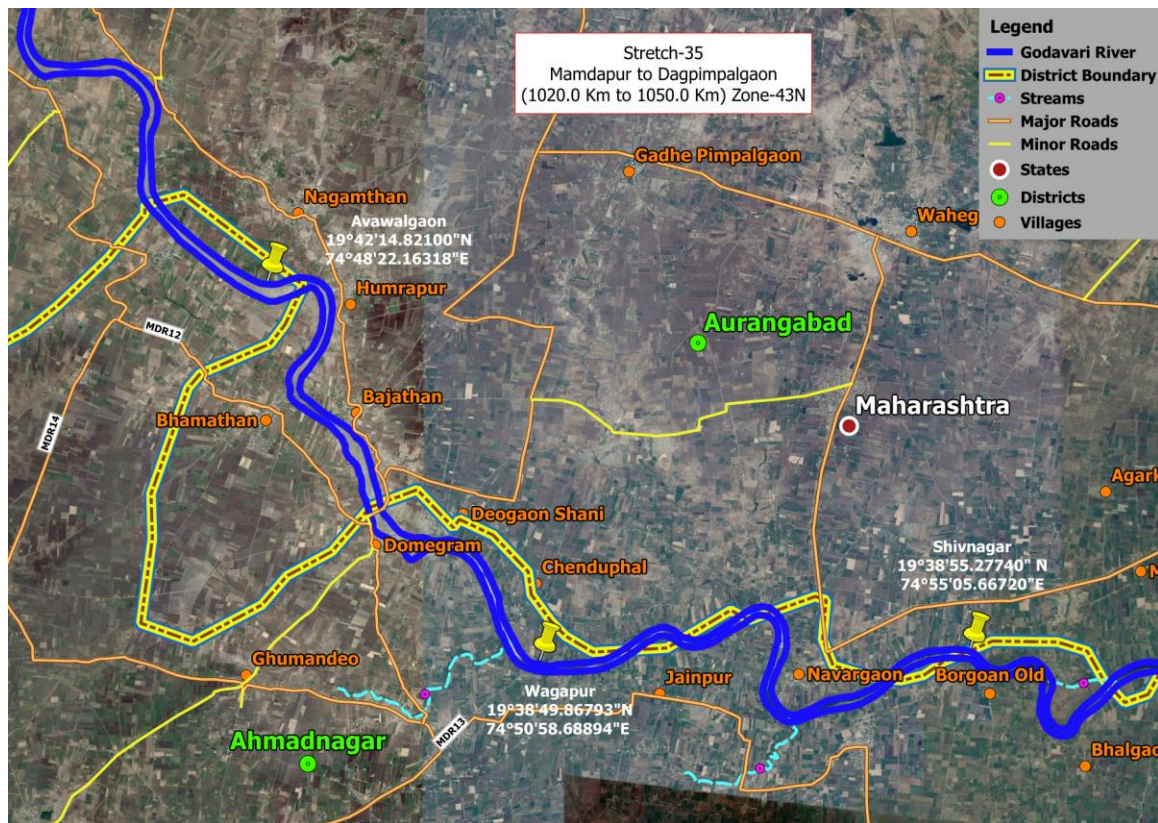


Figure 201 - Stretch-35 Mamdapur to Dagpimpalgaon

- **Bathymetry Survey**
  - a) 16.3km length of the stretch for which the bathymetric survey has been carried out.
- **Topographic Survey**
  - b) 13.7km length of the stretch for which the topographic survey has been carried out.

Stretch-35 is covered 30.0km i.e. from 1020.0km to 1050.0km Mamdapur to Dagpimpalgaon village. From chainage 1020.0km to 1016.3km river is navigable. From chainage 1016.4km to 1050.0km is non-navigable as the depths noted were less than half a meter and hence could not be surveyed using survey boat. Instead, the spot levels were measured using Trimble R4 GPS.



In this stretch along the right bank of the river Shivnagar, Navargaon, Chenduphal, Deogaon Shani, Bajathan, Humrapur, and the village is located. On left bank Suregaon, Domegram, Bhamathan, and Khanpura villages are located.

Both sides of river banks having cultivable land. Cotton, Banana, Sugarcane, Mango, Soyabean, Sweet Lime and Jawar (Sorghum) are the essential crops grown mostly in the area.

From chainage 1023.905km to 1026.143km river is splitting into two streams to form an island-like structure named Jambu- dvip is located near Bhalgaon village.

At chainage 1026.78km Harneshwar Mandir is located the center of the river near Borgaon village.



*Figure 202 - Harneshwar Mandir (ch. 1026.78km)*

At chainage 1027.217km Mahadev Mandir is located on left bank of the river near Borgaon village.

Suregaon Gangapur is a village in Nevasa Taluka in Ahmednagar District of Maharashtra state. It belongs to Nashik Division. It is located 69km towards north from district head quarter Ahmednagar. 17km from Nevasa. Shrirampur, Rahuri, Vaijapur, and Shirdi are the nearby cities to Suregaon.

At chainage 1029.754km Chakradharswami Mandir is in the center of the river near Suregaon village.

At chainage 1031.451km Sankateshwar Mandir is located on right bank of river near Navargaon



*Figure 203 - Sankateshwar Mandir (ch. 1031.451km)*

Deogaon Shani village is located in Vaijapur Tehsil of Aurangabad district in Maharashtra, India. It is situated 35km away from sub-district head quarter Vaijapur and 80km away from district head quarter Aurangabad. Shrirampur is the nearest town to Deogaon Shani which is approximately 22km away.

At chainage 1040.283km Chhinnasthali is located on left bank of the river near Deogaon Shani village.



*Figure 204 – Chhinnasthali (ch.1040.283km)*

At chainage 1041.42km a Check Dam is constructed across Godavari River near Domegram village.



*Figure 205 - Check Dam near Domegram village (ch. 1041.42km)*

At chainage 1046.832km a Check Dam is constructed across Godavari River near Humrapur village.



*Figure 206 - Check Dam near Humrapur village (ch.1046.832km)*

In this stretch features across the river are 02 Check Dam and 03 High Transmission line. In addition to this 05 Temples are along the river side.

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	1020	1050	0.00	10.31	9,800	418,895.27	31,874,859.26	-0.30	8.82	10,100	534,571.11	46,573,855.94
II	1020	1050	0.00	10.31	9,900	640,059.98	48,563,168.75	-0.30	8.82	10,265	788,513.61	69,018,604.11
III	1020	1050	0.00	10.31	10,625	971,919.66	73,435,966.37	-0.30	8.82	10,405	1,156,028.01	101,695,364.81
IV	1020	1050	0.00	10.31	10,810	1,175,370.47	88,669,234.76	-0.30	8.82	10,620	1,368,158.43	120,911,552.99

*Table 107 - Dredging Quantity Details*

### 3.35.1 Observed and reduced Bed Profile of the stretch

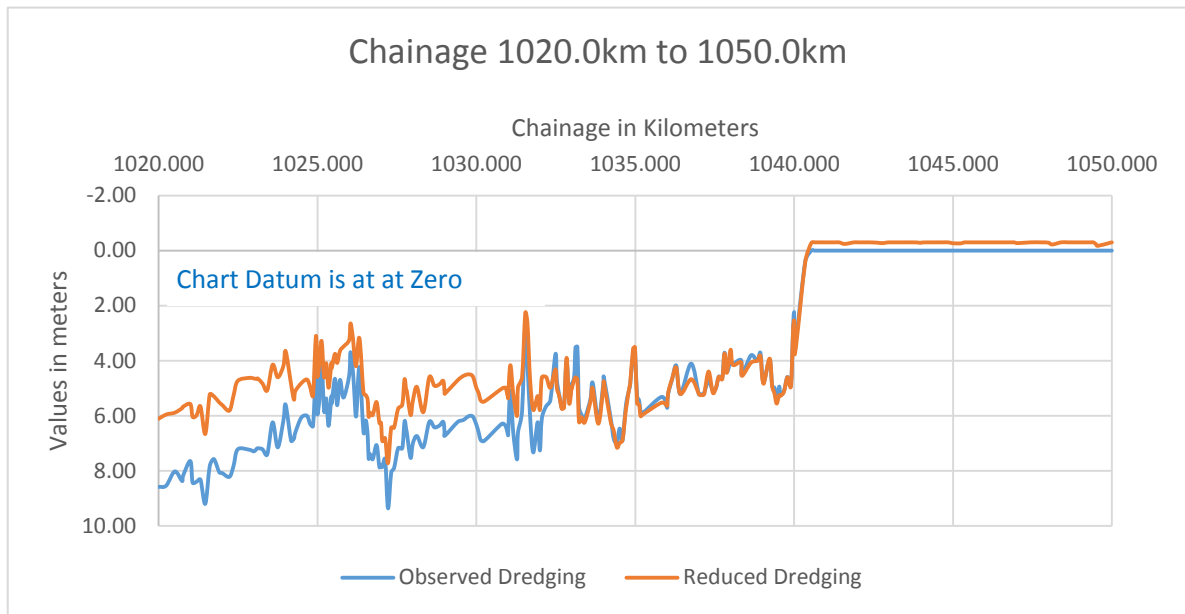


Figure 207 - River bed Profile



### 3.36 Sub-Stretch-36: Dagpimpalgaon to Vari (ch.1050.0km to 1080.0km)

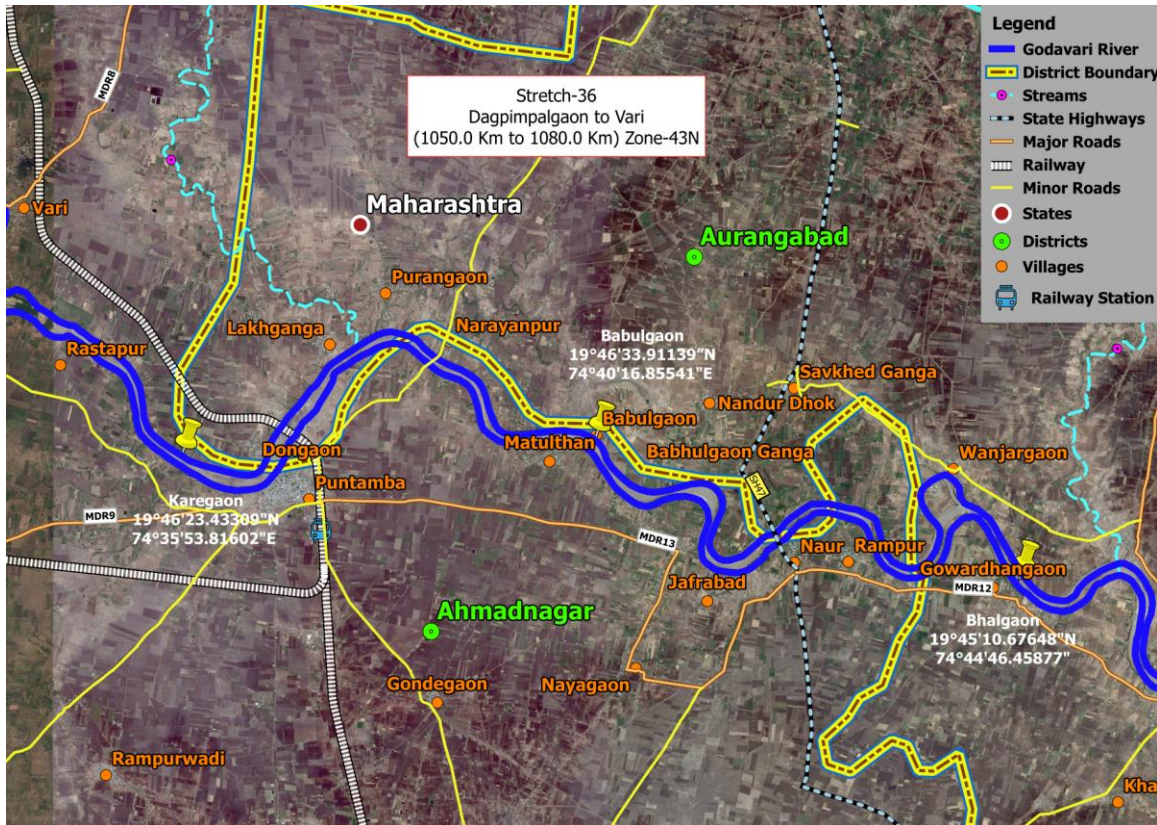


Figure 208 - Stretch-36 Dagpimpalgaon to Vari

- **Bathymetry Survey**
  - a) 30.0km length of the stretch for which the bathymetric survey has been carried out.
- **Topographic Survey**
  - b) 0.0km length of the stretch for which the topographic survey has been carried out.

Stretch-36 is covered 30.0km i.e. from 1050.0km to 1080.0km Dagpimpalgaon to Vari village. From chainage 1050.0km to 1080.0km river is navigable.

In this stretch along the right bank of the river Bhalgaon, Babulgaon, Dongaon, and Vari village are located. On left bank Rampur, Naur, Puntamba, and Shingave villages are located.

Both sides of river banks having cultivable land. Cotton, Banana, Sugarcane, Mango, Soyabean, Sweet Lime and Jawar (Sorghum) are the essential crops grown mostly in the area.



Bhalgaon is a village in Gangapur Taluka in Aurangabad District of Maharashtra state. It belongs to Aurangabad Division. It is located 44km towards west from district head quarter Aurangabad. 13km from Gangapur.

At chainage 1059.332km a Check Dam is located across Godavari River near Bhalgaon.



*Figure 209 - Check Dam near Bhalgaon (ch.1059.332km)*

Wanjargaon village is located in Vaijapur Tehsil of Aurangabad district in Maharashtra state. It is situated 20km away from sub-district head quarter Vaijapur and 90km away from district head quarter Aurangabad. Vaijapur is the nearest town to Wanjargaon which is approximately 20km away.

At chainage 1059.5km Wanjargaon Road Bridge is located on a curve stream of Godavari River making an island-like structure on the right bank.



*Figure 210 - Wanjargaon Road Bridge (ch. 1059.5km)*

At chainage 1064.307km Mumbadevi Mandir is located on left bank of the river near Railway line Bridge, Naur village.



*Figure 211 - Mumbadevi Mandir (ch. 1064.307km)*

At chainage 1064.338km Naur Road Bridge is constructed across Godavari Bridge near Naur village.



*Figure 212 - Naur Road Bridge (ch. 1064.338km)*

At chainage 1064.729km a Check Dam is constructed across Godavari River near Naur village.



*Figure 213 - Check Dam near Naur village (ch. 1064.729km)*

At chainage 1077.01km a Railway line Bridge is crossing over Godavari River near Dongaon village.



*Figure 214 - Railway line Bridge near Dongaon village (ch. 1077.01km)*

At chainage 1077.218km a Check Dam name Puntamba Kolhapur Type Bandhara is constructed across Godavari River near Puntamba village.



*Figure 215 - Check Dam near Naur village (Puntamba Kolhapur Type Bandhara) (ch. 1077.218km)*

Dongaon village is located in Vaijapur Tehsil of Aurangabad district in Maharashtra, India. It is situated 35km away from sub-district head quarter Vaijapur and 90km away from district head quarter Aurangabad. Vaijapur is the nearest town to Dongaon which is approximately 35km away.

Shingave village is located in Rahta Tehsil of Ahmednagar district in Maharashtra. It is situated 30km away from sub-district head quarter Rahta and 77km away from district head quarter Ahmednagar. Kopargaon is the nearest town to Shingave which is approximately 25km away.

Vari is a village in Kopargaon Taluka in Ahmednagar District of Maharashtra state. It belongs to Nashik Division. It is located 93km towards north from district head quarter Ahmednagar. 20km from Kopargaon. Shirdi, Vaijapur, Shrirampur, and Yevla are the nearby cities to Vari.

In this stretch features across the river are 03 Check Dam, 02 Road Bridge, 01 Railway line Bridge and 01 High Transmission line. In addition to this 01 Temple along the river side.

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	1050	1080	0.00	0.00	30,000	1,288,822.82	33,163,682.08	-0.30	0.00	30,000	1,635,452.47	48,209,308.41
II	1050	1080	0.00	0.00	30,000	1,963,057.84	50,526,226.59	-0.30	0.00	30,000	2,410,167.69	71,428,771.80
III	1050	1080	0.00	0.00	30,000	2,966,959.89	76,402,926.26	-0.30	0.00	30,000	3,523,910.97	105,219,275.78
IV	1050	1080	0.00	0.00	30,000	3,580,045.77	92,249,280.53	-0.30	0.00	30,000	4,162,443.30	125,073,996.29

*Table 108 - Dredging Quantity Details*

### 3.36.1 Observed and reduced Bed Profile of the stretch

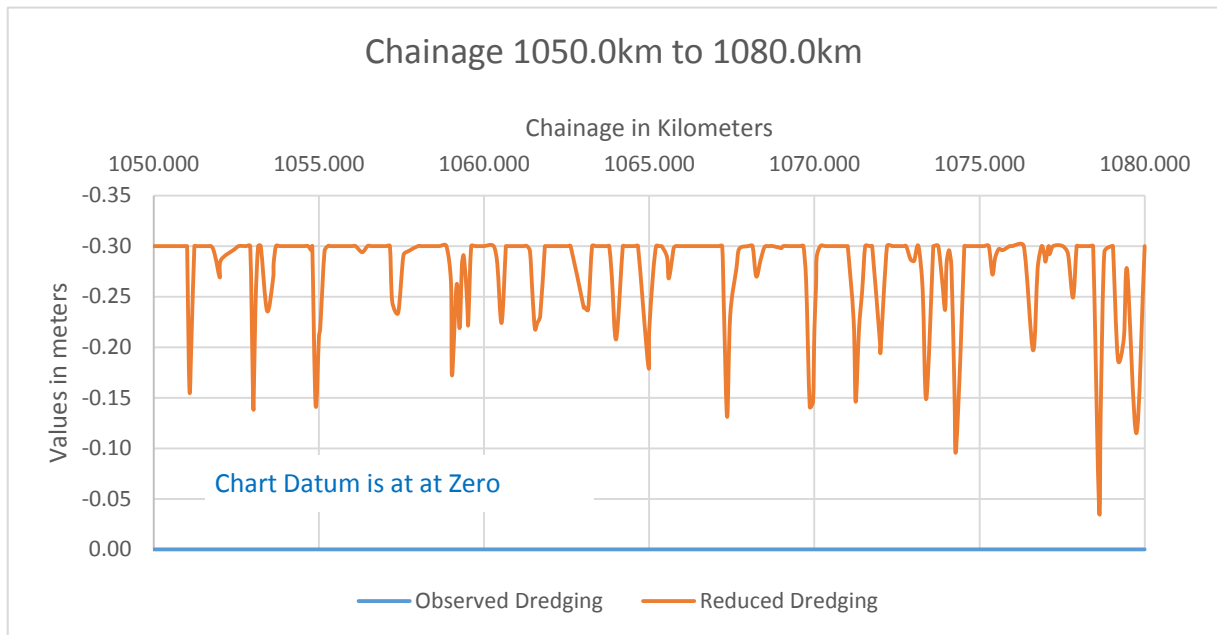


Figure 216 - River bed Profile



### 3.37 ub-Stretch-37: Vari to Sonari (ch.1080.0km to 1110.0km)

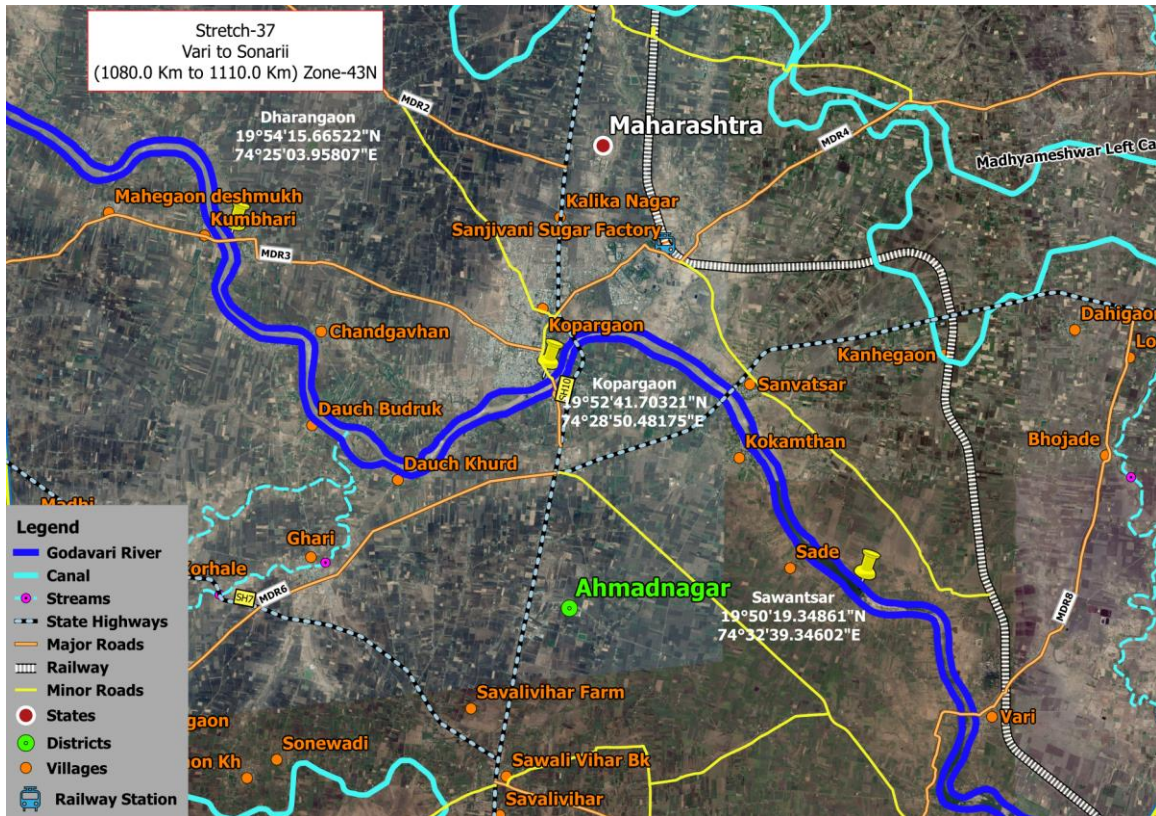


Figure 217 - Stretch-37 Vari to Sonari

- **Bathymetry Survey**
  - a) 30.0km length of the stretch for which the bathymetric survey has been carried out.
- **Topographic Survey**
  - b) 0.0km length of the stretch for which the topographic survey has been carried out.

Stretch-37 is covered 30.0km i.e. from 1080.0km to 1110.0km Vari to Sonari village. From chainage 1080.0km to 1110.0km river is navigable.

In this stretch along the right bank of the river Kopargaon, Chandgavhan, Murshatpur, and Sonari village are located. On left bank Sade, Dauch Khurd, Hingani, and Kumbhari villages are located.

Both sides of river banks having cultivable land. Cotton, Banana, Sugarcane, Mango, Soyabean, Sweet Lime and Jawar (Sorghum) are the essential crops grown mostly in the area.

At chainage 1084.368km a Check Dam is constructed across Godavari River near Duch Khurd village.



*Figure 218 - Check Dam near Duch Khurd village (ch. 1084.368km)*

At chainage 1086.718km Vari Road Bridge is constructed across Godavari River near Vari village.



*Figure 219 - Vari Road Bridge near Vari village (ch. 1086.718km)*

At chainage 1090.485km Check Dam near Vari village is located across the Godavari River.



*Figure 220 - Check Dam near Vari village (ch. 1090.485km)*

Samvatsar village is located in Kopergaon Tehsil of Ahmednagar district in Maharashtra, India. It is situated 8km away from sub-district head quarter Kopergaon and 110km away from district head quarter Ahmadnagar. Kopergaon is the nearest town to Samvatsar which is approximately 8km away.

At chainage 1095.747km Nagpur–Aurangabad–Mumbai Highway Road Bridge is constructed across Godavari River near Sanvatsar village.



*Figure 221 - Nagpur–Aurangabad–Mumbai Highway Road Bridge (ch. 1095.747km)*

At chainage 1096.141km Shrungheshwar Mandir is located on right bank of the river near Sanvatsar village.





*Figure 222 - Shrungeshwar Mandir near Sanvatsar village (ch. 1096.141km)*

Kopergaon is a town and municipality located in the Ahmednagar district of the Indian state of Maharashtra. Kopergaon is located about 14km (8.7 mi) from the holy town of Shirdi. Kopergaon itself is also a holy place. The only temple of Daityaguru Shukracharya (Demons Guru) is located at Kopergaon. During that time a vidya called Sanjivani Vidya was performed here to make alive to a dead person. The main feature of this temple is any of the pooja, vidhi, marriage, Narayan-nag Bali poojan, Kal-sarpa poojan can be performed here without any muhurta, and with best effects as said in Hindu holy books. Datta Par located on the banks of river Godavari is mentioned in Guru Charitra of Sai Baba, the temple of Datta Guru was established with the hands of Sri Sai Baba himself in year around 1910-1915.

Kopergaon is regarded as a holy place by many, as it is located on the banks of the river Godavari. Saints who have considered the place holy include Janardhan Maharaj and Jungli Maharaj. The famous temple of Sai Baba at Shirdi is 14km from the town. There are two more famous temples of Sai Baba in Kopergaon itself, one of which is known as Saidham and another is Sai-Tapobhumi. Also, the famous temple Shani Shingnapur, which is only 86km (53 mi) from Kopergaon.

It is located 40km from Manmad railway junction. There are regular share autos and private taxis available at the railway station in Kopergaon.

At chainage 1099.287km and 1099.304km (02), Sangamner - Kopergaon Road Bridge is constructed across Godavari River near Kopergaon town.



*Figure 223 - Sangamner - Kopergaon Road Bridge (ch. 1099.287km)*

At chainage 1100.293km Kopergaon Road Bridge (Maungiri Setu) is constructed across Godavari River near Kopergaon town.



*Figure 224 - Kopergaon Road Bridge (Maungiri Setu) – ch. 1100.293km*

Dauch Khurd is a village in Kopergaon Taluka in Ahmednagar District of Maharashtra State. It belongs to Khandesh and Northern Maharashtra region. It belongs to Nashik Division. It is located 103km towards north from district head quarter Ahmednagar. 5km from Kopergaon.

Shirdi, Yevla, Vaijapur, and Shrirampur are the nearby cities to Dauch Khurd.

At chainage 1107.705km a Check Dam is constructed across Godavari River near Hingani village.





*Figure 225 - Check Dam near Hingani village (ch. 1107.705km)*

At chainage 1111.293km Kumbhari Road Bridge is constructed across Godavari River near Kumbhari village.



*Figure 226 - Kumbhari Road Bridge (ch. 1111.293km)*

In this stretch features across the river are 03 Check Dam, 06 Road Bridge, and 06 High Transmission line. In addition to this 01 Temple along the river side.

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	1080	1110	0.00	0.00	30,000	1,290,743.95	34,454,426.03	-0.30	0.00	30,000	1,648,544.64	49,857,853.05
II	1080	1110	0.00	0.00	30,000	1,965,980.48	52,492,207.07	-0.30	0.00	30,000	2,426,314.12	73,855,085.92
III	1080	1110	0.00	0.00	30,000	2,971,374.15	79,374,300.41	-0.30	0.00	30,000	3,543,282.96	108,762,558.74
IV	1080	1110	0.00	0.00	30,000	3,585,366.64	95,834,647.17	-0.30	0.00	30,000	4,183,092.55	129,257,088.84

*Table 109 - Dredging Quantity Details*

### 3.37.1 Observed and reduced Bed Profile of the stretch

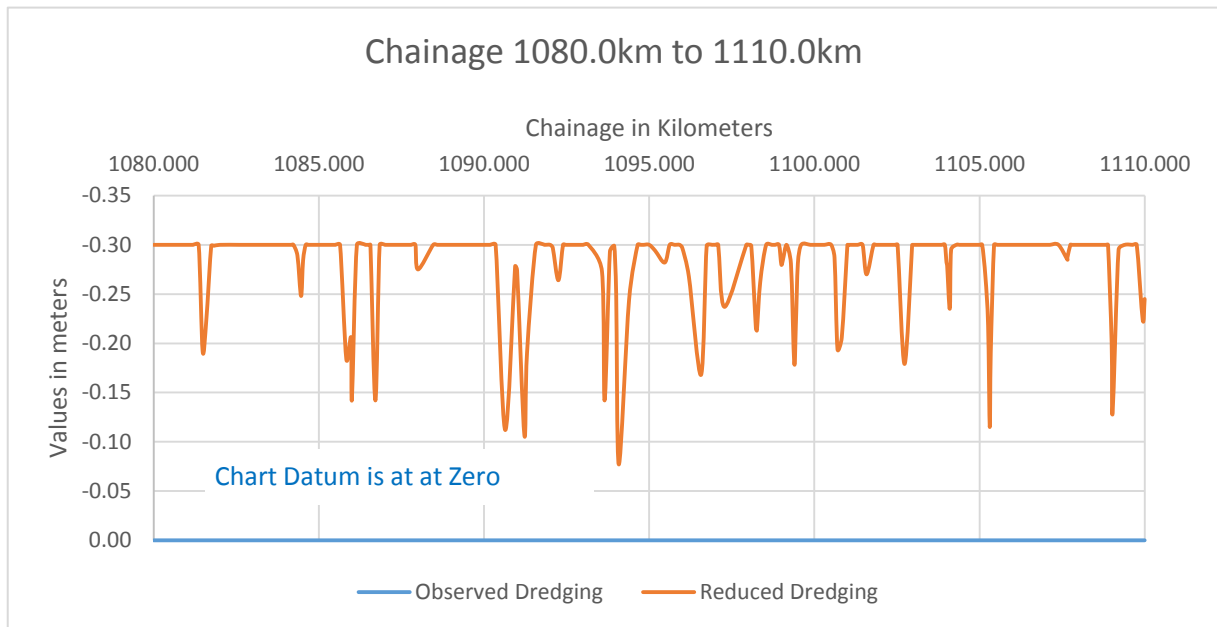


Figure 227 - River bed Profile

### 3.38 Sub-Stretch-38: Sonari to Tamaswadi (Ch.1110.0km to 1140.0km)

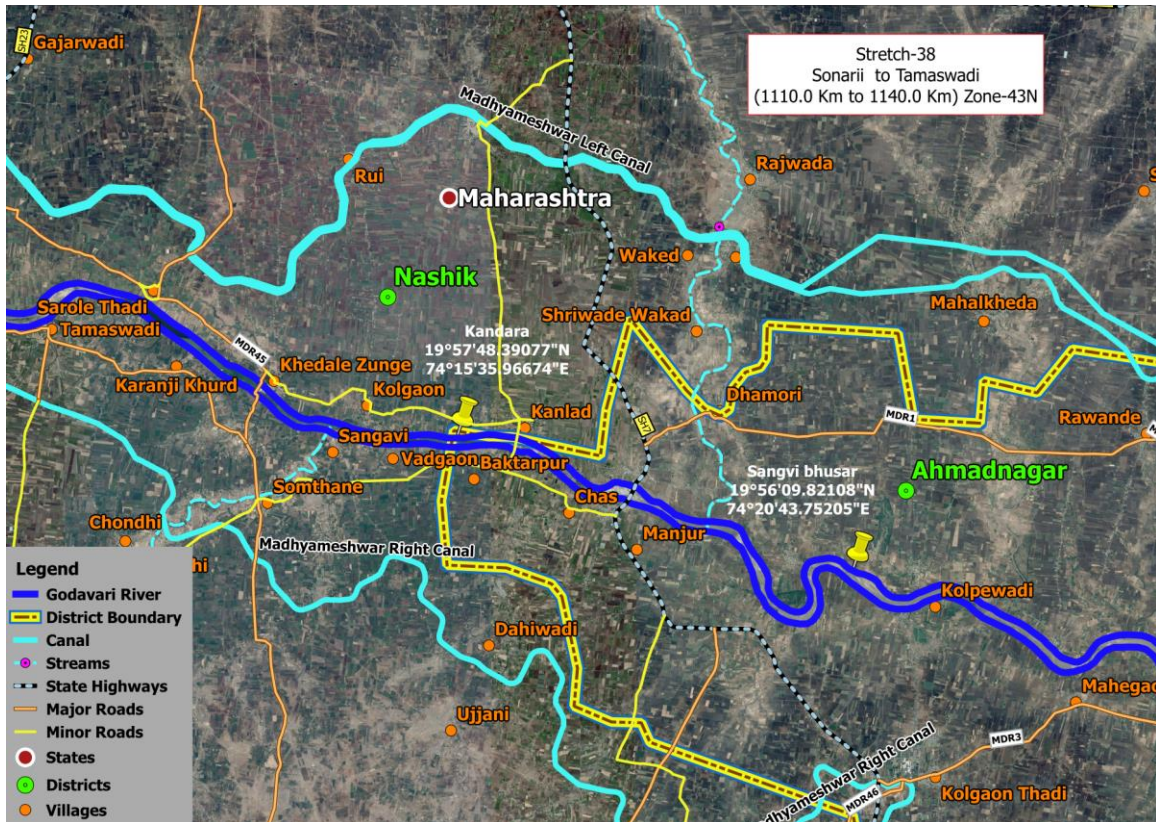


Figure 228 - Stretch-38 Sonari to Tamaswadi

- **Bathymetry Survey**
  - a) 10.9km length of the stretch for which the bathymetric survey has been carried out.
- **Topographic Survey**
  - b) 19.1km length of the stretch for which the topographic survey has been carried out.

Stretch-38 is covered 30.0km i.e. from 1110.0km to 1140.0km Sonari to Tamaswadi village. From chainage 1110.0km to 1127.8km and 1138.90km to 1140.0km is non-navigable as the depths noted were less than half a meter and hence could not be surveyed using survey boat. Instead, the spot levels were measured using Trimble R4 GPS. From chainage 1127.9km to 1138.8km river is navigable.

In this stretch along the right bank of the river Maygaon Devi, Kanlad, Kolgaon, and Sarole Thadi village is located. On left bank Kopewadi, Manjur, Chas, Sangavi, Bramhanwade and Tamaswadi villages are located.

Both sides of river banks having cultivable land. Cotton, Banana, Sugarcane, Mango, Soyabean, Sweet Lime and Jawar (Sorghum) are the essential crops grown mostly in the area.

At chainage 1115.338km a Check Dam is located across Godavari River near Mahegaon Deshmukh village.



*Figure 229 - Check Dam near Mahegaon Deshmukh village (ch. 1115.338km)*

Kolpewadi is a village in Kopergaon Taluka in Ahmednagar District of Maharashtra State, India. It belongs to Khandesh and Northern Maharashtra region. It belongs to Nashik Division. It is located 114km towards north from district head quarter Ahmednagar. 8km from Kopergaon.

Yevla, Shirdi, Vaijapur, and Manmad are the nearby cities to Kolpewadi.

At chainage 1124.601km Mayagaon Devi Temple is located on right bank of the river near Mayagaon Devi village.



*Figure 230 - Mayagaon Devi Temple (ch. 1124.601km)*

At chainage 1125.943km a Check Dam is located across Godavari River near Maygaon Devi village.





*Figure 231 - Check Dam near Maygaon Devi village (ch. 1125.943km)*

At chainage 1128.553km and 1128.561km Shirdi – Lasalgaon Road Bridges (Old and New) are constructed across Godavari River near Chas village.



*Figure 232 - Shirdi – Lasalgaon Road Bridges (ch. 1128.553km)*

At chainage 1131.56km a Check Dam is located across Godavari River near Kanlad village.



*Figure 233 - Check Dam near Kanlad village (ch. 1131.56km)*



At chainage 1137.634km Khedale Zunge Road Bridge is constructed across Godavari River near Khedale Zunge village. It is connecting between Bramhanwade and Khedale Zunge village.



*Figure 234 - Khedale Zunge Road Bridge (ch. 1137.634km)*

At chainage 1137.744km a Check Dam is constructed across Godavari River near Khedala Zunge village.



*Figure 235 - Check Dam near Khedala Zunge village (ch. 1137.744km)*

In this stretch features across the river are 04 Check Dam, 03 Road Bridge, and 03 High Transmission line. In addition to this 01 Temple along the river side.

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	1110	1140	0.00	7.18	21,450	929,431.87	35,383,857.90	-0.30	4.77	22,860	1,202,889.40	51,060,742.45
II	1110	1140	0.00	7.18	21,800	1,417,995.02	53,910,202.09	-0.30	4.77	23,370	1,779,652.06	75,634,737.98
III	1110	1140	0.00	7.18	22,475	2,147,728.70	81,522,029.11	-0.30	4.77	24,105	2,621,832.51	111,384,391.25
IV	1110	1140	0.00	7.18	22,700	2,595,511.66	98,430,158.83	-0.30	4.77	24,800	3,125,582.38	132,382,671.22

*Table 110 - Dredging Quantity Details*

### 3.38.1 Observed and reduced Bed Profile of the stretch

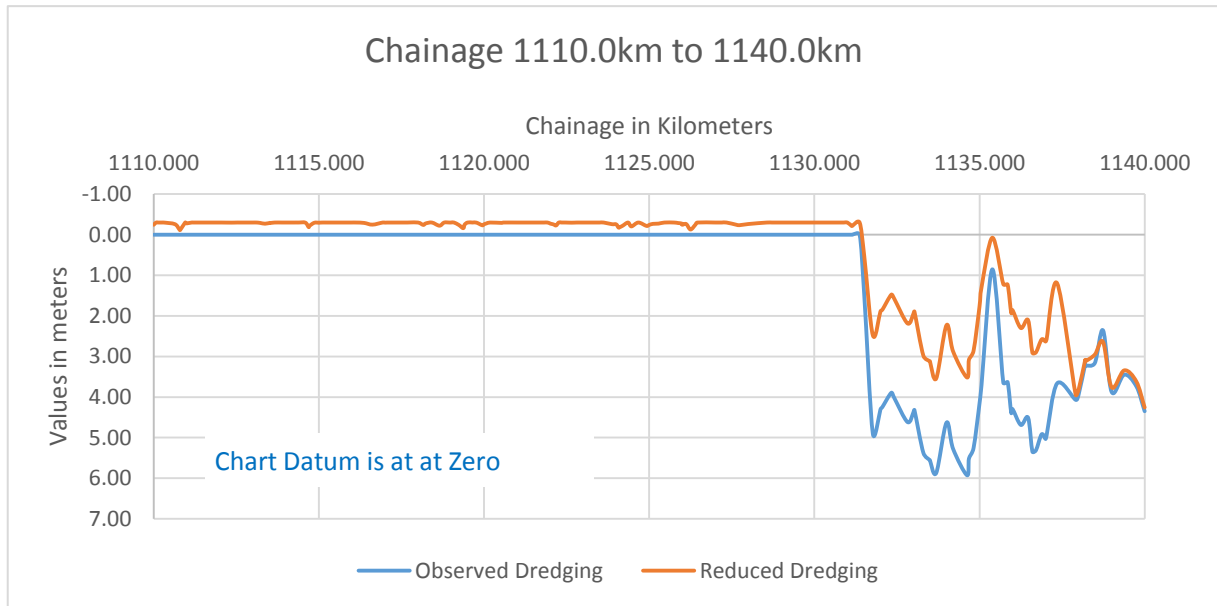


Figure 236 - River bed Profile

### 3.39 Sub-Stretch-39: Tamaswadi to Nagapur (Ch.1140.0km to 1170.0km)

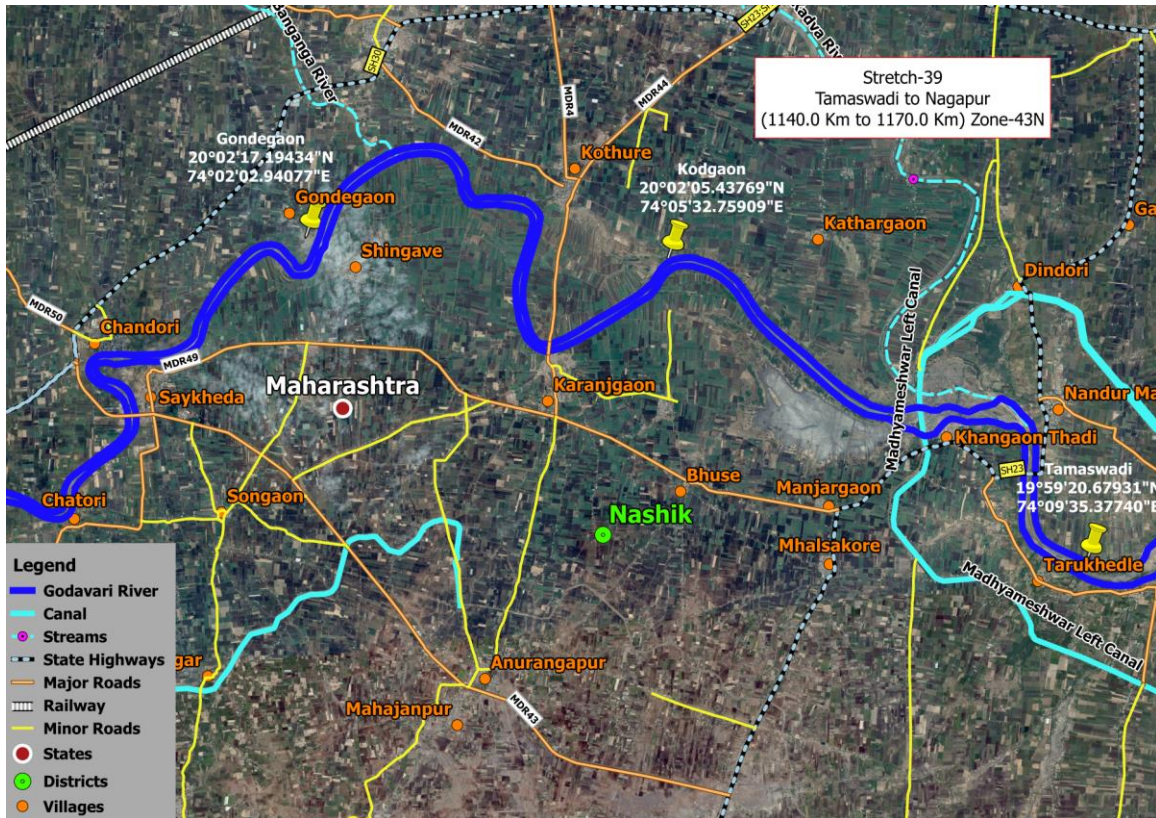


Figure 237 - Stretch-39 Tamaswadi to Nagapur

- **Bathymetry Survey**
  - a) 24.4km length of the stretch for which the bathymetric survey has been carried out.
- **Topographic Survey**
  - b) 5.6km length of the stretch for which the topographic survey has been carried out.

Stretch-39 is covered 30.0km i.e. from 1140.0km to 1170.0km Tamaswadi to Nagapur village. From chainage 1140.0km to 1145.6km is non-navigable as the depths noted were less than half a meter and hence could not be surveyed using survey boat. Instead, the spot levels were measured using Trimble R4 GPS. From chainage 1145.7km to 1170.0km river is navigable.

In this stretch along the right bank of the river Nandur Madhymeshwar, Kathargaon, Gondegaon, Chandori and Nagapur village is located. On left bank Tarukhedle, Khangaon Thadi, Karanjgaon, Shingave, Saykheda and Chatori villages are located.

Both sides of river banks having cultivable land. Cotton, Banana, Sugarcane, Mango, Soyabean, Sweet Lime and Jawar (Sorghum) are the essential crops grown mostly in the area.

Tarukhedle village is located in Niphad Tehsil of Nashik district in Maharashtra, India. It is situated 15km away from sub-district head quarter Niphad and 60km away from district head quarter Nashik. Nashik is the nearest town to Tarukhedle which is approximately 60km away.

At chainage 1144.522km Shree Mulmukai Devi Temple is located on left bank of the river near Tarukhedle village.



*Figure 238 - Shree Mulmukai Devi Temple (ch.1144.522km)*

Nandur Madhyameshwar village is located in Niphad Tehsil of Nashik district in Maharashtra, India. It is situated 12km away from sub-district head quarter Niphad and 47km away from district head quarter Nashik. Nashik is the nearest town to Nandur Madhyameshwar which is approximately 47km away.

At chainage 1146.714km Dharangaon Road Bridge is constructed across Godavari River near Nandur Madhymeswar.





*Figure 239 - Dharangaon Road Bridge (ch1146.714km)*

At chainage 1149.288km Nandhur Madhyameshwar Dam is constructed across Godavari River near Nandur Madhyameshwar village.



*Figure 240 - Nandhur Madhyameshwar Dam (ch. 1149.288km)*

Nandur Madhmeshwar Bird Sanctuary is located at Niphad Tehsil of Nashik District, known as the Bharatpur of Maharashtra

It was constructed in 1907-13 across the river Godavari just below the confluence of Kodwa and Godavari Rivers at Nandur Madhameshwar. This resulted in the formation of a rich environment for biological diversity. The water level is always fluctuating in Nandur Madhameshwar Lake. The water released from Gangapur and Darana water reservoirs is stored at Nandur Madhameshwar and subsequently released from here through canals for irrigation. Silts and organic matter that are carried away with water flow are accumulated in the lake, due to which islands and shallow water ponds have been created. This resulted in the biologically enriched conditions by which aquatic vegetation has been stabilized. Thus the site has turned into good wetland habitat aptly described as ‘Bharatpur of Maharashtra’.



At chainage 1149.360km on the right bank, a tributary Kadwa River joins Godavari River near Nandur Madhmeshwar Dam.

Kadwa is a minor but important tributary of the Godavari in Nashik district, Maharashtra. It originates and flows through the Dindori Taluka of Nashik District.

The Kadwa rises in the Sahyadris to the northwest of Dindori Taluka in the angle between the former and the Satmala Range and crosses Dindori from northwest to the southeast. It is rocky both in bed and bank, but the bed is wide, and the average volume of water is small compared with the area through which it flows. Irrigation works of considerable importance have been established on it. At its confluence with the Godavari, a pickup Weir has been constructed, raising the upstream water levels resulting in the formation of the Nandur Madhyameshwar reservoir. The backwaters of this reservoir harbor rich flora and fauna and have been deemed as the Nandur Madhyameshwar Bird Sanctuary. It witnesses migratory birds belonging to different species arriving here in huge numbers during the winter season. The total length of this river is 74km up to Nandur Madhyameshwar Dam with a total drainage area of near about 1664km<sup>2</sup>.

Karanjgaon is a village in Niphad Taluka in Nashik District of Maharashtra State. It belongs to Khandesh and Northern Maharashtra region. It belongs to Nashik Division. It is located 39km towards east from district head quarter Nashik.

At chainage 1157.081km Karanjgaon Road Bridge is constructed across Godavari River near Karanjgaon village. It is connecting between Karanjgaon and Kothure village.



*Figure 241 - Karanjgaon Road Bridge (ch. 1157.081km)*

Kothure is a village in Niphad Taluka in Nashik District of Maharashtra State. It belongs to Khandesh and Northern Maharashtra region. It belongs to Nashik Division. It is located 35km towards east from district head quarter Nashik. 5km from Niphad.

Saykheda is a village in Niphad Taluka in Nashik District of Maharashtra State, India. It belongs to Khandesh and Northern Maharashtra region. It belongs to Nashik Division. It is located 39km towards east from district head quarter Nashik.

Saikheda is surrounded by Chandwad Taluka towards the north, Sinnar Taluka towards the south, Nashik Taluka towards west, Dindori Taluka towards west. Ozar, Sinnar, Nashik, and Manmad are the nearby cities to Saikheda.

At chainage 1169.365km Chandori Temple is located in the river near Chandori village.



*Figure 242 - Chandori Temple (ch. 1169.365km)*

At chainage 1170.957km Saykheda Road Bridge is crossing across Godavari River near Saykheda village. It is connecting between Saykheda and Chandori villages. It also connects to SH-30 near Chandori village.



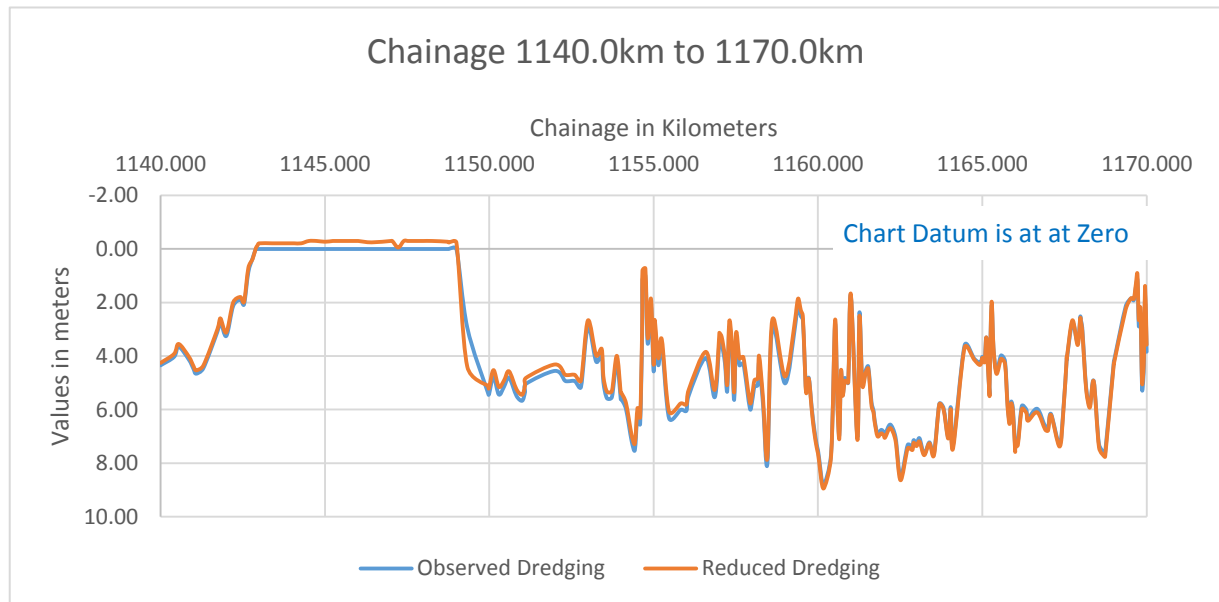
*Figure 243 - Saykheda Road Bridge (ch. 1170.957km)*

In this stretch features across the river are 01 Dam/Reservoir, 03 Road Bridge and 03 High Transmission line. In addition to this 02 Temples along and center of the riverside.

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	1140	1170	0.00	10.22	6,690	285,398.57	35,669,256.47	-0.30	9.99	7,420	300,493.43	51,361,235.88
II	1140	1170	0.00	10.22	7,550	440,157.13	54,350,359.22	-0.30	9.99	8,070	454,882.48	76,089,620.46
III	1140	1170	0.00	10.22	8,790	677,228.89	82,199,258.00	-0.30	9.99	8,645	688,768.76	112,073,160.01
IV	1140	1170	0.00	10.22	8,770	826,674.77	99,256,833.60	-0.30	9.99	9,305	833,935.64	133,216,606.86

*Table 111 - Dredging Quantity Details*

### 3.39.1 Observed and reduced Bed Profile of the stretch



*Figure 244 - River bed Profile*

### 3.40 Sub-Stretch-40: Nagapur to Nashik (Ch.1170.0km to 1201.6km)

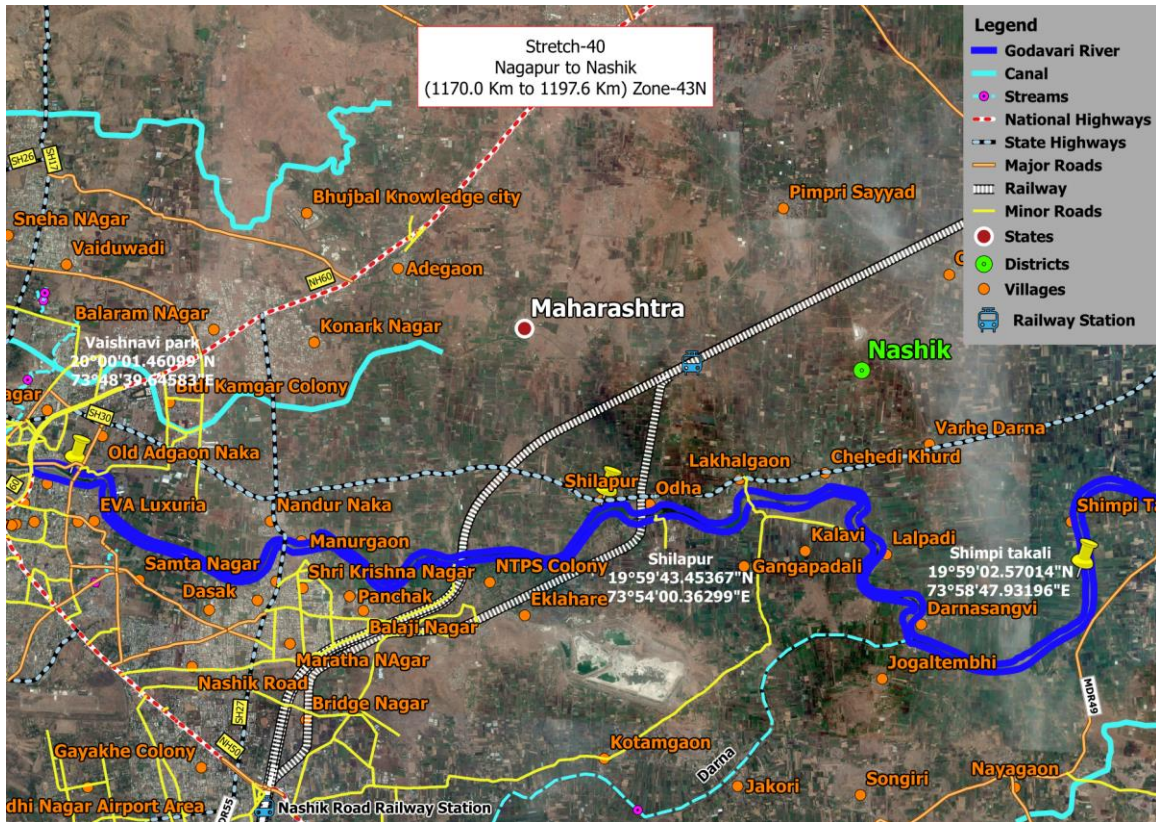


Figure 245 - Stretch-40 Nagapur to Nashik

- **Bathymetry Survey**
  - a) 6.8km length of the stretch for which the bathymetric survey has been carried out.
- **Topographic Survey**
  - b) 24.9km length of the stretch for which the topographic survey has been carried out.

Stretch-40 is covered 27.6km i.e. from 1170.0km to 1201.6km Nagapur to Nashik village. From chainage 1170.0km to 1176.8km river is navigable. From chainage 1176.9km to 1197.6km is non-navigable as the depths noted were less than half a meter and hence could not be surveyed using survey boat. Instead, the spot levels were measured using Trimble R4 GPS.

In this stretch along the right bank of the river Shimpi Takali, Darnasangavi, Lalpadi, Chehedi Khurd, Odha and Shilapur village is located. On left Sawali, Kalavi and Nashik bank and villages are located.



Both sides of river banks having cultivable land. Cotton, Banana, Sugarcane, Mango, Soyabean, Sweet Lime and Jawar (Sorghum) are the essential crops grown mostly in the area.

Shimpi Takli is a village in Niphad Taluka in Nashik District of Maharashtra State, India. It belongs to Khandesh and Northern Maharashtra region. It belongs to Nashik Division. It is located 22km towards east from district head quarter Nashik.

Ozar, Sinnar, Nashik, and Sangamner are the nearby cities to Shimpi Takli.

Darna Sangvi village is located in Niphad Tehsil of Nashik district in Maharashtra, India. It is situated 24km away from sub-district head quarter Niphad and 23km away from district head quarter Nashik. Nashik is the nearest town to Darna Sangvi.

At chainage 1180.372km Darna River a tributary of Godavari River joins near Darnasangvi village.

Darna is a minor right-bank tributary of the Godavari in the Nashik District, Maharashtra. Rising north of the Kalsubai range, it drains Igatpuri, Nashik and Niphad Talukas of Nashik District. The conjunction with the Godavari is situated at Darnasangvi.

The Darna River rises on the northern slopes of the Kulang hill fort in the Sahyadris about 13km. southeast of Igatpuri.

Though the straight line distance from the source to its confluence with the Darna is only about 50km., it has a very long and winding course which measures about 80km. Its banks are like those of the Godavari below Nashik, of no great height, but broken by scores of small streams, making the passage along the banks of the river very difficult for laden carts. It is crossed by a bridge at Chehedi on the Nasik-Pune road, on the way to Sinnar. The bed is most part wide and sandy, though, at times, the water flows over rocks. The Darna Dam is constructed across the river near Nandgaon village giving rise to the storage known as Lake Beale, which is visible for a considerable distance while traveling by train from Mumbai to Nasik on the right-hand side. This has enabled the construction of a pick-up Weir on the Godavari River at Nandur-Madhmeshwar to divert the water into the Godavari canals.

At chainage 1180.638km Darnasangvi Road Bridge is located near Darnasangvi village. It is connecting Hinganvedhe and Darnasangvi villages.





*Figure 246 - Darnasangvi Road Bridge (ch. 1180.638km)*

At chainage 1186.016km Lakhalgaoon Road Bridge is constructed across Godavari River.



*Figure 247 - Lakhalgaoon Road Bridge (ch. 1186.016km)*

Odha village is located in Nashik Tehsil of Nashik district in Maharashtra, India. It is situated 14km away from sub-district head quarter Nashik and 14km away from district head quarter Nashik.

At chainage 1188.294km Odha Road Bridge is constructed across Godavari River near Odha village.



*Figure 248 - Odha Road Bridge (ch. 1188.294km)*

At chainage 1188.608km Odha Railway line Bridge is crossing across Godavari River near Odha village.



*Figure 249 - Odha Railway line Bridge (ch. 1188.608km)*

At chainage 1188.889km a water pipeline is located across the river near Odha village.



*Figure 250 - Water pipeline near Odha village (ch.1188.889km)*

At chainage 1191.644km on the left bank of the river, Nashik Thermal Power plant is located near Eklahare town.

Eklahare is a town in Nashik district in the state of Maharashtra. Nashik Thermal Power Plant is located at Eklahare town near Nashik in Maharashtra. The power plant is one of the coal based power plants of Maharashtra State Power Generation Company (Mahagenco). Nashik Thermal Power Station has an installed capacity of  $140 \times 2 + 210 \times 3 = 910$  MW. It is on the Bhusawal–Kalyan section of Central Railway.

At chainage 1192.181km Panchak Railway line Bridge is constructed across Godavari River near Panchak village.



*Figure 251 - Panchak Railway line Bridge (ch. 1192.181km)*

At chainage 1194.453km Sewage Treatment Plant is located on left bank of the river near Panchak town.

At chainage 1195.923 Nandur Naka Road Bridge (NH-60) is crossing across Godavari River near Nandur Naka town.



*Figure 252 - Nandur Naka Road Bridge-NH-60 (ch. 1195.923km)*

At chainage 1198km Old Saikheda Road Bridge is constructed across Godavari River near Samta Nagar town.



*Figure 253 - Old Saikheda Road Bridge (ch. 1198km)*

At chainage 1194.433 Sewage Treatment Plant is located on left bank of the river near Samta Nagar town.

At chainage 1198.765km Samta Nagar Road Bridge is constructed across Godavari River near Samta Nagar town.





*Figure 254 - Samta Nagar Road Bridge (ch. 1198.765km)*

At chainage 1200.82km Tapovan Road Bridge is constructed across Godavari River near



*Figure 255 - Tapovan Road Bridge (ch. 1200.82km)*

At chainage 1201.622km 02 Mumbai – Agra Highway Bridge and a Flyover is constructed across Godavari River near Takle Nagar, Nashik.





*Figure 256 - Mumbai-Agra Highway Bridge and Fly over (ch. 1201.622km)*

The city of Nashik also known as Nasik is the administrative head quarter of the district. This city is situated at the foothills of the Western Ghats Mountains on the banks of the River Godavari.

The river Godavari originates 24km from Brahmagiri Mountain, Trimbakeshwar, Nashik and flows along the northern boundary of the city through the old residential settlement. The river had been dying at an alarming rate due to pollution created by factories. But it has been successfully cleaned. Other than the Godavari, important rivers like Vaitarana, Bhima, Girana, Kashyapi, and Darana flow across Nashik.

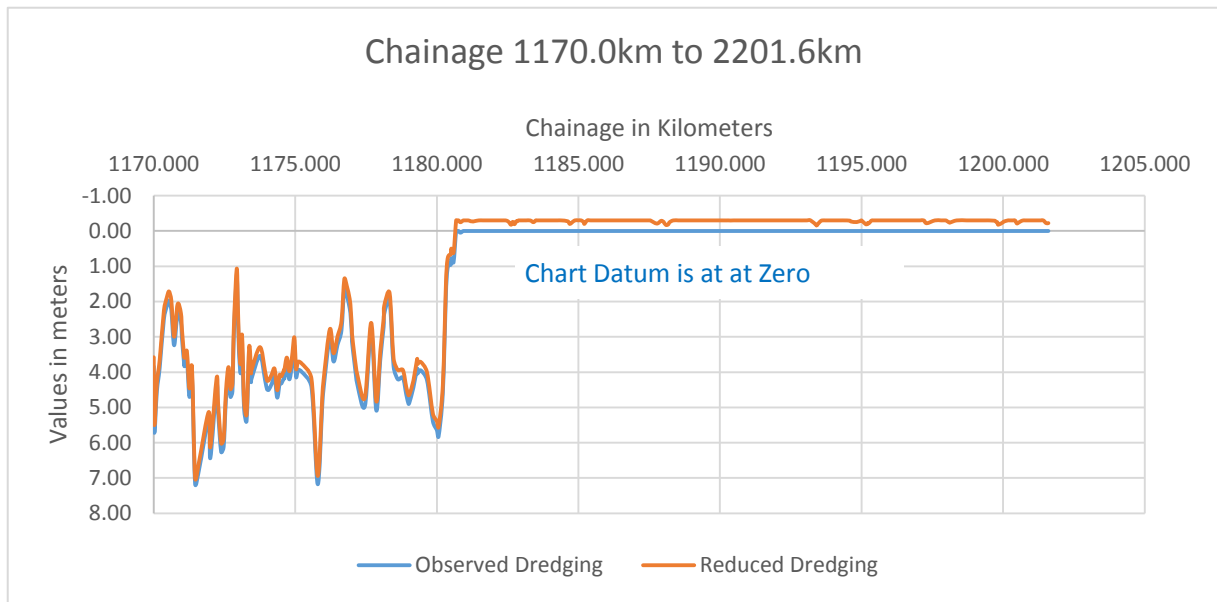
Nashik lies on the western edge of the Deccan Plateau which is a volcanic formation. All over the district, lime nodules and kankar are found. Jalgaon and Aurangabad are to the east of Nashik. Ahmadnagar lies to the south while Thane and part of Gujarat are to the west of Nashik.

In this stretch features across the river are 02 Railway line Bridges, 08 Road Bridge, 01 Water Pipeline, and 02 High Transmission line. In addition to this 02 Sewage Treatment plants along the river side.

Class	Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
I	1170	1201.6	0.00	8.75	21,400	883,034.46	36,552,290.93	-0.30	8.52	21,750	1,128,392.60	52,489,628.48
II	1170	1201.6	0.00	8.75	21,810	1,343,781.85	55,694,141.07	-0.30	8.52	22,120	1,660,392.98	77,750,013.44
III	1170	1201.6	0.00	8.75	22,315	2,030,440.19	84,229,698.19	-0.30	8.52	22,600	2,426,525.04	114,499,685.05
IV	1170	1201.6	0.00	8.75	22,750	2,456,373.20	101,713,206.80	-0.30	8.52	23,010	2,874,096.97	136,090,703.83

*Table 112 - Dredging Quantity Details*

### 3.40.1 Observed and reduced Bed Profile of the stretch



*Figure 257 - River bed Profile*

## 3.41 Other aspects of Waterway

### 3.41.1 Details of Irrigation Canals and Outlets

In this stretch there were four big dams constructed upon Godavari River for irrigation purposes, two dams were in Telangana state and two dams in Maharashtra state. Sripada Yellampalli Dam and Sri Ram Sagar Dam present in Telangana state and Jayakwadi Dam and Nandur Madhameshwar Dam are in Maharashtra state.

Sripada Yellampalli Dam is an irrigation project located at Yellampalli village, Ramagundam Mandal, between Karimnagar and Adilabad district in Telangana. The project is fourth largest on the Godavari River in Telangana region.

The Dam is designed to utilize about 63tmc and 49.5tmc would be lifted to the upland regions of Karimnagar, Adilabad, Nizamabad, Warangal and Medak districts. 6tmc water allotted for NTPC Ramagundem project.

The Dam supply water for NTPC power project reservoir in Ramagundam Mandal in Karimnagar. It is supplying drinking water to Hyderabad city.

Sriramsagar is an irrigation dam across River Godavari in Telangana to serve irrigational needs in Karimnagar, Warangal, Adilabad, Nalgonda, and Khammam districts. It also provides drinking water to Warangal city.

Sriram Sagar Reservoir's capacity is 75tmcft and it has 42 floodgates. It also includes Kakatiya Canal covering 284km, Laxmi Canal, Saraswati Canal and Flood flow canal.

Jayakwadi Dam irrigates a cultivable area of 237,452 hectares in the districts of Aurangabad, Jalna, Beed, Ahmednagar and Parbhani through its left and right canals. The length of left bank canal is 208 km & the length of right bank canal is 132km. The total command area is 183,858 hectares. The gross irrigated area by 96,000 hectares under right bank canal was further enlarged by constructing Majalgaon Dam which acts as a balancing reservoir in addition to harness the Sindphana tributary of the Godavari River.

Nandur Madhameshwar Dam is an Irrigation based project, water released from Gangapur and Darana water reservoirs is stored at Nandur Madhameshwar and subsequently released from here through canals for irrigation.

Nandur Madhameshwar Canal on Left Bank of the existing Nandur Madhameshwar Pick-up Weir 15.70 km D/S of existing Darna Dam and is 125km long fully lined canal with discharge capacity 31.03 cumecs at the head. Two branch canals, each of 18km length.

### 3.41.2 Irrigation/Drinking Water

The Godavari River is utilized for irrigation projects for other cultivation with own lifting by farmers. There is Drinking water pumping facility found throughout the Godavari River.

### 3.41.3 Crops

In Telangana region both side of river banks having well cultivable land. Cotton, Maize, Chilli, Ground Nut, Paddy, Wheat, Sugarcane, Turmeric, Pulses are the major crops that are cultivated mostly in the area.

In Maharashtra region both side of river banks having cultivable land. Cotton, Banana, Sugarcane, Mango, Soyabean, Sweet Lime and Jawar (Sorghum) are the essential crops grown mostly in the area.



*Figure 258 - Crops*

#### **3.41.4 Fishing**

During the survey stretch wherever water is availability, it was observed that the local villager's source of living is fishing. And a maximum number of small boats (fiber and wooden) and thick Thermocol sheets tied together were being used for fishing.



### 3.41.5 Industries

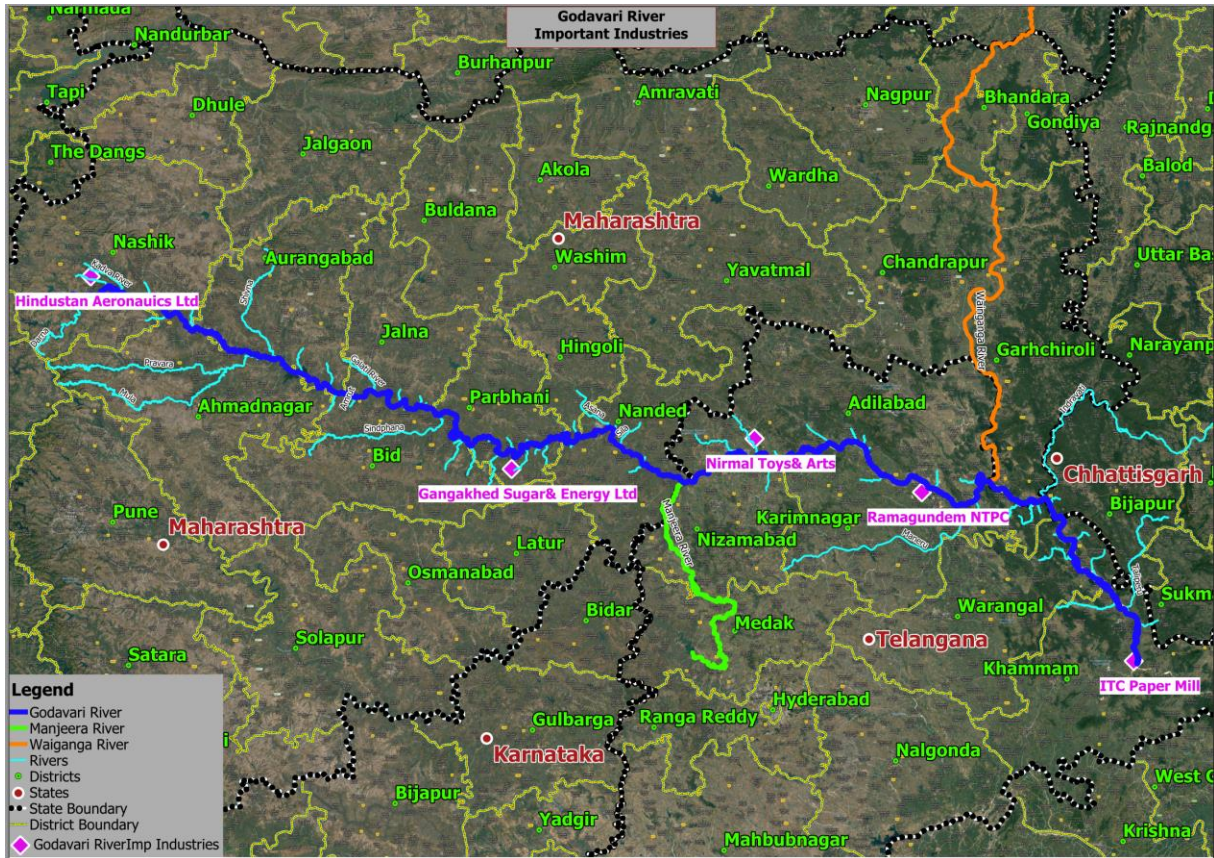


Figure 259 – Important Industries along Godavari River

#### a) Telangana

##### Bhadrachalam

There are two major industries found near Bhadrachalam, Heavy water Plant, ITC Paper mill and Open pit Coal mines present nearby Godavari River.



Figure 260 – Bhadrachalam Paper Mill (Ch.23.759km)



## Ramagundem NTPC

Ramagundam is a city is in the Peddapalli district of Telangana. It is the biggest and most populous city in the Peddapalli district. It is located on the banks of the Godavari River.

NTPC Ramagundam, a part of National Thermal Power Corporation, is a 2600 MW Power station situated at Ramagundam in Peddapalli district in the Indian state of Telangana, India. It is the current largest power station in South India. It is the first ISO 14001 certified "Super Thermal Power Station" in India.

The power station gets its water periodically released from the SRSP-Sriram Sagar project. This water is stored in the balancing reservoir. The water level in the balancing reservoir is monitored daily.

NTPC Ramagundam is a Thermal Power Station and hence uses coal. This coal is available at a large scale from the Singareni Coal mining company nearby and is transported using the MGR (Merry-go-round) system wherein, a train comes on one rail route, delivers coal and returns on another route.



*Figure 261 - NTPC Ramagundem (ch.293.200km)*

## Nirmal

The name Nirmal is derived from one of its famous 17th-century rulers, Nimma Naidu. He was fond and admirer of the arts, encouraging the art of toy making out of teak and poniki, a unique tender wood, which flourished in his time bringing significance to the town. Wooden toy making (Koyya Bommalu) is a small-scale industry in the town.



*Figure 262 – Small Scale Industry at Nirmal (Ch.452.89)*

## **b) Maharashtra**

### **Gangakhed**

In Gangakhed there is Gangakhed sugar and Energy Limited factory with a combined cycle power plant in Gangakhed which caters to the sugarcane farmers in the local region. Several small-scale businesses and business agencies thrive mostly around the agricultural sector. There is also edible oil industry which runs by public and private sector; the region is famous for edible oil production and also famous for cotton production and related industries because Gangakhed is located on Deccan Trap and the bank of river Godavari so the regur soil (black cotton Soil) is there and is very useful for cotton production.



*Figure 263 – Gangakhed Sugar Industry (Ch.715.280km)*

### **Nanded**

The Nanded city has various small scale Textile and Sugar Mill. Nanded is gradually becoming an industrial city as few new industries starting their operations. There has been a constant demand for creation of new industrial zone named Nanded Aurangabad Industrial Corridor which will connect to Delhi-Mumbai Industrial Corridor.

## Paithan

Paithan is famous for its small scale industries of Sarees, Paithani beautiful silk sarees that sport intricately embroidered gold or silver borders.

## Kopergaon

In Kopergaon there are three sugar factories namely, Sanjivini Sugar factory-Kopergaon, KSK Sugar Industry –Kopelwadi and. In addition to this, there is an industrial estate having 52 small-scale industries and dairies.

## Nashik

In Nashik, there is a Hindustan Aeronautics Limited aircraft manufacturing plant located 16km from Nashik, Currency Note Press and India Security Press are on Nashik Road, where Indian currency and government stamp papers are printed respectively. Nashik also has a textile industry, e.g., carpet weaving in remote areas like Surgana Block, Ventura textile industry.

Nashik has been described as "The Wine Capital of India" due to the numerous wineries located within the district, the Nashik region reportedly produces 10,000 tons of grapes per year. There are 22 wineries in Nashik, out of 46 wineries throughout India total.



*Figure 264 – Aircraft Manufacturing Plant (Ch.1185.128km)*



### 3.41.6 Important Cities/Towns

The Major Town/Cities situated along the bank of Godavari River are as follows.

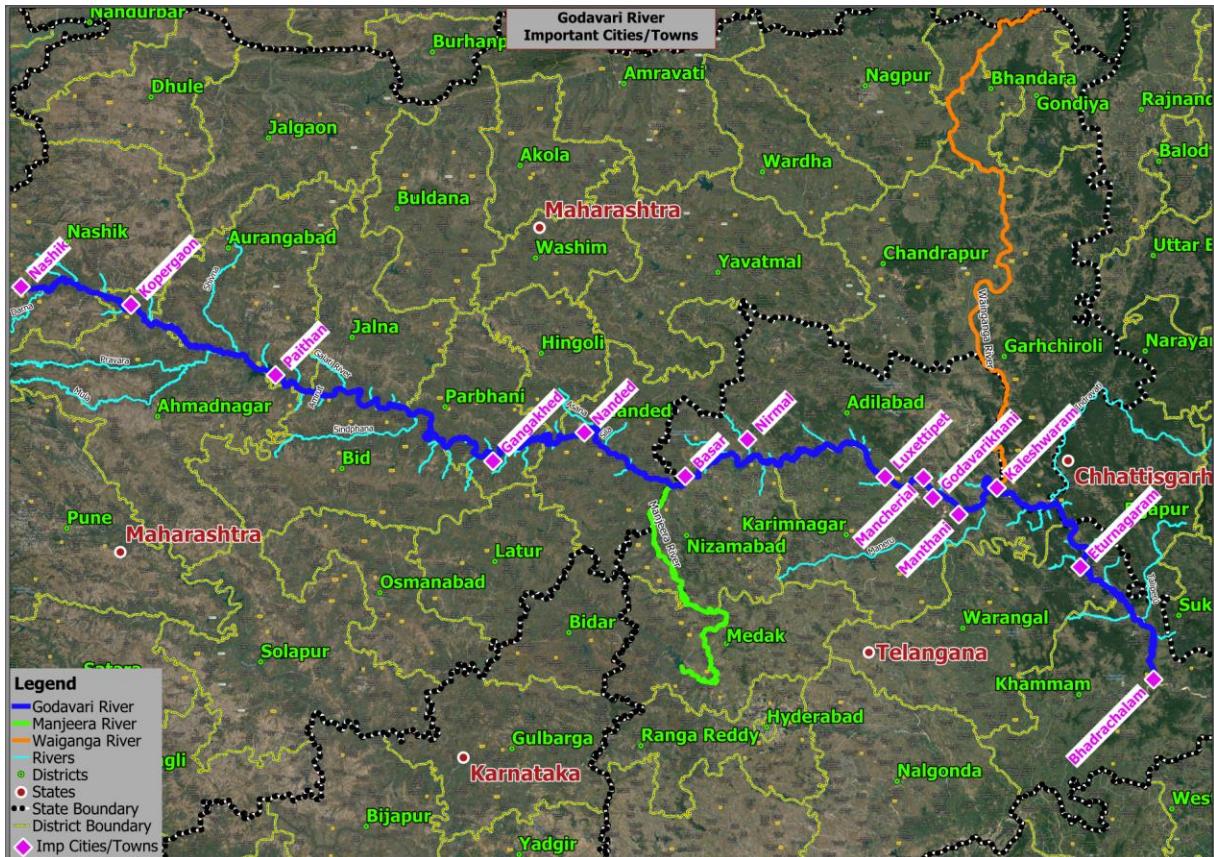


Figure 265 – Important Cities/Towns along Godavari River

#### a) Telangana

##### **Bhadrachalam**

Bhadrachalam is a town in Bhadrachalam District of Telangana. It is an important Hindu pilgrimage town with an existence of the Bhadrachalam Temple of Lord Rama, situated on the banks of Godavari River.

The state bus service TSRTC operates a bus station in Bhadrachalam connecting the town to various places of the state. The nearest railway station, Bhadrachalam Road at 40 km from the town.

##### **Eturnagaram**

Eturnagaram is a village and a Mandal in Jayashankar district in the state of Telangana.

Bogatha Waterfall is located in Koyaveerapuram G, Wazeedu Mandal, Khammam district, Telangana. It is located 120km from Bhadrachalam, 140km away from Warangal and 329km from Hyderabad. As the newly constructed Eturnagaram bridge on NH-202 reduced the distance to 329km from 440km.

### **Kaleshwaram**

Kaleshwaram is a village in Mahadevpur Mandal in Karimnagar district in the state of Telangana. It is located exactly at the merging point of the Godavari River and its tributary Pranhita.

### **Manthani**

Manthani is a village in Peddapalli district of the Indian state of Telangana. It is located in Manthani Mandal. It is situated on the bank of the river Godavari. It is a very ancient center of Vedic learning, and even today houses many scholars well versed in the ancient knowledge of the Vedas and Shastras.

It is surrounded by the Godavari River on the northern side, Bokkala Vaagu in the south, a lush green reserve forest in the east and Ravula Cheruvu, a small lake on the Western side. Manthani is blessed with several ancient temples.

### **Godavarikhani**

Godavarikhani is a city in Peddapalli district of Telangana state. It is located on the banks of Godavari River and hence, the name *Godavari Khani* (Khani=mines). This city is popular for its coal mines, controlled mostly by SCCL.

Godavarikhani is the major region for Singareni. Godavarikhani has 4 open-casts and 14 underground mines. Mainly coal excavated from this city is supplied to various industries and NTPC Ramagundam for power generation.

### **Nirmal**

Nirmal is a town and newly formed district of Telangana. The town is surrounded by various ponds and there are many forts in and around Nirmal. Khilla, Bathees Gargh and Shyam Gargh.



## Mancherial

Mancherial is a town and district head quarter of Mancherial District of Telangana state. It is the administrative head quarter of Mancherial Mandal in Mancherial revenue division, situated on the north banks of Godavari River.

It is well connected by road from major parts of India. By Hyderabad-Karimnagar-Ramagundam Hwy. State-run TSRTC buses run to various towns and cities. It is connected with SH-1, NH-63 and Nagpur highway. Mancherial is one of the A category stations of Secunderabad division. There is an unused airstrip at Basant Nagar Kesoram cement factory at Ramagundam which is about 25km from Mancherial. It was used when the government of India was operating Vayudoot airlines, a subsidiary of Air India and Indian Airlines. After the closure of Vayudoot, it has not been in regular use.

## Luxettipet

Luxettipet is a town in Adilabad District of the state of Telangana.

## Basar

Basar is a town in Nirmal District in the state of Telangana, It is located on the bank of Godavari River and is famous for its Saraswathi Temple in India. This temple is one of the very few temples of Goddess Saraswati in South India.

The Saraswathi Temple in Basar is a unique temple of Saraswati, the Hindu Goddess of Knowledge and Learning. Children are brought here to do the learning ceremony called *Akshara Abyasam*.

It is situated about 200 km from Hyderabad and 34.8km from Nizamabad and 72km from its district head quarter Nirmal. Basar is 600km from Mumbai.



*Figure 266 - Saraswathi temple and Veda Sila (ch.514.614m)*

## b) Maharashtra

### **Sironcha**

Sironcha is a town and the administrative head quarter of Sironcha Tehsil in Gadchiroli district of Maharashtra state. It was a key location for the East India Company from Nizam perspective, it was the southern tehsil of Chanda District, Central Provinces.

The northern portion of the tehsil comprised in the Ahiri zamindari is one of the most densely wooded and sparsely populated areas in the Province; to the south of this Sironcha extends in a long narrow strip to the east of the Godavari, and consists of a belt of rich alluvial soil along the banks of the river and its affluents, with forests and hills in the background.

### **Nanded**

Nanded is a city located in Maharashtra state, it is the 8th largest urban agglomeration of Maharashtra, and the 81st most populous city in India. It is also head quarters of Nanded district and second largest city in Marathwada region after Aurangabad.

Nanded has been a major place of Sikh pilgrimage. 10th Sikh Guru, Guru Gobind Singh made Nanded as his permanent abode and passed Guruship to *Guru Granth Sahib* before his death in 1708 in Nanded. Nanded is located on the banks of Godavari River. Nanded was famous for its Vedic rituals on the sacred banks of river Godavari. Urvashi Ghat, Ram Ghat, Govardhan Ghat are some of them.

### **Gangakhed**

Gangakhed is a city and a municipal council in Parbhani district in the state of Maharashtra.

### **Paithan**

Paithan is a city and a municipal council in Aurangabad district, Maharashtra. It was the capital of the Satavahana dynasty.

### **Kopergaon**

Kopergaon is a town located in the Ahmednagar district of the Indian state of Maharashtra. Kopergaon is located about 14km from the holy town of Shirdi. Kopergaon itself is also a holy place.

## Nashik

The city is situated at the foothills of the Western Ghats Mountains on the banks of the River Godavari.

### 3.41.7 Road Network

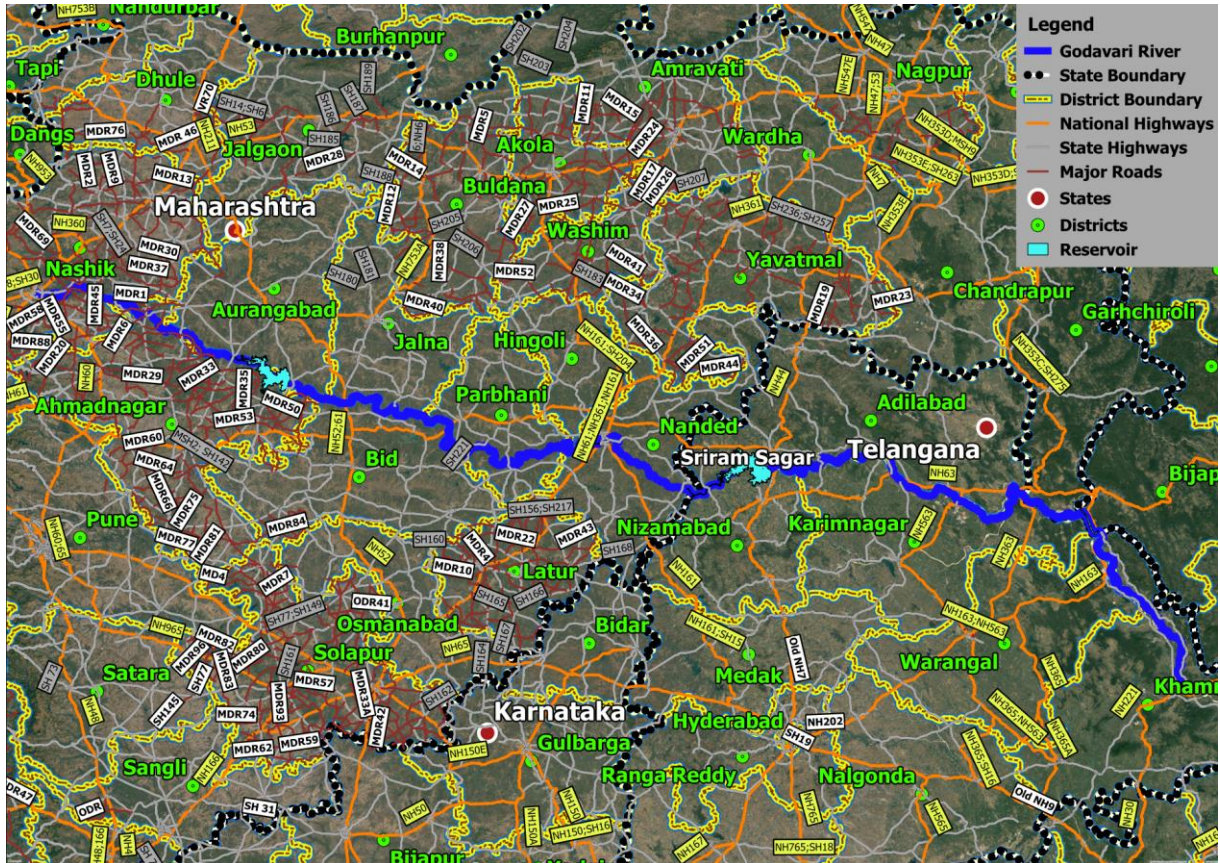


Figure 267 - Road Network

#### 3.41.7.1 National Highway

National Highway-30 is passing across the Godavari River at Bhadrachalam Bridge to Sarapaka village.

National Highway-163 is passing across the Godavari River at Mullakatta, Eturnagaram to Jagannadhapuram village and become parallel along right bank up to Bhadrakali village.

National Highway- 63 is parallel along the right bank from Kopela to Mancherial town.

National Highway-563 is parallel along right bank from Mancherial to Gudem Gutta and crosses from right bank to left bank near Gudem Gutta and become parallel along left bank up to Dharmapuri town.

National Highway-61 is parallel along right bank from Nirmal to Pathri. It crosses the river from right bank to left bank near Dhalegaon village. It becomes parallel to the river on left bank up to Shevgaon village

National Highway-44 is passing across the Godavari River near Soan to Soanpet village from Right bank to left bank.

National Highway-161 is crossing from left bank to right bank near from Wajegaon.

National highway-52 is crossing from right bank to left bank near Shahgadh village.

National Highway-60 is crossing from right bank to left bank near Manurgaon

#### **3.41.7.2 State Highway**

State Highway-12 is passing along the Godavari River on right bank from Bhadrachalam to Border of Telangana and Chhattisgarh.

State Highway-7 is joining NH-563 near Rayapatnam village.

State Highway-24 is passing parallel to river on right bank from Guddem Gutta village to Nirmal in Telangana.

State Highway-03 is crossing the river from right bank to left bank near Amudra and Puneagaon village.

State Highway-148 is crossing from left bank to right bank of the river near Pategaon in Maharashtra.

State Highway-48 is joining Ahmednagar – Aurangabad Road near Kaygaon village on the right bank of the river.

State highway-47 is parallel along the left bank of the river from Puntamba to Kopargaon and merging with SH-7.

State Highway-07 is crossing from left bank to right bank near Kopergaon town.

State Highway-30 is parallel along the right bank of the river from Niphad to Nashik.



### 3.41.7.3 Major District Roads

All Major District in the stretch of Godavari River are well connected by roads.

### 3.41.8 Railway Network

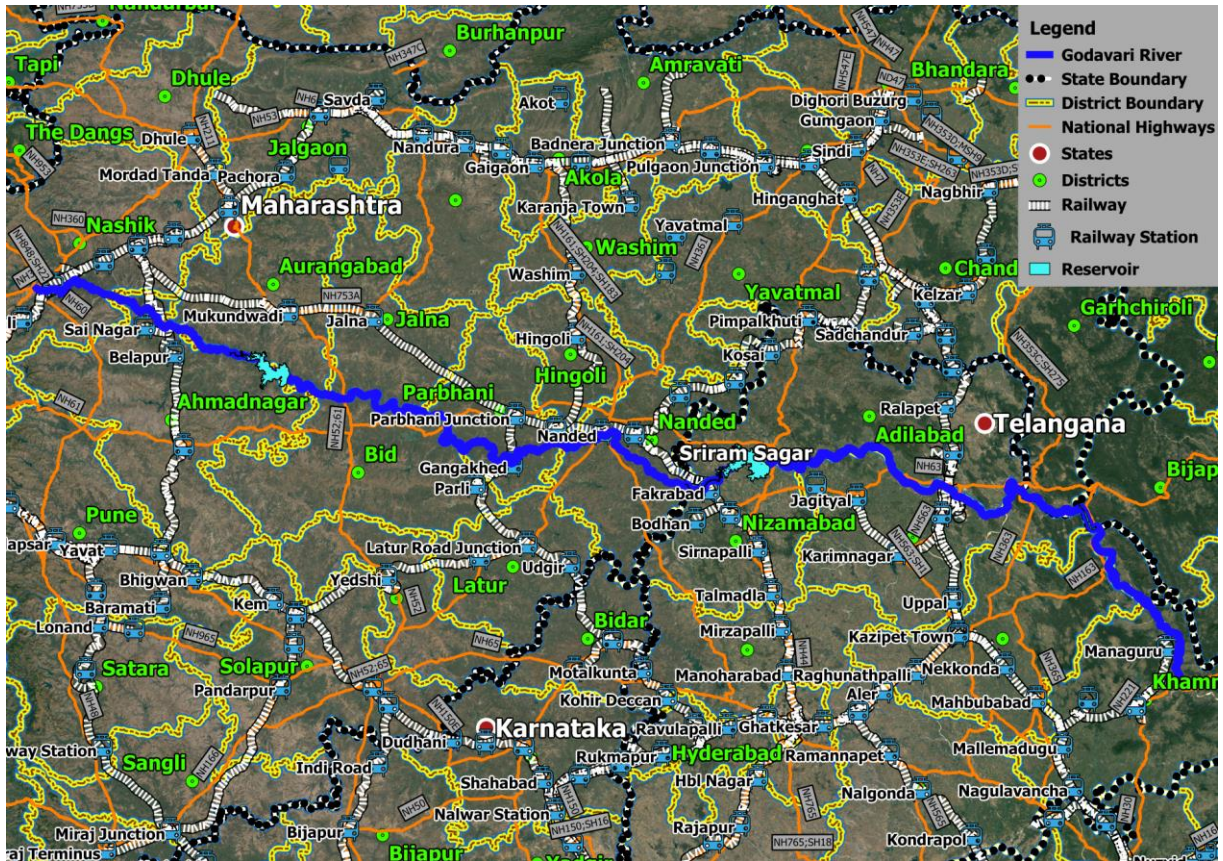


Figure 268 - Map of Rail network

In this River stretch, we found only four numbers of rail networks which are being connected to the nearby cities. The rail network is being mentioned below. The Maximum stretches are being connected by road only. So the easiest ways to approach the stretches are roadways.

Location	Passage	Station Names
Manchiriyal	Manchiriyal to Peddempet/ Crossing	Manchiriyal/ Telangana
Basar	Basar to Fakhrabad/ Crossing	Basar/ Telangana
Basar	Basar to Nanded/Along right bank	Nanded / Maharashtra
Odha	Odha to Nashik/ Crossing	Odha/ Maharashtra

Table 113- Table of Rail network



### 3.41.9 Land Use

#### a) Telangana

##### **Khammam**

In Khammam the land use as follows:

<b>Description Area</b>	<b>(in Km<sup>2</sup>)</b>
Agriculture Plantation	540.72
Aquaculture / Pisciculture	2.04
Agriculture - Crop Land	5959.48
Forest Plantation	205.94
Forest	4533.75
Built up (Urban)	28.75
Built up (Rural)	296.55
Mining / Industrial	63.49
Transportation	7.81
Barren Rocky	12.88
Scrub Land - Dense	16.11
Scrub Land - Open	605.42
Gullied / Ravenous	2.85
Salt Affected Land	6.31
Sandy Areas	0.59
River / Stream / Drain	335.18
Reservoir / Tanks	288.08
Lakes / Ponds	2.83
Canal	16.32

##### **Karimnagar**

In Karimnagar District the land use is as follows:

<b>Description Area</b>	<b>(in Km<sup>2</sup>)</b>
Scrub land	1090
Land with or without scrub	1562
Barren rocky / Stony waste	140
Deciduous forest	1358
Double crop (Kharif+Rabi)	2011
Fallow land	166
Rabi	2624
Kharif	2622
Water bodies	250

## Adilabad

In Adilabad District the land use is as follows:

<b>Description Area</b>	<b>(in Km<sup>2</sup>)</b>
Total Geographical area	16105
Forest	6895.17
Barren & un-utilizable lands	439.20
Land put to non-agriculture use	606.84
Cultivable waste	147.37
Other fallow lands	747.57
Current fallow lands	1285.21
Net area sown	5756.26
Gross cropped area	6342.63

## b) Maharashtra

### Nanded

In Adilabad District the land use is as follows:

<b>Description Area</b>	<b>(in Km<sup>2</sup>)</b>
Geographical area	10.331
Cultivable area	8.087
Forest area	0.853
Land under	
Non-agricultural use	0.358
Permanent pastures	0.506
Cultivable waste land	0.359
Land under Misc. tree	
Crops and groves	0.063
Barren and	
Uncultivable land	0.19
Current fallows	0.734
Other fallows	0.243

### **Parbhani**

In Parbhani District the land use is as follows:

<b>Description Area</b>	<b>(in Km<sup>2</sup>)</b>
Fallow land	481.7864
Built up Area	26.7032
Water body	6.531
Crop land	531.6436
Non crop land	374.4953

### **Nashik**

In Kopergaon District the land use is as follows:

<b>Description Area</b>	<b>(in Km<sup>2</sup>)</b>
Total Geographical area	1425511
Forest	240423
Area put to non-agriculture use	14635
Barren and un-cultivable land	128608
Permant pastures and grazing Lands	40378
Current Fallow	69876
Others fallow	47673

#### **3.41.10 Construction Material**

The area being near to major cities, all type of modern construction materials like cement, iron etc. are available in bulk quantity. Balharsha city having a number of coal mines and it is the city also known as a wood city.

#### **3.41.11 Condition of Banks**

The protection of the river bank was found to be very less in most of the stretches of the river under study. The only way in which we can say that the bank is protected was because of the construction of Ghats. Other than this there was no specific construction for protecting the river bank from erosion.

#### **3.41.12 Jetties and Terminals**

Lack of the jetties and terminals along the river.

### 3.41.13 Cargo Movement

The waterway is not used for any specific type of cargo movements in any stretch of the river.

### 3.41.14 Passenger Ferry Services

During the survey, it was observed that two passenger ferry services are operative, nearby Kaleshwaram and Basar.

Sl. No.	Place Name	Chainage (km)	Lat/Long		Easting/Northing	
			From	To	From	To
1	Kaleshwaram Passenger Ferry	215.619	18°49'2.36"N 79°54'35.43"E	18°49'19.52"N 79°54'42.41"E	385130.85 2080967.25	385338.35 2081493.51
2	Basar Passenger Ferry	514.945	18°52'5.11"N 77°57'38.84"E	18°51'55.65"N 77°57'47.38"E	811978.28 2088840.19	812233.64 2088553.72

Table 114 - Passenger ferry services in Godavari River

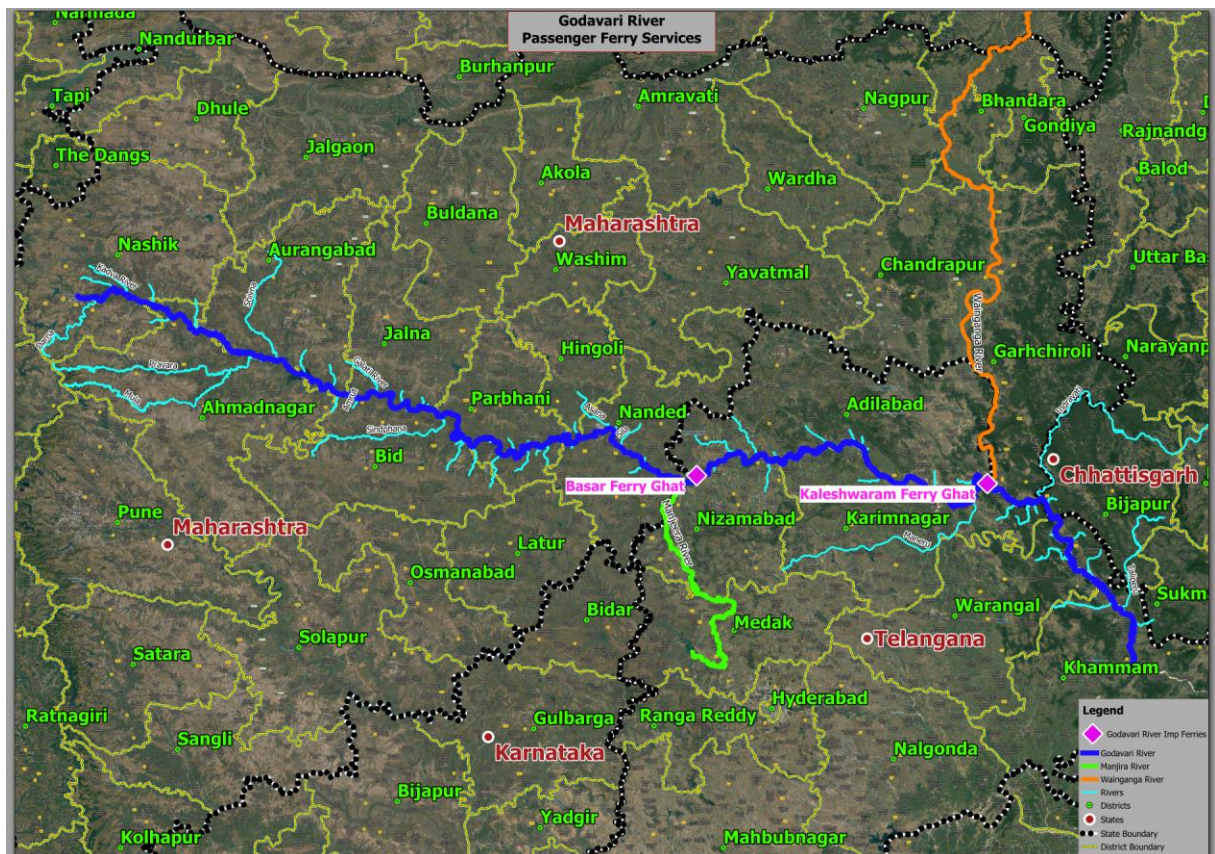


Figure 269 – Important Passenger ferry services in Godavari River

It was found near Kaleshwaram (holy place) the pilgrims take bath, a small ferry Ghat is constructed. People usually use this point to cross the river from Kaleswaram to

Sironcha as there were no means to cross the river earlier, recently a new bridge was constructed near Kaleshwaram to Sironcha across Godavari River. This ferry service is operational only during the monsoon season.



*Figure 270 - Kaleshwaram Ferry Ghat (ch.215.619km)*

Near to right bank of Basar village, a small Ferry Ghat was found for transferring the persons from one bank to other and also for sightseeing and recreation.



*Figure 271 - Basar Ferry Ghat (ch.514.945km)*



### 3.41.15 Historic Importance

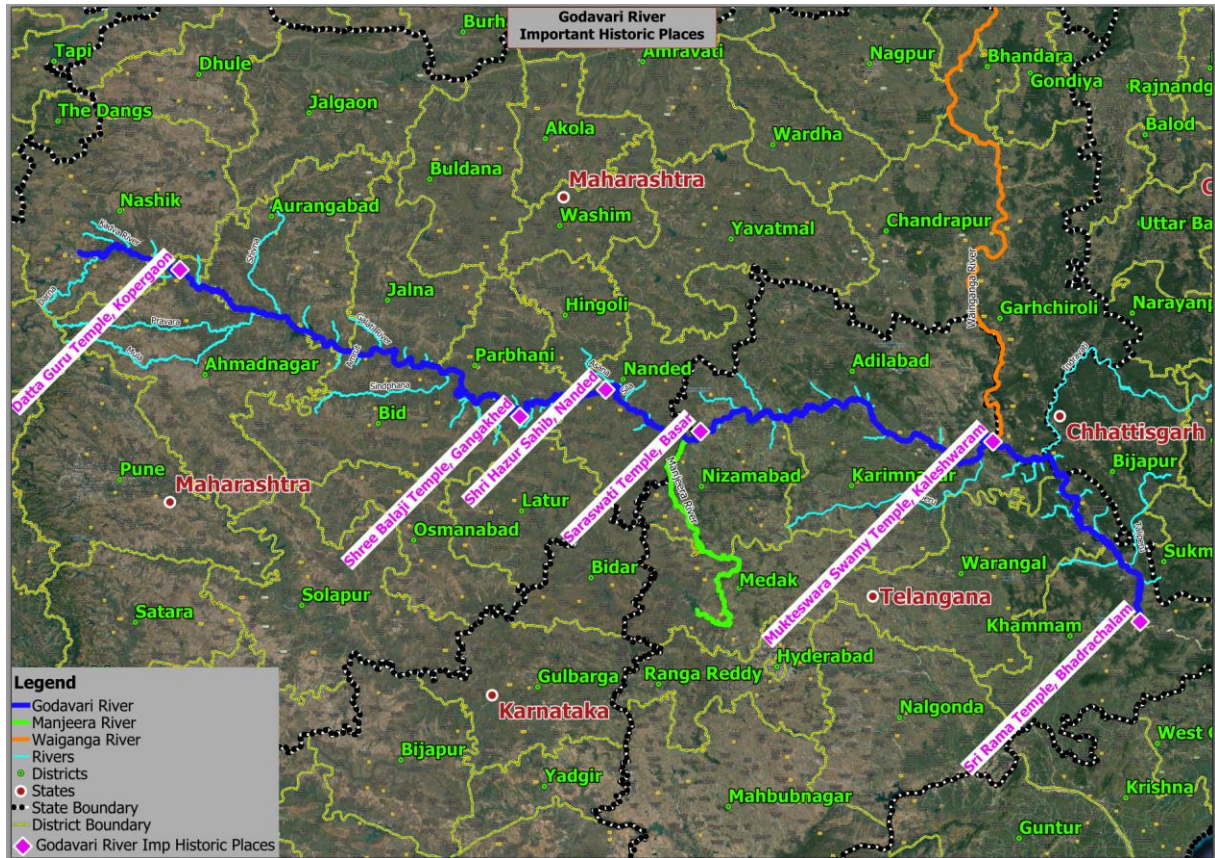


Figure 272 – Important historic places along Godavari River

#### a) Telangana

##### **Bhadrachalam**

Bhadrachalam town is located in Bhadrachalam District of Telangana. It is an important Hindu pilgrimage town with an existence of the Bhadrachalam Temple of Lord Rama, situated on the banks of Godavari River. The town has a documented history of Lord Sri Rama temple constructed circa 17th century CE by Kancherla Gopanna (nearly 370 years ago) popularly known as Bhakta Ramadasu.

Parnasala village is located in Dummugudem Mandal in the Khammam district of Telangana. It is 35km north of Bhadrachalam, is believed to mark the hermitage where According to legend, it is said the "Lord Sri Rama" spent some of the 14 years of exile at this location. The locals believe that Sita, the beloved consort of "Lord Sri Rama" bathed in the stream here and dried her clothes on "Radhagutta" where the imprints are seen even today. The demon king "Ravana" parked his Pushpaka on the hillock on the opposite side of the river and abducted her. An earthen ditch reportedly

caused when Ravana removed earth to carry off Sita to Lanka can be seen here. Another Hindu myth names Parnashala as the location where Rama killed Maricha, who came in disguise of a golden deer to deceive Sita.

### **Kaleshwaram**

Kaleshwaram is a village in Mahadevpur Mandal in Karimnagar District in the state of Telangana. It is located exactly at the merging point of the Godavari River and its tributary Pranhita. People believe that there is another river named Saraswathi flowing under Godavari and Pranhita, therefore calling the meeting point as "Triveni Sangamam", with Triveni meaning "Three" and Sangamam meaning "confluence." Kaleshwaram is the center for Pushkaras which are organized once for every 12 years.

It is the site of a temple of the Hindu god Lord Shiva. The temple is significant because of the two Shiva Lingas that are found on a single pedestal. These Linga are named Lord Shiva and Lord Yama. Collectively, they are known as Kaleshwara Mukteswara Swamy. Kaleshwaram is one of three Shiva temples mentioned in Trilinga Desham, or "Land of Three Lingas."

### **b) Maharashtra**

#### **Nanded**

Nanded is famous for the Sikh Gurudwara-Takhat Sachkhand Shri Hazur Abchalnagar Sahib. A town of great antiquity, Naded was earlier known as 'Nandigram'. Gurudwara Shri Hazur Sahib is the main landmark in Nanded. It is one of the four high seats of the authority of the Sikhs. This is the place where Shri Guru Gobind Singhji breathed his last. The gurudwara was built by Maharaja Ranjit Singh.

#### **Gangakhed**

Gangakhed has the great historical background. It is the birthplace of Shree Sant Janabai. As it is situated on the bank of Godavari River it has the largest number of various temples on the bank of the holy river. Here we can see the old Rajwada (palace) of the time of Nizam. Shree Balaji temple which is the only temple like Tirupati Balaji in the world having both Balaji and Govinda under a roof.

#### **Paithan**

Paithan the ancient city of Pratishtan, is beautifully situated on the left bank of the river Godavari. Since the second millennium B.C. The dawn of the Goda Valley Civilisation

it has played a vital role in shaping the culture of the region and has been a sacred place for the Hindus, the Buddhists, and the Jains.

From ancient times Paithan was the important emporium of trade and commerce with links connecting it to marts in India and in Europe. It developed its own religion and educational institutions and in the field of art, drew the attention of the Muslim invaders, who overran the city and whose culture left its imprint upon the life and manners of the people of Paithan.

### **Kopergaon**

The only temple of Daityaguru Shukracharya is located at Kopergaon. During the period of Daityaguru Shukracharya, a vidya called Sanjivani Viday was performed here to make alive to a dead person.

Datta Par located on the banks of river Godavari is mentioned in Guru Charitra of Sai Baba, the temple of Datta Guru was established with the hands of Sri Sai Baba himself in year around 1910-1915.

### **Nashik**

Nashik city was known as Gulshanabad and it is important historically, mythologically, socially and culturally city. Known for the temples on the banks of the Godavari and it has historically been one of the holy sites of the Hindu and Muslim religion. It is one of the four cities that hosts the massive Sinhastha Kumbh Mela once every twelve years.



### 3.41.16 Tourism

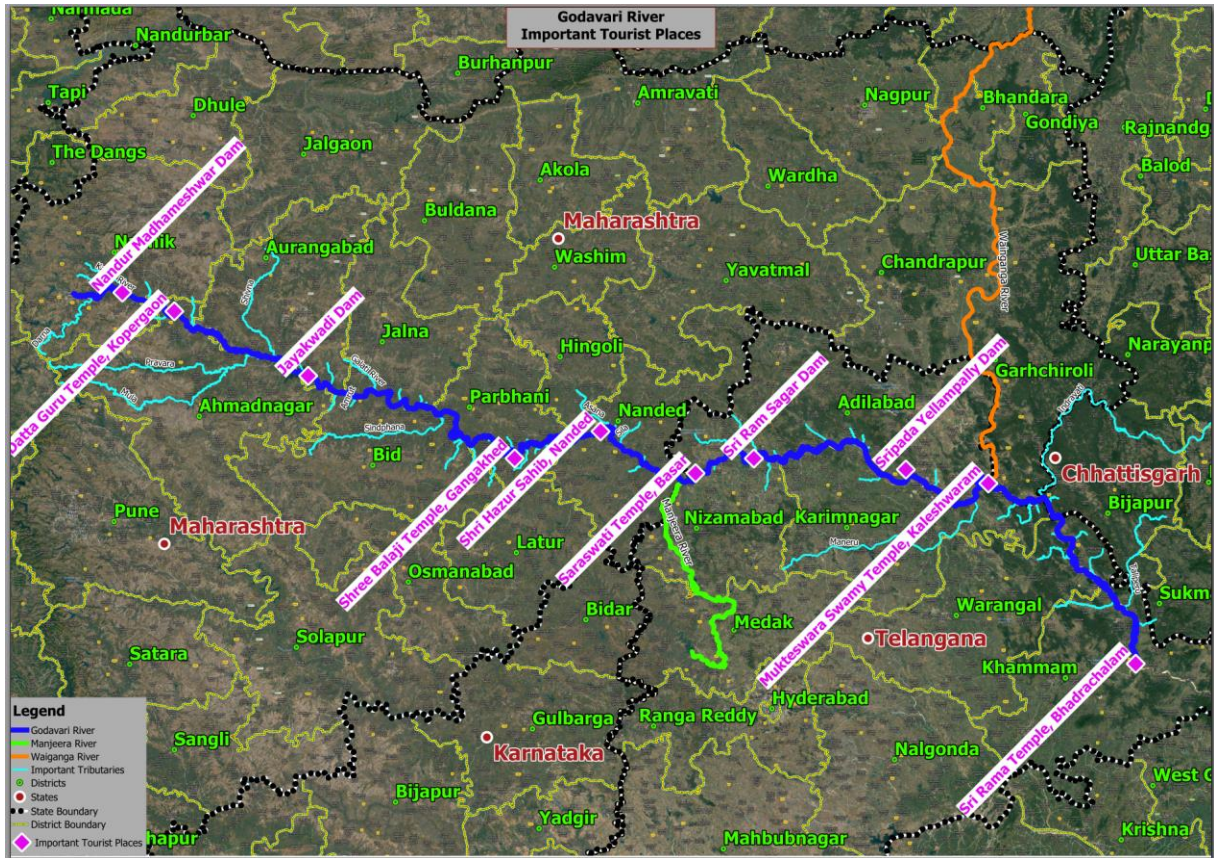


Figure 273 – Important tourist places along Godavari River

#### a) Telangana

##### **Bhadrachalam**

Bhadrachalam town is located in Bhadrachalam District of Telangana. It is an important Hindu pilgrimage town with an existence of the Bhadrachalam Temple of Lord Rama, situated on the banks of Godavari River. The town has a documented history of Lord Sri Rama temple constructed circa 17th century CE by Kancherla Gopanna (nearly 370 years ago) popularly known as Bhakta Ramadasu. It is located 312km east of state capital, Hyderabad. The state bus service TSRTC operates a bus station in Bhadrachalam connecting the town to various places of the state. The nearest railway station, Bhadrachalam Road at 40 km from the town.

This holy town with beautiful landscapes provided by River Godavari attracts several devotees throughout the year from different parts of Telangana and Andhra Pradesh states. This holy river houses most of the sacred shrines of the town in and around its

banks. The Ushnagundam (Hot Pool) or Gundala is located at a short distance from the Temple.



*Figure 274 – Sree Sira Ramachandra Swamy Temple, Bhadrachalam (ch.0.00km)*

### **Eturnagaram**

Bogatha Waterfall is located in Koyaveerapuram G, Wazeedu Mandal, Khammam district, Telangana. It is located 120km from Bhadrachalam, 140km away from Warangal and 329km from Hyderabad. As the newly constructed Eturnagaram bridge on NH-202 reduced the distance to 329km from 440km.



*Figure 275 – Eturnagaram Waterfalls (ch.117.021km)*

### **Kaleshwaram**

Kaleshwaram is located exactly at the merging point of the Godavari River and its tributary Pranhita. It is the site of a temple of the Hindu god Lord Shiva. The temple is



significant because of the two Shiva Lingas that are found on a single pedestal. These Linga are named Lord Shiva and Lord Yama. Collectively, they are known as Kaleshwara Mukteswara Swamy. Kaleshwaram is one of three Shiva temples mentioned in Trilinga Desham, or "Land of Three Lingas."



*Figure 276 – Kaleshwara Mukteswara Swamy Temple (ch.215.258km)*

## **b) Maharashtra**

### **Nanded**

Nanded is associated with the first as well as the last Sikh Gurus. A tourist from all over India visits Nanded especially to see Huzur Sahib Nanded, Gurudwara. Other than this there are many Gurudwaras built in the city.



*Figure 277 - Huzur Sahib Nanded, Gurudwara (ch.615.0km)*

Nanded is famous for its Vedic rituals on the sacred banks of river Godavari. Urvashi Ghat, Ram Ghat, Govardhan Ghat are some of them. Temples like Kaleshwar temple, Shani Temple, in mondha on Ram Ghat. Yagyavalkya Vedpathshala Saraswati temple

in Shree Nagar, Rajput sangh Renuka Mata temple, Marwadi Dharma Shala Hanuman Temple, Other Temples in the locality of Famous old area Holi and Mondha tower are exceptional.

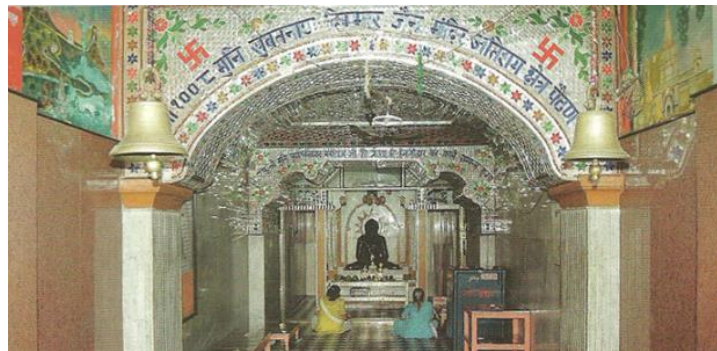
Nanded Fort is situated 4km away from the Nanded Railway Station, the Nanded Fort has a beautiful location. Godavari River encloses the fort on three sides. There are a good garden and water works enhancing its natural beauty.

### **Paithan**

Paithan is a Digambar Jain Atishay Kshetra. Paithan has a Chaturth Kalin temple. This temple is dedicated to 20<sup>th</sup> Tirthanakar Munisuvrata. The moolnayak of this temple is a sand idol of Bhagwan Munisuvrat Nath. The idol is the time period when stone idols were not generally made, and one can estimate its antiquity. It is believed that Ram, Lakshman, and Sita used to worship this idol.

Shri Santaji Jagnade was a prominent Marathi Saint. Jagnade recorded several of Tukaram's Abhangs.

Dnyaneshwar Udyan is one of the largest gardens in Maharashtra. It is situated on the banks of Nathasagar Lake formed due to Jayakwadi Dam. It is located near the town of Paithan.



*Figure 278 – Paithan, Jain Tirth Paithan (ch.967.025km)*

### **Kopergaon**

The only temple of Daityaguru Shukracharya is located at Kopergaon. The main feature of this temple is any of the pooja, vidhi, marriage, Narayan-nag Bali poojan, kal-sarpa poojan can be performed here without any muhurta, and with best effects as said in Hindu holy books. Datta Par located on the banks of river Godavari is mentioned in

Guru Charitra of Sai Baba, the temple of Datta Guru was established with the hands of Sri Sai Baba himself in year around 1910-1915.

## **Nashik**

The city is situated at the foothills of the Western Ghats Mountains on the banks of the river Godavari. Nashik is the first major city on the upstream of the Godavari after Trimbakeshwar. Nashik is located about 185km from Mumbai. It is an important religious center and attracts thousands of pilgrims every year from different parts of the country.

Trimbakeshwar is the origin of the Godavari River. Trimbakeshwar is one of the holy places in the country. It is located about 40 km from Nashik. Trimbakeshwar is one of the twelve Jyotirlingas of Lord Shiva. It is believed that there is no sacred place like Trimbakeshwar, no river like the Godavari and no mountain like Brahma Giri.



*Figure 279 – Nashik Kumba Mela*

There are following tourists places present in and near Nashik and Trimbakeshwar:-

- (a) Dugarwadi Waterfall
- (b) ISKON temple
- (c) Kapaleshwar temple
- (d) Ramshej Fort
- (e) Muktidham temple
- (f) Ramkund
- (g) Panchavati



### 3.41.17 Wildlife Sanctuary

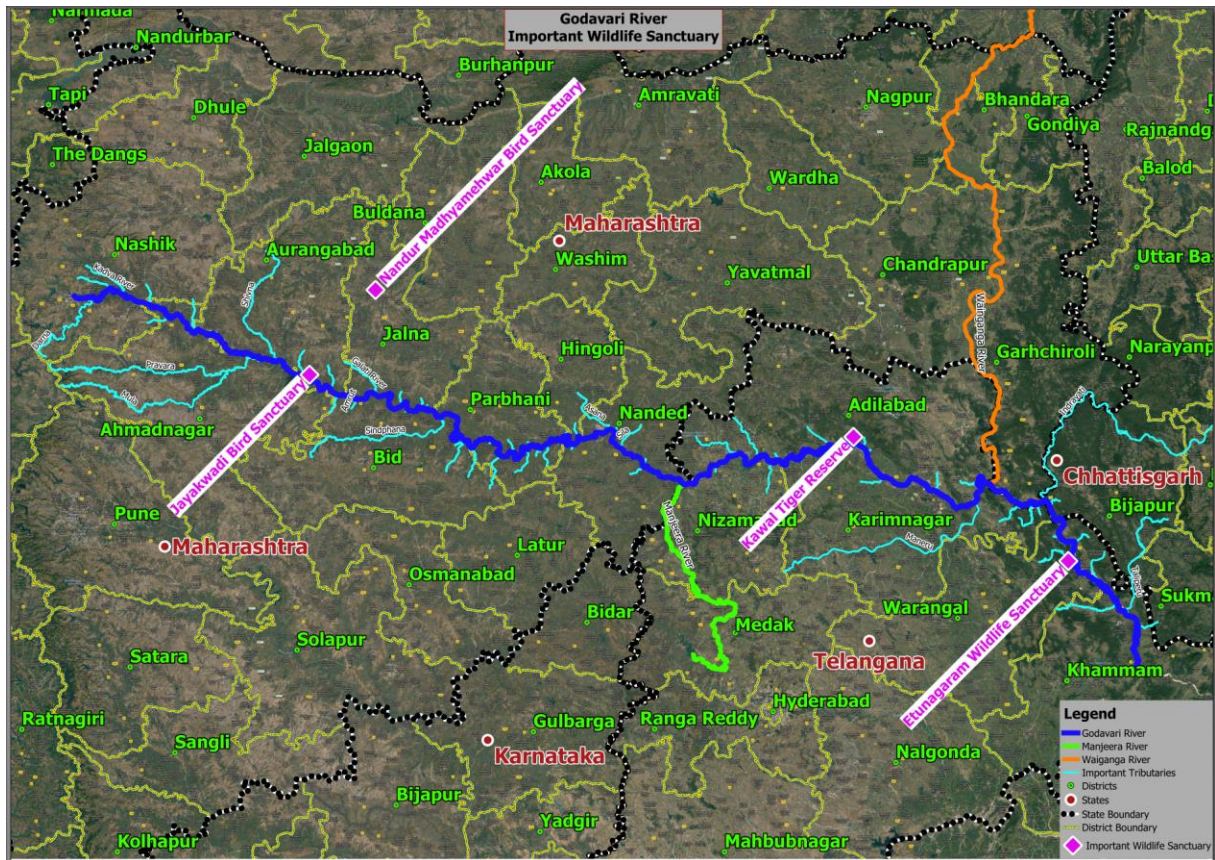


Figure 280 – Important Wildlife Sanctuary along Godavari River

#### a) Telangana

##### Etunagaram Wildlife Sanctuary

Etunagaram Wildlife Sanctuary is surrounded by a deep forest which includes a southern tropical dry deciduous type of teak and its associates including thiruman, maddi and bamboo, while the fauna includes several endangered species including tiger, sloth bear, four-horned antelope, chinkara and black buck.

It was declared a wildlife sanctuary in 1953 because of its bio-diversity. The sanctuary encompasses approximately 806 square km in Warangal district. River Godavari also passes through the outskirts of the village.



*Figure 281 - Etunagaram Wildlife Sanctuary (ch.105.614km)*

### **Kawal Tiger Reserve**

Kawal Tiger Reserve is located at Jannaram Mandal of Adilabad district in Telangana state. Govt of India declared Kawal wildlife sanctuary as Tiger Reserve in 2012.

It is surrounded by Yavotmal and Chandrapur on the north, Karimnagar, and Nizamabad on the south and Nanded district on the west. The KWS was established in 1965 and later declared as the Protected Area (PA) in 1999 under the WPA, 1972. It is located in the schedule area of Adilabad district at a distance of 100km from its district head quarters. It extended from the Sahyadri hill ranges to the Tadoba forest in Maharashtra. It is spread over an area of 893km<sup>2</sup>. It is increasingly getting threatened by growing human encroachments, rampant poaching, illegal wood felling and habitat loss.

The sanctuary is one of the richest Teak forests in the State with dense pristine areas free of human disturbance. The River Kadam flows through this area. Dry Deciduous Teak Forests mixed with Bamboo, Terminalia, Pterocarpus, Anogeisus, and Cassias.

Mammal species that have been sighted include tiger, leopard, gaur, cheetal, sambar and nilgai, barking deer, chowsingha and sloth bear. Several species of birds & reptiles are also found in the sanctuary.

Accessible from Mancherial 50km. And from Hyderabad 270km by road. Nearest Airport in Hyderabad.





Figure 282 – Kawal Tiger Reserve (ch.366.539km)

## b) Maharashtra

### Jayakwadi Bird Sanctuary

The Nath Sagar reservoir has an island of various sizes in the shallow waters, with trees for roosting, this provides an ideal shelter for migratory birds. Close to the dam a bird sanctuary has been created which is home to many species of resident and migrant birds. Almost 200 species of birds can be found in this region, which includes more than 70 species of migratory birds. Out of these, 45 chief species are of international migration. Notable amongst migratory birds are cranes, flamingos, pintails, wigeons, shovelers, brahminy ducks, pochards, teals, godwits, shauces and glossy ibises.



Figure 283 – Jyakwadi Bird Sanctuary (ch.969.12km)

### Nandur Madhyamehwar Bird Sanctuary

Nandur Madhyameshwar Bird Sanctuary situated 53km away from Nashik, is the sanctuary for colorful birds. Here you can also find migratory birds. Today it is a house for thousands of beautiful and migratory birds. Several local water birds also breed here.

The Madhyameshwar dam is constructed at the confluence of Godavari and Kadwa. The sanctuary is named after the ancient temple of Madhyameshwar.



*Figure 284 – Nandur Madhyameshwar Bird Sanctuary (ch.1151.395km)*

## 4 Terminals

### 4.1 Details of terminal survey carried out

In this river, stretch could not find any Terminal, due to the unavailability of water in this stretch most of the time. Instead, small boats were used at various location for conveying men as well as material depending upon the water availability in the river.

### 4.2 Proposed locations for construction of new terminals

Sl. No.	Location	Lat	Long	Land Use	Owner
01	Kaleshwaram	18°49'00.08"N	79°54'32.24"E	Tourist Boat	Govt. Land
	The proposed location is 2.2km from Kaleshwaram – Sironcha Road Bridge and is 0.5km from Kaleshwaram. The area is well connected with the road network and is very near to the place of interest for tourism activities. The Depth in the area needs to be improved for the berthing of boats throughout the period. There are no industries situated near to the proposed location thus scope of development in cargo movement aspect is very less. Kaleswaram and Sironcha are the nearby towns situated 0.5 and 10km from this location. Manchiryal and Warangal are the two nearby railways stations. Manchiryal is the major railhead nearby this stretch. This Terminal may be developed for Tourism aspect.				
Sl. No.	Location	Lat	Long	Land Use	Owner
02	Basar	18°52'04.83"N	77° 57'39.76"E	Tourist Boat	Govt. Land
	The proposed location is 0.5km from Basar road Bridge and is 2.1km from Basar Town, Telangana. The area is well connected with the road network and the area is one of the prominent places between Nirmal and Dharmabad. The Depth in the channel needs to be improved for the berthing of boats throughout the period. There are no industries situated near to the proposed location thus scope of development in cargo movement aspect is very less. This Terminal may be developed for tourism aspect.				
Sl. No.	Location	Lat	Long	Land Use	Owner
03	Nanded	19°08'43.95" N	77°18'59.52" E	Bathing Ghat	Govt. Land
	The proposed location is 0.5km from Guru Gobind Singh Road near to Old Mondha Chowk and is 2 Km from Nanded City, Maharashtra. The proposed area is well connected with the road network. This can be developed as the terminal for tourism. Transportation of Men and material from Nanded to a nearby village in the stretch is not possible due to hindrances like barrages, low height bridges. The depth in the channel needs to be improved for the berthing of boats throughout the period. Nanded Railway station is located 2.1km from the location.				

Sl. No.	Location	Lat	Long	Land Use	Owner
04	Vishnupuri	19°07'23.33" N	77°17'01.72" E	Bathing Ghat	Govt. Land
	<p>The proposed location is 0.5km from Vishnupuri Barrage, 1.5km from Vishnupuri town and is 10 Km from Nanded City, Maharashtra. The proposed area is well connected with the road network. There are no industries situated near to the proposed location thus scope of development in cargo movement aspect is very less. In addition to this hindrance like barrage and check dams are also located in this stretch. The Depth in the channel needs to be improved for the berthing of boats throughout the period. This Terminal may be developed for Tourism aspect.</p>				
Sl. No.	Location	Lat	Long	Land Use	Owner
05	Paithan	19°28'29.23"N	75°22'49.95"E	Bathing Ghat	Govt. Land
	<p>The proposed location is 0.5km from main road crossing and Paithan town, Maharashtra. This location is having a bathing Ghat and tourism place. The area is well connected with the road network. This can be developed as the terminal for the ferry system for Tourism purpose as there are many Temples along the river bank are located with sightseeing. The Depth in the channel needs to be improved for the berthing of boats throughout the period. Jayakwadi Dam is 1.6 km from this point.</p>				
Sl. No.	Location	Lat	Long	Land Use	Owner
06	Nashik	20°00'00.72"N	73°48'50.37"E	Bathing Ghat	Govt. Land
	<p>The proposed location is 1km from State Highway-30 and is 2.5km from Nashik city, Maharashtra. This location is having a small bathing Ghat The area is well connected with the road network. This can be developed as the terminal for the ferry system for Tourism purpose. The Depth in the channel needs to be improved for the berthing of boats throughout the period. Nashik railway station is 10 km from this location.</p>				

## 5 Fairway Development

### 5.1 Fairway Dimensions

As per the specification of the survey, dredging quantity was required to be estimated for a channel dimension of 50m x 2m with Side slope of 1:5, along with the deepest route.

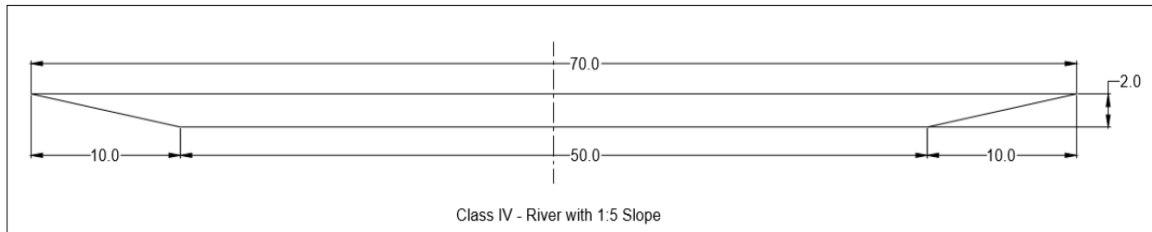
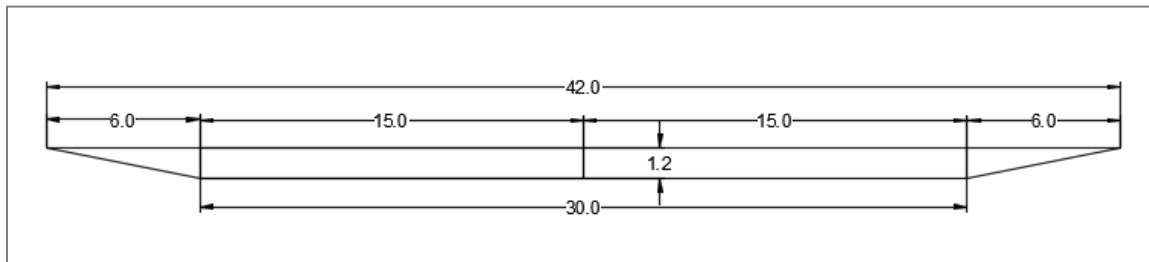


Figure 285 - Fairway Channel Dimensions 50m x 2m

### 5.2 Calculation of Dredging Quantity

The dredge volume calculations were accomplished using the HYPACK dredge volume computation utility. The channel template was created as per the different classification and kilometer wise dredging calculation was carried out. (Enclosed at Annexure 3). The Hypack Standard volume algorithm was used to calculate the dredge volume in each segment. The stretch wise summary of the dredge volume for a different class of fairway is as follows:-

#### 5.2.1 Class-I



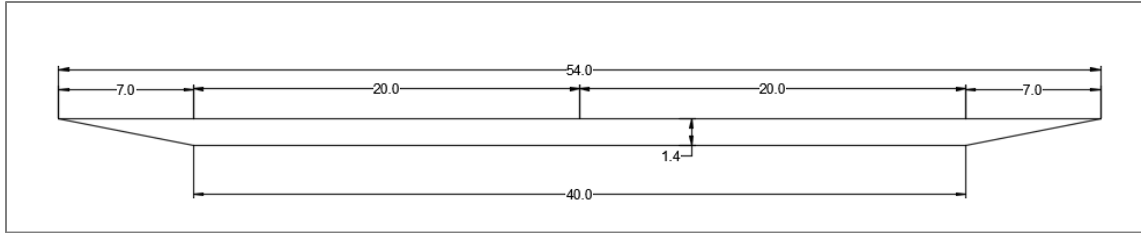
Class I													
Location		Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
From	To	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
Badrachalam	Parnasala	0	30	0	0	30,000	1,298,819.46	1,298,819.46	-0.30	0.00	30,000	1,641,474.24	1,641,474.24
Parnasala	Bandarugudem	30	60	0	0	30,000	1,299,017.55	2,597,837.01	-0.30	0.00	30,000	1,643,775.49	3,285,249.73
Bandarugudem	Venkatapuram	60	90	0	0	30,000	1,297,716.37	3,895,553.38	-0.30	0.00	30,000	1,633,109.19	4,918,358.92
Venkatapuram	Arlagudem G	90	120	0	0	30,000	1,298,589.37	5,194,142.75	-0.30	0.00	30,000	1,551,270.56	6,469,629.48



Class I													
Location		Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
From	To	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
Arlagudem G	Tarlaguda	120	150	0	0	30,000	1,298,083.91	6,492,226.66	-0.30	0.00	30,000	1,590,848.47	8,060,477.95
Tarlaguda	Kambalpet	150	180	0	0	30,000	1,296,552.16	7,788,778.82	-0.30	0.00	30,000	1,642,640.27	9,703,118.22
Kambalpet	Maddikunta	180	210	0	0	30,000	1,294,418.71	9,083,197.53	-0.30	0.00	30,000	1,653,594.93	11,356,713.15
Maddikunta	Chendrupalli	210	240	0	0	30,000	1,284,849.72	10,368,047.25	-0.30	0.00	30,000	1,633,208.79	12,989,921.94
Chendrupalli	Vilochavaram	240	270	0	0	30,000	1,288,711.53	11,656,758.78	-0.30	0.00	30,000	1,636,374.93	14,626,296.87
Vilochavaram	Seetharampally	270	300	0	0	30,000	1,294,953.66	12,951,712.44	-0.30	0.00	30,000	1,642,123.97	16,268,420.84
Seetharampally	Luxettipet	300	330	0	14.77	10,250	451,093.24	13,402,805.68	-0.30	10.01	15,050	675,555.48	16,943,976.32
Luxettipet	Tapalpur	330	360	0	14.8	13,600	595,547.47	13,998,353.15	-0.30	11.82	16,100	843,806.83	17,787,783.15
Tapalpur	Narsingapur	360	390	0	0	30,000	1,295,770.40	15,294,123.55	-0.30	0.00	30,000	1,655,598.54	19,443,381.69
Narsingapur	Kristapuram	390	420	0	0	30,000	1,294,031.48	16,588,155.03	-0.30	0.00	30,000	1,653,053.80	21,096,435.49
Kristapuram	Doodhgaon	420	450	0	0	30,000	1,293,157.18	17,881,312.21	-0.30	0.00	30,000	1,657,245.48	22,753,680.97
Doodhgaon	Gadchanda	450	480	0	15.21	8,000	321,655.84	18,202,968.05	-0.30	10.37	12,420	513,676.18	23,267,357.15
Gadchanda	Voni	480	510	2.11	8.97	0	0.00	18,202,968.05	-0.30	4.04	25,150	875,202.73	24,142,559.88
Voni	Roshangaon	510	540	0	9.54	17,000	659,904.98	18,862,873.03	-0.30	4.41	30,000	1,570,269.47	25,712,829.35
Roshangaon	Manur	540	570	0	7.48	28,300	1,214,518.45	20,077,391.48	-0.30	1.09	30,000	1,634,339.94	27,347,169.29
Manur	Mugat	570	600	2.86	10.66	0	0.00	20,077,391.48	-0.30	5.04	12,725	431,664.83	27,778,834.12
Mugat	Rahathi	600	630	0	13.71	400	4,276.57	20,081,668.05	-0.30	5.09	26,405	1,210,772.41	28,989,606.53
Rahathi	Sarangi	630	660	3.71	10.99	0	0.00	20,081,668.05	-0.30	3.62	26,700	1,181,842.63	30,171,449.16
Sarangi	Devthana	660	690	0.00	10.03	210	7,262.04	20,088,930.09	-0.30	7.78	24,950	959,679.31	31,131,128.47
Devthana	Dusalgaon	690	720	0.00	6.78	15,750	675,432.38	20,764,362.47	-0.30	3.20	29,300	1,312,073.03	32,443,201.50
Dusalgaon	Rampuri	720	750	0.00	0.00	30,000	1,291,385.95	22,055,748.42	-0.30	0.00	30,000	1,652,243.74	34,095,445.24
Rampuri	Daku Pimpri	750	780	0.00	0.00	30,000	1,290,518.56	23,346,266.98	-0.30	0.00	30,000	1,646,629.75	35,742,074.99
Daku Pimpri	Rampuri	780	810	0.00	0.00	30,000	1,292,498.69	24,638,765.67	-0.30	0.00	30,000	1,643,687.82	37,385,762.81
Rampuri	Changtpuri	810	840	0.00	0.00	30,000	1,290,121.01	25,928,886.68	-0.30	0.00	30,000	1,649,806.21	39,035,569.02
Changtpuri	Mangrul	840	870	0.00	0.00	30,000	1,290,985.59	27,219,872.27	-0.30	0.00	30,000	1,651,078.59	40,686,647.61
Mangrul	Sadegaon	870	900	0.00	0.00	30,000	1,292,544.35	28,512,416.62	-0.30	0.00	30,000	1,637,627.24	42,324,274.85
Sadegaon	Hiradpuri	900	930	0.00	0.00	30,000	1,290,874.58	29,803,291.20	-0.30	0.00	30,000	1,646,117.03	43,970,391.88
Hiradpuri	Takali Ambad	930	960	0.00	0.00	30,000	1,289,373.75	31,092,664.95	-0.30	0.00	30,000	1,632,742.64	45,603,134.52
Takali Ambad	Trimbalapur	960	990	0.00	23.70	8,300	363,299.04	31,455,963.99	-0.30	17.31	8,010	436,150.31	46,039,284.83
Trimbalapur	Mamdapur	990	1020	7.58	14.54	0	0.00	31,455,963.99	1.29	11.61	0	0.00	46,039,284.83
Mamdapur	Dagpimpalgaon	1020	1050	0.00	10.31	9,800	418,895.27	31,874,859.26	-0.30	8.82	10,100	534,571.11	46,573,855.94
Dagpimpalgaon	Vari	1050	1080	0.00	0.00	30,000	1,288,822.82	33,163,682.08	-0.30	0.00	30,000	1,635,452.47	48,209,308.41
Vari	Sonari	1080	1110	0.00	0.00	30,000	1,290,743.95	34,454,426.03	-0.30	0.00	30,000	1,648,544.64	49,857,853.05
Sonari	Tamaswadi	1110	1140	0.00	7.18	21,450	929,431.87	35,383,857.90	-0.30	4.77	22,860	1,202,889.40	51,060,742.45
Tamaswadi	Nagapur	1140	1170	0.00	10.22	6,690	285,398.57	35,669,256.47	-0.30	9.99	7,420	300,493.43	51,361,235.88
Nagapur	Nashik	1170	1201.6	0.00	8.75	21,400	883,034.46	36,552,290.93	-0.30	8.52	21,750	1,128,392.60	52,489,628.48
<b>Total</b>							<b>36,552,290.93</b>	<b>Total</b>					<b>52,489,628.48</b>

*Table 115 – Class I Dredge Volumes*

## 5.2.2 Class-II

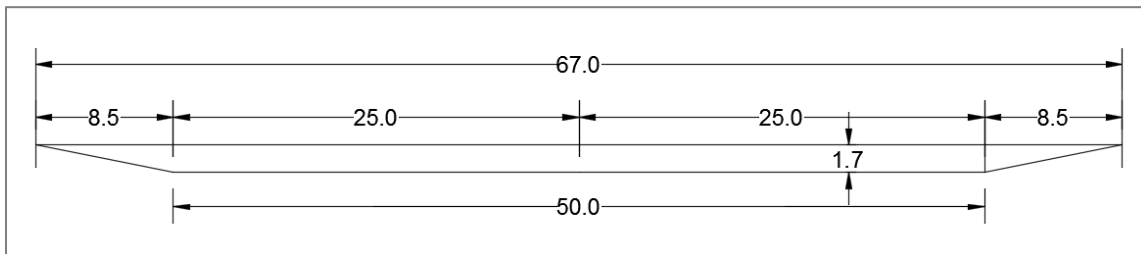


Class II													
Location		Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
From	To	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
Badrachalam	Parnasala	0	30	0	0	30,000	1,978,392.65	1,978,392.65	-0.30	0.00	30,000	2,418,902.62	2,418,902.62
Parnasala	Bandarugudem	30	60	0	0	30,000	1,978,589.05	3,956,981.70	-0.30	0.00	30,000	2,421,988.46	4,840,891.08
Bandarugudem	Venkatapuram	60	90	0	0	30,000	1,976,616.46	5,933,598.16	-0.30	0.00	30,000	2,408,861.44	7,249,752.52
Venkatapuram	Arlagudem G	90	120	0	0	30,000	1,977,949.42	7,911,547.58	-0.30	0.00	30,000	2,295,798.69	9,545,551.21
Arlagudem G	Tarlaguda	120	150	0	0	30,000	1,977,179.59	9,888,727.17	-0.30	0.00	30,000	2,351,997.39	11,897,548.60
Tarlaguda	Kambalpeta	150	180	0	0	30,000	1,974,840.28	11,863,567.45	-0.30	0.00	30,000	2,420,525.60	14,318,074.20
Kambalpeta	Maddikunta	180	210	0	0	30,000	1,971,580.11	13,835,147.56	-0.30	0.00	30,000	2,432,635.42	16,750,709.62
Maddikunta	Chendrupalli	210	240	0	0	30,000	1,955,009.91	15,790,157.47	-0.30	0.00	30,000	2,403,116.86	19,153,826.48
Chendrupalli	Vilochavaram	240	270	0	0	30,000	1,962,153.74	17,752,311.21	-0.30	0.00	30,000	2,408,587.04	21,562,413.52
Vilochavaram	Seetharampally	270	300	0	0	30,000	1,972,344.77	19,724,655.98	-0.30	0.00	30,000	2,418,084.78	23,980,498.30
Seetharampally	Luxettipet	300	330	0	14.77	10,300	687,075.66	20,411,731.64	-0.30	10.01	15,600	1,012,389.60	24,992,887.90
Luxettipet	Tapalpur	330	360	0	16.1	14,000	907,661.28	21,319,392.92	-0.30	11.82	17,250	1,255,634.25	26,248,522.15
Tapalpur	Narsingapur	360	390	0	0	30,000	1,973,639.90	23,293,032.82	-0.30	0.00	30,000	2,436,819.16	28,685,341.31
Narsingapur	Kristapuram	390	420	0	0	30,000	1,970,987.68	25,264,020.50	-0.30	0.00	30,000	2,432,914.53	31,118,255.84
Kristapuram	Doodhgaon	420	450	0	0	30,000	1,969,662.14	27,233,682.64	-0.30	0.00	30,000	2,437,806.46	33,556,062.30
Doodhgaon	Gadchanda	450	480	0	15.21	7,200	490,018.19	27,723,700.83	-0.30	11.59	21,100	801,799.01	34,357,861.31
Gadchanda	Voni	480	510	0	8.97	20	26.56	27,723,727.39	-0.30	4.04	25,500	1,378,421.64	35,736,282.95
Voni	Roshangaon	510	540	0	9.54	16,200	1,010,383.82	28,734,111.21	-0.30	4.41	30,000	2,318,939.30	38,055,222.25
Roshangaon	Manur	540	570	0	7.71	28,450	1,850,678.06	30,584,789.27	-0.30	1.09	30,000	2,409,216.60	40,464,438.85
Manur	Mugat	570	600	2.86	10.96	0	0.00	30,584,789.27	-0.30	5.04	14,405	683,923.70	41,148,362.55
Mugat	Rahathi	600	630	0	13.71	530	9,778.83	30,594,568.10	-0.30	5.09	26,600	1,822,281.08	42,970,643.63
Rahathi	Sarangi	630	660	3.71	11.15	0	0.00	30,594,568.10	-0.30	3.62	27,000	1,776,963.56	44,747,607.19
Sarangi	Devthana	660	690	0.00	10.03	800	13,042.65	30,607,610.75	-0.30	7.78	25,170	1,481,706.62	46,229,313.81
Devthana	Dusalgaon	690	720	0.00	6.90	15,960	1,030,678.66	31,638,289.41	-0.30	3.20	29,300	1,981,771.75	48,211,085.56
Dusalgaon	Rampuri	720	750	0.00	0.00	30,000	1,966,955.70	33,605,245.11	-0.30	0.00	30,000	2,431,181.28	50,642,266.84
Rampuri	Daku Pimpri	750	780	0.00	0.00	30,000	1,965,639.62	35,570,884.73	-0.30	0.00	30,000	2,423,609.78	53,065,876.62
Daku Pimpri	Rampuri	780	810	0.00	0.00	30,000	1,968,652.15	37,539,536.88	-0.30	0.00	30,000	2,419,991.97	55,485,868.59
Rampuri	Changtpuri	810	840	0.00	0.00	30,000	1,965,019.12	39,504,556.00	-0.30	0.00	30,000	2,427,709.40	57,913,577.99

Class II														
Location		Chainage (km)		Observed					Reduced w.r.t. Sounding Datum					
From	To	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	
Changtpuri	Mangrul	840	870	0.00	0.00	30,000	1,966,347.58	41,470,903.58	-0.30	0.00	30,000	2,428,897.83	60,342,475.82	
Mangrul	Sadegaon	870	900	0.00	0.00	30,000	1,968,735.67	43,439,639.25	-0.30	0.00	30,000	2,413,353.52	62,755,829.34	
Sadegaon	Hiradpuri	900	930	0.00	0.00	30,000	1,966,185.18	45,405,824.43	-0.30	0.00	30,000	2,423,252.79	65,179,082.13	
Hiradpuri	Takali Ambad	930	960	0.00	0.00	30,000	1,963,919.39	47,369,743.82	-0.30	0.00	30,000	2,407,528.05	67,586,610.18	
Takali Ambad	Trimbalapur	960	990	0.00	23.70	8,500	553,364.95	47,923,108.77	-0.30	17.31	8,100	642,411.06	68,229,021.24	
Trimbalapur	Mamdapur	990	1020	7.34	14.54	0	0.00	47,923,108.77	0.40	11.61	180	1,069.26	68,230,090.50	
Mamdapur	Dagpimpalgaon	1020	1050	0.00	10.31	9,900	640,059.98	48,563,168.75	-0.30	8.82	10,265	788,513.61	69,018,604.11	
Dagpimpalgaon	Vari	1050	1080	0.00	0.00	30,000	1,963,057.84	50,526,226.59	-0.30	0.00	30,000	2,410,167.69	71,428,771.80	
Vari	Sonari	1080	1110	0.00	0.00	30,000	1,965,980.48	52,492,207.07	-0.30	0.00	30,000	2,426,314.12	73,855,085.92	
Sonari	Tamaswadi	1110	1140	0.00	7.18	21,800	1,417,995.02	53,910,202.09	-0.30	4.77	23,370	1,779,652.06	75,634,737.98	
Tamaswadi	Nagapur	1140	1170	0.00	10.22	7,550	440,157.13	54,350,359.22	-0.30	9.99	8,070	454,882.48	76,089,620.46	
Nagapur	Nashik	1170	1201.6	0.00	8.75	21,810	1,343,781.85	55,694,141.07	-0.30	8.52	22,120	1,660,392.98	77,750,013.44	
<b>Total</b>							<b>55,694,141.07</b>	<b>Total</b>					<b>77,750,013.44</b>	

Table 116 - Class II Dredge Volumes

### 5.2.3 Class-III

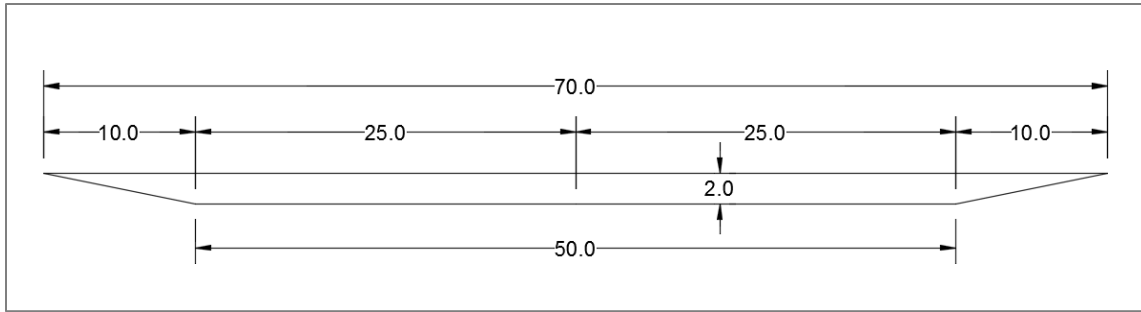


Class III													
Location		Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
From	To	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
Badrachalam	Parnasala	0	30	0	0	30,000	2,990,226.98	2,990,226.98	-0.30	0.00	30,000	3,536,514.14	3,536,514.14
Parnasala	Bandarugudem	30	60	0	0	30,000	2,990,439.20	5,980,666.18	-0.30	0.00	30,000	3,540,672.95	7,077,187.09
Bandarugudem	Venkatapuram	60	90	0	0	30,000	2,987,444.57	8,968,110.75	-0.30	0.00	30,000	3,525,073.60	10,602,260.69
Venkatapuram	Arlagudem G	90	120	0	0	30,000	2,989,463.34	11,957,574.09	-0.30	0.00	30,000	3,376,142.04	13,978,402.73
Arlagudem G	Tarlaguda	120	150	0	0	30,000	2,988,302.15	14,945,876.24	-0.30	0.00	30,000	3,454,053.72	17,432,456.45
Tarlaguda	Kambalpeta	150	180	0	0	30,000	2,984,748.31	17,930,624.55	-0.30	0.00	30,000	3,538,429.99	20,970,886.44
Kambalpeta	Maddikunta	180	210	0	0	30,000	2,979,869.55	20,910,494.10	-0.30	0.00	30,000	3,550,999.90	24,521,886.34
Maddikunta	Chendrupalli	210	240	0	0	30,000	2,950,895.78	23,861,389.88	-0.30	0.00	30,000	3,506,140.95	28,028,027.29
Chendrupalli	Vilochavaram	240	270	0	0	30,000	2,964,088.74	26,825,478.62	-0.30	0.00	30,000	3,517,992.04	31,546,019.33

Class III													
Location		Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
From	To	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
Vilochavaram	Seetharampally	270	300	0	0	30,000	2,979,724.49	29,805,203.11	-0.30	0.00	30,000	3,531,459.88	35,077,479.21
Seetharampally	Luxettipet	300	330	0	14.77	11,000	1,038,450.69	30,843,653.80	-0.30	10.01	15,900	1,503,018.01	36,580,497.22
Luxettipet	Tapalpur	330	360	0	16.1	14,000	1,372,830.37	32,216,484.17	-0.30	11.82	18,100	1,869,464.88	38,449,962.10
Tapalpur	Narsingapur	360	390	0	0	30,000	2,982,950.15	35,199,434.32	-0.30	0.00	30,000	3,557,943.95	42,007,906.05
Narsingapur	Kristapuram	390	420	0	0	30,000	2,978,976.27	38,178,410.59	-0.30	0.00	30,000	3,552,111.62	45,560,017.67
Kristapuram	Doodhgaon	420	450	0	0	30,000	2,976,979.92	41,155,390.51	-0.30	0.00	30,000	3,557,902.08	49,117,919.75
Doodhgaon	Gadchanda	450	480	0	15.42	8,000	742,076.96	41,897,467.47	-0.30	10.51	14,350	1,263,325.01	50,381,244.76
Gadchanda	Voni	480	510	0	8.97	100	694.26	41,898,161.73	-0.30	4.04	26,410	2,183,824.06	52,565,068.82
Voni	Roshangaon	510	540	0	9.54	16,300	1,539,573.10	43,437,734.83	-0.30	4.41	30,000	3,403,720.29	55,968,789.11
Roshangaon	Manur	540	570	0	7.71	28,700	2,799,104.15	46,236,838.98	-0.30	1.09	30,000	3,523,611.20	59,492,400.31
Manur	Mugat	570	600	2.86	10.96	0	0.00	46,236,838.98	-0.30	5.08	15,435	1,113,737.21	60,606,137.52
Mugat	Rahathi	600	630	0	13.71	1,030	27,345.34	46,264,184.32	-0.30	5.09	28,205	2,741,502.28	63,347,639.80
Rahathi	Sarangi	630	660	3.71	11.15	0	0.00	46,264,184.32	-0.30	3.62	27,285	2,678,497.81	66,026,137.61
Sarangi	Devthana	660	690	0.00	10.06	1,110	23,068.08	46,287,252.40	-0.30	7.81	25,270	2,285,446.14	68,311,583.75
Devthana	Dusalgaon	690	720	0.00	6.90	17,175	1,564,065.55	47,851,317.95	-0.30	3.20	29,300	2,979,839.90	71,291,423.65
Dusalgaon	Rampuri	720	750	0.00	0.00	30,000	2,972,811.59	50,824,129.54	-0.30	0.00	30,000	3,549,545.50	74,840,969.15
Rampuri	Daku Pimpri	750	780	0.00	0.00	30,000	2,970,877.19	53,795,006.73	-0.30	0.00	30,000	3,539,520.95	78,380,490.10
Daku Pimpri	Rampuri	780	810	0.00	0.00	30,000	2,975,413.33	56,770,420.06	-0.30	0.00	30,000	3,535,306.36	81,915,796.46
Rampuri	Changtpuri	810	840	0.00	0.00	30,000	2,969,849.29	59,740,269.35	-0.30	0.00	30,000	3,544,226.81	85,460,023.27
Changtpuri	Mangrul	840	870	0.00	0.00	30,000	2,971,937.92	62,712,207.27	-0.30	0.00	30,000	3,545,450.97	89,005,474.24
Mangrul	Sadegaon	870	900	0.00	0.00	30,000	2,975,516.00	65,687,723.27	-0.30	0.00	30,000	3,528,332.15	92,533,806.39
Sadegaon	Hiradpuri	900	930	0.00	0.00	30,000	2,971,690.42	68,659,413.69	-0.30	0.00	30,000	3,539,369.27	96,073,175.66
Hiradpuri	Takali Ambad	930	960	0.00	0.00	30,000	2,968,223.84	71,627,637.53	-0.30	0.00	30,000	3,521,337.59	99,594,513.25
Takali Ambad	Trimbalapur	960	990	0.00	23.70	8,750	836,353.57	72,463,991.10	-0.30	17.31	8,150	939,449.22	100,533,962.47
Trimbalapur	Mamdapur	990	1020	1.43	14.54	10	55.61	72,464,046.71	0.40	11.61	560	5,374.33	100,539,336.80
Mamdapur	Dagpimpalgaon	1020	1050	0.00	10.31	10,625	971,919.66	73,435,966.37	-0.30	8.82	10,405	1,156,028.01	101,695,364.81
Dagpimpalgaon	Vari	1050	1080	0.00	0.00	30,000	2,966,959.89	76,402,926.26	-0.30	0.00	30,000	3,523,910.97	105,219,275.78
Vari	Sonari	1080	1110	0.00	0.00	30,000	2,971,374.15	79,374,300.41	-0.30	0.00	30,000	3,543,282.96	108,762,558.74
Sonari	Tamaswadi	1110	1140	0.00	7.18	22,475	2,147,728.70	81,522,029.11	-0.30	4.77	24,105	2,621,832.51	111,384,391.25
Tamaswadi	Nagapur	1140	1170	0.00	10.22	8,790	677,228.89	82,199,258.00	-0.30	9.99	8,645	688,768.76	112,073,160.01
Nagapur	Nashik	1170	1201.6	0.00	8.75	22,315	2,030,440.19	84,229,698.19	-0.30	8.52	22,600	2,426,525.04	114,499,685.05
<b>Total</b>							<b>84,229,698.19</b>		<b>Total</b>			<b>114,499,685.05</b>	

Table 117 - Class III Dredge Volumes

### 5.2.4 Class-IV



Class IV													
Location		Chainage (km)		Observed					Reduced w.r.t. Sounding Datum				
From	To	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity
Badrachalam	Parnasala	0	30	0	0	30,000	3,608,125.36	3,608,125.36	-0.30	0.00	30,000	4,178,808.70	4,178,808.70
Parnasala	Bandarugudem	30	60	0	0	30,000	3,608,368.30	7,216,493.66	-0.30	0.00	30,000	4,183,320.64	8,362,129.34
Bandarugudem	Venkatapuram	60	90	0	0	30,000	3,604,752.68	10,821,246.34	-0.30	0.00	30,000	4,166,753.58	12,528,882.92
Venkatapuram	Arlagudem G	90	120	0	0	30,000	3,607,196.82	14,428,443.16	-0.30	0.00	30,000	4,008,954.30	16,537,837.22
Arlagudem G	Tarlaguda	120	150	0	0	30,000	3,605,792.61	18,034,235.77	-0.30	0.00	30,000	4,092,651.09	20,630,488.31
Tarlaguda	Kambalpetta	150	180	0	0	30,000	3,601,511.07	21,635,746.84	-0.30	0.00	30,000	4,180,102.06	24,810,590.37
Kambalpetta	Maddikunta	180	210	0	0	30,000	3,595,610.73	25,231,357.57	-0.30	0.00	30,000	4,192,044.21	29,002,634.58
Maddikunta	Chendrupalli	210	240	0	0	30,000	3,559,673.95	28,791,031.52	-0.30	0.00	30,000	4,139,438.79	33,142,073.37
Chendrupalli	Vilochavaram	240	270	0	0	30,000	3,576,337.72	32,367,369.24	-0.30	0.00	30,000	4,154,999.06	37,297,072.43
Vilochavaram	Seetharampally	270	300	0	0	30,000	3,595,146.57	35,962,515.81	-0.30	0.00	30,000	4,171,214.00	41,468,286.43
Seetharampally	Luxettipet	300	330	0	14.79	11,135	1,253,100.31	37,215,616.12	-0.30	10.04	16,000	1,792,134.59	43,260,421.02
Luxettipet	Tapalpur	330	360	0	16.1	14,000	1,657,369.22	38,872,985.34	-0.30	11.82	18,550	2,249,361.64	45,509,782.66
Tapalpur	Narsingapur	360	390	0	0	30,000	3,599,333.16	42,472,318.50	-0.30	0.00	30,000	4,200,070.17	49,709,852.83
Narsingapur	Kristapuram	390	420	0	0	30,000	3,594,544.54	46,066,863.04	-0.30	0.00	30,000	4,193,332.57	53,903,185.40
Kristapuram	Doodhgaon	420	450	0	0	30,000	3,592,147.93	49,659,010.97	-0.30	0.00	30,000	4,199,138.84	58,102,324.24
Doodhgaon	Gadchanda	450	480	0	15.42	8,000	896,724.78	50,555,735.75	-0.30	10.51	15,100	1,578,145.64	59,680,469.88
Gadchanda	Voni	480	510	0	8.97	100	1,116.15	50,556,851.90	-0.30	4.04	28,100	2,732,642.09	62,413,111.97
Voni	Roshangaon	510	540	0	9.54	16,800	1,871,526.21	52,428,378.11	-0.30	4.41	30,000	4,031,490.10	66,444,602.07
Roshangaon	Manur	540	570	0	7.71	28,800	3,379,522.85	55,807,900.96	-0.30	1.09	30,000	4,163,901.03	70,608,503.10
Manur	Mugat	570	600	2.86	10.96	0	0.00	55,807,900.96	-0.30	5.08	16,870	1,457,903.20	72,066,406.30
Mugat	Rahathi	600	630	0	13.71	2,020	60,007.74	55,867,908.70	-0.30	5.09	28,600	3,310,750.89	75,377,157.19
Rahathi	Sarangi	630	660	3.71	11.15	0	0.00	55,867,908.70	-0.30	3.62	28,800	3,246,528.26	78,623,685.45
Sarangi	Devthana	660	690	0.00	10.06	1,460	30,986.32	55,898,895.02	-0.30	7.81	25,550	2,793,928.21	81,417,613.66
Devthana	Dusalgaon	690	720	0.00	6.90	17,665	1,896,194.86	57,795,089.88	-0.30	3.20	29,950	3,582,177.87	84,999,791.53
Dusalgaon	Rampuri	720	750	0.00	0.00	30,000	3,587,097.16	61,382,187.04	-0.30	0.00	30,000	4,189,738.56	89,189,530.09
Rampuri	Daku Pimpri	750	780	0.00	0.00	30,000	3,584,779.02	64,966,966.06	-0.30	0.00	30,000	4,178,939.69	93,368,469.78
Daku Pimpri	Rampuri	780	810	0.00	0.00	30,000	3,590,243.13	68,557,209.19	-0.30	0.00	30,000	4,175,246.74	97,543,716.52



Class IV														
Location		Chainage (km)		Observed					Reduced w.r.t. Sounding Datum					
From	To	From	To	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Accumulated Quantity	
Rampuri	Changtpuri	810	840	0.00	0.00	30,000	3,583,512.15	72,140,721.34	-0.30	0.00	30,000	4,183,706.43	101,727,422.95	
Changtpuri	Mangrul	840	870	0.00	0.00	30,000	3,586,047.12	75,726,768.46	-0.30	0.00	30,000	4,185,206.09	105,912,629.04	
Mangrul	Sadegaon	870	900	0.00	0.00	30,000	3,590,355.57	79,317,124.03	-0.30	0.00	30,000	4,168,255.68	110,080,884.72	
Sadegaon	Hiradpuri	900	930	0.00	0.00	30,000	3,585,755.60	82,902,879.63	-0.30	0.00	30,000	4,178,905.01	114,259,789.73	
Hiradpuri	Takali Ambad	930	960	0.00	0.00	30,000	3,581,566.47	86,484,446.10	-0.30	0.00	30,000	4,160,148.27	118,419,938.00	
Takali Ambad	Trimbalapur	960	990	0.00	23.70	9,000	1,009,170.33	87,493,616.43	-0.30	17.31	8,200	1,110,390.99	119,530,328.99	
Trimbalapur	Mamdapur	990	1020	1.43	14.54	100	247.86	87,493,864.29	0.40	11.61	1,075	13,065.57	119,543,394.56	
Mamdapur	Dagpimpalgaon	1020	1050	0.00	10.31	10,810	1,175,370.47	88,669,234.76	-0.30	8.82	10,620	1,368,158.43	120,911,552.99	
Dagpimpalgaon	Vari	1050	1080	0.00	0.00	30,000	3,580,045.77	92,249,280.53	-0.30	0.00	30,000	4,162,443.30	125,073,996.29	
Vari	Sonari	1080	1110	0.00	0.00	30,000	3,585,366.64	95,834,647.17	-0.30	0.00	30,000	4,183,092.55	129,257,088.84	
Sonari	Tamaswadi	1110	1140	0.00	7.18	22,700	2,595,511.66	98,430,158.83	-0.30	4.77	24,800	3,125,582.38	132,382,671.22	
Tamaswadi	Nagapur	1140	1170	0.00	10.22	8,770	826,674.77	99,256,833.60	-0.30	9.99	9,305	833,935.64	133,216,606.86	
Nagapur	Nashik	1170	1201.6	0.00	8.75	22,750	2,456,373.20	101,713,206.80	-0.30	8.52	23,010	2,874,096.97	136,090,703.83	
<b>Total</b>							<b>101,713,206.80</b>		<b>Total</b>					<b>136,090,703.83</b>

*Table 118 - Class IV Dredge Volumes*

## 6 Conclusion

The purpose of the survey was for assessing the Godavari River stretch from Bhadrachalam to Nasik, for development of water transport facilities in the new National Waterway (NW-4). All conspicuous objects within and in the vicinity of the survey area have been fixed. The deliverable sheets contain shoal biased depths, mean sea level values of elevation information, important landmarks with the state of the river banks created. The survey is considered complete in all respects.

### 6.1 Description of Waterways

The surveyed stretch of Godavari River is 1201.6km in length and is not being explored for any navigational possibility. This survey stretch starts from the Bhadrachalam Bridge in Telangana and goes all along till Nashik in Maharashtra. As the river flows from Trimbakeshwar and nourishes almost 90% of the central India and finally drains itself in the Bay of Bengal. In the course of her flow, she passes through many important towns and cities like Nashik, Kopergaon, Nanded in Maharashtra and Nirmal, Mancherial, Bhadrachalam and Rajahmundry in Telangana.

The river encounters Western Ghat at her beginning following Central Deccan plateau and finally merges with the sea. During the course of the survey, the river bed at most of the places found to be rocky whereas there were places where we found a muddy/sandy bed. It had also been noticed and confirmed by the local peoples that the availability of water in the river is for 5-6 months in a year.

There is no major scope for a navigational aspect of the waterway due to its geographic condition and non-availability of water throughout the region. The other major factor against smooth navigation is the presence of Low Clearance Bridge and numerous barrages. The river can be developed mainly for Tourism. The proposal is mentioned in Section-4 of this report.

The riverbanks are well connected with the road network but the poor connection with railway network. The road is near parallel on both sides throughout the river stretch.

The stretch wise minimum and maximum width range, average width and average slope of the waterway are as below:-

S.No.	Location		Chaiange (km)		Width Range of Water Way (m)		Average Width (m)	Average Slope (in m/km)
	From	To	From	To	Min	Max		
1	Bhadrachalam	Parnasala	0	30	817.01	1,956.79	1,321.42	1 : 0.428
2	Parnasala	Bandarugudem	30	60	1,314.64	5,264.57	2,561.51	1 : 0.281
3	Bandarugudem	Venkatapuram	60	90	2,454.09	4,121.59	3,154.91	1 : 0.338
4	Venkatapuram	Arlagudem G	90	120	1,662.33	3,763.60	2,927.45	1 : 0.053
5	Arlagudem G	Tarlaguda	120	150	622.15	2,222.36	1,227.25	1 : 0.262
6	Tarlaguda	Kambalpeta	150	180	444.01	3,755.83	1,021.21	1 : 0.513
7	Kambalpeta	Maddikunta	180	210	1,112.69	3,467.62	2,297.57	1 : 0.303
8	Maddikunta	Chendrupalli	210	240	596.38	1,863.17	1,096.01	1 : 0.141
9	Chendrupalli	Vilochavaram	240	270	338.65	1,644.26	1,101.43	1 : 0.463
10	Vilochavaram	Seetharampally	270	300	543.76	1,795.50	995.72	1 : 0.509
11	Seetharampally	Luxettipet	300	330	735.24	1,622.04	1,021.00	1 : 0.123
12	Luxettipet	Tapalpur	330	360	419.40	928.63	611.28	1 : 0.697
13	Tapalpur	Narsingapur	360	390	357.46	1,006.31	670.21	1 : 1.005
14	Narsingapur	Kristapuram	390	420	538.15	1,462.72	834.05	1 : 1.848
15	Kristapuram	Doodhgaon	420	450	390.87	1,670.01	809.72	1 : 1.725
16	Doodhgaon	Gadchanda	450	480	255.50	4,853.65	1,349.27	1 : 0.931
17	Gadchanda	Voni	480	510	341.64	1,010.81	494.86	1 : 0.106
18	Voni	Roshangaon	510	540	273.90	611.45	414.82	1 : 0.314
19	Roshangaon	Manur	540	570	210.86	322.38	273.60	1 : 0.104
20	Manur	Mugat	570	600	187.92	346.11	246.72	1 : 0.146
21	Mugat	Rahathi	600	630	127.61	462.45	255.65	1 : 0.491
22	Rahathi	Sarangi	630	660	120.66	533.48	251.65	1 : 0.14
23	Sarangi	Devthana	660	690	152.18	384.33	237.90	1 : 0.217
24	Devthana	Dusalgaon	690	720	122.14	266.65	195.10	1 : 0.245
25	Dusalgaon	Rampuri	720	750	134.70	292.74	208.36	1 : 0.199
26	Rampuri	Daku Pimpri	750	780	90.51	344.40	221.12	1 : 0.348
27	Daku Pimpri	Rampuri	780	810	127.92	341.02	232.06	1 : 0.155
28	Rampuri	Changtpuri	810	840	85.91	474.50	243.35	1 : 0.295
29	Changtpuri	Mangru	840	870	200.05	310.56	263.58	1 : 0.298
30	Mangru	Sadegaon	870	900	175.01	380.70	258.75	1 : 0.284
31	Sadegaon	Hiradpuri	900	930	87.37	312.71	229.67	1 : 0.347
32	Hiradpuri	Takali Ambad	930	960	126.91	329.65	225.56	1 : 0.368
33	Takali Ambad	Trimbapur	960	990	119.04	7,822.00	2,685.43	1 : 0.504
34	Trimbapur	Mamdapur	990	1020	144.54	6,088.56	2,644.10	1 : 0.065
35	Mamdapur	Dagpimpalgaon	1020	1050	114.25	522.21	190.10	1 : 0.518
36	Dagpimpalgaon	Vari	1050	1080	93.27	254.02	167.66	1 : 0.532
37	Vari	Sonari	1080	1110	155.34	381.98	221.42	1 : 0.175
38	Sonari	Tamaswadi	1110	1140	160.35	436.65	249.19	1 : 0.449
39	Tamaswadi	Nagapur	1140	1170	76.93	352.63	167.20	1 : 0.759
40	Nagapur	Nashik	1170	1201.6	56.87	238.73	117.52	1 : 0.914

*Table 119 - Stretch wise Average width and slope of waterway*

## 6.2 Methods for Making Waterway Feasible

For developing a navigational channel of Class-IV having 50m bottom width 2.0m depth below CD with 1:5 side slope the estimated quantity of dredging about 136,090,703.83 cu.m.

Suitable bank protection measures are to be provided almost throughout the river. All the low lying structures are to be re-constructed to provide the requisite horizontal and vertical clearance for the vessel movement.

The class-wise details of reduced dredging quantities of the waterways are as tabulated below:-

Reduced Dredging Quantity (Cu. M)				
Class	I	II	III	IV
0-30 (km)	1,641,474.24	2,418,902.62	3,536,514.14	4,178,808.70
30-60 (km)	1,643,775.49	2,421,988.46	3,540,672.95	4,183,320.64
60-90 (km)	1,633,109.19	2,408,861.44	3,525,073.60	4,166,753.58
90-120 (km)	1,551,270.56	2,295,798.69	3,376,142.04	4,008,954.30
120-150 (km)	1,590,848.47	2,351,997.39	3,454,053.72	4,092,651.09
150-180 (km)	1,642,640.27	2,420,525.60	3,538,429.99	4,180,102.06
180-210 (km)	1,653,594.93	2,432,635.42	3,550,999.90	4,192,044.21
210-240 (km)	1,633,208.79	2,403,116.86	3,506,140.95	4,139,438.79
240-270 (km)	1,636,374.93	2,408,587.04	3,517,992.04	4,154,999.06
270-300 (km)	1,642,123.97	2,418,084.78	3,531,459.88	4,171,214.00
300-330 (km)	675,555.48	1,012,389.60	1,503,018.01	1,792,134.59
330-360 (km)	843,806.83	1,255,634.25	1,869,464.88	2,249,361.64
360-390 (km)	1,655,598.54	2,436,819.16	3,557,943.95	4,200,070.17
390-420 (km)	1,653,053.80	2,432,914.53	3,552,111.62	4,193,332.57
420-450 (km)	1,657,245.48	2,437,806.46	3,557,902.08	4,199,138.84
450-480 (km)	513,676.18	801,799.01	1,263,325.01	1,578,145.64
480-510 (km)	875,202.73	1,378,421.64	2,183,824.06	2,732,642.09
510-540 (km)	1,570,269.47	2,318,939.30	3,403,720.29	4,031,490.10
540-570 (km)	1,634,339.94	2,409,216.60	3,523,611.20	4,163,901.03
570-600 (km)	431,664.83	683,923.70	1,113,737.21	1,457,903.20
600-630 (km)	1,210,772.41	1,822,281.08	2,741,502.28	3,310,750.89
630-660 (km)	1,181,842.63	1,776,963.56	2,678,497.81	3,246,528.26
660-690 (km)	959,679.31	1,481,706.62	2,285,446.14	2,793,928.21
690-720 (km)	1,312,073.03	1,981,771.75	2,979,839.90	3,582,177.87
720-750 (km)	1,652,243.74	2,431,181.28	3,549,545.50	4,189,738.56
750-780 (km)	1,646,629.75	2,423,609.78	3,539,520.95	4,178,939.69
780-810 (km)	1,643,687.82	2,419,991.97	3,535,306.36	4,175,246.74
810-840 (km)	1,649,806.21	2,427,709.40	3,544,226.81	4,183,706.43
840-870 (km)	1,651,078.59	2,428,897.83	3,545,450.97	4,185,206.09
870-900 (km)	1,637,627.24	2,413,353.52	3,528,332.15	4,168,255.68
900-930 (km)	1,646,117.03	2,423,252.79	3,539,369.27	4,178,905.01
930-960 (km)	1,632,742.64	2,407,528.05	3,521,337.59	4,160,148.27
960-990 (km)	436,150.31	642,411.06	939,449.22	1,110,390.99
990-1020 (km)	0.00	1,069.26	5,374.33	13,065.57
1020-1050 (km)	534,571.11	788,513.61	1,156,028.01	1,368,158.43
1050-1080 (km)	1,635,452.47	2,410,167.69	3,523,910.97	4,162,443.30
1080-1110 (km)	1,648,544.64	2,426,314.12	3,543,282.96	4,183,092.55
1110-1140 (km)	1,202,889.40	1,779,652.06	2,621,832.51	3,125,582.38

Reduced Dredging Quantity (Cu. M)				
Class	I	II	III	IV
1140-1170 (km)	300,493.43	454,882.48	688,768.76	833,935.64
1170-1201.6 (km)	1,128,392.60	1,660,392.98	2,426,525.04	2,874,096.97
<b>Total</b>	<b>52,489,628.48</b>	<b>77,750,013.44</b>	<b>114,499,685.05</b>	<b>136,090,703.83</b>

*Table 120 - Class-wise Reduced Dredging Quantities*

Due to the continuous gradient of the river and the water level will not be available during the summer season the navigation aspect will not be fulfilled throughout the year. The navigational Barrage/Lock is required to maintain the minimum depth required for navigation and regulate the water level in the river.

The class-wise details of reduced depth at different stretches of the waterways are as tabulated below:-

Sl.No.	Chaiange (km)		< 1.2		1.2 - 1.4		1.5 - 1.7		1.8 - 2.0		> 2.0	
	From	To	Availability of Depth (km)	% of availability	Availability of Depth (km)	% of availability	Availability of Depth (km)	% of availability	Availability of Depth (km)	% of availability	Availability of Depth (km)	% of availability
1	0	30	30	100%	0	0%	0	0%	0	0%	0	0%
2	30	60	30	100%	0	0%	0	0%	0	0%	0	0%
3	60	90	30	100%	0	0%	0	0%	0	0%	0	0%
4	90	120	30	100%	0	0%	0	0%	0	0%	0	0%
5	120	150	30	100%	0	0%	0	0%	0	0%	0	0%
6	150	180	30	100%	0	0%	0	0%	0	0%	0	0%
7	180	210	30	100%	0	0%	0	0%	0	0%	0	0%
8	210	240	30	100%	0	0%	0	0%	0	0%	0	0%
9	240	270	30	100%	0	0%	0	0%	0	0%	0	0%
10	270	300	30	100%	0	0%	0	0%	0	0%	0	0%
11	300	330	5.22	17%	3.68	12%	4.3	14%	1	3%	15.8	53%
12	330	360	7.21	24%	3.28	11%	4.42	15%	5.45	18%	9.64	32%
13	360	390	30	100%	0	0%	0	0%	0	0%	0	0%
14	390	420	30	100%	0	0%	0	0%	0	0%	0	0%
15	420	450	30	100%	0	0%	0	0%	0	0%	0	0%
16	450	480	5.25	18%	7.83	26%	6.1	20%	5.62	19%	5.2	17%
17	480	510	10.2	34%	7.7	26%	5.59	19%	3.85	13%	2.66	9%
18	510	540	14.7	49%	2.67	9%	0	0%	0.2	1%	12.43	41%
19	540	570	13.9	46%	16.1	54%	0	0%	0	0%	0	0%
20	570	600	12.2	41%	3.72	12%	4.81	16%	4.51	15%	4.76	16%
21	600	630	12.5	42%	4.26	14%	7.71	26%	3.65	12%	1.88	6%
22	630	660	11.2	37%	2.9	10%	6.2	21%	4.7	16%	5	17%
23	660	690	15.1	50%	1.18	4%	5.3	18%	3.22	11%	5.2	17%
24	690	720	14.16	47%	10.97	37%	1.83	6%	1.41	5%	1.63	5%
25	720	750	30	100%	0	0%	0	0%	0	0%	0	0%
26	750	780	30	100%	0	0%	0	0%	0	0%	0	0%
27	780	810	30	100%	0	0%	0	0%	0	0%	0	0%
28	810	840	30	100%	0	0%	0	0%	0	0%	0	0%
29	840	870	30	100%	0	0%	0	0%	0	0%	0	0%
30	870	900	30	100%	0	0%	0	0%	0	0%	0	0%
31	900	930	30	100%	0	0%	0	0%	0	0%	0	0%
32	930	960	30	100%	0	0%	0	0%	0	0%	0	0%
33	960	990	0	0%	0	0%	0	0%	10.75	36%	19.25	64%



Sl.No.	Chaiange (km)		< 1.2		1.2 - 1.4		1.5 - 1.7		1.8 - 2.0		> 2.0	
	From	To	Availability of Depth (km)	% of availability	Availability of Depth (km)	% of availability	Availability of Depth (km)	% of availability	Availability of Depth (km)	% of availability	Availability of Depth (km)	% of availability
34	990	1020	10.2	34%	3.13	10%	3.49	12%	8.2	27%	4.98	17%
35	1020	1050	2.14	7%	0	0%	8.16	27%	3.5	12%	16.2	54%
36	1050	1080	30	100%	0	0%	0	0%	0	0%	0	0%
37	1080	1110	30	100%	0	0%	0	0%	0	0%	0	0%
38	1110	1140	6.84	23%	4.95	17%	7.85	26%	5.12	17%	5.24	17%
39	1140	1170	1	3%	1.65	6%	3.88	13%	7.2	24%	16.27	54%
40	1170	1201.6	1.6	5%	1.39	5%	5.06	17%	9.04	30%	14.51	48%
<b>Total</b>			<b>833.42</b>	<b>69.36%</b>	<b>75.41</b>	<b>6.28%</b>	<b>74.7</b>	<b>6.22%</b>	<b>77.42</b>	<b>6.44%</b>	<b>140.65</b>	<b>11.71%</b>

*Table 121 - Class-wise availability of reduced depth of the waterway*

### 6.3 Modifications/ improvement measures

Improvement measures for design and depth improvement are required on the first phase of the development. River banks being not prominent and no signs of erosion of river banks are found in the entire stretch of Godavari River. The limitation for improvement of navigational aspects includes the gradient of the river, presence of rock outcrops, non-availability of the water throughout the period.

The class-wise modification details of cross structure and high tension line clearance are as tabulated below:-

Bridges Clearances Less than Class			High Tension Lines Clearances Less than Class	
Class	Horizontal	Vertical	Horizontal	Vertical
<b>I</b>	80	23	0	0
<b>II</b>	80	23		
<b>III</b>	80	23		
<b>IV</b>	80	23		

*Table 122 - Bridges and HTL Clearances less than Class no.*

### 6.4 Recommendation

Major industries are found in the stretch of Godavari River, ITC Paper Mill and open pit coal mines in Bhadrachalam, NTPC in Ramagundam it produce power 2600MW, a small scale industries in Nirmal in Telangana. In Gangakhed there is sugar and energy factories and textile industries in Maharashtra. The riverbanks are well connected with roads and other infrastructures.

After the surveillance of the current Godavari River, it is observed that there is a necessity of development of the river and river banks. Some small passenger ferry jetties can be constructed along the Bhadrachalam to Nasik stretch in order to control land

traffic congestion. It will help in saving cost of transportation. Moreover, Ro-Ro services on the route will provide intra-city transportation of passengers and vehicles. It will improve connectivity to tourist and pilgrimage places in and around Bhadrachalam, Basara, Etunagaram and Kaleshwaram in Telangana State. Nanded, Paithan, Kopergaon and Nashik in Maharashtra State.

A major recommendation for improvement of depth and channel design will be required to make the part of the Godavari River as navigable. The design of the waterway cannot be altered to a major extent as this is used mainly for irrigation purpose and drinking water supply. The dams present in the river stretch is used for irrigation purpose, power production and the water through the side way canals are used at large extent for cultivation, thus detailed study on the impact of any change in the channel design needs to be carried out for the entire stretch of Godavari River.

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