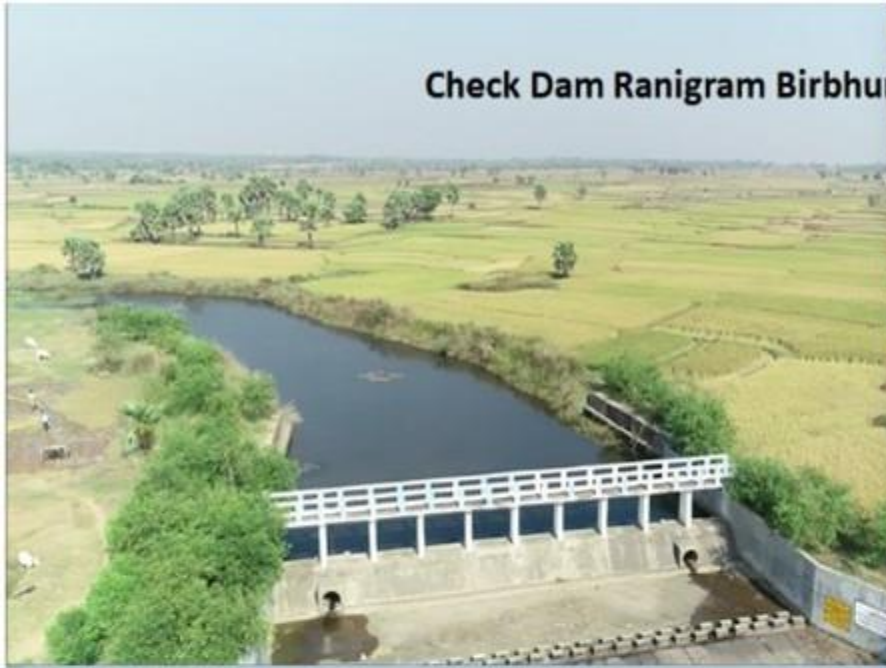


Check Dam Ranigram Birbhum



Solar Dug Well



Hapa



Water Detention Structure



Minor Irrigation Schemes

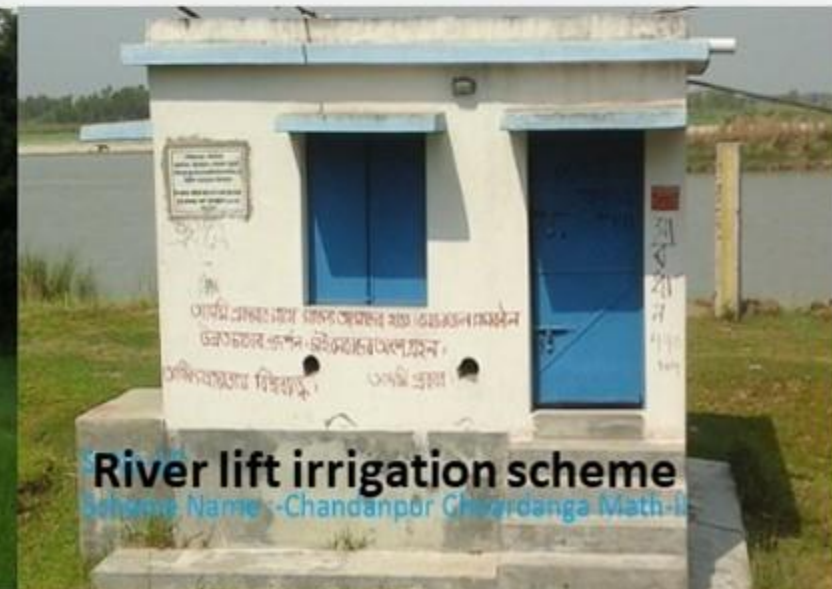
Water Detention Structure



Tube Well



River lift irrigation scheme



WBADMI Project

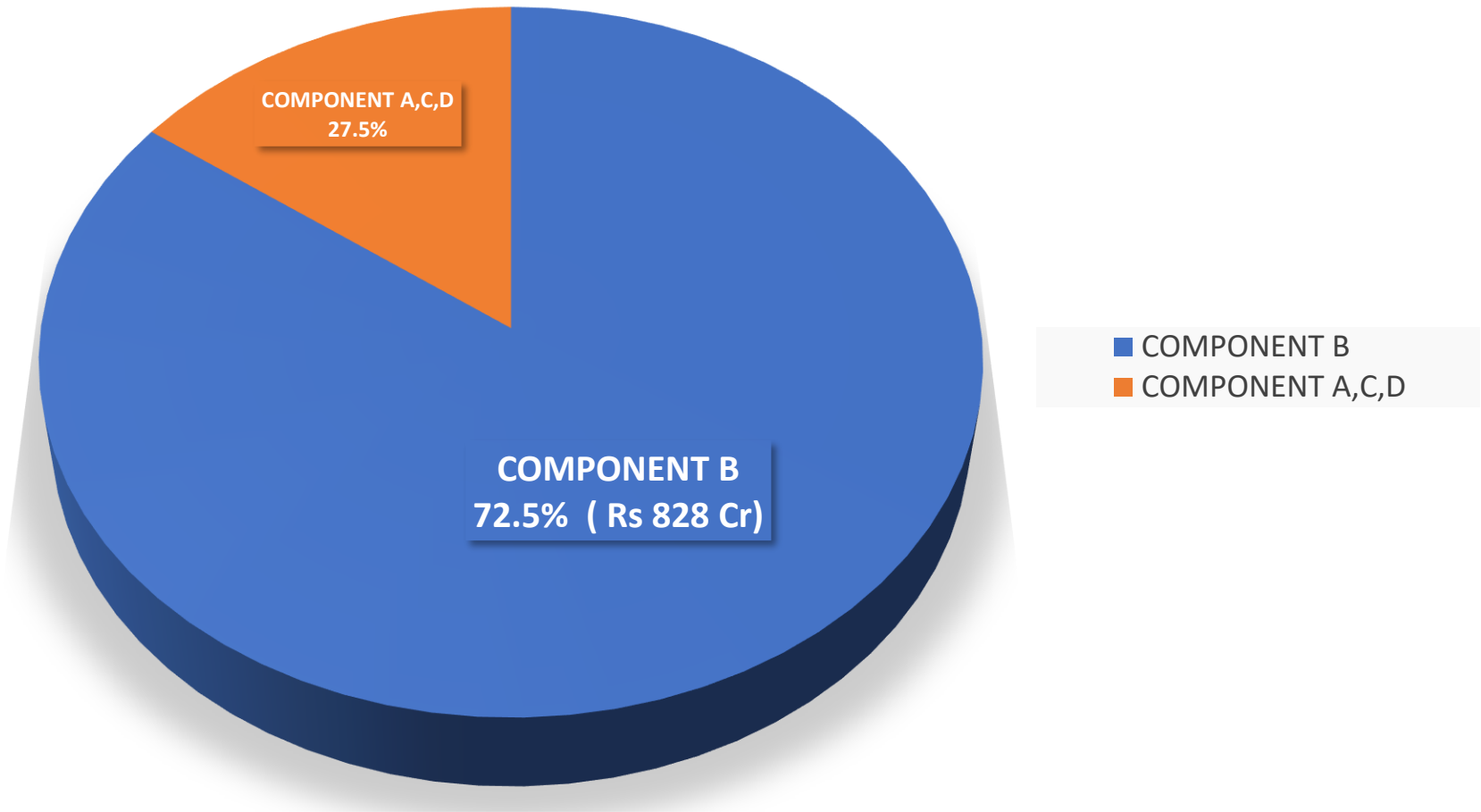
IRRIGATION SYSTEM DEVELOPMENT [Component-B]

Target, achievements, learnings and Way forward



COMPONENET B

Irrigation System Development



COMPONENT B- IRRIGATION SYSTEM DEVELOPMENT

The aims of this component are

1. To improve availability of water for agriculture and fisheries in areas currently cultivated under **rainfed** conditions.
2. The activities of this component include **construction of about 3274 no minor irrigation systems** (command area varying from 1.5 to 100 ha),
3. It comprising **Check dams, river lift schemes and Water detention structures**, and construction of **Tube well and Pump Dug wells**.
4. The total area to be developed under the project is about **44652 ha**, benefiting an estimated **1,00,000** farm families.

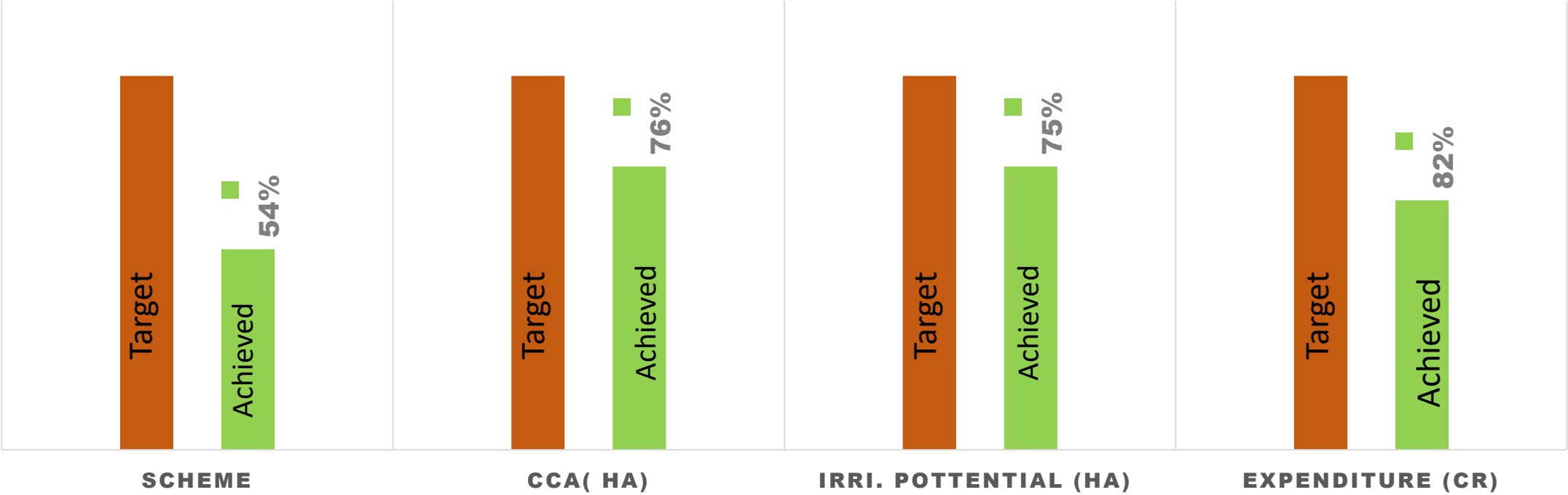
OVER ALL ACHIEVEMENT

Schemes approved	:: 3,274 No
Schemes handed Over	:: 1,756 No
Targeted CCA to be Developed	:: 44,652 Ha
CCA Already Achieved	:: 34,910 Ha
Total Targeted Expenditure	:: Rs 828 Crore
Total Expenditure Achieved	:: Rs 683 Crore

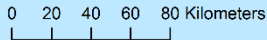
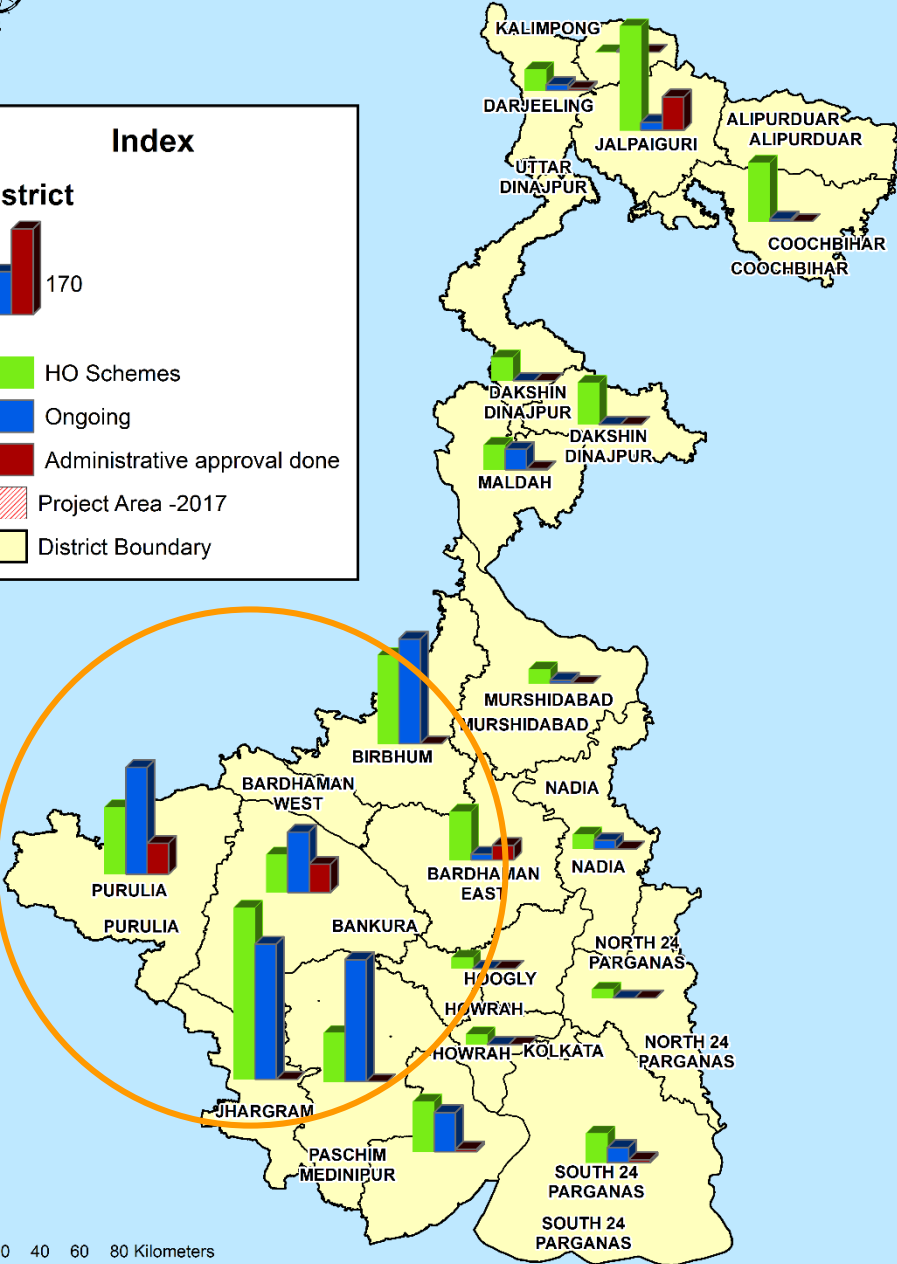
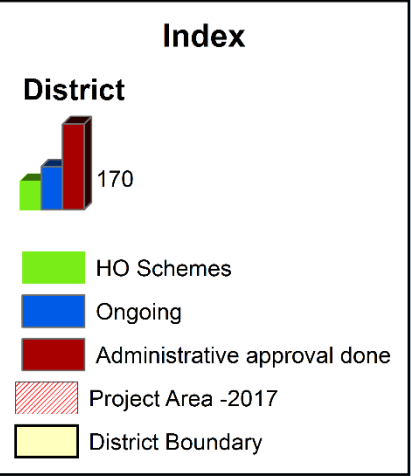
AT A GLANCE TARGET VS ACHIVEMENT

AS ON 10TH SEPTEMBER 2019

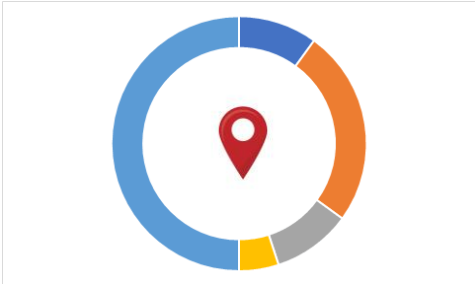
Target Achievement



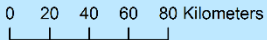
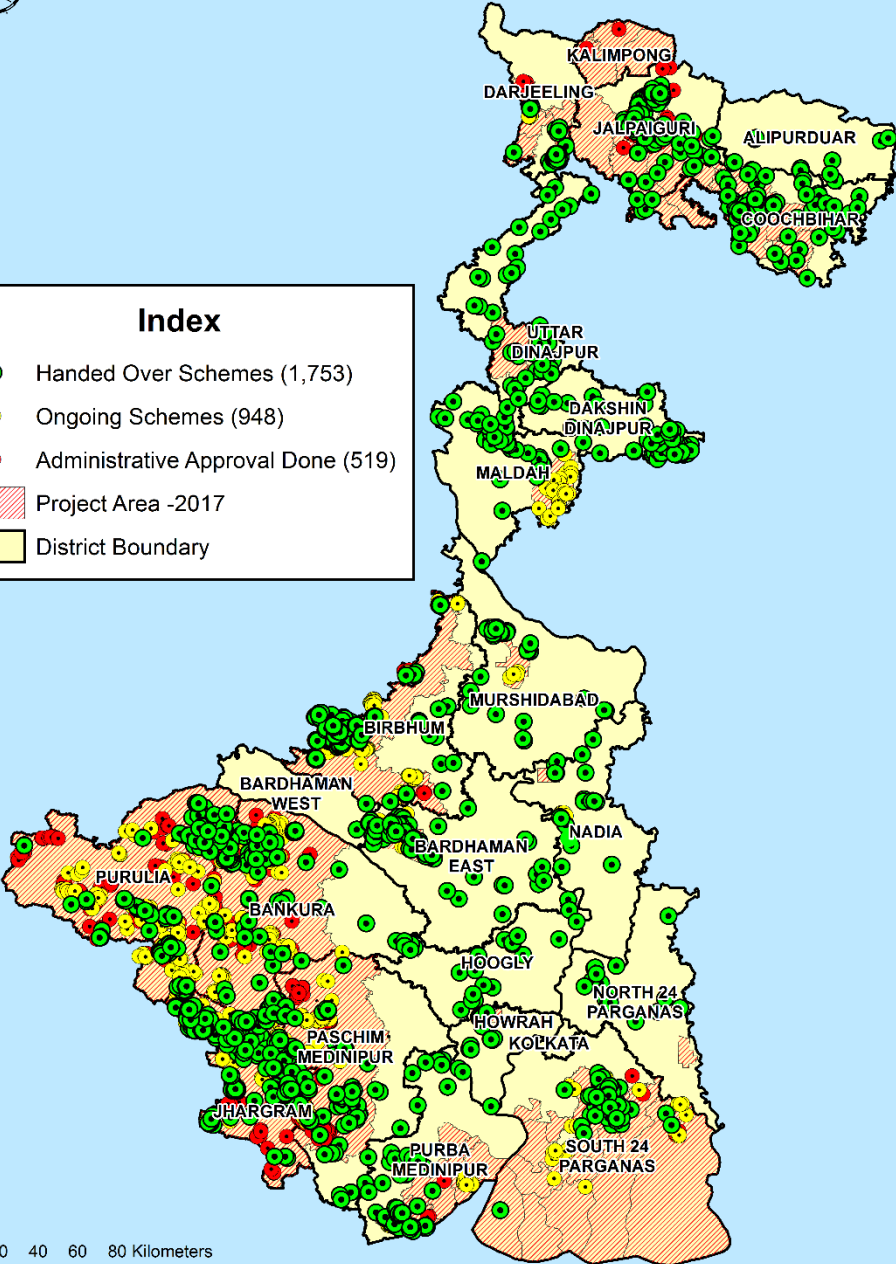
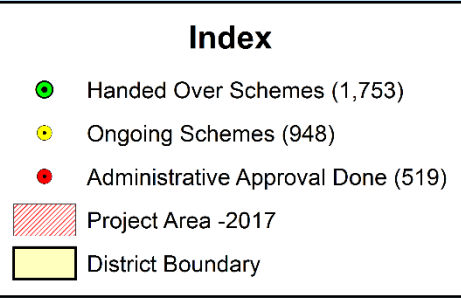
WBADMI PROJECT : CURRENT SCHEME STATUS
As on 30.08.2019



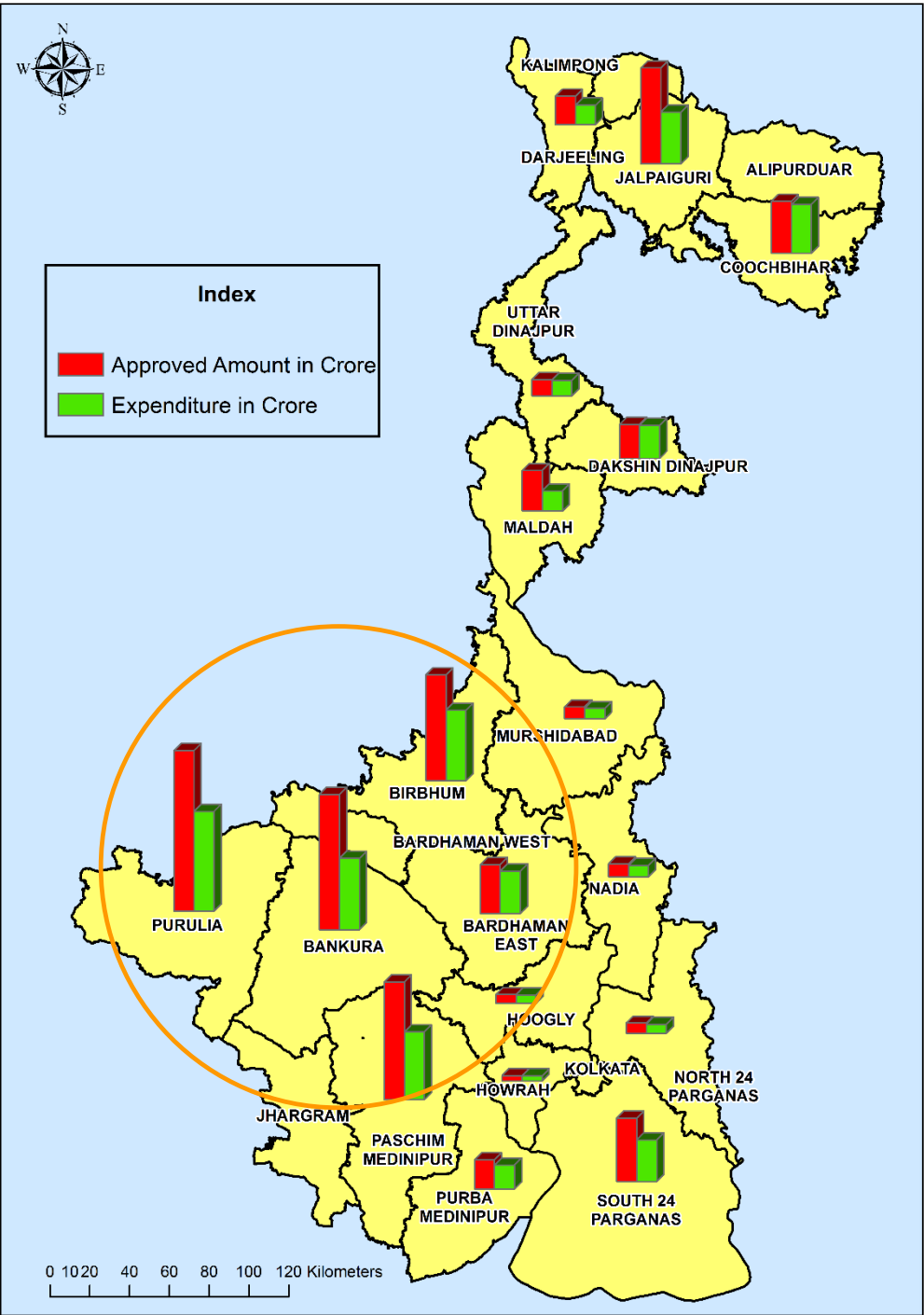
Physical status and
Locations of
schemes



WBADMI PROJECT : CURRENT SCHEME STATUS
As on 30.08.2019

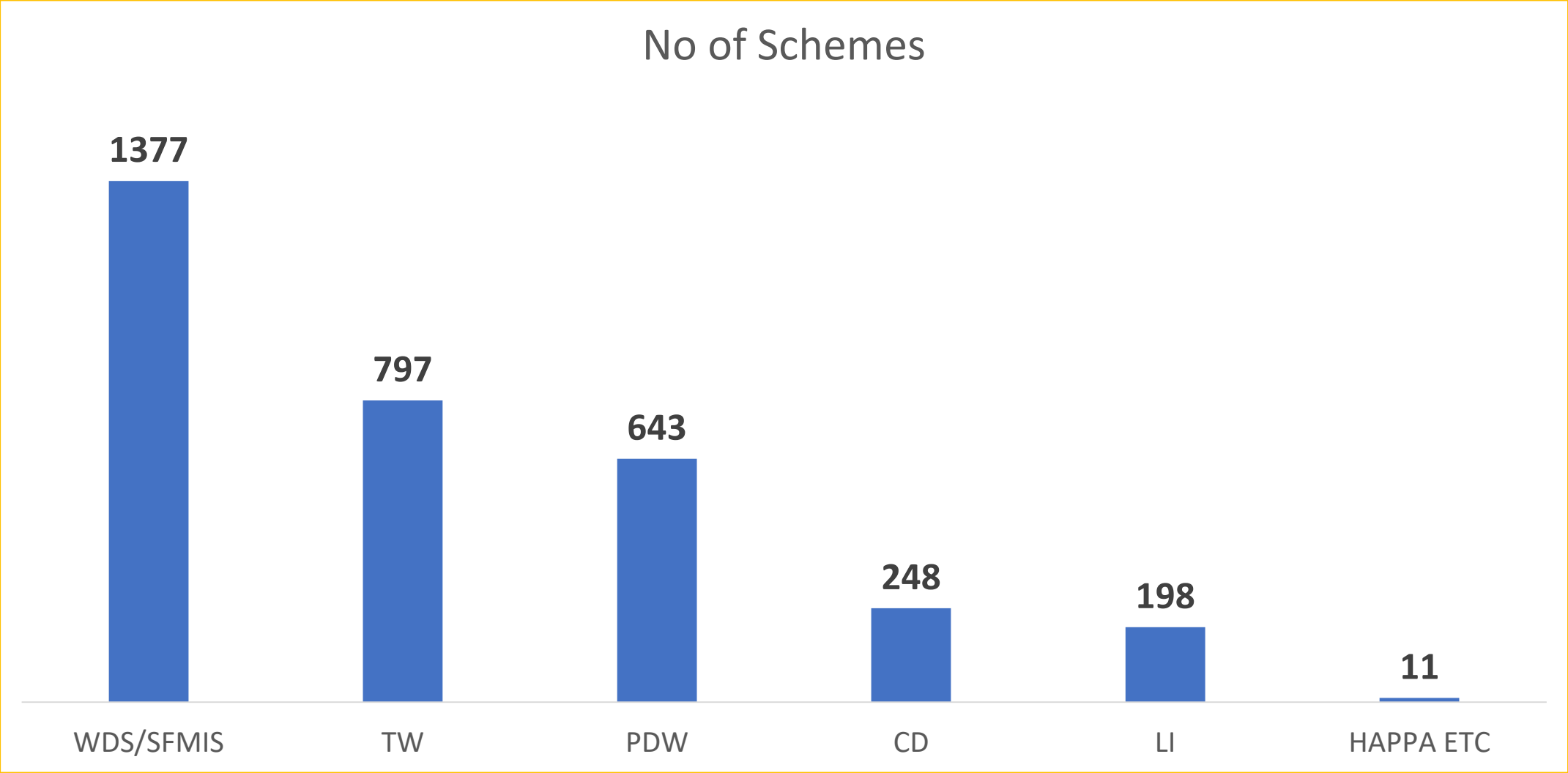


EXPENDITURE WISE DISTRICT PERFORMANCE

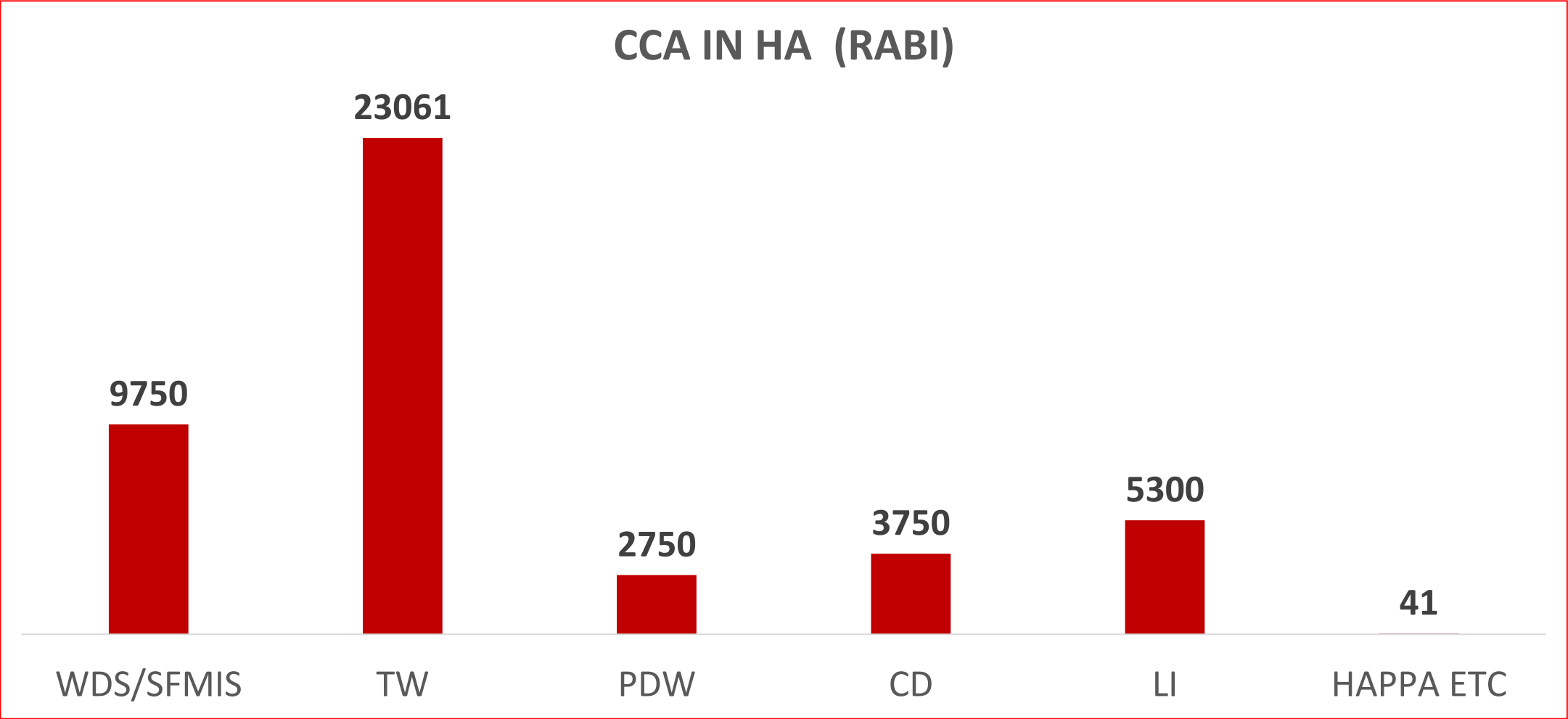


DISTRICT	Administrative Approval Amount (in Crore Rs.)	Expenditure (in Crore Rs.)
BANKURA	134.44	70.90
BIRBHUM	105.26	70.22
BARDHAMAN PURBA	48.41	42.23
COOCHBEHAR	51.39	48.22
DAKSHIN DINAJPUR	33.69	32.76
DARJEELING	28.01	19.31
HOOGLY	8.93	8.42
HOWRAH	5.33	5.14
JALPAIGURI	95.40	51.61
MALDAH	40.49	20.19
MURSHIDABAD	11.83	10.22
NADIA	12.51	11.13
NORTH 24 PARGANAS	10.07	8.88
PASCHIM MEDINIPUR & JHARGRAM	116.99	67.44
PURBA MEDINIPUR	28.95	23.81
PURULIA	159.54	99.29
SOUTH 24 PARGANAS	62.99	41.45
UTTAR DINAJPUR	15.86	15.43

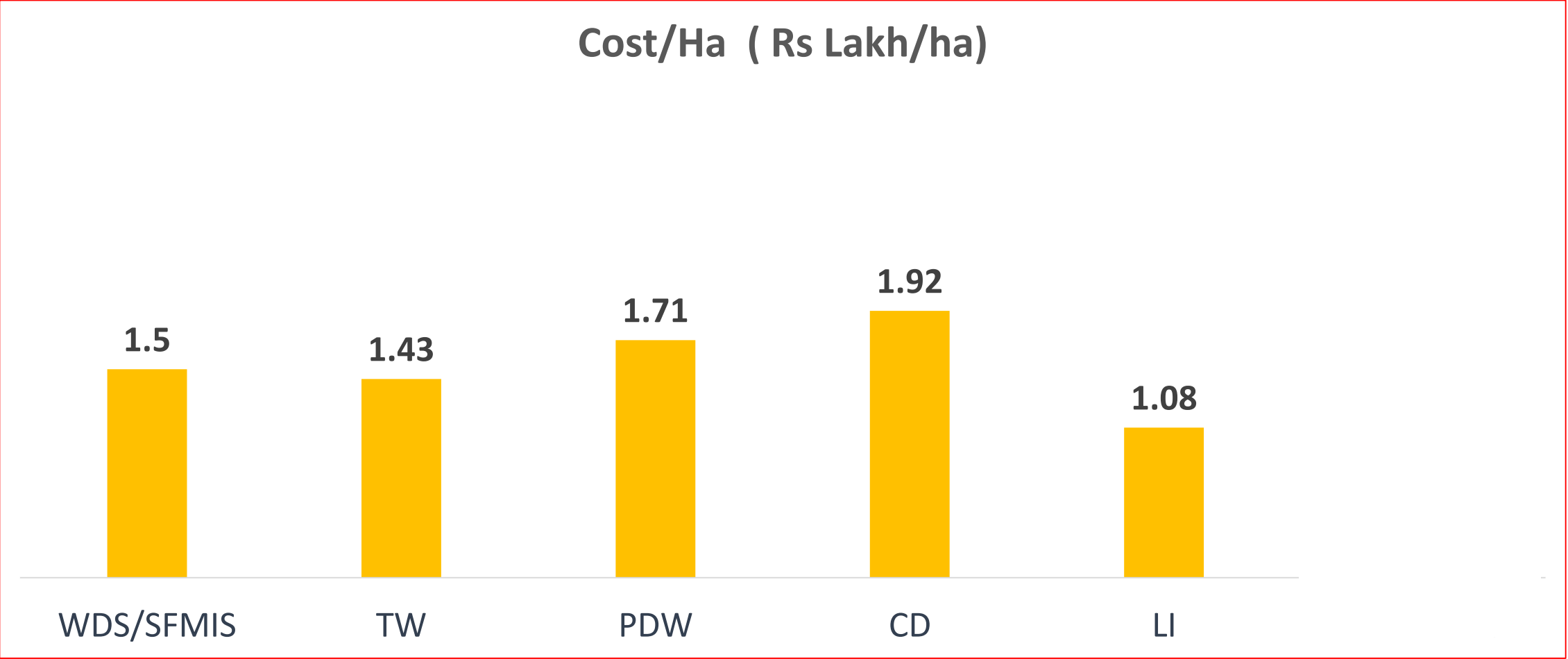
NUMBERS TAKEN FOR EACH TYPE OF SCHEME



RABI CCA FOR EACH TYPE OF SCHEME

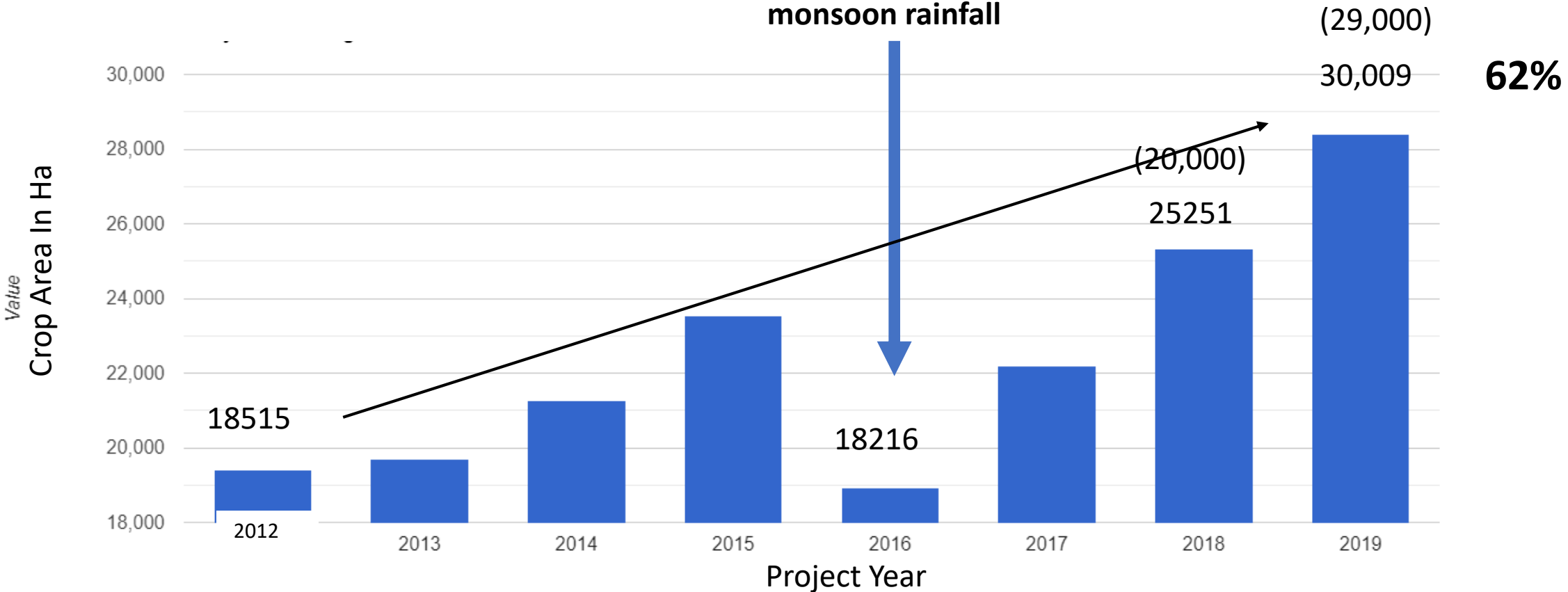


COSTING OF DIFFERENT TYPES OF IRRIGATION SCHEMES

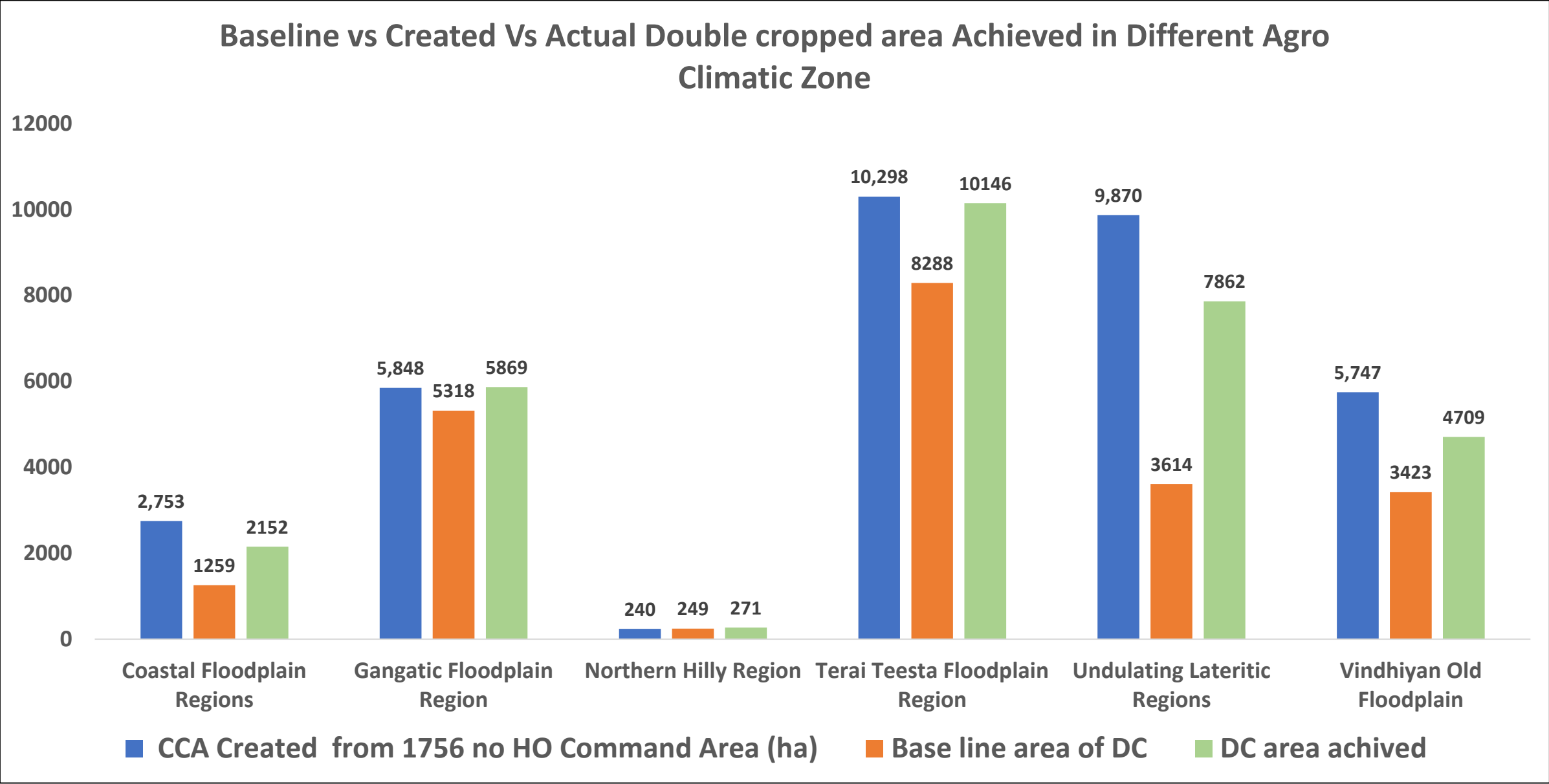


ACTUAL GROWTH OF CROPPED AREA SINCE INCEPTION OF THE PROJECT [2012 TO 2019] IN RABI AND PREKHARIF SEASON (on field)

Fall of crop area due to shortage of monsoon rainfall



Note: Obtained through remote sensing analysis on google earth engine

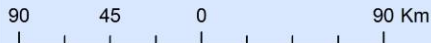
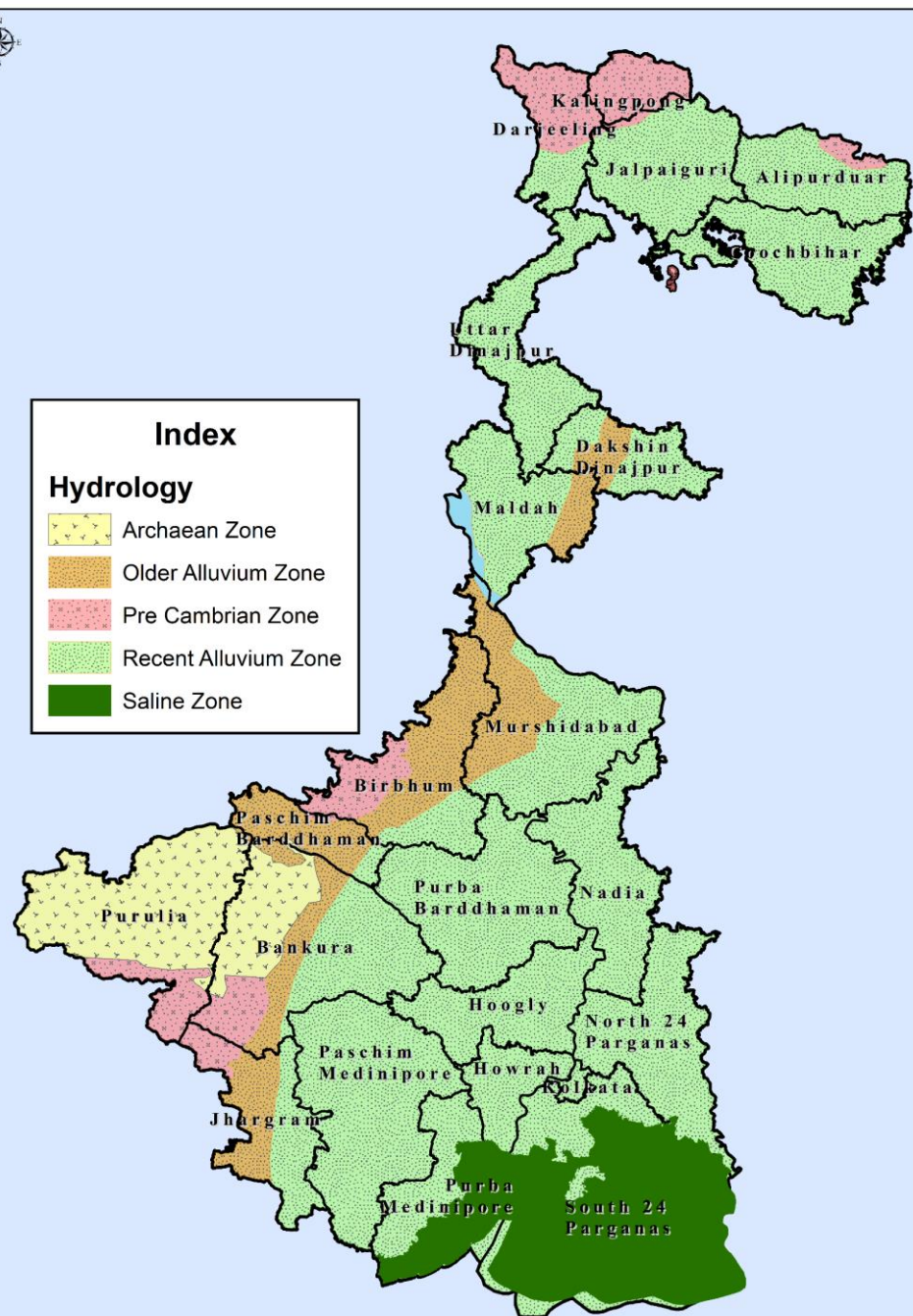
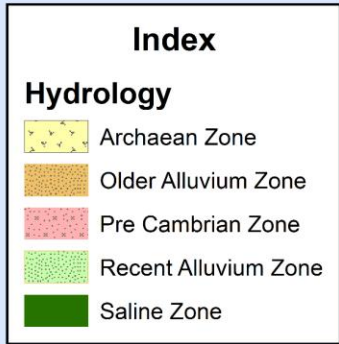
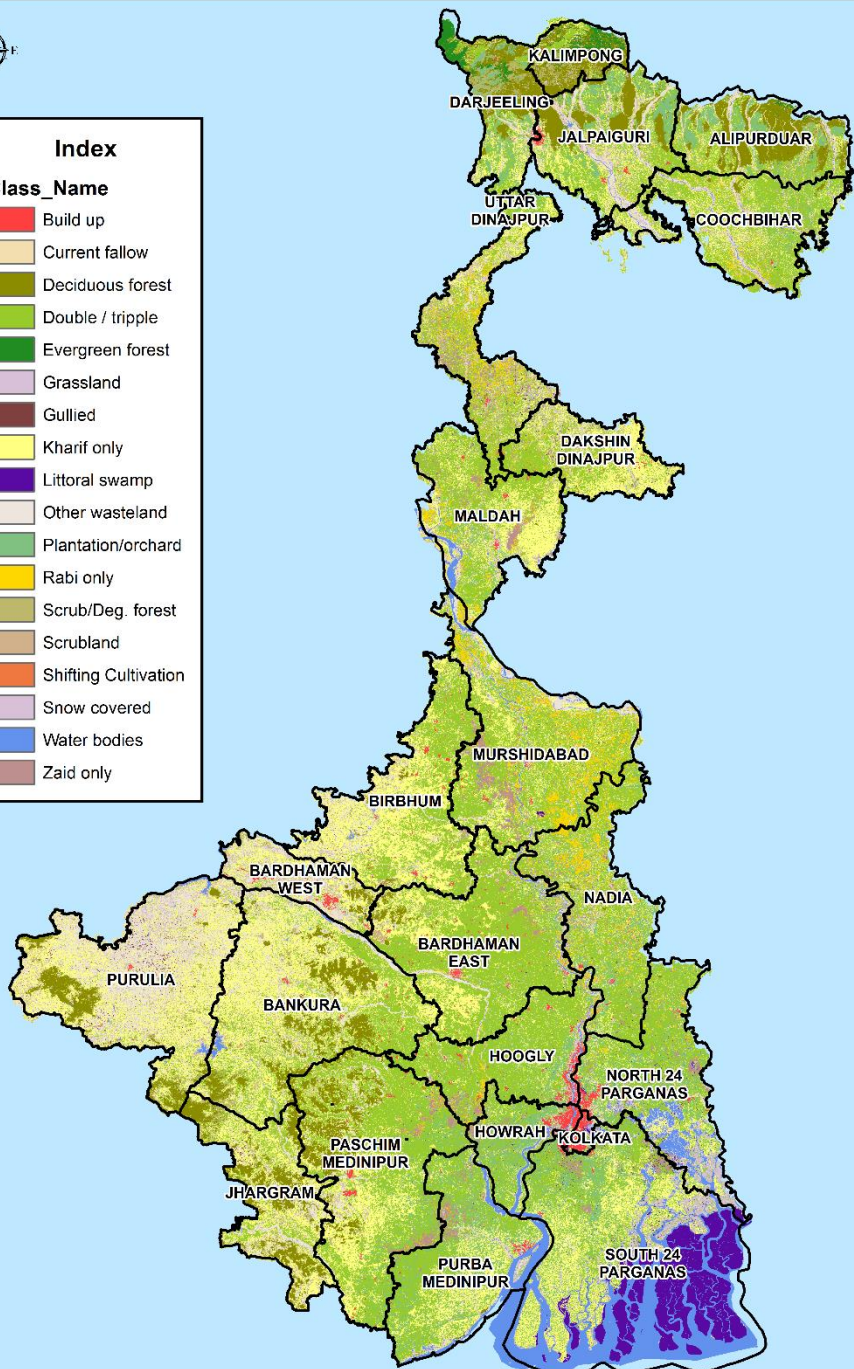


IRRIGATION SYSTEM DEVELOPMENT-summary

Structure Type	Sources of water	Numbers approved	Total cost in Rs Crores	CCA (Rabi)	CCA (Kharif)	Cost / ha in Lakh	Concentration
WDS, SFMIS, including Creek rejuvenation	Surface water / Run-off water	1377	293	9750	19500	1.50	Lateritic district , Coastal districts
Check dam	Surface water / Run-off water	248	216	3750	11250	1.92	Lateritic districts
River Lift Irrigation [Electric]	Surface water (river)	198	54	5300	5300	1.08	All perennial river flowing areas
Tube well [Electric , Solar]	Ground water	797	331	23061	23061	1.43	alluvium zone
Pump Dug well [Electric , solar]	Ground water	643	75	2750	4375	1.71	Alluvium and lateritic zone
Others (Hapa/Sprinkler)	Various	11	1.5	41	51	2.94	
Total		3274	970.87	44652	63537	1.52	

UNDERSTANDING DEPTH AND COMPLEXITY OF DIFFERENT TYPES OF MINOR IRRIGATION STRUCTURE DEVELOPED AND THEIR LOCATIONS IN WBADMIP PROJECT (2012-2019)



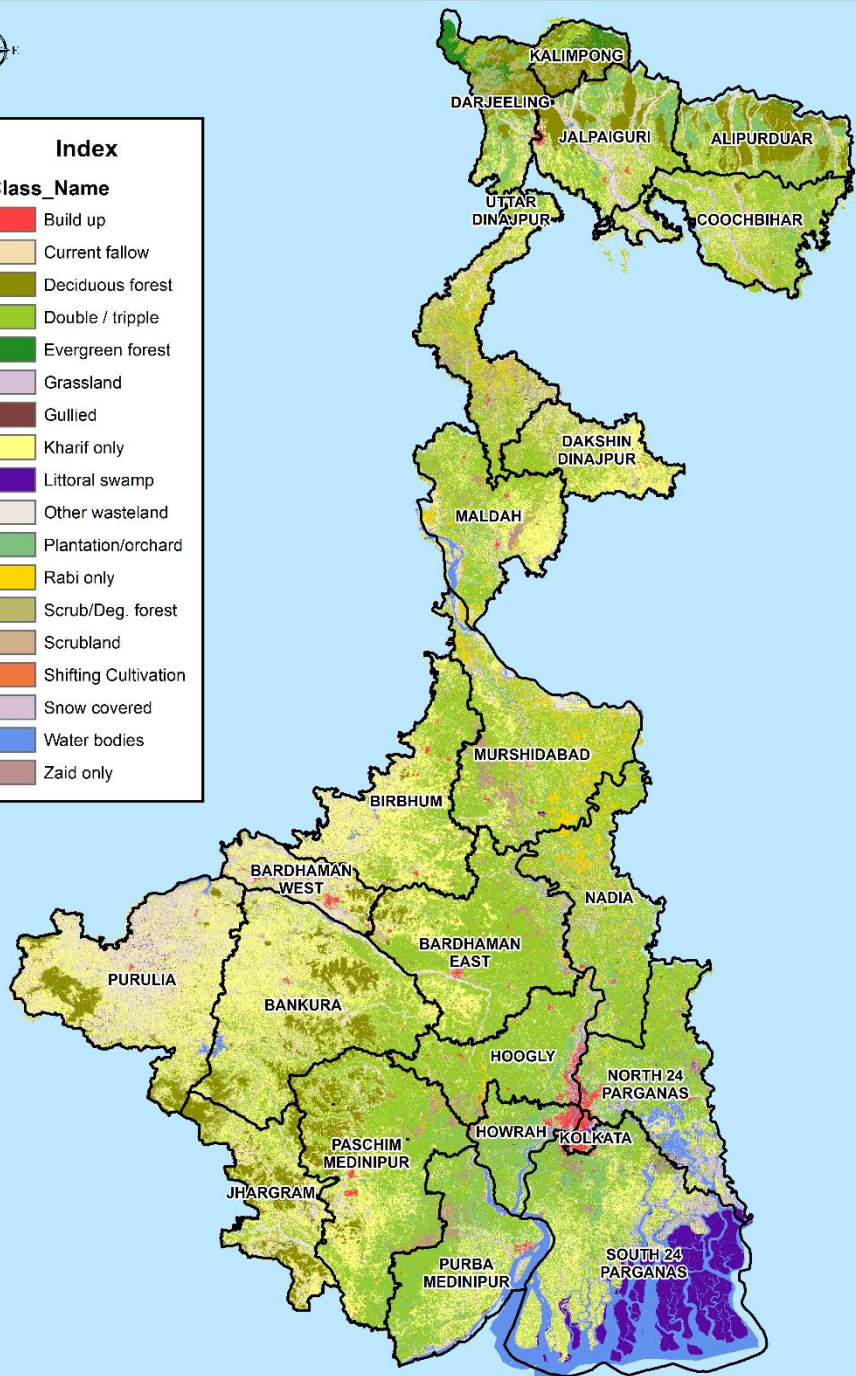




Index

Class_Name

- Build up
- Current fallow
- Deciduous forest
- Double / tripple
- Evergreen forest
- Grassland
- Gullied
- Kharif only
- Littoral swamp
- Other wasteland
- Plantation/orchard
- Rabi only
- Scrub/Deg. forest
- Scrubland
- Shifting Cultivation
- Snow covered
- Water bodies
- Zaid only

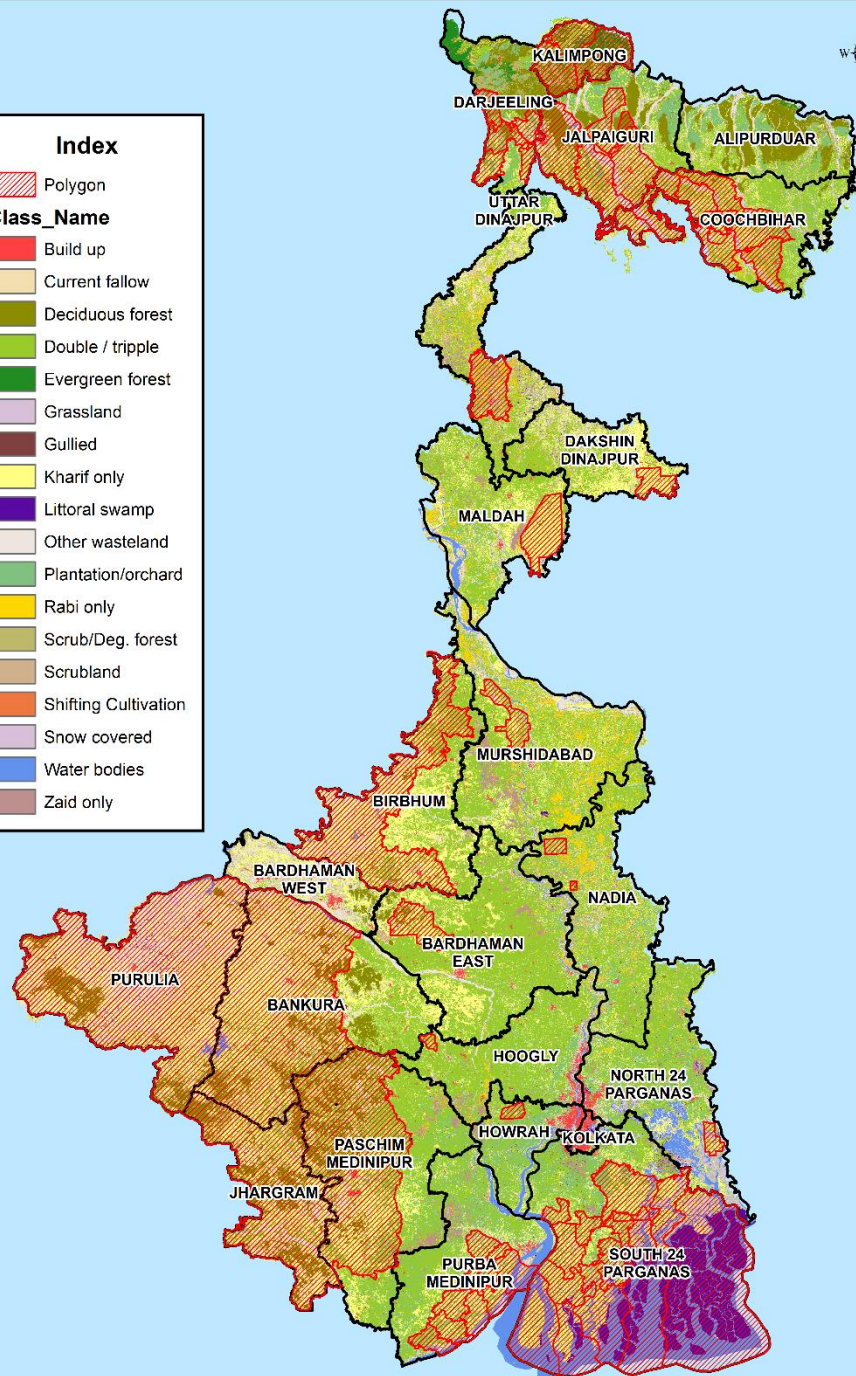


P

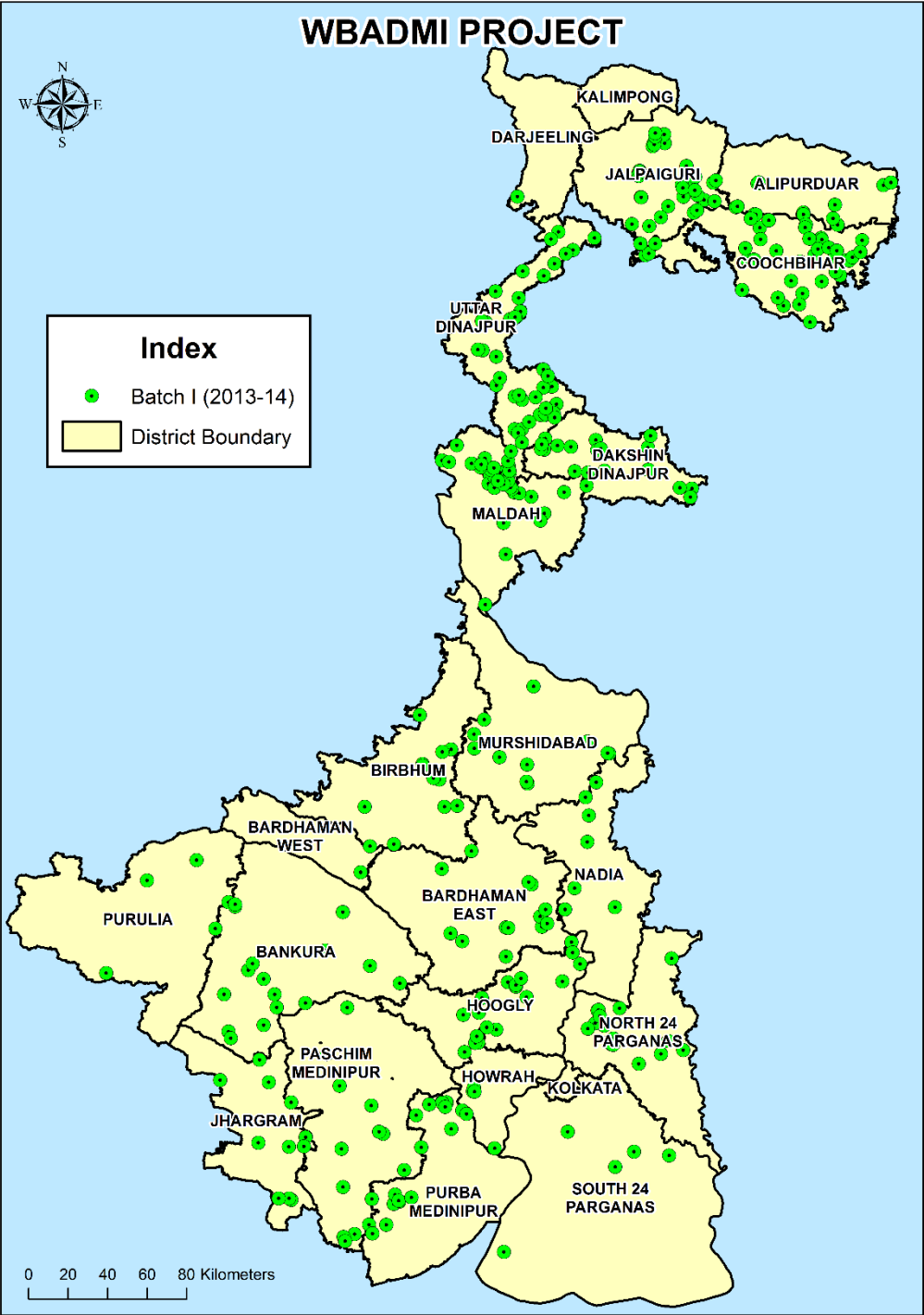
Index

Class_Name

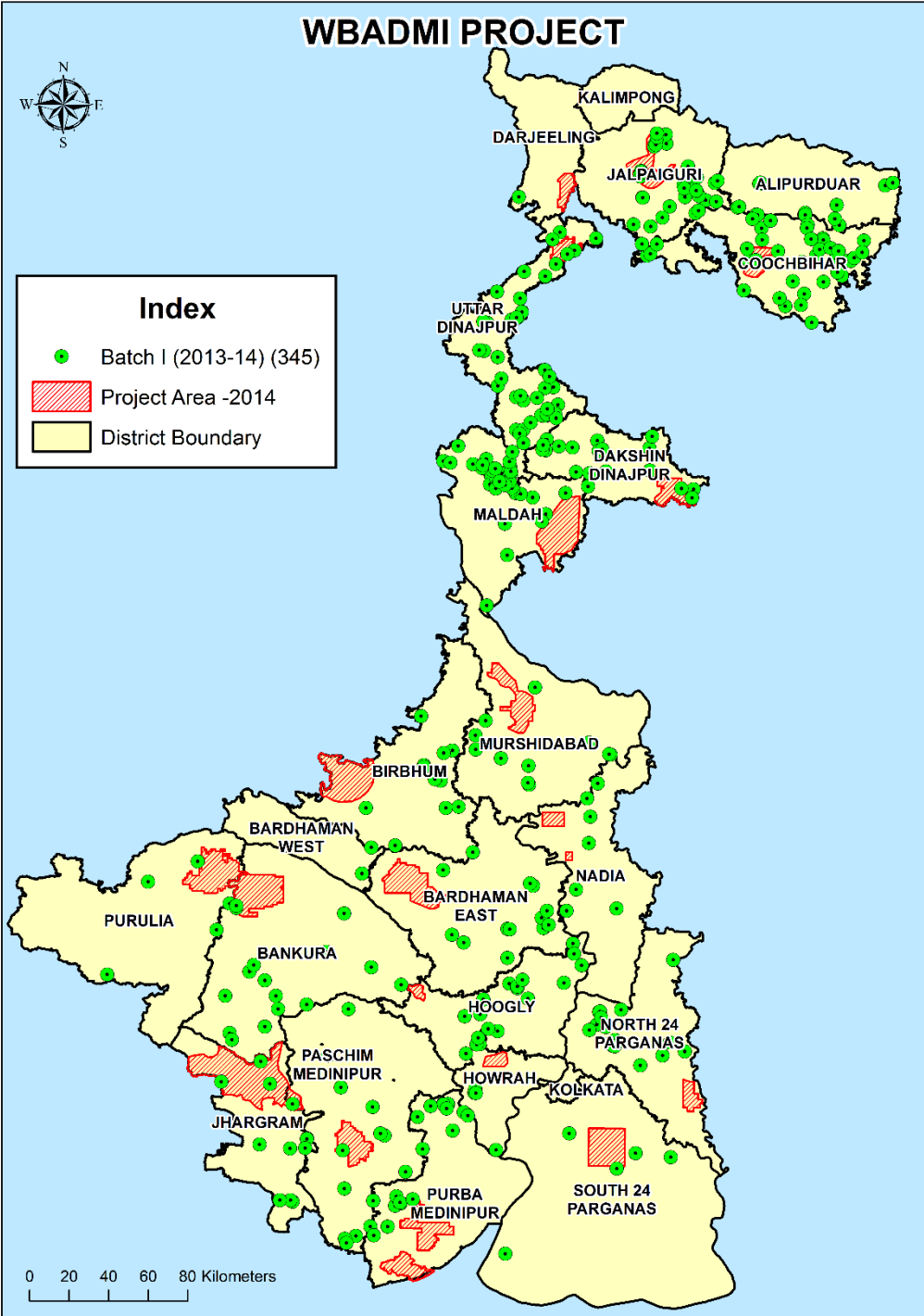
- Polygon
- Build up
- Current fallow
- Deciduous forest
- Double / tripple
- Evergreen forest
- Grassland
- Gullied
- Kharif only
- Littoral swamp
- Other wasteland
- Plantation/orchard
- Rabi only
- Scrub/Deg. forest
- Scrubland
- Shifting Cultivation
- Snow covered
- Water bodies
- Zaid only



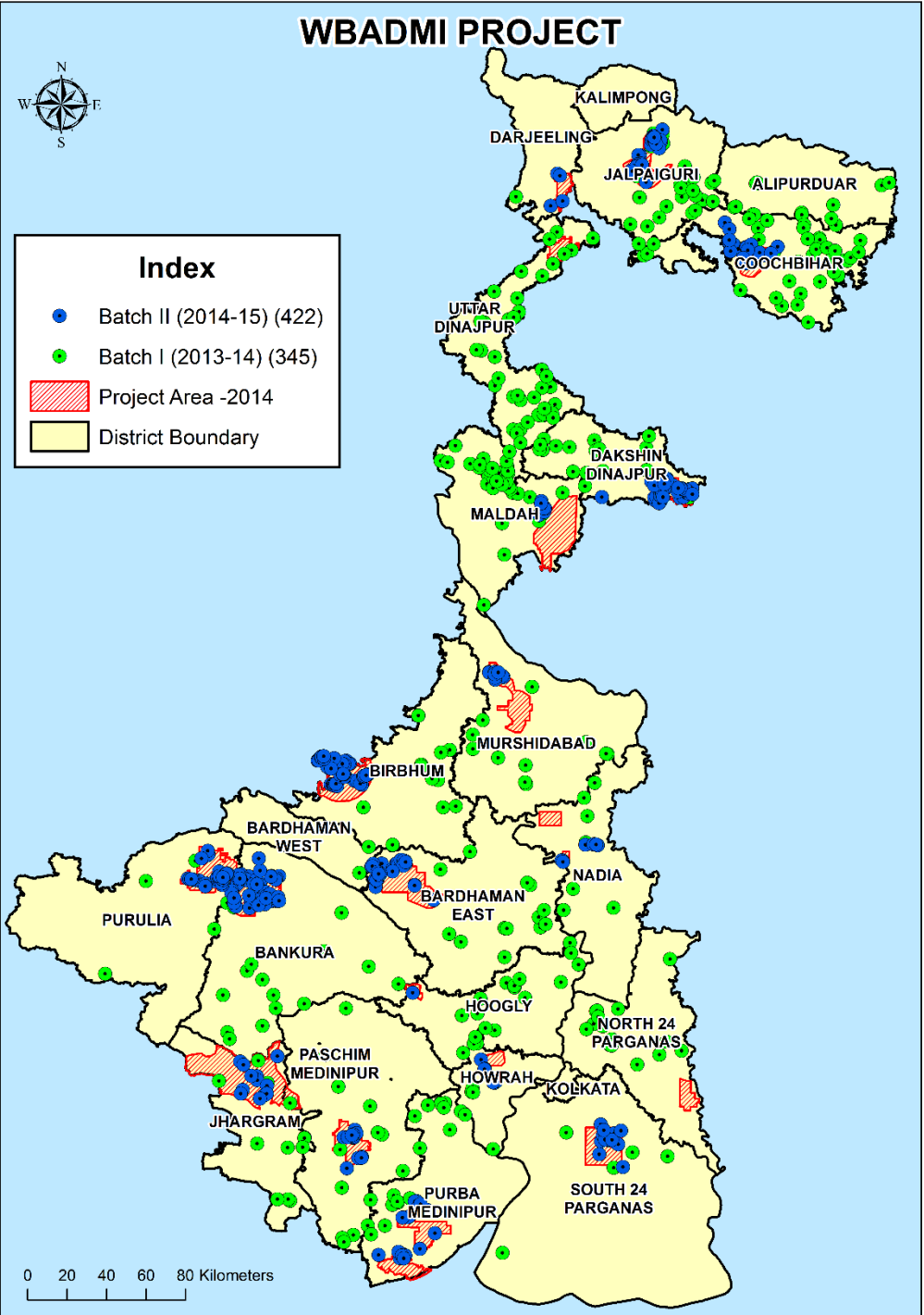
BATCH – I
(2012-2014)



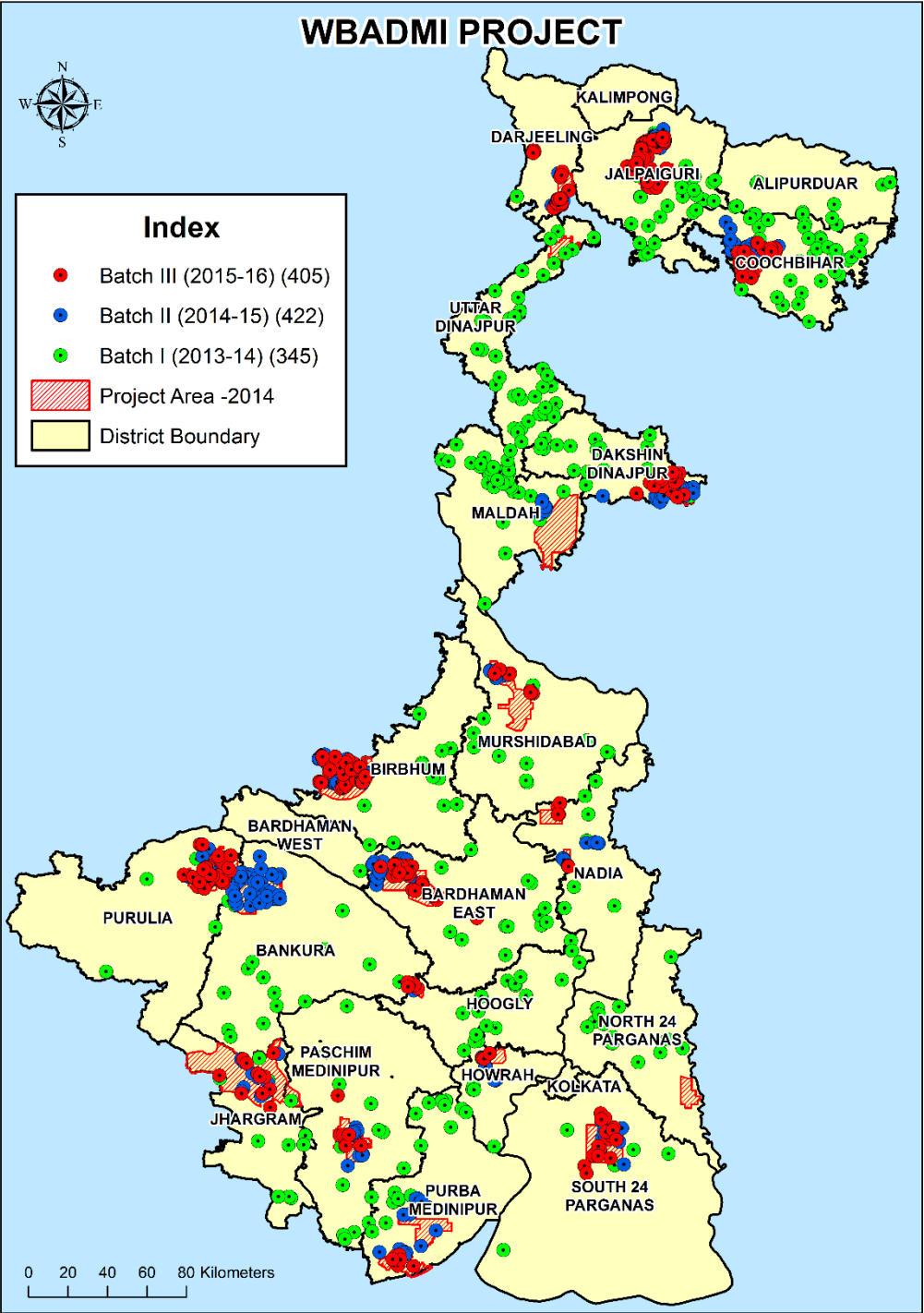
INTRODUCING TARGET
AREA AS POLYGON
(2014-2015)



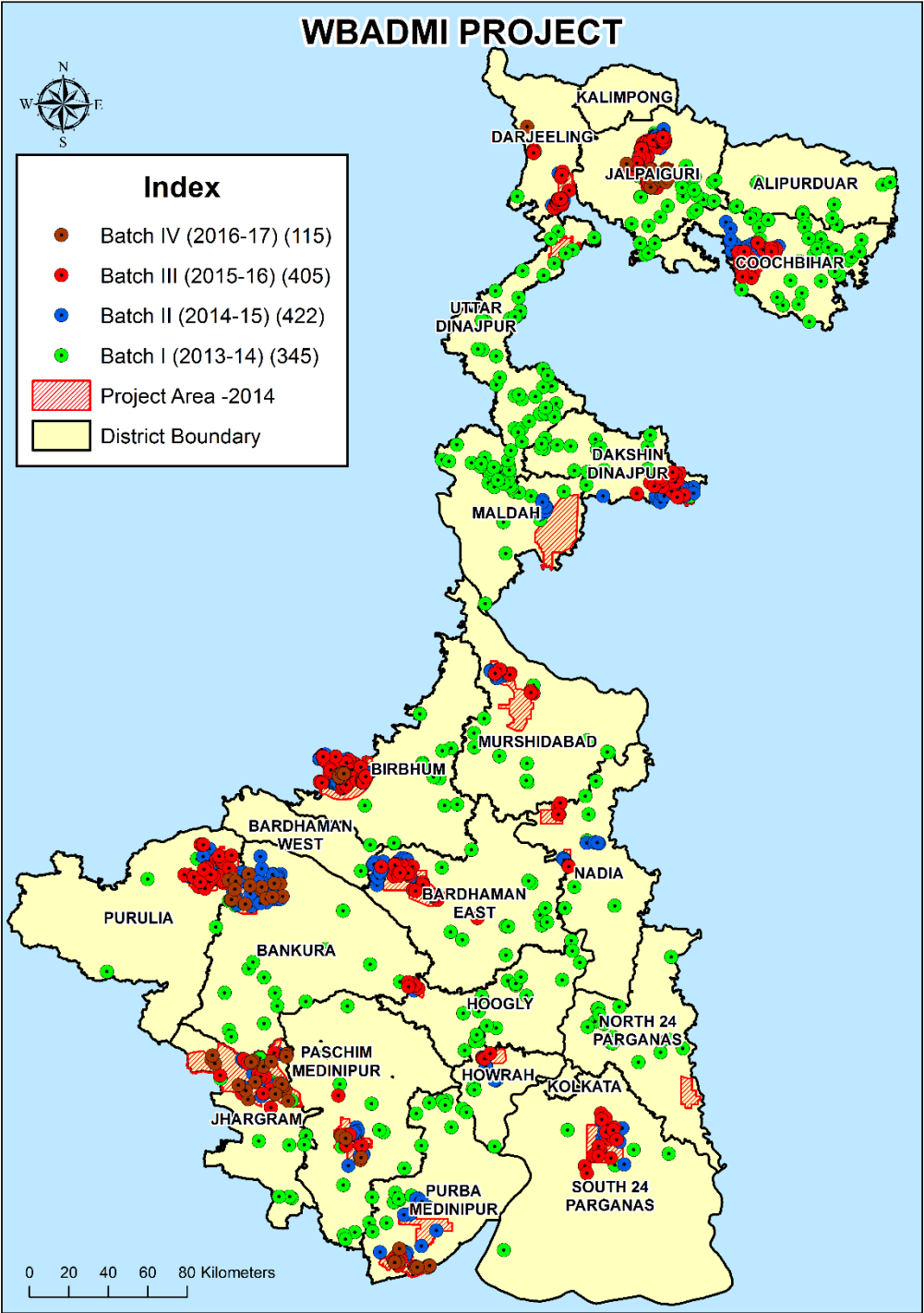
BATCH – II
(2014-2015)



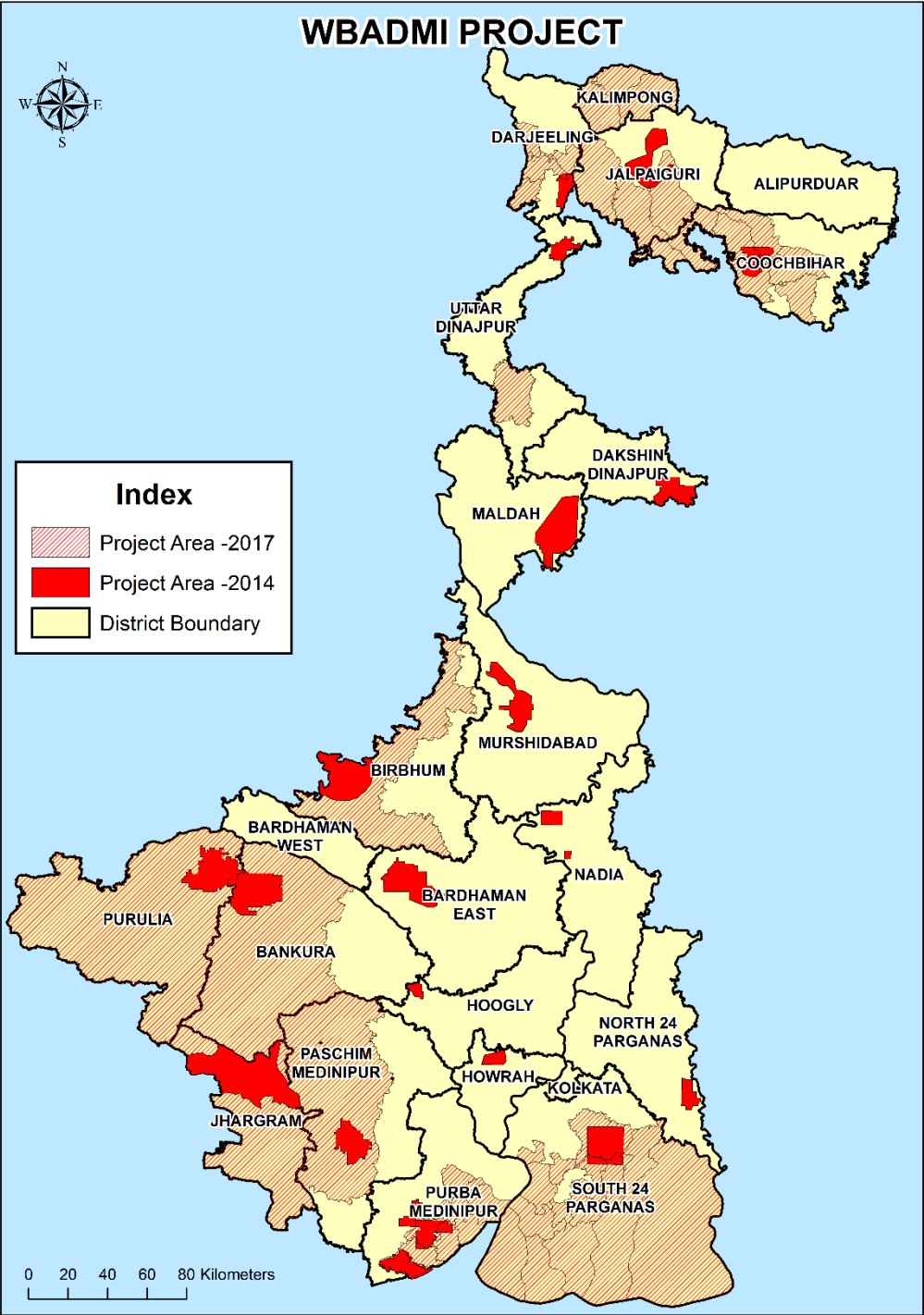
BATCH – III
(2015-2016)



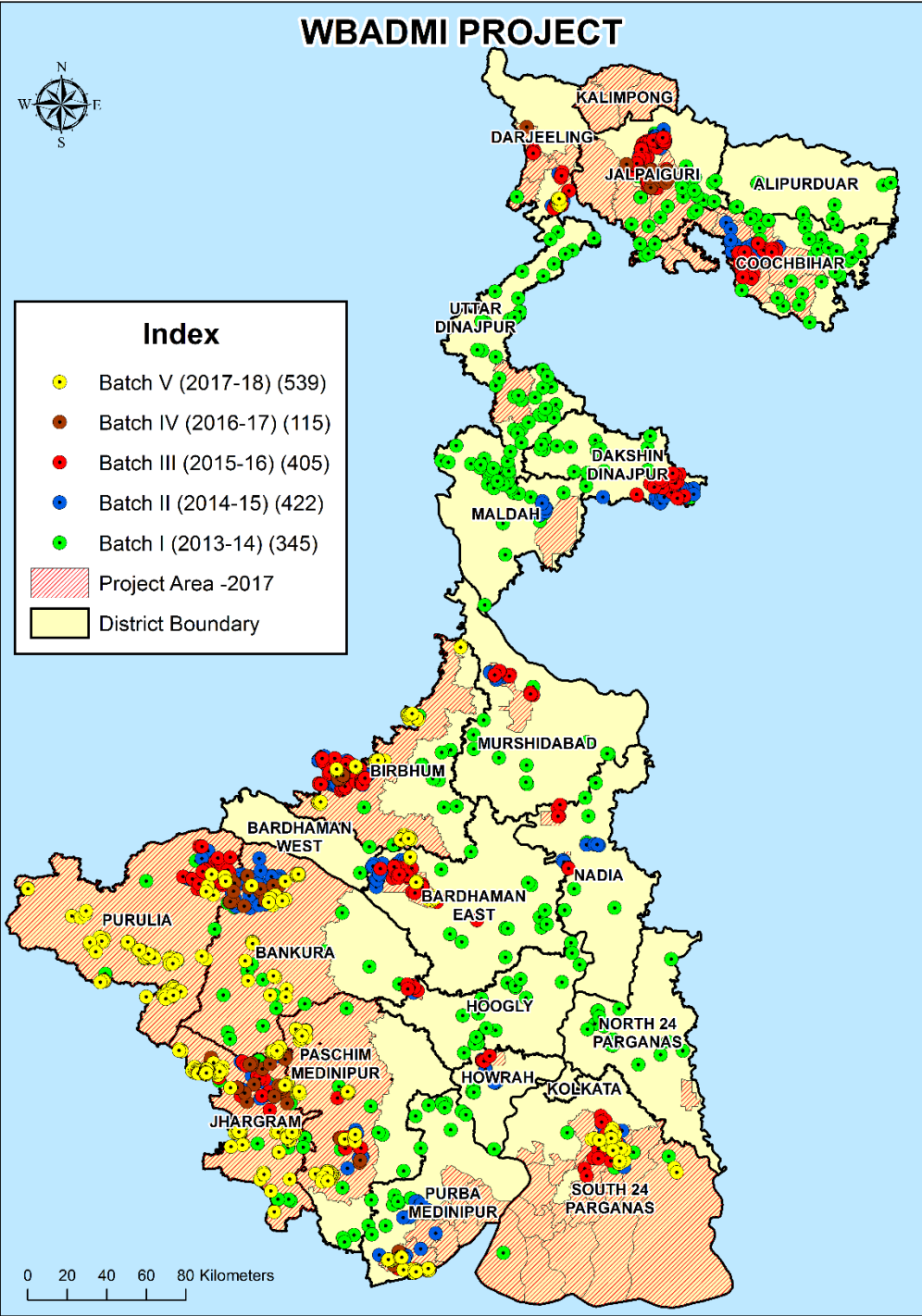
BATCH – IV
(2016-2017)



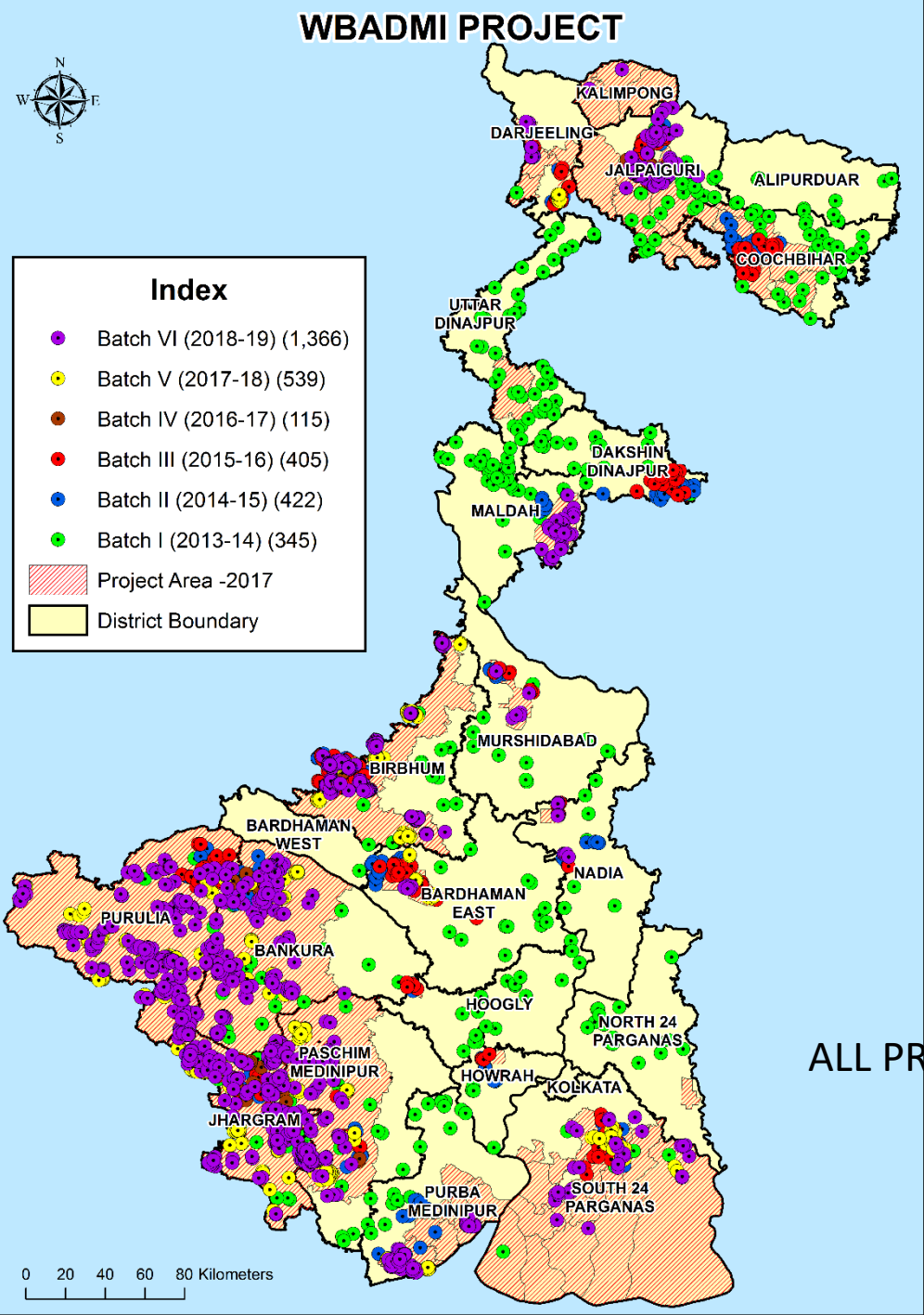
EXPANSION OF
PROJECT AREAS
(2017-2018)



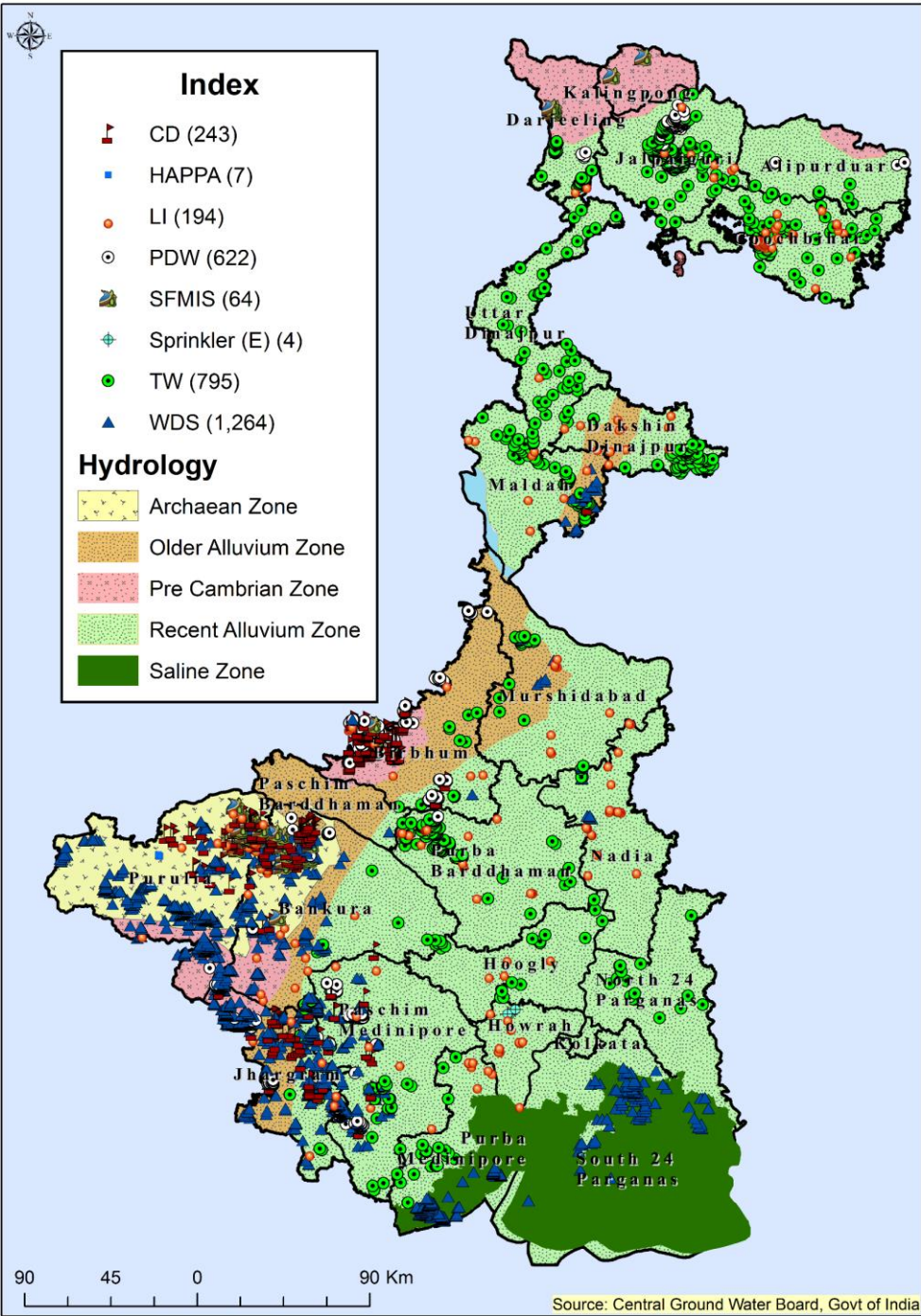
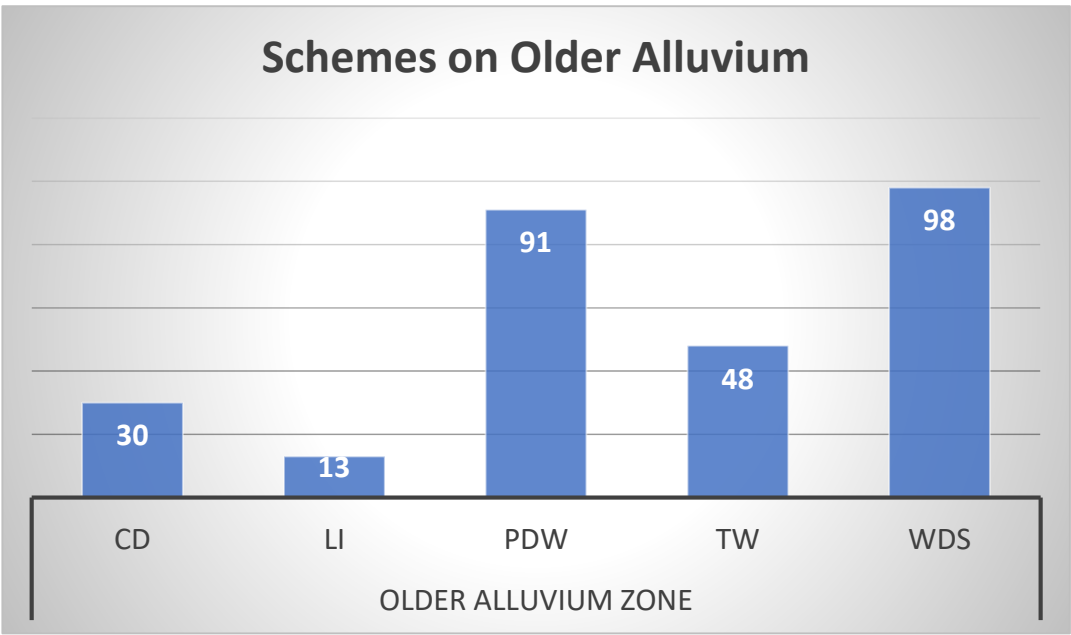
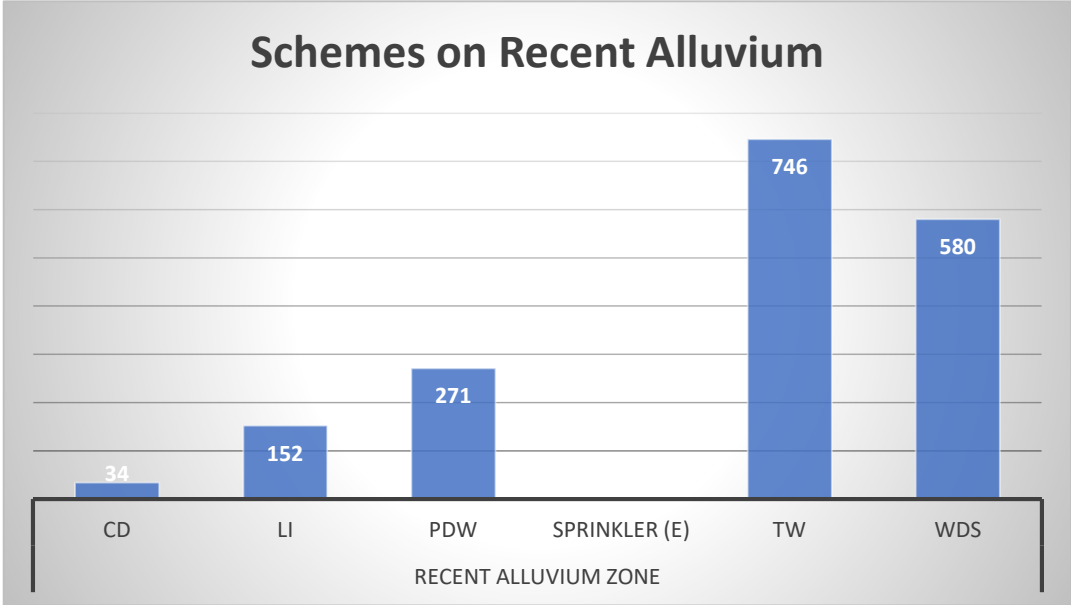
BATCH – V
(2017-2018)



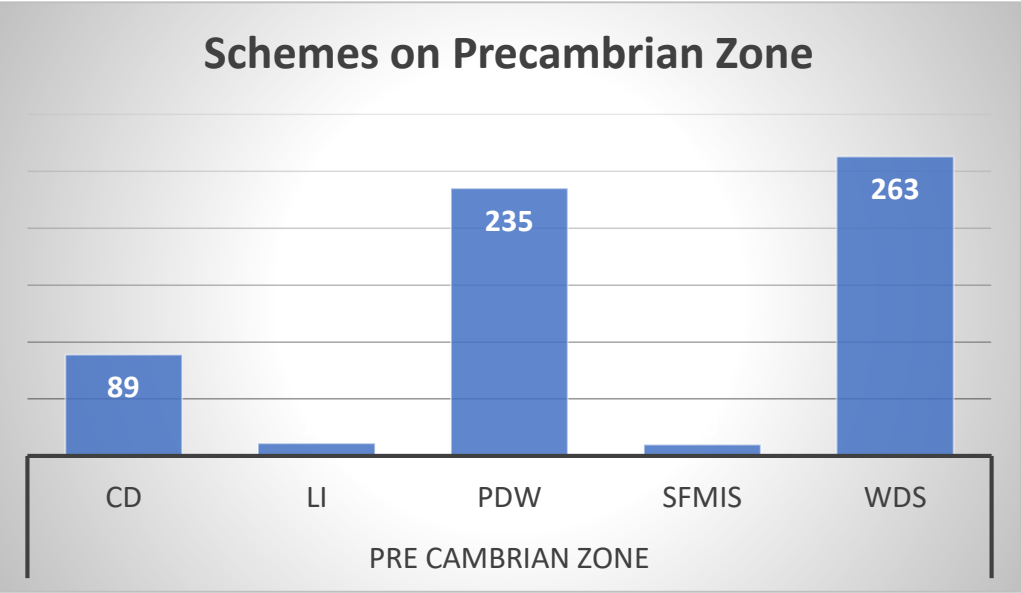
BATCH – V1
(2018-2019)



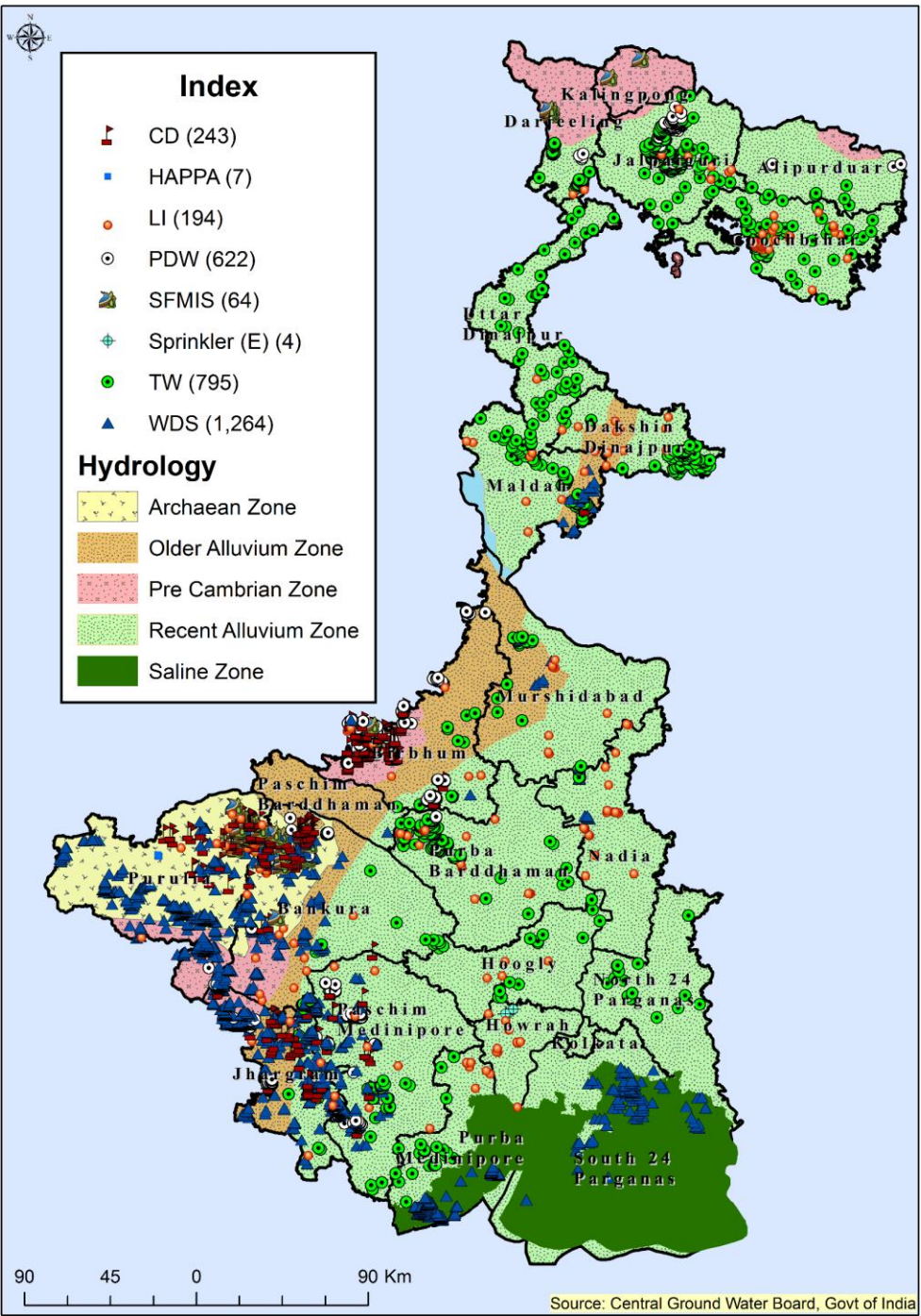
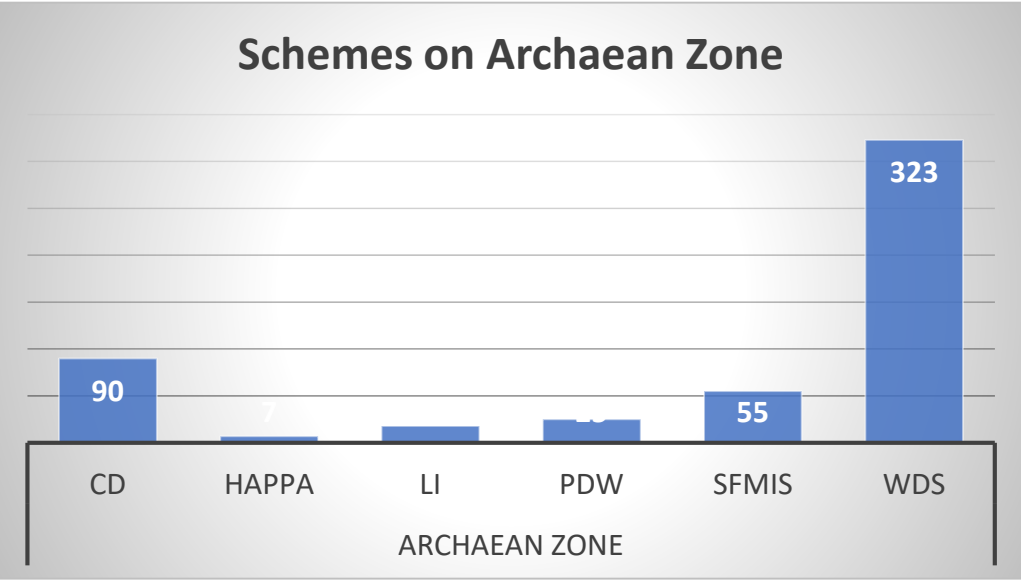
ALL PROJECT LOCATIONS



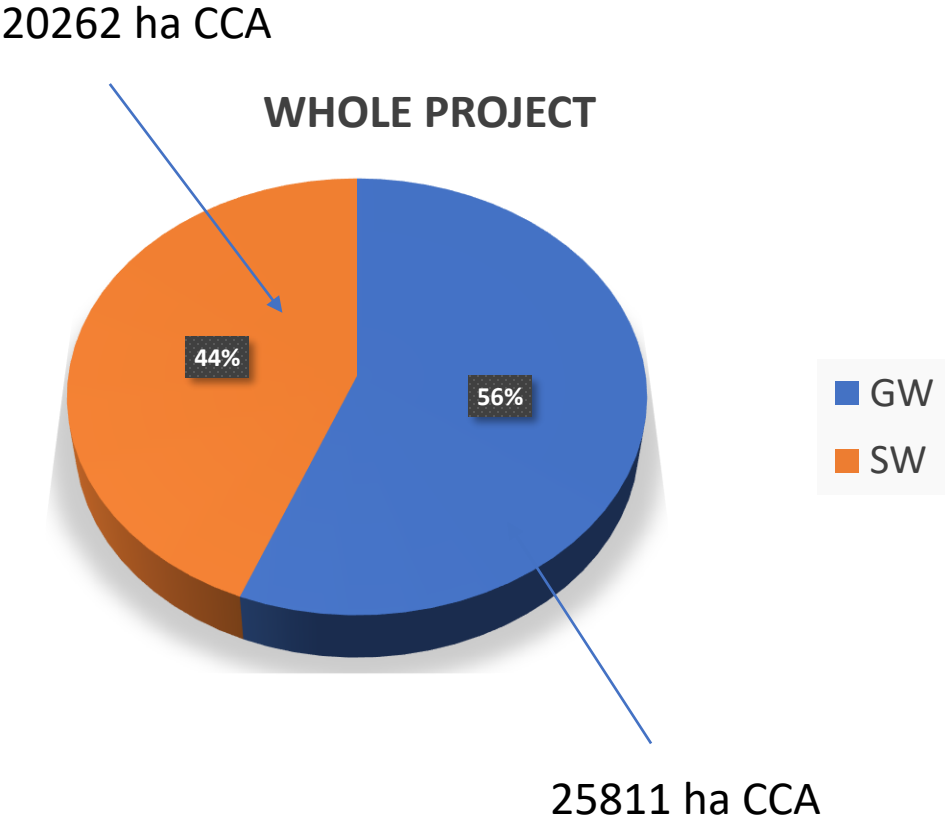
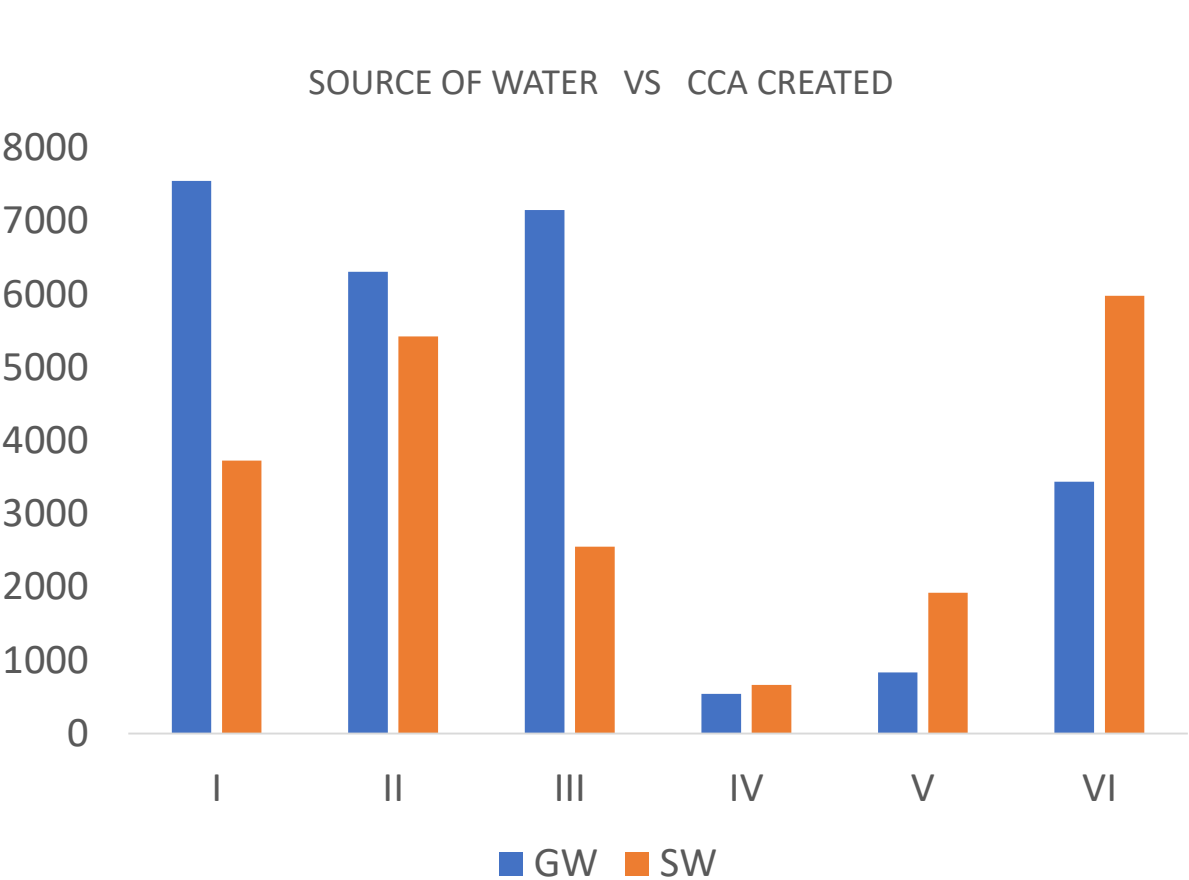
Schemes on Precambrian Zone



Schemes on Archaean Zone



SOURCE OF WATER :: GROUND WATER VS SURFACE WATER



SCHEME PLANNING PROCESS OF PROJECT

Scheme Selection Process

GIS Based Planning

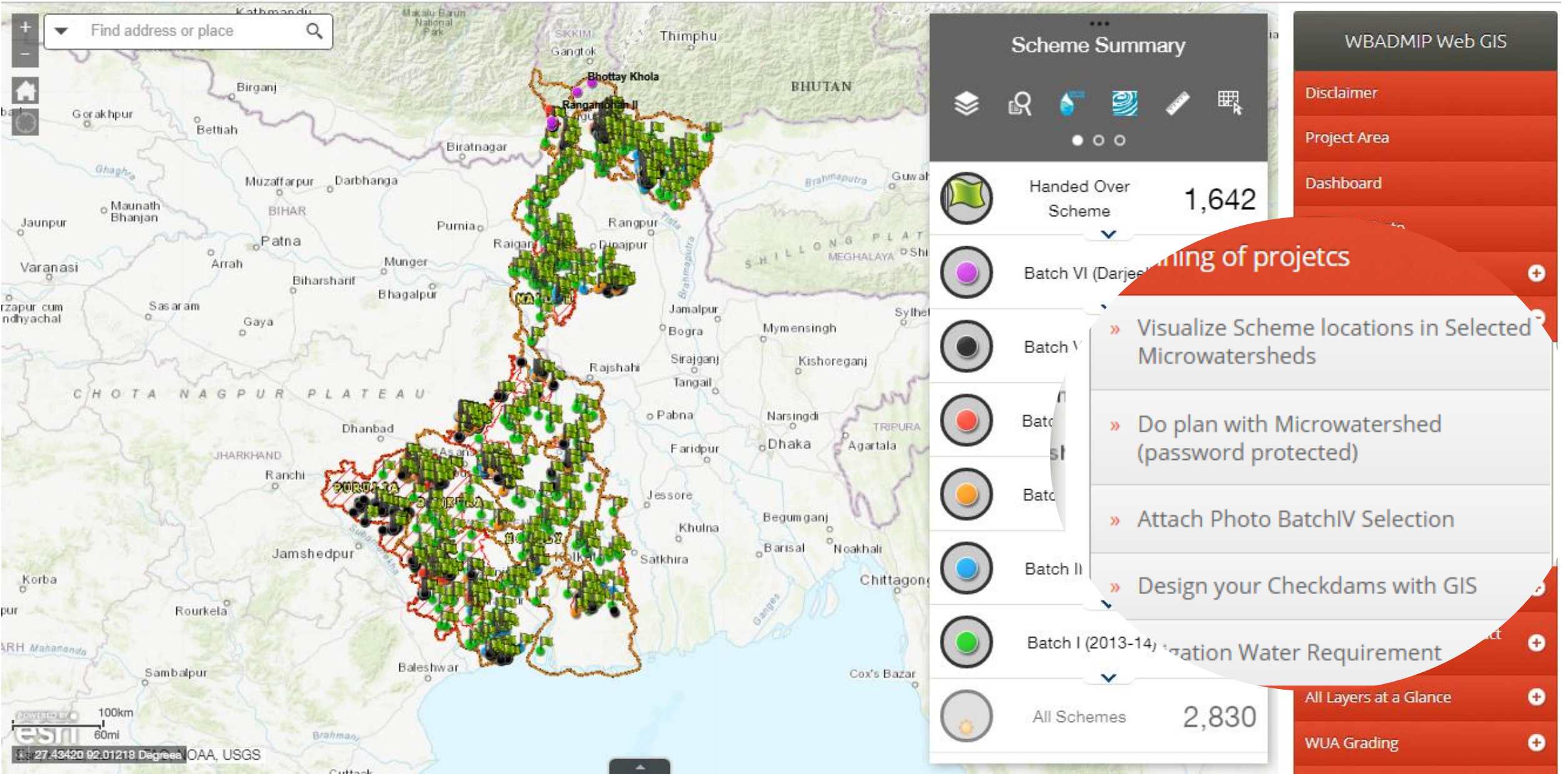
Ground Truthing

1. Web based GIS Platform freely available on public domain.
2. More than 20 thematic map layers for visualization, analyze and decision making.
3. Interactive tools for delineating catchment areas, generating contours, cross sections, cropping intensity etc.

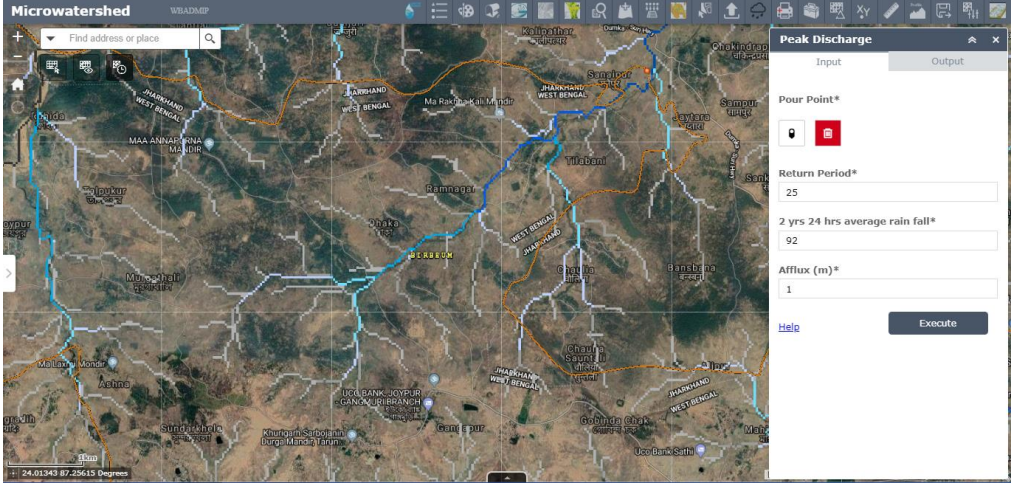
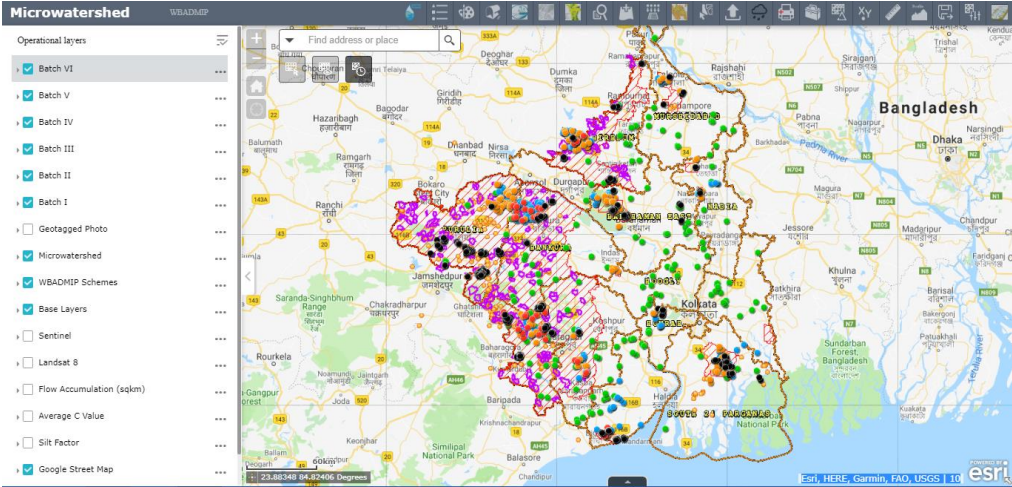
WB ADMI Project

Supported by World Bank

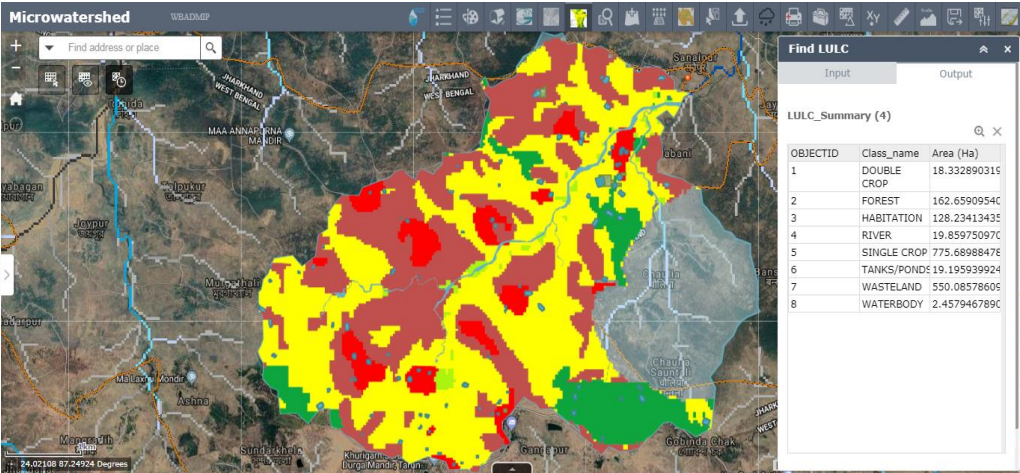
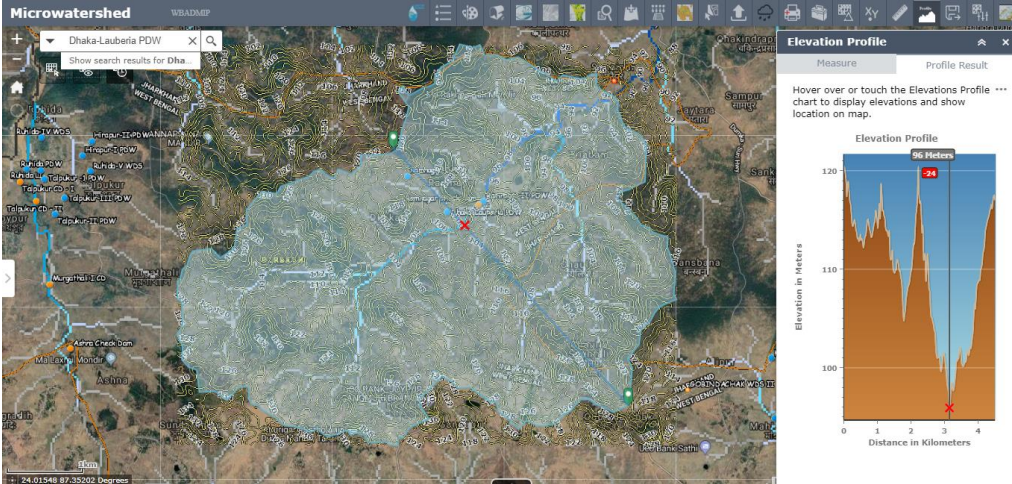
Web GIS Platform for WBADMIP : <http://103.16.143.46/GISWEB/map1.htm>



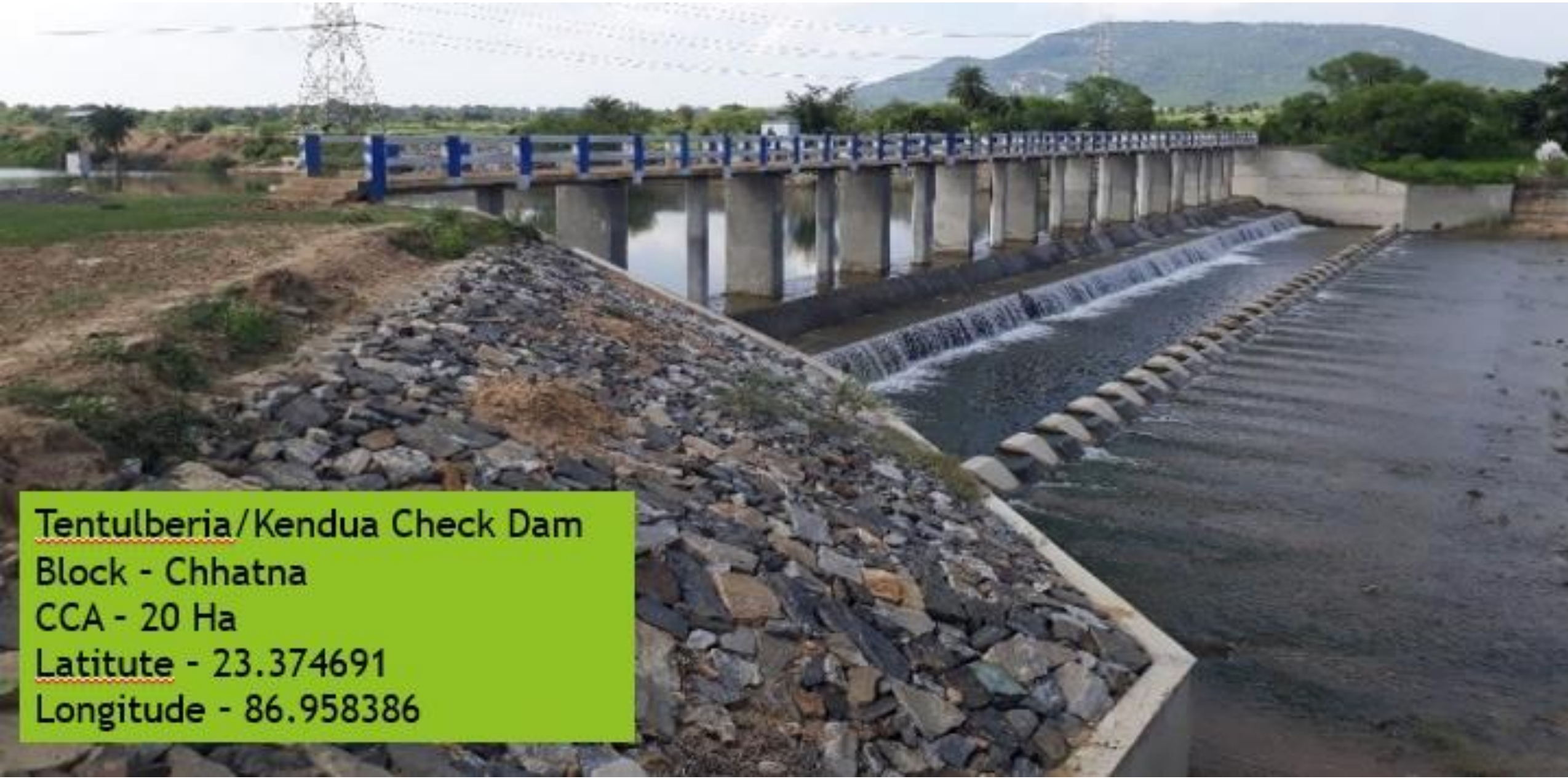
The screenshot displays the WBADMIP Web GIS interface. The main map shows West Bengal with numerous irrigation schemes marked by green and black icons. A sidebar on the right contains a menu with items: Disclaimer, Project Area, Dashboard, and a section titled 'Planning of projects' with sub-items: Visualize Scheme locations in Selected Microwatersheds, Do plan with Microwatershed (password protected), Attach Photo BatchIV Selection, and Design your Checkdams with GIS. Below this is 'Water Requirement' and 'All Layers at a Glance'. A 'Scheme Summary' panel on the left lists various batches (Batch I to Batch VI) and 'All Schemes' with counts (1,642 and 2,830 respectively). The map includes a search bar, scale bar, and coordinate display.



Area (Ha)	2214.42
Maximum Flow Length (m)	8784.28
Average Run-off co-efficient	0.40
Average Slope(s/100)	0.02
Time of Concentration (hr)	1.59
Ic	55.72
Return Period	25.00
Q (cum/sec)	137.62
Q Dicken's (cum/sec)	112.29
Average Discharge (cum/sec)	124.96
H	1.00
L	65.86
Perimeter (m)	23468.50



LET US SEE HOW OUR SCHEMES LOOK LIKE



Tentulberia/Kendua Check Dam

Block - Chhatna

CCA - 20 Ha

Latitude - 23.374691

Longitude - 86.958386

About 210 KM long canal re-excavated in South 24 Parganas through 59 Schemes







Mouza- Madhabpur Block- Binpur-II CCA- 1.37 Ha(Rabi)

Madhabpur wds

22°37'47", 86°53'47", 22.4m, 257°

11/06/2019 12:19:28

CHECK DAM

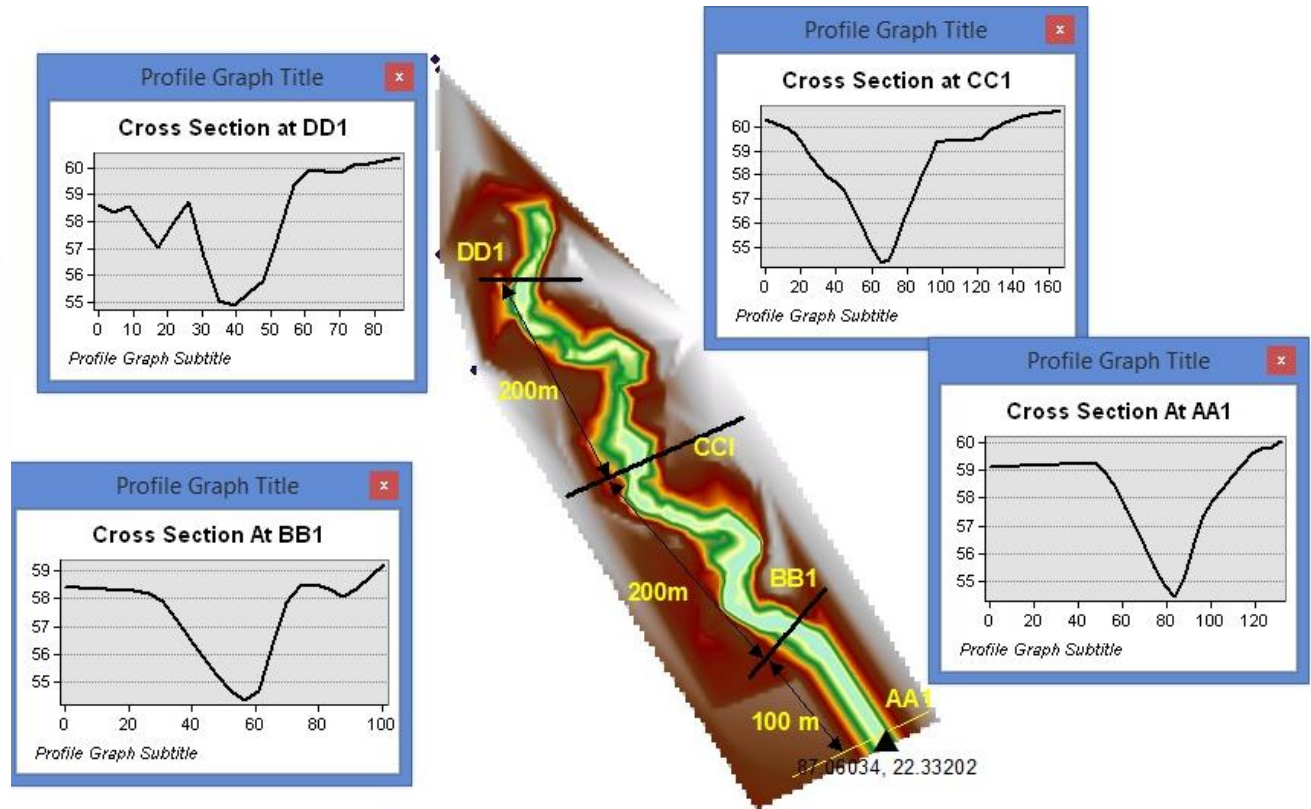
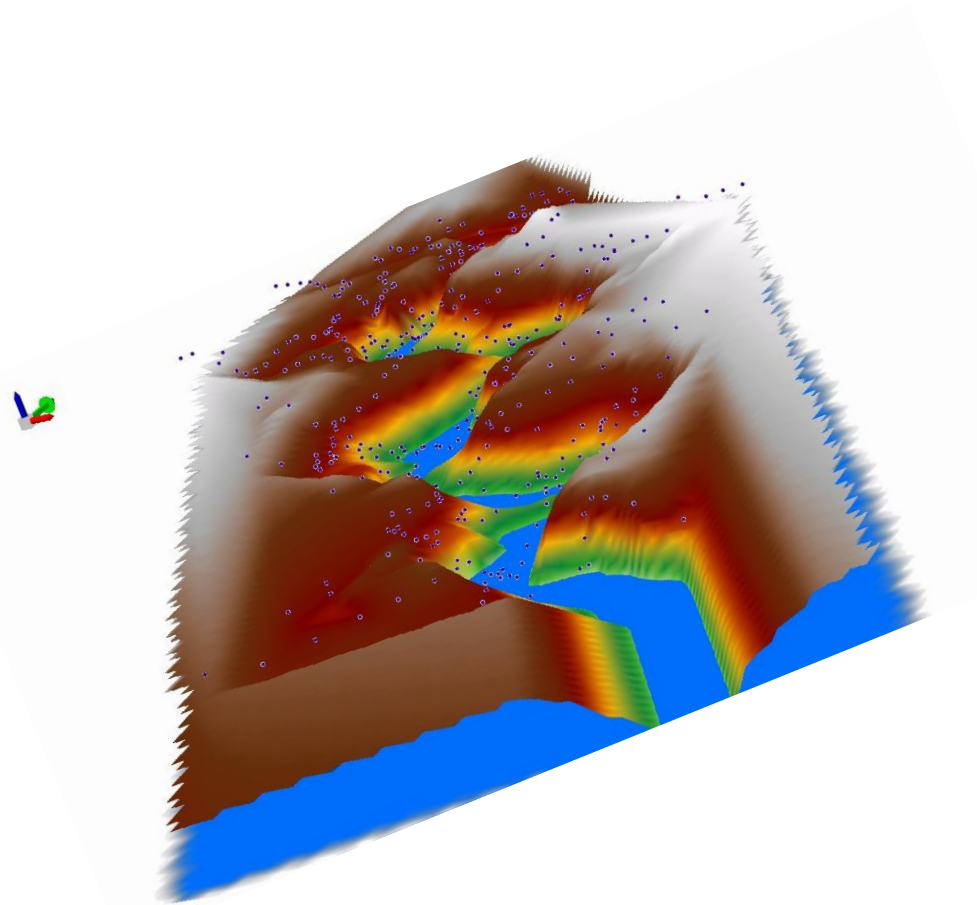


DHATLA CHEK DAM UNDER BANKURA

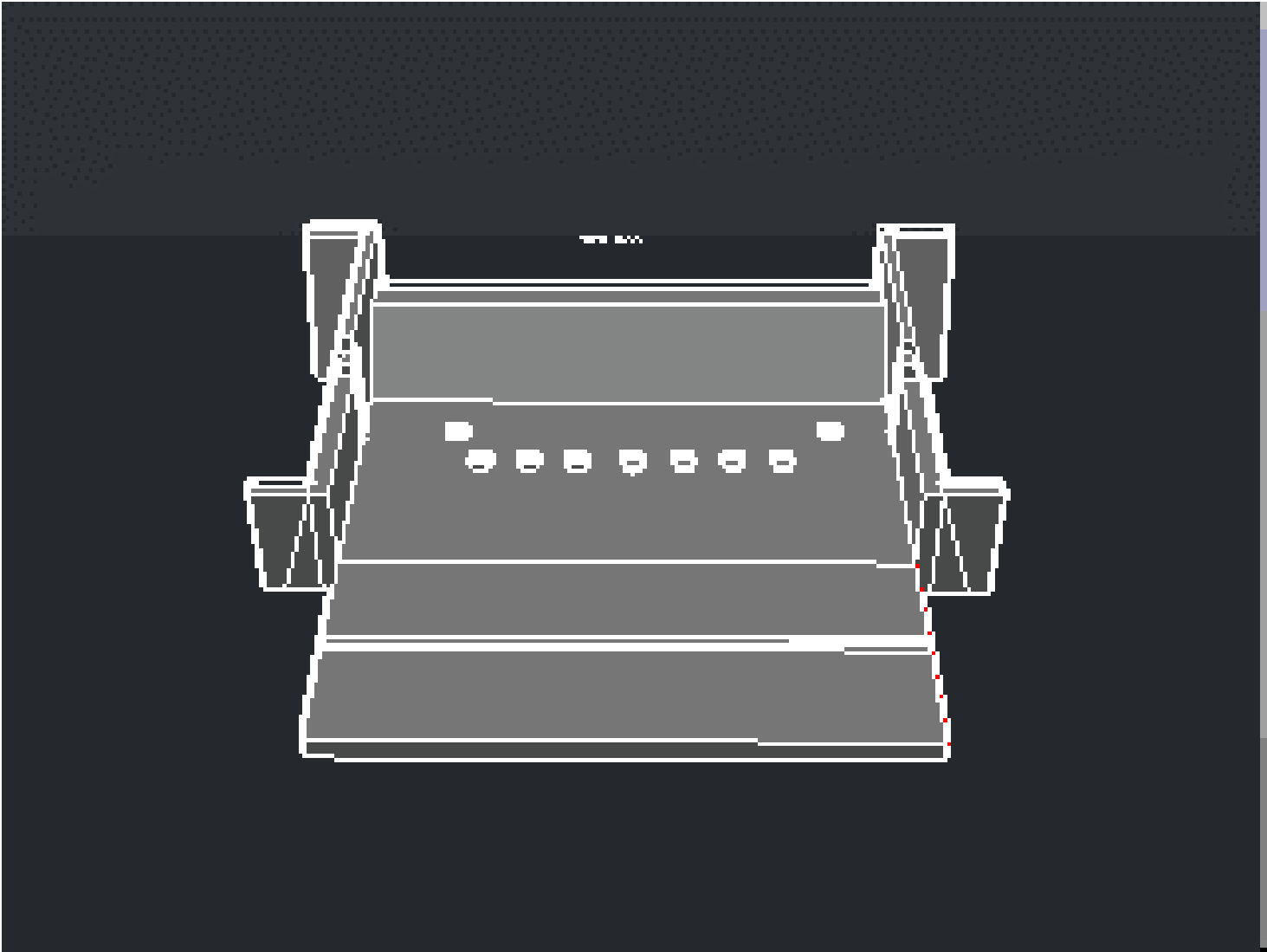


KALIPAHARI CHECK DAM, BANKURA

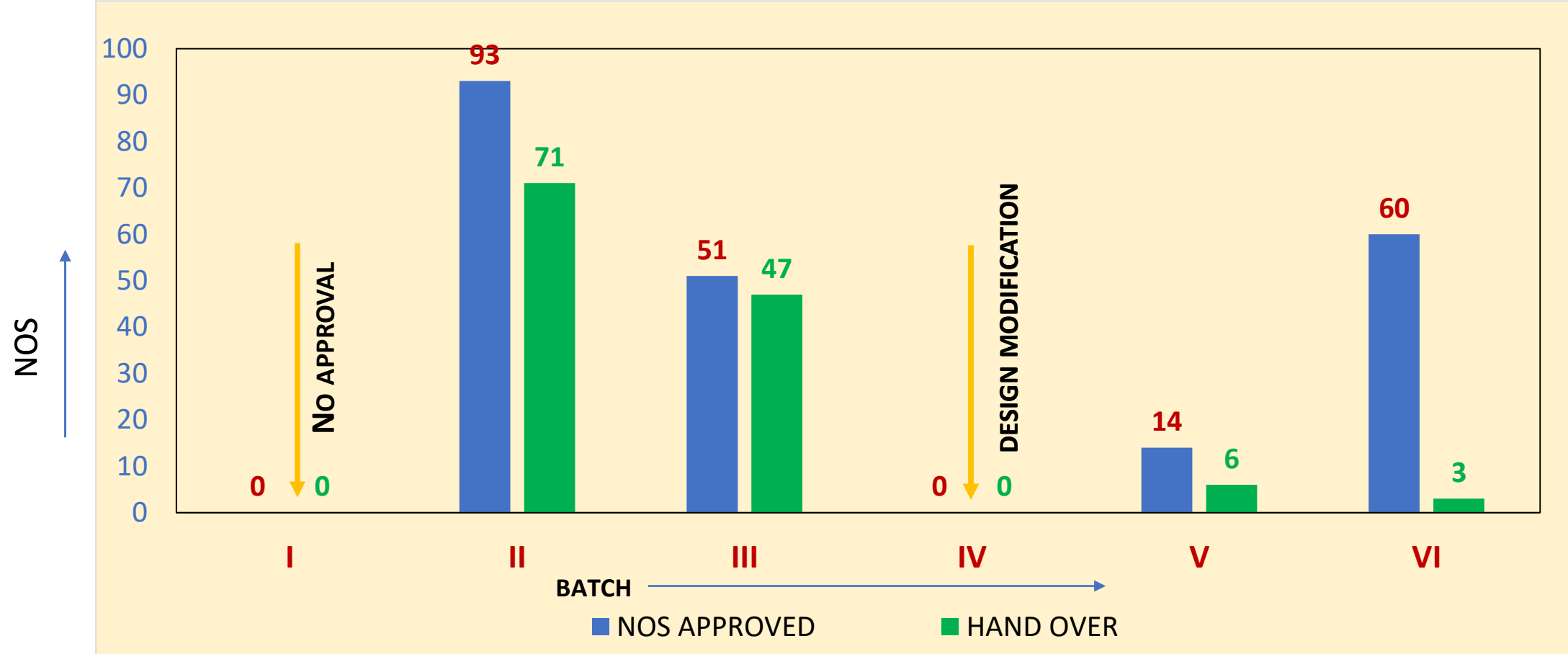
- In **undulating lateritic terrain of Western part of the state.**
- In **series** in suitable spacing in **1st , 2nd and 3rd order streams .**
- **Has gates** to clear up deposited silt and have **cross over bridge or gangway.**
- **248 no of Check dams has been taken** in this project.
- **Estimated cost of Rs 216 Cr and creation of 3750 ha of Rabi CCA and 11250 ha of Kharif CCA.**
- **Water utilisation capacity 4500 ham.**
- **127 no Check dams are already handed over** to WUA.
- **Remaining are under construction and to be completed by December 2019.**



Design with best survey and design methodology using GIS, Remote sensing, modern survey equipment's like DGPS, Total station etc

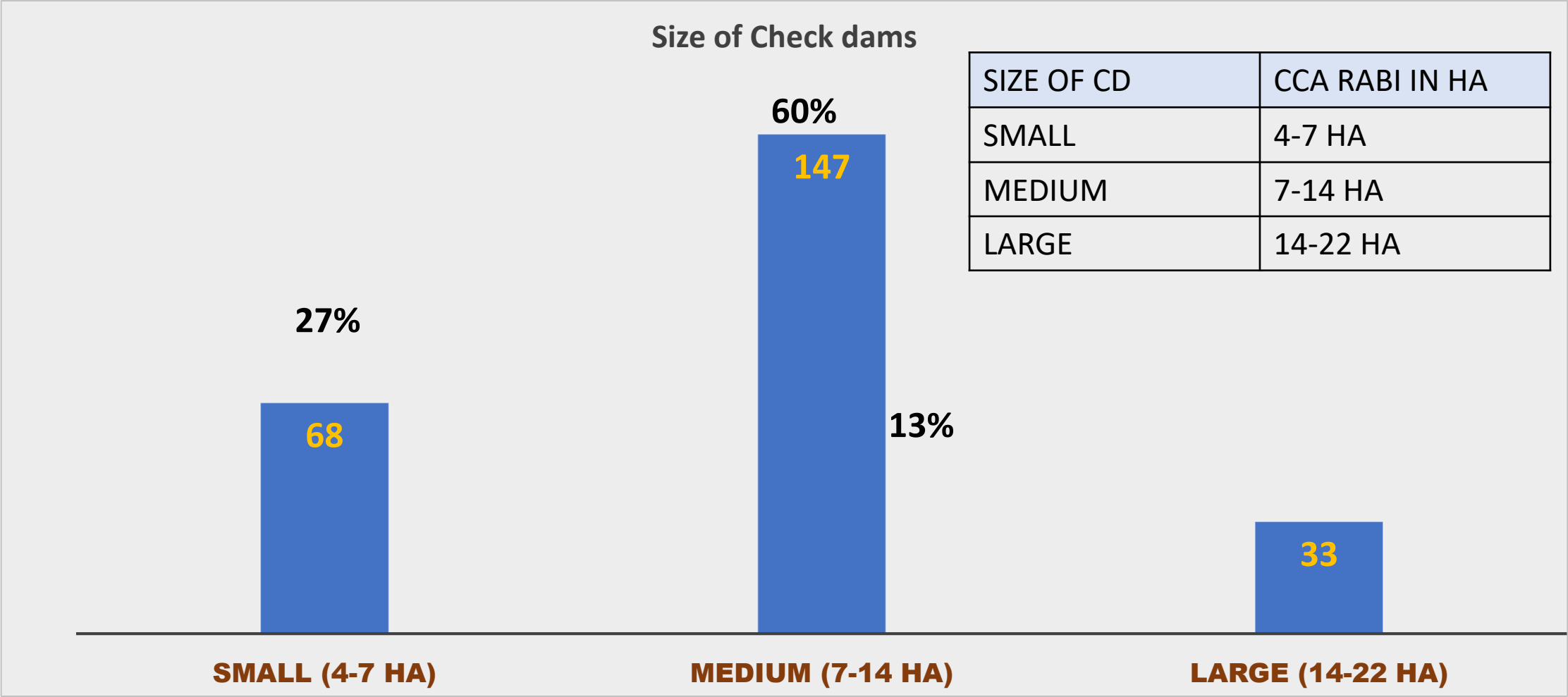


APPROVED VS HANDED OVER OF CHECK DAMS IN DIFFERENT BATCHES



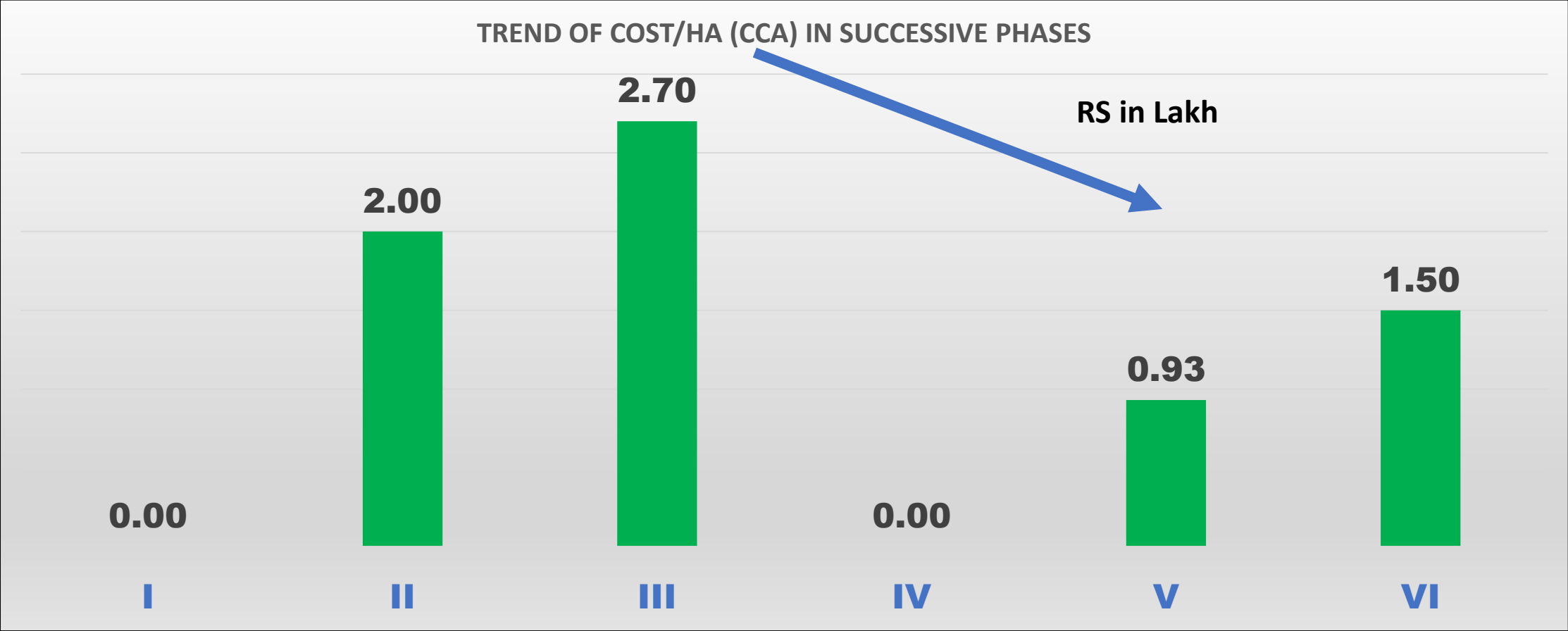
TOTAL APROV-248 and TOTAL HO-127

Size of the check dams depending upon Site situation



(based on Rabi CCA)

COST ANALYSIS OF CHECK DAMS

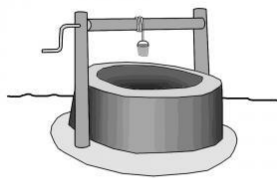


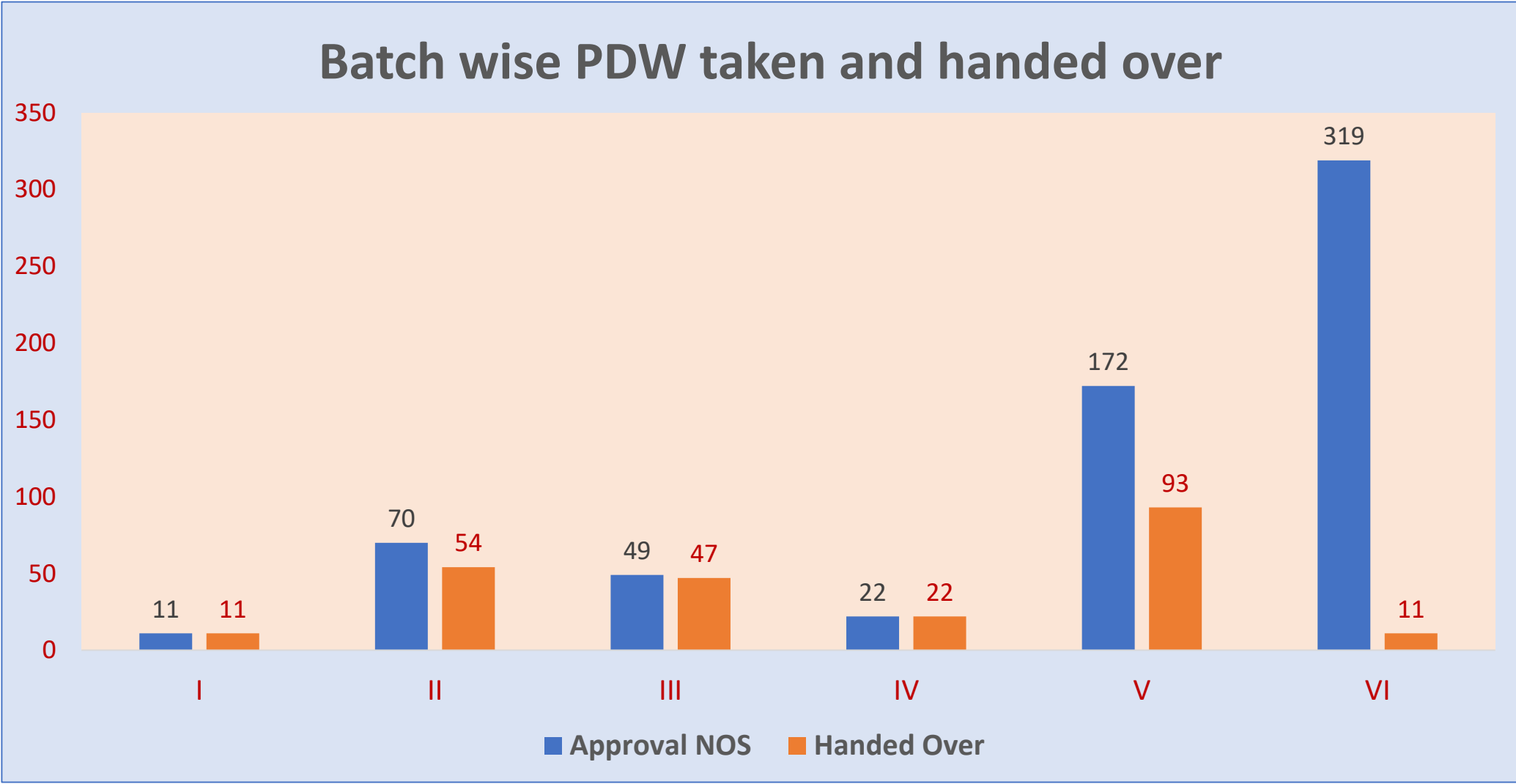
- Average construction cost for check dams is Rs 1.92 Lakh / ha and 4.8 lakh / Ha-m
- The construction cost per ha gradually reduced after several design modification without compromising safety.

PUMP DUG WELL

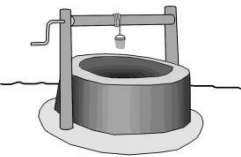


- Mostly constructed in pre Cambrian zone western part and also in alluvial zone of north Bengal
- Depth 10-15 m , 1 .5 m to 3.6 m dia , lined with concrete or brick wall.
- 643 no PDW projects are taken
- Estimated cost of Rs 75 Cr
- Targeted Rabi CCA 2750 ha and in kharif 4375ha
- So far the project had completed about 238 no PDW.

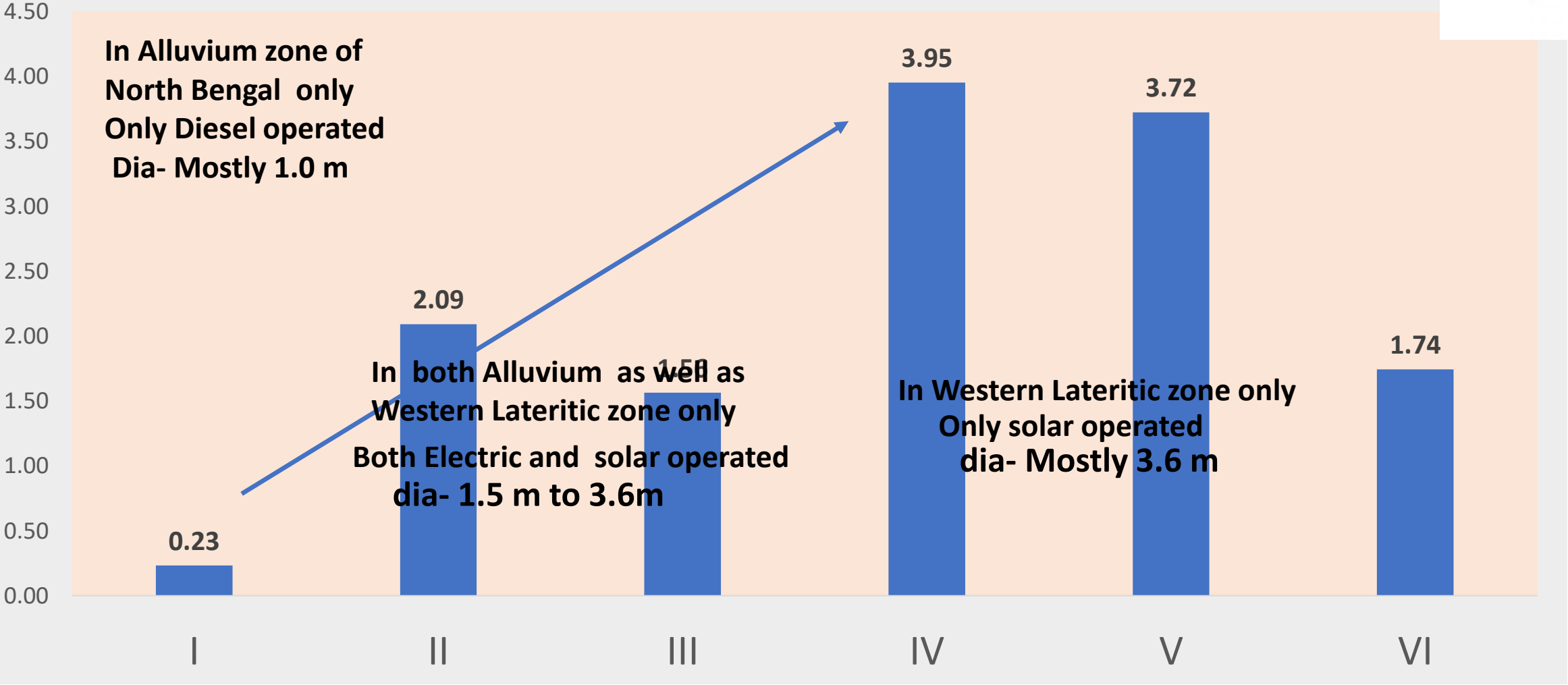




Number taken -643, Handed over -238,



TREND OF COST / HA IN DUGWELLS IN SUCCESSIVE 6 PHASES



OCA(RAB)-2750 Ha, OCA(KARIF)-3894 Ha, Estimated Cost-Rs 75 Cr

AVERAGE COST PER HA DEVELOPMENT=1.71 LAKH

WATER DETENTION STRUCTURES

[VARIOUS SHAPE AND SIZE BASED ON SITE SITUATION AND TOPOGRAPHY



- **New tanks and reservoir** mainly constructed
- One of the most feasible option for rain water harvesting specially in **Lateritic Districts**
- **1226 no of reservoirs** are taken.
- **Estimated Cost Rs 175 cr with creation of 5097 ha CCA in Rabi and 11000 ha in kharif.**
- **443 Nos of such schemes are already handed over**
- **Remaining are in full pace of construction phase and like to be completed by 2019.**

REJUVINATION OF CREEKS

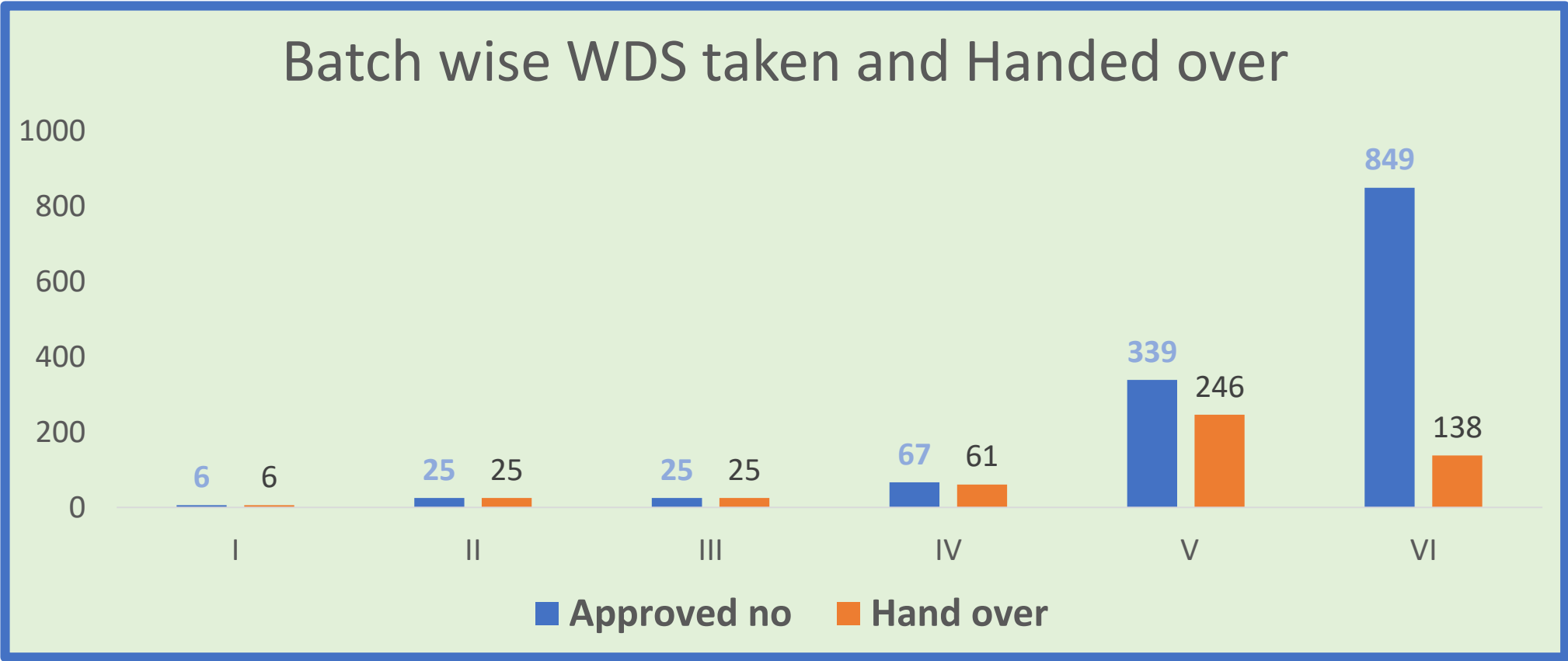
BEFORE AND DURING CONSTRUCTION



AFTER CONSTRUCTION

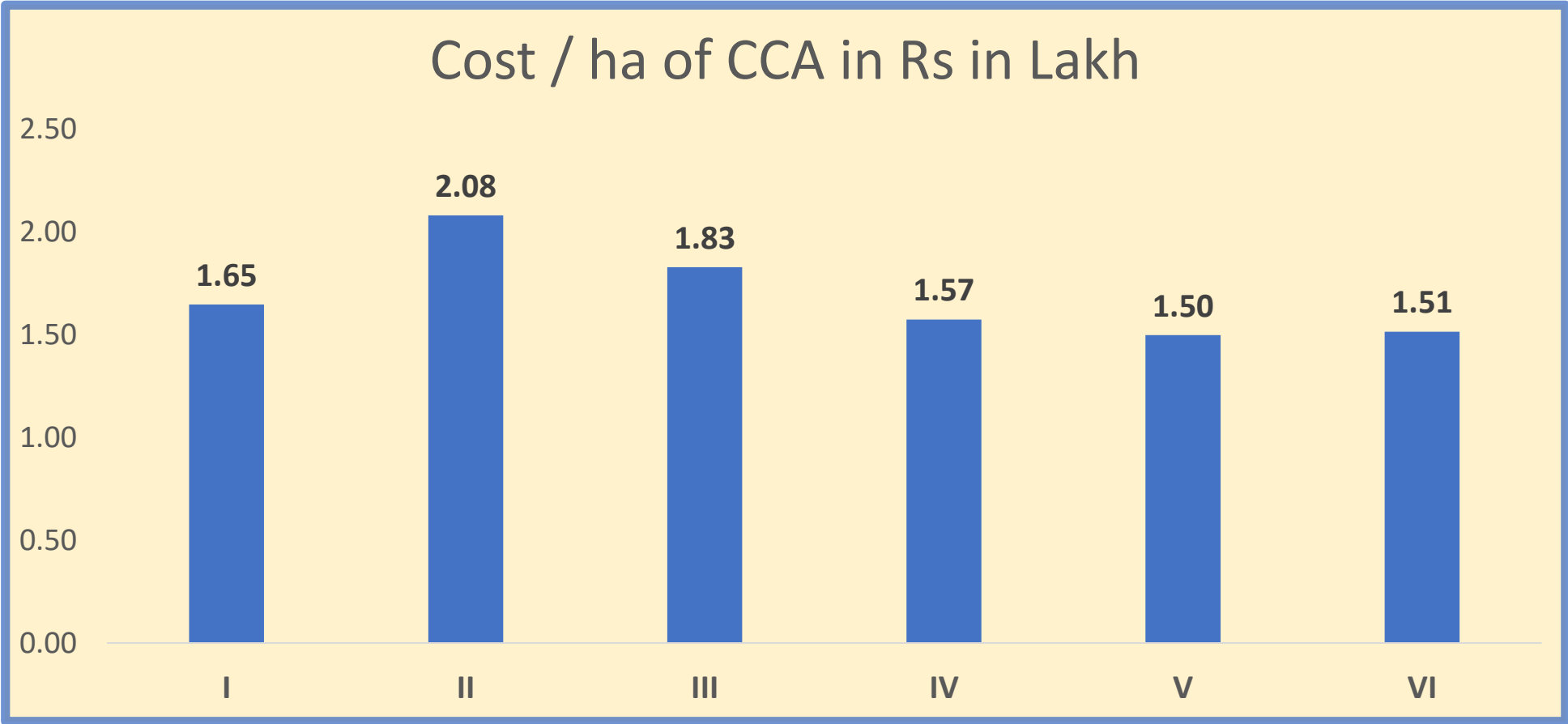


- These are derelict Creeks under complete rejuvenation
- Total 250 km of creeks has been taken for rejuvenation with total 95 no projects so far.
- This will create 4650 cca in Rabi and Double of it in Kharif
- About 201 km of creeks already rejuvenated with 90 no of projects.
- Remaining mostly are under construction and few are in bidding stages.



Gradual increase of Numbers to tap more rain water and facilitating more Ground water recharge

Cost trend of WDS in Different batches



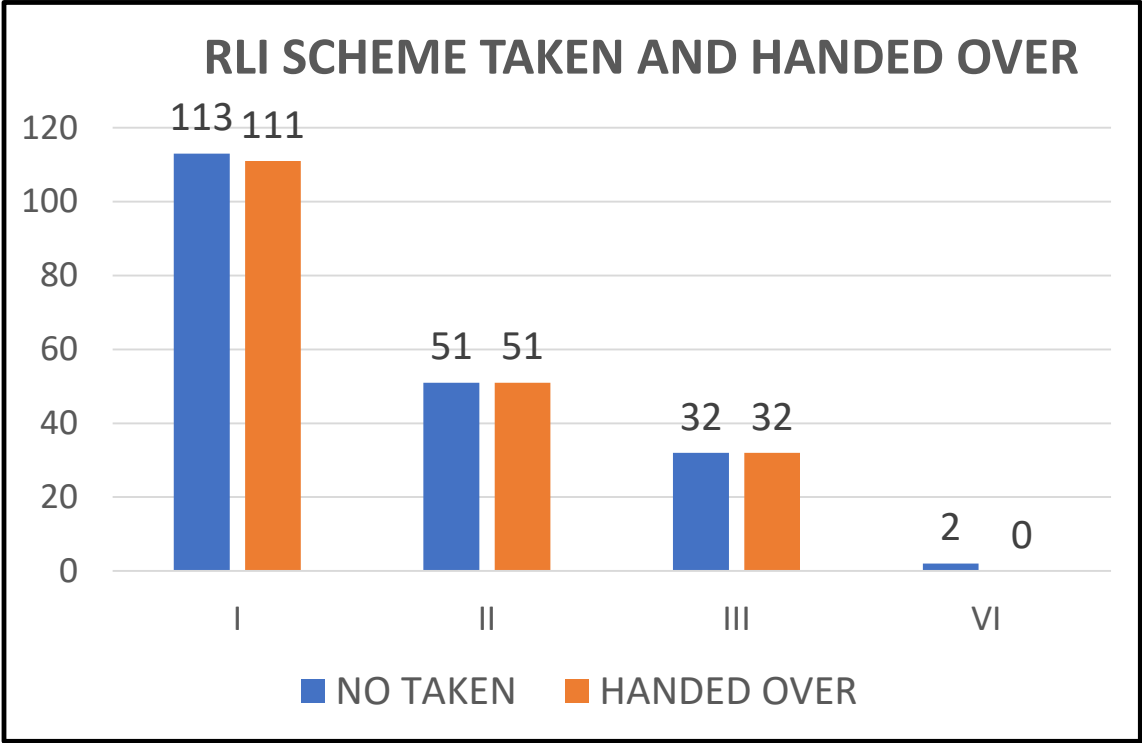
- Average cost of command area development is Rs 1.61 lakh / ha
- Gradual cost reduction achieved after modifying design

RIVER LIFT IRRIGATION

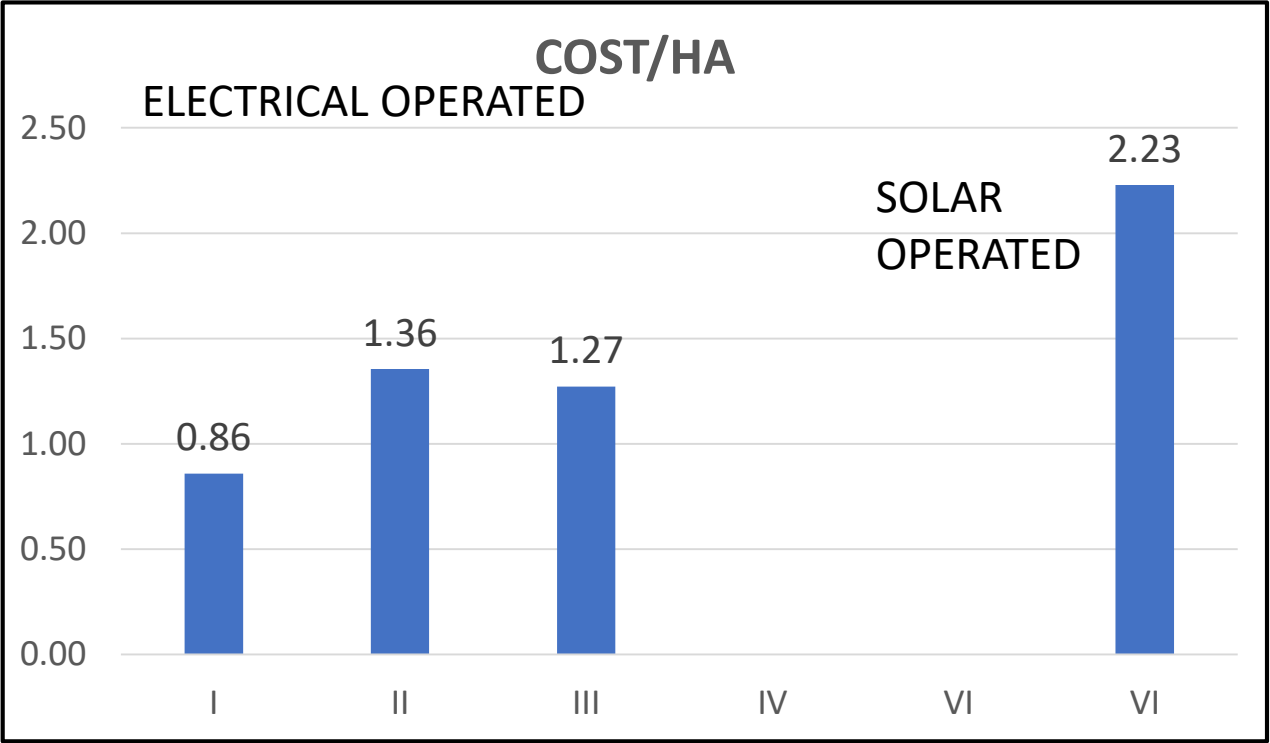


- These schemes are constructed on rivers in all parts of state.
- Total 198 no schemes taken for creation of total cca 5300 ha
- Total cost invovded rs 54 cr.

PROGRESS AND COSTING RIVER LIFT IRRIGATION SCHEME



- HANDED OVER 194 NO OF SCHEMES

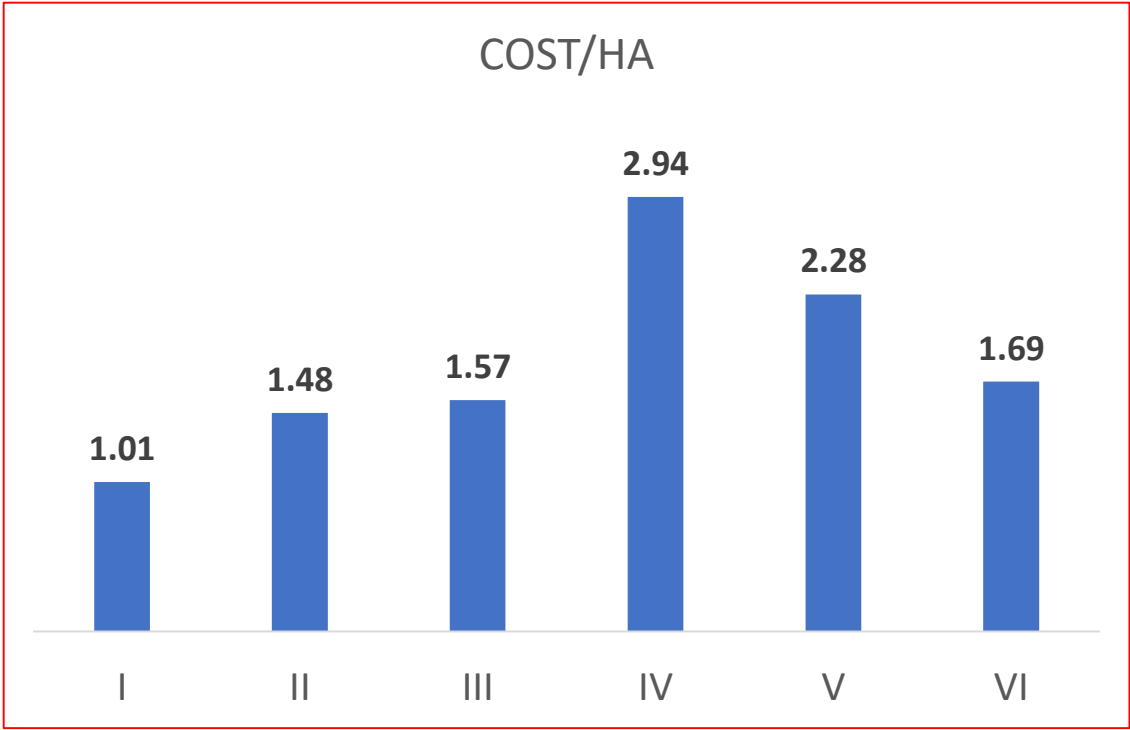
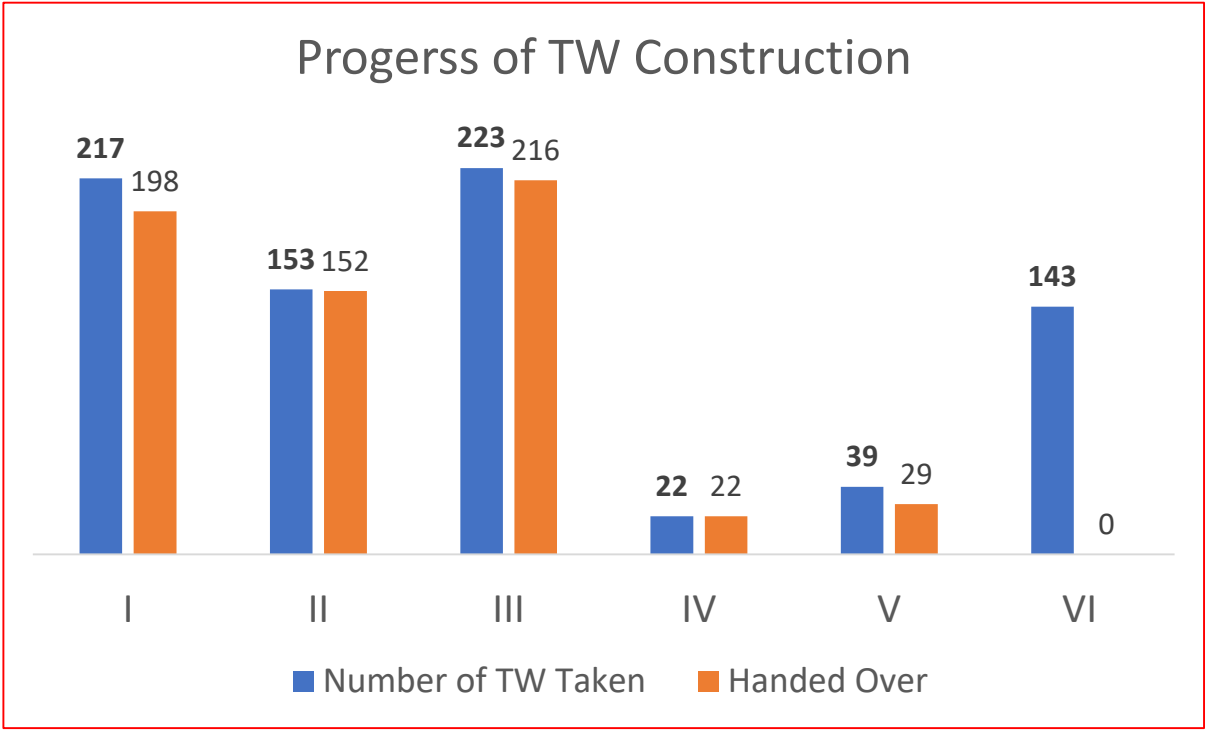


TUBE WELLS



- Constructed in recent **alluvium plain** of the state.
- Total **797** no of **Solar or Electric operated Tube Well** has been approved with estimated cost of **Rs 331 Cr** for creation of **23061 ha**

PROGRESS AND COSTING TUBE WELL SCHEMES



- About 617 no of Tube wells already constructed and handed over that already creates 19255 ha
- Gradual Cost Reduction achieved

SYSTEM OF MONITORING AND QUALITY CONROL



- Implemented Internal Quality Assurance & Control team headed by Superintending Engineer , SPMU, taking the help of Irrigation and water Way Dept’s laboratory.
- WUAs are also part of monitoring of construction.
- The project had prepared and distributed manual of checking quality of construction in vernacular language for WUS for different schemes.
- System of Monitoring through Remote sensing and GIS with MIS has adopted.

QUALITY CONTROL BY INTERNAL AS WELL AS THIRD PARTY



Ramchandrapur, West Bengal 721504

	Decimal	DMS
Latitude	22.486921	22°29'12" N
Longitude	86.982709	86°58'57" E

Ramchandrapur
West Bengal
India

2017-06-21(Wed) 13:02



Baruipur Nirala Road
Devis Abad
West Bengal
India

	Decimal	DMS
Latitude	22.301848	22°18'6" N
Longitude	88.557754	88°33'27" E

2017-06-22(Thu) 12:20(pm)



Height of Boulder masonry at Upstream to be increased to match height of Abutment Wall

Khayradihi, West Bengal
Khayradihi
West Bengal
India

	Decimal	DMS
Latitude	23.896284	23°53'46" N
Longitude	87.355617	87°21'20" E

2017-06-29(Thu) 12:01(pm)

Innovation and Bringing Modern Technology

Project encouraged of modern planning ,design and construction methodology and inculcate new ideas

- **Project utilised Remote sensing and GIS technology through out the project cycle. Probably this is unique in our country in water sector.**
- **Project has introduced DIGITAL BORE LOG machine with GAMA resistivity to finely delineate aquifer zone during construction of tube well. It has been proved to be indispensable in sustainable ground water development.**
- **Project has piloted IoT based irrigation system design in 5 tube well schemes to optimise ground water utilisation in boro paddy.**
- The project has adopted survey works with modern equipment like total station, DGPS. And now planning Lidar system.
- The project has successfully updated design methodology of Check dam, Tube wells and share the same to the Mother department.
- Telemetric based Ultrasonic sonic as well as DWLR are installed in 80 check dam sites to monitor water depth of the check dams.



DIGITAL BORE LOGGER OWNED BY WBADMIP UNDER SUPERVISION OF SENIOR GEOPHYSICS'.

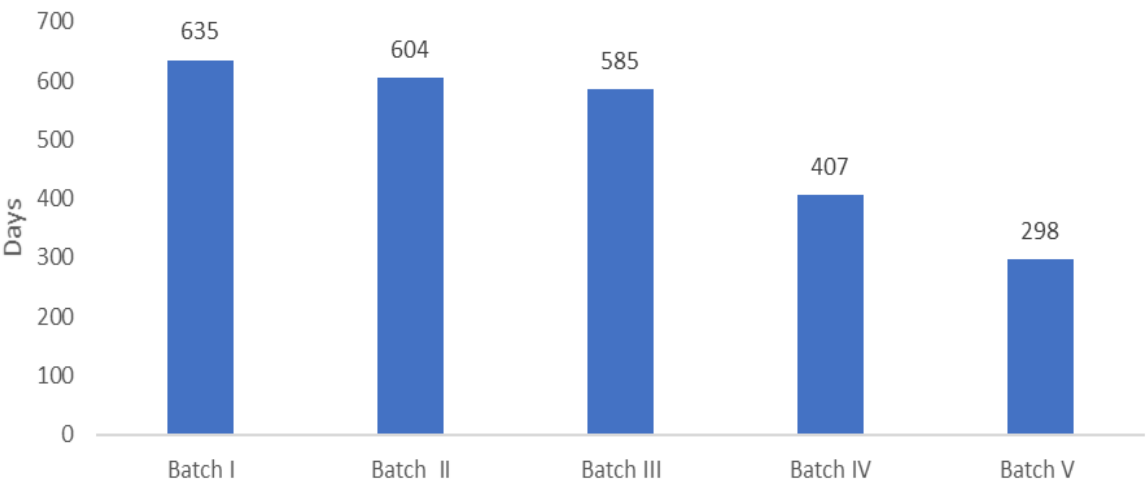
AVERAGE TIME OF CONSTRUCTION

Source: Internship Research Report

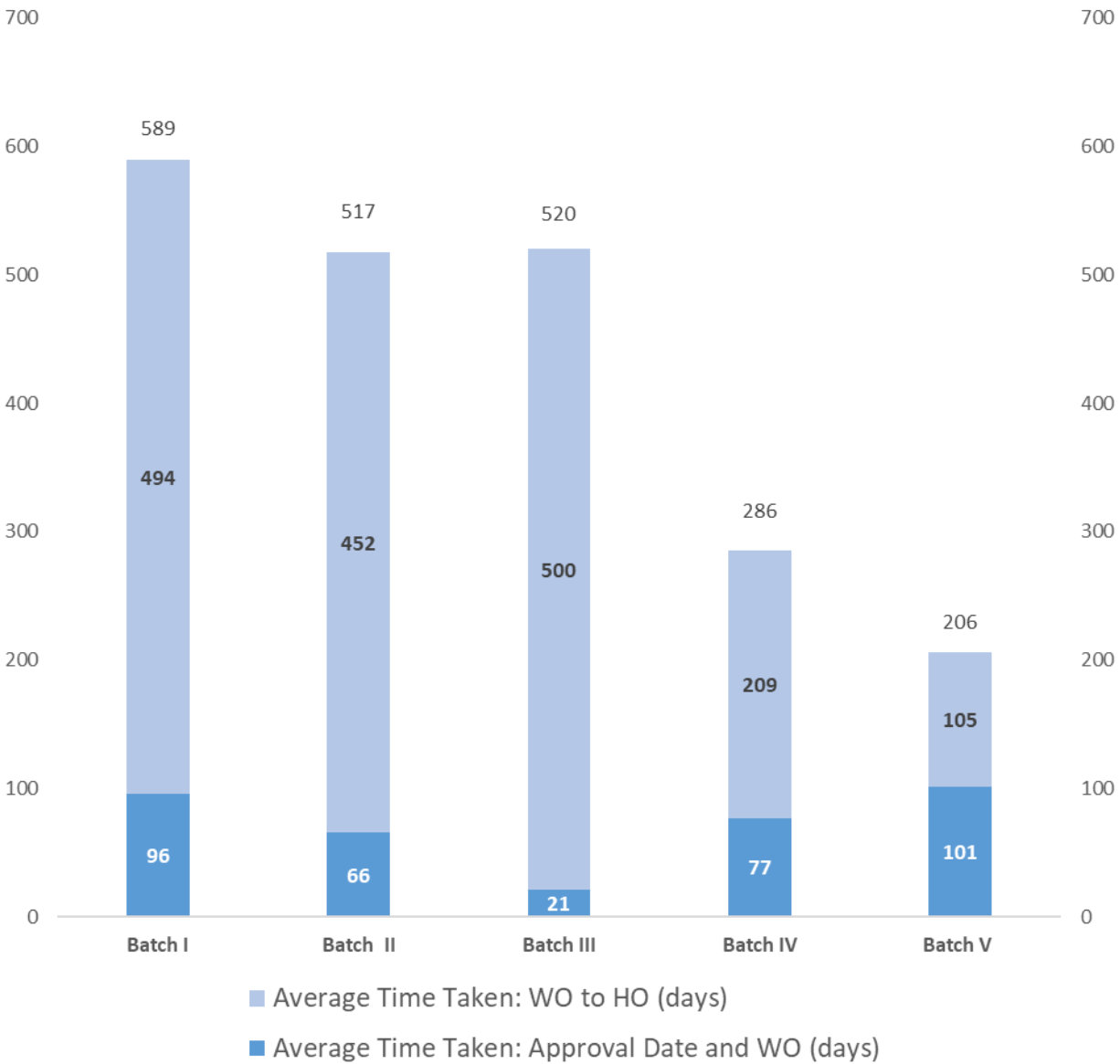
By Mr João Moraes Abreu
Harvard Kennedy School

&
By Somveer
Indian Institute of Technology Kharagpur

Average time between Approval and HO, if all incomplete were handed-over immediately, July 2018 (in days)



(ONLY ALREADY HO) Average Time Taken between Scheme Approval date/Work Order and Handing Over, per batch



Thank You