



**ACHIEVING DRINKING WATER SECURITY THROUGH  
PARTICIPATORY IWRM APPROACH IN DHASAN RIVER SUB-  
BASIN, NOWGON BLOCK, CHHATARPUR (M.P), INDIA**

*Ishaprasad Bhagwat<sup>1</sup>, Asad Umar<sup>2</sup> and Suresh Jaiswal<sup>2</sup>*



# THE CONTEXT

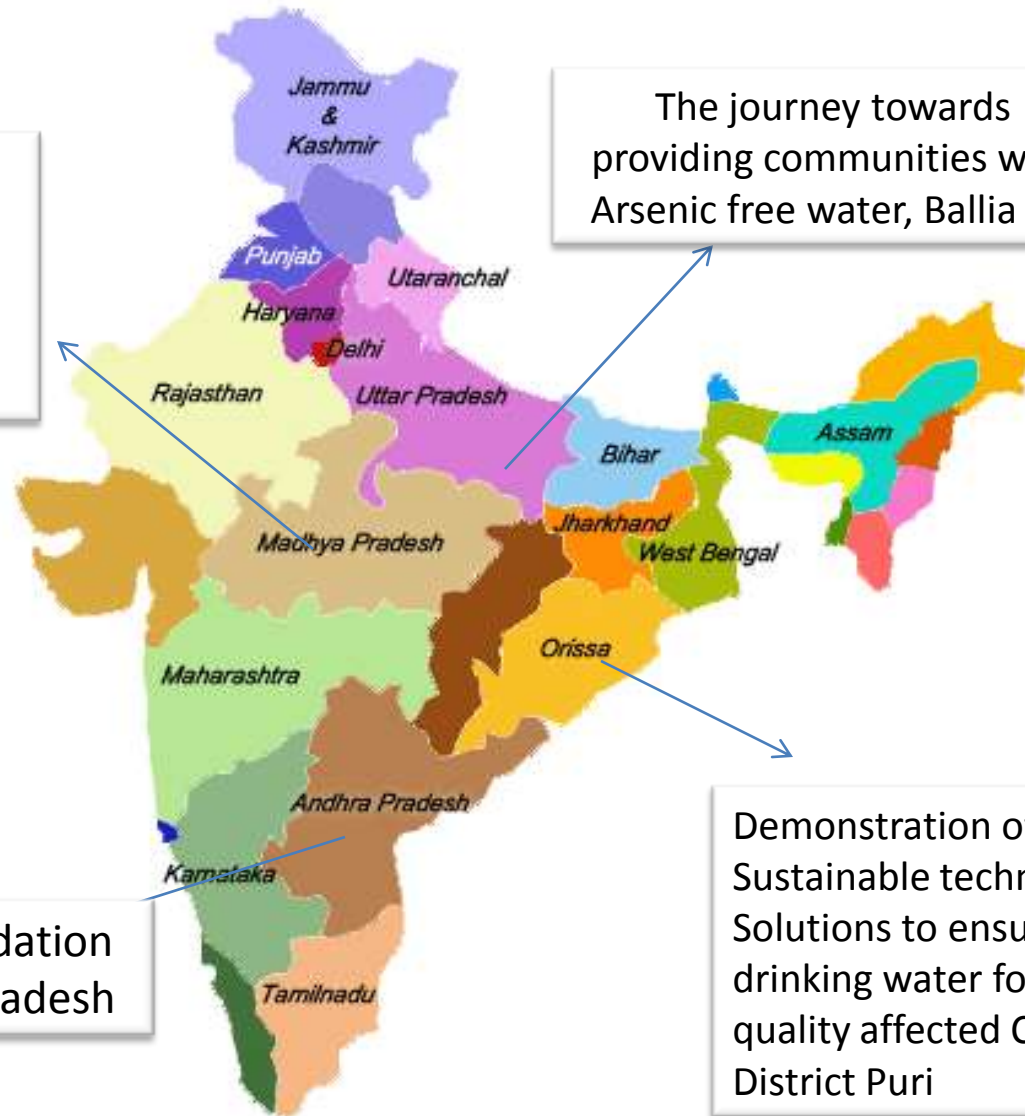
- In India the sustainability of sources and ensuring supply of potable water are two major constraints in achieving the national goal of providing drinking water to all.
- 3.31 lakh habitations which were fully covered have become partially covered due to failure of sources.
- 2.17 lakh habitations have water quality problems
- with more than half of the habitations affected with excess iron (1, 18,088). This is followed by fluoride (31,306), salinity (23,495) nitrate (13,958) arsenic (5,029) in that order.

Thus “Integrated Water Resource Management” through community Participation is a viable option in Indian Context

# WATERAID INITIATIVES IN INDIA TO IMPROVE ACCESS OF SAFE AND SUSTAINABLE DRINKING WATER THROUGH IWRM APPROACH

Achieving Drinking Water Security through IWRM Approach in Dhasan River Sub-basin, Nowgon Block, Chhatarpur (M.P),INDIA

The journey towards providing communities with Arsenic free water, Ballia UP



Raghavpur defluoridation initiative, Andhra Pradesh

Demonstration of Sustainable technical Solutions to ensure safe drinking water for quality affected Coastal District Puri

# Achieving Drinking Water Security through IWRM Approach in Dhasan River Sub-basin, Nowgon Block, Chhatarpur (M.P),INDIA



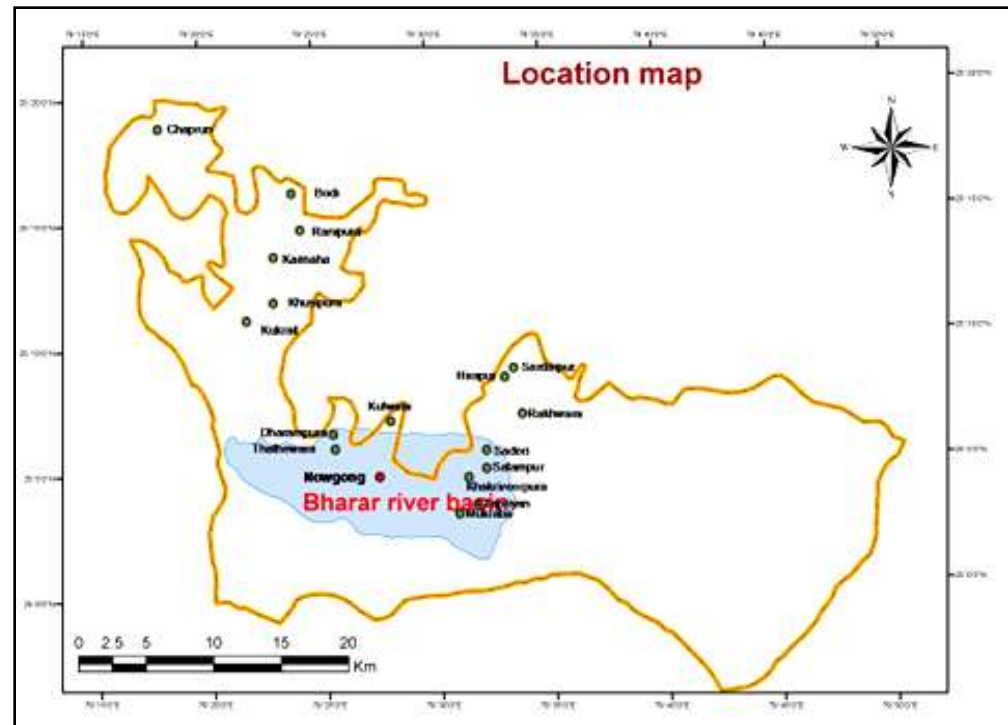
A WATERAID INDIA INITIATIVE IN WATER STRESSED BUNDELKHAND REGION

# ISSUES IN THE REGION

- Over the years ground water scenario in Bundelkhand region has become very depressing. While the demand for the use of water, both for domestic and irrigation needs has been increasing manifold, the level of ground water is decreasing with alarming speed
- On an average, the region has a decent rainfall of about 850 mm, however intermittent but successive years of droughts have resulted in water scarcity in the last one or two decades.
- In case of Chatarpur where project is being implemented 62% villages have water table in the range of 10meter where as in the remaining villages it is between 10 to 30 meter .Due to this declining trend and over exploitation of ground water perennial water sources are becoming seasonal.
- Open wells are source of drinking water in many villages and are prone to bacteriological contamination especially during rainy seasons. Use of excess fertilizer for better yield of crops is also adding to nitrate level in the ground water.
- Decrease in accessibility of water is resulting in more burden on women and children as they have to fetch water from distant sources. This is leading to both social costs (absence from school, health impacts) and economic costs (loss of wages).
- Inequitable and inadequate distribution of water resources.
- Indifferent Attitude of community towards water management practices and judicious utilization of water resources.

# LOCATION

- Project area is part of Dhasan river Sub-basin and falls within the latitudes of  $24^{\circ}06'$  &  $25^{\circ}.20'$  N and Longitude  $78^{\circ}59'$  -  $80^{\circ}.26'$  E.
- This project covers 16 villages with a population of around 9000.
- In 2005 the stage of ground water development was 57% however due to recurring drought and over exploitation there is sever stress on ground water regime.



## Geology and Ground water regime

- The geology is mainly comprised of medium *to fine grained gneisses* and *coarse grained gneisses* with sporadic deposits of alluvium along the river courses.
- The groundwater system in the area is mainly in the form of a shallow unconfined aquifer system and highly inhomogeneous deeper aquifer system.
- The aquifer system is controlled by the degree of weathering and the density and openness of fractures, implying that the yield from the unconfined aquifers is variable and that from the confined aquifers is even more variable.

# THE PROGRAMME APPROACH

- The current programme intervention in the Nowgaon Block of Chhatarpur district is an attempt to demonstrate a community based model for ensuring sustainable access of drinking water facilities in water stressed Bundelkhand region.
- Community based, Demand Driven, Participatory approach
- Decentralized decision making
- Capital cost sharing and O & M sharing
- Integrated approach for providing sustainable water supply, and sanitation services



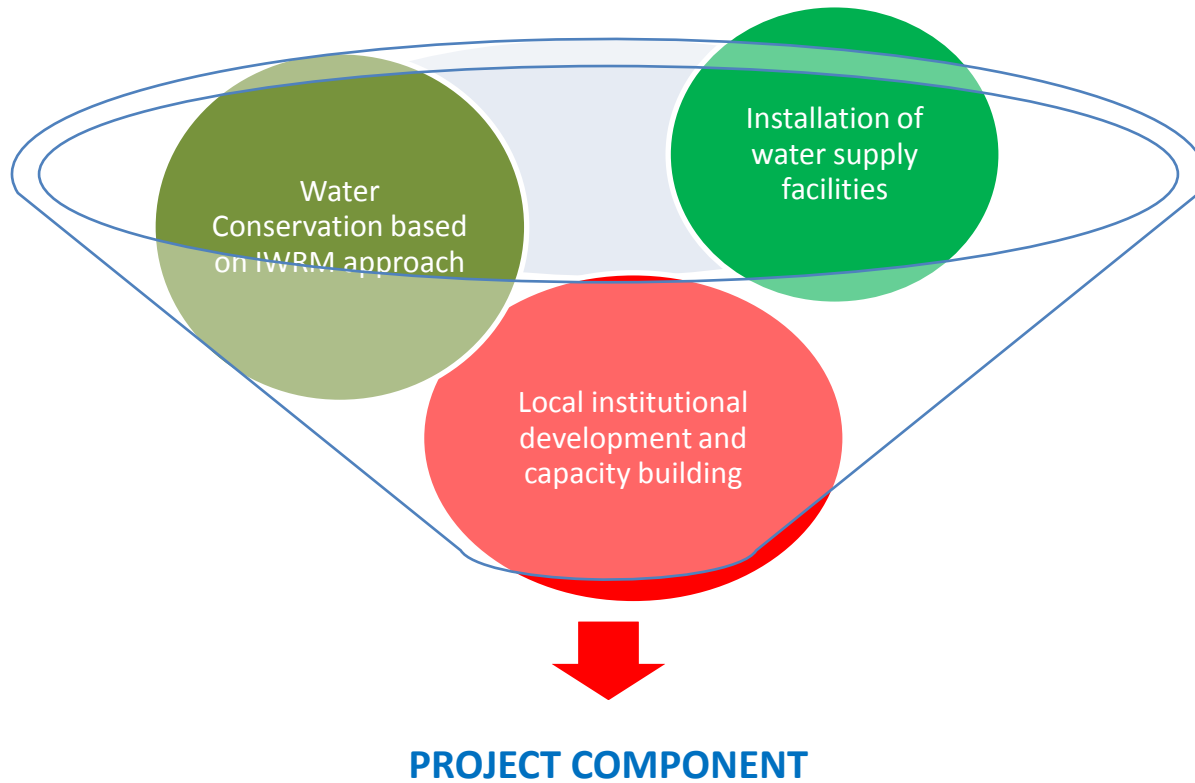
## STEPS OF PROGRAMME IMPLEMENTATION

- Creating awareness and ensuring community participation right from the planning to operation and maintenance stage.
- Formation and strengthening of local institutions (village water supply and sanitation committee) for programme execution.
- Conducting participatory water need assessment and finalizing the option of for improved and equitable access of drinking water to the community.
- Identification of sources through geophysical and hydrological investigation and ascertaining the ground water potential through pumptest. For quality of drinking water conducting bacteriological and hydro chemical test.

## STEPS OF PROGRAMME IMPLEMENTATION

- Based on the selected option finalization of detail project report along with schedule of implementation
- Procurement of services and materials through VWSC to ensure transparency
- Implementation of hardware activities to create water supply facility with basic provision of household connection.
- Adopting integrated approach of drinking water and sanitation to minimize sanitation related risks.
- Supporting all the drinking water sources with source strengthening measures to ensure long term sustainability.
- Setting up of observation wells to monitor the impact of recharge measures and to carry of water balance of the basin.

# THE PROJECT COMPONENTS



# Awareness creation and capacity building

- Reconstitution and strengthening of village level institutions through a series of awareness creation and theme based training programme with the basic objective of ensuring system sustainability
- In order to ensure participation and ownership among the community members, community contribution was made mandatory and people contributed Rs. 1000 per family which is deposited in the VWSC account as a corpus
- In four completed water supply schemes the operation and maintenance is fully managed by user community

# IWRM INITIATIVES



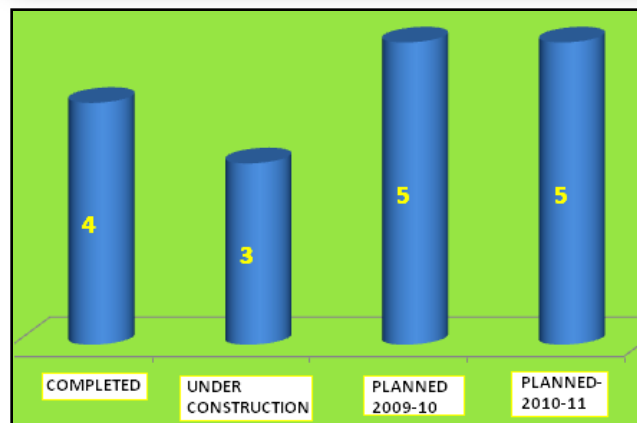
- On the main Bharad River, 5 check dams are constructed to reduce the flow velocity.
- Drainage line treatment were carried out on two local streams which covers at least 5 water supply schemes of five villages. Local stream with an approximate length of 2.5 km originates from an ancient pond and joins river Bharad in Nowgaon block.
- As part of drainage line treatment 7 check dams are constructed in a series on one stream from its starting point till end point and on another stream coming from north direction of Bhadar river, two Stop dam are constructed.
- Similarly other villages are also planned to be covered under drainage line treatment by the end of project duration by year 2011
- It is also planned that in few villages like Thtewra, RWH would also be tried out

# The Water conservation initiatives

- Nine check dams are constructed in the year 2009 and their impact is being monitored through observation wells. Once the cycle of monitoring is completed, it would be easier to quantify the impact. As of now it is quite evident that all the four completed water supply schemes around these structures are sustaining the demands.
- The influence of recharge to ground water are recorded from water harvesting structures at village Singrawan Kala Khurd where three check dams are constructed in the year 2006.
- As revealed by the data of four observation wells, in the summer season of 2006, water was in the range of 9-10 mbgl and within a span of three years it has risen to 6 mbgl.
- This clearly demonstrate that water conservation structures are contributing towards sustainability of drinking water sources

# Interventions to improve drinking water access

- Mini water supply schemes based on ground water sources and consisting of source well, pump house, ESR (Elevated storage reservoir) and household connection are promoted in the villages.
  - So far four schemes have been completed
  - Work on three schemes is under progress.
  - Five schemes are planned and is expected to be completed by the end of this year.



Status of water supply schemes

# Salient features of the created water supply facilities

## Source Sustainability

- Under this programme household connections are provided therefore due precaution are taken to ensure long term sustainability of drinking water sources.
- All drinking water schemes are supported by sources strengthening measures.
- Major focus is given on drainage line treatment to improve ground water availability.

## System Sustainability

- Local institutions (VWSCS) are formed and strengthened.
- Community contribution is a mandatory part of these schemes and it is ensured that a sum of Rs. 1000 per family is deposited in the VWSC account.
- Cost of operation and maintenance is also worked out and shared with community members and they are paying
- All these measures ensures sustainability of system and is important to run the scheme smoothly on a long term basis.

### *Costing of these schemes*

On an average the per capita costs of these schemes are in the range of Rs. 850-1150 for the current population where as standard per capita norms for drinking water supply schemes are Rs.2200.



# CONCLUSION

- The present programme intervention in Nowgaon block of Chattarpur district clearly demonstrates that through a concerted effort of source and system sustainability, drinking water security can be ensured even in the water stressed region of Bundelkhand.
- With this intervention In 16 GPs a projected population of approximately 13000 people would get assured water supply to meet drinking and domestic water requirement.
- The success of water-recharging structures demonstrates that favorable geological conditions can lead towards recharging of shallow aquifers. Therefore it is important that before taking up such initiatives consultation with hydrologist should be a prerequisite.
- It is observed that many farmers tend to overexploit the ground water if ground water potential has increased. Hence there is a need for stronger self regulatory frameworks that recognize the interests of all stakeholders involved, and also prevent over-exploitation of groundwater
- The successful adoption of piped water supply schemes in the area clearly indicates that if a proven technology, which is manageable, affordable, and capable of easy replication is adopted then chances of sustainability increases substantially.

# CONCLUSION

- Gram Panchayat and VWSC have been the focal point in Planning, Implementation and effective management of the Project.
- This clearly indicates that if there is concerted software support to the local institution in form of appropriate training and hand holding support then created infrastructure of rural water supply can be sustained over a long period of time.
- The project experience also reflects that informed and empowered local institutions can address the water needs of poor, underserved and excluded class
- The present program approach also indicates that the drinking water crisis cannot be addressed in isolation. Broader issues of source sustainability, water quality and sanitation must be taken into account.
- The present project reaffirms the belief that assured water supply can lead towards better usage and coverage of sanitation and improved hygiene behavior.
- The assured water supply at household level indicates that giving communities a reliable source of water releases women for participation in other productive activities. Adequate quantity of sustainable and safe water supply also ensures personal hygiene and improved maternal, childhood and community health.

# THE CHALLENGES-

- The IWRM at catchment level is gaining importance and recognition for drinking water sustainability however it requires huge capital cost investment.
- Therefore the major challenge is to collaborate with agencies whose primary mandate is to work mainly for water conservation activities at catchment level.
- The second major challenge is the prevention of overexploitation of water sources through efficient water use and by developing self regulatory norms.

THANK YOU

