REPORT ON
PILOT CENSUS OF MIDNAPUR CANAL IRRIGATION PROJECT

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ABBREVIATIONS

AFC	AFC India Limited
BRGF	Backward Regions Grant Fund
CAD WM	Command Area Development and Water Management
CCA	Culturable Command Area
Cumec	Cubic meter per second
cusec	Cubic feet per second
CWC	Central Water Commission
Dn	Division
DPR	Detailed Project Report
DSS	Data Storage System
Dy	Distributary
E	East
ERM	Extension, Renovation and Modernisation
FRL	Full Reservoir Level
GPS	Global Positioning System
Ha	Hectare
IPC	Irrigation Potential Created
IPU	Irrigation Potential Utilized
km	Kilometer
KML	Keyhole Markup Language
L	Left
Lat.	Latitude
LBC	Left Bank Canal
LBMC	Left Bank Main Canal
Long.	Longitude
m	Meter
m^3	cubic meter
MCM	Million Cubic Meter
MDDL	Minimum Draw Down Level
MMI	Major and Medium Irrigation Projects
MNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
Mr	Minor
MW	Megawatts

N	North
NCR	National Capital Region
O & M	Operations and Maintenance
PIM	Participatory Irrigation Management
PSU	Public Sector Units
R	Right
RBC	Right Bank Canal
RBMC	Right Bank Main Canal
RD	Reduced Distance/ Chainage
RFP	Request For Proposal
RL	Reduced Level
SDy	Sub distributary
SLD	Single Line Diagram
SMr	Sub minor
Sq. km	Square Kilometer
TAC	Technical Appraisal Committee
UGC	Upper Ganga Canal
UIP	Ultimate Irrigation Potential
WUA	Water Users Association

DEFINITIONS OF TERMS USED IN THE REPORT

AGRICULTURE

Cash Crops

A high value marketable crop such as sugarcane, jute, spices, fruits, tobacco and plantation crops.

Cropping intensity

The percentage of the total crop area during a crop year or season to the culturable command area.

Cropping Pattern

Yearly sequence and spacious arrangement of the crops in a given area.

Gross Cropped Area (GCA) (or Cropped Area)

Gross cropped area is the total cropped area under various crops during the whole agricultural year counting the area as many times as the number of crops grown on the same land. Mixed crops sown simultaneously on the same land are treated as one crop.

Kharif crops

Those crops which are cultivated in the monsoon season. The following are the principal kharif crops: Maize, rice, small millets, peas, groundnut, cotton, tobacco, and sesame.

Mixed Crop

Where more than one crop is raised on the same field in the same season simultaneously, without any definite row arrangement such as gram and wheat.

Net Cropped Area (Net Area Sown)

Net cropped area is the area sown (or cropped) during the agricultural season (July-June), counting the area only once even if two or more crops are grown in different seasons on the same land.

Perennial crops

Crops which last several crop years like plantation or orchard crops.

Rabi Crops

Those crops which are cultivated in the winter season. The following are the principal Rabi crops: Wheat, barley, gram, peas, potatoes, mustard, tobacco and linseed.

Summer Crop

Often represents an intermediate (third) crop between the Rabi and Kharif crops.

HYDRAULIC STRUCTURES

Barrage

A structure built across a river, for diverting water into a canal or for providing a small storage pond. It comprises a series of gates for regulating the river flow and water level, while keeping the afflux during floods within, acceptable limits. The structure may or may not have a raised sill. It is constructed to regulate the water-surface level and to divert the water flow from upstream of the gates.

Composite Dam

A concrete/masonry wall with rockfill or earth-backing in downstream.

Lining

A protective covering (over entire or portion of the perimeter) of a water conductor system or reservoir to reduce seepage losses, to withstand pressure, to reduce and prevent erosion and improve conditions of flow.

Pond Level

The level of water immediately upstream of a structure required to facilitate withdrawal into the canal or for any other purpose.

Sill

a) A structure built under water across deep pools of a river course for counteracting the tendency to excessive scour.

b) A structure built at the outlet of a channel where certain minimum depth of flow is to be maintained in the channel, or a structure built at the head of a channel to prevent flow entering the channel until the main river stage reaches the crest of the structure.

c) The invert of a gate or sluice opening.

Under Sluices

The under sluices are bays in continuation of the weir with a crest at lower level on the same side as the canal to maintain a clear and well defined rives channel towards the canal head regulator, to scour the silt deposited on the river bed in the pocket upstream of canal head regulator or to pass winter freshness and low floods without dropping the weir shutters.

Weir or Anicut

An ungated barrier across a stream or a river for the purpose of:

a) measuring its discharge, or

b) raising, controlling and maintaining the water level, and/or,

c) diverting part or all the water from the stream/river into a canal or conduit.

Run-of-the River Power Station

A power station utilizing the run-of-the river flows for generation of power with sufficient pondage for supplying water for meeting diurnal or weekly fluctuations of demand. In such stations, the normal course of the river is not materially altered.

IRRIGATION

Classification of Irrigation Projects

The irrigation projects can be classified as:

i. Major Irrigation Scheme - Culturable Command Area (CCA) more than 10,000 hectare

ii. Medium Irrigation Scheme- Culturable Command Area (CCA) more than 2000 hectare (ha) and upto 10,000 hectare (ha)

iii. Minor Irrigation Scheme - Culturable Command Area (CCA) upto 2000 hectare (ha)

Closure period

The period when the canal is closed for regular maintenance, repairs and other purposes.

Consumptive Use Efficiency

The ratio of consumptive water use by crop and the soil moisture stored in the root zone of the soil during the crop growth period.

Conveyance

The movement of water from its source through the main or secondary canals or conduits to the tertiary or distributary offtakes.

Conveyance Losses or Transmission Losses

Losses of water in transit from the source of supply to the point of field turn out whether in natural channels or in artificial ones, such as canals, distributaries or watercourses. They comprise evaporation from the water surface, seepage and incidental transpiration by vegetation growing in or along the canals network. These also include the operation losses in the canal system.

Crop Water Requirement

The total water needed for evapotranspiration from planting to harvest for a given crop in a specific climate regime, when adequate soil water is maintained, by rainfall and/or irrigation so that it does not limit plant growth or crop yield.

Culturable Command Area

It is the area which can be physically irrigated from the scheme and is fit for cultivation or the difference between the gross command area and the unculturable area falling under the command or Total area in which cultivation is possible.

Distributary or Tertiary

Canal or conduit taking water from the conveyance system and supply it to one tertiary unit.

Diversion Structure

The structure that diverts water from the water sources and supplies it to the irrigation system.

Drip/Trickle Irrigation

It comprises the application of water in drops close to the plant. The entire space between the plants is not watered.

Field Channel

Channel usually taking water from the watercourse and supplying it to one or more forms or fields.

Field Irrigation Requirements

The requirements of irrigation water for crops at the diversion point of supply channel.

Flow Irrigated Area

Area which can be irrigated from the source of water, by flow under gravity alone.

Gross Command Area

The total geographical area which can normally be commanded or serviced from a irrigation project without consideration of water supplies available for irrigation. It is the total area covered by an irrigation project including unculturable area under habitation, road, tanks, waste land, forest land etc.

Gross Irrigated Area

The gross irrigated area is the total irrigated area under various crops during the whole agricultural year, counting the area irrigated under more than one crop during the same year as many times as the number of crops grown. Inter-cultured or mixed crops are treated as one crop.

Irrigation

The supply of water by artificial means for raising crops.

Irrigated Area

The area to which irrigation water has been applied.

Irrigation Potential Created - (As per Planning Commission)

a. The irrigation potential created by a project at a given time during or after its construction is the aggregate gross area that can be irrigated annually by the quantity of water that could be made available by all connected and completed works upto the end of the water courses or the last point in the water delivery system upto which the Government is responsible for construction.

b. Before an area is included and reported under 'Potential Created', it may be ensured that the storage, head-works as well as the distribution system including irrigation outlets to serve the area are completed together with necessary water courses covering chaks or blocks upto 40 hectares in area and that works completed will make available the requisite water for the purpose in a design year for the assumed cropping pattern. The irrigation outlets should be of a capacity of about 0.03 cumec. The capacity may, however, vary depending on local conditions relating to topography, crop pattern, etc. but it should not normally exceed 0.06 cumec. The figures of the potential which relate to the gross irrigated 'new area' and 'old area stabilized' should be reported separately. The potential which refers to the 'old areas stabilized' should, however, not be considered as adding to the total irrigation potential created since this area would have already counted earlier once.

Irrigation Potential Utilized - (As per Planning Commission)

a. The irrigation potential utilized is the total gross area actually irrigated by a project during the year under consideration. The figures relating to the stabilization of 'old area' should be furnished separately in this case also since these will not be additive to the gross area irrigated.

b. As, generally, the utilzation of irrigation potential created can take place only in the year following the creation of such potential, it will be appropriate if the irrigation potential utilized in a particular year is considered with the potential created upto the end of the preceding year for the purpose of comparison.

Irrigation System

It includes storage and diversion structure, main canal, distributory, minors, water courses, field channels, and allied structures including head regulator, cross drainage works and control structures.

Irrigation Water Requirement

The amount of crop water requirement that is not provided by effective rainfall, utilization of stored soil moisture or upward flow of water to the root zone from a saturated zone.

Rostering of Channels

It is the sequencing of water delivery in different channels as a part of regulation.

Surface Irrigation

Method of irrigation where the water flows on to the field surface by gravity from the head to the tail end.

Surface Irrigation Method

It is the application of water by surface method such as wild flooding, border strip, check basis, and furrows for raising crops.

Ultimate Irrigation Potential -(As per Planning Commission)

i. It is the gross area that can be irrigated from a project in a design year for the projected cropping pattern and assumed water allowance on its full development. The gross irrigated area will be aggregate of the areas irrigated in different crop seasons, the areas under two-seasonal and perennial crops being counted only once in the year.

ii.The following considerations have to be taken into account in estimating the ultimate irrigation potential expected from a project in terms of area:

a. It will not be correct to assume the culturable command area as an arbitrary percentage of the gross command area. The CCA should be assessed from actual and by consulting land records.

b. A part of the area being proposed to be brought under irrigation from a project may be already receiving irrigation from other sources, whether major, medium or minor irrigation works, which might have been commissioned earlier. The benefits from the new project may be by way of an additional water allowance to irrigation more secure or to stabilize irrigation the area. Such area should not be counted in new irrigation potential but considered only as stabilize of irrigation in an old area. The Ultimate irrigation potential should indicate only figures of gross irrigation of new area whether in the new command area or in the existing command (by increasing the intensity of cropping). The old area stabilized may be reported separately.

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1. Background

1.1 The growing gap between Irrigation Potential Created (IPC) and that Utilized (IPU) is becoming a matter of great concern. Though there exists a gap between IPC and IPU, which need to be bridged, but often this gap gets over-estimated since the same command area is counted as potential created under surface water major/medium project and again under supplementary minor project (surface lift/ groundwater project). To assess the actual scenario of irrigation in the country, CWC considered necessary to undertake a census of completed major and medium irrigation projects to collect the following information:

a. Culturable Command Area (CCA) and their geographical extent

b. Irrigated area by season

c. Irrigation Potential created and utilized (IPC & IPU)

d. Cropping pattern

e. Other project related information

1.2 CWC has decided to take up the pilot census for standardizing the methodology for the main census of MMI projects by taking one project (major or medium) from each of different regions namely North, South, East, West, North-West, South-East, South-West & Central. As such 8 projects would be covered in the pilot census. The Pilot Census is to be covered in two phases described as below:

Phase-I: Collection of data pertaining to inventory detail of 8 selected projects from project authorities.

Phase-II: Collection of data through outsourcing up to outlet level (i.e. data on utilization part) of the 8 projects covered in the Phase-I.

1.3 **Progress achieved by CWC:** CWC has selected 8 projects covered in the Phase-I for collecting inventory-details. The list of 8 selected projects is as below:

S. No.	Name of Project	Type (Major/Medium)	Region	State
1	Upper Ganga Canal	Major	North	Uttar Pradesh
2	Sethiathope Anicut System	Major	South	Tamilnadu
3	Mangalam	Medium	South	Kerala

S. No.	Name of Project	Type (Major/Medium)	Region	State
4	Midnapur Canal	Major	East	West Bengal
5	Damanganga	Major	West	Gujarat
6	Fulzar-I	Medium	West	Gujarat
7	Pairi	Major	Central	Chhattisgarh
8	Sukla	Major	North-East	Assam

1.4 The data pertaining to inventory details has been collected by CWC in a prescribed schedule while executing Phase – I of the Pilot Census.

1.5 CWC has called for expression of Interest in January 2016 and AFC India Limited (AFC) has expressed its interest to carry out the proposed phase- II of pilot census of selected Major and Medium irrigation projects. Thereafter CWC issued the RFP in April 2016 and AFC submitted its offer online on 5th May 2016 for the 8 selected projects. CWC has awarded the assignment of conducting Census survey for the following five projects to AFC.

S. No.	Name of Project	Type (Major/ Medium)	Region	State
1	Upper Ganga Canal	Major	North	Uttar Pradesh
2	Midnapur Canal	Major	East	West Bengal
3	Fulzar-I	Medium	West	Gujarat
4	Pairi	Major	Central	Chhattisgarh
5	Sukla	Major	North-East	Assam

Subsequently, CWC assigned two more projects to AFC India Limited for carrying out the Pilot Census Survey.

1	Mangalam	Medium	South	Kerala
2	Sethiatope Anicut System	Major	South	Tamilnadu

2. Scope of Work

2.1 AFC will carry out a comprehensive and critical review of the existing irrigation scenario in the field with the following scope of work.

i. To identify the gaps as reported by project-authorities in each project.

ii. To assess the reasons of reported gaps.

iii. To diagnose the constraints and difficulties if any in achieving the targets of achieving IPC as envisaged.

iv. To suggest remedial measures for minimizing the identified gaps of IPC and IPU.

v. To suggest suitable methodology for carrying out the main census of major and medium irrigation projects in the country.

vi. To prepare a command area map including canals.

vii. To prepare Canal Network diagram with attributes attached and types of canal structures marked along with chainage. The output map will be given in *.pdf and *.kmz form.

3. Objectives

3.1 The main objectives of this study are as follows:

i. To develop a command area map including canals;

ii. To develop Canal Network Diagram up to outlet level;

iii. To identify the gap between IPC and IPU.

iv. To suggest remedial measures to bridge the gap between IPC and IPU.

4. Project Details

4.1 Project Location

Details of Midnapur canal project is located in West Midnapur district of West Bengal which has been carved out from erstwhile district of Midnapore and it came into existence on 1st January 2002.

The location of the Midnapur canal project has been shown in Fig. 4.1

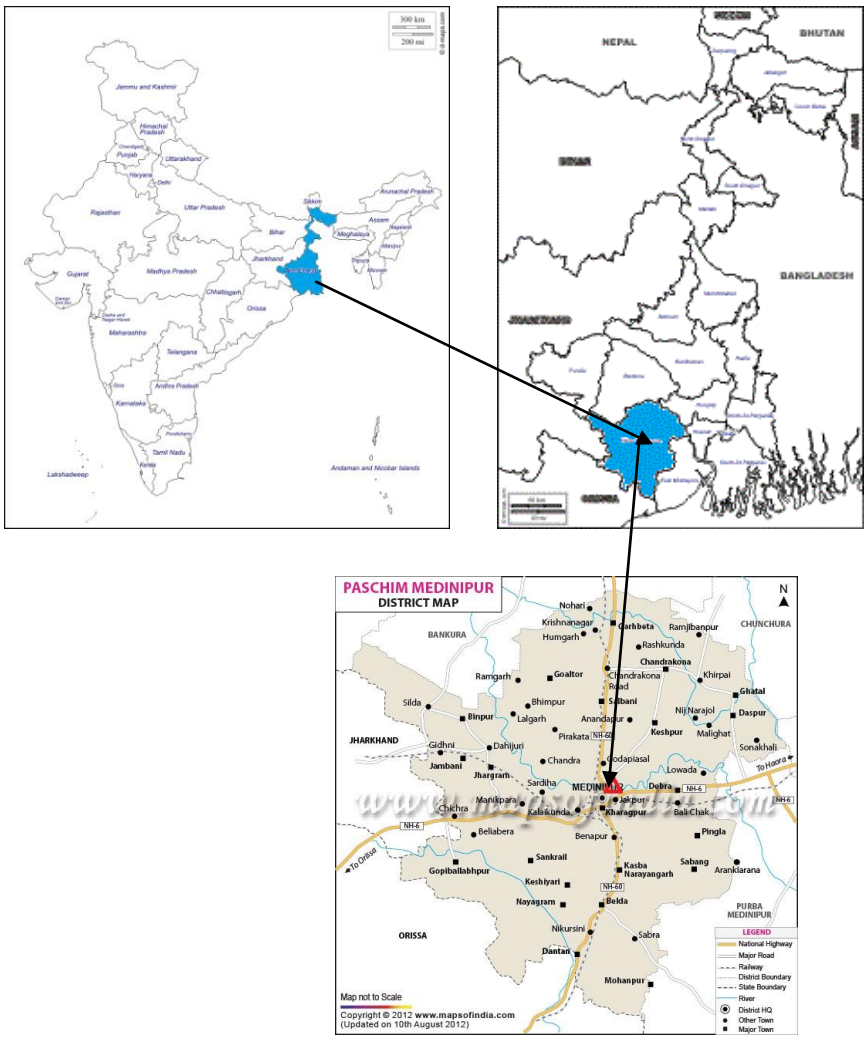


Fig. 4.1 Location Map of Midnapur Canal Irrigation Project

4.2 District Profile of West Midnapur

Paschim Medinipur is situated in the south-western side of West Bengal. It is bounded by Bankura district and Purulia district in the north, Mayurbhanj district and Balasore district of Orissa in the south, Hooghly district and Purba Medinipur district in the east and Singhbhum district of Jharkhand and Purulia district of West Bengal in the west. The district lies between 21^{o} 47' and 23^{o} N latitude, and between 86^{o} 40' and 87^{o} 52' E longitude. National Highway No.6 and 60 run through the district and offer high-speed connectivity to various parts of the district and other cities. It has a total geographical area of 9295.28 sq. kms and a population of 5193411 as per census 2001.

The district has an area of 9, 29, 528 hectares. Out of this the total forest area is 173038 hectares which constitutes about 18.61 percent of its total geographical area. Net area under cultivation is 5, 85, 222 hectares. The climate is tropical and the land surface of the district is characterised by hard rock uplands, lateritic covered area, and flat alluvial and deltaic plains. Extremely rugged topography is seen in the western part of the district and rolling topography is experienced consisting of lateritic covered area. These rolling plains gradually merge into flat alluvial and deltaic plains to the east and south east of the district. The soil is fairly fertile. Normal rainfall is 1560 mm and average rainfall in the district is 1656 mm.

The climate is characterized by hot summer, cold winter, abundant rainfall and humidity from 1450 mm to 1560 mm per year. Kangsabati, Silabati, Subarnarekha, Dulongs, Keleghai and their tributaries are the main rivers of the district. Irrigation is provided to both kharif and rabi crops. Kangsabati canal system is the main irrigation scheme. Ground water supports supplementary irrigation. 63 percent of the net cultivable area is irrigated. The ground water development and judicious management of the surface water are vital factors for promoting modern agriculture through high yielding and remunerative crops, particularly in the western parts of the district.

The district is predominant in agriculture with 70 percent of the population dependent on agriculture and allied activities. At the same time, huge potential exists for various industrial activities in the district. Presently, the main industrial area is around Kharagpur. Small Scale industrial clusters are coming up in Jhargram, Chandrakona Road, Garhbeta and Medinipur. These units are based on agriculture, forest produce, animal husbandry, chemicals and engineering.

The existing industries where improvement, technological up-gradation and further investments can be done profitably include units based on mat stick, wood, floriculture,

pottery, stone carving and crushing, jewellery of conch shell, babui grass, cashew processing and packaging, manufacture of gums, manufacture of incense sticks, soft toys, bamboo and cane work, sal leaf plates, various jute products, sericulture, tussar silks, poultry cattle feed making, potato chips, mango and other fruits pickles, jams, milk chilling, processing and dairy products, processing, packaging and marketing of cereals, pulses, chilli and turmeric powder, rice huller, muri and chira, rice mills, bee keeping, oil mills, medicinal plants, fish processing for export and mushroom processing. Handloom is a traditional industry which engages a considerable number of artisans. The Diesel and EMU workshop has opened scope for small scale and ancillary units. The strategic location of the town has helped to establish some consumer goods, engineering, plastic and chemical industries.

The district is well known for the production of mulberry and tussar silks and silk sarees from Midnapore are much in demand. Kharagpur, an important junction of the South-Eastern Railway is located centrally in the district. It provides connectivity to all parts of the country for passengers as well as goods. Haldia is the nearest port which is well connected to various parts of the district. The district consists of 4 Sub-divisions, 27 Police Stations, 29 Blocks and 8 Municipalities.

The district is primarily agricultural in nature, with cultivation being the chief livelihood of a majority of the people. Paddy occupies the first place in production. The district has a suitable agro-climatic condition for cultivation of mulberry and horticulture crops such as mango, banana, guava, lemon, mousambi, papaya, cashew and jackfruit.

4.3 Salient Features of the Project

West Bengal happened to be a pioneer in the field of irrigation in India. The earliest one namely Midnapur Canal was taken up in 1866 and irrigation commenced in 1871. This is a diversion project. The water supply is derived from the river Kangsabati at Mohanpur where there is a regulating weir with head works and the canal extends to Uluberia.

The total command area of the scheme was 41,058 ha. The work of this canal was first taken up by East India Irrigation and Canal Company and by the Government two years later. Midnapure Main Canal started from Anicut (Chainage 0.0 km with Latitude $22^{o}23'54.1"$N & Longitude $87^{o}20'34.7"$E). Gross command area of the project is 49879 Ha.

Details of the canal network is given in **Table 4.1.**

Table 4.1 Details of Midnapur Canal System

Lachmapore Irrigation Section			
Sl. No	Name of Canal	Length	
1	Midnapore Main Canal	10.970	km
2	1- Main Canal	7.048	km
3	4-Main Canal	10.926	km
4	2 Disty (Kanchdiha Canal)	3.298	km
5	1-S Disty	5.150	km
6	2A Disty	10.396	km
7	1A Disty	3.586	km
8	1B Disty	3.736	km
9	1C Disty	6.624	km
10	Nag's Canal	5.482	km
11	Goalara Sub-Branch	2.000	km
12	Dhenga Sub-Branch	2.178	km
13	4S Dity	4.030	km
14	4B Disty	8.575	km
15	Singerpur Sub-Branch	2.263	km
16	4C Disty	3.766	km
17	Mendichak Pl	1.500	km
18	Branch of 4S	3.000	km
	Total	94.528	km

Mawa Irrigation Section			
Sl. No	Name of Canal	Length	
1	1- Main Canal	19.78	km
2	1-D Distributary Branch Canal	12.18	km

3	Disty Old/D Branch Canal	3.00	km
4	1-E Old/D Branch Canal	5.38	km
5	1-F Old/D Branch Canal	4.41	km
6	1-G Old/D Branch Canal	8.95	km
7	G1 Old/D Branch Canal	6.16	km
8	Narayangar Sub-Branch	2.50	km
9	Fulgaria Sub-Branch	4.00	km
10	Ratanpur Drain	8.56	km
11	Sargaria Drain	5.23	km
12	Chak Kashi Drain	6.16	km
13	Chak Santra Drain	3.00	km
14	Pithapura Drain	7.92	km
15	Baragera Drain	2.19	km
16	Sun Bari Drain	6.87	km
17	Ahar Drain	2.00	km
18	Gokulpur Sub-Branch canal	2.46	km
	Total	110.750	Km

Balichak Irrigation Section			
Sl. No	NAME of Canal	Length	
1	Midnapore Main Canal	23.000	km
2	Distributary No.-6	20.100	km
3	MAHESPUR vill Channel	2.800	km
4	East Parallel	0.800	km
5	West Parallel		
6	Rampura Vill Channel	2.25	km
7	Khirai Sub-Branch	5.00	km
8	Distributary No.-6 Pl	2.67	km
9	Distributary No.-6/S	11.26	km
10	Distributary No.-6/S Pl.	4.80	km

Balichak Irrigation Section			
Sl. No	NAME of Canal	Length	
11	Raghunathpur Vill Channel	0.200	km
12	Distributary No.-8	4.00	km
13	West Parallal	0.500	km
14	Distributary No.-11	1.60	km
15	West Parallal	2.20	km
16	East Parallal	2.035	km
17	Distributary No.-12	5.015	km
18	West Parallal	2.200	km
19	East Parallal	0.885	km
20	Knaru Vill Channel	0.35	km
21	RaisandaVill Channel (2 Nos.)	0.89	km
22	Purul Vill Channel	1.500	km
23	Chanagarh Vill Channel (2 Nos.)	1.20	km
24	Maliara Sub-Branch	4.10	km
25	Distributary No.-13	0.38	km
26	Distributary No.-13/A	0.10	km
	Total	99.835	km

Simlageria Irrigation Section			
Sl. No	NAME of Canal	Length	
1	4-Main Canal(Antra to Jalchak)	14.000	km
2	4-D Canal(Antra to Sudhchhara)	3.000	km
3	4-E Canal(Dujipur to Munumari)	6.000	km
4	4-F Canal(Dujipur to Sanghar)	6.000	km
5	4-G Canal(Gopinathpur to Purnagram)	6.500	km
6	4-H Canal (Gopinathpur to Mohisgoth)	5.00	km
7	4-I1 Canal (Aknageria to Patgeria)	7.00	km
8	4-I2 Canal (Gouranghachak to Korkai bati	6.50	km

	taki)		
9	4-I Main Canal (Jamna to Makarda)	4.50	km
10	West channel Antra to Hosenchak	4.00	km
	Total	62.50	km

Debra Irrigation Section			
Sl. No	Name of Canal	Length	
1	Dy-3 of MMC	26.00	km
2	3No. Parallel canal	2.00	km
3	Sultanpur canal	5.00	km
4	3/A canal	7.00	km
5	Sagarkundu Canal	5.00	km
6	Rambhadrapur canal	7.00	km
7	3/B canal	7.00	km
8	3/D canal	7.00	km
9	Chaltageria canal	7.00	km
10	3/E canal	7.00	km
11	Sonamukhi canal	8.00	km
12	Satyapur canal	2.00	km
13	Garkilla canal	2.00	km
14	Banbarasati canal	5.00	km
15	Dy-3/S of M.M.C.	7.00	km
16	3/S Parallel of 3/S of M.M.C.	8.00	km
17	Gourhati canal	5.00	km
18	Nankar Kotai canal	3.00	km
19	Kalyanpur canal	3.00	km
20	Khargeria canal	5.00	km
21	Kishorepur canal	5.00	km
22	Dy-5 no. of M.M.C.	5.00	km
23	5 No. Parallel canal	3.50	km

Debra Irrigation Section			
Sl. No	Name of Canal	Length	
24	Baichari canal	7.00	km
25	Dy-5/S of M.M.C.	7.00	km
26	5/S Parallel canal	5.00	km
27	Baragarh canal	3.00	km
28	Dy-7 No. canal of M.M.C.	5.00	km
29	7 No. Parallel canal of Dy-7 of M.M.C.	6.00	km
30	Chandanpur canal	6.00	km
	TOTAL	180.50	km

Anicut Irrigation Section			
	Midnapore Main Canal	5.94	km

Summary of the length of Midnapur Canal is given in Table 4.2

Table 4.2 Length of Midnapur Canal System

S.No.	**Section**	**Length**
1	Lachmapore Irrigation Section	94.528 km
2	Mawa Irrigation Section	110.750 km
3	Balichak Irrigation Section	99.835 km
4	Simlageria Irrigation Section	62.500 km
5	Debra Irrigation Section	180.500 km
6	Anicut Irrigation Section	5.940 km
	Total	554.053 km

Total Midnapur Canal Project = 554.053 km

Table 4.3 Details of Components of Midnapur Canal System

S. No.	System Component	Lachm-apore	Mawa	Balichak	Simla-geria	Debra	Anicut	Total
1	Bridge	9	0	3	9	0	0	21
2	Culvert	6	0	0	0	125	0	131
3	Canal HR	11	4	27	11	50	0	103
4	Cross HR	47	7	23	47	140	0	264
5	Outlet	121	260	7	121	547	0	1056
6	Syphone	7	5	6	7	68	0	93
7	Canal Length (km)	89.046	68.820	90.645	58.500	141.50	5.94	454.451
8	Drainge Canal km	5.482	41.930	9.190	4.000	39.00	0.00	99.602
	Total Canal	94.528	110.750	99.835	62.500	180.50	5.94	554.053
9	Service Road (km)	89.046	68.820	90.645	58.500	141.50	2.00	450.511
10	Command Area (Ha)	7871.2	11736	6823.9	6535.7	8091.4	0	41058.2

Command area of the Midnapur Canal Irrigation Project has been given in **Fig. 4.2 and 4.3.**

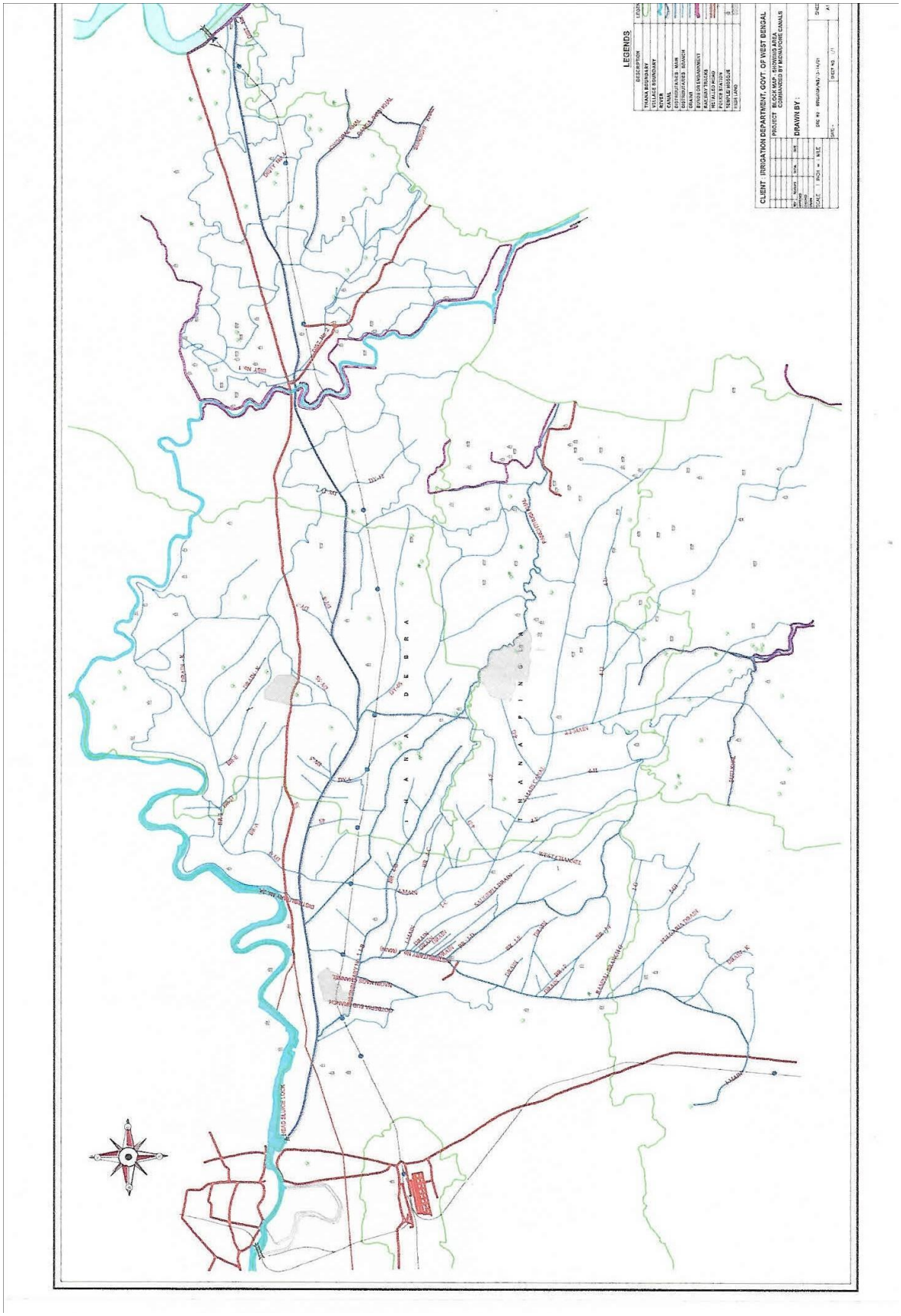

LEGENDS
DESCRIPTION
THANA BOUNDARY
VILLAGE BOUNDARY
CANAL
DISTRIBUTARIES MAIN
DISTRIBUTARIES BRANCH
RIVER
REVISED EMBANKMENT
RAILWAY TRACKS
METALLED ROAD
POLICE STATION
TEMPLE MOSQUE
TOWN LAND
CLIENT IRRIGATION DEPARTMENT, GOVT. OF WEST BENGAL
PROJECT BLOCK MAP SHOWING AREA COMMANDED BY MIDNAPORE CANALS
DRAWN BY :
DEBRA
PINGLA
NARAYANGARH

Fig. 4.2 Command Area of Midnapur Canal Irrigation Project

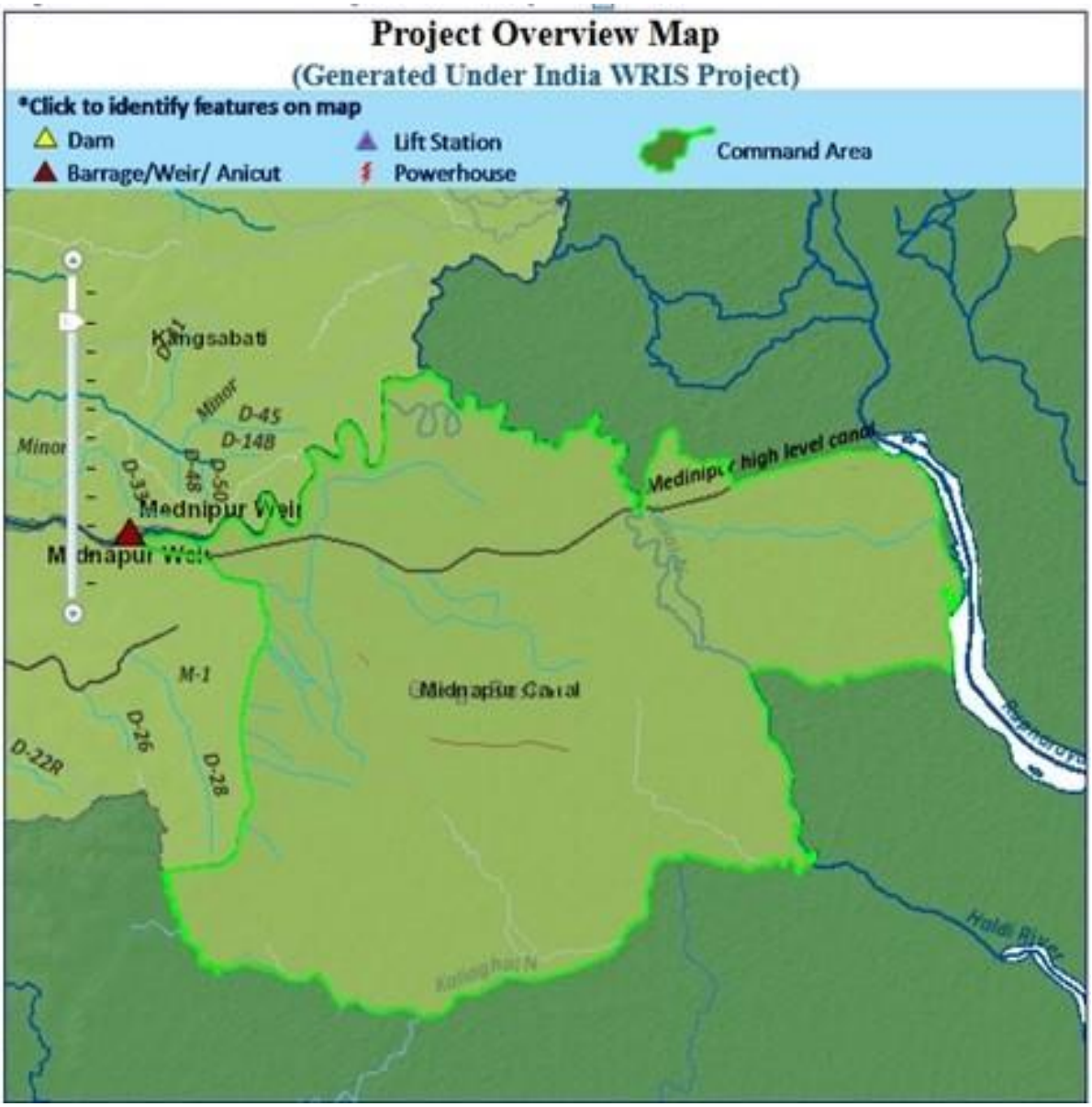


Fig. 4.3 Command Area of Midnapur Canal Irrigation Project

5. Approach and Methodology

5.1 Methodology Envisaged

In order to accomplish the task the following methodology was envisaged to be adopted.

i. Constitution and deployment of a Multi-Disciplinary Team of Experts and required field teams;

ii. Orientation and training programme for the Field Teams (Supervisors and Enumerators) for field survey. The Field teams, so deployed, will be working under the overall guidance and supervision of the Core Team deployed at Head Quarters;

iii. Discussions with State Level Departmental Heads as well as CWC Regional Heads by personnel of Core Team and Field Team;

iv. Discussions with Senior Irrigation/Water Resources Department Officials at different levels;

v. Secondary data as available with state Govt. Including area irrigated under each crop, amount of water released in main canal, branch canal, distributary, minor up to outlet level etc. in each crop season was envisaged to be collected. Additionally, the data was proposed to be collected for Head, middle and tail reach of the canal network

vi. Index and Canal Network Map was to be procured. Additionally, list of outlets for entire system of each of the projects along with their chainage/RD was also proposed to be procured;

vii. It was envisaged to collect information on storage versus water released during the year so as to correlate the same with the rainfall, existing cropping pattern to estimate the gap between potential created and potential utilized.

viii. CWC had collected inventory details the project in structured format under Phase I**.** Filled in schedule prescribed for Data Collection by CWC for Phase I is given in (Annexure-1). CWC desired that the information collected by them earlier and supplied to AFC India Limited (Annexure-1) shall be vetted while carrying out the survey. It was also desired by CWC that the data gaps, if any, identified in the project shall be filled in during the interactions and from various records maintained with the project officials at different levels.

ix. However detailed project information including outlet details are to be collected by the consultant during interaction with stakeholders as envisaged by CWC vide their Proforma specifically designed for Phase-II of the study.

x. During interactions with CWC officials it was desired that while carrying out the survey for collection of information as solicited in Proforma -II to identify the gaps as reported by project-authorities and reasons thereof, constraints and difficulties, if any.

xi. The team would visit the project area to get the first-hand information on the status of canal distribution system including outlet details as per Proforma II and have discussions with state govt officials, farmers, water users associations (WUA) etc., to identify the lacunas in achievement of full utilization of created potential.

xii. During interactions with state govt. officials, efforts may be made to identify remedial measures for minimizing the identified gaps of IPC and IPU;

x. Coordinates (Latitude and Longitude) of the each of the outlets will be recorded by the Field Team at the sill-level of each outlets using GPS meters for the respective canal systems;

xi. The collected data will be geo-referenced to get the SLD and KML files for the canal network;

xii. Study teams will interact with the officials/departmental staff as well as group of the farmers in the outlet command villages to identify the gaps as reported by the department and actual ground situation reported by the farmers. The Group of Farmers will be representative of the Head, Middle and Tail reaches of the system, individually (minors/distributary), as well as on the whole (complete canal system).

xiii. The data collected under Proforma I and II shall be shared by CWC with the key functionaries of the respective project authorities so as to develop a suitable methodology to carry out the main census of major and medium irrigation projects in the country;

5.2 Methodology Adopted

- CWC provided the project details vide filled up Proforma-I as collected from project authorities by them. The same was examined by the AFC team and shortcomings therein were identified for collection during field visits and interaction with state govt officials.

- A multidisciplinary team visited the senior officer at State level and appraised them about the study being carried out by CWC and the benefits thereof. The senior officials agreed and assured to provide all available information to the team members and directed the field formations to help the team members during their visit to the project area.
- The core Team comprised of Dr. S.K. Jain, Mr. R.K. Chaubey, Mr. Deepak Kumar, Mr. Arvind Shukla etc. The core team interacted with principal secretary and others senior officers of Irrigation Department at Kolkatta including Chief Engineer Mr. Siddhartha Datta.
- The core team also visited the office of Superintending Engineer Western Circle II Mr. Anish Ghosh and other officials of irrigation department at Midnapur.
- The team met with officials at different levels to procure the data and support for field work. The field work continued with the support of departmental officials for data collection.
- The team visited the project area and interacted with the concerned Executive Engineer and his team of officials at Midnapur, West Bengal. Detailed discussions were held and the data available at the project office was shared with the AFC team. Subsequently, an official was nominated and deputed by Executive Engineer for providing the relevant information and also to accompany the field team for identification of canal network including outlets located thereof.
- The team along with the nominated official traversed along the whole canal network including main canal, distributaries and minors. Cent- percent tracking along the network was made to identify the outlets including their geo-referencing (latitude and longitude) with a hand-held GPS system. The condition and status of the canal, outlet etc., was observed and recorded.
- The Team had an active interaction with the farmers during the survey along the main canal, distributaries and minors and also discuss the state of affair of irrigation/ water availability in the command area and to identify the constraints.

- Data was also collected from Office of the Subdivision Engineer, Lachmapur at Midnapur.
- The data so collected has been scrutinize at AFC, Delhi office and shortcomings identified for fulfilling the information in Proforma -II prescribed by CWC.
- AFC team also interacted with the state govt officials to bridge/ procure the deficient information. However, some information was reportedly not available with the department which have been indicated in the filled up Proforma-I as well as Proforma-II also.
- The AFC team asked project officials to provide the copy of DPR of the project but it was not available with project officials at different levels.
- AFC Field Teams also interacted with the Farmers and collected their views and observation as per structured questionnaire.
- The data collected by the AFC field teams has been entered in a structured database system.
- Relevant attribute tables have been generated.
- The collected data has been geo-referenced for the canal network system for the project.
- ArcGIS software has been used to create canal network, attachment of attributes and generation of *.kml file to view the network components along with attached attributes on google earth.
- After completion of data collection and its analysis the core team interacted with senior project officials to take their views and opinions for consideration in preparation of the report.
- Soft copy of the same is enclosed.

6. Generation of Canal Network

On the basis of field survey using prescribed proforma wherein details of canal network up to outlet level have been captured using the GPS device Zuno- SB of M/s Trimble of USA. The canal network along with command area and the outlets have been shown in **Fig. 6.1 to 6.8.**

Dry outlets have been demarcated with separate colour in *kml files. All other outlets are wet outlets (liable to receive irrigation water). Farmers also corroborated it during interaction.

Since the command area map based on Google Earth is quite big and when attempted to print on A0 size the map was pixelated and was not readable. Accordingly, efforts were made and Grid has been formed on Command Area Map. The print of each grid is given along with Index map for easy readability.

Since a large number of minor irrigation schemes exists in the command area, the data for them about the location and area covered by them are not available, the same could not be demarcated.

The project DPR is not available with project officials. However, salient features of the project were made available by project authorities. The designed details about IPC, Cropping Pattern and IPU were not available.

Data of Phase I and Phase-II have been collected as per prescribed format and has been given in Annexure-I and II respectively.

The findings are base on field observations and discussions with various groups. The opinions of project officials were also considered while reporting.

The data in the form of network diagram depicting the canal network has been generated on the basis of field survey and geo-referencing of field observations.

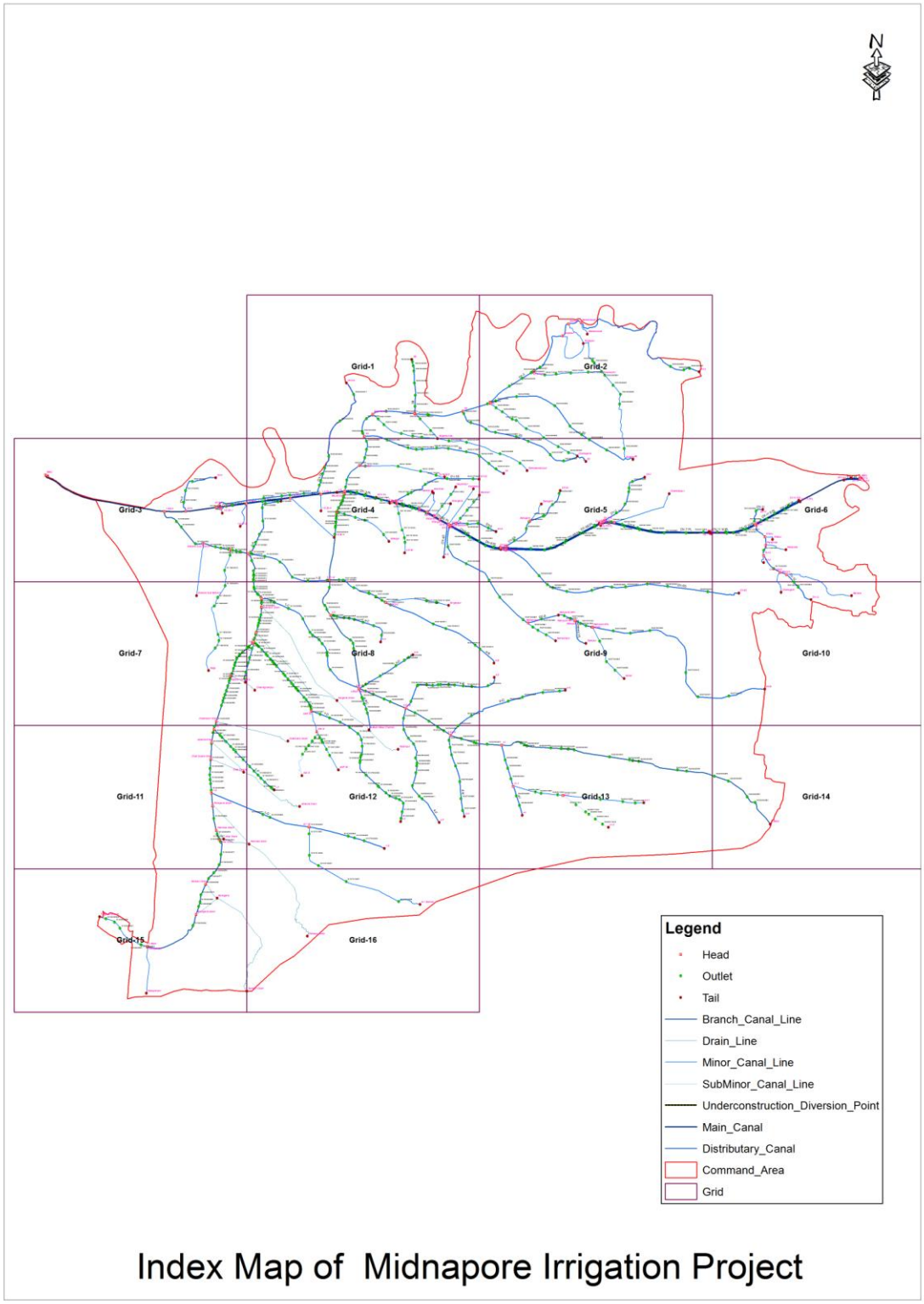


Fig 6.1 Command Area of Midnapur Canal Irrigation Project

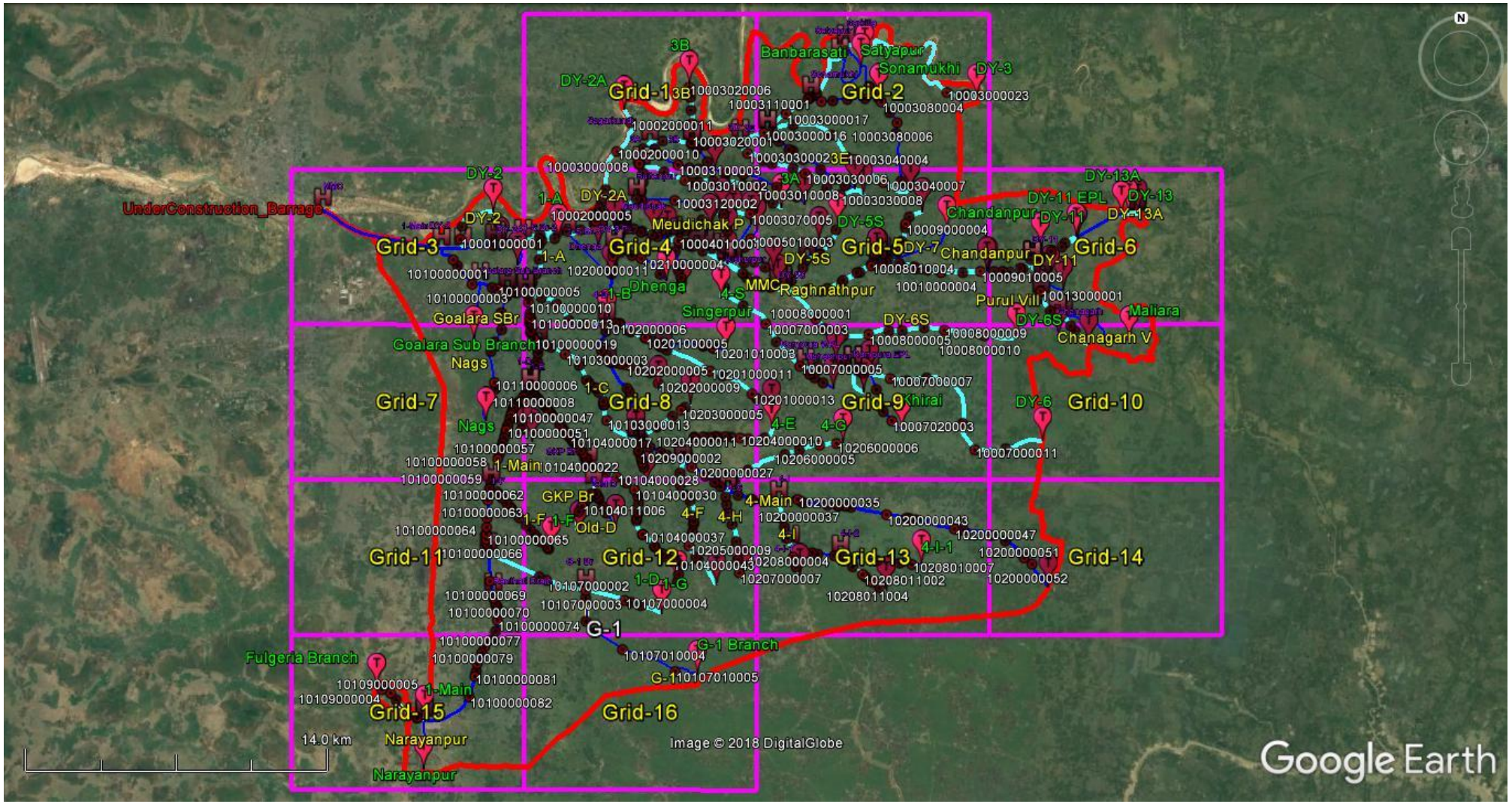


Fig 6.2 Project Overview and Command Area of Midnapur Canal Irrigation Project with outlets

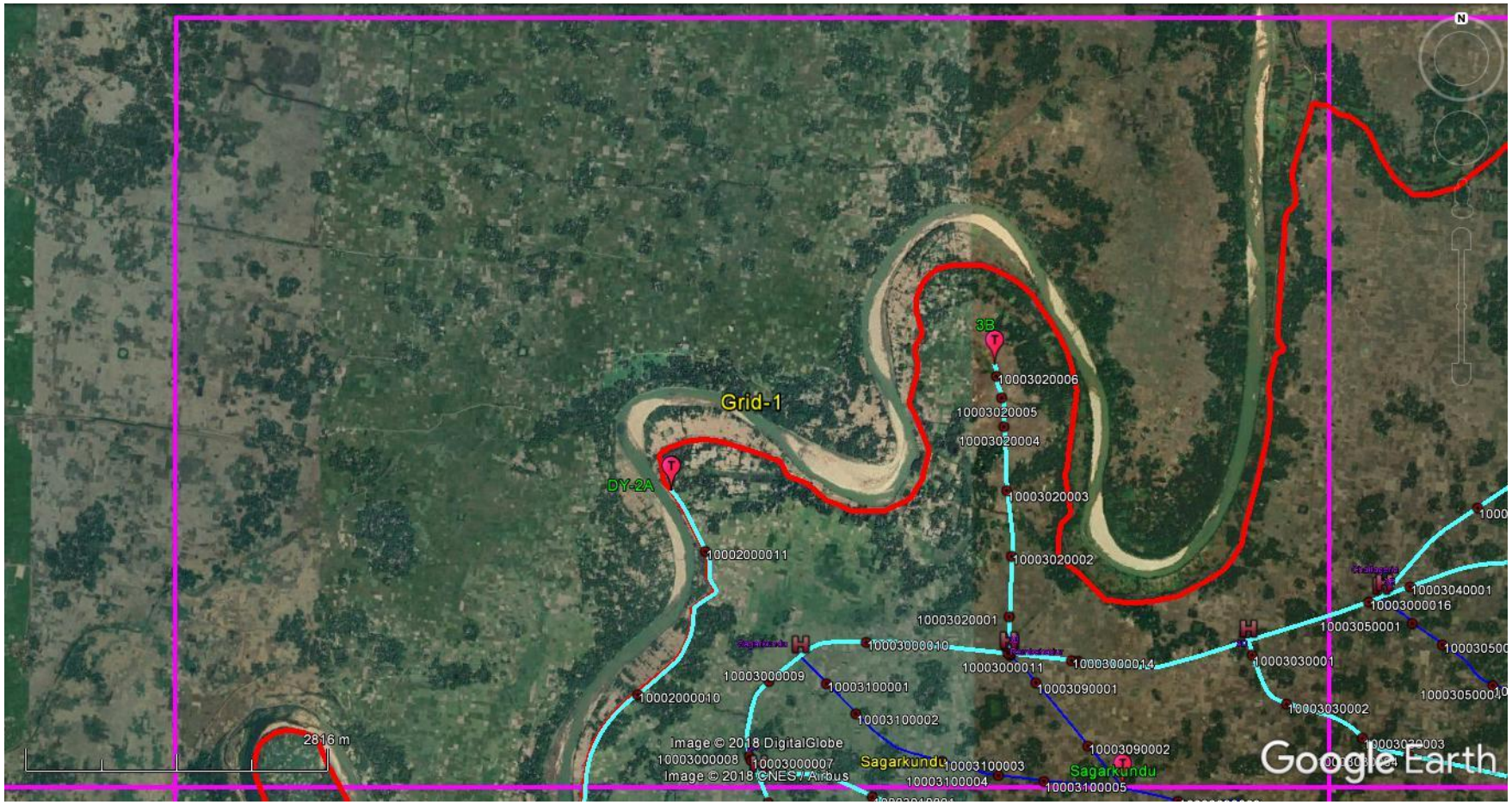


Fig 6.3 Canal Network of Midnapur Canal Irrigation Project with outlets Grid-1

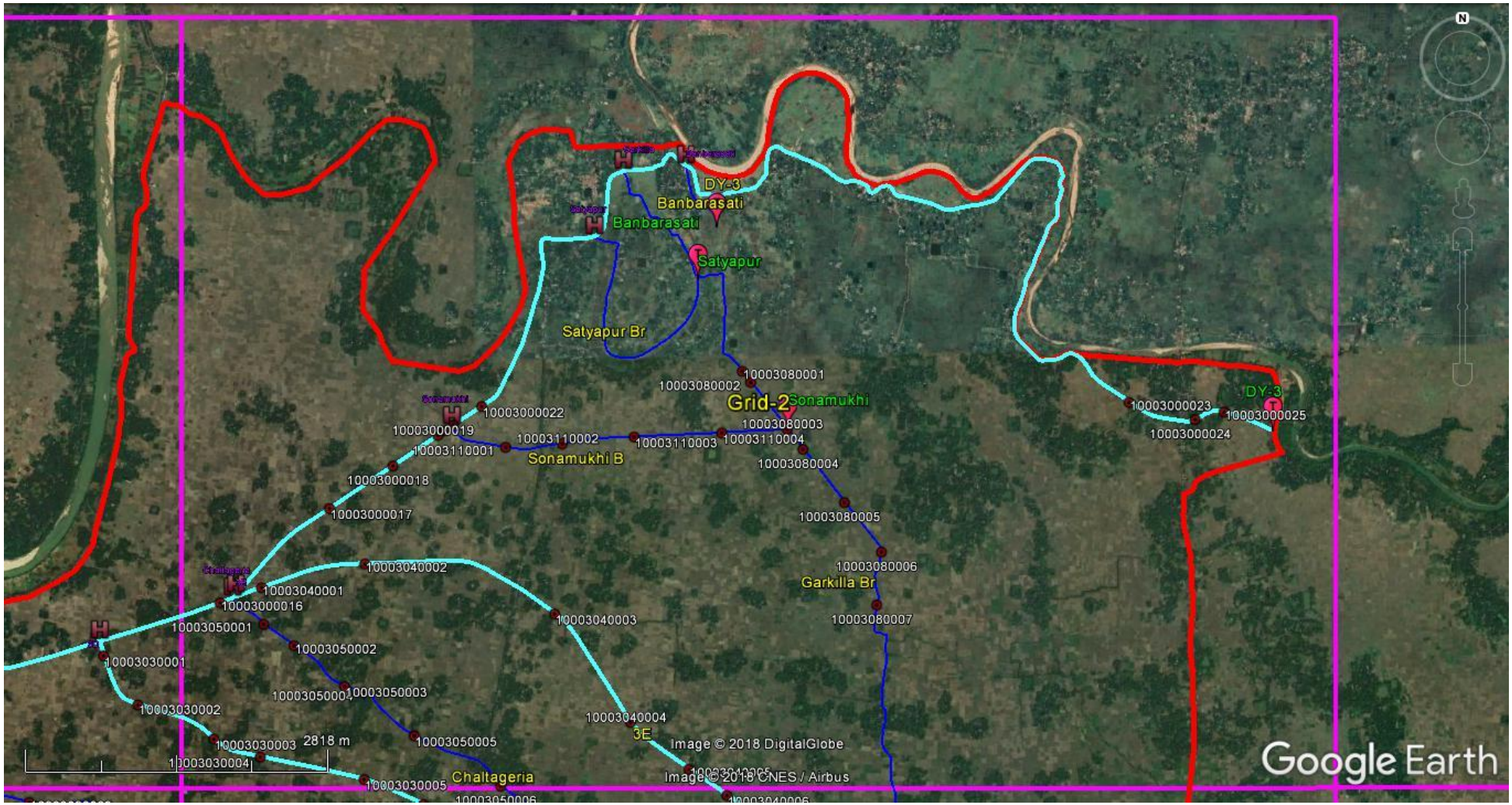


Fig 6.4 Canal Network of Midnapur Canal Irrigation Project with outlets Grid-2

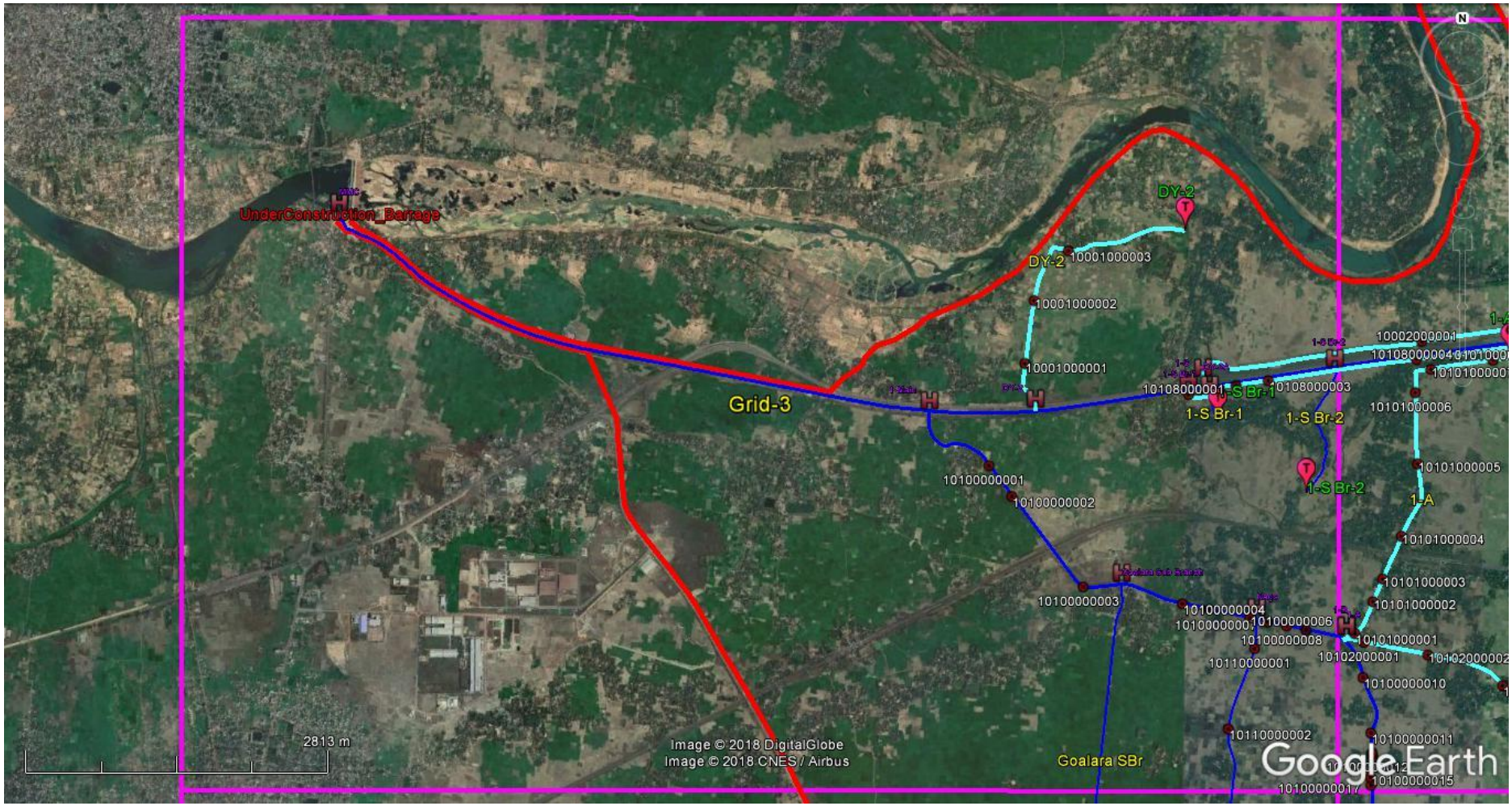


Fig 6.5 Canal Network of Midnapur Canal Irrigation Project with outlets Grid-3

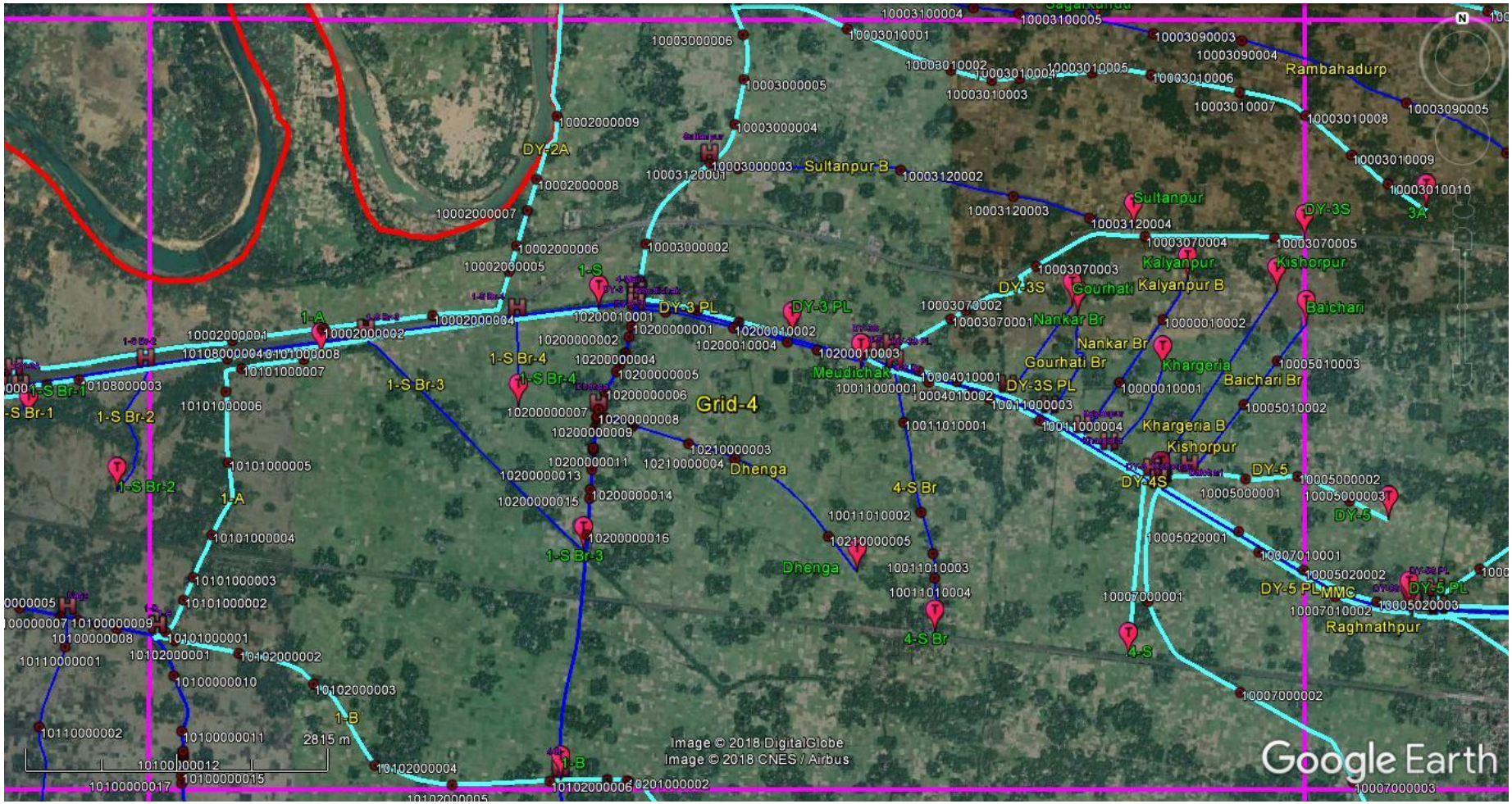


Fig 6.6 Canal Network of Midnapur Canal Irrigation Project with outlets Grid-4

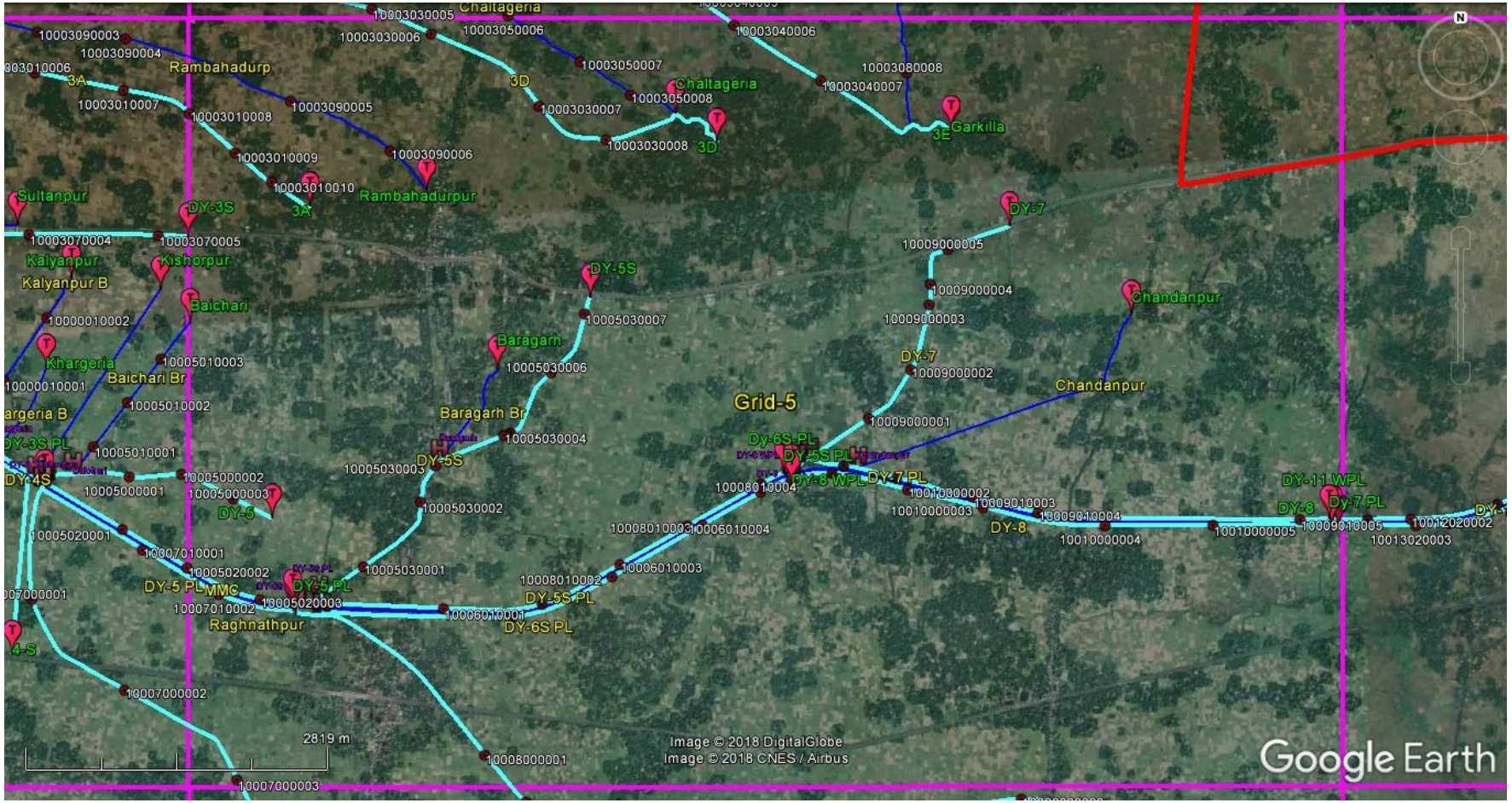


Fig 6.7 Canal Network of Midnapur Canal Irrigation Project with outlets Grid-5

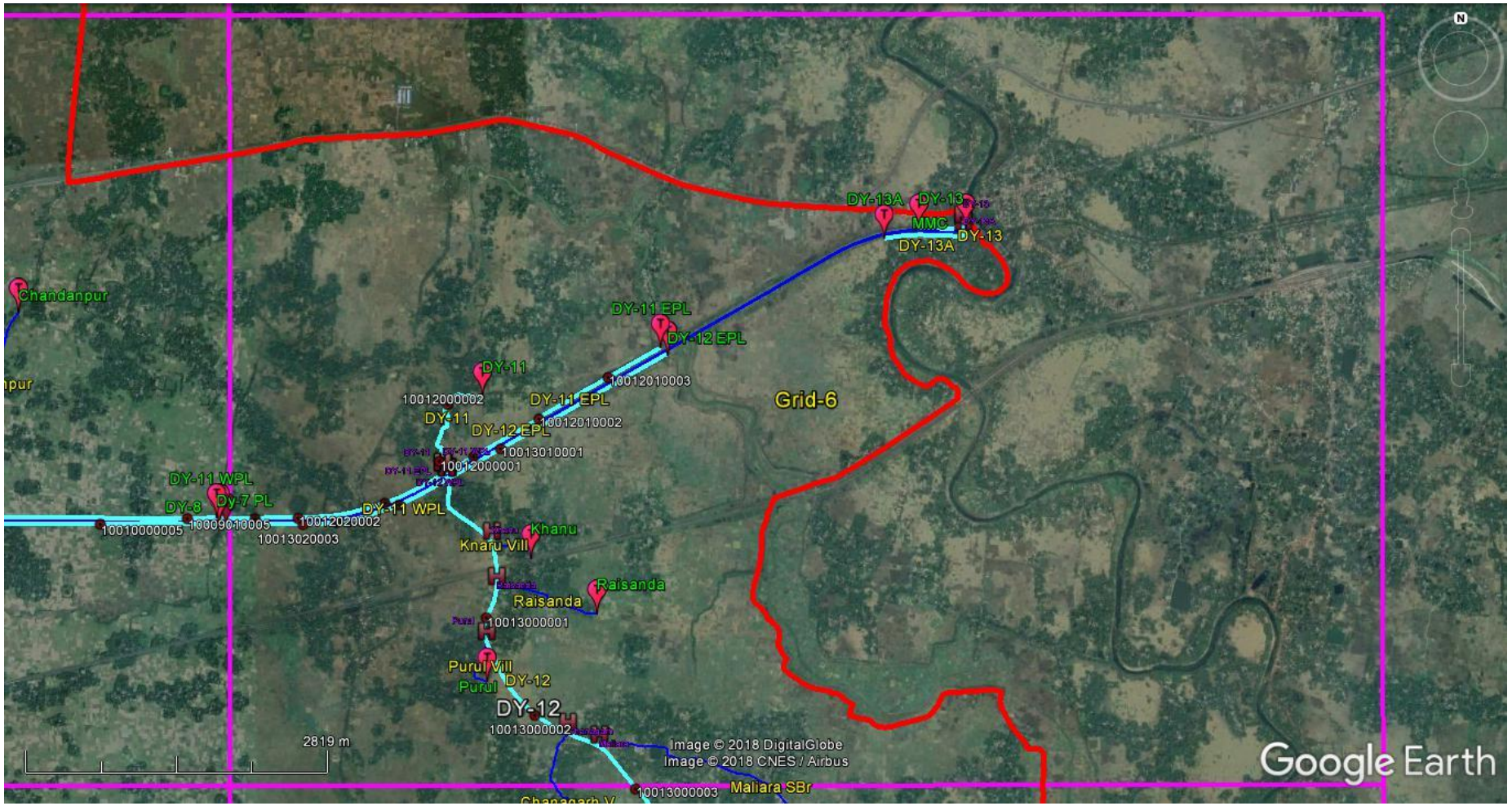


Fig 6.8 Canal Network of Midnapur Canal Irrigation Project with outlets Grid-6

Fig 6.9 Canal Network of Midnapur Canal Irrigation Project with outlets Grid-7

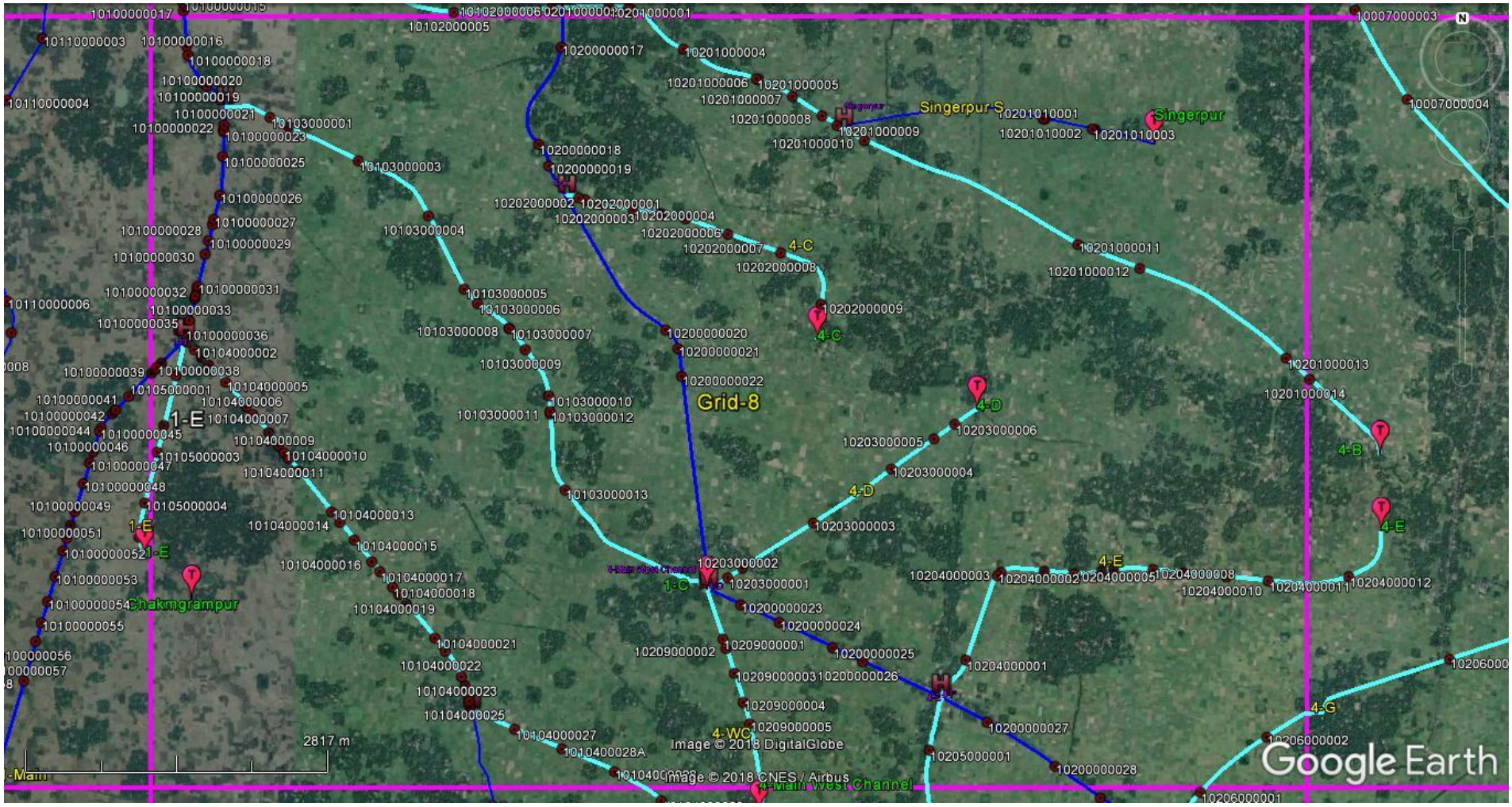


Fig 6.10 Canal Network of Midnapur Canal Irrigation Project with outlets Grid-8

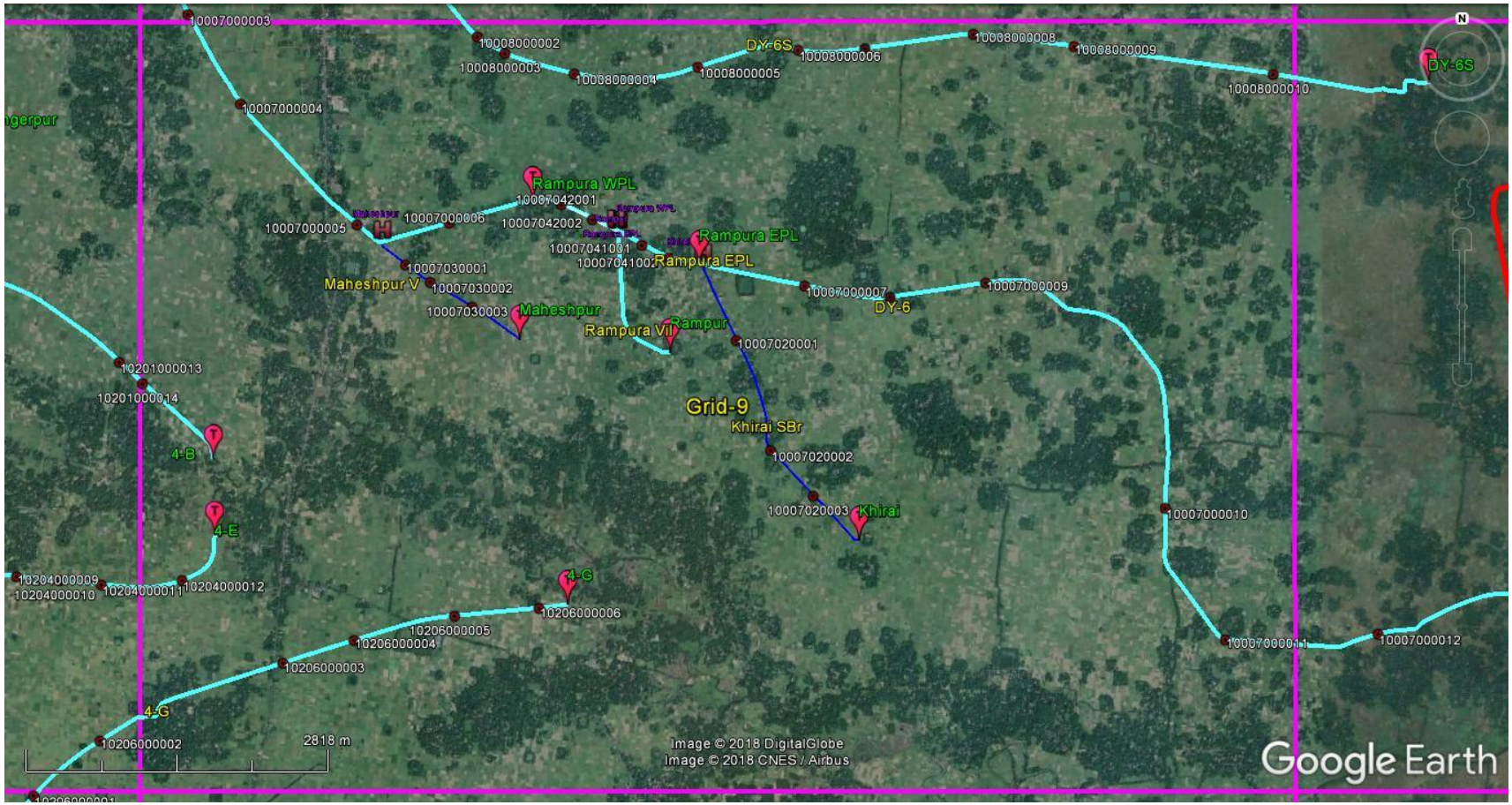


Fig 6.11 Canal Network of Midnapur Canal Irrigation Project with outlets Grid-9

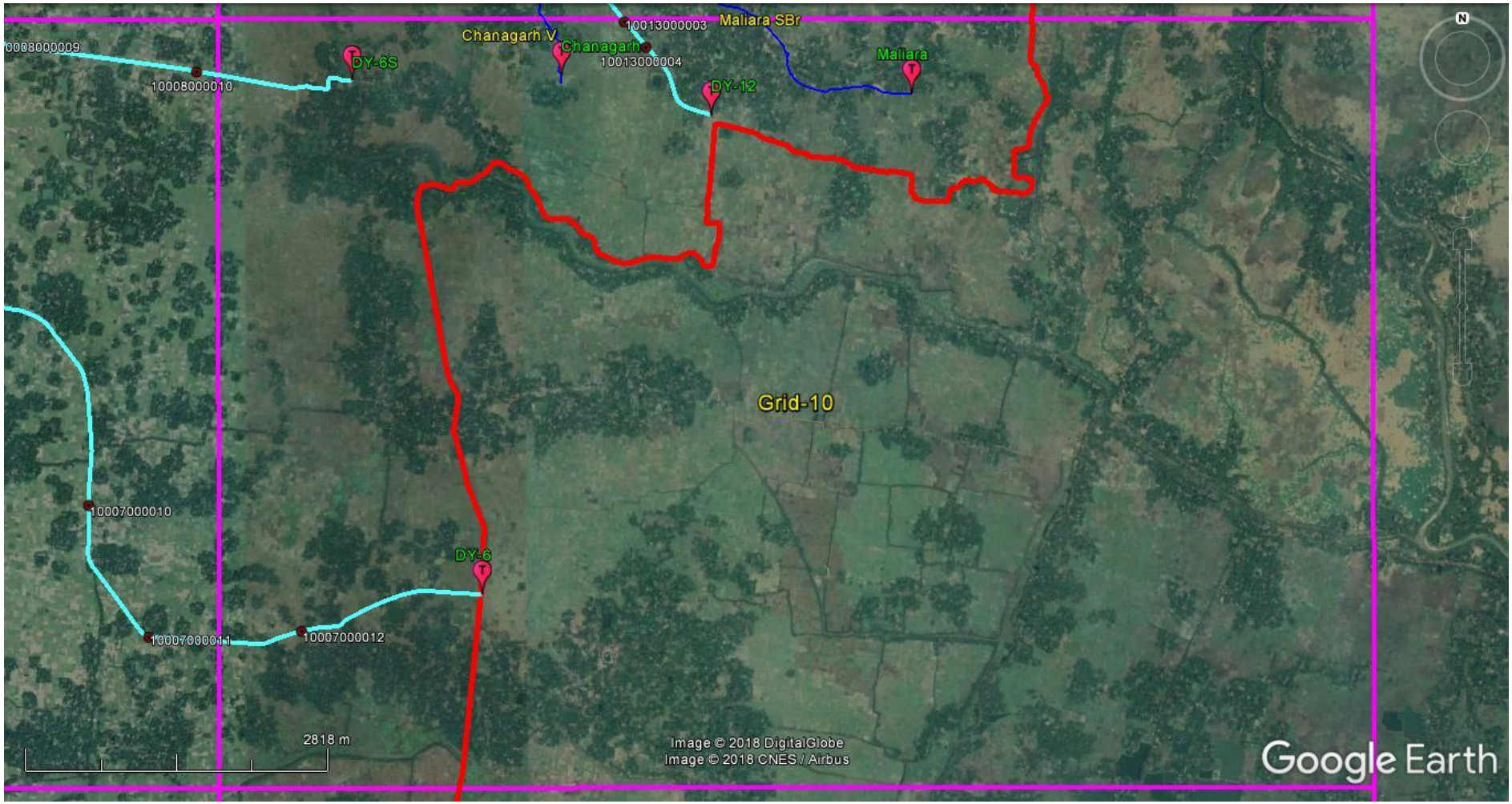


Fig 6.12 Canal Network of Midnapur Canal Irrigation Project with outlets Grid-10

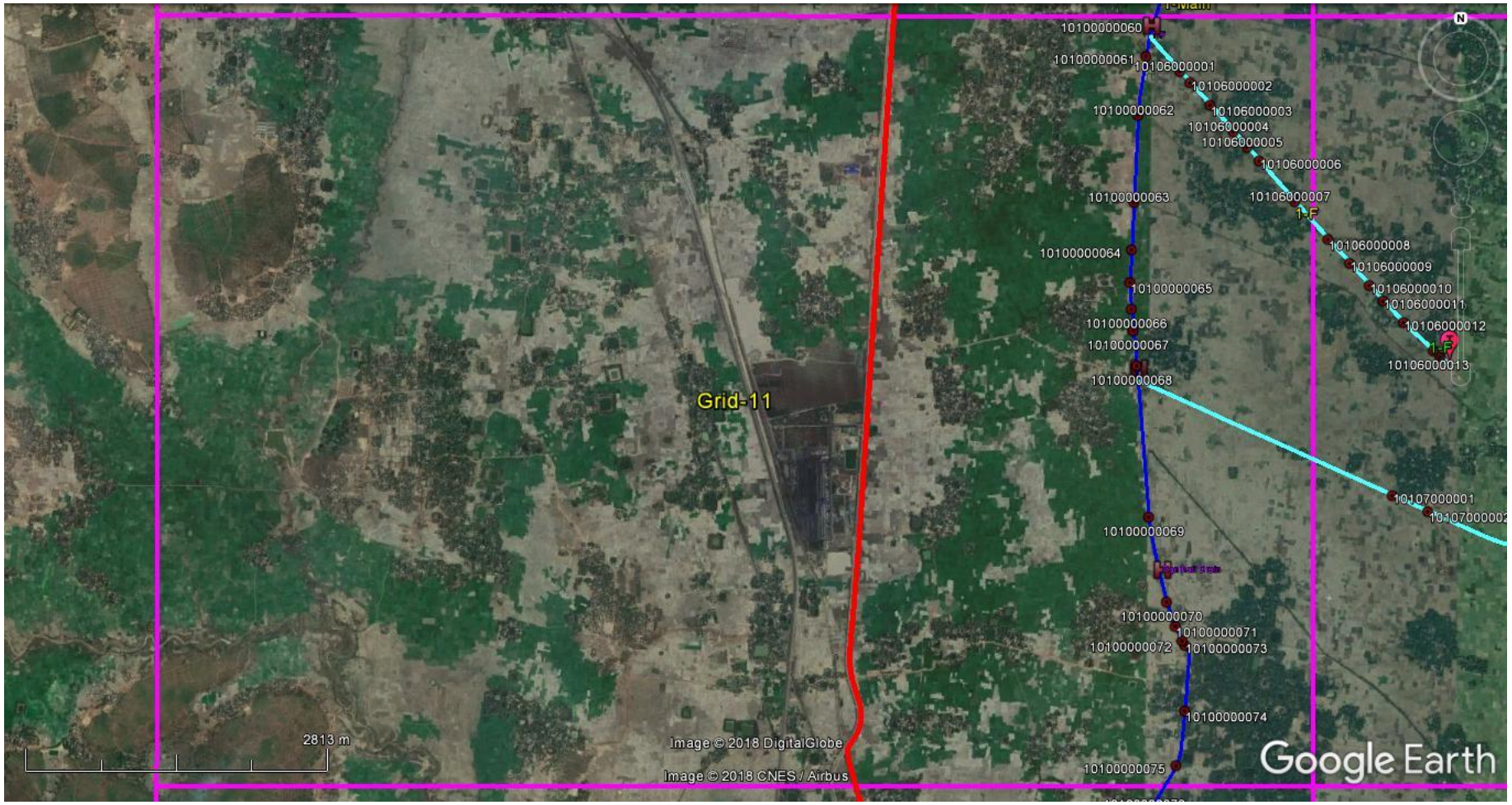


Fig 6.13 Canal Network of Midnapur Canal Irrigation Project with outlets Grid-11

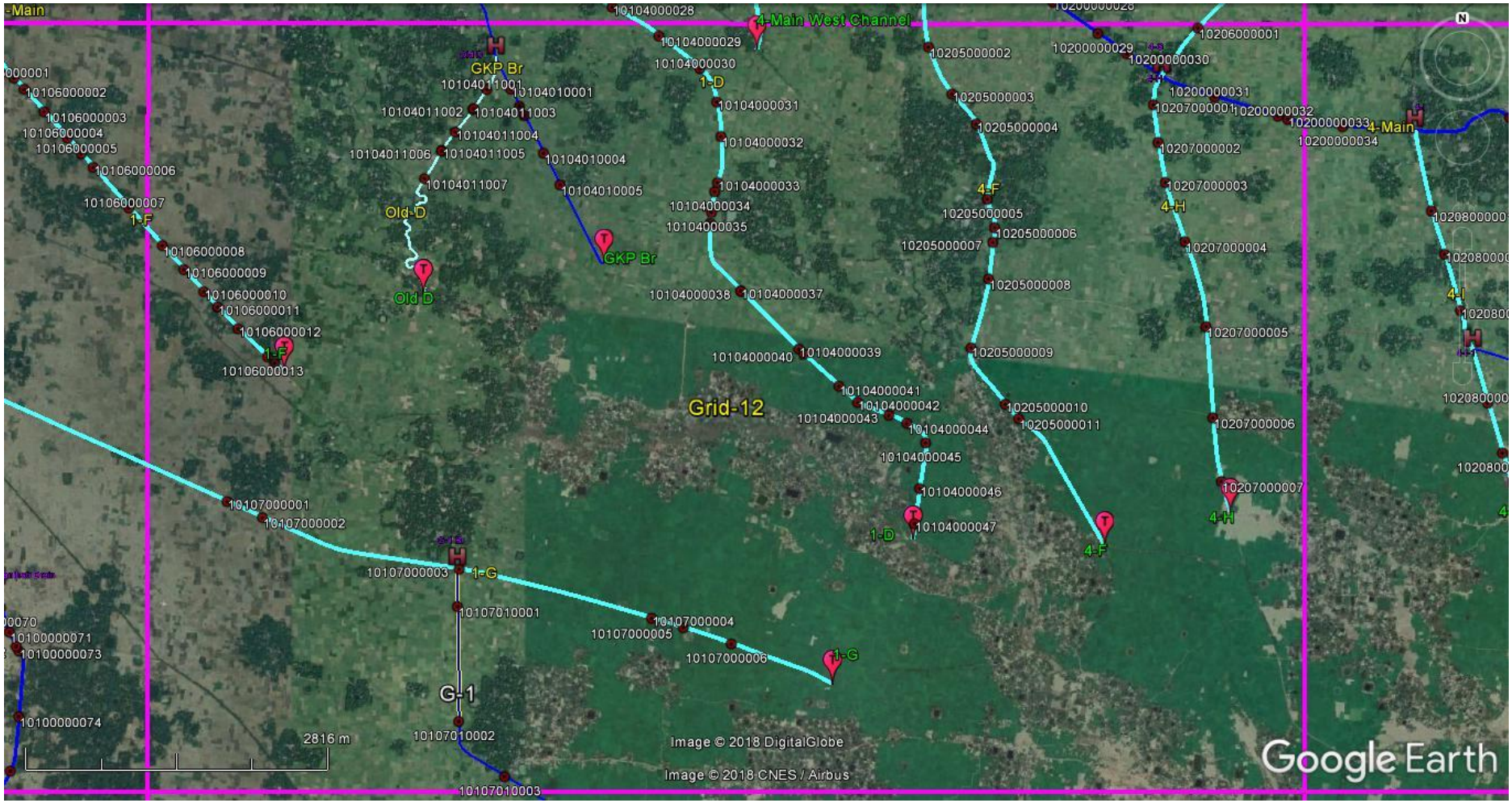


Fig 6.14 Canal Network of Midnapur Canal Irrigation Project with outlets Grid-12

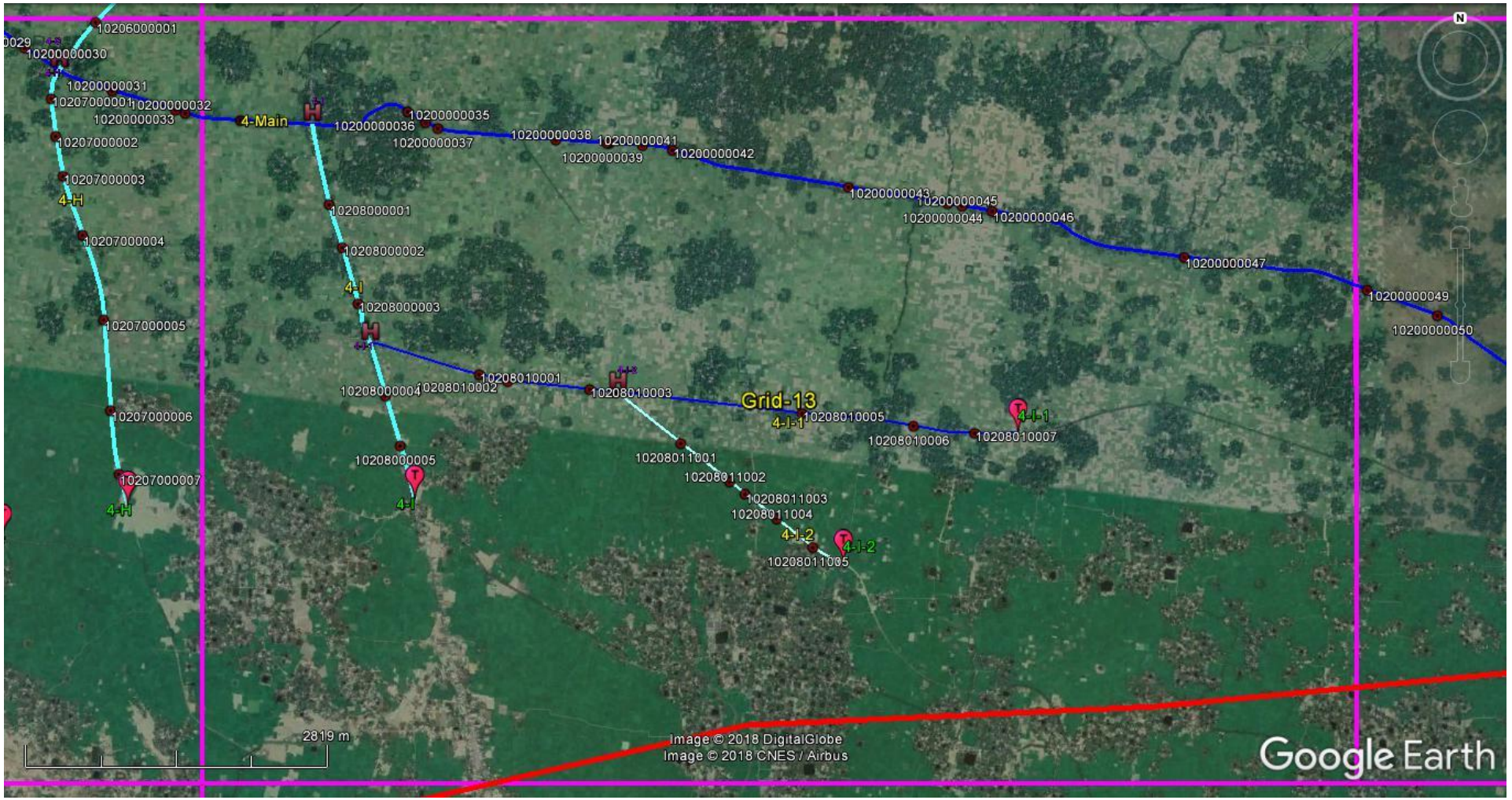


Fig 6.15 Canal Network of Midnapur Canal Irrigation Project with outlets Grid-13

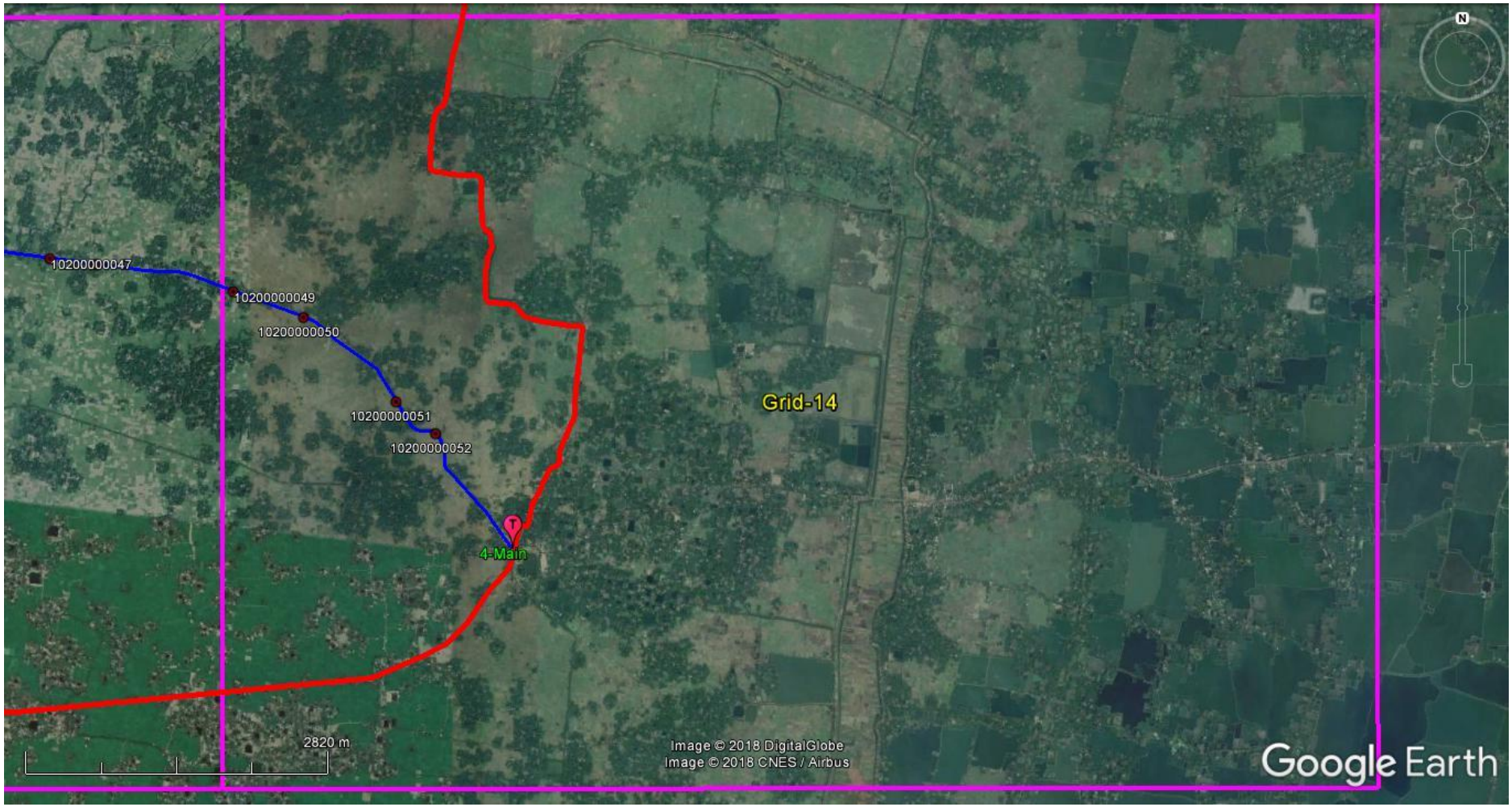


Fig 6.16 Canal Network of Midnapur Canal Irrigation Project with outlets Grid-14

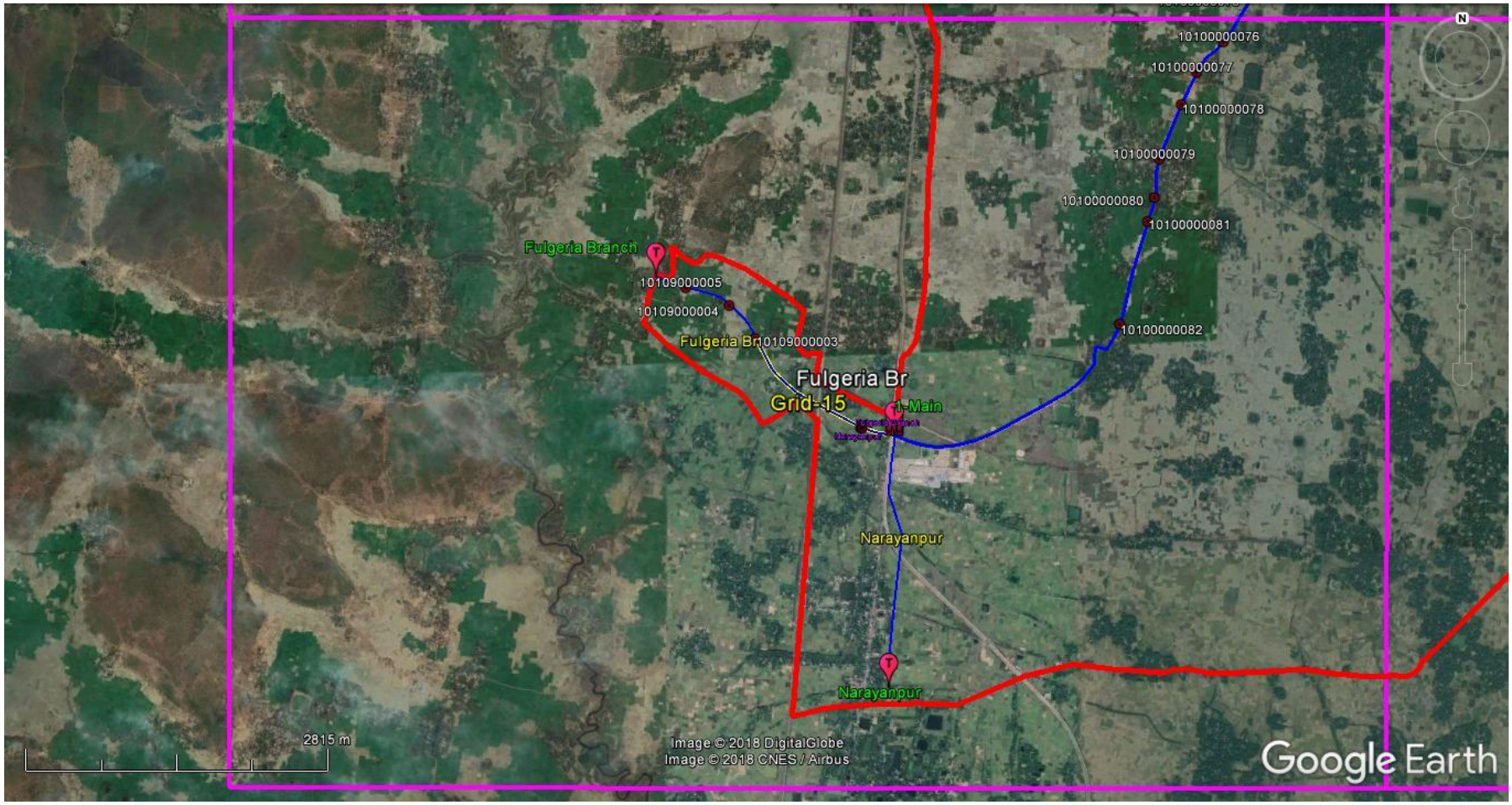


Fig 6.17 Canal Network of Midnapur Canal Irrigation Project with outlets Grid-15

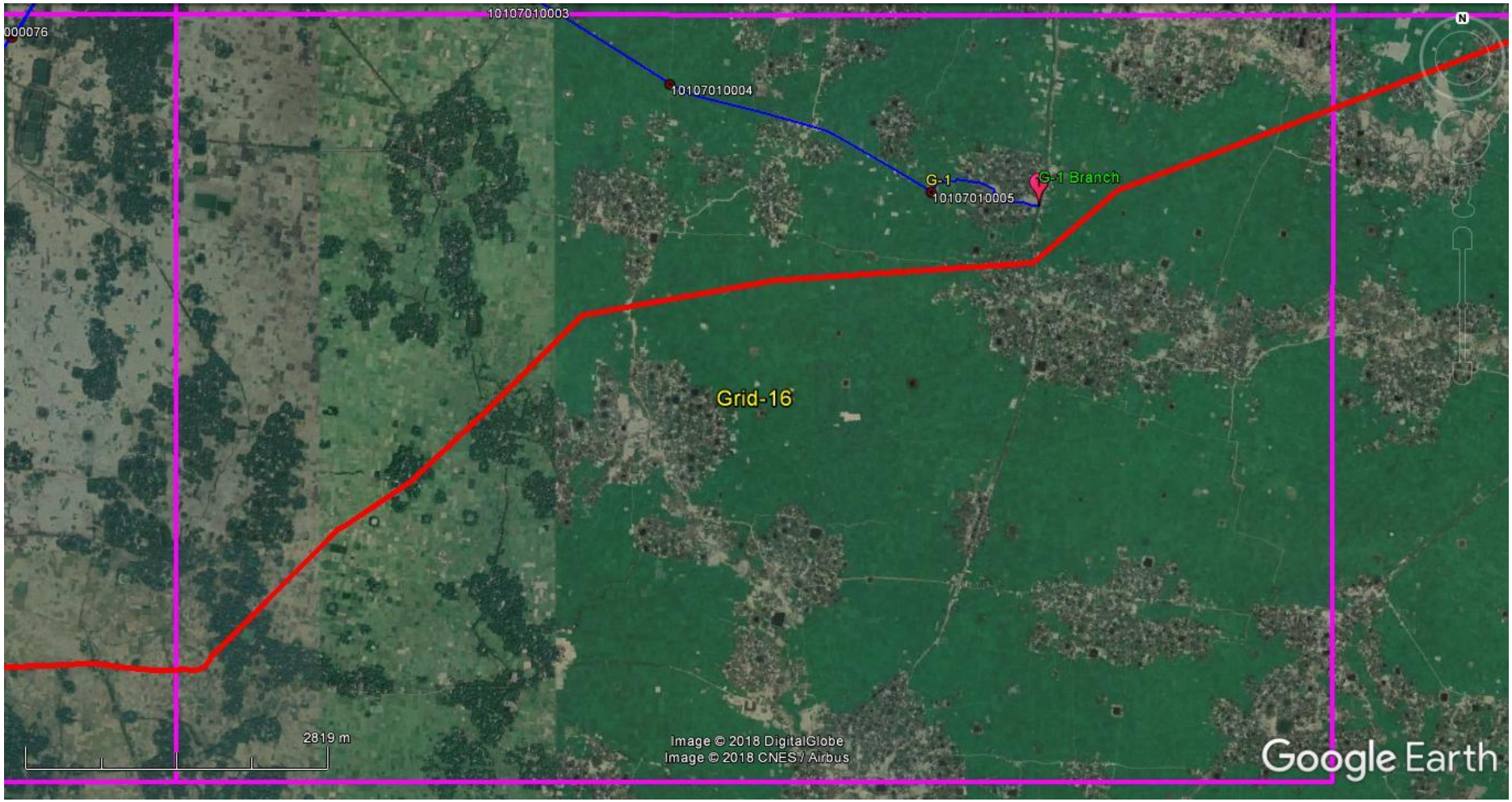


Fig 6.18 Canal Network of Midnapur Canal Irrigation Project with outlets Grid-16

Table 6.1 Details of Outlet Availability

S.No.	Canal Name	Outlet Surveyed	Reported	Remark Comment Head Tail
1	MMC	0	6	Outlet Missing 6
2	1-Main	82	28	Extra Outlet 54
3	Goalara Sub Branch	0	8	Outlet Missing 8
4	Nags	8	22	Outlet Missing 14
5	1-A	8	14	Outlet Missing 6
6	1-B	6	14	Outlet Missing 8
7	1-C	13	26	Outlet Missing 13
8	1-D	48	NA	Total no. of outlet for Mava Division is given 260
9	GKP Br	5	NA	Total no. of outlet for Mava Division is given 260
10	Old D	7	NA	Total no. of outlet for Mava Division is given 260
11	1-E	5	NA	Total no. of outlet for Mava Division is given 260
12	1-F	14	NA	Total no. of outlet for Mava Division is given 260
13	1-G	6	NA	Total no. of outlet for Mava Division is given 260
14	G-1 Branch	5	NA	Total no. of outlet for Mava Division is given 260
15	Narayanpur	0	NA	Total no. of outlet for Mava Division is given 260
16	Fulgeria Branch	5	NA	Total no. of outlet for Mava Division is given 260
17	DY-2	3	12	Outlet Missing 9
18	1-S	4	20	Outlet Missing 16
19	1-S Br-1	0	NA	NA
20	1-S Br-2	0	NA	NA
21	1-S Br-3	0	NA	NA
22	1-S Br-4	0	NA	NA
23	DY-2A	11	40	Outlet Missing 29
24	4-Main	52	72	Outlet Missing 20
25	Meudichak	4	6	Outlet Missing 2
26	Dhenga	5	8	Outlet Missing 3

S.No.	Canal Name	Outlet Surveyed	Reported	Remark Comment Head Tail
27	4-B	14	34	Outlet Missing 20
28	Singerpur	4	8	Outlet Missing 4
29	4-C	9	14	Outlet Missing 5
30	4-D	6	7	Outlet Missing 1
31	4-Main West Channel	5	8	Outlet Missing 3
32	4-E	12	13	Outlet Missing 1
33	4-F	11	12	Outlet Missing 1
34	4-G	6	13	Outlet Missing 7
35	4-H	7	12	Outlet Missing 5
36	4-I	5	12	Outlet Missing 7
37	4-I-1	7	16	Outlet Missing 9
38	4-I-2	5	NA	NA
39	DY-3	25	120	Outlet Missing 95
40	DY-3 PL	2	10	Outlet Missing 8
41	Sultanpur	4	20	Outlet Missing 16
42	3A	10	15	Outlet Missing 5
43	Sagarkundu	5	12	Outlet Missing 7
44	3B	6	19	Outlet Missing 13
45	Rambahadurpur	6	16	Outlet Missing 10
46	3D	8	16	Outlet Missing 8
47	Chaltageria	8	16	Outlet Missing 8
48	3E	7	19	Outlet Missing 12
49	Sonamukhi	4	19	Outlet Missing 15
50	Satyapur	0	6	Outlet Missing 6
51	Garkilla	8	6	Extra Outlet 2
52	Banbarasati	0	7	Outlet Missing 7
53	4-S	4	16	Outlet Missing 12
54	4-S Br	4	12	Outlet Missing 8
55	DY-3S	5	17	Outlet Missing 12
56	DY-3S PL	2	12	Outlet Missing 10
57	Gourhati	0	10	Outlet Missing 10
58	Nankar Br	0	14	Outlet Missing 14
59	Kalyanpur	2	14	Outlet Missing 12
60	Khargeria	0	14	Outlet Missing 14

S.No.	Canal Name	Outlet Surveyed	Reported	Remark Comment Head Tail
61	Kishorpur	0	16	Outlet Missing 16
62	DY-5	3	15	Outlet Missing 12
63	DY-5 PL	3	17	Outlet Missing 14
64	Baichari	3	17	Outlet Missing 14
65	DY-6	12	1	Extra Outlet 11
66	Dy-6 PL	2	NA	NA
67	Maheshpur	3	NA	NA
68	Rampur	0	NA	NA
69	Rampura WPL	2	NA	NA
70	Rampura EPL	2	NA	NA
71	Khirai	3	NA	NA
72	DY-5S	7	19	Outlet Missing 12
73	DY-5S PL	5	16	Outlet Missing 11
74	Baragarh	0	10	Outlet Missing 10
75	DY-6S	10	NA	NA
76	Raghunathpur	0	NA	NA
77	Dy-6S-PL	4	NA	NA
78	DY-7	5	17	Outlet Missing 12
79	Dy-7 PL	5	21	Outlet Missing 16
80	Chandanpur	0	17	Outlet Missing 17
81	DY-8	5	NA	NA
82	DY-8 WPL	1	NA	NA
83	DY-11	2	NA	NA
84	DY-11 WPL	3	NA	NA
85	DY-11 EPL	3	NA	NA
86	DY-12	4	NA	NA
87	DY-12 WPL	3	NA	NA
88	DY-12 EPL	2	NA	NA
89	Khanu	0	NA	NA
90	Raisanda	0	NA	NA
91	Purul	0	NA	NA
92	Chanagarh	0	NA	NA
93	Maliara	0	NA	NA
94	DY-13	0	NA	NA
95	DY-13A	0	NA	NA

7. Constraints/ Results and Findings

- The gap between Irrigation Potential Created (IPC) and Irrigation Potential Utilized (IPU) is 100% in case of Midnapur Canal due to its being non-functional for the last so many Years.
- The Headwork is in dilapidated condition and unable to release the water in the canal system.
- .In total there are 584 outlets in the system out of which 90 outlets are broken, silted and Weeded accounting for 15.41% outlets**.** However, total system is dysfunctional due to damage of head works of the system
- There is no cropping pattern in command area of the project since the canal is inoperative since 2004-05. Farmers are doing rain-fed farming.
- Construction of only Head-work is going on reportedly with the financial assistance from NABARD which is likely to be completed in near future.
- It is presumed that the canal network may be operational on completion of construction work at Head-works.
- During the survey, it was noticed that the earthen canal/ distributary, in general, are not in order.
- Status of canal network is in bad shape being not maintained reportedly for a long time due to the canal system being non - functional since 2004-05.
- Canal maintenance is not there, so weed growth and breakage occurred leading to obstruction in water.
- The naming of the canals, distributaries, minors and outlets have been made by project officials as per their own norms.
- No annual budget for operation and maintenance (O& M) since the project is non-functional so the system further deteriorates.
- The project is reported to be non-functional since 2004-05 since the headworks is in dilapidated condition. Head works was not in a condition to release the water in the canal system. The project authorities reported to have attempted to release water in the year 2010-11 but were not successful in supplying the water in the canal system. The water spread at the Headworks whenever department attempted to release some water.
- During the survey, it was noticed that the earthen canal/ distributary in general are not in order. The survey carried out by AFC India Limited worked out and reported the status of canal network which is in bad shape being, not maintained reportedly for a long time being the canal system non - functional since 2004-05.

- It was observed that the canals are full of weeds, outlets are broken at various places. Since no canal water is there, only rainwater is there which accumulates in the canal network. (Some typical Illustrations are given by Photographs of the canal System taken during survey).
- Discussions with farmers at head, mid and tail reaches revealed that they were doing farming on the basis of rain-fed irrigation only.
- The canal being unlined there is problem of seepage all along the canal.
- Outlets are broken at many places (some typical illustrations are given in photograph section) due to which water divert and do not flow in the direction it was planned.
- Shortage of manpower and resources was also reported to be a major reason for gap in maintenance of canal system.
- The encroachment was observed on canals by erection of squatters along the canal line.

The details of the affected outlets have been elaborated in the Table below:

Table 7.1 Details of Affected Outlets

S. No.	Main canal	Branch canal	Distributary	Minor	Sub - Minor	Chainage_m	Outlet No.	**Canal Status (Reach wise)	Remarks	Outlet ID
1	MMC	1-Main	NA	NA	NA	870	001	1-Main-001	Weeds	10100000001
2	MMC	1-Main	NA	NA	NA	2290	003	1-Main-003	Weeds & Siltation	10100000003
3	MMC	1-Main	NA	NA	NA	3260	004	1-Main-004	Weeds & Siltation	10100000004
4	MMC	1-Main	NA	NA	NA	4070	007	1-Main-007	Weeds	10100000007
5	MMC	1-Main	NA	NA	NA	5940	012	1-Main-012	Weeds & Siltation	10100000012
6	MMC	1-Main	NA	NA	NA	5960	013	1-Main-013	Weeds & Siltation	10100000013
7	MMC	1-Main	NA	NA	NA	6000	014	1-Main-014	Weeds & Siltation	10100000014
8	MMC	1-Main	NA	NA	NA	6163	015	1-Main-015	Weeds & Siltation	10100000015
9	MMC	1-Main	NA	NA	NA	8070	026	1-Main-026	Weeds	10100000026
10	MMC	1-Main	NA	NA	NA	8310	027	1-Main-027	Weeds	10100000027
11	MMC	1-Main	NA	NA	NA	8350	028	1-Main-028	Weeds	10100000028
12	MMC	1-Main	NA	NA	NA	19930	072	1-Main-072	Weeds	10100000072

13	MMC	4-Main	NA	NA	NA	265	002	4-Main-002	Weeds	10200000002
14	MMC	4-Main	NA	NA	NA	825	006	4-Main-006	Weeds	10200000006
15	MMC	4-Main	NA	NA	NA	1070	008	4-Main-008	Obstruction	10200000008
16	MMC	4-Main	NA	NA	NA	1100	009	4-Main-009	Obstruction	10200000009
17	MMC	4-Main	NA	NA	NA	1390	012	4-Main-012	Weeds	10200000012
18	MMC	4-Main	NA	NA	NA	1570	013	4-Main-013	Weeds	10200000013
19	MMC	4-Main	NA	NA	NA	1760	014	4-Main-014	Weeds	10200000014
20	MMC	4-Main	NA	NA	NA	23935	044	4-Main-044	Obstruction	10200000044
21	MMC	4-Main	NA	NA	NA	24070	045	4-Main-045	Obstruction	10200000045
22	MMC	4-Main	NA	NA	NA	24365	046	4-Main-046	Obstruction	10200000046
23	MMC	4-Main	NA	NA	NA	26235	047	4-Main-047	Obstruction	10200000047
24	MMC	4-Main	NA	NA	NA	26660	048	4-Main-048	Obstruction	10200000048
25	MMC	NA	DY-2	NA	NA	510	001	DY-2-001	Weeds	10001000001
26	MMC	1-Main	1-S	NA	NA	25	001	1-S-001	Siltation & Weeds	10108000001
27	MMC	1-Main	1-S	NA	NA	530	002	1-S-002	Siltation & Weeds	10108000002
28	MMC	1-Main	1-D	NA	NA	30	001	1-D-001	Weeds	10104000001
29	MMC	1-Main	1-D	NA	NA	320	004	1-D-004	Weeds	10104000004
30	MMC	1-Main	1-D	NA	NA	930	007	1-D-007	Weeds & Siltation	10104000007
31	MMC	1-Main	1-D	NA	NA	1160	008	1-D-008	Weeds & Siltation	10104000008
32	MMC	1-Main	1-D	NA	NA	2100	013	1-D-013	Weeds	10104000013
33	MMC	1-Main	1-D	NA	NA	4820	027	1-D-027	Weeds & Siltation	10104000027
34	MMC	1-Main	1-D	NA	NA	8340	037	1-D-037	Weeds	10104000037
35	MMC	1-Main	1-D	NA	NA	9920	041	1-D-041	Weeds	10104000041
36	MMC	1-Main	1-D	GKP Br	Old-D	300	001	Old-D-001	Siltation & Weeds	10104011001
37	MMC	NA	DY-2A	NA	NA	2230	001	DY-2A-001	Siltation & Weeds	10002000001
38	MMC	1-Main	1-A	NA	NA	100	001	1-A-001	Weeds	10101000001
39	MMC	1-Main	1-A	NA	NA	1820	005	1-A-005	Obstruction	10101000005
40	MMC	1-Main	1-B	NA	NA	180	001	1-B-001	Weeds &	10102000001

									Siltation	
41	MMC	1-Main	1-C	NA	NA	440	001	1-C-001	Weeds	10103000001
42	MMC	1-Main	Nags Canal	NA	NA	260	001	Nags Canal-001	Siltation & Weeds	10110000001
43	MMC	4-Main	4-C	NA	NA	125	001	4-C-001	Weeds	10202000001
44	MMC	4-Main	4-B	Singerpur SBR	NA	1910	001	Singerpur SBR-001	Obstruction	10201010001
45	MMC	4-Main	4-B	NA	NA	440	001	4-B-001	Weeds & Siltation	10201000001
46	MMC	4-Main	4-B	NA	NA	2900	009	4-B-009	Weeds & Siltation	10201000009
47	MMC	4-Main	NA	Meudichak	NA	300	001	Meudichak-001	Weeds	10200010001
48	MMC	1-Main	1-E	NA	NA	330	001	1-E-001	Siltation & Weeds	10105000001
49	MMC	1-Main	1-E	NA	NA	810	002	1-E-002	Broken	10105000002
50	MMC	1-Main	1-F	NA	NA	540	002	1-F-002	Siltation & Weeds	10106000002
51	MMC	1-Main	1-G	NA	NA	2610	001	1-G-001	Weeds	10107000001
52	MMC	1-Main	1-G	G-1	NA	350	001	G-1-001	Broken	10107010001
53	MMC	1-Main	1-D	GKP Br	NA	1390	001	GKP Br-001	Weeds & Siltation	10104010001
54	MMC	1-Main	Fulgeria Sub Br	NA	NA	305	001	Fulgeria Sub Br-001	Broken	10109000001
55	MMC	4-Main	Dhenga	NA	NA	80	001	Dhenga-001	Weeds & Siltation	10210000001
56	MMC	4-Main	4-D	NA	NA	210	001	4-D-001	Weeds & Siltation	10203000001
57	MMC	4-Main	4-E	NA	NA	410	001	4-E-001	Weeds & Siltation	10204000001
58	MMC	4-Main	4-F	NA	NA	1080	002	4-F-002	Weeds & Siltation	10205000002
59	MMC	4-Main	4-G	NA	NA	560	001	4-G-001	Weeds & Siltation	10206000001
60	MMC	4-Main	4-H	NA	NA	280	001	4-H-001	Weeds & Siltation	10207000001
61	MMC	4-Main	4-H	NA	NA	3260	006	4-H-006	Weeds & Siltation	10207000006
62	MMC	4-Main	4-I	NA	NA	760	001	4-I-001	Weeds &	10208000001

									Siltation	

63	MMC	4-Main	4-I	NA	NA	1190	002	4-I-002	Weeds & Siltation	10208000002
64	MMC	4-Main	4-I	4-I-1	NA	640	001	4-I-1-001	Weeds & Siltation	10208010001
65	MMC	4-Main	4-WC	NA	NA	450	001	4-WC-001	Weeds & Siltation	10209000001
66	MMC	NA	DY-3	DY-3 PL	NA	580	001	DY-3 PL-001	Encroachment	10003060001
67	MMC	NA	DY-3	3A	NA	1120	001	3A-001	Weeds & Siltation	10003010001
68	MMC	NA	DY-3	3B	NA	900	002	3B-002	Weeds & Siltation	10003020002
69	MMC	NA	DY-3	3B	NA	2380	005	3B-005	Weeds & Siltation	10003020005
70	MMC	NA	DY-3	3E	NA	260	001	3E-001	Weeds	10003040001
71	MMC	NA	DY-3S	DY-3S PL	NA	320	001	DY-3S PL-001	Weeds & Siltation	10004010001
72	MMC	NA	DY-5S	DY-5S PL	NA	1180	001	DY-5S PL-001	Weeds	10006010001
73	MMC	NA	DY-3	NA	NA	220	001	DY-3-001	Weeds	10003000001
74	MMC	NA	DY-3	DY-3S	NA	847	001	DY-3S-001	Weeds	10003070001
75	MMC	NA	DY-5	NA	NA	830	001	DY-5-001	Weeds & Siltation	10005000001
76	MMC	NA	DY-5	DY-5S	NA	2653	004	DY-5S-004	Weeds	10005030004
77	MMC	NA	DY-7	NA	NA	1420	002	DY-7-002	Weeds & Siltation	10009000002
78	MMC	NA	DY-5	Baichari Br	NA	840	002	Baichari Br-002	Weeds	10005010002
79	MMC	NA	DY-3	Chaltagerya Br	NA	730	002	Chaltagerya Br-002	Weeds	10003050002
80	MMC	NA	DY-3	Sonamukhi Br	NA	560	001	Sonamukhi Br-001	Weeds & Siltation	10003110001
81	MMC	NA	DY-6	NA	NA	1050	001	DY-6-001	Weeds	10007000001
82	MMC	NA	DY-6	Rampura Br	Rampura EPL	260	001	Rampura EPL-001	Weeds	10007041001
83	MMC	NA	DY-6	Khirai SBr	NA	770	001	Khirai SBr-001	Weeds & Siltation	10007020001
84	MMC	NA	DY-6S	NA	NA	2320	001	DY-6S-001	Weeds & Siltation	10008000001

85	MMC	NA	DY-6S	DY-6S PL	NA	1780	001	DY-6S PL-001	Weeds & Siltation	10008010001
86	MMC	NA	DY-8	NA	NA	410	001	DY-8-001	Weeds & Siltation	10010000001
87	MMC	NA	DY-11	NA	NA	140	001	DY-11-001	Siltation & Weeds	10012000001
88	MMC	NA	DY-11	DY-11 WPL	NA	335	001	DY-11 WPL-001	Weeds & Siltation	10012020001
89	MMC	NA	DY-12	NA	NA	2570	002	DY-12-002	Broken	10013000002
90	MMC	NA	DY-12	DY-12 EPL	NA	580	001	DY-12 EPL-001	Weeds & Siltation	10013010001

8. Reasons for Gap

- Head Regulator broken so irrigation operation in the canal system is non functional since 2004-05. This has resulted in 100% gap
- Non-maintenance of water courses/ distributaries, growth of weed, collapse of side slopes, damage to sides and bed, reduced waterways, seepage and leakages of canal waters etc are also observed during survey
- Non-availability of required infrastructure such as Headworks, Control/ measuring devices, broken outlets etc
- Irrigation Department should make an all out effort to make the Headwork and the distribution system functional so that benefits from the asset created could be utilized
- Policy to be framed immediately to make the project workable and useful at the earliest

9 Recommendations:

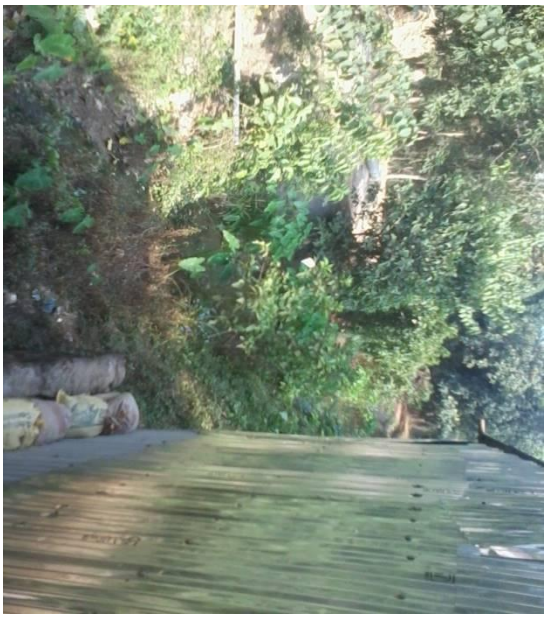
- Since the project is dysfunctional for the last 12 years, it is the foremost requirement to complete the ongoing construction work and make the project functional.
- Capacity building for field functionaries is required together with adequate staff to keep the system in order after restoration of the system.
- Renovation of system is required.
- Selective lining of canal may be undertaken.
- Adequate budget and manpower should be provided for maintenance of the system after making it functional
- Proper third party monitoring system also needs to be evolved to keep a track of project development along with performance at an interval of three years.
- It is recommended that suitable data acquisition system along with proper data storage system (DSS) may be evolved for the project after making it functional to keep track of the precious water resource storage and distribution through the system.
- Proper monitoring system also needs to be evolved to keep a track of leakage and theft of water.
- Adoption of PIM.
- Enhance the role of Women in water management.
- Practice of giving incentive for less water consuming crop cultivation.

10. Photographs of Affected Outlets

		
Photograph Outlet No : 1-Main-001		Photograph Outlet No : 1-Main-003
		
Photograph Outlet No : 1-Main-004		Photograph Outlet No : 1-Main-007

		
Photograph Outlet No : 1-Main-012		Photograph Outlet No : 1-Main-013
		
Photograph Outlet No : 1-Main-014		Photograph Outlet No : 1-Main-015

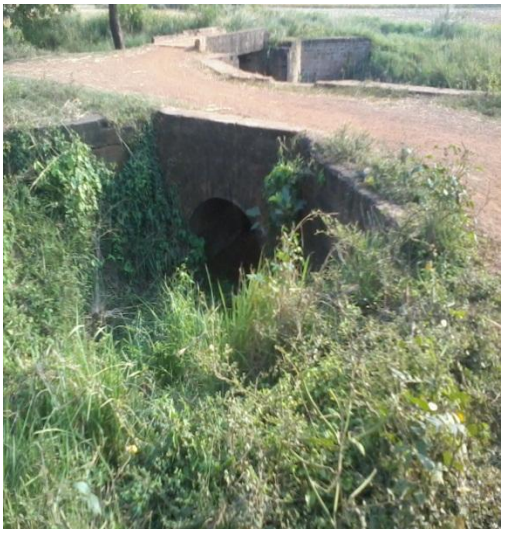
		
Photograph Outlet No : 1-Main-026		Photograph Outlet No : 1-Main-027
		
Photograph Outlet No : 1-Main-028		Photograph Outlet No : 1-Main-072

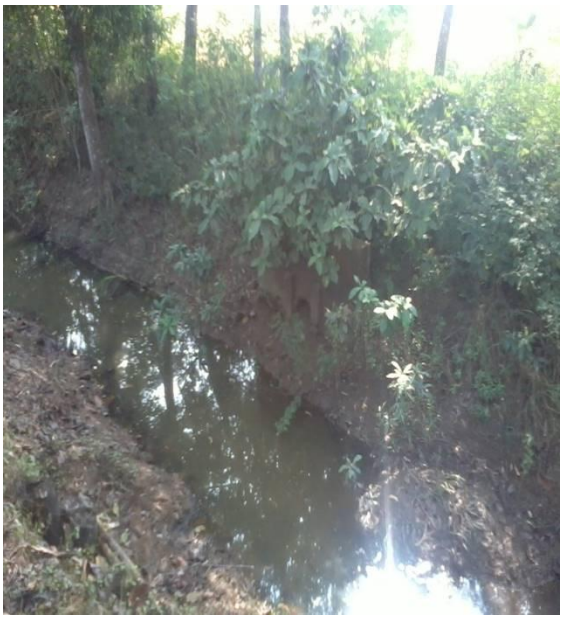
		
Photograph Outlet No : 4-Main-002		Photograph Outlet No : 4-Main-006
		
Photograph Outlet No : 4-Main-008		Photograph Outlet No : 4-Main-009

		
Photograph Outlet No : 4-Main-012		Photograph Outlet No : 4-Main-013
		
Photograph Outlet No : 4-Main-014		Photograph Outlet No : 4-Main-044

		
Photograph Outlet No : 4-Main-045		Photograph Outlet No : 4-Main-046
		
Photograph Outlet No : 4-Main-047		Photograph Outlet No : 4-Main-048

		
Photograph Outlet No : DY-2-001		Photograph Outlet No : 1-S-001
		
Photograph Outlet No : 1-S-002		Photograph Outlet No : 1-D-001

		
Photograph Outlet No : 1-D-004		Photograph Outlet No : 1-D-007
		
Photograph Outlet No : 1-D-008		Photograph Outlet No : 1-D-013

		
Photograph Outlet No : 1-D-027		Photograph Outlet No : 1-D-037
		
Photograph Outlet No : 1-D-041		Photograph Outlet No : Old-D-001

		
Photograph Outlet No : DY-2A-001		Photograph Outlet No : 1-A-001
		
Photograph Outlet No : 1-A-005		Photograph Outlet No : 1-B-001

		
Photograph Outlet No : 1-C-001		Photograph Outlet No : Nags Canal-001
		
Photograph Outlet No : 4-C-001		Photograph Outlet No : Singerpur SBR-001

		
Photograph Outlet No : 4-B-001		Photograph Outlet No : 4-B-009
		
Photograph Outlet No : Meudichak-001		Photograph Outlet No : 1-E-001

		
Photograph Outlet No : 1-E-002		Photograph Outlet No : 1-F-002
		
Photograph Outlet No : 1-G-001		Photograph Outlet No : G-1-001

		
Photograph Outlet No : GKP Br-001		Photograph Outlet No : Fulgeria Sub Br-001
		
Photograph Outlet No : Dhenga-001		Photograph Outlet No : 4-D-001

		
Photograph Outlet No : 4-E-001		Photograph Outlet No : 4-F-002
		
Photograph Outlet No : 4-G-001		Photograph Outlet No : 4-H-001

		
Photograph Outlet No : 4-H-006		Photograph Outlet No : 4-I-001
		
Photograph Outlet No : 4-I-002		Photograph Outlet No : 4-I-1-001

		
Photograph Outlet No : 4-WC-001		Photograph Outlet No : DY-3 PL-001
		
Photograph Outlet No : 3A-001		Photograph Outlet No : 3B-002

		
Photograph Outlet No : 3B-005		Photograph Outlet No : 3E-001
		
Photograph Outlet No : DY-3S PL-001		Photograph Outlet No : DY-5S PL-001

		
Photograph Outlet No : DY-3-001		Photograph Outlet No : DY-3S-001
		
Photograph Outlet No : DY-5-001		Photograph Outlet No : DY-5S-004

		
Photograph Outlet No : DY-7-002		Photograph Outlet No : Baichari Br-002
		
Photograph Outlet No : Chaltagerya Br-002		Photograph Outlet No : Sonamukhi Br-001

		
Photograph Outlet No : DY-6-001		Photograph Outlet No : Rampura EPL-001
		
Photograph Outlet No : Khirai SBr-001		Photograph Outlet No : DY-6S-001

		
Photograph Outlet No : DY-6S PL-001		Photograph Outlet No : DY-8-001
		
Photograph Outlet No : DY-11-001		Photograph Outlet No : DY-11 WPL-001

		
Photograph Outlet No : DY-12-002		Photograph Outlet No : DY-12 EPL-001

Appendix-I

Farmer Interaction Format

Name :

Father's Name:

Village :

Canal Details :

Other Irrigation Source:

Crops Cultivated: Rabi:

Kharif

How many times you get canal water: Rabi

Kharif:

Timely availability of water:

Adequate Availability of Water:

Has any official of Irrigation/ Agriculture:

Appendix-II

Compliance of CWC Comments

	Comments	Compliance
1	The report should give a detailed diagnostic of the canal network. Gap reporting needs to be done RD/Chainage wise in the complete network with specific reasons for the gap supported by Satellite imagery/ Google Earth. The gap should be clearly marked on T diagram in red and the T diagram should have all the attributes like structures, etc. As per Scope of Work, the Agency has to give Command Area Map including canals, Canal Network diagram with all attributes attached and types of canal structures marked along with chainage. The Agency may be therefore, advised to reflect all items as per scope of work agreed upon.	Detailed command area and canal network map has been prepared by geo-referencing canal network as *.kml file which is based on Google earth. The broken/ affected outlets and canal network have been demarcated by different colours at their geographical location. All the attributes of canal network have been attached in *.kml file.
2	The status of outlets needs to be clearly mentioned (dry or wet). This needs to be corroborated with farmers interaction.	Dry outlets have been demarcated in *kml files. All other outlets are wet outlets (liable to receive irrigation water). Farmers also corroborated it during interaction.
3	Details of constitution of the core team that went to the field along with the State govt officials with whom the meeting was conducted needs to be incorporated in the report along with photographs.	Please refer to para 5.2 of the report for details. The relevant photographs have been given in para 8 of the report.
4	The methodology to assess the IPU should be given.	The data for IPU has been collected from the project officials on the basis of their records. Field functionaries record the area irrigated under his jurisdiction which is aggregated at higher levels upto project level.

5	Detailed command area map in Ao size clearly excluding the area/CCA being served by other Minor irrigation schemes within the command should be given.	Since the command area map based on Google earth is quite big and when attempted the print on A0 size it was pixlet and was not readable. Accordingly efforts were made and Grid has been formed on Command Area Map. The print of each grid is given alongwith Index map for easy readability. Since a large number of minor irrigation schemes exists in the command area, the same could not be demarcated
6	Designed IPC vs actual IPC achieved alongwith reasons should be given.	Old DPRs could not be traced. As such designed IPC could not be sacertained. The IPC details as provided by project officials have been considered and indicated in the report.
7	Filled in schedules of Phase-I and Phase-Il should be parts of the reports.	The filled in schedule of Phase I and Phase II with relevant data are given as Annexure I and Annexure II in the report.
8	It is observed from initial 4 to 5 pages of the reports, the Agency is focussing on the Approach & Methodology etc rather than giving details of the project concerned. It would be better that these reports start by giving highlights on features of the project concerned along with agriculture & irrigation profiles of the districts/states being benefited by the project.	Project details including location, salient features, districts benefitted, command area map etc have been indicated in para 4 of the report.
9	It is noted that the most of the findings stated in the reports are based on the opinions taken from the State-Govts officials concerned instead of their own.	The findings are based on the field observations and discussions with various groups. The opinion of project officials was also considered while reporting.
10	Hydrologic analysis scenario may be carried out by collecting storage position of water for the five year under reference to correlate the same with the potential utilised and findings based thereon may be given.	The project is a run-off river project. The Potential utilized values were sought from project officials as per their records.

11	The Agency has reportedly met farmers but nothing has been pointed about their interactions/views in regard to potential utilized/working conditions in regard to availability of water to their fieids.The format devised by AFC for interaction with the farmers should be given.	Farmer's Interaction format has been given in Annexure-III. Outcome of discussions and interaction with the farmers has been considered while reporting. Broadly the farmers opined that timely adequate water is not available and the condition of distribution need improvement
12	It is observed that in some cases, the data of IPC & IPU at outlet level has been indicated as not maintained. In such cases, the Agency may be advised to give detail at least at Minor Level.	The canal is non functional since 2004 so there is no IPU data available since 2004.
13	The designed v/s actual cropping pattern should be given in the project command. The Agency may be advised to point out whether any change in the cropping patterns has occurred in the absence of nil/scanty rainfall (as stated in case of Fulzar-l project).	Designed cropping pattern is not available in the absence of DPR. Actual cropping pattern as provided by project officials on the basis of their records have been reported.
14	The Agency may be asked to give photographs of headworks/canal/distributary/minors wherever conditions are in dilapidated states.	Photographs are given in Para 8 of the report
15	Names of the two projects that were awarded later on to the Agency have not been mentioned correctly in draft reports of Sukla and Midnapur Canal (vide page 4 and page 3 respectively). These names should be (i) Sethiathope Anicut System and (ii) Mangalam.	Corrected on page No. 3. Error is regretted.
16	The general status of O&M of the project, funds being made available to the project authorities and expenditure being made may be provided.	Project officials reported that they are short of funds for O & M. Financial details not collected as per TOR
17	Abbreviations should be given in the beginning. Units in tables are missing.	As suggested, Symbols and Abbreviations have been given. Units in tables have been indicated appropriately.

18	Bed slope should be 1 in 500 instead of 500.	NA
19	Units in tables are missing.	Units in tables have been indicated appropriately.
20	The basis for naming the canals, distributaries, minors and outlets has not been given	The naming of canals, distributaries, minors and outlets have been done by project officials as per their own norms
21	Para-wise description of scope of work should be given.	The understanding of Scope of work by AFC and the brief details are given in para 2 of the report
	MIDNAPUR	
1	On page 15 and 59 CCA given is different. ii.	Typographic error has been corrected on page 11 and 71. Error regretted.
2	Cropping pattern is not given.	Canal network inoperative since 2004 so no dedicated cropping pattern is there in this project
3	It is not stated whether the river is perennial or not.	The river is perennial

भारत सरकार Government of India
केन्द्रीय जल आयोग Central Water Commission
परियोजना प्रबोधन संगठन Project Monitoring Organisation
आयोजना एवं प्रगति निदेशालय Planning and Progress Directorate
*****
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रामाकृष्णपुरम, नई दिल्ली - 110066 R.K. Puram, New Delhi-110066
फोन / फेक्स नं0. 011-26109425
इमेल: ppdtecwc@gmail.com, ppdte@nic.in

To,
G.S.Yadav
AFC India Ltd.
B-19, Community Centre,
Janakpuri, New Delhi-110058

This has reference to your submission of the draft reply of Fulzar-I, Sukla, Pairi and Midnapure projects. The said reports were discussed in the meeting of Monitoring Committee for Pilot Census and many short comings were observed. The same are annexed as Annexure I.

You are requested to kindly submit the draft final report accordingly.

एस. के. राजन
14/3/17
(एस. के. राजन)
निदेशक (आ0 एवं प्र0)

संलग्नक : यथोक्त

Annexure I

i. The report should give a detailed diagnostic of the canal network. Gap reporting needs to be done RD/Chainage wise in the complete network with specific reasons for the gap supported by Satellite imagery/ Google Earth. The gap should be clearly marked on T diagram in red and the T diagram should have all the attributes like structures, etc.As per Scope of Work, the Agency has to give Command Area Map including canals, Canal Network diagram with all attributes attached and types of canal structures marked along with chainage. The Agency may be therefore, advised to reflect all items as per scope of work agreed upon.

ii. The status of outlets needs to be clearly mentioned (dry or wet). This needs to be corroborated with farmers interaction.

iii. Details of constitution of the core team that went to the field along with the State govt officials with whom the meeting was conducted needs to be incorporated in the report along with photographs.

iv. The methodology to assess the IPU should be given.

v. Detailed command area map in Ao size clearly excluding the area/CCA being served by other Minor irrigation schemes within the command should be given.

vi. Designed IPC vs actual IPC achieved alongwith reasons should be given.

vii. Filled in schedules of Phase-I and Phase-II should be parts of the reports.

viii. It is observed from initial 4 to 5 pages of the reports, *the Agency is focussing on the Approach & Methodology etc rather than giving details of the project concerned.* It would be better that these reports start by giving highlights on features of the project concerned along with agriculture & irrigation profiles of the districts/states being benefited by the project.

ix. It is noted that the most of the findings stated in the reports are based on the opinions taken from the State-Govts officials concerned instead of their own.

x. Hydrologic analysis scenario may be carried out by collecting storage position of water for the five year under reference to correlate the same with the potential utilised and findings based thereon may be given.

xi. The Agency has reportedly met farmers but nothing has been pointed about their interactions/views in regard to potential utilized/working conditions in regard to availability of water to their fields.**The format devised by AFC for interaction with the farmers should be given.**

xii. It is observed that in some cases, the data of IPC & IPU at outlet level has been indicated as *not maintained.* In such cases, the Agency may be advised to give detail at least at Minor Level.

xiii. The designed v/s actual cropping pattern should be given in the project command. The Agency may be advised to point out whether any change in the cropping patterns has occurred in the absence of nil/scanty rainfall (as stated in case of Fulzar-I project).

xiv. The Agency may be asked to give photographs of headworks/canal/distributary/minors wherever conditions are in dilapidated states.

xv. Names of the two projects that were awarded later on to the Agency have not been mentioned correctly in draft reports of Sukla and Midnapur Canal (vide page 4 and page 3 respectively). These names should be (i) Sethiathope Anicut System and (ii) Mangalam.

xvi. The general status of O&M of the project, funds being made available to the project authorities and expenditure being made may be provided.
xvii. Abbreviations should be given in the beginning.
xviii. Bed slope should be 1 in 500 instead of 500.
xix. Units in tables are missing.
xx. The basis for naming the canals, distributaries, minors and outlets has not been given.
xxi. Para-wise description of scope of work should be given.

Fulzar I

i. Storage position of the reservoir for the year in which maximum IPU was achieved should be given.
ii. In the column of location, what is the meaning of B.
iii. How volumetric measurement has been done for ungated outlets.

Midnapore

i. On page 15 and 59 CCA given is different.
ii. Cropping pattern is not given.
iii. It is not stated whether the river is perennial or not.

Besides, you are also requested to do the verification of the data presented after carrying out the necessary arithmetical checks in Block No 7 of Phase I of the Schedule so that it is ensured that the data presented are internally consistent. This is required for payment of submission of data for Phase I.