



Selected Best Practices In Water Management

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S. No	Name and place	Implementing agency	Details	Achievements and takeaways
Irrigation water management				

1

Mission
kakatiya,
Telangana

Telangana State
Government

- It was aimed at restoring minor irrigation sources of water.
- Objective is to enhance the development of Minor Irrigation infrastructure, strengthening community based irrigation management in decentralized manner.
- Steps like tank de-siltation, restoration of the feeder channels, re-sectioning of irrigation channels, repair of bund, weir and sluice, raising of FTL(Full Tank Level) were carried out.

- Groundwater level and water retention capacity of soil increased
- Measures like mixing of the slit on farm land preparation reduced the use of chemical fertilizers and also improved the land water retention capacity.
- An appreciable change was observed in the nutritive values of the soil.

Takeaways:

- Public participation will lead to ownership and help long-term sustainability of the interventions.
- Restoration and maintenance of water resources should be a continual process and local people should be trained to manage their resources.

- The use of micro irrigation technology like sprinkler and drip irrigation was made mandatory.
- It was aimed at effective water management and judicious use of bio drainage and tree plantation.
- Particularly Wide variety of salinity resistant crops planted to increase soil productivity.
- Production cost and soil salinity both decreased as a sign of sustainable development.
- There has been significant reduction in losses, both in cultivation and land loss.
- Food production increased.

Takeaways:

- Establishment of integrated irrigation system that comprises of canal systems, micro irrigation facilities and a network that even handles the problems of salinity, soil moisture, drainage etc.
- Micro irrigation processes help in achieving high efficiency and reduces water use as in the conventional methods.

Har Khet ko Pani, Andhra Pradesh

Ministry of Water Resources, River Development & Ganga Rejuvenation (MoWR, RD & GR), Government of India.

- This included renovation of traditional water structures and promotion of crop Diversification.
- The State programme: “Neeru Pragathi” was also implemented and beneficial outcomes were seen during the course.
- The highest priority was given to creating many water harvesting structures and SMC. It works under MGNREGA (Mahatma Gandhi National Rural Employment Guarantee Scheme).
- Other steps like incorporation of solar pumping methods, promotion of drip and sprinkler Micro-Irrigation (MI) techniques were taken.
- It sets benchmark and suggests several best practices for sustainable Agriculture.
- Irrigation potential and water table has been increased.
- Restoration and renovation of water bodies can lead to water use efficiency.
- Optimal utilisation of the resources.

4	<p>Mulching: Harvesting many benefits in cardamom, Kerala</p>	<p>The Indian Cardamom Research Institute (ICRI)</p>	<p>The Indian Cardamom Research Institute (ICRI) studied the soil fertility on a farm and found that the organic carbon/humus content is higher in the farms where this technique is practiced compared to neighbouring plantation.</p>	<ul style="list-style-type: none"> • It increased humus content in the farm. • It helped in retaining the plantation successfully for 17 years with compact clumps. • There is no need for weeding as the soil is not exposed and self- shade of cardamom clumps discourages weed growth.
5	<p>Participatory irrigation management, Waghad, Maharashtra</p>		<p>Steps were taken up to achieve equitable distribution of the resources using the tail to head principle.</p>	<ul style="list-style-type: none"> • There was an improvement in water use efficiency and water productivity of irrigation projects through participation of farmers in irrigation management. • Drip irrigation coverage increased. • It provided tail to head distribution of resources.

6

Micro
irrigation,
Gujarat

Gujarat Green
Revolution Company
Ltd.

- The objective was establishment of a special purpose vehicle – Gujarat Green Revolution Company which would promote and implement Micro Irrigation Scheme.
- The initiative educated the farmers in adoption of scientific water management techniques and benefits of value-addition in crop production and marketing of their produces.
- The intervention in true sense set a green revolution, Gujarat has achieved double digit growth in agriculture sector and the state is a pioneer of second green revolution in the country.
- Strict monitoring and dedicated agencies played a crucial role in making the programme a success.

7

Root zone watering (SWAR),
Telangana

Centre for Environment Concerns

- The intervention discovered a unique irrigation technology called System of Water for Agriculture Rejuvenation (SWAR).
- The system involves storing of water in overhead tanks and sending it through a small diameter pipe to customised locally-made clay pot that is buried near the root area.
- SWAR uses a very less amount of water and there is zero wastage of water.
- This technique was also used to grow vegetables and flowers and this was very suitable for tree plantations.
- Optimal use of water.
- This helped show immediate results in terms of both soil and plant health and farmers' incomes.

8

Bhungroo-
Groundwater
injection well,
Gujarat

Government of
Gujarat

- This system injects and stores excess rainfall water underground.
- The steps such as installation of one unit with sub-surface storage at three levels between 25 - 110 feet with a total capacity of two crore litres was implemented.
- Major beneficiaries of this pilot program were the underprivileged female farmers who were completely depended upon rain fed agriculture.
- This system has reduced drudgery of women thus making them the chief owner and expert of this practice.
- It has helped in contributing to food security.

9

Pani
panchayat,
Orissa

Department of
Water Resource
Orissa

- The primary objective was to improve the planning and development process for the state's water resource; thus increasing the overall agricultural productivity through investments for improvement of the existing scheme.
- The main objectives of the intervention were to promote and secure equitable distribution of water among its users, adequate maintenance of irrigation system, efficient and economical utilization of water.

Bottom-up institutional framework helped in sustained and effective management of the resource.

**Drinking
water
management**

1

Community managed drinking water supply programme, Gujarat

Water and Sanitation Management Organization (WASMO)

- This community managed, demand-driven, decentralized approach for rural water supply program was implemented at village level as an initiative to provide adequate and safe water supply to village community.
- It then brings together the community through Pani Samitis, NGOs, and International organizations like UNICEF, WASH and World Bank.
- It has established a financially sustainable model for water provision.
- Engagement of communities in the implementation process reduced the need for government support, makes the program self-reliant and ensures social sustainability.

2

Jal Dal-
Children's
Institutions for
Water
Management,
Rajasthan

Jal
Bhagirath Foundation
Rajasthan

- The Gram Panchayat of the village constructed a 40,000 liter tank in school, enlargement of village pond and created a Jal Sabha in the village.
- To ensure maintenance of the newly constructed tank, a student body of 10 members called Jal Dal was constituted. The Jal Dal took the responsibility of cleaning the roof and ensuring clean water in the tank.
- This intervention has positively impacted education in the region and has yielded a growth in literacy rate. (Due to lack of availability of drinking water, Government School in Godawas experienced poor enrolment and attendance rates).
- The village has become self-reliant and is now no longer dependent on pricey water tanks run by mafia to fulfil their water requirements.
- Incidences of waterborne diseases have reduced, clean water is available throughout the year for the village.

3

Mazhapolima
initiative,
Kerala

Thrissur District
Administration

- This artificial groundwater recharge program called Mazhapolima, means bounty of rain.
- In the rainy season, the rooftop rainwater is led through pipes with sand filter at the end, to open dug well to replenish the aquifer.
- Under this initiative, employees of 100 NGOs received training to install roof water harvesting systems.
- Money earlier spent on obtaining drinking water through tankers is now spent on building self-sustaining rooftop rainwater harvesting structures.
- Rise in groundwater level.

4

Adaptive
Water
management,
Rajasthan

Jal Bhagirathi
Foundation, Village
Communities

- The members undertook a participatory planning exercise and decided to increase the area of pond which would allow it to capacitate more water.
- The members of the Jal Sabha undertook a participatory planning exercise and generated funds through contribution of every household in the village.
- This money is used for regular maintenance of the catchment by renovation of water channels and tree plantation to improve water inflow.
- Availability of sweet drinking water round-the-year, water security ensured even in a severe drought year.
- The Jal Sabha has achieved a sustainable financial source for regular maintenance of the talaab through coupon system. The village, has been able to adapt to changing climatic patterns and recurring droughts .

5	Meeting Water Requirements through Innovation, Gujarat	Swajaldhara	<ul style="list-style-type: none"> • Under this program, collection tank was built near a perennial spring at a height of 120 meters from the main village. • A storage tank was built 40 meters above the village and connected with pipelines. • The tank capacity was 10000 liters and stand posts were constructed to provide water to the village. 	<ul style="list-style-type: none"> • Through this intervention villagers were able to obtain water in their village and no longer had to depend on one single open well to meet their daily water requirements. • The intervention also allowed the villagers to tap into a perennial source thereby ensuring maximum water security.
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**Urban water
management**

1

Nagpur
Orange city
water Project,
Maharashtra

Nagpur Municipal
Corporation

- The project aimed at addressing problems related to unbilled water.
- Tariffs are decided by MNC and collections are carried out by the consortium.
- The model follows a PPP framework wherein Asset Ownership lies with the NMC, operations are looked after by a private consortium and investment is done by Government of India and Govt. of Maharashtra.
- Service delivery issues being tackled through infrastructure augmentation and increase in capacity of Elevated Service Reservoirs.
- 24x7 water supply has ensured better standards of living for Nagpur residents.
- Consumer grievances being addressed through round the clock call centre, bill payments managed through zone level kiosks.

2

Surat:
formation of
Non-revenue
water cell,
Gujarat

Surat Municipal
Corporation

- Recognising need to improve service delivery, SMC (Surat Municipal Corporation) formed an NRW (Non Revenue water cell) to make a thorough estimate of non-revenue water and then to maintain overall NRW levels at 20%.
- Water audit and initial leakage mapping exercise of the core city area was conducted.
- Reduction of leakages.
- Reduction in number of consumer complaints. Better complaint tracking and redressal. Leak repairs and water savings.

Birkha
Bawari,
Jodhpur,
Rajasthan

Umaid Heritage Real
Estate

- The Birkha Bawari as the structure draws inspiration from traditional step wells in the region and is used to catch rainwater from the site catchment area.
- Apart from storage and conservation of rainwater, the project also highlights sustainable stormwater management in the housing complex, as it collects runoff and minimizes water logging in the area.
- The rainwater is collected from open areas through natural slopes as well as from the rooftop of the house connected through drainage conduits.
- The structure has increased property value of the complex by demonstrating perfect combination of good architectural design and well maintained green spaces in scanty rainfall region.
- Overall dependence on municipal stormwater structure has lessened and water logging controlled. The project provides green landscaped area to the site, which is hugely sustainable.

4	Bulk Metering System, Bangalore, Karnataka	Bangalore Water Supply & Sewerage Board	<ul style="list-style-type: none"> • Flow meters were installed at critical locations including inlet and outlet of all Ground Level Reservoirs and Elevated Service Reservoirs and on feeder mains which feed water directly to the distribution network. • All the meters were geo-tagged so aid data collection. • An ICT application is also being developed by IBM to capture data from bulk meters and transmit it to users for analysis. 	<ul style="list-style-type: none"> • Leakage reduction and efficient use of water. • This ensures affordable and equitable water supply to citizens while minimizing wastages consistently and reliably.
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1

Johads,
Haryana,
Uttar
Pradesh,
Rajasthan

Tarun Bharat Sangh

- Johads are simple mud and rubble barriers built across the contour of a slope to arrest rainwater.
- It is one of the oldest systems used to conserve and recharge ground water. Johads collect monsoon water, which slowly seeps in to recharge groundwater.
- Resulted in increased water availability and acted as a resource to agriculture, animal husbandry etc.
- Acted as a protection of forests and green cover in catchments.

- It is an indigenous irrigation practice in South Bihar.
- Ahar is a rectangular embankment type water harvesting structure-embanked on three sides & fourth side being the natural gradient of land- also used to grow Rabi Crops. Pyne are the irrigation channels.
- For this region floodwater harvesting the best option here, to which this system is admirably suited.
- It is a cheap source of water for irrigation.
- Effective use of flood water.

3

Apatani,
Arunachal
Pradesh

- It is a wet rice cultivation cum fish farming system practiced by Apatani Tribes of Ziro in lower Subansiri district of Arunachal Pradesh.
- This system harvests both rainwater and surface water which is simultaneously used for irrigation and pisciculture.
- In this method water from small streams and springs is tapped by creating temporary mud walls that acts as barriers and provide storage.
- The local drainage system is merged with the irrigation system which, in turn, improves the nutrient content of water required for rice cultivation. Thus the organic way of agriculture is followed.
- It marks as one of the most sustainable method where both waste management, water management along with the best practices of agriculture is showcased.

4

Phad,
Maharashtra

- Effective management of resources.
- Proper maintenance of water distribution system.

- It is prevalent in north-western Maharashtra and the system came into existence about 400 years ago. Majorly this practice is followed on three rivers in the Tapi basin - Panjhra, Mosam and Aram.
- Group of Phad(land blocks) are known as Thal. The Phad receives water from the Bandhara (A check dam) and is diverted through the canal or Pat. The excess water is diverted back to the main river through Sandwa (the waste weir). Between each Phad, there are small opening called Bara. Gravity acts as the main force for distribution of water from one Phad to another.

5

Kuls/kuhls,
Himachal
Pradesh

- Kulhs are community managed traditional irrigation system which use surface channels to divert water from natural flowing streams.
- Government of India has already taken many steps to restore and protect this unique system.

Integration of traditional methods and modern day technologies helped in aligning with local requirements.

6

Bamboo drip irrigation, Meghalaya

- Bamboo drip irrigation system is normally used to irrigate the betel leaf or black pepper crops planted in areca nut orchards or in mixed orchards. The channel sections, made of bamboo, divert and convey water to the plot site where it is distributed without leakage into branches, again made and laid out with different forms of bamboo pipes.
- It is practiced in the areas of Jaintia, Khasi, and Garo hills of Meghalaya are largely made up of steep slopes and generally rocky terrain where the soil has low water retention capacity.
- Bamboo Drip Irrigation practice helped in preventing leakage and also increased crop yield with less water consumption.
- It remained as one of the sustainable distribution channels.

Watershed management

1

Artificial glaciers,
Ladakh

Chewang Norphel

- In this concept, artificial glaciers and man-made canals are used to divert water from the main glacial stream to a small shaded catchment area away from the village to keep water frozen.
- Ice retaining walls were constructed on the sides in series to store frozen water. This creates secondary source for water.
- Significant increase in agricultural production, thereby increasing income of the locals.
- This technique brought water close to the village and made it available when it was needed the most.
- Reduction in travel time to fetch water, lessened dependency on already scarce natural sources.
- Adaptation to climate change and enhanced sustainability.
- Reduction in migration to cities. Overall improvement in water availability to the watershed

2	Hiware Bazar, Maharashtra	Yashwant Krishi Gram and Watershed Development Organization	<ul style="list-style-type: none"> • Under this watershed development program, specific steps were taken like implementation of artificial recharge structure, contouring on hilltop, structures to store water and proper distribution channels, and shift in the conventional cropping method was also adopted by the farmers. • The infrastructural activities carried out were mainly contributed and supervised by the local people in form of shramdan. Capital was generated with the help of several agencies. 	<ul style="list-style-type: none"> • There was a significant rise in the groundwater level. • Due to increase in surface water availability there was a reduction in pumping lift.
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Department of Rural Development

- The chief objective of Dhara Vikas Yojna was to ensure water security in the water scarce areas, to enhance the hydrological contribution of the mountainous ecosystem as water tower for the people, and to ensure disaster risk management by reducing landslides and floods.
- Some of the measures taken were adoption of a landscape-level approach for reviving springs, streams and lakes. Community participation and community - driven initiatives were taken for successfully implementing pilot projects for spring-shed development.
- Dhara Vikas has created significant impact by recharging lakes and reviving as many as 50 springs in Sikkim.
- Increased groundwater recharge.
- Dhara Vikas has initiated an environmental isotopic fingerprinting study of springs in Sikkim to increase knowledge of mountain aquifers.

4

Project
Bhujal,
Bundelkhand,
Uttar Pradesh

Anandana

- Project Bhujal specifically aimed in rejuvenating the watershed and it created a storage capacity of 100 million liters of water.
- Project Bhujal along with project Jalnidhi and project Unnati has created a remarkable impact in areas of Bundelkhand.
- Regular public interaction platform was developed in which there was equal representation of women, men and all the stakeholder groups which provided a platform for discussion and suggestions and gave a fair and transparent evaluation of the intervention.
- After this intervention the cropping intensity increased up to 30% and a significant increase the ground water recorded up to 2 to 5 meters.
- Significant improvement in level of water resources can be achieved with collective efforts.

