K. E. Society's

Rajarambapu Institute of Technology, Rajaramnagar

(An Autonomous Institute, affiliated to SUK)

Department of Civil Engineering

6.3.3 Details of professional *development / administrative training programmes organized* by the Institution for teaching and non-teaching staff during the year

Sr. No.	Title of the professional development programme organised for teaching staff	Title of the administrative training programme organised for non-teaching staff	No. of participants	Dates (from-to) (DD-MM-YYYY)	
1	One day workshop on 'Irrigation Management: Focus on distributor and minor network – II' (Follow-up Workshop) under Unnat Maharashtra Abhiyan (UMA) Sponsored by DTE, Higher & Technical Education Department Maharashtra, Organized by UMA Cell CTARA IIT Bombay and RIT Rajaramnagar	--	69	29-04-2023	29-04-2023

Head, Civil Engineering Department

RAJARAMBAPU INSTT. OF TECHNOLOGY RAJARAMNAGAR CIVIL ENGG. DEPT.

K. E. Society's
Rajarambapu Institute of Technology, Rajaramnagar,
Department of Civil Engineering

One day workshop on 'Irrigation Management: Focus on distributor and minor network – II' (Follow-up Workshop) under Unnat Maharashtra Abhiyan (UMA) Sponsored by DTE, Higher & Technical Education Department Maharashtra, Organized by UMA Cell CTARA IIT Bombay and RIT Rajaramnagar

K.E. Society's
R.I.T. Rajaramnagar

Department of Civil Engineering

One Day Workshop
on
29th April 2023
Irrigation management

Theme/Topic: Irrigation management: Focus on distributary and minor network - II (Follow-up Workshop)

Day and Date: Saturday, 29th April 2023

Time: 09:30 am to 5:00 pm

Venue: Video Conference Hall, RIT Rajaramnagar

Program Schedule:

Time	Topics	Resource persons
09:30-09:45	Inauguration and Introduction	RIT organising team
09:45-10:00	Welcome Address	Director/Principal RIT
10:00-10:30	1. Experience and Issues of Irrigation Management in Western Maharashtra 2. Challenges of lift Irrigation Schemes	WRD officers
10:30-10:45	Agenda setting for the day	Dr Gopal Chavan, UMA
10:45-13:00	Presentation of participating institutes Time for each team to present: 10 min + 5 min QA (Presentations by 9 teams)	Students and Faculty members of participating colleges
13:00-14:00	**Lunch break**	
14:00-16:15	Presentation of participating institutes Time for each team to present: 10 min + 5 min QA (Presentations by 9 teams)	Students and Faculty members of participating colleges
16:15-17:00	Concluding remarks and way forward	UMA team and IITB faculty members

RAJARAMBAPU INSTT. OF TECHNOLOGY
RAJARAMNAGAR CIVIL ENGG. DEPT

Workshop On

"Irrigation management: Focus on distributary and minor network - II"

(Follow-up Workshop)

Under

Unnat Maharashtra Abhiyan (UMA)

Sponsored by

Directorate of Technical Education (DTE)
Higher and Technical Education Department, Maharashtra

Organised by

UMA Cell, CTARA, IIT Bombay
and
Rajarambapu Institute of Technology,
Rajaramnagar

29th April 2023

Venu: Video Conference Hall, RIT Rajaramnagar

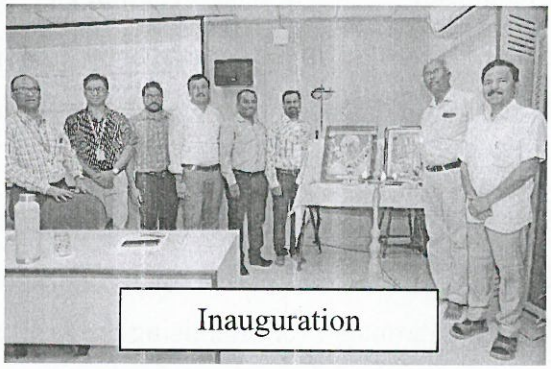
Kasegaon Educational Society's
Rajarambapu Institute of Technology, Rajaramnagar, Islampur, Dist Sangli

Department of Civil Engineering

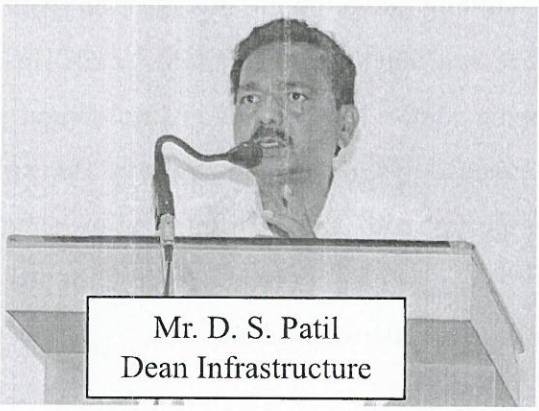
A Report on

Irrigation management: Focus on distributary and minor network - II

(Follow-up Workshop)


Inauguration

A One-day workshop on **Irrigation management: Focus on distributary and minor network - II (Follow-up Workshop)** was organised by UMA (Unnat Maharashtra Abhiyan) cell, CTARA, IIT Bombay and RIT Rajaramnagar. Sponsored by Directorate of Technical Education (DTE) Higher and Technical Education Department, Maharashtra on Saturday, 29th April 2023. The chief guest and guest of honour invited for the inaugural function and delivering expert talks in the workshop were Mr. Vinayak Kharat (Executive Engineer, Soil and Wate Conservation Department, Sangli) and Mr. Sachin Naik (Deputy Engineer, Takari Lift Irrigation Management Subdivision, Tasgaon| Sangli Irrigation Circle, Sangli).


Mr. D. S. Patil
Dean Infrastructure


Dr. S. S. Kumbhar
HoD

Mr. D. S. Patil (Dean Infrastructure, RIT Rajaramnagar) welcomed Hon'ble guests, delegates, faculty, staff, and students who have participated and registered for this workshop. He gave brief information about the Civil Engineering Department and RIT, Rajaramnagar. Dr. S. S. Kumbhar (Co-coordinator & HoD) welcomed the guest and participants for being present in the workshop. He gave the introduction of Mr. Vinayak Kharat highlighting the various works carried out in Irrigation department of

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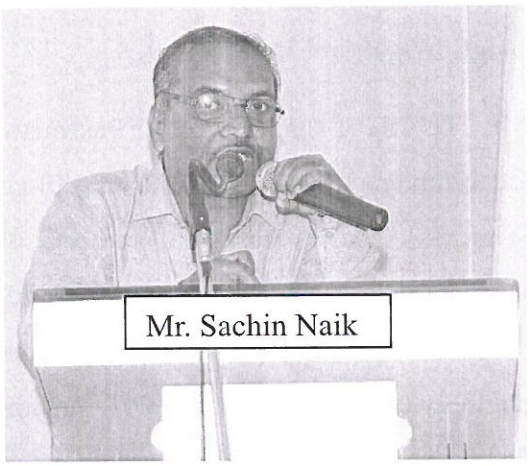
Maharashtra and his close association with Civil Engineering Department, RIT Rajaramnagar. Dr. S. S. Kumbhar also gave introduction of Mr. Sachin Naik and briefed about his work in lift irrigation schemes in the Subdivision of Takari. He introduced about the Dr. Gopal Chavan (Coordinator of UMA cell, IIT Bombay), Mr. Prathamesh (SRF, UMA cell, IIT Bombay) and Miss. Bhagyashree (SRF, UMA cell, IIT Bombay), their role in UMA cell at IIT Bombay. He briefed about various irrigation schemes executed by State Government of Maharashtra. He explained about the motivation behind organizing todays one-day workshop under Unnat Maharashtra Abhiyan (UMA) cell in RIT. He shared his work experience with various project under UMA at different village on irrigation management and explained about the importance of irrigation management network for various agricultural crops in Maharashtra.

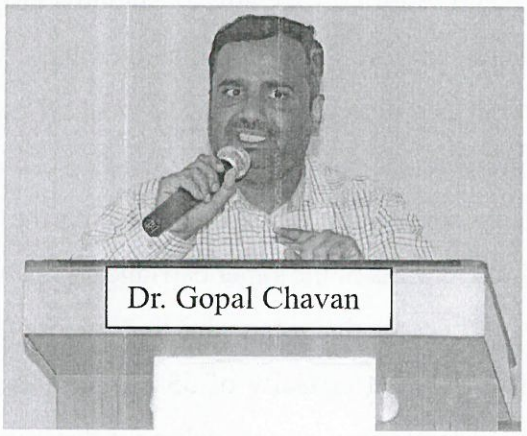
Hon'ble Chief guest, Mr. Vinaya Kharat, appreciated the efforts done by the IIT Bombay and RIT Rajaramnagar for organising this workshop and involving government organisation with regional technical institutes under UMA cell. He explained about Major, Medium, and Minor irrigation project launched by Govt. of Maharashtra. He explained the importance of Takari lift irrigation scheme (LIS) project and its importance to drought prone talukas of Sangli district, Maharashtra.


Mr. Vinaya Kharat

Hon'ble Guest, Mr. Sachin Naik, also appreciated the efforts done by the IIT Bombay and RIT Rajaramnagar for organising this workshop and involving government organisation with regional technical institutes under UMA cell. He also said, he will share a data for the students to do research and development in the area. He gave information about water auditing and metering. Total cost of Takari irrigation scheme is 1,302.96Cr and in total 27430 Ha. command area is covered under Takari LIS. He showed the newly introduced app in Irrigation department for the benefits of farmer and application of GIS to quantify the


Mr. Sachin Naik

agricultural area. He showed new development adopted in the irrigation department for farmers.


Dr. Gopal Chavan

Dr. Gopal Chavan, Gave brief about the UMA cell and its working all over the Maharashtra. He explained the motive and focus of todays workshop in RIT Rajaramnagar. He briefed about the workshop conducted in Aurangabad and highlights of that workshop. He showed some achievement done by UMA cell under the guidance of Dr. Milind Soni (Professor, CTARA, IIT Bombay). He also explained about the motive behind the organisation of workshop and case studies need to conduct on irrigation. He explained the agenda for today's workshop to the participants.

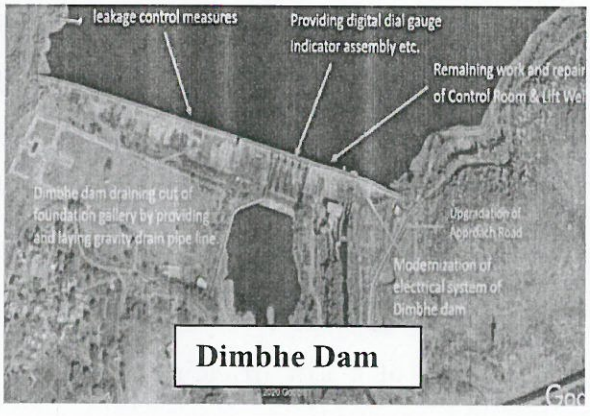
❖ **Case study presentation by participated institutes**

1. **College name: Government college of Engineering, Avasari Khurd**

Topic: Repair and Maintance of LBC of Dimbhe Dam

Guide: Dr. W. N. Deulkar, Dr. S.B.Kharmale, Prof. S.B. Kalamalar

Students: 1) Zargad Abhishek Vitthal
2) Gore Kunal Kanifnath
3) Patil Shivprasad Anandrao
4) Ambatkar Mukund Ganesh
5) Borawake Tushar Sainath

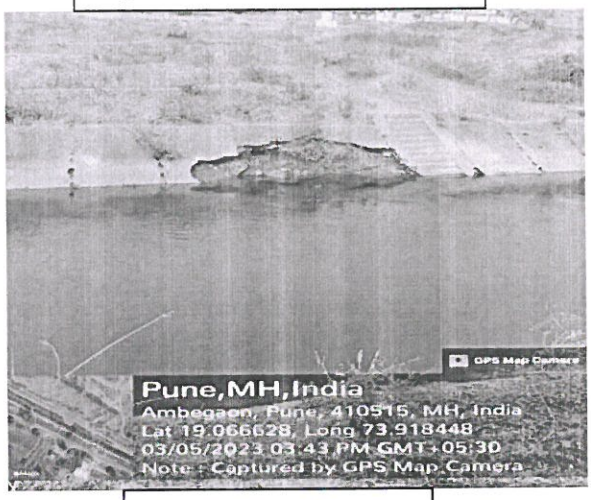


Dimbhe Dam

They discussed about the history and features of Dimbhe Dam. This dam is under Kukadi Project, consisting of five dams namely, Dimbhe, Manikdob, Wadaj, Yedgaon and Pimpalgaon Joge. Its left bank canal consisting of length 55 km and Right bank canal consisting of length 116 km. It has 5MW hydroelectric power generation capacity, installed at the foot of the Dam. This dam consists of length 852m and store water of 276.19 cu.mec. They conducted field survey of left bank canal of Dimbhe Dam of length 55km, covered a village of kalamb, narayangaon and manchar.

Following problems, they have identified are 1) Water from canal is spreaded over the road & taken the form of stream. 2) Standing crop got damaged due to accumulated water. 3)The canal has deteriorated due to wear of cement lining in the last ten years. 4) The canal has burst several times and the bridge on the canal and the walls of the super carriage on the bridge have become dangerous due to deterioration. 5) The carrying capacity of 55 km long canal is 1244 cusecs but due to leaking it decreased by 500 cusec. 6) Due to decrease in carrying capacity it is difficult to complete the AVARTAN and 6 Months of water cycle. 7) The water accumulated in the fields has started flowing through the Warulwadi Gunjalwadi road. 8) Standing crops has damaged 50 acres of area in Warulemala, Dhavlemala, Vaikarmala area.

Agricultural land survey



Lekages on LBC

A temporary solution has been planned to pump the seepage water accumulated near the canal and repair the damaged portion. They have highlighted some crucial problems faced by farmers such as 1) The water accumulated in the fields has started flowing through the Warulwadi Gunjalwadi road. 2) Standing crops has damaged 50 acres of area in Warulemala, Dhavlemala, Vaikarmala area. 3) A temporary solution has been planned to pump the seepage water accumulated near the canal and repair the damaged portion.

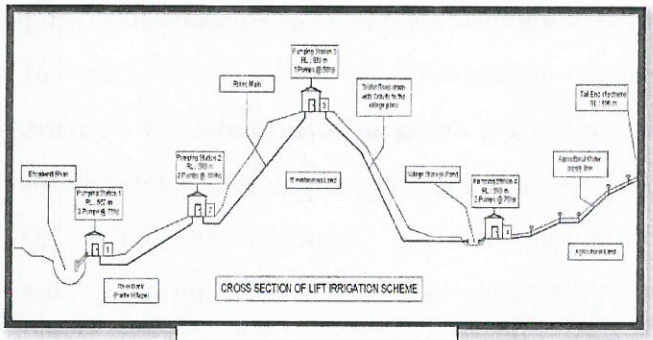
2. **College name: KIT's College of Engineering, Kolhapur**

Topic: Study of a Lift Irrigation System at Bele Kolhapur

Guide: Dr. Aditya Khebudkar

Students: 1. Mr. Digvijay Phalake 2. Mandar Thakur

They studied Shri Hanuman Sahakari Panipuravtha Sanstha Ltd. Bele, Kolhapur. They have found an unequal distribution of irrigation water at 1.5 km interval. They highlighted that Kolhapur's agriculture largely depends on community lift irrigation systems of both government and co-operative owned. The Shri Hanuman Sahakari Panipuravtha Sanstha Ltd. Bele, Kolhapur is one of the community lift irrigation systems. It is installed on Bhogawati river. It has 4 pumping stations and covers an area of equal to 550 acres and total benefited farmers are 900.

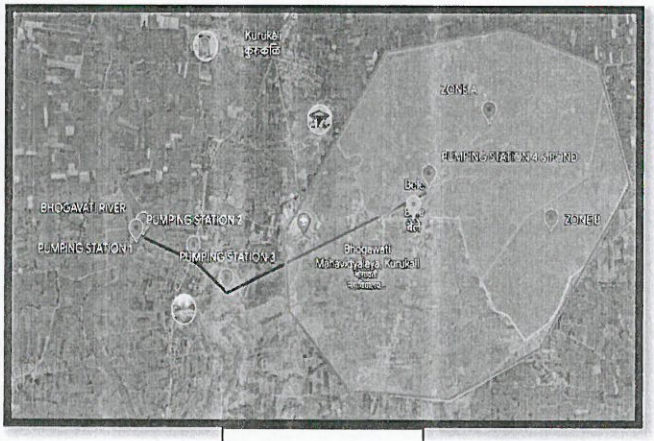


Pumping stations

The objective the study was 1. compute the energy cost per acre per day 2. Determine amount of water applied through Lift Irrigation system 3. Find out crop yields, incomes, and overall cost benefit analysis.

In their field observation, they found that Sugarcane, Maize, and Sunflower are the main crops taken by the farmers.

They have zoned the study area into 'A' and 'B.' In zone 'A,' The difference they found as zone 'A' is closer that zone 'B' from pumping station 'IV' and Zone is comparatively at higher elevation than zone 'A.'Their interaction with farmers have provided them valuable input such as 1) Differential water rotation periods. 2) Discrepancy in crop yield. 3) Annual Expenditure on agriculture. 4) Annual income and profit due to agriculture. 5) Expectations of farmers from the scheme.



Study area

The energy consumption per day they found as Rs. 10, 410/- and per acre as Rs. 185.92/-. This scheme irrigates 56 acres land per day. It applies 90mm delta per day water for standing crops.

They computed the discharge by using following input parameters 1) Technical Details of operation and working of scheme. 2) Farmers surveys to determine actual time required for irrigation of land through the outlet. 3) Computation of discharge through the representative outlets.

Table 1. Discharge computation

Sr. No.	Outlet Number	Reduced level (RL) (m)	Volume (liters)	Time (sec)	Discharge (LPS)	Zone
1.	Outlet 1	502.61	40	4.20	9.524	A
2.	Outlet 2	504.13	40	4.31	9.281	A
3.	Outlet 3	512.36	40	4.60	8.696	B
4.	Outlet 4	509.32	40	4.50	8.889	B

The cost benefit analysis shows that

1. Total average annual expenses of farmers for sugarcane = Rs 42,000/-
2. Average yield is 35 tonne per acre for Zone A and 28 tonne per acre for Zone B
3. Rate of Sugarcane is Rs 3,100 per tonne.
4. Approx. total profit in Zone A is RS 2,17,900 and Zone B is about RS 1,83,000
5. Annuity of water paid by farmers is Rs. 10,000 per acre which comes to about 33.27% of total expenses.
6. Profit calculations in terms of water applied through lift irrigation scheme (neglecting other factors such as fertilizers, labour, harvesting etc.)

Table 2. Cost benefit analysis

Sr No.	Farmer name	Land Under Irrigation [Acre]	Water Rotation Periods [Days]	Irrigated Land per day [Acre]	Zone	Benefits [Rs]	Cost Benefit Ratio
1	Rahul Shivaji Sonalkar	4	20-22	1.5	A	19,523	0.512
2	Santosh Govind Patil	1.5	21-22	1	A	15,295	0.654
3	Vilas Sambhaji Patil	2.5	20-23	1-1.25	A	11,730	0.853
4	Dinkar Keshav Patil	1	25	0.5	B	6,739	1.481
5	Sajerao Maruti Patil	1	25	0.5	B	7,452	1.342
6	Maruti Babu Patil	2	25	0.5	B	8,165	1.225

Zone 'A'=0.33×2,17,900=Rs.71,907/3=Rs. 23.969/-

Zone 'B' =0.33×1,83,300 = Rs. 60,489 / 3 = Rs. 20163/-

Cost Benefit Ratio = Expenses / Profits in terms of irrigation water

Cost to benefit ratio = 0.417

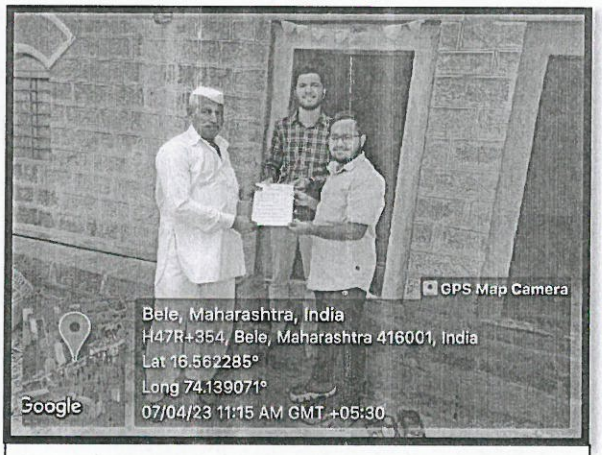
Therefore, they concluded that:

a) If the ratio is less than 1 then it indicates that the profit is higher than the expenses.

b) In some of the cases (the highlighted rows) the cost to benefit ratio is greater than 1.

c) This indicates that the farmer experienced loss with respect to expense and profit of irrigation water. Such farmers are in Zone B. If we calculate cost benefit ratio of the same farmers including all expenses and profits then it is less than 1. This is because of the

dynamic rates of fertilizers used, labour charges, tilling-ploughing etc. Hence the cost-benefit ratio is computed in terms of irrigation water only.



Village survey

The major out comes from this study are:

a) The supply of water of the scheme (number of rotations) and discharge rates is lower in Zone B as compared to the Zone A.

b) The crop yield in Zone B is comparatively less than the Zone A.

c) Rate of discharge and amount of water applied per acre reduces as we move away from the pumping station with increase in elevation.

d) Less amount of water is supplied towards the tail end of the lift irrigation scheme, especially in Zone B.

e) Farmers in Zone B are facing losses in terms of cost benefit calculated in correspondence to the irrigation water only.

3. College name: SVKM'S Institute of Technology, Dhule

Topic: Mapping and assessment of Irrigation Infrastructure at minor level

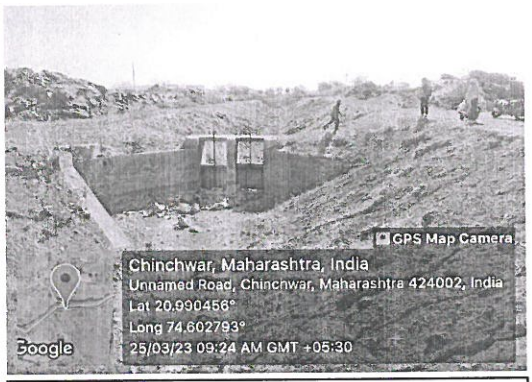
Guide: Mr. Pratik Deore and Prof. Prerna Ikhar

Students: 1. Nirbhay Manoj Deore 2. Dhiraj Magan Patil 3. Swapnil Sahebrao Dhanrale 4. Dhiraj Tulshiram Chaudhari 5. Saiprasad Pundlik Badgujar

The canals associated with the Lower Panzara Dam are designed to distribute water from the reservoir to the agricultural fields in the command area. The **Right Bank Canal (RBC)** was designed to distribute the water from the Lower Panzara Dam to the right bank areas of the Panzara River. The RBC is a major canal of the Lower Panzara Dam and it has a capacity of 150 cubic meters per second (m^3/s) and consist

Vegetation grown in canal

of 14.13 km length with head discharge of 5.58 m^3/s, distributing water to 6 Villages. Similarly, the **Left Bank Canal (LBC)** is designed to distribute water from the Lower Panzara Dam to the left bank areas of the Panzara River. The LBC is a smaller canal compared to the RBC and has a capacity of 35 cubic meters per second (m^3/s) and 32.85 km length with head discharge of 3.42 m^3/s, distributing water to **16** Villages. The objectives of their studies were 1) To map irrigation infrastructure minor level 2) To assess quality of irrigation minor level. 3) To identify lossy patches canal level. 4) To provide possible solution to identified problem. The problems they identified was 1) Growth of vegetation on canal lining: Excessive vegetation growth on canal lining also causes problems. Vegetation can obstruct the flow of water leading to reduced water flow and increase risk of flooding. Also cause damage of canal lining. 2) The gate of canal is in bad condition: A damaged gate can lead water leakage or loss, reduced water flow and potential flooding in surrounding area. 3) Erosion of canal lining on turning: when the water flow through canal and encounters a turn, the force of water increases on outer side of turn which cause lining erode fast. 4) Side slope is missing: If the canal side slope is eroded it can lead to several issues such as instability, structural damage, and safety hazards. Erosion can cause by a variety of factor including water flow, soil type, vegetation, and weather condition.



Unlined canal

Conclusion of their study was 1) The majority of canals offer irrigation and water as per their needs which will help to protects the crop from drought and helps farms become more productive. 2) Farmers also claim that wells near canals still have water two to three months after the canal has dried, on the other hand, in rainy seasons several canals overflow and flood the surrounding area during the. 2) Vegetation grown inside and outside the canals, leads to loss of water and affecting on the lining of the canal. 3) Suggesting a line canal with a rigid boundary. Overall, farmers are adjusting to the canals, but there is a severe shortage of water in the summer due to a lack of water supply.

4. **College name: Dr. Daulatrao Aher College of Engineering, Karad**

   Topic: ***Studying a LIS (Lift Irrigation Scheme)*** Mapping and assessment of Irrigation Infrastructure at minor level

   Guide: Dr. Abhijit Zhende

Students: 1. Mr. Janugade Pranav Anandrao 2. Mr. Gharge Sameer Rajendra 3. Ms. Kadam Anuja Chandrakant 4. Ms. Patil Trupti Sunil

Krishna basin covers about an 69.42 lakh ha area which is 22.6% of the total area of Maharashtra. It covers an area of Pune, Satara, Sangli, Kolhapur and Solapur districts. The basin receives annual rainfall average of as 500 mm to above 3000 mm.

Objectives of their study was 1) study of components of Tembhu Lift Irrigation. 2) To view the pump house working system. 3) To view distribution network and issue. 4) Feedback of farmers and problems. 5) Now water charges recovery condition

Table 3. Irrigation area & Water use according to different talukas

Taluka	No. of villa-ges	Total area (ha)	Culturable command area (ha)	Irrigated command area (ha)	Irrigation intensity (%)	Water use	
						TMC	Mm^3
Karad	2	1,150	860	600	69.77	0.16	4.70
Khanapur	86	61,350	49,100	28,300	57.63	7.82	221.63
Tasgaon	15	20,570	15,450	7,700	49.84	2.13	60.30
Atpadi	36	61,568	43,100	16,000	37.12	4.42	125.3
K.Mahankal	13	13,750	10,300	7,000	67.96	1.94	54.82
Sangola	21	36,500	29,200	20,000	68.49	5.53	156.63
Total	**173**	**194,888**	**148,010**	**79,600**	**53.78**	**22.00**	**623.38**

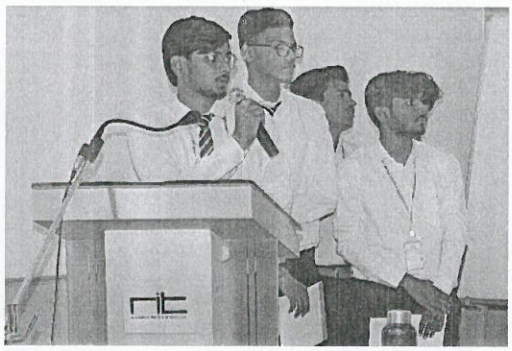
Silent features of "Tembhu Lift Irrigation Scheme, Tembhu, Karad" are:

This scheme is approved in 1996, Tembhu eastern bank of the river Krishna, its cost is Rs 9-billion irrigation project. It stores a water of 22 billion cubic feet or TMC and irrigate 80, 472-hectare areas. The benefited districts are Satara, Solapur and Sangli districts.

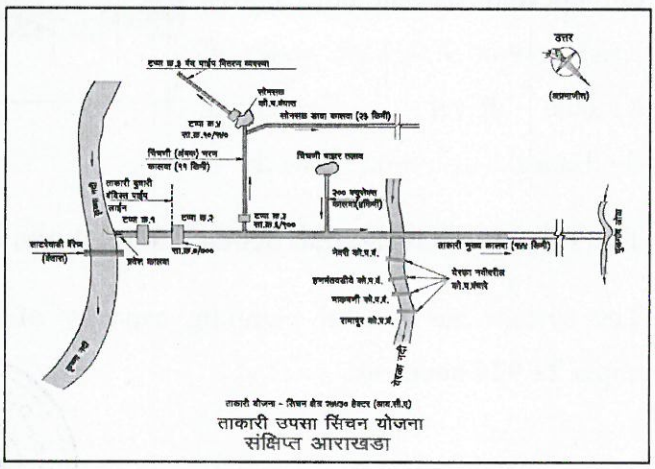
5. **College name: Walchand College of Engineering, Sangli**

Topic: ***Takari Lift Irrigation Scheme: Case Study*** level

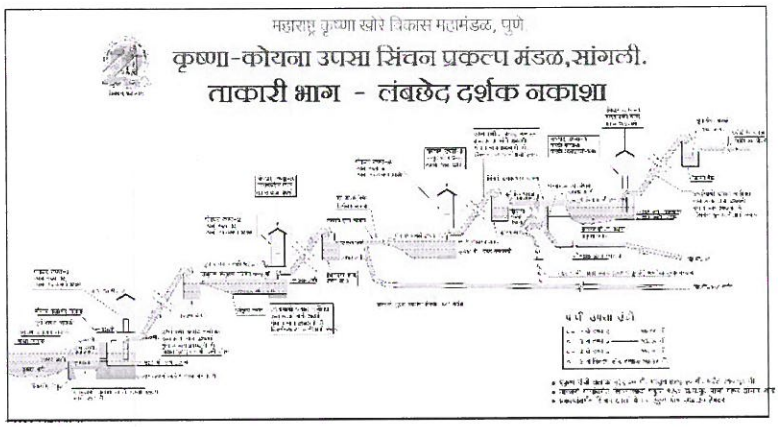
Guide: Prof. C. H. Wagh

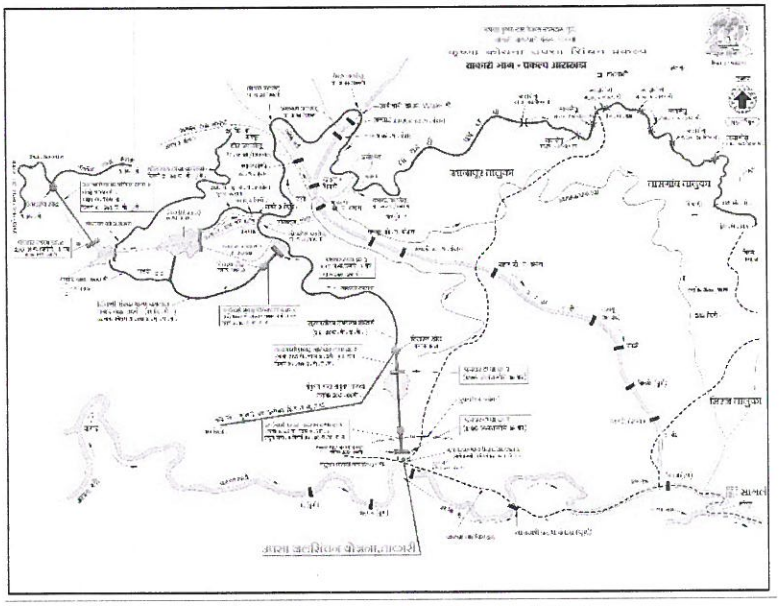


Students: 1. Yashvardhan Rajput 2. Vishal Pawar 3 Yash Mali. 4. Parth Dhavale 5. Abhishek Sangamkar. They highlighted the purpose of Takari Lift Irrigation Scheme project such as 1) Better Agricultural Productivity 2) Provide irrigation to drought prone areas 3) Enhance Rural Livelihoods. They discussed in details about the technical

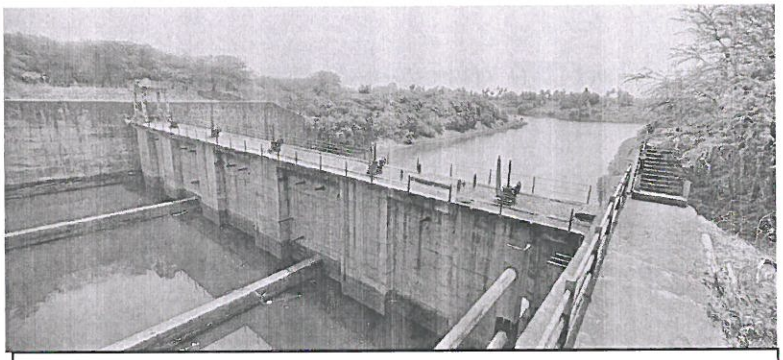


aspects of the Scheme, Impact on the farmers of Sangli District and Sustainability.





The scheme was funded by the World Bank and implemented by the **Maharashtra Krishna Valley Development Corporation (MKVDC).** The cost of the scheme was approximately **460 million Indian rupees**. This scheme comprises of 4 stages which are responsible for supplying water to 70 villages of Walva, Palus, Kadegaon, Khanapur, Tasgaon, Miraj talukas of Sangli District. The scheme has benefited about **11,700 farmers**, who have been able to increase their agricultural productivity and improve their livelihoods.



Stage 1

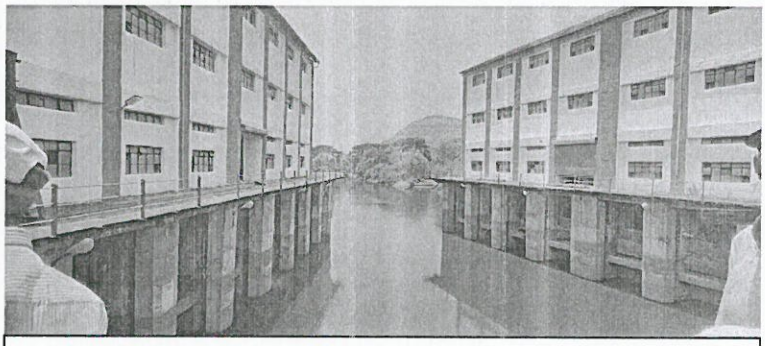
It comprises a lift irrigation system that pumps water from the Krishna River with the help of Satpewadi Barrage built across Krishna river. 9.34 TMC water of Krishna River is reserved for Takari distribution network.

The **Takari Lift Irrigation Scheme Stage 1** was initiated in 1990 and completed in 1996.

The system has a total pumping capacity of **24.2 cumecs** and can irrigate an area of about **21,936 hectares**.

The scheme includes the construction of a **48 km long** main canal and **277 km** distribution network, with a total of **475 distribution outlets.**

Stage 1 consists of **14 operational pumps + 2 additional pumps** of capacity 1786 HP each.



Stage 2

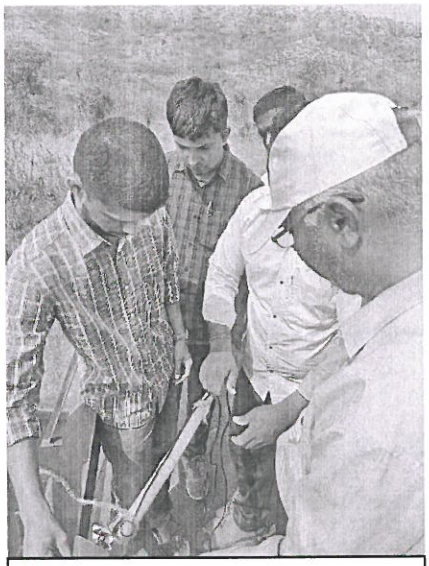
The Takari Lift Irrigation Scheme **Stage 2** is located at deorashtre which is at a distance of 8.5km from stage 1, The scheme was funded by the Government of India, the World Bank, and the Japan Bank for International Cooperation. The objective **of Stage 2** was to enhance the irrigation potential of the region by providing additional water to farmers and improving the efficiency and sustainability of the scheme. The scheme also included the construction of a new PDN Takari Dudhari and the extension of the existing distribution network. The head difference between stage 2 and stage 1 is 60m. Stage 2 consists of **14 operational pumps + 2 additional pumps** of capacity 1786 HP each. The pumped water from stage 1 is delivered to stage 2 with the help of 3 rising mains of 2.5km pressure filter plants – cooling the pumps. The delivery chamber located at elevation of 54m from stage 2 pump house.

Table 4. seasonally required water

Sr. No.	Season	Duration			Required water TMC	% of Water
		From	TO	Day		
1	Kharif season	July 1 to October 14		106	1.85	29%
2	Rabi Season	October 15 to Feb 28		137	4.37	37%
3	Summer Season	1 March to June 30		122	3.12	34%
Total				365	9.34	100%

The advantages of Takari Lift irrigation found such as 1) Allocation of irrigation water to nearby Talukas such as Palus, Kadegaon, Tasgaon, Khanapur, Walwa. 2) Extension of irrigation facility to regions which are water stressed. 3) Increased agricultural productivity so that mainly sugarcane production in area boosted 4) Flexibility in water allocation even during hot weather season with increase in water depth requirement. 5) Reduced dependency on rainfall 6) Efficient water utilization in corresponding areas 7) Expansion of cultivated area about 62% of CCA providing agricultural growth in nearby areas 8) Improved water control and regulation which includes construction of reservoirs, canals, improved pumping station. Problems they have identified are 1) Infrastructure Requirements: Proper design of canals, head requirements, proper laying of

PDN, implementations of new technologies considering older designs. 2) Availability of water resource: Consistent and adequate supply of water plays most important role as Krishna is not a perennial River. 3) Financial Constraints: Proper availability of fund for adoption of new technologies with sustainable development. 4) Need of technical expertise: Hiring of trained professionals with necessary skills, building of local institutions 5) Social and Community consideration: Challenges related to land acquisition, relocation of communities in proposed stage 4 lift irrigation scheme.



Flow velocity measured using Current Meter

In their field work they have measured flow velocity using current meter apparatus. They calculated the velocity of flow at Kavathe canal at 200 m, 1, 100 m, 38, 100 m and 54, 320 m from 5th stage chamber.

They compared the calculated discharge values with design values. It has found that the water discharge at 200m and 1100m was observed to be similar with the design values but discharge at 54320m at kuchi village of Sangli district was observed to be comparatively less than expected discharge. That is due to drop in discharge is due to theft and losses.

Their study concluded that the Lift irrigation schemes can use advanced technology such as pumps, pipes, and sensors to ensure efficient water distribution so there is a lot of potential area for research in this field to design or develop models which can help the system to work more efficiently. This scheme can use Information about various farming practices, such as crop selection, crop rotation, and soil management, and how they are adapted to local climatic and soil conditions has been collected. The lessons learned from the implementation of the scheme, such as the importance of community participation and the need for a comprehensive approach to rural development, can be applied to other development projects. The scheme has improved agricultural productivity, provided irrigation to drought-prone areas, and enhanced rural livelihoods, thus contributing to the overall development of the region.

6. **College name: Pimpri Chinchwad CoE**

   Topic: ***Takari Lift Irrigation Scheme***

   Guide: Prof. Sandeep T. Mali, Mrs. Nameeta S. Sane

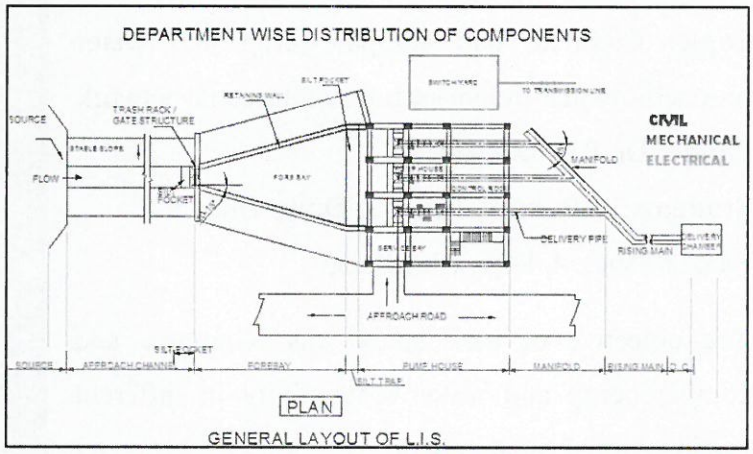
Students: 1. Sharad Maruti Narute 2. Omraj Sunil Nalage 3. Sumit Bhagwan Sonvane 4. Vaibhav Nitin Shinde 5. Sufiyan Hidayat Khan

Mrs. Nameeta S. Sane

In Introduction of the Lift Irrigation schemes they gathered information. In their study they found that the northern part of the District Sangli in Maharashtra comprised Kadepur, Khanapur, Tasgaon, Miraj and Palus taluka, where there is uncertainty and inadequacy of rain fall year after year. These area receives rainfall ranging from 500 mm to 650 mm. Therefore, to meet the need of irrigation water requirement, Krishna Koyna lift irrigation project launched by Krishna Valley Development Corporation. The Takari Lift irrigation scheme is a section of Krishna Koyna lift irrigation project. The Takari section has proposed to provide irrigation to 27630 Ha. of land in 67 villages in above five talukas in the district Sangli.

Table 5. The proposed area under various canal

Stages	Total No. of Pump	Static Head Mts.	Proposed Area in Ha.	Proposed Discharge Cumecs
1	14+2	58	No Irrigation	24.12
2	14+2	58	23859	24.12
3	4	48.05	3259	5.20
4	3	56.69	512	0.513
Total -		220.74	27630	



The Takari Lift Irrigation Scheme was evaluated for several performance indicators for both pre-transfer (1984–2000) and post-transfer (2001–2010) periods. They used following performance indicators for assessment of the scheme are given in Table 5.

They have identified following problems in this study are: 1) Check the feasibility of provision of lined canal. 2) Reduction of salinity of water. 3) Monitoring of waterlogging problem.

Table 6. Performance indicator

Sr. No.	Details	Takari Main Canal
1	Command area (ha)	30921
2	Main Crop (%)	60
3	Length of Irrigation canals (km)	81.55
4	Number of Villages	34
5	Number of members	2000 appx.

Irrigation potential of a project should then be measured not in term of what was designed but in term of what was achieved over a period. The percentage of proposed and actual irrigated area for year 2005-06 is considered for analysis here. It represents that out of 24 villages 10 villages have received below 20 percent of irrigation land out of the proposed irrigated area viz. Kumbhargaon, Chinchani, wangi, Ambak, Padali, Sonsal, Shirasgaon, Shivani, Hanmantvadiye, Bhalawani and Shirgaon etc.

The underutilization of the proposed irrigated potential has been most marked in respect of the major project such as, in Takari scheme, The average actual irrigated land out of proposed area in actual benefited villages is about only 22.34%.

The eight villages comprised in the category of 20 to 40 percent area and the category of 40 to 60 percent area has included in two villages viz. Asad and Kadepur. Above 80 percent of the area actual irrigated from proposed, comprised both villages viz. Devarashtre and Tupewadi

7. **College name: Chh. Shahu College Of Engineering Kanchanwadi Chh.Sambhajinagar (CSMSS)**

   Topic: Compute and compare crop and water productivity in different sections of the canal network

   Guide: Dr. P.D. Dabhade

   Students: 1. Rohit Kalwane 2. Divya Dhas 3. Sanket Patare 4. Bhgyashri Balap

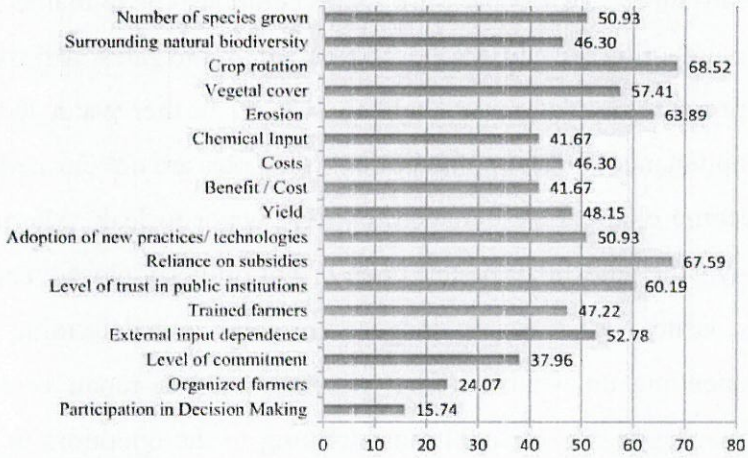
   The objective of their study was "Compute and compare crop and water productivity in different sections of the canal network".

Hiradpuri Study area

   They have selected an appropriate field area or irrigation project location which is at a critical step to achieve a successful agricultural production. The chosen location had a significant impact on crop productivity, water use efficiency, and environmental sustainability. They considered an important range of factors, such as soil type, topography, water availability, climate, and accessibility, in order to identify a site that is suitable for the specific crop and irrigation system. In this presentation, we will discuss the process of selecting and introducing a field area or

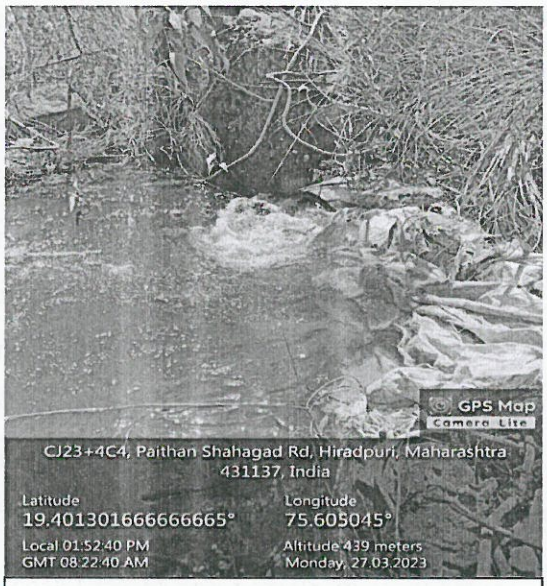
irrigation project location, and highlight some of the key factors and challenges that must be addressed to achieve optimal productivity and sustainability.

Climatic conditions: - The temperature in Paithan is generally hot and dry, with average daily temperatures ranging from 30°C to 35°C (86°F to 95°F) during the summer months of April to June. The winter months of December to February are relatively cooler, with average daily temperatures ranging from 12°C to 26°C (54°F to 78°F).



Humidity: - Paithan experiences high humidity levels during the monsoon season, with relative humidity typically exceeding 70%. The humidity levels are relatively lower during the rest of the year, with average relative humidity ranging from 25% to 60%.

Data collection tools: These are instruments used to gather information from the field, such as questionnaires, surveys, and field measurements. They can be paper-based or digital. Statistical software: This type of software can be used to analyse data collected from the field, such as crop yields and water use. We used Ms Excel here in the project. GIS software: GIS (Geographic Information System) software is used for spatial analysis and visualization. It can be used to create maps that show the location and extent of different canal network sections and to overlay this information with other data such as cropping patterns and soil characteristics. GIS software we used are Google maps, Google Earth, ArcGIS Equipment for measuring water use and irrigation system performance: Flow meters, pressure gauges, Etc. Project proposal templates or guidelines: template provided by UMA cell and IIT Bombay named as "Way Forward". The identified a problem on the minor canal where water is being lost from the gates. The canal is supplied by a 5 HP pump and the water loss may



Water clogging problem

be due to several factors. One possibility is that the gates are damaged or worn out, which can cause leaks or cracks that allow water to escape. Another possibility is that the gates were not installed properly, causing water to leak from the sides or bottom. In addition to installation and wear-and-tear, water pressure issues could also be to blame. If the water pressure in the canal is too high, this can cause water to flow out of the gates. Adjusting the water pressure by installing a pressure regulator may help to prevent further water loss. Another possibility is that poor maintenance is causing the issue. If the gates are not cleaned and maintained regularly, they can become clogged or damaged, causing water to leak. Alternatively, operator error could be at play - the gates may be left open or not properly closed, causing water to leak out. To address the issue, we'll need to inspect the gates and determine the root cause of the water loss. Depending on what we find, we may need to repair or replace the gates, adjust the water pressure, or provide additional training to the operators to ensure that the gates are used and maintained properly. By addressing the issue promptly and thoroughly, we can prevent further water loss and ensure that the water is properly distributed to the fields."

Findings And Conclusion: The findings and conclusions of the project of computing and comparing crop and water productivity in different sections of the canal network can help farmers and water resource managers to identify the most productive and efficient sections of the canal network, and optimize water use and crop production. Based on the data analysis, the project team can draw the following conclusions: Water productivity varies significantly across different sections of the canal network. Some sections may use water more efficiently than others, resulting in higher water productivity. Crop productivity also varies across different sections of the canal network, with some sections producing higher crop yields than others for the same amount of water used. By comparing water productivity and crop productivity across different sections of the canal network, farmers and water resource managers can identify areas where improvements can be made to optimize water use and crop production. Improving water management practices, such as optimizing irrigation schedules and using more efficient irrigation methods, can increase water productivity and crop productivity in the canal network. Crop selection and management practices can also have a significant impact on crop productivity. By selecting high-yielding crop varieties and adopting good management practices.

8. College Name: Indian Institute of Technology Bombay

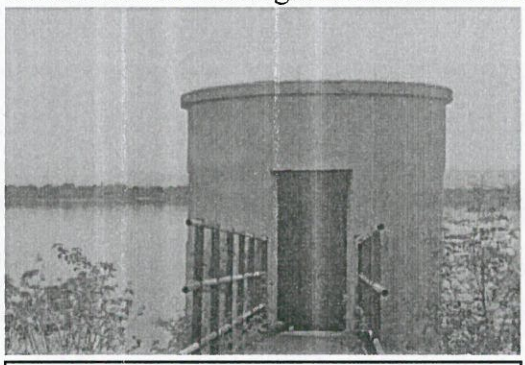
Topic: Mapping and Assessment of Irrigation Infrastructure at Minor Level

Guide: Prof. Ankit U. Konlade

Student: 1. Dnyaneshwari Ingole 2. Dnyaneshwari kale 3. Chetan kale

The Loni Dhawalgiri Minor Project located in Varud district, Amravati, is a significant dam constructed to serve multiple purposes, including irrigation and drinking water supply. The project falls within the catchment area of the larger project, the Upper Wardha Project, and was initiated in December 2016. The project has a catchment area of 74.074 sq.km and is an approximately 2890 m (1.790 miles) long earthen dam with stone. The project serves the primary purpose of supplying water for irrigation and drinking purposes to the village of Sawanga, Ramapur, Loni, Aloda, Goulkheda, Kasurna, and other surrounding areas.

The objectives of the Loni Dhawalgiri Minor Project were to assess the irrigation infrastructure at the minor level, interact with the Water User Association (WUA), and identify defects in the structure at the minor level. The methodology involved visiting the project site, the main canal structure and minor level, identifying the structures and their current conditions, interacting with WUA officials and farmers, and collecting data from the sub-division office, Varud.

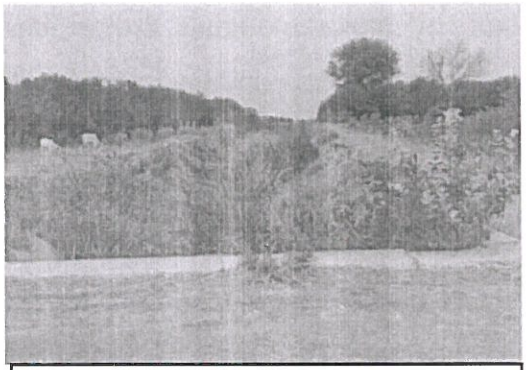


Head Regulator

The structures at the minor level include a head regulator, main canal, minor canal and escape, field channel, canal gate, aqueduct, and overflow section. The head regulator is a crucial component of the irrigation system that serves as the main control structure for regulating water flow and is manually operated. The main canal is the primary conveyance structure for water from the dam or

Main Canal

reservoir to the downstream areas, and its lining was effective in reducing seepage and water losses. The minor canal branches out from the main canal and distributes water to various agricultural fields, but it was found to be in poor condition. The escape canal structure is a channel built alongside the main canal to divert excess water during times of flood or high-water levels to prevent damage to the canal structure and surrounding areas due to overflowing water. The aqueduct is a structure in which the canal flows over the drainage, and the flow of the drainage below is an open channel. This section is designed to allow water to flow out of the dam when it reaches capacity, preventing the dam from overtopping and potentially causing damage downstream.



Aqueduct

The interaction with the Water User Association revealed that the Pataleshwar Water User Association, started in 2019, has a President and Secretary, and elections are held every six years, with four members elected from head, middle, and tail sections. Presidents rotate between head, middle, and tail every two years, and the irrigable command area is 636 hectares. Minimum water demand is approximately 50 hectares according to canal rates that vary for different types of crops, with Rabi season from October to December and Kharif season from September to October.

The analysis of the Loni Dhawalgiri Minor Project revealed that almost all structures are in good condition, but the field channel requires maintenance, and the lining is provided mainly at the turning point to reduce soil erosion. The lack of measuring instruments, such as the installation of a CTF, is necessary. Maintenance of the infrastructure is also required, and there is a lot of work load as the WRD does not have funding.

In conclusion, the Loni Dhawalgiri Minor Project has improved water availability, and water scarcity faced by farmers in the area has been reduced. However, improvements are needed, including the installation of measuring instruments, maintenance of the infrastructure, and improvement of the field channels at the minor level. Additionally, as the President of the WUA changes every two years, it leads to miscommunication and incomplete work. Therefore, these improvements are necessary to sustain the Loni Dhawalgiri Minor Project and continue to benefit the surrounding communities.

9. College Name: Sanjivani College of Engineering, Kopargoan

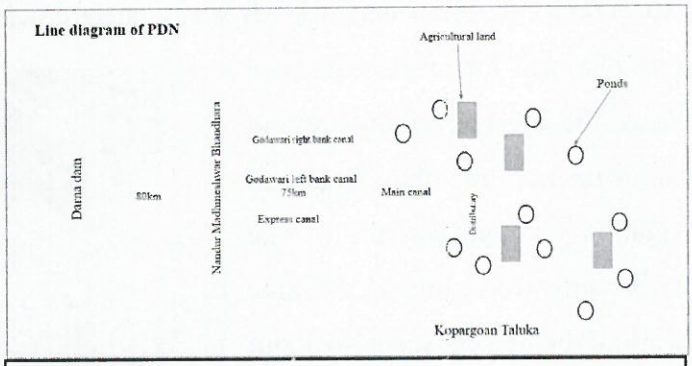
Topic: Design and implementation of a pipe distribution network for efficient irrigation management in agricultural and urban areas

Guide: Prof. V. M. Mahajan

Student: 1. Mr. Bachhav Heramb Bajirao
2. Mr. Yelekar Sumit Kisan

This project aimed to design and implement a pipe distribution network for efficient irrigation management in agricultural and urban areas. The objective was to reduce the losses of water through canals and distributaries, achieve more Crop Per drop in agriculture, increase the total cultivable area for irrigation, and minimize percolation and evaporation of open flow irrigation systems.

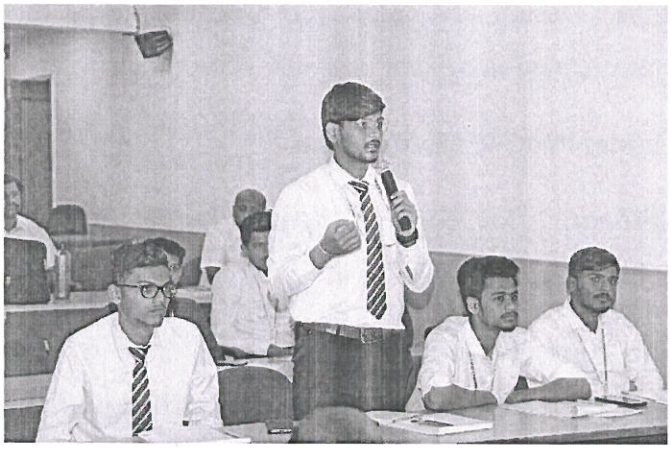
In Maharashtra State, the demand for water, irrigation, and non-irrigation is increasing rapidly. However, the availability of water every year is not assured. Conventional flow irrigation systems, such as canals and distributaries, lead to large-scale loss of water, and almost 75% of water is used for irrigation out of the total available water. Therefore, adopting a Piped Distribution Network (PDN) can be an efficient solution to overcome the losses of flow irrigation. The pressure requirements, and flow rates. The system also incorporated an irrigation management system, which allows farmers to manage irrigation scheduling and control the amount of water supplied to crops.



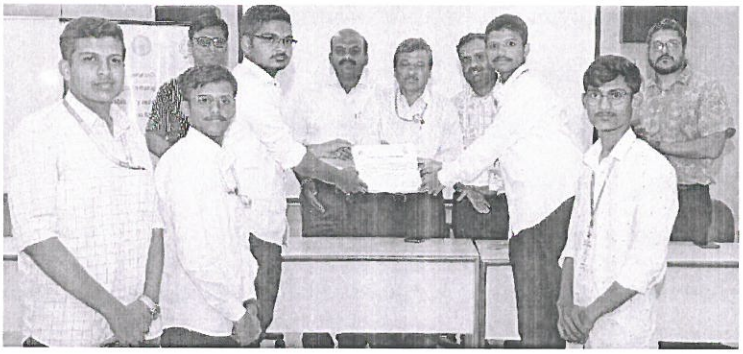
Line diagram of PDM

The project team successfully implemented the PDN system in agricultural and urban areas. The system's benefits include the reduction of water loss, increased cultivable land for irrigation, efficient irrigation management, and improved crop yield. Furthermore, the PDN system can be used in other regions to overcome the challenges associated with conventional flow irrigation systems.

In conclusion, the design and implementation of the PDN system provides a sustainable and efficient solution for irrigation management in agricultural and urban areas. The project achieved its objectives of reducing water loss, increasing crop yield, and increasing cultivable land for irrigation. The PDN system's successful implementation could have significant benefits for regions facing water scarcity and challenges associated with conventional irrigation systems.



It is great to hear that the One-day workshop on Irrigation Management with a focus on distributary and minor network - II was a success with 68 participants present. It provided a great platform for professionals to discuss the latest developments and advancements in the field of irrigation management. The participants were able to become aware of the present scenario about water importance, scarcity, and the need to make efficient use of water for various activities.



The participation certificate was distributed by I/C Director Dr. H.S Jadhav to delegates and students who have actively participated in the workshop.

It is noteworthy that Hon'ble Guest appreciated the efforts of the students who presented their research and expected to have an association with the institute. The guest was also happy to provide curriculum design guidance in reference to water management for undergraduate courses. They appreciated and willing to collaborate on research project. They happy to share the data for providing better solutions to the challenges faced in the

field. Participants have shared their experience and appreciated the accommodation and food facility and overall organisation of the workshop in the RIT Rajaramnagar campus. They are happy to visit the RIT Rajaramnagar campus for future workshop and training programme.

The workshop provided an excellent opportunity for networking and sharing knowledge among the attendees. The participants were able to gain valuable insights into the challenges and advancements in the field of irrigation management.

Finally, the Coordinator, Dr, S. S. Sathe, gave the vote of thanks to the Hon'ble Guest, participants, Department of Civil Engineering, and Director RIT for allowing them to participate in the workshop. It is essential to acknowledge the efforts of everyone involved in organizing and participating in the workshop. Such events can go a long way in promoting research and collaboration in the field of irrigation management.

Dr. Sandip S. Sathe

(Workshop Coordinator)

Dr. S. S. Kumbhar

(Workshop Co-coordinator)

HOD, Civil Engg. Dept.

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