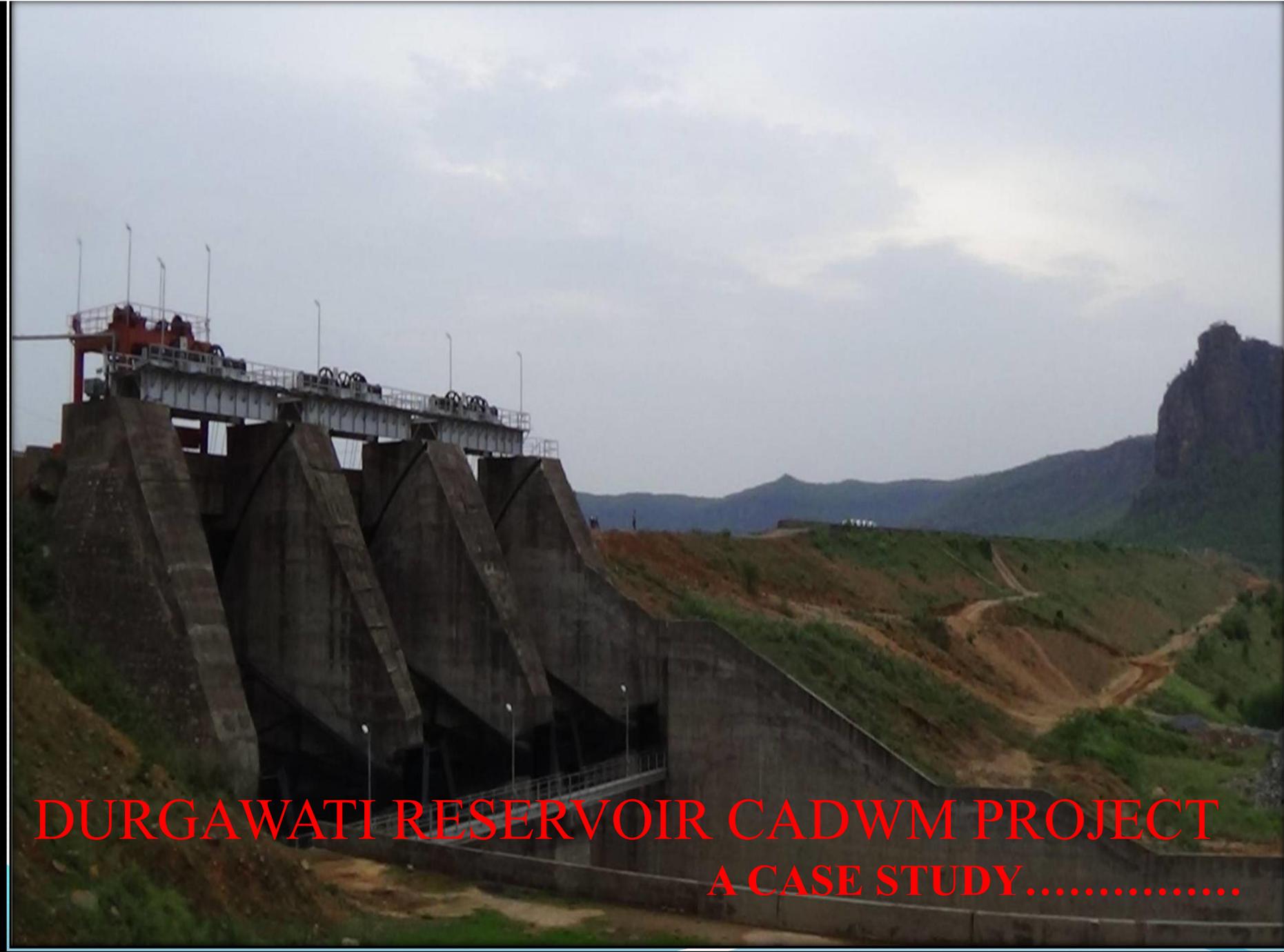




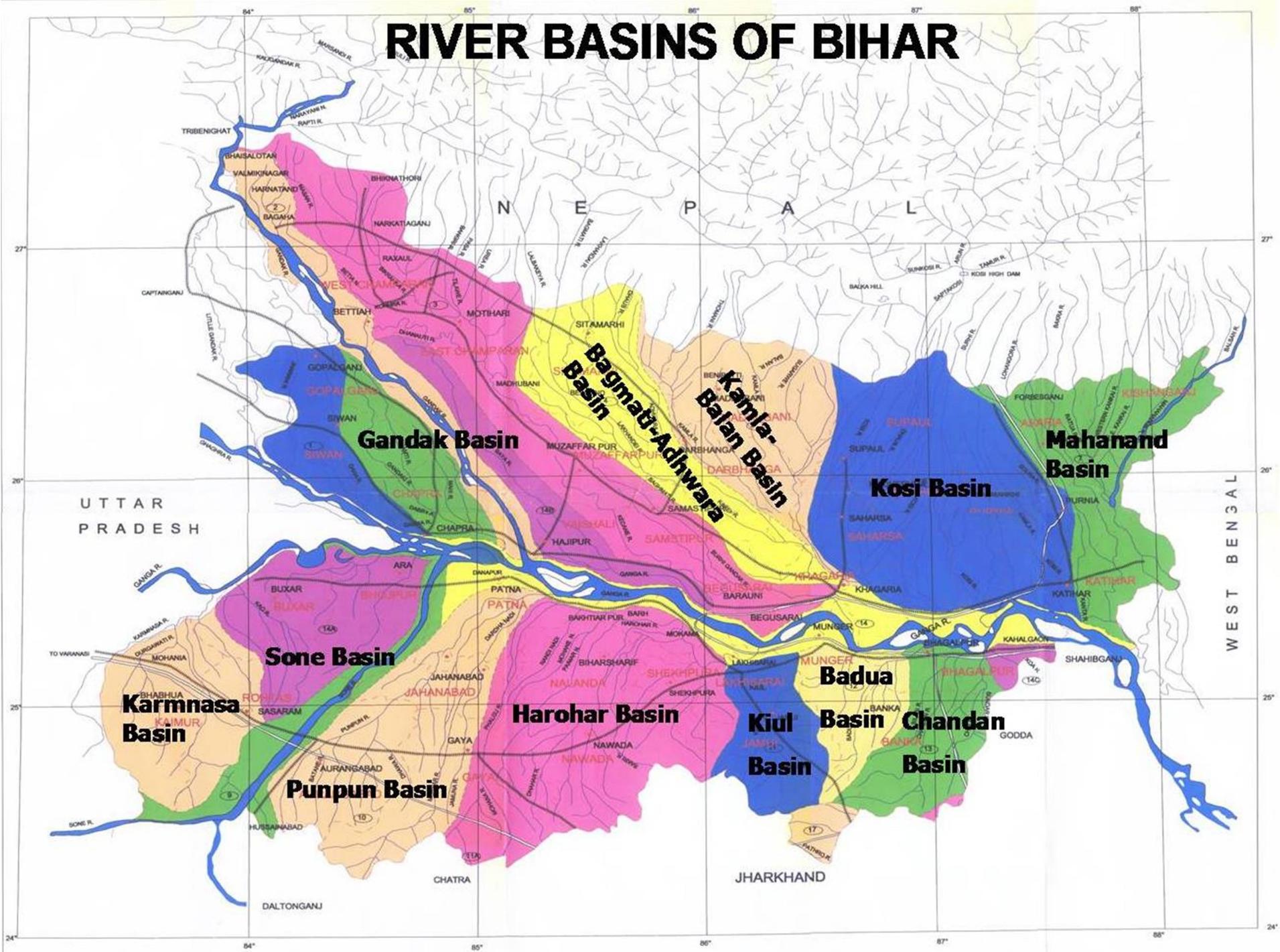
**Presentation
for
2nd CADWM Conference
at
Ahmedabad, Gujrat
on
28th May 2019**

BIHAR



**DURGAWATI RESERVOIR CADWM PROJECT
A CASE STUDY.....**

RIVER BASINS OF BIHAR



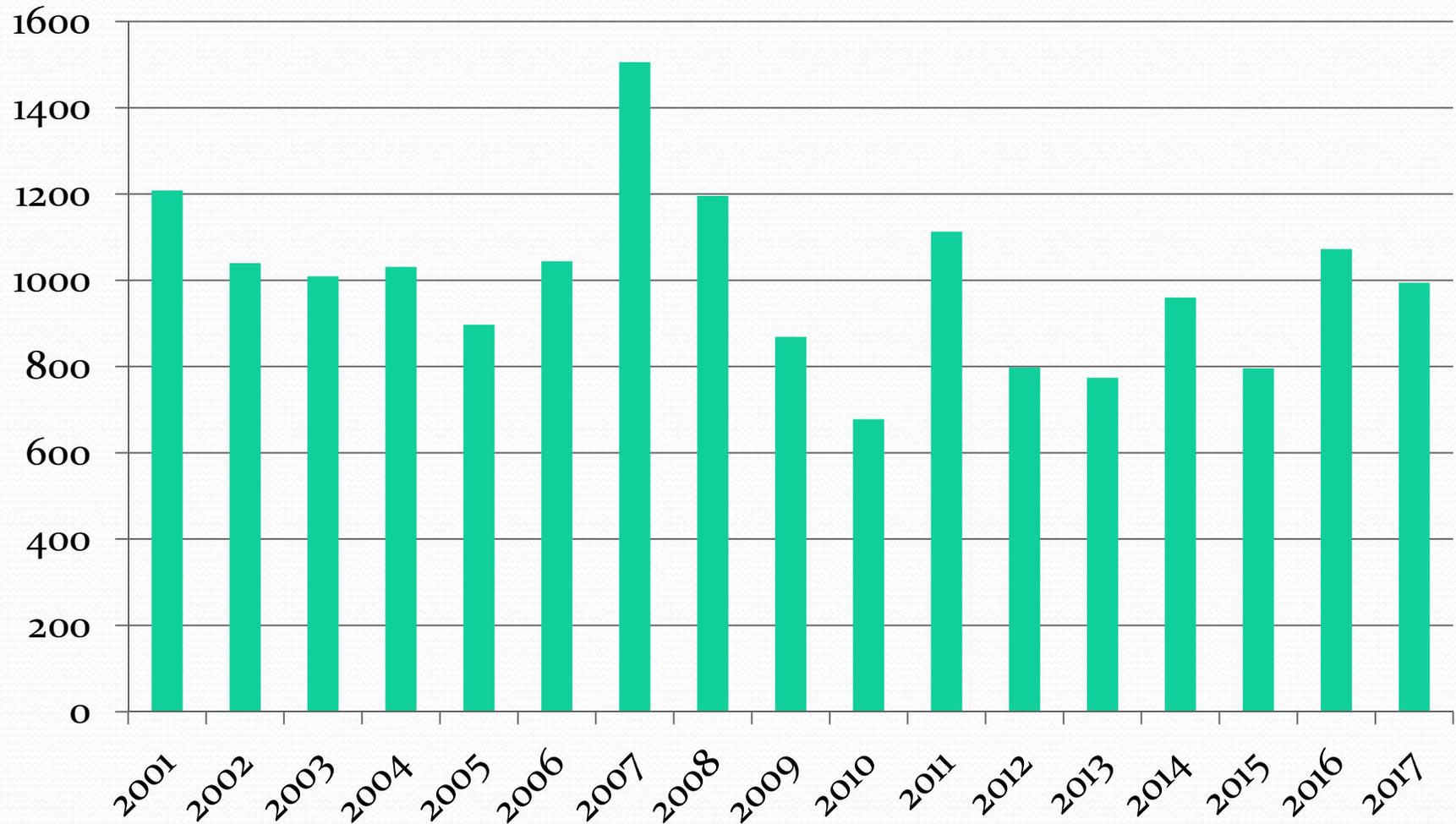


Introduction

- The implications of a sustained growth of agricultural sector is huge for the economy of Bihar.
- Considering that about 88.7 percent of the state's population resides in rural areas, agricultural sector holds the key for its overall growth.
- Located in the eastern part of India, Bihar has an area of 93.6 lakh hectares, accounting for nearly 3 percent of the country's total geographical area. Overall about 56.55 percent of the land is under cultivation in Bihar .
- Bihar is endowed with rich ground and surface water resources. Along with the river Ganges, the tributaries of Gandak, Ghaghra, Burhi Gandak, Kosi, Mahananda, Karmanasa, Sone, Punpun, Phalgu, Sakri and Kiul contribute towards availability of water in Bihar for agricultural and non-agricultural purposes.

- 
- Only around 57 percent of the cultivated area in the state is irrigated.
 - The agricultural sector in the state is largely dependent on monsoons and the varying water resource endowments in the southern and northern parts of Bihar calls for a need to identify mechanisms to ensure adequate, timely and assured irrigation for cultivation.
 - In the context of adoption of productivity enhancing inputs such as improved seeds, fertilizers and new methods of cultivation, irrigation plays an important role.
 - State government has envisaged specific initiatives for better water management and creation of irrigation potential through measures such as:-
 - Restoration and extension of canals
 - Schemes for surface & groundwater irrigation
 - **Command area development**
 - Intra-state linking of rivers

Annual Rainfall in Bihar (2001-2017) (in mms)



Irrigation at a Glance

- **Ultimate irrigation potential (Major & Medium) - 53.53 Lha**
- **Irrigation Potential Created till 3/18 - 29.91 Lha**
- **Irrigation Potential Utilized - 26.27 Lha**

Brief Description of Durgawati Reservoir Project

- **Objective**

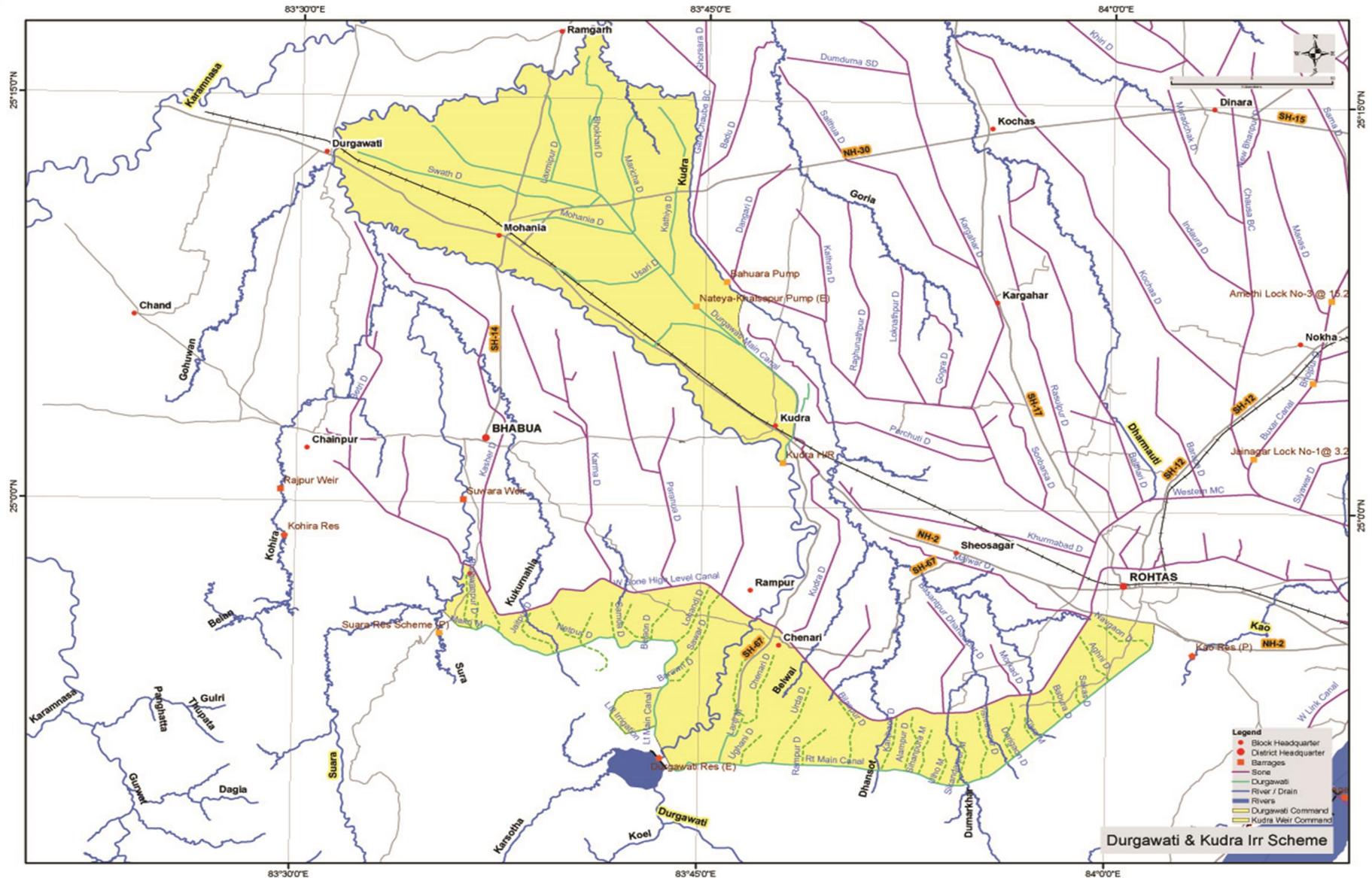
To provide assured irrigation facilities to the fertile land lying between Kaimur hill range and Sone high level canal in the districts of Rohtas and Kaimur.

- **Blocks covered**

Rohtas district :- Chenari, Sheosagar and Sasaram

Kaimur district :- Rampur, Bhagwanpur, Adhaura
(drought prone area),
Kudra, Mohaniya, and Dugrawati.

INDEX map of Durgawati Reservoir Project



Important Data related to the project

(As per 2011 Census & Bihar Economic Survey 2018-19)

Sl. No.	Indicator	Unit	Rohtas	Kaimur	Bihar
1.	<u>No. of</u> Sub-divisions Blocks Villages	Nos.	3 19 2072	2 11 1695	
2.	Population	In Lakh	29.60	16.30	1041
3.	Density of Population	Persons per Sq. Km	763	488	1106
4.	Literacy Rate	%	73.40	69.34	61.8
5.	Annual Rainfall (Year 2017)	MM	754.2	821.4	994.4

Sl. No.	Indicator	Unit	Rohtas	Kaimur	Bihar
6.	Land Use Pattern (2014-15) (i) Geographical Area (ii) Culturable Area	Tha	390.7 247.3	342.4 145.7	9360.0 5293.0
7.	Agro Climatic Zone		South West Bihar Alluvial Plane	South West Bihar Alluvial Plane	(i) North West Alluvial Plain (ii) North East Alluvial Plain (iii) South Bihar Alluvial Plain
8.	Soil Type		Alluvial to sandy loam	Alluvial to sandy loam	
9.	Major Crops		Rice, Wheat, Pulses, Guava, Potato, Onion, Bringal & Cauliflower	Rice, Wheat, Pulses, Potato, Onion, Bringal & Cauliflower	Cereals -86.94% Pulses-6.77% Oil Seeds-1.46% Fiber Crops-1.5% Sugarcane-3.33%
10.	Cropping Intensity		1.47	1.42	1.45

Sl. No.	Indicator	Unit	Rohtas	Kaimur	Bihar
11.	Area under Major Crops & Productivity (Year 2017-18)				
a.	Rice	Area -Tha. Productivity Qtl/Ha.	190.72 38.78	117.43 34.12	3306.9 24.47
b.	Wheat	Area-Tha. Productivity Qtl/Ha.	140.75 33.54	68.51 23.56	2101.31 29.05
c.	Vegetables (Potato, Onion, Cauliflower & Bringel)	Area-Tha.	11.5	5.62	498.6

Status of Durgawati Reservoir Project

Components of Work	Status
(a) Construction of dam across the River Durgawati at Shergarh (length of dam 1554.88 m, height 60.97 m).	Completed
(b) Construction of Right main canal and Left main canal	Almost Completed
(c) Distributaries, Minors & Other Structure	Work in Progress
(d) Kudra weir was constructed at 32 km downstream of the present location of Dugrawati dam in the year 1962, to provide irrigation facilities in CCA of 15200 Ha of land at Mohania and Durgawati blocks under Kaimur district	

Durgawati Reservoir CADWM Project

- **Year of Inclusion under CADWM Programme :- 2015-16**
- **CCA :- 32467 ha**
- **Estimated Cost :- Rs. 14857.54 lacs.**

Status of the Project

Components of Work	Scope of Work	Present Status
▪ Lined Field channel	29220 Ha.	13880 Ha.
▪ Construction of Infrastructure for Micro Irrigation	3247 Ha.	5 Schemes covering 200 Ha. is in progress
▪ Formation of WUAs	30 Nos.	8 Nos. (Registration in Progress)
▪ Functional Grant to WUAs	30 Nos.	To be given after registration & handing over the distributory /Minors to WUAs
▪ Infrastructure grant to WUAs	30 Nos.	Grant will be given after registration & handing over the distributory /Minors to WUAs
▪ Training (State Level & Project Level)	30 Nos.	23 Nos.
▪ Monitoring & Evaluation		Yearly Concurrent Evaluation by NIT, Patna

Photographs for Field Channels and Infrastructure for Micro Irrigation.





Latitude: 24.875199
Longitude: 83.770125
Elevation: 112.79m
Accuracy: 8.0m
Time: 09-01-2019 17:12
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Powered by NoteCam



BIHAR



Participatory Irrigation Management (PIM) in Bihar

- Govt. of Bihar has promulgated “The Bihar Irrigation Act 1997” (Act No. 11,1998)
- The promulgation of the act by the state provides legal status to Water Users’ Associations.
- The article 46 of this act stipulates that –
Government may transfer distributory, minor or water course to Water Users’ Association (s).
- Water Resources Department has made rules and regulations regarding transfer of management of distributories of Canal systems to WUAs.
- The Department has also issued guidelines regarding formation of WUAs.
- Normally distributories having CCA approximately 500 Ha. to 2000 Ha. are handed over to WUAs.
- At present 54 nos. distributories/Sub-distributories of various canal system of the state have been handed over to registered WUAs.
- 8 nos. Distributories/Sub-distributories/Minor level committee of Durgawati Reservoir project has been formed and registration of the System Level Committee is under progress.

- **Farmers' Organisation (WUA) in Bihar is two tier-**

- (i) Village Level Committee (VLC) – For every village of the system.

- (ii) System Level Committee (SLC) – Where System stands for Distributory, Sub-distributory or Minor, where PIM programme has been taken up.

- **Executive Committee of VLC**

- 1. President – 1

- 2. Vice President – 2

- 3. Secretary – 1

- 4. Treasure – 1

- 5. Executive Members – 6

Total – 11 members

- All beneficiary land holders of the village shall be the general member of VLC

- Scheme Level Committee (SLC) – Presidents of all VLCs - general body of SLC

Continue.....

- **Executive Committee of SLC**

1. President – 1

2. Vice President – 2

3. Secretary – 1

4. Treasurer – 1

5. Executive Members – 6

Total – 11 members

- SLC is a corporate body, registered under the Society Registration Act, 1860 in which at least one female should be the member of Executive committee.
- Water Resources Department hands over the management of the system to the registered SLC on the basis of a MoU between the department and the committee.



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- SLC manages, operates, maintains and collects water charges.
- As per the MoU, the Committee has to deposit 30 percent of the agreed water Charges to government treasury and balance 70 percent is retained by the Committee for the upkeep of the system and irrigation management works under its command.
- Farmers are being motivated and trained to take up PIM programme.
- Field officers of the Department are also being trained by WALMI, Patna to promote this programme amongst the farmers.

Bottlenecks

■ **Construction of Lined Field Channels :-**

- Through beneficiary farmers since formation of WUAs is in process.
- No Land Acquisition is involved. Construction of field channels is being done on farmers' land.
- Average land holding being very small (Avg. 0.4 Ha.), hence farmers are not interested in giving their valuable land for construction of field channels.
- Limited period for execution of work.

Due to crops in the field, the working period for construction of field channel is available only between the month of April to June.

- Construction work of some of the distributaries has not been started yet due to land acquisition issues.
- After completion of work, the field channels are handed over to the beneficiary committees of the concerned channels till the registered WUAs are formed. The Beneficiary farmers do not take interest in repair and maintenance of the field channels after construction.

• **Micro irrigation:-**

- Cost norm for infrastructure development (Pump house, sump, filtration unit, main & sub-main pipe line, outlet etc.) of Micro irrigation as per provision in guideline is only Rs. 50,000/-Ha. whereas Actual Cost is Rs. 1,15,000/- Ha., this needs enhancement.
- Farmers' Reluctance to adopt Micro Irrigation
- Easy availability of water for growing traditional crops like paddy & wheat. So farmers are reluctant to adopt Micro Irrigation for growing vegetables, flowers etc.
- Small & Fragmented Land Holding
91% of farmers of Bihar are small & marginal farmers with average land holding of 0.4 Ha.
- Scarcity of capital
- Average cost of providing drip irrigation system to farmers in Bihar is approx. Rs. 1,30,000/- Ha. + 12% GST.
- To promote micro irrigation total subsidy offered by Govt. is 90% of the basic cost.
- GST (@ 12%) & balance 10% of the basic cost drip system which amounts to be approx. Rs. 28600/- Ha. has to be borne by the farmers.

- 
- Marginal & Small farmers are not taking interest due to higher cost farmers' share i.e. Rs. 28600/- Ha
 - Sub-letting of Plots
 - Owners of plots sublet their plots to other small farmers on lump sum contract so the owners do not show interest for making investment in Micro irrigation.
 - Conjunctive use of Water
 - Farmers demand tube wells to supplement canal water for assured availability of water during lean season.
-
- **Inadequate Storage & Transport facility for produce.**
 - **Poor Agriculture marketing services.**



■ Participatory Irrigation Management (PIM)

- Lack of interest of farmers towards PIM.
- Functional grant to WUAs is Rs. 1200/- Ha. Out of this farmers' share is 10% (Rs. 120/- Ha.). Farmers are not interested in paying even this contribution. Due to this functional grant could not be transferred to WUAs.
- WUAs are not collecting Irrigation cess properly. They are collecting only about 10% -15% of Irrigation cess inspite of the provision to keep 70% of the collected cess for maintenance of canal system and only 30% to be deposited in government account.
- Cost norm for infrastructure grant to WUAs (Rs. 3.0 Lacs/- WUA) is inadequate.

Corrective Majors Adopted

■ Lined Field Channels

- Trainings and awareness programmes for farmers, officers & WUAs are being organized at State Level as well as field level.
- A Pilot Scheme is being formulated for use of underground PVC pipe in place of open Lined field channel to save useful land as well as for better water use efficiency.
- Micro irrigation is being promoted among farmers through distribution of leaflets, display of banners & films shows covering information & benefits of Micro Irrigation.



Conclusion

- **Suggestive Measures**

- Provision in guidelines for CADWM programme should not be same for all states. It should be based on States' geographical, water availability & socio-economic factors.

As per the report released by NITI Aayog regarding performance of various states in composite water management index, it has been observed that high & medium performing states are those facing looming water shortages.

The low performers are populous northern States of U.P, Bihar, Rajasthan, Haryana & others, that are home to over 600 million people. These states also account for 20-30% of India's agricultural output.

- Funding pattern for development of infrastructure for Micro irrigation should be increased to 75: 25 (C:S).
- Cost norm for infrastructure development of Micro irrigation should be increased to Rs.1,00,000/-per ha to make it realistic.

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- GST on drip/sprinkler should be waived off to promote Micro irrigation.
 - Cost norms for infrastructure grant to WUAs should be at least Rs. 7.0 lacs per WUA.
 - Deposit of Farmers' share for functional grant should not be made mandatory before giving Central & State shares. It may be deposited once WUA starts functioning smoothly.
 - 10% of the area marked for Micro Irrigation should be provided as demonstration plots. For demonstration plots 100% cost of CAD component & drip system should be borne by centre to promote Micro irrigation in states like Bihar.
 - Details of best practices (concept, design, drawing, estimates, execution process etc) adopted by various states in implementing CADWM programme should be shared among other states regularly.



THANKS.....