MAHATMA PHULE KRISHI VIDYAPEETH, RAHURI

All India Coordinated Research Project on Irrigation Water Management

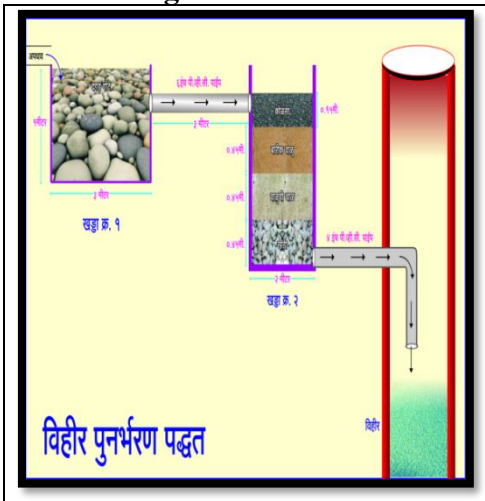
1	**Name and complete address of Research scheme/ center**	Name : All India Co-ordinated Research Project on Irrigation Water Management, Address: Department of Agronomy, Post Graduate Institute (PGI), Mahatma Phule Krishi Vidyapeeth, Rahuri –413 722, Dist. Ahmednagar (M.S.) India
2.	**Year of establishment**	The All India Co-ordinated Project for Research on Water Management Project, was established at Mahatma Phule Krishi Vidyapeeth, Rahuri on 17th December, 1970 and AICRP on Groundwater Utilization was established on August 1989. Further AICRP on WMP and AICRP on GWU were merged into AICRP on IWM vide U.R.No. MTG-3/654/509/2015,dt. 21/12/2015
3.	**Major objectives/ mandates for research establishment of research schemes/center**	**Theme 1** : Assessment of surface, ground water and waste water availability and quality at regional level and to evolve management strategies using decision support systems (DSS) for matching water supply and demand in agricultural production systems. **Theme 2** : Design, development and refinement of surface and pressurized irrigation system including small holders, system for enhancing water use efficiency and water productivity for different agro eco systems. **Theme 3** : Management of rain water for judicious use and to develop and evaluate groundwater recharge technologies for augmenting groundwater availability under different hydro-geological conditions. **Theme 4** : Basic studies on soil-water-plant-environment relationship under changing scenarios of irrigation water management including waste water irrigation. **Theme 5** : To evolve management strategies for conjunctive use of surface and ground water resources for sustainable crop production.
4.	**Historical background**	
5.	**Details of sanction post**	

Sr. No.	Name of Post	Designation	Total Posts Sectioned	Posts Filled	Name of the Person
A)	**Technical Staff**				

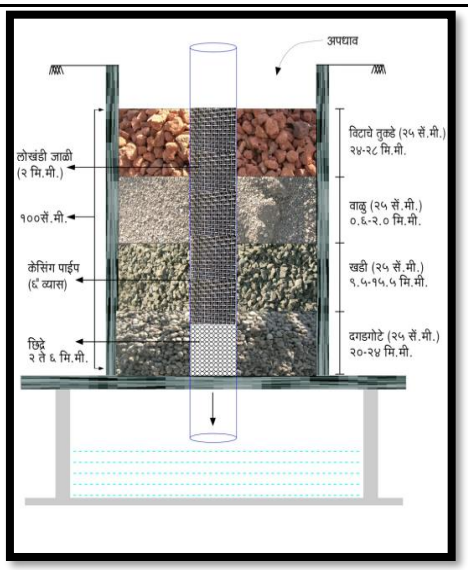
		1.	Chief Scientist	Professor	1	-	Dr. P.S. Bodake
		2.	Sr. Scientist (IDE)	Asso. Professor	1	--	--
		3.	Sr. Scientist (Soils)	Asso. Professor	1	1	Dr. A. G. Durgude
		4.	Scientist (IDE)	Assist. Professor	1	1	Dr. P. G. Popale
		5.	Scientist (Agro.)	Assist. Professor	1	--	--
		B)	**Supporting Staff**				
		6.	Agril. Assistant	Filed Assistant	4	4	Shri. B. A. Joshi Shri. U. R. Palwe Shri. G. B. Gaikwad Shri. N. B. Tamnar
		7.	Senior Clerk	Administrative	1	1	Miss. B. J. Talekar
		8.	Lab Attendant	Lab Attendant	1	--	--
				Total	**11**	**7**	
6.	**Significant/ Innovative activities and programmes implemented by the Research Scheme/center**	Fifty three recommendations on various crops were given to state department through this project on the aspect of irrigation water management, irrigation and fertigation scheduling, drip design, recharge technology, IFS model etc. **Programmes implemented by the Research Scheme/center** **1. To demonstrate the irrigation scheduling technologies developed by the AICRP on IWM in Nadurbar district** Objectives: To increase the productivity of crops by using improved irrigation technologies and to increase the WUE **2. To demonstrate the effect of integrated farming system model with reference to climatic conditions of Nandurbar District.** Location: Nandurbar district (Villages: Nimboni, Karanjani, Borchek and Dongitwai). These villages are selected as farmers are of tribal community viz. ST/SC whose economical and social status is very poor. The number of families benefited : 53 (18 drip and 35 sprinkler sets are distributed to families) **3. Awareness Programme on adoption of drip and sprinkler system at KVK, Nandurbar**					

				 ॥ सुस्वागतम् ॥
				
			 अखिल भारतीय समन्वित जलसिंचन व्यवस्थापन प्रकल्प अंतर्गत आदिवासी विकास योजना (Tribal Sub-Plan Programme) महात्मा फुले कृषि विद्यापीठ, राहुरी आणि कृषि विभाग महाराष्ट्र शासन यांच्या संयुक्त विद्यमाने "ठिबक व तुषार सिंचन आणि विहीर व कूपनलीका पुनर्भ शेतकरी प्रशिक्षण वर्ग स्थळ मारुती मंदिर प्रांगण, पिंपरी, अकोले तहसिल, जि.अहमदनगर वेळ शुक्रवार, दि. १४.०६ रोजी सकाळी ९.३ आयोजक श्री. पी. बी. गोसावी तालुका कृषि अधिकारी अकोले, जि.अहमदनगर डॉ. प्रशांत बोडके प्रमुख शास्त्रज्ञ जलसिंचन व्यवस्थापन प्रकल्प मफुकृवि, राहुरी	

			   Shri.Ramesh Tukaram Kokani,tribal farmer from Itwai village has cultivated okra on drip irrigation system.  Shri.Pandit Bulya Kokani, Itwai with his brinjal crop on drip irrigation.  Project Director and Deputy Director, ATMA and KVK, Nandurbar scientists visited the plot of okra with drip irrigation.  Project Director and Deputy Director, ATMA and KVK, Nandurbar scientists discussing with farmers about benefits of drip
7.	**Major improved/ hybrid varieties, agriculture technologies developed at research scheme/ center**		**Integrated Farming System Research Model** In scarcity zone of Maharashtra, farmers having 2.00 ha irrigated area and 200 ha-cm average annual water availability (2 Cores lit.), the Integrated Farming System module developed by MPKV, Rahuri consisting of crop production (1.5 ha), Horticulture (0.40 ha), Dairy and Poultry (0.05 ha) and farm pond for fishery (0.05 ha) plus bund planting of Drumstick + Papaya + flowers on field bunds for getting sustainable income, maximum water productivity and employment generation is recommended.

<table>
<tr><td></td><td></td><td> 
</td></tr>
<tr><td>8.</td><td>Major agricultural technological recommendations released by research scheme/center</td><td>1. The four layer filter is recommended for recharge of open wells for obtaining more filtration efficiency as given below.


Specifications of four layer filter
<table>
<tr><th>Filter layer No.</th><th>Filter layer thickness (top to bottom</th><th>Filter material and its size</th></tr>
<tr><td>1</td><td>15 cm</td><td>Coal layer (4.0 to 8.0 mm)</td></tr>
<tr><td>2</td><td>45 cm</td><td>Sand grade- I (0.6 to 2.00 mm)</td></tr>
<tr><td>3</td><td>45 cm</td><td>Pea gravel grade – I (2.00 to 6.00 mm)</td></tr>
<tr><td>4</td><td>45 cm</td><td>Angular gravel grade- I (9.5 to15.50mm)</td></tr>
</table>
2. The four layer filter is recommended for recharge of bore wells to obtain more filtration efficiency as given below</td></tr>
</table>



Specifications of four layer filter

Filter layer No.	Filter layer thickness (top to bottom)	Filter material and its size
1	25 cm	Brick flakes (24 to 28 mm)
2	25 cm	Sand grade I (0.6 to 2.00 mm)
3	25 cm	Angular gravel grade I (9.5 to 15.5mm)
4	25 cm	Pea gravel grade I (20 to 24 mm)

9. Future road map of the research

Currently the Rahuri centre of AICRP on IWM addresses the issues related to irrigation water management as deficit irrigation for different crops, development of the crop coefficient, dissemination of technology for irrigation scheduling through on farm research and groundwater recharge, groundwater potential zoning, water budgeting, Rainwater harvesting and conjunctive utilization. The research programmes are mainly concentrated at developing and generating the information required for strategic research and planning. Therefore it is necessity to strengthen the research programme of this center for strategic research at river basin and command area scales.

In addition this centre needs to address following road map of the research more precisely the climate change concern, and its impact on surface and ground water resources, develop the decision support systems, mobile apps. The simulation of soil moisture in root zone and estimation of yield by the use of remote sensing and GIS technologies for irrigation water management in river basin or command area have been started in this project but needs to be strengthened further.

Future road map of the research:

- Impact of climate change on surface and groundwater availability and demand of water for different crops
- Performance evaluation in terms of the productivity, equity, adequacy & reliability of the irrigation project & identification and improvement of low

		performing irrigation projects • Adoption of remote sensing, GIS technologies for Irrigation Water Management in command area • Simulation models and decision support systems (DSS) for irrigation water management • Development of strategies for polluted and waste water utilization for agriculture • Development of decision support tools which enables the stakeholders and policy makers to adopt improved packages in uncertainty for water and food security • Adoption of Micro irrigation on canal command area • Optimum design of pressurized irrigation methods by hydraulic computational and simulation studies • Development of low pressure irrigation system for using hilly terrain and in absence of electricity • Development of climate resilient water technologies for enhancing crop and water productivity • Development of crop contingent plan • Development of rain water harvesting structures in different in situ and ex situ on groundwater recharge • Farm pond water balance studies • Development practices for deficit irrigation management and crop coefficients for different crops • Irrigation and fertilizer scheduling for field crops, orchard and crops under protected cultivation • Irrigation water management at river basin scale • Application of IT technologies and automation in irrigation water management • Development of low cost deficit irrigation technology for high quality and nutritive produce to cater the need of industries • Create new option through climate smart agriculture practices for sustainable crop production through use of surface and groundwater to minimize the risks.
10	**Measures required for improvement/ strengthening of the research scheme/center**	**Funding for Research:** One of the most important requirements for research is the availability of adequate funds. **Infrastructure for Research:** We need to develop our research infrastructure for enhancing our research and improving our research quality drastically. This can be made possible by identifying and establishing research institutes and research centers within those institutes that are capable of undertaking high quality research. Besides adequate, trained manpower, these centers need to be fully equipped with sophisticated instruments required to conduct high-end research, databases that are required to undertake systematic literature reviews, meta-analyses, access to literature through databases. **Manpower for Research:** Apart from funds and infrastructures, it is the trained manpower that really makes the things to happen. Adequate, qualified, trained,

		well-oriented and specialized manpower is needed in the right numbers to run the research centers and carry out research in identified thrust areas. **Policies for Research**: We need comprehensive, goal-oriented and focused research policies at the institutional, regional/state levels as well as the national level for enhancing research and promoting research quality in tune with fast changing global trends. **Collaborative Research/ Need-based Research:** Addressing needs of the society through contextual research is the need of the hour.

11. Photographs (jpeg) of historical and innovative activities of the research /center

Distributing the pressurised irrigation material to the tribal's of Bamblewadi Village

Sugarcane + potato intercropping with drip

Brinjal-chilli crop sequence

	
Distribution of Drip and Sprinkler sets to TSP farmers	**Adoption of bore well recharge technology by farmers at 25 locations in Bramhanpuri village, Nandurbar district under the guidance of AICRP on IWM (GWU) and adopted as "Rahuri pattern of groundwater recharge**