

**A STUDY ON IMPLEMENTATION OF 'JAL SHAKTI ABHIYAN' IN SIKAR
DISTRICT OF RAJASTHAN**

(A Dissertation submitted to the Punjab University, Chandigarh for the award of Master of Philosophy in Social Sciences, in Partial Fulfilment of the requirement for the Advanced Professional Programme in Public Administration (APPPA))

BY

**CAPTAIN (IN) VIKAS CHAWLA, ROLL NO 4506
PARTICIPANT, 45TH APPPA COURSE**

UNDER THE GUIDANCE OF

DR SUJIT K PRUSETH



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ADMINISTRATION (2019-2020)**

**INDIAN INSTITUTE OF PUBLIC ADMINISTRATION
INDRAPRASTHA ESTATE, RING ROAD, NEW DELHI - 110002**

INDIAN INSTITUTE OF PUBLIC ADMINISTRATION**NEW DELHI****CERTIFICATE**

I have the pleasure to certify that **Captain (IN) Vikas Chawla** has pursued his research work and prepared the present dissertation titled “*A Study on Implementation of ‘Jal Shakti Abhiyan’ in Sikar District of Rajasthan*” under my guidance and supervision. The dissertation is the result of his own research and to the best of my knowledge, no part of it has earlier comprised any other monograph, dissertation or book. This is being submitted to the Panjab University for the degree of **Master of Philosophy in Social Sciences** in partial fulfilment of the requirement for the Advanced Professional Programme in Public Administration (APPPA) of Indian Institute of Public Administration (IIPA), New Delhi.

I recommend that the dissertation of **Captain (IN) Vikas Chawla** is worthy for the consideration for the award of M.Phil. degree by Panjab University, Chandigarh.

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(Dr Sujit Kumar Pruseth)

Supervisor & Faculty

Indian Institute of Public Administration

I.P Estate Ring Road,

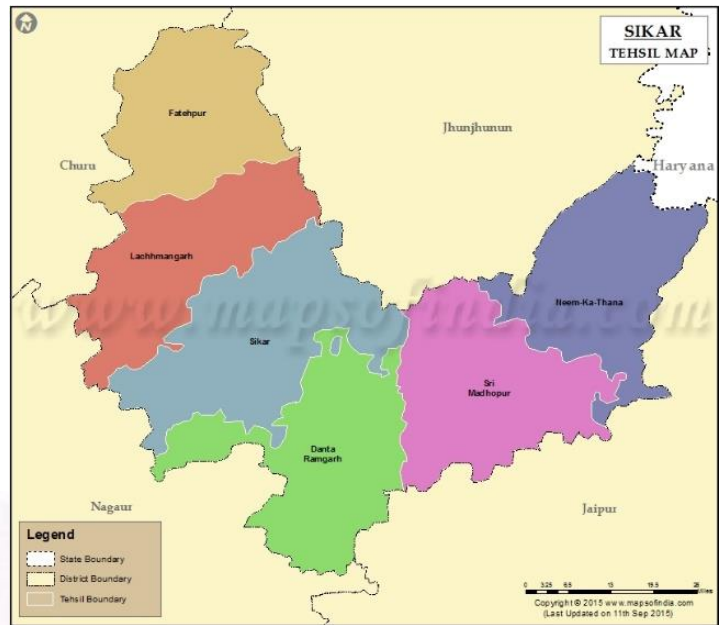
New Delhi, 110002

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Captain (IN) Vikas Chawla



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LIST OF ABBREVIATIONS

<u>Abbreviation</u>	<u>Full Form</u>
CCT	Continuous Contour Trench
CGWB	Central Ground Water Board
CNO	Central Nodal Officer
DCCT	Deep Continuous Contour Trench
DDWS	Department of Drinking Water and Sanitation
DSMP	Double wall Stone Masonry Pond
GP	Gram Panchayat
HH	Household
IWMP	Integrated Watershed Management Programme
JSA	Jal Shakti Abhiyan
KVK	Krishi Vigyaan Kendra
LSCD	Loose Stone Check Dam
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
MJSA	Mukhyamantri Jal Svavlamban Abhiyaan
MMS	Medium Masonry Structure
MPLADS	Members of Parliament Local Area Development Scheme
MST	Micro Storage Tank
NAP	National Afforestation Programme
NAQUIM	National Aquifer Mapping
NGO	Non-Governmental Organisation
NRDWP	National Rural Drinking Water Programme
NYKS	Nehru Yuva Kendra Sangathan
PMKSY	Pradhan Mantri Krishi Sinchayee Yojna
PT	Percolation Tank
RTRWHS	Roof Top Rain Water Harvesting System
SGT	Staggered Trench

SMC	Soil and Moisture Conservation
SNO	State Nodal Officer
SSB	Sub Surface Barrier
WDSC	Watershed Development and Soil Conservation Department
WHS	Water Harvesting Structure

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CHAPTER I

INTRODUCTION AND RESEARCH METHODOLOGY

“I call upon all citizens to join hands for water conservation and create a jan-andolan along the lines of the Swachh Bharat Mission, to save water and secure the future”.

- Honourable Prime Minister

Introduction

1. Water is one of the precious natural resources; each and every living thing needs water to survive. Even though, 97 per cent of the earth is surrounded by water, only three per cent is fresh and two thirds of this is frozen, the remaining unfrozen was found mainly as groundwater, and a small fraction present above the ground or in the air. The usage of water across various sectors in India is on the rise. Therefore, its sustainable management is essential to protect the water environment and to meet the increasing water demand in the future. However, the past few decades has seen an increase in demand amongst various water using sectors putting enormous stress on the natural resource.

2. India has 17 percent of the world’s population and 4 percent of the world’s freshwater resources ranking it among the top ten water rich countries. About 50% of annual precipitation is received in just about 15 days in a year, which is not being brought to productive use due to limited storage capacity (Agarwal, 2017). A 2017 study of Food and Agriculture Organisation of the United Nations (FAO) shows India’s per capita storage capacity is significantly low where only 8% of annual rainfall is being stored (FAO, 2017). Further, India the second most

populated nation in the world is currently designated as water stressed by Intergovernmental Panel on Climate Change (IPCC) with current utilizable freshwater much lower than international standards. A major grain producer, India also uses 3-5 times more water for crops than China, US and Israel, which is considered disproportionate use of water per crop. Heavy dependence on groundwater, years of deficient rains and disproportionate demand for water due to rapid population increase, urbanization and industrialization have put considerable stress on water management (Ministry of Jal Shakti, 2019). The ground water level is declining at a rate of 10 cm per year. Over 70% of surface water and ground water sources are contaminated. All this is leading towards a water scarce situation in many parts of the country (Agarwal, 2017).

3. The Ministry of Jal Shakti, Government of India has launched the Jal Shakti Abhiyan (JSA) to revive India back to a sustained system of water conservation and efficient irrigation. Jal Shakti Abhiyan (JSA) is a time bound campaign with a mission mode approach intended to improve conditions in around 1500 Blocks that are drought affected, water stressed or over-exploited falling in 254 Districts with water conservation related central programmes. 23 of these districts are aspirational districts. Designed in the lines of Gram Swaraj Abhiyan, JSA was carried out in two phases. Phase I was carried out between July 1 and September 15, 2019 for all States. For States/UTs with retreating monsoon namely Andhra Pradesh, Tamilnadu, Karnataka, and Puducherry, the campaign was carried out between October 2 and November 30, 2019.

4. During the campaign, senior officers, groundwater experts and scientists from the Government of India worked together with State and District officials in India's most water-stressed districts. JSA aims at making water conservation and promotion of irrigation efficiency

a Jan-Andolan through asset creation and communication campaigns. Under this campaign, targeted activities were to be undertaken under 5 areas of intervention as follows: -

- (a) Water conservation and rainwater harvesting,
- (b) Renovation of traditional water bodies/tanks,
- (c) Reuse, borewell recharge structures,
- (d) Watershed development, and
- (e) Intensive afforestation.

5. In addition, development of integrated Block and District water conservation plans which will incorporate the District irrigation plans, promoting efficient water use for irrigation by shifting to micro irrigation systems for water intensive crops, and motivating farmers to move to better choice of crops (More Crop per Drop) through initiatives like Krishi Vigyan Kendra (KVK) Melas were also to be carried out. Targeted communication was to be designed to promote and achieve accelerated progress of the 5 identified interventions. Special focus was to be given to mobilise farmers and communities and encourage them to participate in the campaign.

6. All the above interventions were to be implemented in 254 districts. To facilitate this, about 254 Additional Secretaries/Joint Secretaries/JS level officers, 400 Deputy Secretaries/Directors, 400 Technical Officers from Government of India have been made responsible to oversee the implementation, review progress and provide feedback. Each district is allotted to an Additional Secretary/ Joint Secretary/Joint Secretary level officer also referred to as Central Nodal Officer (CNO). Scientists/Technical Officers from the participating Ministries/Departments were linked to the Joint Secretaries and their teams for technical guidance and were given regional allocation. At the State level, Additional Chief

Secretary/Principal Secretary (Panchayati Raj & Rural Development and/or Water Resources) were made the State Nodal Officer (SNO). The SNO are to coordinate between the CNO and the District Collectors of their State for implementation of JSA.

7. A team of officials was formed for every Block. The team had 4 officers, headed by a Director/Dy. Secretary level officer from the Central Ministries, along with one technical officer from Central Ground Water Board/Central Water Commission two district officers nominated by the District Collector. Each of these teams were reporting to their CNO. About 400 such teams were to take a minimum of three trips (three days each) covering all villages allocated to them. Engineering students from local colleges, NGOs, Nehru Yuva Kendra Sangathan (NYKS)/ National Service Scheme (NSS)/ National Cadet Corps/ school eco-clubs and school students as nominated by District Collectors can be co-opted to be part of the campaign, where applicable. Best performing districts were to be assessed and recognized by Ministry of Jal Shakti.

8. A portal has been developed by DDWS and NIC through which Districts were provided a separate login (<https://indiawater.gov.in/jsa>) to report progress under all 5 JSA intervention areas. District Collectors and/or nominated officials by District Collector in each district were also provided access to JSA portal.

9. Sikar district in Rajasthan has a total of 9 blocks, out of which 8 blocks fall in 'over exploited' category and have been included in the JSA. These include Dantaramgarh, Dhod, Khandela, Lacchmangarh, Neemkathana, Patan, Piprali and Srimadhapur. This District has been chosen for the study due to proximity to Delhi and convenience.

Statement of the Problem

10. The statement of problem identified is as follows: -

“A total of eight blocks in Sikar District of Rajasthan fall in the ‘over exploited’ category with the average ground water extraction being 177%, and have been included in the ‘Jal Shakti Abhiyan’. The Jal Shakti Abhiyan is a unique initiative by GoI which aligns the efforts of all agencies towards actions in five Areas of Intervention which would lead to better water conservation and rainwater harvesting, renovation of traditional water bodies, reuse and borewell recharge, watershed development and afforestation. It is therefore extremely important that the implementation of JSA is effectively carried out in the designated Blocks.”

Rationale of the Study

11. Water scarcity is a concern across parts of the country. Water availability per capita is reducing progressively due to increase in population. The average annual per capita water availability in the years 2001 and 2011 was assessed as 1820 cubic meters and 1545 cubic meters respectively which may reduce further to 1341 and 1140 in the years 2025 and 2050 respectively (Ministry of Jal Shakti, 2019). Ground water levels have fallen in many parts of the country, which becomes acute in the summer months. The Areas of Intervention identified by JSA address all important aspects in water conservation and ground water recharge as enumerated in succeeding paragraphs.

12. Increasing water demand and over dependence on ground water for agriculture and other uses coupled with lack of (i) conscious water conservation and (ii) rain water harvesting have

decreased the availability of water. There is an urgent need to focus on water conservation measures including rainwater harvesting to augment water resources, which is the first area of intervention of JSA.

13. There are 5.92 lakh water bodies providing surface flow irrigation. The surface flow schemes typically consist of tanks, check-dams, structures and can serve as water conservation cum ground water recharge scheme. In addition to these, there are varied traditional water harvesting techniques that reflect the geographical peculiarities and cultural uniqueness of the regions. Many of these water bodies have gone into disuse because of the surge in ground water based irrigation systems, inadequate maintenance, encroachments, illegal diversion of land for construction purpose etc. Under the JSA, focused efforts at district and block levels would be made to inventorise, restore and rejuvenate traditional as well as other water bodies and tanks with people's participation.

14. Watershed is the area of land that drains water into a specific receiving water body, such as a lake or a river. Watershed management is a participatory approach of integrated land use and water management to protect and improve quality and productivity of soil, water, forests, livestock and livelihoods. Awareness generation and community based institution building by way of Watershed Development Committees is also an integral part of JSA interventions.

15. Reuse of water is a very important intervention to mitigate effects of depleting water availability. Water used once can in many cases be reused for multiple purposes. Used water can also be used effectively to recharge ground water. An important concept is of Grey water. Grey water includes water that comes out from after bathing, kitchen use, laundry etc. devoid of feco-urine contamination. Of the total available water, only 30-35% is consumed while the

remaining 65% to 70% of the total water is converted into grey water. Thus, on an average, one rural household of 5-6 members generates 150 litres of grey water daily. Thus, rural India on an average generates about 31,000 Million litres of grey water daily. In India, from each HH a huge quantum of grey water is generated, which if treated appropriately can be reused for several non-potable (non-drinking) activities.

16. Forests are a crucial natural resource that plays a vital role in water conservation and water retention in the soil. Trees play an important role in intercepting precipitation in the foliage, absorbing and filtering water that infiltrates into the soil. Trees also improve water quality by reducing soil erosion and preventing sediments choking water bodies. Therefore, JSA focuses on afforestation using low water consuming trees as another area of intervention.

17. One of the major additional outputs of Jal Shakti Abhiyan was to develop district water conservation plan. This is essentially a strategy to conserve, recharge and improve water use efficiency. The District Water Conservation Plan is developed by compilation of Block level conservation plans, which is essentially the compilation of water conservation plans of respective Gram Panchayats (GPs) within the block. The formation of District Water Conservation Plan will involve following steps: Identify all the concerned departments and engage them in water conservation e.g. Panchayati Raj (PR), drinking water, agriculture, irrigation, endowment boards etc. Create an inventory of GP/block-wise water harvesting and recharge structures with geo-tagging and other details of the location along with the photographs, determine the functionality status of each of these structures, conduct a functionality assessment on how many structures are functional and non-functional etc are part of the plans. Ensuring community involvement in the planning implementation and management of structures and Pre-monsoon inspection of all the identified structures by the

concerned department and maintenance would be made mandatory. The water conservation plan will be complete only by shifting to efficient systems in every facet.

18. As is evident from above, the Jal Shakti Abhiyan through its recommended areas of intervention, addresses all aspects of water conservation, through an integrated whole of government and community approach. The successful implementation of the same would benefit the citizens immensely by ensuring the availability of safe water in all the selected Districts, ensure availability of irrigation to farmers towards doubling of their income and to industries for ensuring the desired growth of Indian economy. It is therefore proposed to study the implementation of the Jal Shakti Abhiyan in the selected District.

Research Objectives

19. The objectives of research are as under:-
- (a) To study the effectiveness of implementation of 'Jal Shakti Abhiyan' in the five main intervention areas in the selected blocks of Sikar District, Rajasthan.
 - (b) To identify the challenges in implementation of JSA in Sikar District.

Research Questions

20. The major research questions that the study intends to address are as follows: -
- (a) **RQ 1** What were the gains in the five areas of intervention by implementation of Jal Shakti Abhiyan in the eight selected Blocks of Sikar District, Rajasthan?

- (b) **RQ 2** What were the challenges faced by the Nodal Teams (at Centre, State, Block and Panchayat level) in the implementation of Jal Shakti Abhiyan in Sikar District? What are the recommendations to overcome these challenges?

21. **Research Strategy and Design.**

RQ 1

- (a) **Research Strategy.** The research strategy would be Quantitative in approach.
- (b) **Research Design.** The research question aims to assess the extent to which the implementation of JSA has been achieved in Sikar District. Therefore, the research design would be descriptive to understand the extent of achievement in each of the Areas of Intervention.

RQ 2

- (a) **Research Strategy.** The research strategy would be Qualitative in approach.
- (b) **Research Design.** The research question is about the challenges faced by the Nodal Team members in the implementation of JSA. Therefore, the research design would be Exploratory, and would be explored by seeking the views of sample individuals/ key personnel in the Nodal Team.

Research Limitations/Delimitations

22. The Jal Shakti Abhiyan is being implemented in about 1500 Blocks of 254 Districts across the country. However, this study confines itself to the eight Blocks of Sikar District in Rajasthan. The Research Design for RQ1 would be descriptive, based on the data made

available by the Government of India in public domain. This includes data from the Ministry of Jal Shakti uploaded on the JSA website after completion of JSA.

Research Methodology

23. The dissertation would be based on analysis of both, primary as well as secondary data, as follows: -

(a) **RQ 1**

(i) Secondary data from Government of India comprising baseline data (pre monsoon) and final data (end Sep 2019) in respect of five Areas of Intervention for eight selected Blocks in Sikar District, Rajasthan.

(ii) Additional secondary data on other areas of intervention collated during field visit to Sikar from District Administration.

(b) **RQ 2**

(i) Primary data through Semi- structured interviews or Questionnaires during field visit.

(ii) Judgemental sampling to be employed for key personnel- Nodal officers from Ministry, State, District, Blocks and Panchayats.

24. **Data Sources**

(a) The study pertains to eight selected blocks in Sikar District of Rajasthan, and the data pertains to these eight blocks.

(b) The Secondary data would be obtained from public domain i.e. relevant reports released by Ministry of Jal Shakti, Govt of India, or uploaded on official websites. Other

reports prepared by Ministry of Jal Shakti in collaboration with Ministry of Urban Affairs, Rural Affairs and the World Bank etc.

(c) Primary data would be collected through Semi- structured interviews or Questionnaires handed over to key personnel of the Nodal Teams during field visit from 24-26 Sep 19.

CHAPTER II

AREAS OF INTERVENTION- JAL SHAKTI ABHIYAN

“I request you all to share ideas about traditional methods that have been in use over the centuries in our country for the conservation of water”.

- Prime Minister in Mann ki Baat

Jal Shakti Abhiyan

1. The Ministry of Jal Shakti, Government of India has launched the Jal Shakti Abhiyan (JSA) to revive India back to a sustained system of water conservation and efficient irrigation. Jal Shakti Abhiyan (JSA) is a time bound campaign with a mission mode approach intended to improve conditions in around 1500 Blocks that are drought affected, water stressed or over-exploited falling in 254 Districts with water conservation related central programmes. 23 of these districts are aspirational districts. Designed in the lines of Gram Swaraj Abhiyan, JSA was carried out in two phases.

- (a) Phase I was carried out between July 1 and September 15, 2019 for all States.
- (b) For States/UTs with retreating monsoon namely Andhra Pradesh, Tamilnadu, Karnataka, and Puducherry, the campaign was carried out between October 2 and November 30, 2019.

2. During the campaign, senior officers, groundwater experts and scientists from the Government of India worked together with State and District officials in India’s most water-stressed districts. JSA aims at making water conservation and promotion of irrigation efficiency

a Jan-Andolan through asset creation and communication campaigns. This chapter explains the methodology to be adopted by all levels for water conservation under the Jal Shakti Abhiyan, as spelt out by the Ministry of Jal Shakti in the Concept Note and detailed brochure (Ministry of Jal Shakti, 2019) . Under this campaign, targeted activities were to be undertaken under five areas of intervention as follows: -

- (a) Water conservation and rainwater harvesting,
- (b) Renovation of traditional water bodies/tanks,
- (c) Reuse, borewell recharge structures,
- (d) Watershed development, and
- (e) Intensive afforestation.

3. In addition, development of integrated Block and District water conservation plans which will incorporate the District irrigation plans, promoting efficient water use for irrigation by shifting to micro irrigation systems for water intensive crops, and motivating farmers to move to better choice of crops (More Crop per Drop) through initiatives like Krishi Vigyan Kendra (KVK) Melas were also to be carried out. Targeted communication was to be designed to promote and achieve accelerated progress of the 5 identified interventions. Special focus was to be given to mobilise farmers and communities and encourage them to participate in the campaign.

Areas of Intervention

Water conservation and rainwater harvesting

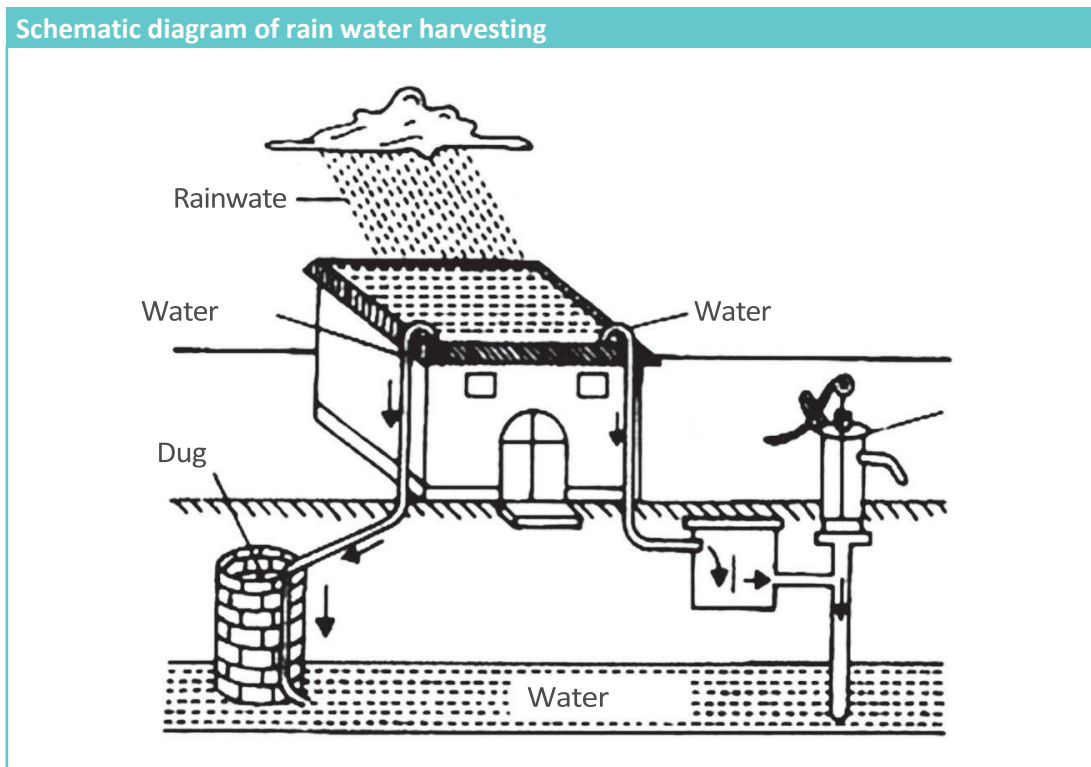
4. The demand for water among various sectors is increasing due to population growth and economic development, in turn creating competition within sectors. The severity of this issue

will have direct impact on water and food security of the country in future. Due to overexploitation of water resources, it has become scarce in many parts of the country (Ramappa, Balappa & Patil, 2014). The scarcity of water is a concern across most parts of the country and availability per capita is reducing progressively due to increase in population. The average annual per capita water availability in the years 2001 and 2011 was assessed as 1820 cubic meters and 1545 cubic meters respectively which may reduce further to 1341 and 1140 in the years 2025 and 2050 respectively (Ministry of Jal Shakti, 2019). Ground water levels have fallen in many parts of the country, which becomes acute in the summer months. Increasing water demand and over dependence on ground water for agriculture and other uses coupled with inter-alia lack of (i) conscious water conservation and (ii) rain water harvesting have decreased the availability of water. There is an urgent need to focus on water conservation measures including rainwater harvesting to augment water resources.

5. Certain issues with water conservation and rainwater harvesting are as follows:-
 - (a) Spatial and temporal variation of rainfall across the district
 - (b) Encroachment and disuse of existing water conservation structures
 - (c) Large-scale growth of aquatic weeds displacing natural species and choking the water bodies leading to eutrophication and evaporation losses.
 - (d) Lack of enforcement of legal instruments relating to rain water harvesting.
 - (e) Lack of awareness about available technology options for community based harvesting of rain water.
 - (f) Lack of people's participation to sustain conservation activities since these are seen more as Government intervention than people's participation.

6. The important actions envisaged under the JSA for Water Conservation and Rain Water Harvesting include:-

- (a) Assessment of water availability and planning for type of conservation structure suiting local conditions.
- (b) Mobilizing local NGOs, industries, college and school students and other volunteers for undertaking the conservation works.
- (c) Geo-morphology based site identification for effective water harvesting and recharging (technical officers to provide guidance)
- (d) Inventorising and restoring existing water conservation structures (like gully plugs, small check dams, staggered trenches, ponds etc) at village level and undertake renovation and maintenance activities to improve their efficiency and effectiveness.
- (e) Development of additional water conservation structures.
- (f) Cleaning of wells and allowing the filtered rain water to be collected in it.
- (g) Contour bunding and trenching in slopes for water percolation to soil
- (h) Construct rain water harvesting structures in panchayat buildings, public schools, public health centres, government buildings and
- (i) Encourage construction of rain water harvesting at household levels.
- (j) Identification of suitable sites for construction of sub-surface Dykes to check the sub-base flow in rivers and streams.
- (k) Improving the canal water distribution management and efficiency.
- (l) Effective watershed management involving contour trenching and nala plugging in hills and other appropriate water conservation and rain water- harvesting structures.




Source: Ministry of Jal Shakti, 2019



7. The most favoured activities that can be undertaken are construction of Rooftop rainwater harvesting structures at individual household level, building of Check dams, Trenches and Farm Ponds (individual or community).

8. MGNREGA and various forestry schemes could help in taking up water storage and conservation structures in rural areas. In addition, State Government schemes for water conservation under taken by Rural Development and Panchayati raj Departments could be utilised for this intervention.

Renovation of Traditional and Other Water Bodies

9. It is an accepted fact that water conservation is one of the most important tools in the country's efforts to double the farmer's income and rural prosperity. As per Ministry of Jal Shakti (Department of Water Resources River Development and Ganga Rejuvenation), there are 5.92 lakh water bodies providing surface flow irrigation (Ministry of Jal Shakti, 2019). The surface flow schemes typically consist of tanks, check-dams, structures and can serve as water conservation cum ground water recharge scheme. In addition to these, there are varied traditional water harvesting techniques that reflect the geographical peculiarities and cultural uniqueness of the regions. Many of these water bodies have gone into disuse because of the surge in ground water based irrigation systems, inadequate maintenance, encroachments, illegal diversion of land for construction purpose etc. Some of the key water harvesting bodies/structures and examples found specifically in Rajasthan are as follows (Narain, Khan & Singh, 2005): -

Type of structure	Use	Pictures
Tanka	Household level water harvesting	
Jhalara /Vav	Water conservation	

Johad	Water conservation	
Bawdi	Step well for water collection	

10. Issues faced in renovation of traditional and other water bodies are as follows (Ministry of Jal Shakti, 2019) :-

- (a) At the national level, Ground water based schemes are increasing but Surface water schemes are declining.
- (b) Heavy silting of the tank bed and choked up feeder channels largely due to lack of vegetation cover.
- (c) Shift from community based tank system to individual beneficiary oriented ground water dependent system.
- (d) Leaking bunds and sluices and dilapidated surplus weirs due to poor maintenance.
- (e) Deforestation, denudation and encroachments in the catchments areas including tank bunds.
- (f) Indiscriminate use of tank beds as dumping yards

- (g) Lack of community ownership/people's participation to sustain conservation activities since these are seen more a Government intervention than people's participation.

11. The Central Government Schemes having potential to finance Renovation of traditional and other water bodies /tanks are as follows:-

- (a) Under the Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), the Repair, Renovation and Restoration (RRR) of water bodies scheme of Department of Water Resources River Development and Ganga Rejuvenation is an important intervention in ensuring the utilisation of the full potential.
- (b) The RRR scheme in rural areas is proposed to be implemented in convergence with the Integrated Watershed Management Programme (IWMP), so that the catchment areas of the water body selected are located either in treated micro/mini watersheds or those selected for treatment during the next year or two.
- (c) Repair, Restoration and Renovation (RRR) of water bodies, under Department of Water Resources River Development and Ganga Rejuvenation, Government of India.
- (d) MGNREGA have provisions for construction and/or repairs/ renovation/ restoration and desilting of traditional water bodies/tanks.

12. Important actions under the JSA for renovation of water bodies are as follows:-

- (a) Identify the number of water bodies owned by different agencies (irrigation/ Panchayat raj etc)
- (b) Identify traditional tanks with district support
- (c) Inventorize such traditional waterbodies and other water bodies capturing their geo-coordinates, sizes, water spread area, inlet channel details etc.

- (d) Select water bodies in such a way that watershed activities are taken up/likely to be taken up in their catchment area.
- (e) Removal of encroachment and marking of land boundaries.
- (f) Repair of conveyance systems and feeder channels and Strengthening of bund(s)
- (g) De-silting to increase tank storage capacity and use the silt in farms. Farmers can be encouraged to volunteer for this activity using their tractors/carts etc.
- (h) Improvement of catchment areas of tank by undertaking watershed works (planting trees to arrest the soil erosion leading to silting of water bodies,
- (i) Promotion of conjunctive use of surface and groundwater (if groundwater is available)
- (j) Community participation through Water User Associations for post rejuvenation sustainable management.
- (k) Awareness generation and Capacity Building of communities, in better water management and development of tourism, cultural activities, etc.
- (l) Regulations by local bodies to avoid encroachments and its strict implementation.

13. The activities that could be undertaken under JSA towards the renovation of water bodies would be:-

- (a) Restoration of large water bodies.
- (b) Inventory of all traditional water bodies/ tanks
- (c) Restoration of traditional water bodies/ tanks
- (d) Periodical renovation of small water bodies at individual household level

Watershed Development

14. Watershed is an important area of land that drains water into a specific receiving water body, such as a lake or a river. Due to the interdependence of agriculture and forests, sustainable development can be attained through integrated watershed development. Watershed modelling needs to incorporate planning, implementation and impact assessment with participation of communities. A critical review of the organisational structure is needed to make it more professional, including the use of multidisciplinary expertise and participatory management techniques so that it remains flexible and responsive to the situation on the ground (Das, 2008). Watershed management is a participatory approach of integrated land use and water management to protect and improve quality and productivity of soil, water, forests, livestock and livelihoods. Watershed management follows a ridge to valley approach and involves in situ soil and water conservation, water resource development through drainage line treatments, productivity enhancement, livelihood strengthening and capacity building.

15. Watershed development programmes in India face the following challenges (Ministry of Jal Shakti, 2019): -

- (a) Lack of community participation, poor capacities and institution building
- (b) Poor operation and maintenance of soil water conservation structures
- (c) Changing climate and rainfall patterns and linked water scarcity
- (d) Over extraction and depletion of surface and ground water sources
- (e) Lack of protective irrigation amidst water intensive cropping pattern
- (f) Depleting drinking water sources
- (g) Soil erosion, land degradation and low productivity of crop land
- (h) Lack of alternate livelihood opportunities and resultant migration
- (i) Depletion and degradation of ridge area forest resources

- (j) Lack of availability of fodder and fuel for livestock

16. Important facts to be considered under JSA for Watershed Development are:-

- (a) In situ soil and moisture conservation through land/area and drainage line treatment
- (b) Land/area treatment through afforestation, percolation tanks, terracing, vegetative barriers, summer ploughing etc.
- (c) Drainage line treatment through construction of check dams, earthen bunds, percolation tanks, sunken pits etc.
- (d) Promote artificial ground water recharge structures and rain water harvesting
- (e) Agriculture productivity enhancement activities through promoting water saving techniques, drought resilient crops etc.
- (f) Develop Natural Resource Management based livelihood opportunities
- (g) Implement Awareness campaign for water demand management, its optimal use, adopting water saving practices and technologies.
- (h) Capacity strengthening of community institutions and PRIs for better management and upkeep of the assets created.

17. The activities that can be carried out under the Watershed Development are formation of Staggered trenches, Gully plugs and Percolation tanks.

18. Integrated Watershed Management Programme (IWMP) under the Department of Land Resources, Ministry of Rural Development, Government of India- (This programme is currently subsumed under PMKSY) can be utilised to finance the various activities.

Reuse and Borewell Recharge Structures

19. In recent decades, the dependence of an increasing population over ground water has made the ground water resource scarce. The level of ground water has depleted significantly over the last few decades, and needs to be checked. Progressive development of the aquifer system by artificial recharging can be considered as a tool for increasing groundwater resource (Satheeshkumar & Venkateswaran, 2018). Borewell Recharge Structures thus become an important part of the Water Conservation Effort in the country.

20. It is important to note that water used once can in many cases be reused for multiple purposes. Reuse of water is a very important intervention to mitigate effects of depleting water availability. Used water can also be used effectively to recharge ground water. An important concept is of Grey water. Grey water includes water that comes out from after bathing, kitchen use, laundry etc devoid of feco-urine contamination.

21. In most villages of India, the average supply of water is between 40 litres per capita per day (lpcd) to 55 lpcd (Average say 50 lpcd). Of the total available water, only 30-35% is consumed while the remaining 65% to 70% of the total water is converted into grey water. Thus, on an average, one rural household of 5-6 members generates 150 litres of grey water daily. Thus, rural India on an average generates about 31,000 Million litres of grey water daily. In India, from each HH a huge quantum of grey water is generated, which if treated appropriately can be reused for several non-potable (non-drinking) activities (Ministry of Jal Shakti, 2019). Additionally, untreated grey water is otherwise a wasted resource that if treated and managed effectively, can be used to provide relief from acute water stress as well as reduce water borne diseases in many parts of India.

22. There has been several issues and problems identified to the management of grey water at the HH and community level. In general, there is a belief that once water is used and flows out it cannot be reused. Some of the specific issues are:

- (a) Lack of awareness at household and community level about potential of used water towards ground water recharging and technologies therein.
- (b) Reluctance in the use of grey water due to socio-cultural norms, beliefs and practices.
- (c) Currently emphasis is given on construction of drainage systems to carry grey water out of habitations without providing a specific discharge point or treatment facility
- (d) Discharge of black water of septic tanks directly into the open drains contaminating the grey water and making it unsuitable of easy reuse
- (e) Lack of institutional support at the Gram Panchayat level to support and popularise grey water management technologies, awareness generation and implementation.
- (f) Lack of operation and maintenance of HH and community level grey water management systems

23. Central Government Schemes having potential to finance Reuse and Borewell recharge structures are as follows:-

- (a) Swachh Bharat Mission (Gramin): Depending on the size of the Gram panchayat, between Rs 8 lakh and Rs 20 lakh is available for solid liquid and waste management (SLWM) activities including grey water management
- (b) MGNREGS: Construction of community level grey water treatment and ground water recharge structures can be funded from this scheme. This can be included as part of the Gram Panchayat development plan (GPDP)

- (c) NRDWP and SWAJAL: The National Rural Drinking Water Programme and the Swajal programmes ensures water safety and promotes improved environment around drinking water sources. This can be used in managing grey water and handpump/ borewell excess flow for water recharge while also keeping the environment clean
- (d) Schemes under watershed, forestry, irrigation and agriculture programmes include interventions that promote point recharge

24. Important fact about Reuse and Borewell recharge structures is that the Grey water management and fresh water augmentation is based on the 4Rs concept: Reduce, Recycle, Recuperate and Recover. The community along with planners and implementers need to initiate simple water conservation methods to protect water sources from drying up and also build structures at household (HH) level and community levels for reuse of grey water and its use for point recharging. A three-pronged strategy can be adopted (Ministry of Jal Shakti, 2019): -

- (a) Promote grey water management at HH level and community level through construction of simple structures, in and around homes and public places specifically around water sources
- (b) Awareness and capacity building at community level to address behavioural barriers regarding water reuse and on importance of grey water and its effective management
- (c) Renovate and protect all existing traditional surface water sources to improve recharge, thus supplementing use of groundwater for irrigation purpose.

25. Activities to be undertaken under the Intervention:-

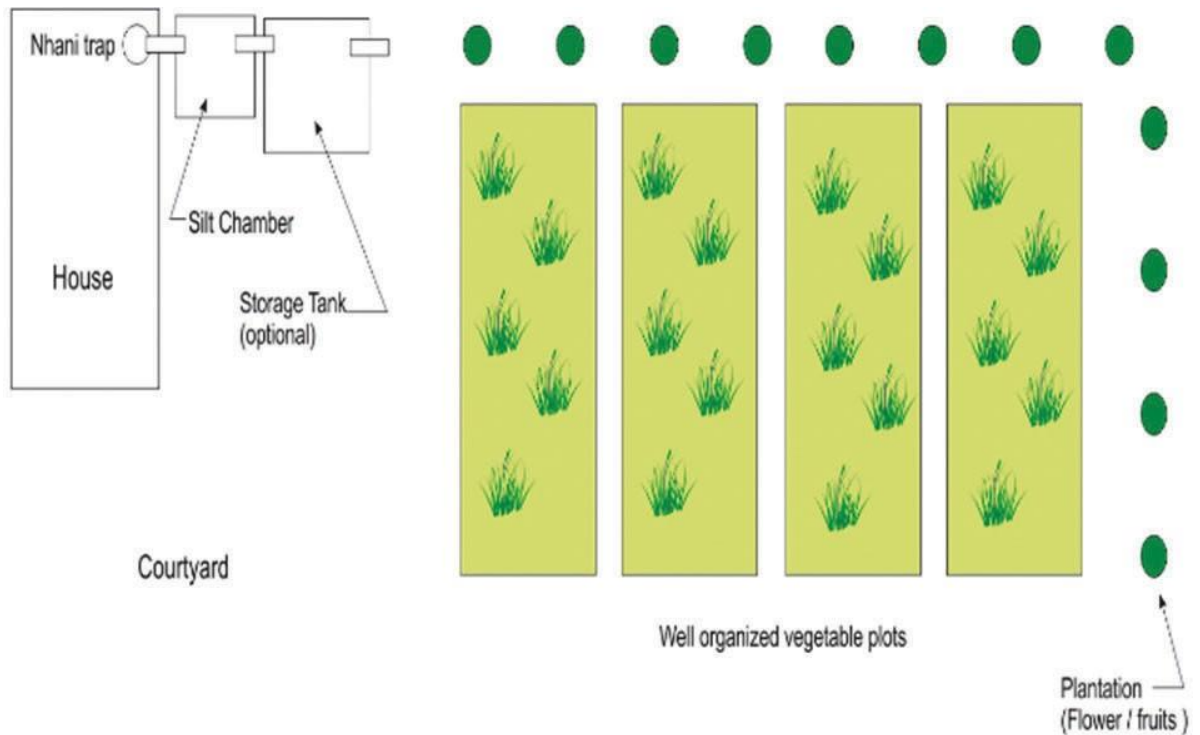
- (a) Construction of bore well recharge structures
- (b) Construction of individual and community soak pits

(c) Construction of Greywater treatment ponds

26. There are many options to manage this grey water at the HH and community level. The most common of them are:-

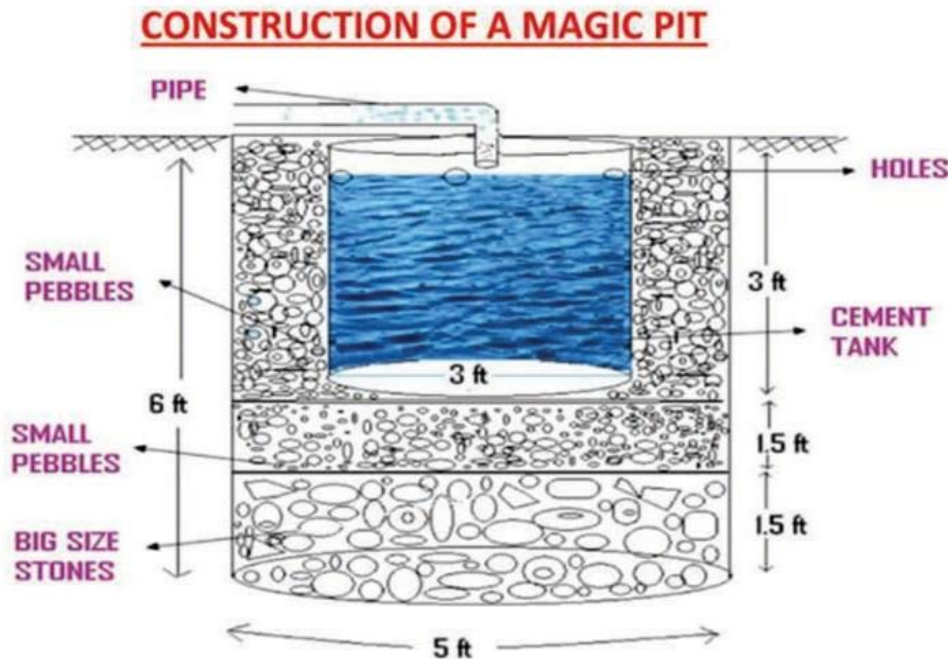
At HH level	At Community Level
<ol style="list-style-type: none"> 1. Use in Kitchen Garden 2. Ground water recharge through soak pits 	<ol style="list-style-type: none"> 1. Recharge structures near the bore wells. 2. Construction of soak pits/magic pits at community level for grey water management. 3. Construction of grey water treatment ponds.

27. **Kitchen Garden.** Grey water can be used in kitchen gardens with a little bit of precaution and can easily be constructed in all HHs. An Nhani trap, silt chamber and storage tank is required to use the grey water in kitchen garden for agricultural purposes.



Source: Ministry of Jal Shakti, 2019

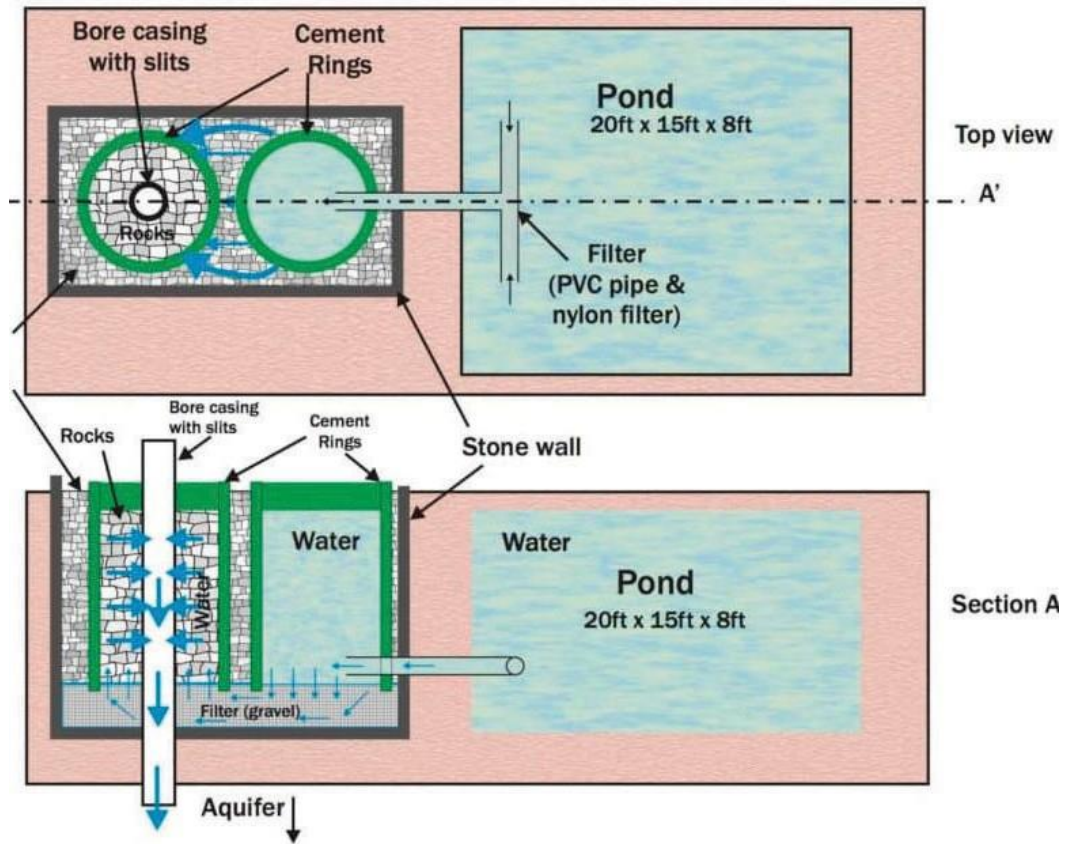
28. **Soak Pit/ Magic Pit.** The soak pit/magic pit is one of the cost- effective options that can be adopted in each HH and at community water sources for easy management of grey water. The magic pit is a pit technology option where pre-settled effluent from a Collection & Storage/ Treatment or (Semi-) Centralized Treatment technology is discharged to the underground chamber from which it infiltrates into the surrounding soil. The soak pit/magic pit initiative not only helps to support recharging of ground water table but also keeps the environment clean and hygienic.



Source: Ministry of Jal Shakti, 2019

29. **Borewell Recharge Structure.** The bore well recharge structure is constructed through the twin ring method. The method is simple, efficient and cost effective. In this method a pond is made near to the bore well site and a pit is dug around the actual bore well casing. The bottom of this pit is lined with filtration material and a second pit is dug near to the first well. The dug well is connected to the pond through a pipe. During rainy season the water flows from the pond into the first empty well where it percolates down through the filtration material and subsequently up into the second well. It then enters through the pores and filters down into the underlying aquifer where it is stored for the following dry season.

BORE WELL RECHARGE USING TWIN RING METHOD

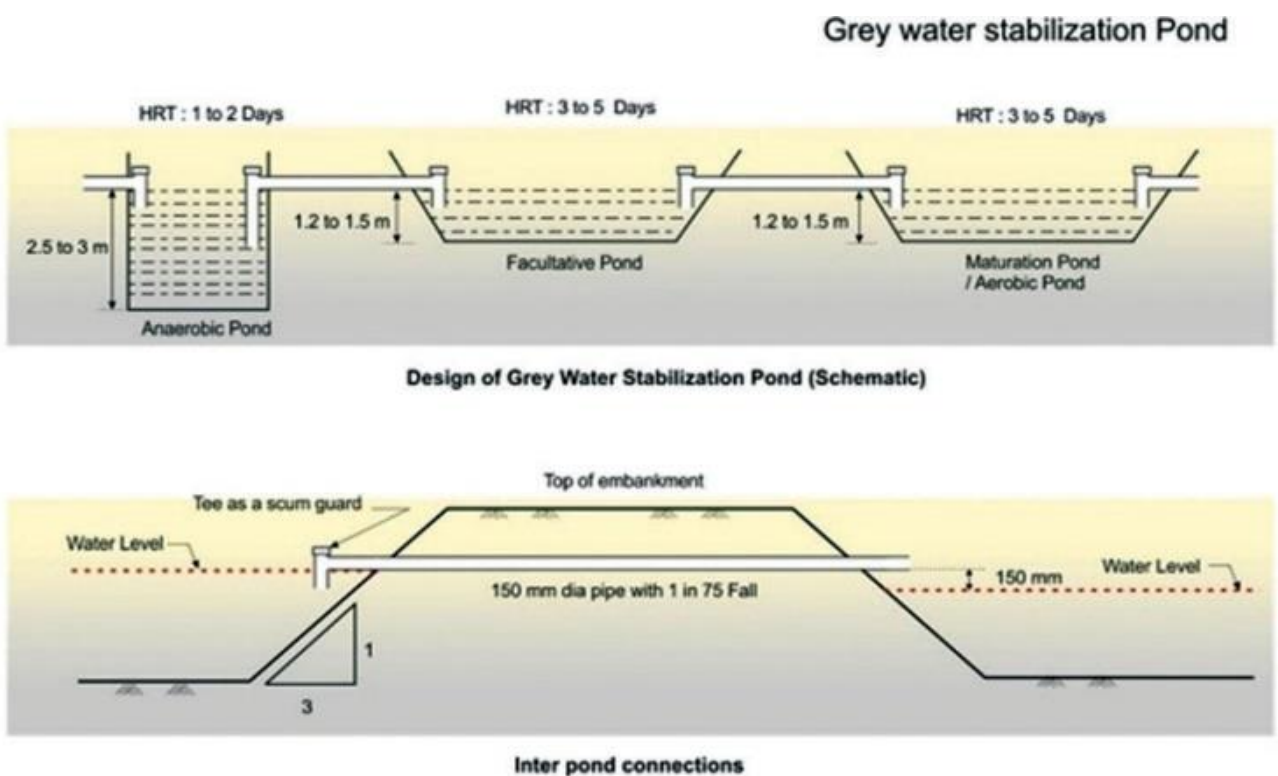


Source: Ministry of Jal Shakti, 2019



30. **Grey Water Stabilisation Ponds.** This is a series of basins or ponds located at a suitable site away from the human habitation, where grey water is treated. The grey water is brought to these ponds through covered drains. The treatment is natural and involves:

- (a) Sedimentation or settling of solids in the waste water, and
- (b) Degradation process involving bacteria, algae, sunlight and oxygen which degrades the organics and utilizes the nutrients in grey water and increases its usability.



Source: Ministry of Jal Shakti, 2019

31. The system has three basic units called ponds, placed in series and characterized by their function such as:

- (a) Anaerobic pond – one number
- (b) Facultative pond – one number (function both as anaerobic and aerobic)

- (c) Aerobic pond or maturation pond – one or more in number depending upon the impurities in the grey water

32. The treated water from the grey water stabilization pond can be used for agriculture or pisciculture (Fish rearing) depending upon the purity of water.

Intensive Afforestation

33. Forests are a crucial natural resource that plays a vital role in water conservation and water retention in the soil. Forest Survey of India report indicated that water bodies inside forests have increased by 2,647 square km during last decade (2005 to 2015) (Ministry of Jal Shakti, 2019). Trees play an important role in intercepting precipitation in the foliage, absorbing and filtering water that infiltrates into the soil. Trees also improve water quality by reducing soil erosion and preventing sediments chocking water bodies.

34. Few problems associated with afforestation are as follows:-

- (a) Deforestation and illicit felling of trees with reducing area under new plantations is a concern and needs to be tackled
- (b) High preference to water intensive non-indigenous species and inadequate soil and moisture conservation (SMC) activities is an area of concern.
- (c) Participatory and community led plantation and their protection and maintenance is often inadequate to meet the prevailing gaps.

35. The Central Government Schemes that can be potential funding sources for Afforestation are:-

(a) **National Afforestation Programme (NAP)**. The National Afforestation and Eco- Development Board (NAEB), under the Ministry of Environment and Forests, is responsible for the flagship scheme, the National Afforestation Programme (NAP). The scheme promotes afforestation, tree planting, ecological restoration and eco-development activities in the country. NAEB supports the district level Forest Development Agencies (FDAs) to institutionalise Joint Forest Management and promote afforestation.

(b) **MGNREGS**. Funds are available for various forestry schemes at the state and district level, under MNREGS and from other local funding sources for forestry activities, which include:-

- (i) Pitting and planting of. saplings
- (ii) Soil and Moisture Conservation activities

(c) **Green Highways Policy**. The Green Highways (Plantation, Transplantation, Beautification & Maintenance) Policy 2015, aims to plant trees along all the highways in the country.

36. Important facts about Afforestation drive under JSA are as follows:-

- (a) Prioritise planting of low water demanding indigenous tree species. A suggestive list is given below (Table 1).
- (b) Plantations to incorporate Soil and Moisture Conservation (SMC) structures like contour trenches, check dams, gully plugs, etc. to increase survival in hilly areas.
- (c) Involvement of Village Forest Management Committees (VFMC) in protecting and managing forests
- (d) Promote planting of trees in forest and non-forest (degraded lands in common and GP lands) areas and in farms and homesteads

- (e) Promote planting of a minimum number of trees by every household and local institutions like GPs, schools, colleges etc.
- (f) Activate Schools and Youth groups like Boy Scouts, Girls Guides, NYK, NSS, NCC in tree planting and protection management in communities with special focus on drinking water sources and water bodies.
- (g) Involve Self Help Groups (SHGs) to take up greening of villages and SMC works
- (h) Institute District, Block and Gram Panchayat (GP) level awards for best HHs, best student/group, SHG, etc. for tree planting.
- (i) Districts to develop indigenous species nurseries to grow and provide saplings at low cost to GPs, communities, institutions and HHs for planting. Resources to be mobilized by convergence for this on priority.
- (j) Live fencing of homesteads and farmlands by planting trees may be promoted under the Social Forestry wings of government in conjunction with District panchayats
- (k) Interventions that discourage use of tree wood as fuel and convergence with other government schemes that promote alternative fuel sources.

37. Plantations can be taken up in:-

- (a) Degraded Forests
- (b) Blanks in forest area
- (c) Roadside plantations
- (d) Plantation in common village lands
- (e) Plantation around boundaries of the farm lands
- (f) Individual household plantation with fruit species.

Table 1: A suggestive list of trees for intensive afforestation interaction

Zone	Species	Common Name
Central Highlands	<i>Azadirachta indica</i>	Neem
	<i>Albizia procera</i>	White Siris or Saras
	<i>Cassia fistula</i>	Amaltas
	<i>Moringa pterygosperma</i>	Drum stick tree, suhanjana
	<i>Tamarindus indica</i>	Imli
	<i>Albizia lebeck</i> <i>Erythrina</i>	Black Siris or Saras or Womans
	<i>indica</i>	tongue tree Coral tree
	<i>Leucaena leucocephala</i>	Su Babool
	<i>Mangifera indica</i>	Mango
	<i>Pongamia glabra</i>	Indian Beech tree, Papdi
<i>Dalbergia sissoo</i>	Shisham, Tali	
Deccan Plateau	<i>Acacia auriculiformis</i>	Ear leaf Acacia or Ear pod wattle
	<i>Bauhinia variegata</i>	Kachnar
	<i>Syzygium cumini</i> <i>Erythrina</i>	Jamun Coral tree
	<i>indica</i>	Aonla or Amla
	<i>Emblica officinalis</i>	
	<i>Azadirachta indica</i>	Neem
<i>Moringa oleifera</i>	Horseradish or Benzoil tree	
Deccan Plateau	<i>Dichrostachys cinerea</i>	Sicklebush, Bell mimosa, Chinese lantern tree
	<i>Crataeva religiosa</i>	Sacred garlic pear or temple plant
	<i>Aegle marmelos</i>	Bel Tree

	<i>Tamarindus indica</i>	Imli
	<i>Bauhinia variegata</i>	Kachnar
Chandigarh	<i>Bombax ceiba</i>	Semul cotton tree
	<i>Tecomella undulata</i>	Rohida or Rohera
	<i>Zizyphus jujuba</i>	Ber
	<i>Tamarix orientalis</i>	tamarisk, salt cedar
	<i>Jacaranda mimosifolia</i>	Blue Gulmohor
	<i>Grevillea robusta</i>	Silver Oak
	<i>Tamarindus indica</i>	Imli or Tamarind
Eastern Plains	<i>Michelia oblonga</i>	
	<i>Alnus nepalensis</i>	Napalese Alder
	<i>Butea monosperma</i>	Dhak, Flame of Forest
	<i>Albizzia lebbeck</i>	Black Siris or Saras or Womans tongue tree
	<i>Grewia subinaequalis</i>	Falsa
	<i>Bauhinia variegata</i>	Kachnar
	<i>Sterculia urens</i>	Gum Karaya, Ghost tree
	<i>Boswellia serrate</i>	Guggul
Northern Region	<i>Pithecellobium dulce</i>	Jungle Jalebi
	<i>Cordia gharaf</i>	Saucer berry
	<i>Syzygium cumini</i>	Jamun
	<i>Pongamia pinnata</i>	Papdi Ber
	<i>Zizyphus jujuba</i> <i>Bauhinia</i> <i>variegata</i>	Kachnar

	<i>Salvadora oleoides</i>	Peelu
	<i>Sterculia urens</i>	Gum Karaya, Ghost tree
	<i>Boswelli aserrata</i>	Guggul
Western India	<i>Cordia dichotoma</i>	Lasooda
	<i>Prosopis cineraria</i>	Khejri or Khejdi
	<i>Tecomella undulata</i>	Rohida or Rohera
	<i>Murraya exotica</i>	Orange Jasmine
	<i>Grewia subinaequalis</i>	Falsa
	<i>Capparis divaricata</i>	Pachunda, Turatti
	<i>Lagerstroemia flosreginae</i>	Pride of India, Jarul
	<i>Bauhinia purpurea</i>	Kachnar
	<i>Artocarpus heterophyllus</i>	Kathal, Jack fruit
	<i>Dipterocarpus turbinatus</i>	Garjan
Eastern Plateau	<i>Moringa oleifera</i>	Drum stick tree, suhanjana
	<i>Crataeva religiosa</i>	Sacred garlic pear
	<i>Aegle marmelos</i>	Bel Patther
	<i>Grewia disperma</i>	Falsa
	<i>Tamarindus indica</i>	Imli, Tamarind
	<i>Bauhinia variegata</i>	Kachnar
	<i>Hiptagemadablota</i>	Madhavi, Helicopter flower
	<i>Anthocephalus cadamba</i>	Kadamb
	<i>Grewia disperma</i>	Falsa
	<i>Cochlospermum gossypium</i>	Butter cup tree

Source: Ministry of Jal Shakti, 2019

District Water Conservation Plan

38. In addition to the five areas of intervention explained above, one of the major outputs of Jal Shakti Abhiyan is to develop district water conservation plan. This is essentially a strategy to conserve, recharge and improve water use efficiency. The District Water Conservation Plan is developed by compilation of block level conservation plans, which is essentially the compilation of water conservation plans of respective Gram Panchayats (GPs) within the block. Thus the template given below can be used to generate the plan for GP or block or district as the case may be. The formation of District Water Conservation Plan will involve following steps (Ministry of Jal Shakti, 2019) :-

- (a) Identify all the concerned departments and engage them in water conservation e.g. Panchayati Raj (PR), drinking water, agriculture, irrigation, endowment boards etc.
- (b) Create an inventory of GP/block-wise water harvesting and recharge structures with geo-tagging and other details of the location along with the photographs.
- (c) Determine the functionality status of each of these structures. Conduct a functionality assessment on how many structures are functional and non-functional
- (d) Determine the feasibility of restoring the non -functional structures with the cost assessment; this should be followed by identification of schemes/programmes under which the restoration can be taken up.
- (e) This should be followed by fixing annual targets, so that every structure which is non-functional and where a possibility of restoration exists, will be made functional in a time bound manner.
- (f) All government owned buildings should have rainwater-harvesting structures. An inventory of all the government buildings yet to have rainwater harvesting structures need to be developed.

- (g) Efforts must be intensified to motivate owners of privately owned buildings to have water-harvesting structures.
- (h) Local self-governing institutions like Gram Panchayats may come up with policy interventions like tax sops to incentivize the owners of the buildings having water-harvesting structures.
- (i) Ensure community involvement in the planning implementation and management of structures
- (j) Pre-monsoon inspection of all the identified structures by the concerned department and maintenance to be made mandatory.
- (k) The water conservation plan will be complete only by shifting to water use efficient systems in every sector like treatment and re-use of waste water, water saving irrigation practices (“per drop more crop”), drinking water supply system meeting design standards (NRW leakages) etc.

Roll Out Plan for JSA

39. The Ministry of Jal Shakti has also promulgated a Roll out plan. All the above interventions shall be implemented in 254 districts. To facilitate this, about 254 Additional Secretaries/Joint Secretaries/JS level officers, 400 Deputy Secretaries/Directors, 400 Technical Officers from Government of India are made responsible to oversee the implementation, review progress and provide feedback.

40. Each district is allotted to an Additional Secretary/ Joint Secretary/Joint Secretary level officer also referred to as Central Nodal Officer (CNO). Scientists/Technical Officers from the

participating Ministries/Departments would be linked to the Joint Secretaries and their teams for technical guidance and will be given regional allocation.

41. At the State level, Additional Chief Secretary/Principal Secretary (Panchayati Raj& Rural Development and/or Water Resources) will be the State Nodal Officer (SNO). The SNO will coordinate between the CNO and the District Collectors of their State for implementation of JSA.

42. A team of officials would be formed for every Block. The team shall have 4 officers, headed by a Director/Dy. Secretary level officer from the Central Ministries, along with one technical officer from Central Ground Water Board/Central Water Commission two district officers nominated by the District Collector. Each of these teams will report to their CNO. About 400 such teams will take a minimum of three trips (three days each) covering all villages allocated to them (Ministry of Jal Shakti, 2019) .

43. Other groups to be involved in the JSA Campaign are as follows:-

- (a) 180 Assistant Secretaries who will be oriented and given targets to undertake necessary work as part of their field visits
- (b) Engineering students from local colleges, as nominated by District Collectors can be opted to be part of the campaign, where applicable
- (c) Local NGOs, nominated by the District Collector can be involved in community mobilization, IEC, etc if necessary
- (d) Reputed NGOs with national presence in the water sector can also be engaged by the States.

(e) Nehru Yuva Kendra Sangathan (NYKS)/ National Service Scheme (NSS)/ National Cadet Corps/ school eco-clubs and school students can also be mobilised to join Block level teams.

44. **Support and Monitoring.** A portal has been developed by DDWS and NIC through which Districts will be provided a separate login (<https://indiawater.gov.in/jsa>) to report progress under all 5 JSA intervention areas and IEC activities. District Collectors and/or nominated officials by District Collector in each district will be provided access to JSA portal.

45. A national level dashboard has been developed that shows progress of the States against key JSA interventions and IEC activities. Based on progress reported under dashboard, ranking of districts will be generated for rewarding best performers. A separate mobile application is developed to report feedback and key observations from assigned Central Nodal Officer and District/Block level officers. All officers are to submit their feedback and geo-tag photographs of assets created through this mobile app. The app is available on Android and iOS platforms.

46. **Communication Plan.** All SHGs, PRIs and Swachhagrahis are to be engaged to join the campaign for community communication. Concerned Ministries are to mobilize their grassroots components.

(a) Promoting efficient water use for irrigation through through initiatives like Krishi Vigyan Kendra (KVK) Melas and motivating farmers to move to better choice of crops (More Crop per Drop)

(b) Each district will develop an IEC plan and a media plan which can include Public Service Announcements, print and social media mobilisation at local level

(c) Well known personalities can be mobilized to generate awareness for the campaign.

47. Targeted communication shall be designed to promote and achieve accelerated progress of the 5 identified interventions. Special focus will be given to mobilise farmers and communities and encourage them to participate in the campaign.

48. These areas of intervention broadly fall under the mandate of Ministry of Jal Shakti, Ministry of Rural Development, Ministry of Agriculture, Cooperation and Farmers Welfare, Ministry of Environment, Forests and Climate Change, and Ministry of Housing and Urban Affairs and these will be the concerned Ministries for implementing the campaign. **The Department of Drinking Water and Sanitation, Ministry of Jal Shakti is the nodal department for the campaign.**

CHAPTER III

IMPLEMENTATION OF JSA IN SIKAR

“The government aims at providing drinking water to every household on priority and in a sustainable manner and bring a positive change in people for water conservation through Jal Shakti Abhiyan”

- Shri Gajendra Singh Shekhawat, Union Minister for Jal Shakti

District Sikar, Rajasthan

1. The Sikar district is located in the north-eastern part of the state of Rajasthan. It is bounded by Jhunjhunu district to the north, by Churu district to the north-east, by Nagaur district to the south-west and by Jaipur district to the south-east. It also touches Mahendragarh district of Haryana at its north-east corner. The district has an area of 7742.43 km². Districts Sikar, Churu and Jhunjhunu comprise the “Shekhawati” region of Rajasthan. The old name of Sikar was "Veer BhanKa Bas". As brought out in Chapter 1, the primary and secondary data has been collected from eight blocks of Sikar district. Few details regarding the district are enumerated in the succeeding paragraphs.

2. **Demographics.** According to the 2011 census, Sikar district has a population of 26,77,333, of which males and females are 13,74,990 and 13,02,343 respectively. This gives it a ranking of 150th in India (out of total 640 districts). The district has a population density of 346 inhabitants per square kilometer (900/ Sq M). Sikar has a sex ratio of 947 females for every 1000 males as per the census of 2011. In Rural area Sex Ratio is 951 and in urban area

Sex Ratio is 935. In education section, total literates in Sikar are 16,52,117 of which 9,95,275 are males while 6,56,842 are females according to the census of 2011. Average literacy rate of Sikar city is 71.91 percent of which male and female literacy was 85.11 and 58.23 percent respectively.

3. **Climate.** The Sikar district has a hot summer, scanty rainfall, a chilly winter season and a general dryness of the air, except in the brief monsoon season. The maximum and minimum temperatures are 47 to 48 and 1 to 0 degrees Celsius, respectively. The average temperature around the year is about 16 to 20 degrees Celsius. The normal rainfall, mostly received from the southwest monsoon, is 459.8 mm. The maximum temperatures during the months of May & June can reach close to 50 °C (122 °F) with little to no humidity. During the monsoon, there are frequent, heavy rains and thunderstorms, but flooding is not common. The winter months of November to February are mild and pleasant, with average temperatures ranging from 15–18 °C (59–64 °F) and with little or no humidity. There are however occasional cold fronts that lead to temperatures near freezing.

4. **Sikar District at a Glance.**

Table 2: General Information, Sikar District

Area	7,742.43 Sq. Km.		
Population (as per 2011 Census)	26,77,333	Male	Female
		13,74,990	13,02,343
Assembly Constituencies	08		
Sub-divisions	09		
Tehsils	09		

Sub-tehsils	05
Panchayat Samitis	09
Municipal Councils/Boards	09
Gram Panchayats	343
Total Cities	09
Total Villages	1192

Source: Official portal <https://sikar.rajasthan.gov.in/content/raj/sikar/en/home.html>

5. The total number of Blocks/ Panchayat Samitis in Sikar District, and the number of Villages / Gram Panchayats under them are as follows:-

Table 3: Gram Panchayats in Sikar

S.No.	Pachayat Samiti/ Blocks	Total No. Of Gram Panchayats
1	Srimadhapur	34
2	Fathepur	29
3	Khandela	41
4	Laxmangarh	44
5	Neemkathana	41
6	Patan	25
7	Piprali	40
8	Dhod	43
9	Dantaramgarh	46
Total		343

Source: Official portal <https://sikar.rajasthan.gov.in/content/raj/sikar/en/home.html>

6. **Economy.** Sikar district is one of the semi desert districts of Rajasthan. Agriculture and animal husbandry are the main occupation in this district. It was an industrial backward district but since last few years it appears to have bright future for industrial development due to favourable geographical situation regarding availability of raw material from mineral

resources. Human resources are the basic input for managing the existing and future industrial development of an area. According to Census 2011, the total working force in the district was estimated at 10.07 Lacs, representing 37.59 percent of the total population. Out of this working force 24.57 percent were males and 13.02 percent were females.

7. **Occupation.** According to Census 2011, there were 49.81 percent cultivators, 8.73 percent agriculture labourers, 2.26 percent engaged in household industry and the remaining 39.20 percent engaged in other works in Sikar district.

8. **Irrigation and Ground Water Resources.** The major part of the cropped area in the district is un-irrigated. Wells are the major sources of irrigation in the district. There is only one lake in the district, which is insignificant from the irrigation point of view. There are few streams in the district which flow for some time during rainy season and contribute towards irrigation through sub-surface water to the wells situated near the bank. The mean annual rainfall (1971-2011) of the district is 463.0 mm whereas normal rainfall (1901-70) is lower than average rainfall and placed at 459.8. Almost 95% of the total annual rainfall is received during the southwest monsoon, which enters the district in the last week of June and lasts upto the middle of September. The mean annual rainfall is highest (536.6 mm) in Neem Ka Thana, which is located in the south eastern part of the district. It is lowest in Fatehpur (407.8 mm), which lies near north western boundary of the district. The climate of the district is generally dry except during the monsoon period. The humidity is highest in month of August with mean daily relative humidity of 80%.

9. Primary source of water is Ground water and Rainwater. As reported by the district Administration and from National Aquifer Mapping (NAQUIM) report by Central Ground

Water Board (CGWB), the year wise ground water level depletion of all blocks in Sikar is as below:

Table 4: Block wise average water level depletion trend during 2001 – 2015

Block	Trend (m/year)
Danta Ramgarh	0.70
Dhod	1.12
Khandella	0.76
Lachhmangarh	0.37
Neem Ka Thana	0.48
Piprali	0.57
Sri Madhopur	1.04

Source: Data collected by the researcher from District officials

10. From the above table, it is seen that water level is decreasing rapidly in seven blocks. This has led to acute shortage of water in all the blocks. Further, against the annual extractable ground water recharge of 31001 Ha-m, ground water extraction for all uses is 49,530 Ha-m i.e. 177% of the annual extractable ground water recharge. The ground water shows large variation, both quantitatively and qualitatively. Two facts are relevant:-

- (a) The water level varies from 5 meters to over 100 meters in the different part of the district.
- (b) The quality of water is fairly good and suitable for drinking as well as irrigation purposes, except few places.

**Table 5: Ground Water Recharge, Extraction and Stage of Ground water development
in Sikar district**

Block	Area (Ha)	Annual extractable G.W Recharge (Ha-m)	G.W extraction for all uses (Ha-m)	Stage of G.W extraction (%)	Net G.W Availability for future (Ha-m)	Category
Danta Ramgarh	121051	4712	8283	195	0.00	Over Exploited
Dhod	91115	4031	7421	204	0.00	Over Exploited
Fatehpur	129123	3911	2771	78	343.00	Safe
Khandela	74346	3129	4733	168	0.00	Over Exploited
Lachhmangarh	105162	4524	6391	157	0.00	Over Exploited
Neem kathana	71823	2722	4479	183	0.00	Over Exploited
Patan	47889	1119	1609	160	0.00	Over Exploited
Piprali	80766	3239	6384	219	0.00	Over Exploited
Sri Madhopur	66810	3614	7459	229	0.00	Over Exploited
Sikar District	788085	31001	49530	177	0.00	Over Exploited

Source: Data collected by the researcher from District officials

11. As is clear from the table above, eight blocks in Sikar district are in the over exploited category. The blocks were included in the Jal Shakti Abhiyan.

12. **Major Crops.** Bajra, Wheat, Gram, Barley, Rape & Mustard Groundnut, Pulses and Guar are the major crops of the Sikar District. Khariff crops constitute the bulk of field production in the district since the agricultural activities mostly depend on monsoon.

13. **Livestock.** Animal husbandry plays a vital role in the economy of the district. Sikar, district is very rich in livestock, both quantitatively and qualitatively since rearing of livestock forms an important spare time occupation of the cultivators of the district. The main livestock of the district are cows, buffaloes, sheep, goats and camels. On the basis of availability of milk, this district has an important place in the State. There is a large number of milk animals like buffaloes and cows in the district. The yield of milk is sufficiently large to an extent of 10 Lac litres per day. After the local consumption of milk in the district, a surplus of about 3 Lac litres per day is available for processing. At present the surplus milk is purchased by Rajasthan Cooperative Dairy Federation, Jaipur at the rates fixed by them and some other private dairies.

14. **Forest Resources.** The total area under forest is reported to be 63768.40 hectares. A large-scale plantation program has been carried out in the district in recent years. The common trees found in the district are Rohida, Babool, Khair, Hingot, Khejra, Shisham, Neem etc. The principal forest products of the district are grasses, honey, bamboo and firewood.

Mukhyamantri Jal Svavlamban Abhiyan (MJSA)

15. Mukhyamantri Jal Swavlamban Abhiyan (MJSA), described as the country's largest campaign of its kind towards water harvesting and conservation in rural areas, was launched by Rajasthan Chief Minister Vasundhara Raje in Jan 2016. The campaign was launched with an aim to benefit 21,000 villages by 2020. The programme focussed towards participation from the village locals, NGOs, non-resident villagers, religious communities, and corporate houses through their CSR initiatives in cash, kind and labour for water harvesting in Rajasthan's rural areas. The shortfall in budget for the campaign was met by crowd funding, with the Chief Minister, all ministers and bureaucrats contributing a part of their salary towards the scheme.

The local population also participated enthusiastically and contributed generously for the scheme.

16. The stated objectives of the campaign were as follows:-

- (a) Emergence of self 'water-reliant' villages
- (b) Increase in groundwater level, availability of surface flow in the main stream of watershed and availability of drinking water
- (c) Increase in irrigated area, cultivable area and crop production
- (d) Change in the cropping pattern
- (e) Reduction in suspended sediments in flowing water of main streams and reduction in depletion of ground water

17. The main features of the scheme were as follows:-

- (a) Making villages self-sufficient in water & creating "Islands of Excellence"
- (b) Four-year program, each phase of one year
- (c) Launched across 295 Blocks of 33 districts including Sikar
- (d) People's participation was central theme.
- (e) Mobilizing financial resources from multiple sources- Line Departments, NGOs, Corporate houses, Religious Trusts, Non-resident villagers, Social groups etc.
- (f) Use of technology including geo tagging.
- (g) Construction of low cost water harvesting structures on watershed approach.

18. Shri Sriram Vedire, chairperson of Rajasthan River Basin and Water Resources Planning Authority and advisor to the Union ministry of water resources, river development and Ganga rejuvenation was the chief architect of the campaign. Shri Vedire worked as an Engineer for 15

years in USA and returned to India in 2009. He was associated with the Parliamentary Standing Committee on Water Resources and advised it on various aspects of Water Management (like 'Ground Water Recharge', 'National Water Policy 2012' etc.). After the successful implementation of the MJSA in Rajasthan, the Prime Minister decided to replicate the scheme pan India in the most water stressed districts in the form of Jal Shakti Abhiyan in Jun 2019.

Findings

19. The Central Nodal Team nominated for Sikar District by the Ministry of Jal Shakti was as follows:-

- (a) Smt Dipti Mohil Chawla, Joint Secretary, MoD, New Delhi (CNO)
- (b) Shri Anoop Kumar, Deputy Secretary, MoSPI, New Delhi (BNO)
- (c) Shri Guru Prasad. J, Deputy Director, Central Water Commission, New Delhi
(TO)
- (d) Shri Abhishek Gaurav, Deputy Director, Central Water Commission, New Delhi
(TO)

20. The Central Nodal Team was mandated to make at least three visits to the District, covering all the affected Blocks. Detailed reports were prepared by the CNO after each visit and uploaded on the JSA website. The field visit for this Dissertation was planned to coincide with the third and final visit of the Central Team from 24-26 Sep 2019. The secondary data regarding works planned and completed under the JSA was collected from various Block Development Officers and from the reports filed by the Central Nodal Team on the Ministry of Jal Shakti website. In addition, interviews were conducted during field visit with members of the Central Nodal Team, the State and District Nodal Officers, the Block Development

Officers, various Technical Officers from Central Ground Water Board/Central Water Commission and other district officers nominated for JSA by the District Collector. Interviews were also conducted with Gram Panchayat members and local beneficiaries.

21. The perceptions of locals and Panchayat officials regarding the usefulness of the Jal Shakti Abhiyan and the type of structures created under the scheme were also collected during formal and informal town hall type meetings.

22. Owing to the implementation of MJSA in Sikar, the awareness of District and Block level officers regarding the water conservation methods was quite high. The same was observed during interaction with Gram Panchayats and the locals. However, the awareness about the Jal Shakti Abhiyan and the interventions planned therein was quite low when the scheme was launched. This was primarily owing to very short time gap between the launch of the Abhiyan formally in June 2019 and commencement of the Phase 1 in July 2019. In subsequent interactions, and during the field visit, the villagers were observed to be fully aware of the provisions of the scheme.

23. Analysis of the data collected through field work in the district and from the secondary data obtained from Block Development Officer and JSA website revealed important aspects of the Jal Shakti Abhiyan in the district and these are presented in the succeeding paragraphs.

Water Conservation & Rainwater Harvesting

24. A list of activities carried out in the district under first intervention i.e. Water conservation and Rain Water Harvesting is shown in the table below. Detailed list of activities,

for both old and new structures under this intervention is also enclosed in District Water Conservation Plan at Annexure IV.

Table 6: Activity status in Sikar under First Intervention

Activity	Existing Number of functional structures	Non Functional Structure to be restored under JSA	New Structures under progress and Planned till Sep 19 under JSA	Present Status of Old/ New structures completed (old/new)
Natural water bodies- Ponds, lakes (Less than 5 ha submergence area)	6	0	0	0/0
Large Water Bodies- more than 5 ha submergence area	45	2	4	2/4
Check dams- Anicut, Pakka Check Dam, MST, WHS (including Khadin & Johad), SSB, MMS	1000	1	66	1/66
Farm Ponds- Diggi, Jalhose, Farm Pond, Khet Talai,	308	12	52	12/52
Rooftop Rain Water Harvesting Structures with storage- Community and privately owned	3197	3	360	111/608

Source: Data collected by the researcher from District officials

25. As seen from the table above, the progress achieved in construction of water conservation and harvesting structures is quite significant. The target set under JSA for construction of large water bodies, check dams/ johads and farm ponds of various types have all been met fully. In case of rooftop rain water harvesting structures with storage, the target has been surpassed by a wide margin. This was owing to the awareness of the Block officials, Panchayats and locals regarding harvesting, conservation and storage of clean rainwater which

could be used for drinking/ cooking all year round. During the field visit, it was observed that there were a large number of privately owned rooftop structures in addition to the Community structures.

26. The team visited construction of Jalkund (storage tank) on the field of Sh. Sohanlal of Bagri village under Lachhmangarh block. It is having a storage capacity of 30000 litres with a catchment area of 90 sqm constructed at an amount of Rs.1.50 lakh under PMKSY (Watershed component) by Watershed Development & Soil Conservation (WDSC) department of state government. The rain water harvested from the catchment is used by the beneficiary for drinking, bathing (domestic purpose), for livestock and for plantation also. Water is also used for floriculture and for vegetable farming.



Photo: Central Team at Jalkund being Interviewed by Local Media

27. The team visited the Rooftop Water Harvesting System (RTWHS) on the field of Sh. Nagarmal of Bagri village under Lachhmangarh block. It is having a storage capacity of 28000 liters constructed at an amount of Rs.0.90 lakh under PMKSY (Watershed component) by Watershed Development & Soil Conservation (WDSC) department of state government. The rain water harvested from roof of houses is used by beneficiary for drinking, for bathing (domestic purpose), for livestock and for plantation also.



Photo: Central Team visits RTRWHS

28. The team visited construction of Jalkund on the field of Sh Jitender, Bagri village under Lachhmangarh block. It has a storage capacity of 30000 litres with a catchment area of 90 sqm constructed at an amount of Rs.1.50 lakh under PMKSY (Watershed component) by Watershed Development & Soil Conservation (WDSC) department of state government. The rain water harvested from the catchment is used by the beneficiary for drinking, bathing (domestic purpose), for livestock and for plantation also. Water is also used for floriculture and for vegetable farming.



Photo: Central Team at Jalkund

29. The team also visited Water Harvesting Structure at Nathuwala village of Dokan GP in Patan Block. The Rain Water/Runoff of 22 Hectare areas is harvesting to this structure constructed under MGNREGA Scheme at an amount of Rs. 3.17 lakhs by Rural Development Department having storing capacity of 3500 Cum. Water availability in the structure is 6-8 months in a year which is useful for wild life and animals. The water level has increase approx. 130 Feet in the open wells situated downstream of WHS.





Photo: Central Team at the WHS (top) and Interacting with Gram Panchayat

30. At village Bhulawa, there was adverse situation of water and even the drinking water extracted from the ground had fluoride content. Rooftop Rain Water Harvesting system with ‘Tankas’ were built under JSA. After completion of this work, farmers have the availability of drinking water throughout the year due to rain water harvesting. Also the rain water is being used for gardening and afforestation / plantation by farmers.



Photo: Central Team at the Tanka

31. **Introduction to Sundaram Verma's Dryland Agroforestry.** During the field visit coinciding with the visit of the Central team to Dantaramgarh block, the Block level nodal officer introduced the researcher to a unique farmer in the Dantaramgarh Block. It sounds impossible to grow the sapling of a tree with just one litre water in scorching heat and extremely dry soil in Rajasthan. But it is the innovation by a progressive farmer Mr. Sundaram Verma which has made this possible. He analysed every small aspect of growing the sapling meticulously for years, and come up with this solution of using minimum water in transplanting the sapling in the farmland. He explained that rainwater absorbed in the soil is crucial in farming but it is lost due to two reasons, one evapo-transpiration through weeds and secondly upward movement of water due to capillary action of soil. These are the major causes of water loss from the soil. Soil can hold back sufficient water if these losses are prevented. The method promotes water use efficiency and maximises production and is called 'Dryland Agroforestry' or 'one litre water per tree' method (Chawla, 2020).



Photo: The Researcher with Padmashri Sundaram ji and Block Officials

32. While developing this method by experimenting on his farmland, he also got an opportunity to study dryland farming at the Indian Agriculture Research Institute in New Delhi through Krishi Vigyan Kendra (KVK). Since he was already working with KVK to help him increase the agricultural output, KVK suggested that he study the dryland farming system. That two-month course significantly enhanced his knowledge and helped him develop the one-litre water method. Finally, after 10 years of rigorous trial and errors, Sh Verma cracked the formula to grow all kinds of trees including the fruit-bearing ones.



Photo: Padmashri Sundaram ji showing his Agroforest

33. Sh Verma detailed out his practice as follows:-

- (a) First and foremost the farmland must be levelled to stop the rainwater runoff. After receiving the first rain, 5-6 days later the weeds grow naturally.
- (b) To remove these weeds deep ploughing is done. It also helps in breaking capillaries of upper soil layer. This checks the upward capillary movement of water. Similarly, just after last rain of monsoon once again deep ploughing is done in the

farmland. It is usually done during the end of September. Deep ploughing implies turning the upper soil surface to at least 10 inches deep in the field. In this way the water is held back 10 inches deep inside the soil.

(c) After second deep ploughing, the saplings are planted in 60-70 cms deep pits in such a way that their root zone remains in soil layer below 30 cm.

(d) After planting, approximately one litre of water is poured in the pit and the sapling is allowed to grow naturally. When the saplings are planted in September last week or first week of October the temperature drops and as a result the upper soil surface is cold, hence the roots of the sapling penetrates as deep as possible. Consequently, the sapling survives as roots get tight grip of the soil till February-March.

(e) Finally in April, when summer season begins, the top soil surface begins to dry and moisture content moves to deeper levels so the roots further moves down towards the moisture. In this way the plants get accustomed to absorb water from deeper levels in the soil and survive in less water on the top surface.

32. Sh. Verma holds ownership of 6-hectare farmland. Using the same technique of planting sapling with one litre water he has planted varied forest trees, fodder plants and fruit trees. Results are phenomenal with plant survival rate close to 100%. Overall he has planted over 50,000 trees using this technique. In addition, he has set up multiple nurseries and distributed 1,50,000 saplings to other farmers, and provided them training in his technique to promote afforestation in the drylands. He also collects and preserves local variety of seeds, and

has planted local varieties in his farm which are drought resistant, have good yield and are resistant to pests.



Photo: Local Varieties Planted by Sundaram ji

33. Towards water conservation, he has effectively utilised the rain water by creating an efficient way to direct the run off into the farm pond. The surface of his fields have been covered with synthetic sheets, which help in directing the run off during rains towards the farm pond due to slope. The technique is primarily effective in cultivation of fruit trees where it is possible to cover most of the field with polythene to ensure free flow of water to the farm pond. The farm ponds themselves have been lined with synthetic sheets which prevent water loss. He has used one Hectare of his farm for the pond, and layered it with 6000 sq yard polythene. The photographs below show his farm pond before and after the rains, as monitored by the central team. The entire requirement of water for the farm for the year is met through this farm pond.

The second picture taken during the field visit shows the farm pond full to its capacity, accumulating 2 million litres of water.



Photo: Polythene Sheets for Efficient Run Off on Field



Photo: Farm Pond with Polythene Sheets to Prevent Loss



Photo: Farm Pond at Full Capacity of 2 Million Litres

34. For his entire drinking water requirements, he has set up a simple but effective rain water harvesting system on the rooftop, which collects water in a fresh water tank in the basement. The grey water generated in the household is also directed to soak pits, which in turn are used to recharge the ground water.



Photo: Rooftop Rainwater Harvesting System and Storage

35. This researcher and the Central Nodal Team was pleasantly surprised meeting such an aware farmer, who was appreciated by each member of the local Block level teams. The Central Team requested the BDO to forward a report on the achievements of Mr Sundaram to the State authorities and to the central ministries (Agriculture and Jal Shakti Ministry). The Central team also included Mr Sundaram and his achievements in their visit reports. Consequently, the Government of India has recognised his significant contributions in the field of Environment and Afforestation and conferred the Padmashree award on him on 26 Jan 2020.



<h2 style="text-align: center;">Sundaram Verma</h2> <p style="text-align: center;">Sanvahniyata ke Sikar</p>	<p style="text-align: center;">"planted 50,000+ trees in arid areas of Rajasthan with 100% survival rate, using just 1 litre of water per tree"</p>
<ul style="list-style-type: none"> • Farmer who grew 50,000 trees with a water-saving technique 'dryland agroforestry' that requires only 1 litre of water per tree, in the arid Shekawati region of Rajasthan • His technique involved leveling the land to prevent rainwater from draining away, ploughing the fields multiple times to remove the weeds & capillaries, planting the saplings in deeper and wider pits, pouring 1 litre of water in it and allowing the plant to grow • Set-up 6 nurseries, distributing 1,50,000 saplings among farmers • Collected & preserved local varieties of seeds, crops and plants • Recognised for his outstanding work in the afforestation of dry lands and conservation of Bio-diversity 	
<p style="text-align: center;">Padma Shri Social Work (<i>Environment - Afforestation</i>) Rajasthan 68 Yrs</p> 	

Photo: Padmashri Citation- Sundaram Verma

36. Mr Shivji Ram Katariya, Dy Director Agriculture Department, Dantaramgarh Block brought out that the time given for implementation of JSA was short as the Abhiyan kicked off with the commencement of rainfall. An early start would have given preparatory time to all concerned. Further, there was no funding available under the scheme, and existing schemes were to be used for the funding. The farm ponds were being sanctioned under PMKSY, and farmers were given go ahead to start digging their ponds even before the sanctions were in place in order to maximise the gains from the rainfall. Smt Durga Dhaka, BDO opined that a preparatory phase would also have helped in publicising the JSA to farmers and other beneficiaries.

Renovation of Traditional Water Bodies

34. The list of activities carried out in Sikar district under second intervention i.e. Renovation of traditional water bodies/Tank is placed in the table below. Detailed list of activities, their capacities along with funding under this intervention is also enclosed in District Water Conservation Plan at Annexure IV.

Table 7: Activity Status under Second Intervention

Activity	Existing Number of functional structures	Non Functional Structure to be restored under JSA	New Structures Planned till now under JSA	Present Status of Old/ New structures completed (old/new)
Stepwell, bawari, Johad, Khadin, Kund, Talaab, Talai, Nadi , Tanka	3552	38	168	38/168

Source: Data collected by the researcher from District officials

37. The researcher and the Central team visited Nehru Park, Ganga sagar, Bawali step well (Traditional pond) with recharge structure at Sikar. It was built about 150 years back and was maintained by Nagar parishad, Sikar under MJSA-1. It has a catchment area, the rain water run-off from which enters a connecting pond where all the floating bodies and grit are separated. The clear water flows into the major tank which is in turn connected to water storage tank for use later. As the tank was filled with silt and weeds, removal of the silt and weeds was undertaken under the JSA to increase its capacity.



Photo: The Bawali at Nehru Park, Sikar

38. The team visited desilting of old Anicut nadiwala (near Bohara Shamshan) of Lisadiya village of Srimodhopur block. Due to storage of water in this structure, the ground water level of adjoining areas has been rising. Therefore, capacity of some tube wells in the area has been increased, resulting in more agriculture production for farmers. As the farmers were demanding bigger structure, it was suggested to raise the height of the structure or to build one more structure upstream. It was decided by the TO to raise the height of the structure. To minimize/

arrest silting, it was suggested to construct a low level bund upstream. Both works have since been completed.



Photo: The Central Team at the Anicut

Reuse, Borewell Recharge Structures

35. The third intervention under the JSA was Reuse of grey water and Borewell Recharge Structures. The list of activities carried out and future plans under third intervention are placed in the table below. Detailed list of activities, their capacities along with funding under this intervention is also enclosed in District Water Conservation Plan at Annexure IV.

Table 8: Activity Status under Third Intervention

Activity	Existing Number of functional structures	Non Functional Structure to be restored under JSA	New Structures under progress and Planned till now under JSA	Present Status of Old/ New structures completed (old/new)
Percolation tanks	645	0	119	0/119
Individual soak pit	76	0	10	0/1149
Community soak pit	84	0	5	0/5
Bore well recharge structures	248	0	87	0/87
Grey water treatment ponds/waste stablization ponds	0	0	5	0/5
Rooftop Rain Water Harvesting Structures with recharge- Community and privately owned	353	0	30	0/30

Source: Data collected by the researcher from District officials

39. The team visited a dry well in Charanwas village of Integrated Watershed Management Project (IWMP) project area of Jal graham subcommittee prior to the rains. During the rains and at other times, the rain water and daily use surplus/ waste water from houses of village accumulates in the streets and intersections, causing lot of filth. A recharge system was planned to divert the rainwater run-off and the grey water to this well. After the construction of this recharge system, the waste water / grey water from houses and rain water accumulated on the roof top of houses goes to this well through nallas and is used for replenishment of ground water.



Photo: Dry Well with New Greywater Recharge System

40. The team visited Construction of Recharging Structure (Grey water treatment pond) near a location called Ramkui, Lisariya village of Srimadhapur block under the scheme MJSA (MLA LAD) at an amount of Rs. 7.4 lakhs by Watershed Department. Before the construction of this recharge Structure(pond) water level of tube wells nearby was very low, but after the construction of this structure the rain water which is collected, get recharged and water level has been increased and there is a continued supply of drinking water in the nearby areas. The team suggested to go for three tank system in series for better purification of grey water.



Photo: Recharge Structure Under Construction

41. It was observed during field visit that most efficient Ground Water Recharge structures were made at Village Harsh, Block Piprali, Sikar. The structures were being developed by Vivekanand Navyug Mandal, Harsh, working for the **Nehru Yuva Kendra, Sikar**. The motivated youth of the Mandal were contributing immensely to the JSA.



Photo: Ground Water Recharge Structure in Village Harsh

Watershed Development

36. The list of activities carried out under fourth intervention Watershed Development in Sikar district are listed in the table below. Detailed list of activities, their capacities along with funding under this intervention is also enclosed in District Water Conservation Plan at Annexure IV.

Table 9: Activity Status under Fourth Intervention

Activity	Existing Number of functional structures	New Structures under progress and Planned till now under JSA	Present Status of New structures completed
Trenches- SGT, CCT, DCCT, Field Bund, Peripheral Bund, Diversion Channel.	855723 in meters	31100 in meters	31100 in meters
Gully Plugs- LSCD, Gabion, Gully Plugs, DSMP	37	5	5

Source: Data collected by the researcher from District officials

42. The team visited Anicut and Drop Structure in Danta Ramgarh Block built under MJSY. It was filled with water after the season's rainfall. Mr Prahlad Singh Jakhar, SE Watershed Department explained that Watershed Development is carried out in stages from the upper catchment area to lower catchment area, with different structures recommended for different areas. This being the lower catchment,



Photo: Drop Structure- Watershed Development

43. The team visited a trench (Diversion Nala) leading to tank at Ganwari village at an amount of Rs.1.995 lakh by the Watershed Department of state government. The Runoff of approximate 60 Hectare area is diverted in to Traditional Johad of village through this Nala. Before this nala Construction, the runoff of this area was disturbing the arable land of farmers and was flowing waste. Now this water is being harvested in the Johad of Village. Villagers feel that this Johad is Lifeline of this Village. As there was a problem in the direction of flow of water and breach of trench bund, it was suggested for concrete/pucca structure at the breaching point and also suggested for bed slope correction for trench. The works have been completed.



Photo: Diversion Nala to Control Run Off

Intensive Afforestation

44. A list of activities carried out under fifth intervention i.e Intensive Afforestation are listed in the table below. Detailed list of activities, their capacities along with funding under this intervention is also enclosed as Annexure IV.

Table 10: Activity Status under Fifth Intervention

Activity	New Activities under progress and Planned till now under JSA	Present Status of activities completed
Saplings planted	321000	443351
Seedling raised (In Nursery)	441000	441000

Source: Data collected by the researcher from District officials

45. The team visited Smriti van developed by Forest department. The department has planted around 55470 plants of different types in the area. Saplings from other agencies were also planted in the area.



Photo: Sapling Plantation by Central Team

46. Similar plantation has been carried out in Bawdi Gram Panchayat in Khandela Block, which was attended by the central team.



Photo: Plantation Drive at Khandela Block

47. Under Integrated watershed management program (IWMP), plantation is being done near the Bhulawa gram panchayat Bhawan. The cattle grazing ground was continuously being encroached upon by the farmers and animals. Therefore, to save the land from encroachment and for the purpose of afforestation, the work of plantation was started in the year 2015 through the one litre method formulated by Shri Sundaram. There are approx. 2140 plants alive in the above mentioned land, i.e approx 75% of plants planted here. There are mostly plant of Arhu tree whose branches are being used by the villagers presently for the purpose of feeding the cattle. Maintenance and fence repair has been carried out under JSA.



Photo: Plantation by One Litre Per Tree Method

48. The Central Nodal Officer inaugurated the afforestation programme by planting a tree at the newly allotted land for cremation ground at Mehron Ki Dhani, Village Harsh, Block Piprali, Sikar. The cremation ground is being developed by Vivekanand Navyug Mandal, Harsh, working for the **Nehru Yuva Kendra, Sikar**. Viveknand Navyug Mandal has planted around 300 trees in the adjoining forest land also.



Photo: Inauguration of Afforestation Drive at Village Harsh

49. During the field visit, the researcher observed that the youth from the Vivekananda Navyug Mandal had made considerable progress in levelling the cremation ground, and had almost completed the plantation. The youth were self-motivated and were contributing in the water conservation efforts not only in their own village, but the entire district. They had also constructed a number of ground water recharge structures in their village, which were recharging the ground water with rainwater during rains and with filtered grey water otherwise. A similar structure was under construction at the cremation ground too.



Photo: The Researcher Interacting with BDO and Youth from Vivekanand Navyug Mandal



Photo: Saplings Planted by the Youth

50. An extensive Afforestation drive was carried out in Nani Beed area, Nagar Parishad Sikar with the participation of local MLA, various NGOs and local population. Owing to extensive publicity drive, the plantation attracted large public participation and contribution. Around 1100 trees were donated by people, at the cost of Rs 1000/- per tree. The cost of each sapling was Rs 800/- and one-year care would cost Rs 200/- to enable sustenance of the saplings. The afforestation was jointly promoted by the forest department and the Nagar Parishad. This researcher interacted with Mr Wajid Ahmed, AE, Nagar Parishad and Mr Shravan Kumar, Range Officer, Forest Deptt and learnt that the afforestation drive aims to plant 5000-7000 trees of local variety. These local varieties would replace the Julieflora trees planted in the entire desert belt with the intention of greening of desert areas with a fast growing variety imported by the government.



Photo: The Researcher Interacting With Wajid Ahmed, Nagar Parishad



Photo: Saplings Planted at Nani Beed

51. The city's sewage is also diverted to Nani Beed area. A traditional talao in the area captures the rain water run-off and helps recharge the groundwater. However, the sewage mixes with this water and renders it unusable for most uses. The Nagar Parishad has planned a Waste Water Treatment Plant in the area to treat this water and make it usable. However, the programme is not linked with JSA.

Block and District Water Conservation Plans

52. As part of the JSA special interventions, the Block and District water conservation Plans have been prepared by the State Government as per the formats recommended by the Jal Shakti Ministry. The plans give a clear roadmap to the district and Block level officials on the path to be followed and works to be undertaken during the JSA and beyond for water

conservation, rainwater harvesting, ground water recharge, watershed development and afforestation. The Block level plans are then amalgamated to the District Water Conservation Plan. The District Water Conservation Plan is placed at Annexure IV.

People Participation

53. An important part of the JSA was the participation of the people in keeping with the vision of the hon'ble Prime Minister to make water conservation a Jan Andolan. Accordingly, each district was mandated to conduct Krishi Vigyan Kendra (KVK) Melas, Public awareness meetings, rallies etc. The details of the public participation achieved during JSA at Sikar are placed in the table below:-

Table 11: Details of Peoples' Participation

Type of event	No. of such events	Categories of people who participated	No. of participants	How did they participate?
KVK Melas	1029	Defence personnel / paramilitary, Ex-servicemen and pensioners, General Citizens, Local Non Governmental Organization (NGO), National Cadet Corps (NCC) cadets, National Service Scheme (NSS) cadets, Nehru Yuva Kendra Sangathan (NYKS), Panchayati Raj institution members, Public representatives (MP/MLA etc.), School eco clubs (MALE), School Students, Self help group, Senior citizens.	26445	Exchange of water conservation methods and ideas, Training on latest water saving techniques of agriculture and seasonal farming activities.
Poster/Painting/Sllogan/Essay/Debate competitions	193		16065	Participating themselves and helping participants in these activities.
Public awareness meetings/Discussions	103		22531	Sharing ideas and knowledge regarding water conservation and rain water harvesting.
Rallies/Route march etc.	118		19431	Participating in rallies and motivating general public about water conservation methods.

Dance/Drama/ Kathputli/Nukkar Nataks	3	Government officials from Centre, State, District and Block level also participated and helped raise awareness regarding water conservation and afforestation.	277	Creating awareness and increasing knowledge about water conservation and rain water harvesting.
Other modes of mass awareness campaign	243		52785	Cleaning of traditional water sources, taking part in Shramdan and planting of saplings in schools and other institutions.
Total	1928		137534	

Source: Data collected by the researcher from District officials

54. It is clear from the table above that the District Administration was very successful in ensuring Public participation in the JSA. People's participation was in good numbers in various rallies, events, Drama, Dance, Nukkad Natak alongwith other modes of awareness campaigns.

55. As part of the field visit, this researcher attended a Public Awareness Meeting held at Village Mandavra, Dhod Block, Sikar. The meeting was attended by the Central Team, in addition to the BDO, Senior Civil Engineer from Watershed Development Department, the Sarpanch and Gram Panchayat of the village. A large number of local villagers attended the meeting, which included a large number of women too. Sh Prahlad Singh Jakhar, SCE, Watershed Department conducted the Meeting and conveyed the importance of Water Conservation to the villagers and the various ways in which it could be achieved. He also highlighted the various schemes under which assistance could be given to community and individuals for water conservation efforts.



Photo: Sarpanch Smt Shashi Kumari at the Community Centre



Photo: Public Awareness Meeting in Progress



Photo: The Researcher with villagers and Panchayat Members

56. The interaction of the researcher with the BDO Shri Sitaram, Sarpach Smt Shashi Kumari and certain progressive farmers proved to be very fruitful. The village as a community was very aware of the need for Water Conservation and Rain Water Harvesting, owing to the successful run of the MJSA in the District. The researcher learnt that during the JSA, the following structures had been built in the village under various schemes:-

- (a) Rooftop Rain Water Harvesting System in the village school and in the Community Centre
- (b) Total six 100 foot recharge wells
- (c) A number of Johads, Talao and Tankas
- (d) Paytan Tankas in the farms where the farmer doesn't reside and Rooftop harvesting is not possible.



Photo: Researcher Interacting with Farmers and BDO

57. During the interaction with the officials and the farmers, the researcher sought inputs regarding the difficulties faced by the farmers, Panchayat members, Block officials etc in the implementation of JSA. Since the locals and Panchayat members were not comfortable filling questionnaires, inputs obtained through Semi structured interviews conducted by the researcher are as follows:-

- (a) The Jal Shakti Abhiyan was launched too close to the rainy season, giving very little time for preparation, education of locals etc.
- (b) The MGNREGA funds are to be utilised for SC/ST/BPL personnel only. In case of leftover funds after these categories are exhausted, the general category poor farmers can be allocated funds. This leaves a large number of farmers out of the scheme.
- (c) MGNREGA labour payments are released timely, however the material payments are delayed by more than a year, causing hardship to poor farmers.

- (d) The schemes under Watershed Development are very good, but cannot be extended to all due to budget constraints. Only a few villages are covered at a time. Further, 10% contribution is expected from the individual (5% from SC/ST).
- (e) Similarly, Agriculture department scheme for Rs 90000/- for farm pond is extended to certain other villages.
- (f) MPLAD and MLA funds cannot be used for individual beneficiaries.
- (g) Therefore, there is no transparency or clarity about availability of various funds and the parameters for selection criteria.

58. The district has been taking the Public Participation very seriously. Scores of Billboards regarding JSA and Water Conservation are put up in various blocks. Few photographs are placed at Annexure II. The Abhiyaan was widely covered in the local media, extracts of which are placed at Annexure III.

59. Few of the photographs below indicating the various events conducted for Public Participation have been sourced from the Nodal teams and are placed below.



Painting and slogan Competition



Awareness Campaign at Panchayat



Rally by School Children



Quiz Competition at School



School Rally



Jal Chetna Programme



Shramdaan



Prabhata Feri by Children (Schools, NCC etc)

Comparison Between Blocks

60. During the Jal Shakti Abhiyan, one of the tools for comparison of progress of implementation of schemes has been based on the number of works/ structures completed in each block, under the specified areas of intervention. These are essentially those works that were carried out under schemes other than MGNREGA. The comparative statement of the works carried out in the eight selected Blocks of Sikar district are as follows:-

Table 12: Comparison Between Blocks

Block Name	Intervention Name (Non-MGNREGA)					
	Water conservation & Rain Water Harvesting (RWH)	Renovation of traditional water bodies/ tank	Reuse, borewell recharge structure	Watershed Development	Intensive Afforestation	
					Activity	Saplings
Danta Ramgarh	187	20	323	0	107	32425
Dhod	144	7	41	0	32	22630
Khandela	99	2	290	0	55	48410
Lachhmangarh	83	0	77	0	77	16925
Neem Ka Thana	61	0	101	8	77	154941
Patan	47	0	141	6	47	118592
Piprali	93	0	123	0	61	15878
Sri Madhopur	59	0	82	0	115	12920
Total	773	29	1178	14	571	422721

Source: Data collected by the researcher from District officials

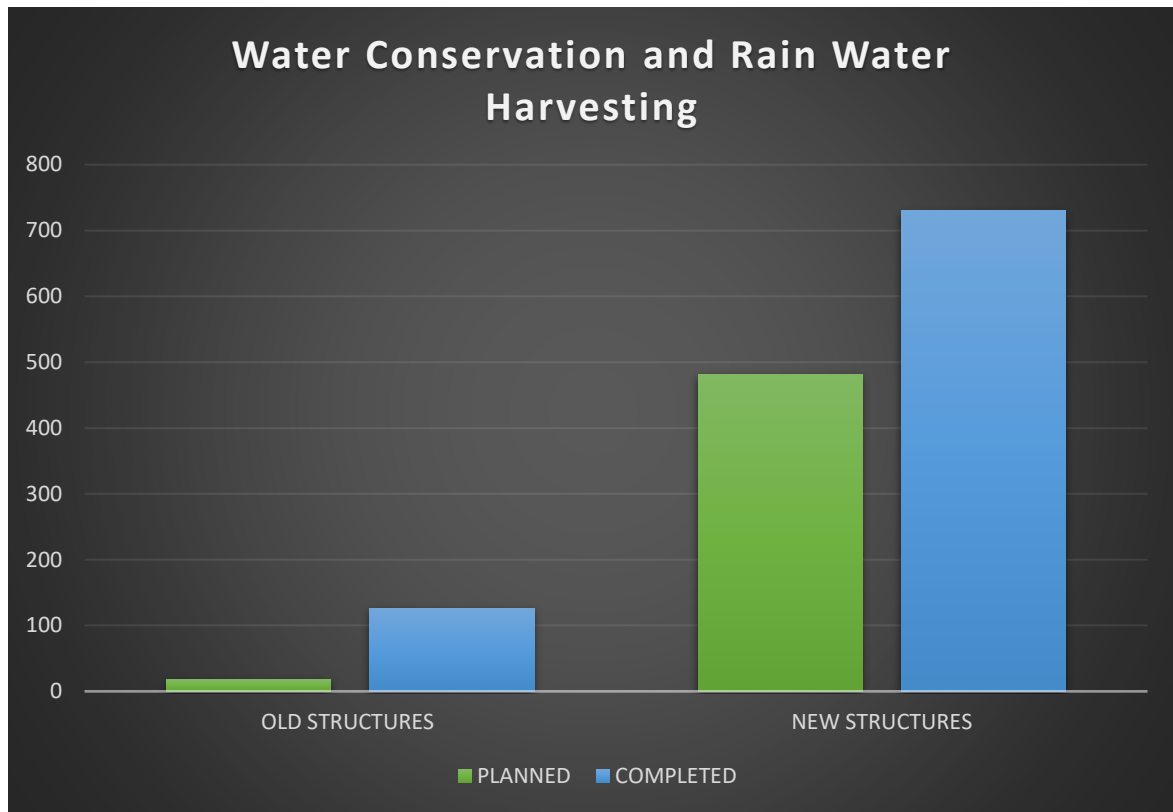
Measurement of Outcome Parameters

61. During the course of the Abhiyan, after the first visits of central teams had been completed, the Ministry of Jal Shakti directed that 5 works, one in each area of intervention, be allocated to each member of the Central team. A format was promulgated to enable the measurement of Outcome Parameters in each of the works selected. Duly completed formats uploaded on the JSA website in respect of each of these activities is placed at Annexure V. The outcome parameters give an excellent indication of success of activities undertaken under the JSA.

Analysis of the Data

62. Analysis of the various findings mentioned above in respect of the selected Areas of Intervention are enumerated in the succeeding paragraphs.

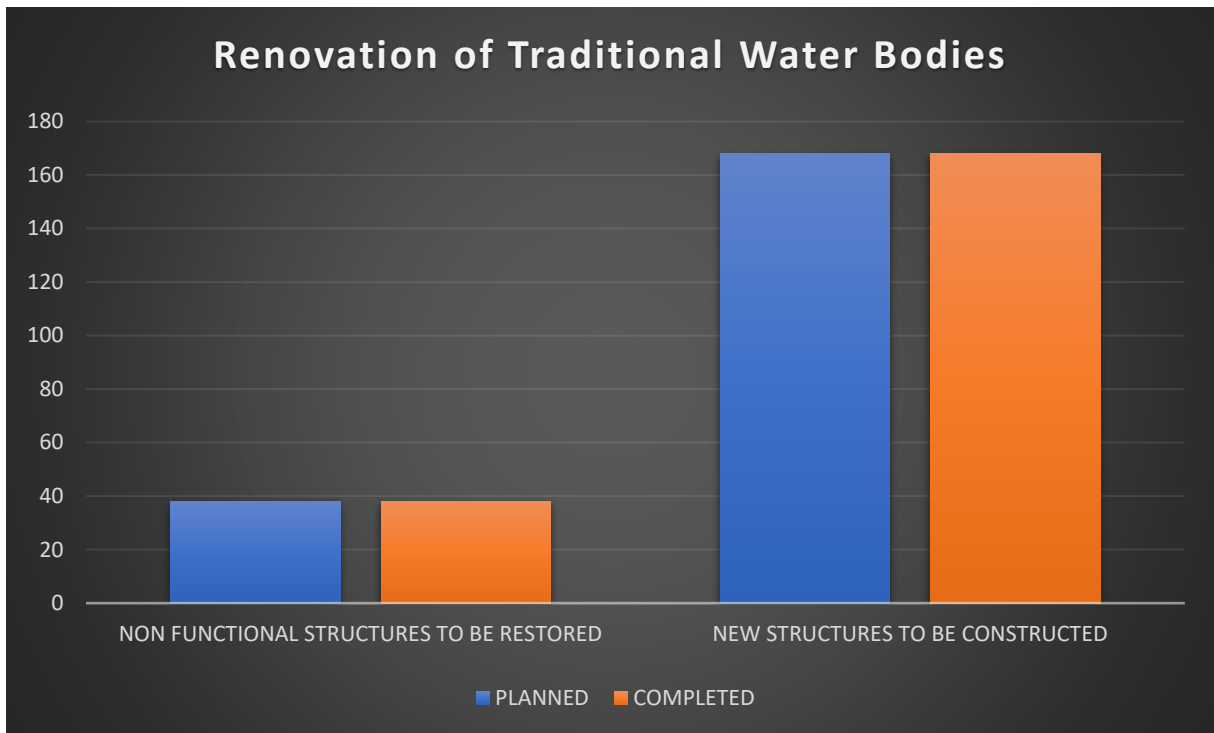
63. **Water Conservation and Rain Water Harvesting.** The analysis of data mentioned in Table 6 reveals the following:-



Source: Data Analysis by the Researcher

64. The number of structures like water bodies, farm ponds, check dams and Rooftop Water Harvesting Systems completed during the JSA has **far exceeded the projected numbers**. This is primarily due to very high awareness of people towards requirement of water conservation and Rain water harvesting. The planned target for Sikar district was far exceeded due to the **high number of Rooftop rain water harvesting systems installed, both private and community based**.

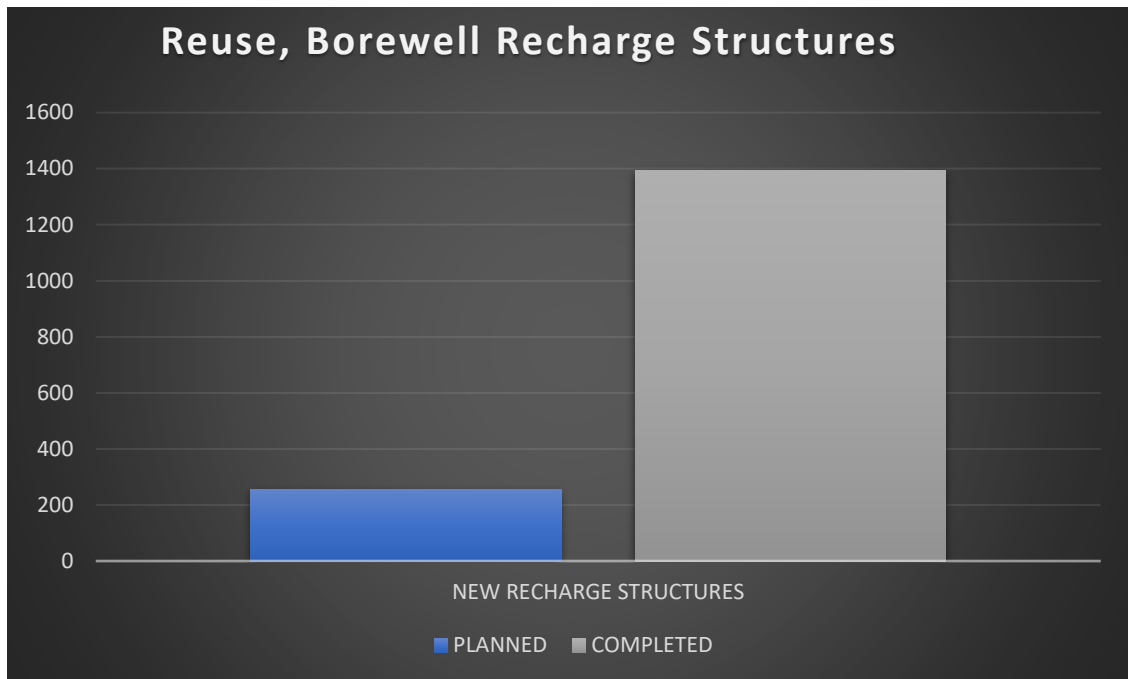
65. **Renovation of Traditional Water Bodies**. The analysis of the data on Renovation of Traditional Water Bodies in respect of Sikar district as per Table 7 reveals the following:-



Source: Data Analysis by the Researcher

66. The target set by the District in terms of Renovation of non-functional structures and construction of new traditional structures like Johads, Bawri, Khadin, Tanka etc. has been fully met. There was also widespread support from the locals for returning to traditional methods of water conservation, which was being neglected for some time due to over dependence on ground water.

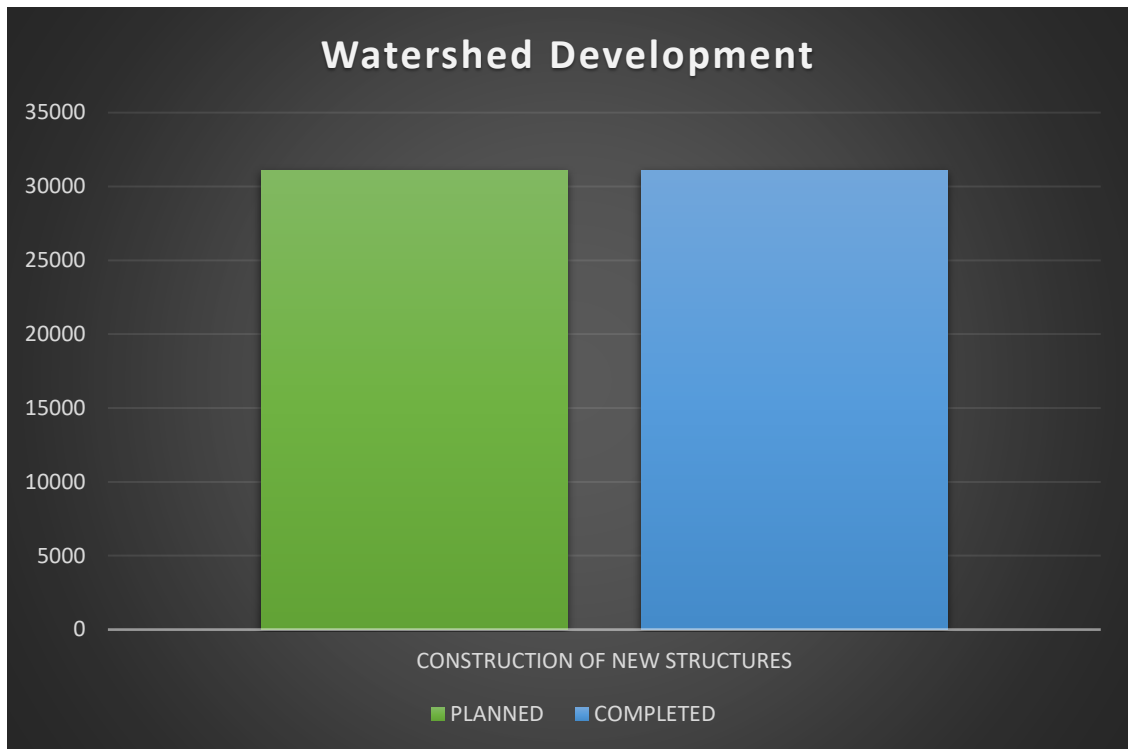
67. **Reuse, Borewell Recharge Structures.** The analysis of data mentioned in Table 8 reveals the following:-



Source: Data Analysis by the Researcher

68. The target set by the District for the construction of new Percolation tanks, Soak pits, Borewell recharge structures and RTRWHS (with recharge) has been surpassed. While other structures have met the target numbers, the number of soak pits constructed during JSA has far exceeded the target. This is primarily due to the low cost of the structure and huge benefits accrued. Even during the MJSA, one soak pit was being developed between 5-6 houses and observed to be very effective.

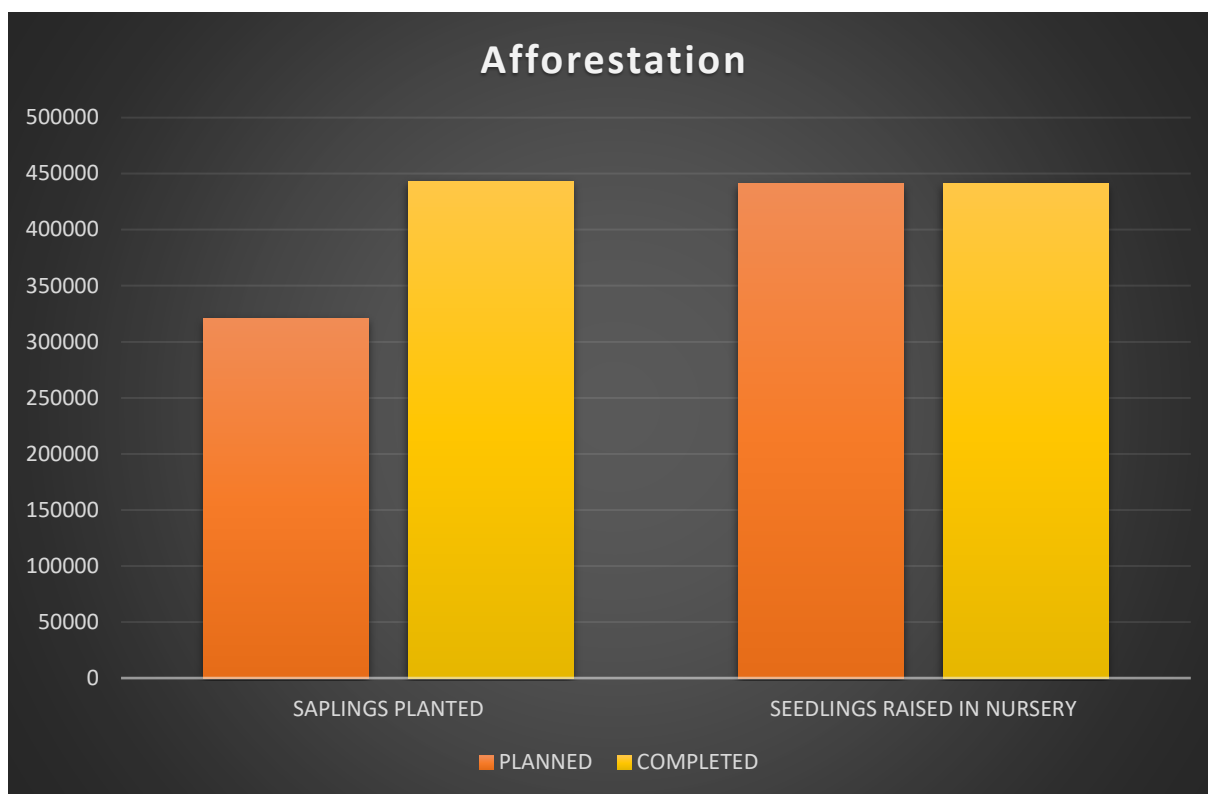
69. **Watershed Development.** The analysis of data mentioned in Table 9 reveals the following:-



Source: Data Analysis by the Researcher

70. The construction of the trenches, Staggered Trenches, bunds and channels etc has been completed as per the planned targets. Despite restricted funds, considerable work has been undertaken towards Watershed Development.

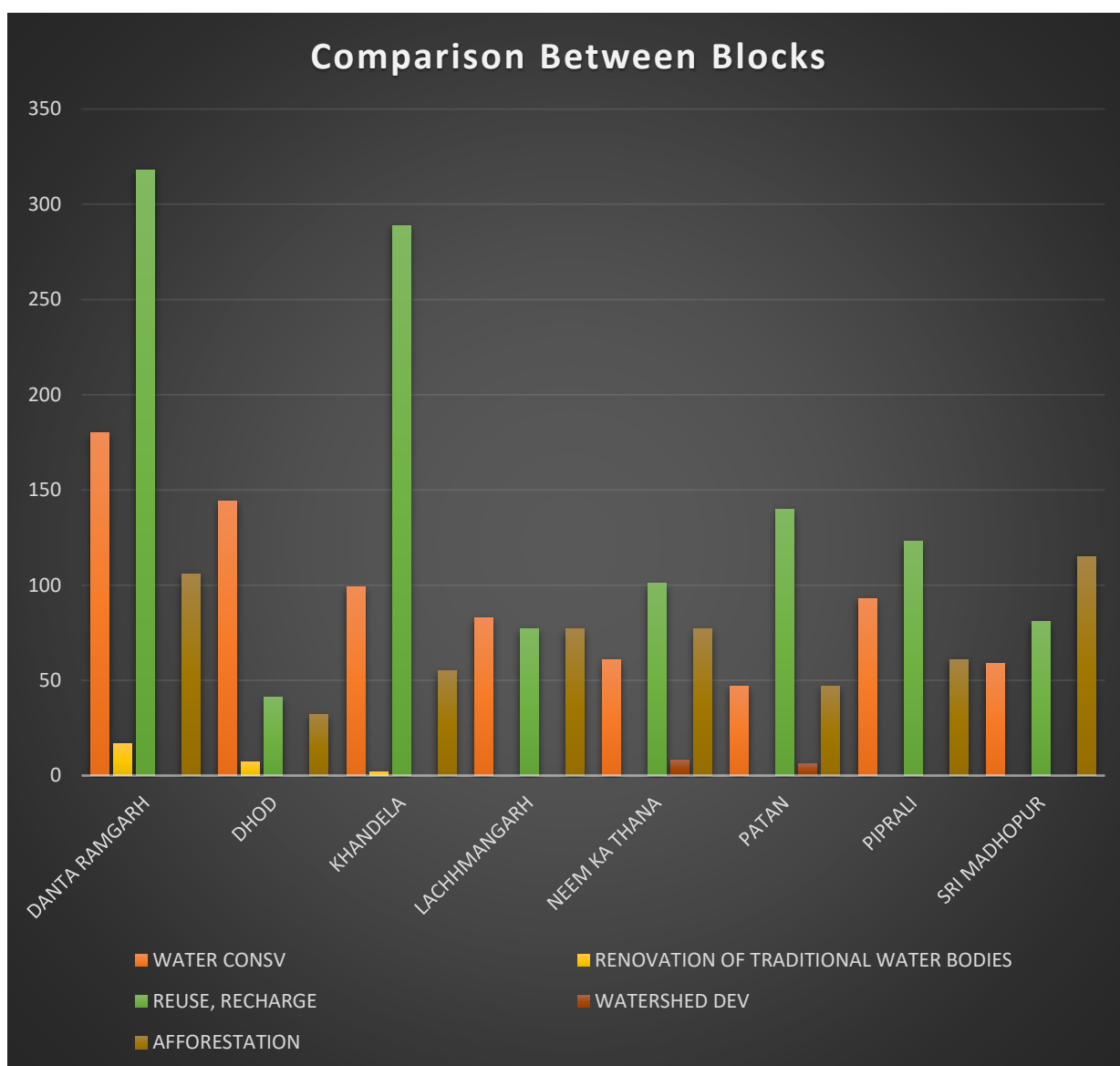
71. **Afforestation.** The analysis of data mentioned in Table 10 reveals the following:-



Source: Data Analysis by the Researcher

72. A major thrust was given to Afforestation by the District administration of Sikar. Widespread campaigns, rallies and organisation of public events drew largescale participation in tree plantation drives. Consequently, the targets set for Saplings planted and seedlings raised in nurseries were easily met, with the number of saplings planted finally surpassing the planned targets.

73. **Comparison Between Blocks.** As brought out earlier, one of the tools for comparison of progress of implementation of schemes has been based on the number of works/ structures completed in each block, under the specified areas of intervention. The comparative statement of the works carried out in the eight selected Blocks of Sikar district was brought out in Table 11. Analysis of the data reveals the following: -



Source: Data Analysis by the Researcher

74. As revealed by the figure above, the Danta Ramgarh Block of Sikar district has led all other blocks in progress made under almost all the Areas of Intervention specified under JSA. Similarly, it can be seen that Patan Block has lagged behind all other Blocks in completion of works under JSA.

75. **Measurement of Outcome Parameters.** The analysis of the outcome parameters in respect of the 25 works allocated to the Central Nodal Team (Annexure V) indicated clearly

that the Ground Water level in all blocks has risen from 1.71 m to 4 m as a result of measures taken during JSA. In addition, the Soil Moisture content in all Blocks has increased by 0.1-0.2 % which is quite significant. The effect of efforts made during JSA on water storage capacity and number of saplings planted is also very significant.

CHAPTER IV

CONCLUSIONS AND RECOMMENDATIONS

1. The Jal Shakti Abhiyan, through its recommended areas of intervention, addresses all aspects of water conservation, through an integrated whole of government and community approach. The successful implementation of the same would benefit the citizens immensely by ensuring the availability of safe water in all the selected Districts, ensure availability of irrigation to farmers and to industries for ensuring the desired growth of Indian economy. The analysis of the data in the previous chapter gives a clear indication of the status of implementation of JSA in the District. The conclusion of the researcher regarding the status of implementation of JSA and the gains in each of the recommended areas of intervention in respect of Sikar district is enumerated in the succeeding paragraphs.

Conclusions

2. As per the data obtained by the researcher, the progress achieved in construction of **water conservation and harvesting structures** is significant. The target set under JSA for construction of large water bodies, check dams/ johads and farm ponds of various types have all been met fully, and a total of **856 structures** have been created. In case of rooftop rain water harvesting structures with storage, the target has been surpassed by a wide margin. Against a plan of 360 structures, 608 structures were created. This was owing to the awareness of the Block officials, Panchayats and locals regarding importance of harvesting, conservation and storage of clean rainwater which could be used for drinking/ cooking all year round. During the field visit, it was observed that there were a large number of privately owned rooftop

structures in addition to the Community structures. Some part of the credit also goes to the successful implementation of MJSA in the District earlier.

3. In case of **Renovation of Traditional Water Bodies**, the target set by the District in terms of renovation of non-functional structures and construction of new traditional structures like Johads, Bawri, Khadin, Tanka etc. has been fully met. A total of **206 traditional structures** were renovated/ constructed in the district as planned. There was also widespread support from the locals for returning to traditional methods of water conservation, which was being neglected for some time due to over dependence on ground water.

4. The **Reuse of Water and Borewell Recharge Structures** has been another success story in the District as part of JSA. The target set by the District for the construction of new Percolation tanks, Soak pits, Borewell recharge structures and RTRWHS (with recharge) has been surpassed. As against 256 new recharge structures planned, a total of **1395 structures** were finally constructed under the JSA. While other structures have met the target numbers, the number of individual soak pits constructed during JSA has far exceeded the target. This is primarily due to the low cost of the structure and understanding of individuals regarding huge benefits accrued.

5. The **Watershed Development** and Soil Conservation Department was observed to be very active in Sikar District. The funding schemes under the department were also considered very attractive by the locals, with only 10 % of the cost of structure to be borne by the beneficiaries. The construction of the trenches, Staggered Trenches, bunds and channels etc has been completed as per the planned target of a staggering **31,100 metres**. Despite restricted funds, considerable work has been undertaken towards Watershed Development.

6. A major thrust was given to **Afforestation** by the District administration of Sikar. Widespread campaigns, rallies and organisation of public events drew largescale participation in tree plantation drives. Consequently, the targets set for Saplings planted and seedlings raised in nurseries were easily met, with the number of saplings planted finally surpassing the planned targets. A total of **4,43,351 saplings** were planted and **4,41,000 seedlings** were raised in nurseries in the District as part of JSA, a huge achievement in itself.

7. A total of **1928 public events** were conducted in the District as a part of the **Public Participation** initiative. This included KVK Melas, Poster/ painting/ Essay competitions, Public awareness meetings, Rallies, Dance dramas etc. which attracted participation by **1,37,534 people** in all. It is clear from the data collated by the researcher that the District Administration was very successful in ensuring Public participation in the JSA. People's participation was in good numbers in various rallies, events, Drama, Dance, Nukkad Natak alongwith other modes of awareness campaigns. Scores of Billboards regarding JSA and Water Conservation were put up in various blocks. The Abhiyaan was widely covered in the local media.

8. During the course of the Abhiyan, the Ministry of Jal Shakti directed that 5 works, one in each area of intervention, be allocated to each member of the Central team. A format was promulgated to enable the **measurement of Outcome Parameters** in each of the works selected. The researcher analysed the outcome parameters in respect of the 25 works allocated to the Central Nodal Team. The data indicated clearly that the Ground Water level in all blocks has risen from between **1.71 m to 4 m** as a result of measures taken during JSA. In addition, the Soil Moisture content in al Blocks has increased by **0.1-0.2 %** which is quite significant.

The effect of efforts made during JSA on water storage capacity and number of saplings planted is also very significant.

9. The researcher used one additional tool for **comparison of progress of implementation** of schemes, which is based on the number of works/ structures completed in each block, under the specified areas of intervention. As revealed by the data, the **Danta Ramgarh Block** of Sikar district has led all other blocks in progress made under almost all the Areas of Intervention specified under JSA. This also indicates that even though the implementation of JSA has been quite successful overall, there is room for improvement in the progress made in certain blocks within the district.

10. **Challenges During Implementation.** Having elaborated on the gains made in the areas of intervention during JSA, the researcher observed the following challenges faced by various stakeholders (the Nodal Teams at Centre, State, Block and Panchayat level) during the implementation of JSA in the District:-

(a) The Jal Shakti Abhiyan was launched too close to the rainy season, giving very little time for preparation by the State and District authorities. It left no time for publicity, education of locals etc. prior to commencement of the Abhiyan.

(b) Jal Shakti Abhiyan by itself has no financial provisions or budget. The funding under the existing schemes were to be used for activities under the JSA by prioritising Water Conservation related works. However, the other schemes were already struggling for funds when JSA was launched. For instance, The State Government raised the issue of non-availability of funds under the PMKSY (Watershed Component), primarily due to change of funding pattern from 90:10 to 60:40, even for the projects approved under the earlier funding pattern.

- (c) The MGNREGA funds are to be utilised for SC/ST/BPL personnel only. In case of leftover funds after these categories are exhausted, the general category poor farmers can be allocated funds. This leaves a large number of poor farmers out of the scheme.
- (d) MGNREGA labour payments are released timely, however the material payments are delayed by more than a year, causing hardship to poor farmers.
- (e) The schemes under Watershed Development are very good, but cannot be extended to all due to budget constraints. Only a few villages are covered at a time. Further, 10% contribution is expected from the individual (5% from SC/ST).
- (f) Similarly, Agriculture department scheme for allocating Rs 90,000/- per beneficiary for farm pond is extended to certain other villages. However, the requirement of farm ponds exists in all areas.
- (g) MPLAD and MLA funds cannot be used for individual beneficiaries. This removes the flexibility in utilisation of funds.
- (h) There is no transparency or clarity about availability of various funds and the parameters for selection criteria of works by the officials. As there are no specific guidelines for allotment of funds, the farmers do not undertake any work prior rains, hoping for allocation of some funding from one scheme or other.
- (i) Inadequate infrastructure and poor internet connectivity in the Common Service Centres which slows down the decision making cycle.
- (j) The JSA portal login details were not available with Block level officials. There were teething troubles and glitches with the Geo-tagging in early stages of JSA. This delayed the uploading of status of implementation in the initial few weeks.

- (k) The allocation of five works each to all members of the Central Team for measurement of Outcome Parameters was done half way into the Abhiyan, leaving very short time for completion of the activities.

Recommendations

11. Many of the Jal Shakti Abhiyan activities involve construction and other field work which is difficult during rainy season. It is therefore recommended that from next year, the Jal Shakti Abhiyan should have an additional preparatory phase during April-May to plan and complete the construction and other field activities. The next phase– actual work of water harvesting, recharging etc.- could be carried out from July to September. The preparatory phase could also be utilised to conduct workshops for Block and Panchayat level officials to raise their awareness towards water conservation techniques.
12. The JSA should have some budgetary provisions for works to be carried out under the Abhiyan. Else, sufficient funds should be made available to the State under various schemes prior to the commencement of JSA.
13. A transparent selection criterion must be drawn up by the District Administration for the selection of beneficiaries under the various schemes. Further, the selection parameters must be made public. Area wise plans for the various schemes must also be in place to ensure equitable distribution of funds/ works under various schemes throughout the District.
14. The cost of material under MGNREGA should be paid in time as the delay in payment is resulting in the reluctance of contractors to take up new works under the scheme. This delays

the completion of works. Further, a mechanism may be worked out to enable General category poor farmers to be benefitted from the scheme.

15. The contribution of Vivekananda Navyuvak Mandal of village Harsh under the umbrella Nehru Yuva Kendra to the activities under JSA has been exemplary. Nehru Yuva Kendras across the country may be involved to work for the Jal Shakti Abhiyan on similar model.

16. To make optimum use of Common Service Centers (CSC) in the district, it is essential to equip them with internet facility and BSNL connections wherever available. This would reduce the decision making cycle by improving communication.

17. Sprinkler irrigation is being extensively used in the district which is commendable. However, there is scope for its optimisation by running sprinklers in early morning or late evenings to prevent evaporation losses. Further, keeping in view the scarcity of water in the district, there is an urgent need to move towards widespread use of drip irrigation.

18. The 'one-litre per tree' plantation technique developed by Padmashri Sunda Ram Verma, Village Danta, Dataramgarh Block, Sikar may be promoted across the country. His services can be better utilised by authorising him to run training programme in one litre plantation and this technique be promoted by Government across all States & UTs.

19. The technique of use of polythene in the field with a slope towards the farm pond to direct the rain water run-off, as evolved by Shri Sunda Ram Verma should be promoted given less rainfall in many parts of the country and the need to better collect rain water and overflows

in fields and farms. Similarly, the farm ponds can also be lined with sturdy polythene sheets for retention of water. The water collected in one rainfall season can meet the entire year's water requirement in the field without resorting to use of ground water. As experienced by Shri Sunda Ram ji, a farm pond made using these techniques on 1 Ha land with suitable catchment area and run off during rains can easily irrigate 2 Ha farm all year round.

20. The successful experiments of Sunda Ram ji with the local varieties of plants can also be replicated across the state. A balance of local and newer varieties of crops/ trees need to be used based on local conditions. Further, his use of drip irrigation and green house to grow profitable crops/ vegetables like salad leaves, tomato and cucumber during off season can also be replicated in the district.

21. The adoption of 5 specific works by each of the Central Nodal Team members to measure the outcome parameters was a very good idea. However, in future editions of JSA, the same should be carried out prior to commencement of Phase I.

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Definitions1. Water conservation and rainwater harvesting.

(a) **Roof Top Rain Water Harvesting System:** A technique through which rain water is captured from the roof catchments and stored in reservoirs. Harvested rain water can be stored in sub-surface ground water aquifers by adopting artificial recharge techniques or meet the household needs through storage in tanks. These works have to be compulsorily taken up for public/community buildings namely Panchayat Bhawans, schools, Anaganwadis, Public Health enters and Community halls (if available). Also, households should be convinced to take up roof-top rainwater harvesting structures for their houses.

(b) **Check dams:** Small engineering structures constructed across a stream/ water course with cement to store water.

(c) **Trenches:** Constructed depressions of about 6 feet length, 2 feet width and 1-foot-deep (sizes may vary across states) to impound the expected runoff.

(d) **Farm ponds:** Constructed depressions in a farm land occupying 6 to 8% of land with 2 to 3 metre depth. Ponds can retain water for long duration (up to 10 months), they provide excellent opportunity to promote composite fish farming besides providing irrigation.

2. Renovation of traditional water bodies/tanks. These are traditional water storage structures called by different names across States. Some examples from Rajasthan – Johad, Bawaris, Taanka, etc. Water bodies with minimum water spread area of five hectares (ha) and above, are generally owned by Water Resources Departments or at times local bodies. These

are either standalone water bodies with individual catchments (called as nonsystem tanks in south India) or system of cascading water bodies with a common source, say a river (called as system tanks in south India).

3. **Reuse and point recharge structures.**

(a) **Borewell recharge structure:** Groundwater recharge structures constructed near an individual borewell/ tubewell used as a drinking water sources. A typical structure has a 3m x 3m x 3m pit with a borehole pipe having perforations installed at the centre of the pit and packed with filtering media (different sizes of stones). It has a lead drain to the pit and a masonry structure around the pit to protect the structure.

(b) **Soak pits:** A soak pit is a pit technology option where pre-settled effluent from a collection and storage/treatment or (semi-) centralized treatment technology is discharged to the underground chamber from which it infiltrates into the surrounding soil. It can be for an individual household or for a community.

(c) **Greywater treatment ponds:** Manmade ponds in which different types of wastewaters are treated by naturally occurring processes.

4. **Watershed development.** This is a major theme for development of rain fed areas with a view to conserve natural resources of water, soil and vegetation by mobilizing social capital. Its development involves three phases, (i) preparatory (ii) works and (iii) consolidation and withdrawal phases.

(a) **Staggered trenches:** These are similar to trenches mentioned above, but constructed in hilly areas staggered across the slopes for gradual percolation of water to soil mass.

(b) **Gully Plugs:** Gully plugs are small check dams made up of loose rocks in a series across the gully. A gully plug is one of the erosion control measures in non-agricultural land. A gully plug is constructed in series along a gully to change a sloping bed to a series of flat beds. The vertical interval between two such structures is equal to its height. The height of the structure is generally kept less than 1 m.

(c) **Percolation tank:** An artificially created surface water body made of earth, submerging in its reservoir, a highly permeable land so that surface runoff is made to percolate and recharge the groundwater storage.

5. **Intensive afforestation.** Only trees which require less water are to be planted and grown. Some examples are Babul, Amaltas, Banyan, Neem, Tamarind, Jackfruit etc. Local varieties are to be preferred.

Photographs of Billboards Regarding JSA in Sikar District









Local Media Coverage of JSA in Sikar

पत्रिका

4/4

केन्द्रीय नोडल अधिकारी ने लिसाड़िया पंचायत भवन में ली अधिकारियों की बैठक

जल शक्ति अभियान को दें जन आंदोलन का रूप: चावला

पत्रिका न्यूज नेटवर्क
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मूंडरू, भारत निर्माण राजीव गांधी सेवा केंद्र लिसाड़िया में शुक्रवार को केन्द्रीय नोडल अधिकारी दीप्ति चावला ने प्रधानमंत्री जल शक्ति अभियान को लेकर अधिकारियों व ग्रामीणों की बैठक ली। जिसमें चावला ने कहा कि जल शक्ति अभियान प्रधानमंत्री की महत्वाकांक्षी योजना है। जिसका उद्देश्य वाटर हार्वैस्टिंग, कुओं का रिचार्ज, पुरानी बवड़ियों की सफाई, क्लोरोपण और सिंचाई के लिए मेड बंदी करने करना है। ग्राम पंचायतों में अधिकाधिक पौधे लगाए जाएंगे। इसके साथ-साथ सभी सरकारी भवनों में रेनवाटर हार्वैस्टिंग लगाया जाएगा। ताकि बरसाती पानी का संचयन किया जा सके और पृथि के जल स्तर में सुधार हो। उन्होंने जल संरक्षण व वाटर हार्वैस्टिंग पर जोर दिया। उन्होंने घर की



लिसाड़िया गांव में बने एनीकट के बारे में जानकारी लेती केन्द्रीय नोडल अधिकारी।

छत पर पानी को जमा कर हार्वैस्टिंग करने, नया तालाब बनाने, पुराने जल स्रोतों को जिंदा करने, अतिक्रमि जल निकास को संतुलित तरीके से अतिक्रमणमुक्त करने, जलस्तर की समस्या को दूर करने के लिए पौधरोपण करने पर बल दिया गया। उन्होंने राजस्व विभाग, पंचायती राज संस्थान, कृषि विभाग के अधिकारियों व कर्मचारियों की बैठक लेकर उन्हें जरूरी दिशा निर्देश

दिए। उन्होंने कहा कि अधिकारी जिले के सभी तालाबों की सफाई, उनकी क्षमता में वृद्धि तथा सौंदर्यकरण के कार्य को शीघ्र पूरा कराए। ताकि मानसून के सीजन में अधिक से अधिक जल का संरक्षण किया जा सके। विशेष प्रचार-प्रसार से आम जन को जल बचाने के लिए जागरूक किया जाए। रक्षा मंत्रालय में नियुक्त संयुक्त सचिव दीप्ति चावला के साथ केन्द्रीय जल आयोग के डिप्टी डायरेक्टर अनूप, एसडीएम लक्ष्मीकांत गुप्ता, तहसीलदार नईमुहान, विकास अधिकारी संपत लाल सैनी, डिजिट जिला प्रभारी अधिकारी श्रीनिवास नेहरा, जल ग्रहण विकास एवं संरक्षण विभाग के अधिशासी अधिकारी रमेश मीणा, ग्राम विकास अधिकारी कुंदन सिंह, सरपंच मधु सैनी सहित अधिकारियों के साथ लिसाड़िया गांव में बने एनीकट, टाकों इत्यादि का भी भौतिक निरीक्षण किया।

गांवड़ी में जल संचय के लिए अधिकारियों की बैठक

नीमकावाणा/गणेश्वर | जल शक्ति अभियान को लेकर गुरुवार को केन्द्रीय नोडल अधिकारी और रक्षा मंत्रालय की संयुक्त सचिव दीप्ति मोहिल चावला ने गांवड़ी में अधिकारियों की मीटिंग ली।

बैठक को संबोधित करते हुए चावला ने कहा कि हमें जल संचय के लिए मिलकर कार्य करना होगा। इलाका खनन का है। पानी की स्थिति भी अच्छी नहीं है। ऐसे में जल संचय के लिए बेहतरीन कार्य करने होंगे। उन्होंने बारिश के पानी को संग्रहित करने के लिए अधिकारियों को निर्देश दिए। कहा- इसके लिए कुएं, बावड़ी एवं जल स्यावलंबन के तहत पानी संग्रह के स्रोतों की देखरेख करें। इसके साथ ही अधिकाधिक पौधे लगाने की



गांवड़ी में जल शक्ति अभियान को लेकर अधिकारियों की बैठक ली।

अपील भी की। गांवड़ी सरपंच को गांव व उसके आस-पास पौधे लगाने को कहा। उन्होंने बड़ का पेड़ भी लगाया। केन्द्रीय दल के सदस्यों ने जल संग्रहण के विभिन्न तरीके बताए। टीम ने वन विभाग के कार्य भी जांचे। उन्होंने विभाग के कार्यों को सराहा। इस दौरान उपखंड अधिकारी अंजू

शर्मा, बीडीओ राजू राम सैनी, क्षेत्रीय वन अधिकारी देवेन्द्र सिंह राठौड़ सहित अन्य विभागों के अधिकारी मौजूद रहे।

नरेगा में मशीनरी उपयोग एवं नाला निर्माण की शिकायत की: गांवड़ी पहाड़ी तलहटी में खोदे गए नाले को लेकर ग्रामीणों ने नोडल अधिकारी दीप्ति चावला

से शिकायत की। लोगों का आरोप है कि नाला खुदाई तरीके से नहीं किया गया। ऐसे में जल संचय के स्रोतों में पानी नहीं पहुंच रहा है। लोगों ने सरपंच व अधिकारियों पर आरोप लगाया कि उन्होंने पास के खेत मालिकों को फायदा पहुंचाया है। नाले का पानी खेतों में जा रहा है। केन्द्रीय टीम ने अधिकारियों को निर्देश दिए। नाले को चोड़ा करने एवं कुछ जगह पक्का निर्माण के निर्देश दिए।

गालव कुंड के झरने को देखा: नोडल अधिकारी दीप्ति चावला टीम के साथ तीर्थधाम गणेश्वर के गालव कुंड पहुंची। वहां गम पानी के झरने को देखा। यहां नोडल अधिकारी ने ग्रामीण महिलाओं के साथ नृत्य किया और सेल्फी ली।

जल का संरक्षण कर आत्मनिर्भर बनें : गौरव

भास्कर संवाददाता | सीकर

जल शक्ति अभियान के तहत केंद्रीय दल के उपनिदेशक अभिषेक गौरव ने बुधवार को दांतारामगढ़ क्षेत्र के रलावता, जीणमाता, जीणवास, गोडियावास, सुलियावास, दांता में जल संरक्षण कार्यों का निरीक्षण किया। सफल क्रियान्वयन के संबंध में सुझाव मांगे। उपनिदेशक ने कहा कि गांव का पानी गांव में रहे और गांव जल का संरक्षण कर जल में आत्मनिर्भर बने। आमजन की सक्रिय सहभागिता लेकर व्यर्थ बहने वाले जल का संचय करने एवं अभियान को मन से लेने की बात कही। जल संरक्षण के लिए अपने मोबाईल पर एप अपलोड कर जियो टेक करें और अपने सुझाव जल संरक्षण के संबंध में दे सकते हैं। दांता में प्रगतिशील किसान सुपडाराम कुमावत के खेत में बने फार्म



जल शक्ति अभियान के तहत निरीक्षण किया।

पौण्ड (खेत तलाई), एक लीटर पानी में खेती करने के तरीके, लाटनल, प्लास्टिक मल्ट्व, ड्रिप सिंचाई तकनीकी का बारीकी से निरीक्षण किया। जीणवास में वन विभाग द्वारा बनवाए गए एनीकट, एमपीटी, शंखपौण्ड, पौधारोपण कार्यों का निरीक्षण कर पर्यावरण संरक्षण को बढ़ावा देने के लिए मेला मजिस्ट्रेट कार्यालय जीणमाता में गुलर का पौधा लगाया। इस दौरान विकास अधिकारी दुर्गादेवी ढाका, रमेश मीणा, हरि सिंह, सरपंच अशोक सिंह शेखावत, भागीरथ सबल आदि मौजूद थे।

जल संग्रहण अभियान में आमजन की सहभागिता जरूरी : उपनिदेशक गौरव

कुशलपुरा ग्राम पंचायत का किया निरीक्षण



भास्कर संवाददाता | सीकर

जलशक्ति अभियान के तहत भारत सरकार का केंद्रीय दल उपनिदेशक अभिषेक गौरव के नेतृत्व में को रघुनाथगढ़, कुशलपुरा पहुंचा। पिपराली की रघुनाथगढ़ ग्राम पंचायत में विभिन्न जल संरचनाओं का निरीक्षण किया। दल ने जल संचय की जानकारी हासिल की। ग्रामवासियों को बताया कि जल संरक्षण और वर्षा जल संग्रह के लिए जलशक्ति अभियान चलाया जा रहा

है तथा एक जुलाई से जारी यह अभियान 15 सितंबर तक चलेगा। इसमें आमजन की सहभागिता जरूरी है। गौरव ने कहा कि बारिश के पानी को एकत्रित करना चाहिए, जिससे आने वाली पीढ़ी पानी का महत्व समझ सकें। केंद्रीय टीम दल के साथ अधिशाषी अभिव्यक्ता जलग्रहण रमेश कुमार मीणा, रंजर श्रवण कुमार झाड़िया, विकास अधिकारी पिपराली विजय प्रकाश शर्मा, जेईएन जल ग्रहण अनिल चौधरी, नरेन्द्र कुमार आदि थे।

केंद्रीय टीम ने ब्लॉकों में किया दौरा

सीकर, जल शक्ति अभियान के तहत केंद्रीय टीम ने धोद, नीमकाथाना, खण्डेला ब्लॉक में दौरा किया। सीकर नोडल अधिकारी संयुक्त सचिव रक्षा मंत्रालय दीप्ति मोहिल चावला एवं उप सचिव साख्खिकी एवं क्रियान्वयन विभाग अनुप कुमार के नेतृत्व में बुधवार को धोद पंचायत समिति के खोरी डूंगर में प्रगतिशील कृषक शेरसिंह शेखावत के फार्म हाउस का निरीक्षण कर जैविक खेती, जल संचय एवं कम पानी में फसल उत्पादन एवं फलदार पौधे लगाने की तकनीक की जानकारी प्राप्त की।

उधर सांसद सुप्रेधानन्द सरस्वती ने पीने के पानी के लिए फतेहपुर व रामगढ़ शेखावाटी को जल शक्ति अभियान में जोड़ने के लिए सरकार



को प्रस्ताव बनाकर भेजने के लिए कहा। सर्किट हाउस में बुधवार को जल शक्ति अभियान की केंद्रीय टीम के साथ जल संरक्षण के बारे में चर्चा करते हुए उन्होंने कहा कि जल संचय को आंदोलन के रूप में लेने की बात भी कही। छत्तों के पानी को टाके बनाकर संचय करें।

उन्होंने कहा कि सरकार द्वारा टाके बनाने का अभियान चलाया जाए, ताकि लोगों को पीने का शुद्ध पानी मिल सके। सरकार ने जिस प्रकार घर-घर शौचालय बनाने का अभियान चलाया है, उसी प्रकार सब्सिडी देकर घर-घर टाके बनाने का अभियान चलाएं।

केंद्रीय टीम ने जोहड़ व पौधरोपण कार्यों का किया निरीक्षण, जल शक्ति अभियान की जानकारी दी

नीमकाथाना इलाके में दौरा कर अधिकारियों को दिशा-निर्देश दिए, पानी संचय के स्रोत भी जांचे

भास्कर न्यूज़ | गणेशपुर, खंडेला

जलशक्ति अभियान के तहत बुधवार को केंद्रीय अधिकारियों की टीम ने इलाके का दौरा कर जोहड़, बावड़ियों एवं वनक्षेत्र में किए गए पौधरोपण का निरीक्षण किया। टीम में अधिकारी पीएस वर्मा उपसचिव स्किल डवलपमेंट भारत सरकार एवं गुरुप्रसाद जय शामिल थे। उन्होंने नुसिंहपुरी, गुहाला, गांवड़ी में जल शक्ति कार्यों का निरीक्षण किया और दिशा निर्देश दिए। टपकेश्वर वन क्षेत्र में वन विभाग के दीपावास प्लॉट का अवलोकन किया। क्षेत्रीय वन अधिकारी देवेन्द्रसिंह राठीडू से कार्यों की जानकारी ली। रेंजर ने बताया कि यहां करीब 10 हजार पौधे विभिन्न प्रजाति के लगाए गए हैं। टीम सदस्यों ने योजना में बने पानी संचय के स्रोत भी जांचे। वनक्षेत्र के कार्यों को सराहा। नुसिंहपुरी में पौधरोपण तथा जोहड़ का निरीक्षण किया। वहीं गांवड़ी में पिछली बार निरीक्षण के दौरान लगाए पौधे का निरीक्षण कर संपर्क को सार-संभाल की जिम्मेदारी सौंपी। इससे पूर्व नुसिंहपुरी पंचायत भवन में सरपंच गोपाल सेनी के नेतृत्व में अधिकारियों का माला व साफा पहनाकर सम्मान किया गया।



नीमकाथाना



खंडेला

ग्रामीणों को जल संचयन के बारे में जानकारी दी। लोगों को बताया कि घर के पानी को डेम बनाकर एकत्रित करें। जोहड़ में कचरा नहीं डालें, सदैव स्वच्छ रखें। बरसात के पानी अधिकारिक रोके। पौधों में उसी पानी को डालें। इससे पर्यावरण को बचाया जा सकता है। ग्रामीणों ने घर में डेम के लिए केंद्र सरकार से अनुदान दिलाने की मांग की। इस दौरान राजराम चौडीओ, सुरेश

वर्मा एईएन, क्षेत्रीय वन अधिकारी देवेन्द्रसिंह राठीडू, वनपाल रविंसिंह भाटी, रामकिशोर कुमावत, राजेंद्र प्रसाद गजराज, रणधीर सिंह आदि मौजूद रहे।

संयुक्त सचिव चावला ने पुलिस थाने में जल संग्रहण ढांचे का किया शिलान्यास
खंडेला। जिला व ब्लॉक स्तर पर चल रहे जल शक्ति अभियान की

प्रगति के लिए केंद्र सरकार की संयुक्त सचिव व सेक्टर नोडल अधिकारी दीप्ति मोहन चावला ने क्षेत्र का निरीक्षण किया तथा प्रथम फेज में पुलिस थाने में जल संग्रहण ढांचे का शिलान्यास किया। संयुक्त सचिव चावला ने नगर पालिका परिषद में निर्मित टॉप वाटर हार्वैस्टिंग टाके का निरीक्षण कर नगरपालिका अध्यक्ष पवन गोयल, अभिशामी अधिकारी सुरेश चौहान से कस्बे की भौगोलिक स्थिति पर विचार विमर्श किया। साथ ही नगरपालिका क्षेत्र में चल रहे जल संग्रहण की गतिविधियों का निरीक्षण किया। रोयल रोड स्थित मोहता गड्डे का निरीक्षण कर कार्य के प्रति संतोष व्यक्त किया। नगरपालिका अध्यक्ष ने कस्बे में बरसाती पानी को रोकने के उपाय सुझाए। इससे कस्बे व आसपास के क्षेत्र में जलस्तर बढ़ सके। संयुक्त सचिव चावला ने अध्यक्ष के सुझाव पर सहयोग देने का आश्वासन दिया। इस अवसर पर डिप्टी मेन्ट्री भारत सरकार अनुप कुमार, अभिशामी अभियंता जल संग्रह रमेश कुमार मीणा, विकास अधिकारी रोमा सहारण, सहायक अभियंता रविंद्र चाहर, ग्राम सरपंच मेहरो की डाणी विकास बडुगुजर सहित अनेक कर्मचारी व जनप्रतिनिधि उपस्थित रहे।



9	Gully Plugs	LSCD, Gabion, Gully Plugs, DSMP	Nos	37	990	0	0	0	0	0	0	0	0	0	0	0	0	5	15	3
10	Other Watershed construction activities	All other activities specified under row no 8,9 and 11 to be provided	Nos	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Recharge structures				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	Percolation tanks	MPT, PT	Nos	645	20633896.9	3	7500	18.57	0	0	0	4	13000	8	0	0	0	115	218105	410.2
12	Individual soak pit		Nos	76	0	0	0	0	0	0	0	0	0	0	0	0	0	10	100	5
13	Community soak pit		Nos	84	5000	0	0	0	0	0	0	0	0	0	0	0	0	5	50	2.5
14	Bore well recharge structures		Nos	248	12023	0	0	0	0	0	0	0	0	0	0	0	0	87	3523.55	128.5
14	Grey water treatment ponds/waste stablization ponds		Nos	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	2355	12.5
15	Rooftop Rain Water Harvesting Structures with recharge	Community and privately owned	Nos	353	12012	0	0	0	0	0	0	10	210	15	0	0	0	20	421	30
Intensive Afforestation																				
16	Saplings planted		Nos	X	X	X	X	X				321000		0	0	0	0	0	0	0
17	Seedling raised (In Nursery)		Nos	X	X	X	X	X				441000		0	0	0	0	0	0	0
Water Use Efficiency									0	0	0	0	0	0	0	0	0	0	0	0
18	Area under drip		ha	X	X	X	X	X	0	0	0	0	0	0	0	0	0	5	0	5.61
19	Area under sprinkler		ha	X	X	X	X	X	0	0	0	0	0	0	0	0	0	13	0	3.75
20	Area under micro sprinkler		ha	X	X	X	X	X	0	0	0	0	0	0	0	0	0	4	0	2.88
21	Area under pipe line		Metre	x	X	X	X	X	22000	0	7.7	0	0	0	50000	0	17.5	300	0	0.15

* MST= Micro Storage Tank, WHS= Water Harvesting Structure, SSB= Sub Surface Barrier, MMS= Medium Masonry Structure, SGT= Staggered Trenches, CCT= Continuous Contour Trench, DCCT= Deep Continuous Contour Trench, LSCD= Loose Stone Check Dam, DSMP= Double Wall Stone Masonry Pond, MPT= Mini Percolation Tank, PT= Percolation Tank

