**GOVERNMENT COLLEGE OF ENGINEERING, YAVATMAL**
**IN ASSOCIATION WITH**
**UNNAT MAHARASHTRA ABHIYAN ,IIT BOMBAY**

# TWO DAYS WORKSHOP REPORT ON

# ENERGIZED IRRIGATION SYSTEM (GIS REPRESENTATION AND ANALYSIS OF LT NETWORK)

## Organized by :

Civil and Electrical Engineering Department
Government College of Engineering ,Yavatmal

**Government College Of Engineering**
**Yavatmal**

**In association with**

**Unnat Maharashtra Abhiyan, IIT Bombay**

Two Days Workshop On

# Energized Irrigation System Workshop on GIS representation and analysis of LT network

## 23rd & 24th October 2024

**Organized By**

Civil & Electrical Engineering Department

| Head civil | Head Electrical | Principal |
|---|---|---|
| Dr. M.N. Qureshi | Prof.A.S.Sindekar | Prof.V.B.Waghmare |

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# 1. Acknowledgment

We express our sincere gratitude to the Government College of Engineering, Yavatmal, for organizing the two-day workshop on "Energized Irrigation System: GIS Representation and LT Analysis," held from 23rd to 25th October 2024.
We extend our heartfelt thanks to Prof. V.B. Waghmare, Principal of Government College of Engineering, Yavatmal, for permitting the workshop and his constant support and encouragement, which played a significant role in the success of the workshop.

Our sincere thanks go to Dr.M.N.Qureshi, Head of the Civil Engineering Department, and Prof. A.S. Sindekar, Head of the Electrical Engineering Department, for their invaluable contributions and support throughout the event.

Special thanks go to Prof. Sanjay Shinde, the workshop coordinator, for his meticulous planning and execution of the event. His guidance was instrumental in making this workshop a great success.

We also extend our heartfelt thanks to our esteemed workshop guides, __, Shri Vivek Shinde and Shri Gopal Chavan from IIT Bombay, for their expert training and practical insights. Their sessions were both engaging and informative.

A warm acknowledgment goes to the event anchors, Akshay Uttamrao Khadse and Dakshani Babhutkar, who ensured smooth and effective coordination throughout the workshop.

# 2. Introduction

The workshop on "Energized Irrigation System: GIS Representation and LT Analysis" aimed to combine theoretical knowledge with practical applications in GIS technology..

The increasing demand for sustainable agricultural practices and efficient power distribution systems in rural areas has led to the integration of advanced technological tools. Recognizing the need for skilled professionals in this domain, the Government College of Engineering, Yavatmal, organized a two-day workshop titled "Energized Irrigation System: GIS Representation and LT Analysis" on 23rd and 25th October 2024. The event aimed to bridge the gap between theoretical knowledge and practical applications in the fields of Geographic Information Systems (GIS), energized irrigation, and low-tension (LT) power distribution.

The workshop was coordinated by the esteemed Prof. Sanjay Shinde, whose leadership and attention to detail ensured the program's success. Anchors Akshay Uttamrao Khadse and Dakshani Babhutkar played a pivotal role in organizing the events and maintaining a lively and engaging atmosphere throughout the sessions. The guidance and expertise provided by the guest speakers, Shri Tejas Nagotkar and Shri Vivek Shinde from IIT Bombay, added immense value to the program by delivering in-depth knowledge and practical insights.

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# 3. Workshop Objectives

1. Familiarization with GIS Tools:
Introduce participants to GIS tools (QGIS software) for spatial data representation.

2.Hands-On Training in GIS-Based Irrigation System Design:
Provide practical training in real-time mapping and analysis of energized irrigation systems

3. Introduction to LT Analysis:
Introduce participants to low-tension (LT) analysis techniques for sustainable power distribution.

4. Field-Based Learning:
Provide practical exposure to real-world scenarios through field visits.

5.Training in Decision Support System (DSS) Software:
Introduce participants to DSS software for enhancing decision-making in irrigation and power distribution.

6. Bridging the Gap Between Academics and Industry Applications:
Connect academic knowledge with industry practices

7. Encouraging Interaction and Collaboration:
Create a platform for meaningful interactions among students, faculty members, and industry experts

# 4. Day 1: Inauguration and Seminar Activities

Date: 23rd October 2024

## Event 1: Inauguration

The workshop was inaugurated by Prof. Sanjay Shinde, with a warm welcome extended to the guides, Shri Tejas Nagotkar and Vivek Sir, from IIT Bombay. The anchors, Akshay Uttamrao Khadse and Dakshani Babhutkar, led the program, ensuring smooth coordination of activities.

## Welcoming the Guests of Honor

A special highlight of the inauguration was the welcoming of the distinguished guides from IIT Bombay, Shri Tejas Nagotkar and Vivek Sir, who played an instrumental role in the workshop. Their expertise in GIS and DSS technologies added immense value to the sessions. Prof. Shinde expressed gratitude to these experts for dedicating their time and sharing their knowledge with the participants.

Dignitaries present during the inauguration included:
Prof. V.B. Waghmare (Principal)
Prof.A.S.Sindekar (Head of Electrical Engg. Department)
Dr.Rampravesh K. Rai
Dr.M.N.Qureshi ( Head of Civil Engg. Department


(A snapshot of the dignitaries and IIT bombay experts being welcomed)

Workshop Overview by the Coordinator

Prof. Sanjay Shinde provided an overview of the workshop's structure, outlining the schedule and key activities planned for the two days. He highlighted the objectives of the workshop, which included familiarization with QGIS software, hands-on training with Geo Tracker, and the application of Decision Support System (DSS) for LT analysis.

(Prof. Sanjay Shinde addressing the audience during the inagruation)

## Role of Anchors

The event was seamlessly coordinated by the dynamic anchors, Akshay Uttamrao Khadse and Dakshani Babhutkar. Their energetic hosting and meticulous management ensured a smooth flow of activities during the inauguration. They facilitated introductions, welcomed the dignitaries, and maintained the program's liveliness, creating an engaging environment for all attendees.

( Akshay Khadse and Dakshani Babhutkar anchoring the event)

## Event 2: Unnat Maharashtra Abhiyan

The first technical session was led by Dr. Gopal Chavan, who elaborated on the Unnat Maharashtra Abhiyan, focusing on the need for sustainable development and its integration into education. This session emphasized the role of educational institutions in driving change in rural and agricultural systems.

( Students of Civil and Electrical Engineering Department )

## Event 3: Energy for Irrigation and Field-Based Study

Dr. Gopal Chavan and Vivek Shinde presented insights on energy requirements for irrigation, covering aspects such as energy demand, crop-water-energy linkages, and supply-side issues. The session provided a comprehensive understanding of irrigation systems from an energy perspective.

Vivek Shinde conducted a session on data collection for field-based studies. Participants learned methods for conducting field studies related to energy, cropping data, and census using mobile applications. This session prepared participants for practical field visits.

After a break, the workshop resumed with focused technical sessions on GIS and network systems. The session provided participants with the foundational knowledge to use GIS tools effectively in real-world scenarios

## Event 4: Basics of GIS and Understanding Agricultural Distribution Network Systems

The final session of the day, conducted by Shri. Tejas Nagotkar, focused on the network and components of agricultural distribution systems. The session provided insights into the technical specifications and applications of these systems for irrigation.

A detailed introduction to GIS was presented by Shri. Vivek Shinde, covering topics such as QGIS, layers, maps, and creating shape files. Participants received hands-on training to build their skills in GIS tools.

(Shri.Vivek Shinde demonstrating mobile data collection techniques.)

The final session of the day, conducted byShri. Tejas Nagotkar, focused on the network and components of agricultural distribution systems. The session provided insights into the technical specifications and applications of these systems for irrigation.

In this session, Shri. Tejas Nagotkar and Shri Vivek Shinde conducted an interactive seminar on QGIS software. Key highlights of the session included:

(Shri. Tejas Nagotkar conducting a session on LT systems.)

Basics of QGIS and its applications in GIS representation.

- Demonstration of mapping techniques using Geo Tracker, a mobile application.

- Tutorials on marking poles and other field objects on a digital map

## 5. Day 2: Field Visit and DSS Seminar

Date: 24th October 2024

Event 1: Field Visit Activities

The second day began with a field visit to a site near Yavatmal. The participants were accompanied by local technicians and faculty members to gain practical insights into energized irrigation systems.

Key activities during the visit included:

Learning about the structure and functioning of transformers.

Operating Geo Tracker to map electrical poles in the field.

Visiting a local farm to interact with farmers and understand the irrigation process.

Discussing key agricultural components such as crops, pumps, and motors.

This practical session enabled participants to connect their theoretical knowledge with on-ground realities.

(All participants, faculty, and dignitaries at the end of the workshop.)

Upon arrival at the site, the group gathered to receive an introductory briefing about the day's activities. The local technicians began by explaining the structure and functioning of transformers, which are crucial in distributing electrical power to various agricultural applications. Participants had the opportunity to observe different types of transformers up close and learn about their roles in converting high-voltage electricity from power lines to a lower voltage suitable for farm operations. One of the key activities involved operating the Geo Tracker, a sophisticated tool used to map electrical poles in the field. The participants were divided into smaller groups, each equipped with a Geo Tracker device. They were guided through the process of accurately pinpointing the locations of electrical poles, which is essential for maintaining and optimizing the power distribution network

## Event 2: Power flow modeling

In the afternoon session, a seminar on DSS (Decision Support System) software was conducted. Topics covered included:

An overview of DSS software and its applications in LT analysis.

Real-life examples of using DSS in managing power distribution.

Techniques to enhance decision-making in irrigation planning.

Participants were encouraged to ask questions and engage in discussions, making the session highly interactive and informative.

## 6.Outcomes of the Workshop

1. Enhanced Knowledge and Skills: Participants gained a comprehensive understanding of GIS tools like QGIS and Geo Tracker and their applications in mapping and LT analysis.

2. Practical Exposure: The field visit offered hands-on experience in mapping electrical poles, analyzing transformers, and understanding irrigation systems in real-world scenarios.

3. Improved Technical Expertise: The seminar on DSS software equipped participants with advanced decision-making skills for LT power distribution.

4. Increased Awareness: Students developed a deeper appreciation for the integration of technology in agriculture and energy system

5. Networking Opportunities: Interaction with experts from IIT Bombay and local technicians facilitated knowledge-sharing and networking among participants.

# 7.Recommendations

1. Regular Workshops: Organize similar workshops regularly to keep students updated with advancements in GIS and LT analysis technologies.

2. Expanded Focus Areas: Include additional topics such as renewable energy systems, advanced GIS techniques, and smart irrigation technologies in future workshops.

3. Extended Field Visits: Incorporate longer and more diverse field visits to provide participants with broader exposure to real-world applications.

4. Collaborations with Industry: Partner with local industries and farms to provide participants with opportunities for internships and hands-on training.

5. Provision of Resources: Provide participants with access to software tools like QGIS, Geo Tracker, and DSS to enable continuous learning post-workshop.

# 8. Conclusion

The two-day workshop on "Energized Irrigation System: GIS Representation and LT Analysis", organized at the Government College of Engineering, Yavatmal, proved to be an enlightening and enriching experience for all participants. With the guidance of distinguished experts Shri Tejas Nagotkar and Shri Vivek Shinde from IIT Bombay and the meticulous coordination by Prof. Sanjay Shinde, the workshop successfully achieved its objectives of bridging the gap between theoretical knowledge and real-world applications in GIS and LT analysis.

The event's focus on practical learning and technical expertise provided participants with hands-on experience in using tools like QGIS and Geo Tracker. The seminar on Decision Support System (DSS) further enriched the participants' understanding of LT power distribution and its integration with modern irrigation systems..

In conclusion, the workshop was not only a platform for learning but also a significant step towards modernizing agricultural practices and power systems. It empowered participants with the skills and knowledge to address real-world challenges in energized irrigation systems.

# 9.Annexures

## 1. Workshop Schedule

| Sr. No. | Name of Topic | Content | Resource Person | Time |
|---|---|---|---|---|
| **Day 1** | | | | |
| | Introduction | Inauguration and Opening Remarks | - | 10:00-10:15 |
| Session I | Unnat Maharashtra Abhiyan | स्थानिक विकासाच्या गरजा आणि आपले शिक्षण | Dr. Gopal Chavan | 10:15-11:00 |
| | Energy for Irrigation | Energy for Irrigation - Present Context, Supply- Demand side Crop-Water-Energy Linkages | Dr. Gopal Chavan, Vivek Shinde | 11:00-12:00 |
| Session II | Field Based Study | Data for field Based Study Census, Energy & Cropping dataPrimary data collection app | Vivek Shinde | 12:00 - 1.00 |
| **Break** | | | | |
| Session III | Basic of GIS | Theory and introduction of GIS | Vivek Shinde | 2.00 -2.30 |
| | Hands-on QGIS | QGIS, Layers, maps, MakingShape Files, Attribute Table | Vivek Shinde and Tejas Nagotkar | 2.30 -4.30 |
| Session IV | Understanding Ag Distribution Network System | Network and its components - Technical Specifications. | Tejas Nagotkar | 4.30 - 5.30 |
| **Day 2** | | | | |
| Session I | Field Visit | Visit to DT, Farmer Interaction, Noting primary data, Demonstration of mapping apps | Vivek Shinde and Tejas Nagotkar | 9:00-12:00 |
| **Break** | | | | |
| Session II | Power flow Modelling | R/X model, Introduction toOpen DSS | Tejas Nagotkar | 2.00 - 3.30 |

| | | | | |
|---|---|---|---|---|
| Session III | The way forward | Sharing reference material andFuture scope | - | 3.30 - 4.00 |

## 2.Participant List

| Sr no | Name of the student | PRN | Contact number |
|---|---|---|---|
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| | | | |
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3. Feedback Forms

Consolidated feedback from participants highlighting their learning experiences and suggestions for future events.