Groundwater Quality, Health Risk Assessment, and Source Distribution of Heavy Metals Contamination around the industrial areas of Aurangabad Municipal Corporation Area.

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Submitted By : Dr. Monica Narayan Chakraborty

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Submission Date : 10-Aug-2023

PROPOSAL DETAILS

(PDF/2023/003661)

Principal Investigator	Mentor & Host Institution
Dr. Monica Narayan Chakraborty monicachakraborty1@gmail.com (Civil Engineering) **Contact No** : +919673091991 **Date of Birth** : 24-Mar-1992 **Name of Father/Spouse :** Narayan Chakraborty	**Dattatray Regulwar** drdregulwar@gmail.com Professor(Civil) **Govt. College of Engineering** Station road, osmanpura, Aurangabad (mh), Maharashtra-431005 **Contact No.** : +919881495711 **Registrar Email** : drdregulwar@gmail.com **No. of PHD Scholars** : 7 **No. Post-Doctoral Fellow** : 0

Details of Post Doctorate

Ph.D. (Geology)[Degree Awarded on : 29-May-2023]

Groundwater Contamination Due To Municipal And Industrial Waste In Aurangabad Municipal Corporation Area. A Framework For Efficient Wastewater Treatment And Recycling Systems

Research Supervisor/Guide & Institution :

Prof. A.V.Tejankar

Deogiri College, Aurangabad

Brief details of Thesis work :

Thereafter the practical problem faced by the people was observed, by visiting every locality and which came to be the shortage and acute scarcity of drinking water. Then various solutions of waste water treatment were suggested. Such locations were visited where they have actually set up waste water treatment plants and the after effects on the rising groundwater table in the areas alongside.

- In the sector of water resource, there are limited availability of mapping of the surface water resources in terms of quantity, availability, exploitation, usage etc.
- Remediation or the rejuvenation steps taken are very limited. Sometimes it is seen that the solid domestic waste is being dumped in the open water bodies.
- When we note the domestic water management problems, the correlation between the generation and treatment is often misleading, the water budgeting exercise is also missing along with the computation of the water footprint.
- The surveillance/ inventorization in the cradle to grave approach is never applied.
- It can be noticed that the sample collection systems and treatment facility is very limited especially in the remote areas.
- Water resources are mostly the polluted ones and the reuse options and networks are also missing.
- In concern with the industrial sector, the performance of CETP is questionable where about 30 industries are in non compliance of the terms of meeting discharge standards.

Why Selected:Aurangabad is one of the fastest growing cities in Asia. Innumerous two wheelers and four wheelers are increasing day by day, thereby creating a havoc in traffic management. The city has very little agriculture land within the municipal limits. The employment in primary sectors is very less. The surrounding rural area however has agriculture land and the chief crop grown is cotton and sugarcane.

But the geology of Aurangabad is not very favorable for farming because of its stony/ rocky structure present. The soil is mostly muroom and the hard rock terrainisunjointed in nature.

Study Area:Aurangabad District is located mainly in Godavari Basin. This District's general down level is towards South and East and North West part comes in Purna-Godavari river basin. The area lies between latitude 19º 53'50'' north and longitude 75 º 22'46'' east. The district sits in a strategic position on the Deccan plateau. The city is surrounded by Vindhyan ranges and the river Kham passes through the city.Aurangabad city is located 529 meters above the sea level. The city is a dry arid type of region where the summer temperature rises to a maximum of 45º C and a minimum 28ºC with winter temperature between 32ºC and 5ºC, hence the summer and winter ranges are quite broad. Rainfalls in the region are scarce and errant. The irrigation resources are rain-dependent rivulets, percolation reservoirs, and water wells, but due to low rainfall, the natural inflow of freshwater merely remains dependent on the groundwater flowing through the fractures and joints in the rocks, which are mostly unjointed basaltic rocks. Aurangabad is situated on the Kham river in the Dudhna Valley.

Details of the problem:The general scope of the study is to identify the contaminated zone of the area in the Aurangabadregion by conceptualizing and assimilating the geochemistry of the groundwater in the city area along with the industrial zones alongside. This practice might help for effective and proper utilization of groundwater resource and environmental protection. It is also important for scientific work to exercise different modeling concepts by applying available data.

Survey Method:Various methods such as physical sampling on the fields, laboratory geochemical analysis and then the computational works were done on the prior basis.Analysis of the collected groundwater samples was carried out. Chemical parameters such as the TDS, Hardness, pH, Chloride, Magnesium, Conductivity and Total Hardness were checked on the field and other parameters were analyzed in the laboratory itself. The Aurangabad city and MIDC area were scanned and digitized in the Arc Map 10.1 GIS software. Finally, utilizing ARC Map GIS 10.1 and groundwater quality data, a complete water quality map of the research field was created. The thorough investigation and digitization technique were conducted using a geographic information system (GIS), which is a strong tool for mapping, vulnerability assessments, and making quick choices concerning ecological health issues.

Report:The evaluation of irrigation index parameters in groundwater for its best level utilization. The research includes the study of the human health index in respect of the water sample parameters studied. The water samples collected from the industrial and domestic areas of the city imply that the water flowing getting mixed along with the effluents and thereby destroying the concentration of drinking water and making it unusable and unfit to drink. Therefore the implications have been provided that the waste water once treated and then use leads to water cleaning and making it safer when compared for drinking and if not drinking then atleast can be used for the purpose ofwashing, flushing and gardening in the households, hospitals, institutions as well as the industries.

Over 89 percent of the samples are inappropriate for irrigation and also drinking, based on the current TH categorization.

The research work has a social importance, because of the chronic draughts and arid spells in the study area. Additionally the falling quality rate of groundwater both in potable acceptance as well as the irrigation quality is a recurring question arising in the minds of people nowadays. Water being the basic necessity of humans and the building block of health is responsible for many issues if not taken properly.

Technical Details :

Research Area : Earth & Atmospheric Sciences (Earth & Atmospheric Sciences)

Project Summary :

India is the largest global freshwater user despite being highly water scarce. Agriculture is largest consumer of water and is most affected by water scarcity. Water scarcity is a persistent challenge in India, due to a gap in science and policy spheres (Katyaini, S. 2017). Maharashtra is similarly dominated by hard rocks, whose rainfall susceptibility is limited by weathering and primary porosity as is their volume to store and covey water. As an outcome, water scarcity occurs throughout the summer months, even in sections of the state with high rainfall. Hard rock aquifers status is determined by the secondary porosity, which develop due to decomposition and weathering processes (Radhakrishna, 1970).The PhD research was related to the groundwater contamination finding and its laboratory analysis. The topic of my PhD was Groundwater Contamination in Aurangabad Municipal Area due to the waste water lead from the Industrial as well as the municipal waste. A framework for efficient waste water treatment in the selected sites. The research work included groundwater sample collection from the various locations in and around the city, including the industrial zones and also the municipal area. Thereafter the various contaminants were analyzed and studied in the laboratory and then the various GIS maps were made. These maps interpreted to understand the contamination in the various zones of the study area.

Objectives :

- To carry out detailed study of the Geomorphology, Hydrogeology. To conceive the aquifer system with the help of Geological, Hydrological and Geophysical data. To identify the suitable structure for artificial recharge based on Geology, Hydrogeology & Geophysical studies and demarcation of favourable and unfavourable areas for percolation. To create the database of groundwater potential zone by observing inventory of wells and identify the potential groundwater recharge zone through Remote Sensing and Geographical Information System (GIS). To identify the groundwater potable or non-potable for drinking and irrigation purpose To mitigate the groundwater contamination & create awareness of the groundwater contamination and improve groundwater quality.
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Keywords :

Groundwater Contamination, Nitrate Pollution, GIS Techniques, Ecological Balance, Waste water treatment

Expected Output and Outcome of the proposal :

The main aim of the study is Groundwater Quality and Health Risk Assessment of the groundwater present in the area, and Source Distribution of Heavy Metals Contamination around the industrial areas of Aurangabad Municipal Corporation Area. This will bring light to the various issues faced in the city area. Presently a lot of diseases are causing severe health hazards on the life of the citizens residing in the area. The results will help conserving the environment by studying the heavy mineral concentrations present in the city and which are being directly used for drinking by the citizen belonging here. The final result interpretation will help in many criteria such as to maintain the ecological balance, to help put a curb on water contamination, health hazards can be stopped.

Reference Details :

S.No	Reference Details
1	**Dr. Ashok Tejankar, Deogiri College, Aurangabad[+9423149333]** dravtejankar@gmail.com
2	**Ranjana Gawande, Deogiri College, Aurangabad[+739906457]** drrgawande@gmail.com

Methodology

In order to systematize the Geohydrological investigations, the following Methodology will be adopted.

Geohydrological survey and sample collection:

Field and Geohydrological character of different type of basaltic flows will be critically studied. During this survey thickness, lateral extent and disposition of basalt flows will be ascertained. Jointing pattern of weathering of the rock also be studied. This data will be helpful in preparing Geohydrological map. Groundwater samples from the various locations will be collected for their contamination.

The Sampling will be done for both the season of pre and post monsoon for the complete year of study.

Analysis of the Collected Samples:

The samples collected will be studied in the laboratory using the proper analytical techniques.

Data interpretation:

The collected final results will be compared in the laboratory using the various statistical softwares.

Interpretation of Geohydrological map:

The integrated study, involving Geohydrology, geomorphology supported by Electrical resistivity soundings, will throw light upon overall permeability characters and percolation conditions in the area. On the basis of this interpretation, guide lines for canal water management and development can be ascertained. Diseases which are rising in the particular areas with the various contaminations will be studied and interpreted.

Integrated Remote Sensing and GIS Techniques:

Preparation of Thematic map like Geology, Geomorphology, Contour map, DEM, Drainage Map, Groundwater potential Map etc.

For preparation of thematic maps various parameter like Lithology, Structures, land use, land cover, Geomorphological and Drainage Parameters will be extracted from visual interpretation of satellite data.

Statistical softwares will be used to design the graphs from the data collected.

Result Interpretation:

The relations will be found with the diseases and the contaminants present in the water, their effects on the health of the citizen will be observed and studied.

Proposed work Plan:

Year-wise Plan of work and targets to be achieved

First Year

Collection of material and review of literature for research
Preparation of base map and identification of observation wells from where data will be collected.
Complete all works related to field and carry out field work.
Sample Collection and analysis.

Second Year

Compilation of previous year's data.
Complete all works related to field trip and will carry out fieldwork for collection of Electrical resistivity data.
Analysis of rock samples for their hydrogeological characters.
Preparation of litholog.

Third year

Compilation, Plotting as well as interpretation of previous year's data.
Complete all works related to field trip and will carry out fieldwork for collection of Electrical resistivity data and detailed litholog will be prepared.
Analysis of all the samples. Interpretation and compilation of all the data. Identification and final mapping of groundwater potential zones and suggesting the precautionary measures and submission of report.

Forth Year

Data processing and mapping. Creation of the graphs and study of the various models.

Fifth Year

Identification and final mapping of groundwater potential zones and suggesting the precautionary measures. Editing for any changes and final submission of report.

PROFORMA FOR BIO-DATA

1. Name and full correspondence address: Monica Chakraborty
   6, Seema Apartment, Trimurty Chowk,
   jawahar Colony, Aurangabad 431005

2. Email(s) and contact number(s): monicachakraborty1@gmail.com 9673091991

3. Institution: Deogiri College, Aurangabad

4. Date of Birth: 24/03/1992

5. Gender (M/F/T) Female

6. Category Gen/SC/ST/OBC General

7. Whether differently abled (Yes/No) No

8. Academic Qualification (Undergraduate Onwards)

	Degree	Year	Subject	University/Institution	% of marks
1.	Ph.D	2023	Geology	Dr. Babasaheb Ambedkar Marathwada University	-
2.	M.Sc	2016	Geology	Dr. Babasaheb Ambedkar Marathwada University	81.9
3.	B.Sc	2013	Physics, Geology, Computer Science	Dr. Babasaheb Ambedkar Marathwada University	81.2

9. Ph.D thesis title, Guide's Name, Institute/Organization/University, Year of Award.

Sr. No	***Thesis Name***	***Under Guide***	***Date***	***University***
1.	Groundwater contamination Due To Municipal And Industrial Waste In Aurangabad Municipal Corporation Area. A Framework For Efficient Wastewater Treatment And Recycling Systems	Professor Dr. A.V.Tejankar	29/05/2023	Dr. Babasaheb Ambedkar Marathwada University

10. Work experience (in chronological order).

S.No.	Positions held	Name of the Institute	From	To	Pay Scale
1.	Junior Research Fellow (INSPIRE)	Department of Science and Technology/ Deogiri College, Aurangabad	2017	2019	29000+ HRA
2	Senior Research Fellow(INSPIRE)	Department of Science and Technology/ Deogiri College, Aurangabad	2019	2022	35000+HRA
3	Assistant Professor(Visiting)	Government College of Engineering, Aurangabad	2022	Present	900 per lecture and 450 per practical

11. Professional Recognition/ Award/ Prize/ Certificate, Fellowship received by the applicant.

S.No	Name of Award	Awarding Agency	Year
1	Late Sow. Sitabai Ramchandra Mudalwad Paritoshak	Dr. Babasaheb Ambedkar Marathwada University	2016
2	Inspire Fellowship	Department of Science and Technology, Ministry of Science and Technology, Government of India.	2017
3	Protolith Winner 2020 3mt Poster Presentation National Level Technical Symposium	Department of Earth Science, IIT Bombay	2020

12. Publications *(List of papers published in SCI Journals, in year wise descending order).*

S. No.	Author(s)	Title	Name of Journal	Volume	Year
1	Monica Chakraborty*, Dr. A.V. Tejankar, Sudip Chakraborty, Gerardo Coppola	Assessment of groundwater quality using statistical methods: a case study	Arabian Journal of Geosciences (Springer) https://doi.org/10.1007/s12517-022-10276-2		2022
2	Monica Chakraborty, Ramamoorthy Ayyamperumal*,Shankar Karuppannanc, Gnanachandrasamy Gopalakrishnan, Xiaozhong Huang	Isotopic signatures, hydrochemical and multivariate statistical analysis of seawater intrusion in the coastal aquifers of Chennai and Tiruvallur District, Tamil Nadu, India	Marine Pollution Bulletin (Elsevier) https://doi.org/10.1016/j.marpolbul.2021.113232 Volume 174, January 2022, 113232	174	2022

3	Monica Chakraborty*, Ramamoorthy Ayyamperumal, Dr. A.V. Tejankar	Site Suitability for Artificial Groundwater Recharge Potential Zone Using A GIS Approach in Basaltic Terrain, Buldhana District, Maharashtra, India	Journal of Pharmaceutical Research ISSN: 2573-962X	5	2021
4	Monica Chakraborty*, Dr. A.V. Tejankar, P.U. Terker	Physical Evidence of Vertical and Horizontal Vesicular Cylinders in Imampur Ghat Section in Ahmednagar District	International Journal of Innovative Research and Technology ISSN: 2349-6002 Volume 8 Issue 1	8	2021
5	Monica Chakraborty*, Dr. A.V. Tejankar	Geochemistry and Assessment of Groundwater Quality in Municipal & Industrial (MIDC) Area of Aurangabad City, Maharashtra, India	International Journal of Innovative Science and Research Technology ISSN No:-2456-2165 Volume-4, Issue-5	4	2019

Marathwada Shikshan Prasarak Mandal's

DEOGIRI COLLEGE, AURANGABAD

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16807

TRANSFER CERTIFICATE

****ORIGINAL****

Tc No :2016-2017/5399 **Date :08/07/2016**

Register No.	: 102813
Name of Student in Full	**: Chakraborty Monika Narayan**
Father's/Husband's name	: Narayan
Mother's name	: RANU
Class and Date of Admission	: MSC GEOLOGY II 30/06/2010
Roll No.	: 1
Date of Birth	: 24/03/1992 Twenty fourth March Nineteen Ninty two
Place of Birth	: AURANGABAD.
Caste	: NOT RECORD
Nationality	: INDIAN
Date of Leaving	: 08/07/2016
Class at the time of Leaving	: MSC GEOLOGY II
Subject / Group of Subject	:ix,x,xi,xii,xiii,ixv,xv,xvi
Progress	: Good
Conduct	: Good
General Remark	: PASSED M.SC.GEOLOGY II YR.WITH SEAT NO.GD0401003 APRIL-2016

Certified that above information is in accordance with the College General Register.

CLERK **O.S. / REGISTRAR** **PRINCIPAL**

Principal
Deogiri College
Aurangabad.

Undertaking by the Principal Investigator

To

The Secretary
SERB, New Delhi

Sir

I Monica Chakraborty hereby certify that the research proposal titled "Groundwater Quality, Health Risk Assessment, and Source Distribution of Heavy Metals Contamination around the industrial areas of Aurangabad Municipal Corporation Area". submitted for possible funding by SERB, New Delhi is my original idea and has not been copied/taken verbatim from anyone or from any other sources. I further certify that this proposal has been checked for plagiarism through a plagiarism detection tool i.e. Urkund approved by the Institute and the contents are original and not copied/taken from any one or many other sources. I am aware of the UGCs Regulations on prevention of Plagiarism i.e. University Grant Commission (Promotion of Academic Integrity and Prevention of Plagiarism in Higher Educational Institutions) Regulation, 2018. I also declare that there are no plagiarism charges established or pending against me in the last five years. If the funding agency notices any plagiarism or any other discrepancies in the above proposal of mine, I would abide by whatsoever action taken against me by SERB, as deemed necessary.

Monica 10/8/23

Signature of PI with date

Name / designation

Asst. professor, Deogiri College, Aurangabad.

BIO-DATA

DR. D. G. REGULWAR
Professor of Civil Engineering
Government College of Engineering, Au
Aurangabad
Maharashtra State, India.
E-mail: regulwar@gmail.com;
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Office: +91 02133 230582
Mobile: 09422202380
Residence: +91 240 2344984
Date of Birth:17-07-1964

Educational Qualifications:

- ✓ **Ph.D. Civil Engineering** (Water Resources Engineering) from National Institute of Technology, Warangal (A.P.) in 2006
- ✓ **M.E.Civil-Water Resources Engineering** from Walchand College of Engineering, Sangli, Maharashtra State (Shivaji University, Kolhapur) in 1997
- ✓ **Diploma in Business Management** from Dr. Babasaheb Ambedkar Marathwada University, Aurangabad in 1989
- ✓ **B.E.Civil** from Government College of Engineering, Aurangabad, Maharashtra State (Dr. Babasaheb Ambedkar Marathwada University, Aurangabad) in 1987

Ph.D. topic: Multi Objective Multi-reservoir Optimization in Fuzzy Environment for River Sub Basin Development and Management

Citations: 305 **h-index: 10** **i10 Index: 10**

Recognized Ph.D. guide at:Dr. B.A.M.University, Aurangabad

Research Areas:

- ➢ Water resources systems modeling
- ➢ Multi objective optimization for river basin management
- ➢ Fuzzy logic applications in water resources engineering
- ➢ Soft computing in water resources engineering

- Associate Editor, ISH Journal of Hydraulic Engineering, Taylor & Francis (Scopus)

Research Project Completed:

Project No.	Title of project / Principal Investigator	Amount Sanctioned
TEQIP/R&D/Seed Money/Civil/2014 /01	"Calibration and influence of uncertainty analysis of hydrological responses in watershed management practices using ARC-SWAT" Principal Investigator: Dr.D.G.Regulwar Civil Engineering Department	Rs. 3,00,000/- (Rs. Three lakhs only)

PATENTS:

Patents (Design) Obtained:

1. Bearing Converting Instrument for Surveying (Class: 01-01),
   Design Patent Application Number: 260180, C.B.R. No. 1688 Dated: 06-02-2014
2. COMBO COMPASS FOR SURVEYING (Class: 01-01)
   Design Patent Application Number: 265731, C.B.R. No. 14287 Date 17-09-2014

Patents filed and published in patent journal:

1. Bearing Converting Instrument for Surveying
   Patent Application Number: **3499/MUM/2014** Dated: November 06, 2014
2. COMBO COMPASS FOR SURVEYING (Class: 01-01)
   Patent Application Number: **1456 /MUM/2015** Dated: April 07, 2015

Copyright Obtained:

1. **"KazApp":** A mobile app for data entry and calculation of Reduced Levels in the filed (13-09-2017)
2. **"Bhumi Tantra"**: A software for calculation of Reduced Levels (30-10-2017)

Trade Mark registration Obtained: (24-8-2018)

1. "KazApp"Nos. 3550065 and 3550066 in classes9 and 42
2. "Bhumi Tantra"Nos.3555611 and 3555612in classes 9 and 42

Book Chapter:

1. D. G. Regulwar, J. B. Gurav, R. U. Kamodkar, and V. S. Pradhan (2017)"Conjunctive use of Surface Water and Groundwater using Fuzzy Logic" book chapter in a Book *Sustainable Holistic Water Resources Management in a Changing Climate*, Editors: K. Srinivasa Raju and A. Vasan,M/S Jain Brothers, New Delhi

2. D. G. Regulwar and S. G. Taji (2018), "Management and Modeling of Urban Stormwater" book chapter in a Book "*Managing Stormwater:*

Practices and Challenges for Reuse and Recycling" Nova Science Publishers, USA, Editor: Faisal Anwar, Curtin University, Australia

3. S. G. Taji, D. G. Regulwar and V. R. Saraf (2020), "Smart Rain Water Harvesting for Smart Cities", Chapter 6, a book chapter in a book "Security and Privacy Applications for Smart City Development", Springer Nature.

Member of Professional Bodies

- Member of Institution of Engineer's(India) M.I.E 116049/9
- Life member of Indian Society for Technical Education, LM 16581
- Life member of Indian Water Resources Society, LM-00-5043
- Life member of Indian Society for Hydraulics, LM-692
- Fellow Member, Indian Association of Hydrologists, Roorkee, FM-303

- **Executive Council Member (2014-16),** Indian Society for Hydraulics, CWPRS Pune
- **Executive Council Member** of Indian Water Resources Society, Roorkee for 2015-17
- **Executive Council Member**, IE(I) Aurangabad Local Centre
- **Editorial board member of International Journal for Technology, Science and Humanity (ECO REVOLUTION)**
- **Chairman, ISH-Aurangabad Local Centre**
- **Chairman, IWRS-Aurangabad Local Centre**

Reviewer of Journals:

- Journal of Water Resources Management, Springer
- Journal of Applied Soft Computing, Elsevier
- ISH Journal of Hydraulic Engineering, Taylor and Francis Group
- Hydrological Sciences Journal, Wiley
- Fuzzy Sets and Systems, Elsevier
- Journal of Water Resources Systems Planning and Management, ASCE
- Computers and Electronics in Agriculture, Elsevier
- Environmental Engineering and Management Journal, Technical University of lasi, Romania
- Hydrological Processes, Wiley

Countries Visited:

1. Presented a paper in Special Seminar on "Optimal Irrigation Planning with Minimization of Cost of Cultivation using Fuzzy Logic"on September 10, 2013 in 35thIAHR World Congress, Century City International Convention Center, 88, Century City Boulevard, **Chengdu,**

Sichuan, 610041 China during September 8 to 13, 2013 under TEQIP-II (Co-author: Dr. J.B.Gurav)

2. Presented a paper on "Evaluation of Uncertainty Estimates in Distributed Hydrological Modeling for Micro Watershed in Godavari River in India using Sufi-2, and Parasol Methods" in an International Conference 36th IAHR World Congress, during 28 June-3 July, 2015 **Delft – The Hague, The Netherlands.**(Co-author: Ms. Sonali Nagargoje)

Publications (Total: 110)

International Journal Papers:

1. Regulwar, D.G., and Anand Raj, P. (2008). "Development of 3 – D Optimal Surface for Operation Policies of A Multireservoir in Fuzzy Environment Using Genetic Algorithm for River Basin Development and Management", Water Resources Management, Springer, Vol. 22, 595-610 Impact Factor: 2.463, ISSN: 0920-4741 (Print)1573-1650 (Online)DOI 10.1007/s11269-007-9180-1
2. Regulwar, D.G., and Anand Raj, P (2009). "Multi-Objective Multi-reservoir optimization in Fuzzy Environment for River Sub Basin Development and Management" , Journal of Water Resources and Protection, Scientific Research, Vol.1, No.4, 271-280 Impact Factor: 0.41, **ISSN Print:** 1945-3094, **ISSN Online:** 1945-3108**DOI:** 10.4236/jwarp.2009.14033
3. Regulwar D.G. and Gurav J.B. (2010). "Fuzzy Approach Based Management Model for Irrigation Planning", Journal of Water Resources and Protection, Scientific Research, Vol.2, No.6, June 2010, pp. 545-554. Impact Factor: 0.41, **ISSN Print:** 1945-3094, **ISSN Online:** 1945-3108DOI: 10.4236/jwarp.2010.26062
4. Regulwar, D.G., Choudhari, S.A. and Anand Raj, P. (2010). "Differential evolution algorithm with application to optimal operation of multipurpose reservoir", Journal of Water Resources and Protection, Scientific Research, Vol.2, No.6, 560-568. Impact Factor: 0.41, **ISSN Print:** 1945-3094, **ISSN Online:** 1945-3108DOI: 10.4236/jwarp.2010.26064
5. Regulwar, D.G., and Kamodkar, R.U. (2010). "Derivation of Multipurpose Single Reservoir Release policies with Fuzzy Constraints", Journal of Water Resources and Protection, Scientific Research, Vol.2, No.12, 1028-1039, Impact Factor: 0.41, **ISSN Print:** 1945-3094, **ISSN Online:** 1945-3108DOI: 10.4236/jwarp.2010.212123
6. Regulwar D.G. and Gurav J.B. (2011) "Irrigation Planning under Uncertainty - A Multi Objective Fuzzy Linear Programming Approach", Journal of Water Resources Management- An International Journal

(Springer-Netherlands), Vol. 25, No.5, pp. 1387-1416 (doi 10.1007/ s11269-010-9750-5) Impact factor:2.463, ISSN: 0920-4741 (Print)1573-1650 (Online)(doi 10.1007/ s11269-010-9750-5)

7. Gurav, J. B. and Regulwar, D.G. (2012). "Multi Objective Sustainable Irrigation Planning with Decision Parameters and Decision Variables Fuzzy in Nature" Journal of Water Resources Management- An International Journal (Springer-Netherlands), Vol. 26, No.10, pp. 3005-3021 (DOI : 10.1007/s11269-012-0062-9) Impact factor:2.463, ISSN: 0920-4741 (Print)1573-1650 (Online)(DOI : 10.1007/s11269-012-0062-9)
8. Regulwar D.G. and Gurav J.B. (2012). "Sustainable Irrigation Planning with Imprecise Parameters under Fuzzy Environment", Journal of Water Resources Management- An International Journal (Springer-Netherlands), Vol. 26 No. 13, pp. 3871-3892 (doi:10.1007/11269-012-0109-y)Impact Factor: 2.463, ISSN: 0920-4741 (Print)1573-1650 (Online)(doi:10.1007/11269-012-0109-y)
9. Dabhade, P.D. and Regulwar, D.G. (2012). "Optimal Design of Water Supply Network by using Piping System Fluidflow"International Journal of Environmental Engineering and Management, Research India Publications, Vol.3, No.2 pp249-252
10. Debbarma Sentu and Regulwar, D.G. (2011). "Inflow Prediction by Different Neural Network Architectures: A Case Study",International Journal of Earth Sciences and Engineering, *CAFET-INNOVA TECHNICAL SOCIETY*, Volume 04, No 06 SPL, , pp 225-230, ISSN : 0974-5904
11. Kamodkar, R.U. and Regulwar, D.G. (2013). "Multipurpose Reservoir Operating Policies: A Fully Fuzzy Linear Programming Approach" , Journal of Agricultural Science and Technology (JAST), (University of Tarbiat Modares), Vol. 15,No 6, November, 2013, Impact Factor:0.685, ISSN: 1680-7073
12. Regulwar D G and Gurav J B. (2014). "Irrigation Planning with Fuzzy Parameters-An Interactive Approach", Journal of Agricultural Science and Technology (JAST), (University of Tarbiat Modares), Vol. 16(5) September and October 2014: pp 1157-1172 Impact Factor: **0.685**, ISSN: 1680-7073
13. Regulwar D.G. and Gurav J.B. (2013). "Two-Phase Multi Objective Fuzzy Linear Programming Approach for Sustainable Irrigation Planning",Journal of Water Resources and Protection, Scientific Research, Vol.5, No.6, 642-651, Impact Factor: 0.41, **ISSN Print:** 1945-3094, **ISSN Online:** 1945-3108DOI: 10.4236/jwarp.2013.56065
14. Regulwar D.G. and Pradhan V.S. (2013). "Irrigation Planning with Conjunctive use of Surface and Groundwater Using Fuzzy Resources", Journal of Water Resources and Protection, Scientific Research, Vol.5,

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2. Nikumbh T.K., Regulwar D.G. (2019). "ASSESSMENT OF IMPACT OF CHANGE IN LAND COVER ON RUNOFF – A CASE STUDY OF UPPER GODAVARI RIVER, NASHIK, INDIA", National Conference on Environment Pollution Control and Management (EPCM2019), College of Engineering Pune, 1-2 March 2019

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Conferences/Workshop Organized:

Sr. No.	Organizer	Name of conference	Duration

1	Convener: Dr.D.G.Regulwar	National Conference on Sustainable Water Resources Development and Management (SWRDAM-2008), Govt. College of Engineering, Aurangabad, Maharashtra, India	13-14 June, 2008
2	Organizing Secretary: Dr.D.G.Regulwar	Organizing Secretary, National Conference on Environmental Pollution and Management, EPM-2011, Govt. College of Engineering, Aurangabad, Maharashtra, India	January 28-29, 2011
3	Dr.D.G.Regulwar and Dr. P.A.Sadgir	One Day Workshop on Intellectual Property and Patent Lifecycle Management (IPPLM-2012), Department of Civil Engineering, Govt. College of Engineering, Aurangabad under CEP and in association with Inrex ITeS, Pune	February 18, 2012
4	Organizing Secretary: Dr.D.G.Regulwar	TEQIP- Workshop on "Patent and Copyright Policy of Government College of Engineering, Aurangabad", (Phase-I)	April 09, 2013
5	Organizing Secretary Dr.D.G.Regulwar	TEQIP-Two Days Workshop On "Impact of Climate Change on River Basin Management, ICCORIBAM-2013" during August 16-17, 2013	August 16-17, 2013
6	Organizing Secretary Dr.D.G.Regulwar	National Conference on Sustainable Water Resources Development and Management (SWARDAM-2013), Govt. College of Engineering, Aurangabad, Maharashtra, India	30 September-01 October, 2013
7	Organizing Secretary Dr. D.G.Regulwar	TEQIP-Two Days National Workshop on **"Innovations, Inventions, and Patents IIAP-2016",**in association with ISH Aurangabad Local Centre. Organizing at Department of Civil Engineering, Govt. College of Engineering, Aurangabad	1-2 February, 2016,
8	Convener: Dr D G Regulwar	**Post Graduate Colloquium – 2016 (PGC-2016)**	26-27 May 2016

9	Organizing Secretary Dr.D.G.Regulwar	3rdNational Conference on Sustainable Water Resources Development and Management (SWARDAM-2016), Govt. College of Engineering, Aurangabad, Maharashtra, India	4-5 July, 2016
10	Coordinator: Dr D G Regulwar	TEQIP one day workshop on "Pipe Network Analysis"	25 September, 2016
11	Organizing Secretary: Dr D G Regulwar	One Day National Workshop on **"Intellectual Property and Patent Lifecycle Management, IPPLM-2017** Sponsored by Technical Education Quality Improvement Programme (TEQIP Phase II).	**23 January**, **2017**
12	Coordinator: Dr D G Regulwar	Two Days National Workshop on Engineering Optimization and its Applications (EOAIA-2017) Sponsored by Technical Education Quality Improvement Programme (TEQIP Phase II).	30-31 January, 2017
13	Convener: Dr. D. G. Regulwar	**Research Colloquium – 2017 (RC-2017)**	24-25February 2017

ISTE/TEQIP-Short Term Training Programme Organized:

Sr.No.	Co-ordinator(s)	Topic	Duration
1	Dr. D G Regulwar	ISTE-STTP on "Engineering Optimization", EO-2010	28 June – 9 July 2010 Organized at Department of Civil Engineering, Govt. College of Engineering, Aurangabad.
2	Dr. D G Regulwar	ISTE-STTP on "Genetic Algorithm Neuro Fuzzy Applications in Engineering", GANEUFAE-2010	29 November – 10 December 2010 Organized at Department of Civil Engineering, Govt. College of Engineering, Aurangabad.
3	Dr. D G Regulwar and Dr. K A. Patil	ISTE-STTP on "Soft Computing Tools and its Applications in Engineering" , SOCTAPE-2011	20 June - 1 July, 2011 Organized at Department of Civil Engineering, Govt. College of Engineering, Aurangabad.
4	Dr.D.G.Regulwar	TEQIP-STTP on "Engineering Optimization and its applications" EOAIA-2012	25-29 June 2012, Organized at Department of Civil Engineering, Govt. College of Engineering, Aurangabad under CEP
5	Dr.D.G.Regulwar	TEQIP-STTP on "Genetic Algorithm Neuro Fuzzy Applications in Engineering, GANEUFAE-2012"	17-21 December 2012, Organized at Department of Civil Engineering, Govt. College of Engineering, Aurangabad
6	Dr.D.G.Regulwar	TEQIP-STTP on "Soft Computing Tools and its Applications in Engineering (SOCTAPE-2013)"	3-7 June, 2013, Organized at Department of Civil Engineering, Govt. College of Engineering, Aurangabad under CEP
7	Dr. D.G.Regulwar	TEQIP-STTP on "Research Methodology - Concepts and Tools (REMECOAT-2013)"	16-20 December, 2013 Organized at Department of Civil Engineering, Govt. College of Engineering,

			Aurangabad
8	Dr. D.G.Regulwar	TEQIP-STTP on "Introduction to Geomatics"	11-15 May, 2014, Organizing at Department of Civil Engineering, Govt. College of Engineering, Aurangabad
9	Dr. D.G.Regulwar	TEQIP-STTP on "Statistical Techniques for Data Analysis in Research" (STEDAR-2014)	09-13 June, 2014, Organizing at Department of Civil Engineering, Govt. College of Engineering, Aurangabad
10	Dr. D.G.Regulwar	TEQIP - STTP on "**Hydrological Modeling using Open Source Geospatial Techniques**"	27-31 October, 2015, Organizing at Department of Civil Engineering, Govt. College of Engineering, Aurangabad
11	Dr. D.G. Regulwar	one week TEQIP - STTP on "**Quantum GIS and its applications to Water Resources Engineering (QGISAWRE-2016)**"	22-26 October, 2016, Organizing at Department of Civil Engineering, Govt. College of Engineering, Aurangabad
12	Dr. D.G. Regulwar	One week TEQIP - STTP on "**Soft Computing Techniques in Engineering Applications", (SOCTEA-2017)**	**15-19 February, 2017,** Organizing at Department of Civil Engineering, Govt. College of Engineering, Aurangabad
13	Dr. D. G. Regulwar	One week TEQIP – STTPon"**Quantum GIS & QSWAT applications in Water Resources Engineering"**	3-7 March, 2018
14	Dr. D. G. Regulwar	TEQIP-TWO DAYS WORKSHOP On "Water Supply and Distribution Networks Systems (WSDNS-2018)"	10-11 March, 2018

Edited Books Published:

Sr.No.	Author(s)	Title of Edited Book	Publisher	Year
1	Dr.D.G.Regulwar Co-authors: Dr.U.J.Kahalekar, Dr. K.A.Patil and Dr. P.A.Sadgir	Proceedings of Sustainable Water Resources Development and Management-SWRDAM-2008	EXCEL India Publishers, New Delhi *ISBN: 978-81-906531-5-2*	2008
2	Dr. P.A.Sadgir Dr.U.J.Kahalekar, Prof. G.K.Patil Prof. A.M.Mokadam Dr.D.G.Regulwar Dr. K.A.Patil	Proceedings of Environmental Pollution and Management, EPM-2011	Chinmay Prakashan, Aurangabad *ISBN: 978-81-90495-8-8*	2011
3	Dr.D. G. Regulwar Dr. U. J. Kahalekar	Proceedings of Sustainable Water Resources Development and Management-SWARDAM-2013	EXCEL India Publishers, New Delhi *ISBN: 978-93-82880-63-9*	2013
4	Dr.D.G.Regulwar Co-authors: Dr. K.A.Patil and Dr. P.A.Sadgir	Proceedings of Sustainable Water Resources Development and Management-SWARDAM-2016	EXCEL India Publishers, New Delhi *ISBN: 978-93-85777-75-2*	2016

Expert Lectures Presented:

Sr. No	Topic	Organization	Duration
1	Types of Research and Research Design	One Week Online Research Methodology Workshop Organized by G. H. Raisoni College of Engineering and Management Wagholi, Pune during 29 June-04 July 2020	3-7-2020
2	Mathematical Modeling in Civil Engineering	One week online National Level FDP on "Mathematics: A Practical Approach in Science and Technology" during 28 June – 30 July Organized by the Department of Basic	30 June 2020

		Sciences and Humanities, Deogiri Institute of Engineering and Management Studies, Aurangabad.	
3	Sustainable Water Resources Management	Webinar on "Present and Future Practices in Civil Engineering organized by Dept of Civil Engineering, Govt. College of Engineering, Jalgaon under TEQIP-III	8 June 2020
4	Applications of Fuzzy Logic in Civil Engineering	Webinar on "Applications of Fuzzy Logic in Civil Engineering" organized by Dept of Civil Engineering, K.K.Wagh Institute of Engineering Education and Research Nashik on 6 June 2020	6 June 2020
5	Optimization Techniques	National Level Faculty Development Program (online) on "Research Methodology" at LSSBMS Padm. Dr. V. B. Kolte College of Engineering, Malkapur 26 - 30 of May 2020	29-5-2020
6	Introduction to fuzzy logic tool box with simple example and Introduction to GA tool box with simple example	One-week online training program on "Introduction to MATLAB and its Applications in Climate Smart Agriculture" during April 25-30, 2020 Organized by the Centre for Advanced Agricultural Science and Technology (CAAST) for Climate Smart Agriculture and Water Management (CSAWM), Mahatma Phule Krushi Vidyapeeth, Rahuri	29 & 30 April, 2020
7	Genetic Algorithm and Fuzzy Analysis	AICTE-QIP-STC on Analytical Techniques for Applied Research organized by Dept. of Civil Engineering, SGGSIET, Nanded	20-2-2020
8	The Impact of Landcover Change on Catchment Hydrology: A Case Study of Nashik City, Maharashtra, India	AICTE - Faculty Development Programme (FDP) on "Applications of GPS and Remote Sensing in Civil Engineering" at SPCE Mumbai during 6-18 January 2020	17 January 2020

9	Introduction to Research Methodology	M.I.T. Engineering College, Aurangabad	29-3-2019
10	Research Methodology	Two Days State Level Workshop on "Research Methodology, Indian Patent Drafting and Filling Procedure". Organized at JSPM's Imperial College of Engineering and Research Wagholi, Pune, in Association Savitribai Phule Pune University (SPPU)	11-1-2019
11	Inventions, Innovations and Patents	Three days National Level Workshop on "Inventions, Innovations and Patents", Dept of Computer Engg, D.N.Patel College of Engineering, Shahada, Dist. Nandurbar, 14-16 September 2018	15-16 September 2018
12	Watershed Management	Department of Civil Engineering, SGGSIE&T, Nanded	14-8-2018
13	Outcome Based Education	M.I.T. Engineering College, Aurangabad	9-7-2018
14	Introduction to Genetic Algorithm and its Applications Genetic Algorithm Application on Reservoir Operation under Fuzzy Environment	TEQIP-III STTP on "APPLICATION OF SOFT COMPUTING TECHNIQUES IN CIVIL ENGINEERING", Department of Civil Engineering, Sardar Vallabhbhai National Institute of Technology, Surat during 12-16 March 2018	13-3-2018
15	Engineering Optimization and its Applications	K.K.Wagh Institute of Engineering Education and Research, Nashik	27-2-2018
16	Patents filing, Registration (IPR)	DTE sponsored Short Term Course on "Research Methodology and Optimization Techniques" (RMOT-2018) 30th January – 3rd February, 2018, Government Polytechnic, Nashik	31-1-2018
17	Genetic Algorithm	Department of Civil Engineering, SPPU Sponsored Two days workshop on "Application of Soft Computing Techniques in Civil Engineering", STES Sinhgad Institute	21-12-2017

		of Technology & Science, Narhe, Pune	
18	Introduction to Optimization and Fuzzy Logic and its Application in Waste Management	Present Scenario of Treatment of Waste in India: Challenges, Issues and New Techniques of Treatment, Sanjivani Rural Education Society's COLLEGE OF ENGINEERING, KOPARGAON, Tal. Kopargaon, Dist. Ahmednagar 423603	22-11-2017
19	Research Methodology	One Week FDP on "Research Methodology", Tatyasaheb Kore Institute of Engineering & Technology, Warananagar	29-5-2017
20	Keynote Speech on "Engineering Optimization and its Applications"	3 days International Conference on Recent Trends in Civil Engineering, Science and Management, (ICCSM-17), during 24-26 March 2017, Guru Gobind Singh College of Engineering & Research Center, Nashik	24-3-2017
21	Integrated Watershed Management	MSBTE Sponsored FDP on "Watershed Management" Organized by Dept of Civil Engg, P. L. Govt. Polytechnic, Latur	11 January 2017
22	Basics of Optimization, Fuzzy Logic	State Level Two Days Workshop on „Optimization Techniques for Engineering Applications" at S.B. Patil, COE, and Indapur 23-24 December 2016	23-12-2016
23	Keynote address on " Matlab tools and its applications for soft computing"	One week STTP on "Aspects of MATLAB Tools in Communication, control and Signal Processing with Simulink" organized at Dept of E&TC, JNEC, Aurangabad	28 November 2016
24	Research Methodology & Soft computing applications for research	One day workshop on "Research Methodology" (Under lead College activity, Shivaji University, Kolhapur) Organized by Dr. J. J. Magdum College of Engineering, Jaysingpur	20th October 2016
25	Modeling and Soft computing tools in WRE	h Induction Training Programme for direct recruit (MSE Class – I) Officers of Water Resources Department of Govt. of Maharashtra during 1st Aug. 2016 to 26th Aug. 2016, WALMI Aurangabad	19-8-2016

26	Soft Computing tools in WRE (Fuzzy logic and ANN)	Induction Training Programme for direct recruit (MSE Class – I) Officers of Water Resources Department of Govt. of Maharashtra during 4th July 2016 to 30th July 2016, WALMI Aurangabad	15-7-2016
27	Introduction to Optimization, Data Analysis, Fuzzy Logic, Genetic Algorithm	One Week STTP on "Design of Experiment & Optimization Techniques" Organized by DEPARTMENT OF MECHANICAL ENGINEERING, M.S.P. MANDAL'S DEOGIRI INSTITUTE OF ENGINEERING AND MANAGEMENT STUDIES, AURANGABAD, 9-13 May 2016	10-5-2016, 11-5-2016
28	Research Methodology	Sanjivani Rural Education Society's COLLEGE OF ENGINEERING, KOPARGAON, Tal. Kopargaon, Dist. Ahmednagar 423603	9-5-2016
29	Innovations & Inventions in Engineering and Case Study	Two Days National Workshopon "Innovations, Inventions, and Patents IIAP-2016",Sponsored by TEQIP Phase II and in association with ISH Aurangabad Local Centre at Government College of Engineering Aurangabad	1-2 February, 2016
30	Mathematical Modeling Concepts and Case Studies	"Two Days Workshop on Mathematical Modeling in Engineering Projects", Computer Engineering Department, Sandip Institute of engineering and Management (SIEM), Nashik, 18-19 January 2016	19-1-2016
31	Introduction to Research Methodology, Optimization Techniques, Fuzzy Logic, Genetic Algorithms, Thesis Writing, Ethics in research and publishing	Two days National Level Workshop on "Research Methodology: Concepts and Tools", Dept of Computer Engg and IT, D.N.Patel College of Engineering, Shahada, Dist. Nandurbar	16-17 January, 2016
32	Introduction to Research Methodology, Thesis Writing, Journal Paper Writing	Two days workshop on "Research Methodology", College of Engineering, Kashti, Dist. Ahmednagar	30-12-2015

33	Techniques, principles and ethics in research and publishing	Workshop on "Principles of Research Methods", JNEC Aurangabad	29-12-2015
34	Optimization Techniques, Introduction to Fuzzy Logic and Genetic Algorithm, GA-Fuzzy Modeling	IETE Certified FDP on "Soft Computing-ANN and Fuzzy Applications in Engineering, Dept of E&TC, Deogiri Institute of Engineering and Management Studies	30 November – 3 December 2015
35	Introduction to Research Methodology, Optimization Techniques, Fuzzy Logic, Genetic Algorithms, Thesis Writing	Two Week STTP on "Advanced Research Thrust Areas in Engineering Science" from 21-11-2015 to 30-11-2015 at Govt. College of Engineering Karad	23-24 November 2015
36	Intellectural Property Rights & Innovation in Engineering	Expert Lecture at JNEC Aurangabad	9-10-2015
37	Hydrological Modeling, Systems Approach to Civil Engineering	K.K.Wagh College of Engineering, Nashik	20-9-2015
38	Innovation in Engineering and Case Study	Workshop on "Intellectural Property Rights & Innovation in Engineering", JNEC Aurangabad	12-9-2015
39	Smart Cities: Cities of Tomorrow	Two days Seminar on "Smart City", P.E.S. College of Engineering Aurangabad	28-29 August 2015
40	Research Methodology	Two days FDP for Teaching Staff, Shreeyash College of Engineering & Technology, Aurangabad	9-10 July 2015
41	Applications of Mathematics in Civil Engineering	One Week Workshop on "Applications of Engineering Mathematics"at SANDIP INSTITUTE OF TECHNOLOGY AND RESEARCH CENTRE Nashik	**20th – 24th April, 2015**
42	Correlation and Regression Analysis	TEQIP-STTP on Recent Advances in Traffic Engineering and Transportation Planning (RATE&TP) at Department of Civil Engineering, Malnad College of Engineering, Hassan Karnataka	12-12-2014
43	Introduction to research, Overview of research and	Eight Days Workshop on "Research Methodology and IPR" 17th November –	17-11-2014

	Formulating Problem statement	24th November, 2014 In collaboration with BCUD, The Savitribai Phule Pune University, Pune at SANDIP INSTITUTE OF TECHNOLOGY AND RESEARCH CENTRE Nashik	
44	Remote Sensing & GIS Applications in Hydrology	Workshop on "Introduction to Remote Sensing", JNEC, Aurangabad	10-7-2014
45	Data Analysis	TEQIP-STTP on "Statistical Techniques for Data Analysis in Research (STEDAR-2014)" during 09-13 June, 2014 at Govt. College of Engineering, Aurangabad	11-6-2014
46	Skewness and Kurtosis, Probability and Theoretical Distributions	TEQIP-STTP on "Computational and Statistical Methods Applied in Engineering" during 7-11 July, 2014 at Dept. of Civil Engg., Govt. College of Engineering, Jalgaon	9-7-2014
47	Introduction to Optimization Fuzzy Logic and its applications	Department of Civil Engineering, Govt. College of Engineering, **Jalgaon.** (TEQIP-STTP on Mathematical & Statistical Approaches in Engineering Applications (MSAEA-2013) 26-30 December 2013."	December 27, 2013
48	Research Design/Literature Review Introduction to Optimization Dynamic Programming Genetic Algorithm and its applications & Fuzzy Logic and its applications	Department of Civil Engineering, Govt. College of Engineering, Aurangabad. (TEQIP-STTP on "Research Methodology - Concepts and Tools (REMECOAT-2013)"	16-20 December, 2013
49	Genetic Algorithm and its applications & Fuzzy Logic and its applications	Department of Civil Engineering, Govt. College of Engineering, Karad. (TEQIP-STTP on "New Trends in Hydroelectric power project, 9-13 December 2013"	December 11, 2013
50	Genetic Algorithm and its applications	Department of Civil Engineering, SGSITS, Indore.	October 26, 2013
51	a) Fuzzy linear programming and its application in reservoir	Department of Civil Engineering, SVNIT, Surat (TEQIP- One week short term training programme on	July 4, 2013

	operation (1.5 hrs) b) Genetic Algorithm and its application in reservoir operation. (1.5 hrs).	Hydraulic and Hydrologic Modelling: Concepts and Applications July 1-5, 2013	
52	Genetic Algorithm and its applications & Fuzzy Logic and its applications	Department of Civil Engineering, Govt. College of Engineering, Aurangabad. (TEQIP-STTP on "Soft Computing Tools and its Applications in Engineering (SOCTAPE-2013)"	3-7 June, 2013
53	Soft Computing	Conference on "Advanced Computational Techniques, ACT-2013" at SKN-SIT, Lonavala, Pune	March 29-30, 2013
54	Fuzzy Logic and Genetic Algorithm Applications	Computer Department, JNEC, Aurangabad	22-23 March, 2013
55	Genetic Algorithm and its applications & Fuzzy Logic and its applications	Department of Civil Engineering, SGGSI E&T Nanded (TEQIP-STTP on "Analytical Techniques in Applied Research"	January 22, 2013
56	Genetic Algorithm and its applications & Fuzzy Logic and its applications	Department of Civil Engineering, Govt. College of Engineering, Aurangabad. (TEQIP-STTP on "Genetic Algorithm Neuro Fuzzy Applications in Engineering, GANEUFAE-2012")	17-21 December 2012
57	Introduction to Optimization and Linear Programming	Department of Civil Engineering, Govt. College of Engineering, Aurangabad. (TEQIP-STTP on "Engineering Optimization and its Applications, EOAIA-2012")	25-29 June 2012
58	Linear programming, Dynamic Programming, and Fuzzy Logic	Department of Mechanical Engineering, Govt. College of Engineering, Aurangabad. (TEQIP-STTP on "Engineering Optimization and its Applications, EOAIA-2012")	25-29 June 2012
59	Applications of Engineering Mathematics in Civil Engineering	One day Seminar on "Applications of Engineering Mathematics in Various Engineering Disciplines" Organized at M.I.T., Aurangabad	11-2-2012
60	Linear programming, Dynamic Programming, and Fuzzy Logic	Department of Mechanical Engineering, Govt. College of Engineering, Aurangabad. (ISTE-STTP on Engineering Optimization Techniques and its Applications in Research (EOTAR-2012))	2-1-2012 to 12-1-2012

61	Introduction to Genetic Algorithm and its applications	Department of Civil Engineering, Govt. College of Engineering, Aurangabad. (ISTE-STTP on Soft Computing Tools and its Applications in Engineering (SOCTAPE-2011))	20 June - 1 July, 2011
62	Introduction to Optimization and Linear Programming	Department of Civil Engineering, Govt. College of Engineering, Aurangabad. (ISTE-STTP on "Engineering Optimization, EO-2010")	28 June – 9 July 2010
63	Genetic Algorithm and its applications	Department of Civil Engineering, Govt. College of Engineering, Aurangabad. (ISTE-STTP on "Genetic Algorithm Neuro Fuzzy Applications in Engineering, GANEUFAE-2010")	29 November – 10 December 2010
64	Fundamentals and Applications of Genetic Algorithm in Irrigation Planning and Reservoir Operation	Amrutvahini College of Engineering Sangamner. (Two days State Level Workshop on Applications of Neural Network, Fuzzy and Genetic Algorithm in Water Resources and Environmental Engineering, FANGA-10)	28-29 January 2010
65	Dams and Spillways	Regional Training Centre, Water Resources Department, WALMI, Aurangabad	29-4-2010
66	Use of Hydrological Data in Water Resources Systems Optimization	HDUG workshop at Irrigation Department, Jalna	21 December, 2009
67	Developments in Reservoir Operation	Pravara Rural Engineering College, Loni, Maharashtra, India. (Two-day work shop on Techniques in Water Management)	25-26 September, 2008
68	Keynote address on: Emerging Trends In Civil Engineering" in Pravara International Conference on Emerging trends in engineering	Pravara Rural Engineering College, Loni, Maharashtra, India.	20-22, December, 2008
69	Standard Draft Practices for Project Report	Govt. Polytechnic, Aurangabad	2-8-2008
70	Micro-Irrigaion	Govt. Polytechnic, Aurangabad (State level workshop on Micro Irrigation sponsored by MSBTE)	2-1-2007 to 6-1-2007

71	Watershed Management	Maharashtra Institute of Technology, Aurangabad	November, 2010

Short Term Training Programmes Participated:

Sr. No.	Topic	Organized at	Duration	Weeks
1	Specialist course on “Reservoir Sedimentation”	V.R.C.E., Nagpur and Indian Society for Hydraulics	27-29 October 1994.	
2	ISTE summer school programme on "Computer Applications"	Govt. Polytechnic, Solapur	15-04-1996 to 12-06-1996	8
3	"Industrial Training of Teacher XV"	Govt. Polytechnic, Nashik under World Bank Project Assistance Scheme.	04-05-1998 to 24-07-1998	12
4	ISTE short term training programme on " Advance course on Water shed management"	Govt. College of Engineering, Aurangabad	3-15 January 2000	2
5	QIP Short term course on "Advanced IT Applications to Civil Engineering"	Indian Institute of Technology, Kharagpur	4-15 December 2000.	2
6	ISTE short term training programme on “Neuro-Fuzzy applications in Civil Engineering”	Regional Engineering College, Warangal (A.P.)	June11-23, 2001	2
7	QIP Short term course on "Advanced Technologies in Water Resources & Environmental Management"	Indian Institute of Technology, Powai, Mumbai	6-10 May 2002.	1
8	ISTE short term training programme on “Environmental Pollution Control”	Govt. College of Engineering, Aurangabad	July 14-25, 2003.	2
9	(TEQIP) Training Programme on “Management Capacity Building”	Govt. College of Engineering, Aurangabad	19-22 June 2007	
10	(TEQIP) Training Programme for staff on “Communication Skills”	Govt. College of Engineering, Aurangabad	18-19 July 2007	
11	(TEQIP) Training Programme for staff on “Developing and Maintaining Question Bank”	Govt. College of Engineering, Aurangabad	20-21 July 2007	
12	(TEQIP) and Asian Institute of	Govt. College of	14-20 January	1

	Quality Management, Pune Training Programme for staff on "Managing & Functioning in an Autonomous Institute"	Engineering, Aurangabad	2008.	
13	(TEQIP) and Asian Institute of Quality Management, Pune Training Programme for staff on "Efficient Usage of Laboratory and Laboratory Equipment for Students"	Govt. College of Engineering, Aurangabad	21-27 January 2008.	1
14	ISTE short term training programme on "Engineering Optimization, EO-2010"	Govt. College of Engineering, Aurangabad	28 June-9 July, 2010	2
15	ISTE short term training programme on "Genetic Algorithm Neuro Fuzzy Applications in Engineering, GANEUFAE-2010"	Govt. College of Engineering, Aurangabad	29 November – 10 December 2010	2
16	TEQIP Short Term Training Programme on "Pedagogy"	Govt. College of Engineering, Aurangabad	16-5-2011 to 21-5-2011	1
17	ISTE short term training programme on "Soft Computing Tools and its Applications in Engineering , SOCTAPE-2011"	Govt. College of Engineering, Aurangabad	20 June - 1 July, 2011	2
18	ISTE-STTP on "Skill Matrix Enhancement Effective Teaching Learning"	Govt. College of Engineering, Aurangabad	November 28-December 9, 2011	2
19	ReliaSoft's Reliability Engineering Education	Govt Polytechnic Aurangabad	March 5-9, 2012	1
20	TEQIP-STTP on "Engineering Optimization and its applications" EOAIA-2012	Govt. College of Engineering, Aurangabad	25-29 June 2012	1
21	National Workshop on Advance Soft Computing Techniques in Hydrology and its Applications (ASCTHA-2012)	National Institute of Hydrology, Roorkee	29 OCTOBER – 2 NOVEMBER, 2012	1
22	TEQIP-STTP on "Genetic Algorithm Neuro Fuzzy	Govt. College of Engineering, Aurangabad	17-21 December	1

	Applications in Engineering, GANEUFAE-2012"		2013	
23	One Week STTP on Advanced Engineering Optimization through Intelligent Techniques	Department of Mech Engineering SVNIT, Surat	7-11 January 2013	1
24	2nd High Noon Spring School sponsored by UKaid DFID	Department of Civil Engineering IIT, Delhi	4th to 7th February 2013	
25	TEQIP-STTP on "Soft Computing Tools and its Applications in Engineering (SOCTAPE-2013)"	Department of Civil Engineering, Govt. College of Engineering, Aurangabad	3-7 June, 2013	1
26	QIP-Short Term Course on "Water Resources Management Studies using Geospatial Techniques and Numerical Modeling"	Department of Civil Engineering, IIT, Mumbai	July 08-12, 2013	1
27	TEQIP-STTP on "Research Methodology - Concepts and Tools (REMECOAT-2013)"	Department of Civil Engineering, Govt. College of Engineering, Aurangabad	16-20 December, 2013	1
28	Introductory and Advanced SWAT Workshop	Department of Civil Engineering, IIT Madras, Chennai.	30-12-2013 to 3-01-2014	
29	Training Course on Advanced Hydrologic Modeling	Deltaic Regional Centre, National Institute of Hydrology, Kakinada-533 003, AP.	February 24 - 28, 2014	1
30	TEQIP-STTP on "Statistical Techniques for Data Analysis in Research" (STEDAR-2014)	Department of Civil Engineering, Govt. College of Engineering, Aurangabad	09-13 June, 2014	1
31	QIP-Short Term Course on "Hydro-climatic Modeling and Climate Change Impacts Assessment"	Department of Civil Engineering, IIT, Mumbai	30 June – 4 July 2014	1
32	TEQIP-STTP on "Hydrological Modeling using Open Source Geospatial Techniques"	Department of Civil Engineering, Govt. College of Engineering, Aurangabad	27-31 October, 2015	1

33	AICTE-Short Term Course on "Introduction to Soil and Water Assessment Tool using Open Source Software:QGIS & QSWAT"	Dept of Civil Engg, Indian Institute of Technology Madras, Chennai	4-9 January, 2016	1
34	GIAN international course cum workshop on "Optimization Methods to Groundwater Resources Management"	Dept of Civil Engg, Indian Institute of Technology Guwahati, India	7-11 March 2016	1
35	FDP on "Engineering Exploration"	Centre for Engineering Education Research, KLE Technological University, B.V.B. Campus, Hubballi	14-18 May, 2018	1
36	TEQIP sponsored short course on "Sustainable Water Resources Management under Changing Climate"	Conducted at Discipline of Civil Engineering, IIT Indore	28 May 2018 to 02 June 2018	1
37	TEQIP-III FDP on "Training the Trainers for the course: Engineering Exploration"	Dept. of Electronics and Telecommunications, Govt. College of Engineering, Aurangabad	3-7 August 2018	1
38	Online One Week FDP on "Computational Tools and Techniques: MATLAB, ANSYS" under TEQIP III	Jointly Organised by Government College of Engineering, Karad, MS and Rajkiya Engineering College, Azamgarh, UP	27 April - 1 May, 2020	1
39	Online Training Programme on "Introduction to Python Programming and its Applications in Climate Smart Agriculture"	Centre for Advanced Agricultural Science and Technology (CAAST) for Climate Smart Agriculture and Water Management (CSAWM), Mahatma Phule Krushi Vidyapeeth, Rahuri	7-10 May 2020	
40	One week online Faculty Development Program on "OUTCOME BASED EDUCATION: A STEP TOWARDS EXCELLENCE" under Margdarshan Scheme of AICTE, New Delhi	Government College of Engineering Karad	11-15 May 2020	1
41	One Week Online Faculty Development Program on "Machine Learning and Deep Learning Applications in Engineering &	Dept of Civil Engineering, Govt. College of Engineering, Karad	16th May 2020 to 20th May 2020	1

	Science" under TEQIP-III			

Conference / Seminar/Workshop Participated:

Sr. No	Topic	Organized at	Duration
1	First state level ISTE convention, Maharashtra-Goa section	W.C.E., Sangli,	1996
2	27th Annual convention of ISTE	M.A.C.T., Bhopal	1997
3	National seminar on Teacher vacancies in degree and diploma level technical institutions-Causes and possible remedial measures	Govt. Engg., College, Aurangabad	1998
4	Second state level ISTE convention, Maharashtra-Goa section	J.N.E.C., Aurangabad	1998
5	National Seminar on Groundwater salinity, Water resource development and management of Purna alluvial basin	Govt. College of Engineering, Amravati	1999
6	National Seminar on Financing, Design, Construction and Operation of Highways, FDCOH-2002	Govt. College of Engineering, Aurangabad, Maharashtra, India	2002
7	International Conference on Advances in civil engineering, ACE 2002	I.I.T., Kharagpur, India	2002
8	International Conference on Advanced modeling techniques for sustainable management of water resources, AMTSMW- 2004	N.I.T., Warangal, India	2004
9	One day work shop on "Rain Water Harvesting	Govt. College of Engineering, Aurangabad	22-8-2005
10	One day work shop on "Solid Waste Management"	Govt. College of Engineering, Aurangabad	31-1-2006
11	One day work shop on "Supervisory	Govt. College of	01-4-2006

	Development and Stress Management"	Engineering, Aurangabad	
12	One day work shop on "Designing Student Conducted Studies"	Govt. College of Engineering, Aurangabad	30-7-2006
13	National Conference on Sustainable Water Resources Development and Management (SWRDAM-2008)	Govt. College of Engineering, Aurangabad, Maharashtra, India	June 13-14, 2008
14	National Conference on Environment Pollution and Management, EPM-2011	Government College of Engg, Aurangabad	Jan 28-29, 2011
15	One Day Workshop on Intellectual Property and Patent Lifecycle Management (IPPLM-2012), under CEP and in association with Inrex ITeS, Pune	Department of Civil Engineering, Govt. College of Engineering, Aurangabad	February 18, 2012
16	International Conference on "Current Trends and Challenges in Management, Engineering, Computer Application and Technology (ICCTCMECAT, 2012)	Deogiri College Aurangabad	23-25 March 2012
17	One Days Workshop on "Self Management & Team Management for Success-Breaking the Barriers"	Govt. College of Engineering, Aurangabad	18th September 2012
18	National Conference on Hydraulics, Water Resources, Coastal and Environmental Engineering, HYDRO-2012	IIT, Bombay, Mumbai, India	7-8 December, 2012
19	Two Days Workshop on "Effective Administration"	Department of Civil Engineering, Govt. College of Engineering, Aurangabad	15-16 February 2013
20	2nd International Conference on "Recent Trends in Engineering & Technology" (ICRTET-2013)	SNJB'S College of Engineering Chandwad, Dist: Nashik	22-24 February, 2013
21	National Conference on Sustainable Water Resources Planning, Management and Impact of Climate Change (SWRM-2013)	BITS –Pilani, Hyderabad Campus	April 5-6, 2013
22	International Conference on Advances in Engineering and Technology, ICAET-2013	SKN-SIT Lonawala Pune	15-17 May 2013
23	Two Days Workshop On "Impact of	Department of Civil	August 16-

	Climate Change on River Basin Management, ICCORIBAM-2013"	Engineering, Govt. College of Engineering, Aurangabad	17, 2013
24	International Conference on 35thIAHR World Congress	Century City International Convention Center, 88, Century City Boulevard, Chengdu, Sichuan, 610041 China	September 8 to 13, 2013
25	National Conference on Sustainable Water Resources Development and Management (SWARDAM-2013)	Department of Civil Engineering, Govt. College of Engineering, Aurangabad	30 September-01 October, 2013
26	International Conference on Hydraulics, Water Resources, Coastal and Environmental Engineering, HYDRO-2013	IIT Madras, Chennai, India	4-6 December, 2013
27	Symposium on Outstanding Issues for Hydrological Research in India	Department of Civil Engineering, NITK, Surathkal	October 21, 2013
28	International Conference on "Science and Technology (ICST-2K14)"	S.B.Patil College of Engineering Indapur, Pune	21-22 February, 2014
29	3rd International Conference on "Recent Trends in Engineering & Technology" (ICRTET-2014)	SNJB'S College of Engineering Chandwad, Dist: Nashik	28-30 March, 2014
30	Workshop on "Scientific Writing"	Indian Institute of Technology, Indore	July 11-12, 2014
31	One day Workshop on "Avenues for Research in the Areas of Hydrology, Water Resources and Climate Change Impacts"	Dept. of Civil Engg, SVNIT, Surat	July 14, 2014
32	TEQIP Workshop: Collaborative Research in Water Sector	TEQIP-KITE of IIT Bombay	September 12, 2014
33	National Level Workshop on "Scientometric Tools and Techniques for Research Analysis" (STTRA 2014)	K. L. University Greenfields, Vaddeswaram – 522502 Guntur District, Andhra Pradesh	September 27-28, 2014
34	International Conference HYDRO 2014	Maulana Azad National	December

	INTERNATIONAL	Institute of Technology, Bhopal	18-20, 2014
35	International Conference and workshop on Modeling Tools for Sustainable Water Resources Management , MTSWRM	Department of Civil Engineering, Indian Institute of Technology, Hyderabad	December 28-29, 2014
36	Workshop on "Outcome Based Education and NBA"	Govt. College of Engineering, Aurangabad (under TEQIP-II)	31st January-1st February 2015
37	International Conference 36th IAHR World Congress	World Forum Convention Center Delft – The Hague, The Netherlands	28 June-3 July, 2015
38	Two days workshop on "Outcomes-Based Education"	BMS College of Engineering, Bengaluru.	August 2 to 3, 2015
39	ISH Specialty Conference, National Conference on Climate Change and Sustainable Water Resources Management (CSWM-2015)	National Institute of Technology, Warangal	3-5 September 2015
40	Half day workshop on "Indo-Japan Workshop for Rainfall Disaster and Human Adaptability"	Dept of Civil Engg, Indian Institute of Technology Guwahati, India	9th March, 2016
41	CEP course on "Technology-Driven Innovation and Entrepreneurship"	Conducted at Govt. College of Engineering Aurangabad and organized by I.I.T. Bombay, Powai, Mumbai	8-12 February 2017
42	CEP course on "Rainwater Harvesting & Sustainable Water Management"	Dept of Civil Engg, I.I.T. Bombay, Powai, Mumbai.	4-5 March 2017
43	3 – day workshop on "Analysis and Design of Water Distribution Networks"	Dept of Civil Engineering N.I.T. Warangal	16-18 March 2017
44	National Conference on "Environment Pollution Control and Management-EPCM 2019"	Dept. of Civil Engineering, College of Engineering Pune	1-2 March 2019
45	HYDRO-2019 an International Conference	Dept of Civil Engineering, University College of Engineering, Osmania University, Hyderabad	18-20 December 2019
46	Online workshop on "Intellectual Property Rights"	Pandit Deendayal Petroleum University Dehradun	10-11 April 2020

Other information

- Conducted M.Tech. (Water Resources Engineering) viva-voce (Online Presentation) of 5 students, 2018-20 Batch on 29-6-2020 of Dept of Civil Engineering, National Institute of Technology, Jamshedpur, Jharkhand
- Evaluated and examined Ph.D thesis of Shri. **Ranganath L. R. on 31-10-2020 on the topic "**Assessment of Coastal Sedimentation Pattern along the West Coast of India" **at Department of Civil Engineering, U.V.C.E., Jnana Bharathi Campus, Banglore Univesity, Bengaluru.**
- **Evaluated Ph.D. thesis of** MADDALI SATYA DURGA HIMA BINDU on the topic "Optimization of Disinfectant Dosage in Water Distribution Network of Intermittent Supply with Booster Chlorination", K. L. University, Vaddeswaram-522502 (A.P.) on 30-5-2020
- Evaluated and examined Ph.D. thesis on 7-6-2019 of Mr. Vignesh Rajkumar L. on the topic CLIMATE CHANGE INDUCED DROUGHT: VULNERABILITY ASSESSMENT AND FARMERS' PRIORITIZATION OF CLIMATE SMART AGRICULTURAL PRACTICES FOR VAIGAI BASIN, INDIA, at Faculty of Civil Engineering, Anna University, Chennai.
- Evaluated Ph.D. thesis of Mr. Sarang V. Paranjpe **on the topic "Spatial Correlation of Surface and Sub-surface Hydrological Parameters for Basin Development", Nagpur University, Nagpur.**

- Worked as BOS member, Civil Engineering, University of Pune & VIIT Pune (Ex)
- BoS Member, Civil Engineering, University of Mumbai and MGM University
- **Research guidance for PhD: 05 Completed, and 07 ongoing**
- Guided 52 students for M. E. Dissertations.
- International Advisory Committee Member, International Conference on "Smart Innovations in Design, Environment, Management, Planning and Computing (ICSIDEMPC-2020)", 30-31 October 2020 at Jawaharlal Nehru Engineering College, Aurangabad (MGM University)
- Technical Advisory Committee member, National Conference (online) on Advanced Modelling and Innovations in Water Resources Engineering (AMIWRE-2020), during 19-20 September, 2020 Organized by Dept of Civil Engineering, National Institute of Technology, Jamshedpur, Jharkhand
- Session Chair, Fourth International Conference on Advances in Civil and Structural Engineering (ICACSE-2020), 28-30 May 2020, Dept of Civil Engineering, Government College of Engineering, Karad

- Technical Committee Member, ISH Specialty conference, *National Conference on Climate Change and Sustainable Water Resources Management (CSWM-2015)* during 3-5 September 2015 at N.I.T. Warangal, Andhra Pradesh
- Technical Committee Member, 2nd National conference on "Innovations in Civil Engineering", NCICE-2016 during 8-9 January 2016 at Govt. College of Engineering Karad
- Advisor of 5th International Conference on "Recent Trends in Engineering and Technology" ICRTET-2015, 28-30 April 2016 at SNJB College of Engineering, Chandwad
- Advisor of 4nd International Conference on "Recent Trends in Engineering and Technology" ICRTET-2015, 2-4 July 2015 at SNJB College of Engineering, Chandwad
- Advisor of 3rdInternational Conference on Recent Trends in Engineering and Technology 28-30 March 2014 at SNJB College of Engineering, Chandwad
- Advisor of 2nd International Conference on Recent Trends in Engineering and Technology 22-24 February 2013 at SNJB College of Engineering, Chandwad
- Session Chair, National conference on HYDRO-2012 at IIT, Mumbai during 7-8 December 2012.
- Session Chair, National Conference on Sustainable Water Resources Planning, Management and Impact of Climate Change, April 5-6, 2013, BITS –Pilani, Hyderabad Campus
- Session Co-Chair, International Conference on Advances in Engineering and Technology (ICAET-2013), 15-17 May, 2013, SKNSITS, Lonavala, Pune
- Worked as expert in Ph.d. interviews, University of Pune, Sinhagad Research Centre
- Worked as subject expert in faculty selection committee at WALMI Aurangabad
- Member of starting new PG programme i.e. MMS (Land and Water Management) at Dr. B.A.M. University Aurangabad (2004-05)

List of Ph.D. Thesis Supervised by Dr. D.G.Regulwar :

Sr.No.	Topic	Research Scholar	Status of Research Work
1	Multi Objective Multi Criterion Decision Making in Sustainable irrigation Planning Under Fuzzy Environment	Gurav Jyotiba Bhalchandra (Registration:30-7-2007)	Degree Awarded (2012)
2	Fuzzy Mathematical Programming for Optimal Multipurpose Multi-Reservoir Operation	Kamodkar Ravindra Uttamrao (Registration:30-7-2008)	Degree Awarded (2013)
3	Multi-objective Irrigation Planning with Conjunctive use of Surface and Groundwater under Fuzzy Environment	Ms. Vijaya S. Pradhan (Registration: August 2010)	Awarded (22-12-2014)
4	Conjunctive use of surface and ground water in fuzzy environment for sustainable irrigation planning	Nikam Neelkanth Gopalkrishna (Registration:30-7-2008)	Awarded (4-8-2016)
5	Climate Change and its Effects on River Basin Management (Area of research)	Saraf Vidya Rohidas (Registration: 5-11-2013)	Awarded (21-11-2016)

List of Ongoing Ph.D. Thesis under supervision of Dr. D.G.Regulwar:

Sr.No.	Topic	Research Scholar	Status of Research Work
1	A Decision Support System for Sustainable Water Resources Management in River Basin under Fuzzy Environment	Thete Ajit Ramrao (Registration: August 2009)	Ongoing
2	Calibration and Uncertainty Analysis of Hydrological Responses of Water Shed	Nagargoje Sonali Ramkrishna (Registration: 5-11-2013)	Ongoing
3	Sustainable multi-reservoir Operation (Area of research)	Dabhade Pushpak Dilip (Registration: 5-11-2013)	Ongoing
4	Multi-Reservoir Operation (Area of research)	Ms. Shilpa Survase (Registration: 23-9-2014)	Ongoing
5	Multi-objective Optimization for Water Resources (Area of research)	Mr. H.S. Kumawat (Registration: 23-9-2014)	Ongoing
6	Impact of climate change and land use on groundwater and surface water interactions	Ms. Pallavi R. Saraf (August 2018)	Ongoing
7	Optimized Sustainable Quantity-Quality model for Conjunctive surface and Groundwater use	Mr. Rahul P. Agrawal (August 2018)	Ongoing

List of M. E. Dissertations Guided by Dr. D.G.Regulwar:

Sr.No	Name of Candidate	Title of Dissertation	Year of

			Passing
1	Miss Kankal Padmaja Dhananjay	Optimal Operation of Multipurpose Reservoir: A Multiobjective Fuzzy Linear Programming Approach	2005
2	Miss Ustoorikar Ketaki Shirish	Optimal Reservoir Operation for Hydropower Production by Genetic Algorithm	2005
3	Choudhari Sumant Anant	Optimal Operation of Multipurpose Reservoir for Hydropower Production Via Differential Evolution Algorithm	2005
4	Kamodkar Ravindra Uttam	Fuzzy Stochastic Dynamic Programming Model for Optimal Policies of a Multipurpose Reservoir	2005
5	Miss Kale Shailaja Shankarrao	Multiobjective Optimization of a Reservoir via Differential Evolution Algorithm	2006
6	Smt. Dhonde Sadhana Gitaram	Optimal Irrigation Planning and Reservoir Operation in Fuzzy Environment	2006
7	Mr. Gurav Jyotiba Bhalchandra	Optimal Operation of Reservoir under Deficit Irrigation	2006
8	Mr. Ingole Sushil Babanrao	Optimal Reservoir Operation for Hydropower Production by Successive Linear Programming	2006
9	Smt. Borse Sunanda S.	Design of Reinforced Soil Structure for Fly Over Bridge Approaches	2002
10	Smt. Nikam Sandhya Anandrao	Design of Reinforced Embankments with Geosynthetic Material	2004
11	Thete Ajit Ramrao	Joint Operation of Multipurpose Multireservoir System	2008
12	Miss Gorkar Amruta Pandurang	Optimal operation policies for a multipurpose reservoir using successive linear programming	2007
13	Ms. Pradhan Vijaya S.	Conjunctive use of surface and groundwater	2009
14	Ms. Rutuja Ramesh Choudhari	Monthly Inflow Prediction using Artificial Neural Network	2011
15	Sentu Debbarma	Inflow Prediction by Different Neural Network Architecture-A Case Study	2011
16	Ms. Alka K. Pardeshi	Inflow Prediction by using Artificial Neural Network-A Case Study	2011
17	Ms. Dipeeka K. Pardeshi	Hydro-informatics in Groundwater Exploration : A Case study	2011
18	Ingle Vishal V.	Comparative Study of Optimal Cropping	2011

		Pattern using Linear Programming and Genetic Algorithm	
19	Mr. Dabhade Pushpak D.	"Optimal Design of Water Distribution Network by using Piping System Fluid Flow"	2012
20	Miss. Wevhal Alka Sahebrao	"Decision Support System for Integrated Water Resources Management-A Case Study"	2012
21	Miss Balve Pranita Narayan	"Optimal Operation of Reservoir using Fuzzy If-Then Rules and Fuzzy Linear Programming"	2013
22	Miss Sonali R. Nagargoje	"Delineation of watershed using ArcSWAT-A Case Study"	2013
23	Miss Sangita Vilas Pawar	"Optimal Reservoir Operation for Irrigation under Fuzzy Environment-A Case Study"	2013
24	Miss Smita Ramesh Varade	"Stage Discharge Prediction Model Using Artificial Neural Network"	2013
25	Ghuge Harshanand Kashiram	"Prediction of missing rainfall data by artificial neural network and conventional methods"	2013
26	Gitte Kapil Kishanrao	Analysis of Hydrological Responses of Watershed by using SWAT model	2014
27	Kodihal Sweta Suresh	Downscaling the precipitation using Statistical Downscaling Model (SDSM)	2014
28	Patil Nikhil Sunil	Estimation of Evapotranspiration by Artificial Neural Network	2015
29	Satpute Anjali Laxman	Optimal Reservoir Operation using Multi-objective Fuzzy Linear Programming Approach	2015
30	Ujgare Rohini Arjunrao	Reservoir Operation using Linear Programming	2015
31	Abhishek P Sinha	Soil Erosion Estimation of Watershed using USLE and Geo-informatics	2015
32	Mr. Akhlaque Ahmad Syed Saber Ali	Statistical Behavior and Analysis of Rainfall Data	2015
33	Ms. Vaishali S. Bhuktar	Computation of Runoff by SCS-CN Method and GIS	2015
34	Mr. Sumit N. Sharma	"Prediction of Evapo-transpiration by Artificial Neural Network and Conventional Methods"	2016
35	Mr. Rahul P. Agrawal	"Flow Analysis of Dudhana River using HEC-RAS: A Case Study"	2016

36	Ms Priyanka Kakasaheb Gaikwad	"Impact of Urbanization and Land Use Change on Runoff in Small Watersheds"	2016
37	Ambhore Rushikesh Mahendra	Site suitability analysis of soil & water conservation structures in watershed using GIS	2017
38	Ikhar Prerana Ramdas	Multireservoir Optimization: A GIS based study	2017
39	Keskar Abhijeet Purushottam	Evaluation of drought indices for drought monitoring in Marathwada Region, India	2017
40	Potdar Sonali Vinod	Conversion of existing field channels with pipe distribution network for irrigation	2017
41	Taji Satish Ganesh	Development of GIS based Storm Water Management Model (SWMM) for Aurangabad City, India	2017
42	Misal Priyanka Sanjay	Determination of Crop water Requirement and Irrigation Scheduling using CROPWAT and GIS	2018
43	Pawar Preetamkumar Shamrao	Storm Water Quantity and Quality Analysis Using HEC-HMS/RAS and SWAT	2018
44	Karanjeekar Diksha Diliprao	"Evaluation of Treated Wastewater Reuse Alternatives by using Multi Criteria Decision Making Techniques in Fuzzy Environment"	2018
45	Shaikh Saba Anjoom	Selecting Best Suitable Crop for Crop Scheduling: An AHP and TOPSIS approach	2018
46	Jadhav Kiran Chandrakant	Reservoir Operation using Particle Swarm Optimization	2018
47	Yogesh Janardhan Barokar	Assessment of Climate Change for Generating Gridwise Future Scenarios of Precipitation and Temperature Over Lower Godavari Sub Basin Maharashtra State, India.	2019
48	Parag Dilip Mahajan	Optimization of Irrigation Planning using Multiobjective Fuzzy Linear Programming: An Intuitionistic Fuzzy Approach	2019
49	Tejas Kamalakar Nikumbh	Integrated Approach to Assess the Impact of Land Cover Change in Upper Godavari Sub Basin – A Case Study of Nashik City, Maharashtra	2019
50	Akshay Bajirao Pachore	Meteorological Drought Analysis and	2019

		Characterization for Marathwada Region, Maharashtra State, India	
51	Sohailraheman Shaikh Aminullah Shaikh	Design and optimization of 24x7 water distribution network using WaterGEMS: A case study	2019
52	Abid Noor Khan	Design of Sewer-Storm System by SewerGEMS	2019

Undertaking by the Fellow

I, Dr. Monica Chakraborty, Daughter of Shri N.K.Chakraborty, resident of Aurangabad. Maharashtra have been awarded SERB N-PDF . I accept the award and undertake that:

1. I shall abide by the rules and regulations of SERB during the entire tenure of the fellowship.
2. I shall also abide by the rules, discipline of the institution where I will be implementing my fellowship
3. I shall devote full time to research work during the tenure of the fellowship
4. I shall prepare the progress report at the end of each year and communicate the same to SERB through the mentor
5. I shall send two copies of the consolidated progress report at the end of the fellowship period.
6. I further state that I shall have no claim whatsoever for regular/permanent absorption on expiry of the fellowship.

Date: 10/08/2023

Monica

Signature

Endorsement Certificate from the Mentor & Host Institute

This is to certify that:

I. The applicant, Dr. Monica Chakraborty, will assume full responsibility for implementing the project.

II. The fellowship will start from the date on which the fellow joins University/Institute where he/she implements the fellowship. The mentor will send the joining report to the SERB. SERB will release the funds on receipt of the joining report.

III. The applicant, if selected as SERB-N PDF, will be governed by the rules and regulations of the University/ Institute and will be under administrative control of the University/ Institute for the duration of the Fellowship.

IV. The grant-in-aid by the Science & Engineering Research Board (SERB) will be used to meet the expenditure on the project and for the period for which the project has been sanctioned as indicated in the sanction letter/ order.

V. No administrative or other liability will be attached to the Science & Engineering Research Board (SERB) at the end of the Fellowship.

VI. The University/ Institute will provide basic infrastructure and other required facilities to the fellow for undertaking the research objectives.

VII. The University/ Institute will take into its books all assets received under this sanction and its disposal would be at the discretion of Science & Engineering Research Board (SERB).

VIII. University/ Institute assume to undertake the financial and other management responsibilities of the project.

IX. The University/ Institute shall settle the financial accounts to the SERB as per the prescribed guidelines within three months from the date of termination of the Fellowship.

Dated: 10/08/2023.

Signature of the Mentor: 10/08/2023.

Name & Designation: Dr. D.Cr. Regulwar.
Dean, Head. Department of Civil Engineering.
Govt. Engineering College, Aurangabad.

Dated: 10/08/2023.

Signature of the Registrar of University/Head of Institute

Seal of the Institution

Dr. Babasaheb Ambedkar Marathwada University ★ Aurangabad ★ Controller of Examinations

Registrar
Registrar
Dr. Babasaheb Ambedkar
Marathwada University,
Aurangabad

Dr. Babasaheb Ambedkar Marathwada University,
Aurangabad-431 004, Maharashtra State, India.

NAAC Re-accredited "A" Grade

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Ph.D. Section

Ph.D. Office : (0240) 2403122	Website : www.bamu.ac.in	http://bamua.digitaluniversity.ac	E-mail : phdsection@bamu.ac.in

NOTIFICATION

DOCTOR OF PHILOSOPHY

It is hereby notified that, the thesis entitled, **"GROUNDWATER CONTAMINATION DUE TO MUNICIPAL AND INDUSTRIAL WASTE IN AURANGABAD MUNICIPAL CORPORATION AREA-A FRAMEWORK FOR EFFICIENT WASTEWATER TREATMENT AND RECYCLING SYSTEMS."** submitted by **Ms.Chakraborty Monica Narayan,** has been accepted by this University for the award of Ph.D. Degree in subject of **Geology** under the faculty of **Science & Technology** is as per UGC (Minimum Standard and Procedure for Award of Ph. D. Degree) Regulation - 2016. In supersession of the U.G.C. (Minimum Standard and Procedure for Award of Ph.D. Degree) Regulation – 2009. Ms.Chakraborty Monica Narayan, been declared eligible for the award of the said Degree.

The candidate submitted his/her thesis under the guidance of **Dr. Ashok V. Tejankar,** Research Guide, Professor & Head, UG & PG Department of Geology, Deogiri College, Aurangabad. The said Notification is implementing from the date of declaration **(i.e. 29 May 2023)** of Doctor of Philosophy (Ph.D.) Viva-voce Examination.

University Campus,
Ref.No. Ph.D./2022-23/3029-39
Outward Date: - 14.06.23

Director
Board of Examinations & Evaluation

P.T.O.

Sr. No.: 0202000165

We,
the Chancellor, Vice-Chancellor
and Members of the Management Council of

Dr. Babasaheb Ambedkar Marathwada University,

Aurangabad (Maharashtra State), India

Certify that the withinsigned

Chakraborty Monica Narayan

who has been found duly qualified for the Degree of

Doctor of Philosophy (Geology)

The Degree of

Doctor of Philosophy

(Geology)

(Under The Faculty of Science & Technology)

has been conferred on him/her at Aurangabad, on the twenty seventh day of the month of June in the year two thousand twenty three.

In Testimony whereof are set the Seal of the said University and the signature of the said Vice-Chancellor.

Date of Notification: **29th May,2023**
Place : Aurangabad
Date of Issue: **27/06/2023**

Vice-Chancellor