Chandranath Chatterjee

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EDUCATION *(Details in Annexure-I)*

Ph.D. - Indian Institute of Technology Kharagpur- India, 1999, Water Management

M.Tech. - Indian Institute of Technology Kharagpur- India, 1994, Soil & Water Conservation Engineering

B.Tech. - Orissa University of Agriculture and Technology Bhubaneswar – India, 1992, Agricultural Engineering

EXPERIENCE

Professor, Department of Agricultural and Food Engineering
Indian Institute of Technology Kharagpur, India, October 2014 - to date

Associate Professor, Department of Agricultural and Food Engineering
Indian Institute of Technology Kharagpur, India, June 2010 – October 2014

Assistant Professor, Department of Agricultural and Food Engineering
Indian Institute of Technology Kharagpur, India, May 2004 – June 2010

Alexander-von-Humboldt Research Fellow, Institute of Earth and Environmental Sciences
Potsdam University, Germany, May 2005 – July 2006 (Research Area: Flood Modeling)

Scientist 'C', Centre for Flood Management Studies, Patna
National Institute of Hydrology, Roorkee, India, February 2000 – May 2004

Scientist 'B', Centre for Flood Management Studies, Patna
National Institute of Hydrology, Roorkee, India, February 1997 – February 2000

RESEARCH INTERESTS

- ✓ Flood inundation modeling, hazard and risk analysis
- ✓ Flood forecasting using machine learning tools
- ✓ Impact of climate change on flood risk
- ✓ Design flood estimation using deterministic and probabilistic approaches
- ✓ Geo-informatics for hydrological/hydraulic modeling
- ✓ Application of Unmanned Aerial Vehicle (UAV) for crop condition monitoring

AWARDS AND HONORS

- ✓ Alexander von Humboldt Foundation Fellowship, Germany, 2005
- ✓ Union Ministry of Water Resources – Department of Irrigation Award of the Institution of Engineers (India), 2004
- ✓ Certificate of Merit of the Institution of Engineers (India), 2002
- ✓ DST SERC Fast Track Proposal for Young Scientists, 2002
- ✓ Reddy award from Indian Society of Agril. Engineers (ISAE) for best M.Tech. Thesis, 1994
- ✓ University gold medal in B.Tech. (Agricultural Engineering), OUAT, Bhubaneswar, 1992

COURSES TAUGHT *(Details of Teaching Feedback in Annexure-II)*

Average Teaching Feedback: 4.33

(On a scale of 1 to 5: 1 = Poor, 2 = Fair, 3 = Good, 4 = Very good, 5 = Excellent)

Courses at Undergraduate level:

- ✓ Land and Water Resources Engineering (AG31003)
- ✓ Land and Water Resources Engineering Laboratory (AG39003)
- ✓ GIS Principles & Applications (AG40003)

Courses at Postgraduate level:

- ✓ Geo-informatics for Land & Water Resources (AG60203)
- ✓ Geo-informatics for Land & Water Resources Laboratory (AG69039)
- ✓ Water Resources System Analysis (AG60042)
- ✓ Systems Approach in Agriculture (AG60064)
- ✓ Mathematical Models in Hydrology (AG60041)
- ✓ Hydrology & Water Resources Engineering Laboratory (AG69019)
- ✓ River Basin Management (WM60004)
- ✓ Remote Sensing for Land & Water Resources (AG60099)

E-Courses:

Developed the following e-courses for B. Tech. (Agricultural Engineering) under ICAR-NAIP (New Delhi)

- ✓ Remote Sensing and GIS Application 3 (2 + 1)
- ✓ Watershed Hydrology 3 (2 + 1)

PUBLICATIONS *(Details in Annexure-III)*

Google Scholar Citations:

Citations	**4094**
h-index	**35**
i10-index	**58**

- ✓ 99 papers in Refereed journals
- ✓ 110 papers in Proceedings of seminars/conferences
- ✓ 4 Book chapters
- ✓ 15 Technical reports

Top 20 Significant Publications:

1. Khatun, A., Sahoo, B., **Chatterjee, C.** (2023) "Two novel error-updating model frameworks for short-to-medium range streamflow forecasting using bias-corrected rainfall inputs: Development and comparative assessment", Journal of Hydrology, Elsevier, 618, DOI: 10.1016/j.jhydrol.2023.129199 (Impact Factor: 6.708)

2. Barbetta, S., Sahoo, B., Bonaccorsi, B., Nanda, T., **Chatterjee, C.**, Moramarco, T., Todini, E. (2023) "Addressing effective real-time forecasting inflows to dams through predictive uncertainty estimate", Journal of Hydrology, Elsevier, DOI: DOI: 10.1016/j.jhydrol.2023.129512 (Impact Factor: 6.708)

3. Khatun, A., Ganguli, P., Bisht, D.S., **Chatterjee, C.**, Sahoo, B. (2022) "Understanding the impacts of predecessor rain events on flood hazard in a changing climate", Hydrological Processes, John Wiley and Sons Ltd., 36(2), e14500, DOI: 10.1002/hyp.14500 (Impact Factor: 3.565)

4. Bisht, D. S., Mohite, A. R., Jena, P. P., Khatun, A., **Chatterjee, C.**, Raghuwanshi, N. S., Singh, R., Sahoo, B. (2020) "Impact of climate change on streamflow regime of a large Indian river basin using a novel monthly hybrid bias correction technique and a conceptual modeling framework", Journal of Hydrology, Elsevier, 590, DOI: 10.1016/ j.jhydrol.2020.125448 (Impact Factor: 4.5)

5. Nanda, T., Sahoo, B., **Chatterjee, C.** (2019) "Enhancing real-time streamflow forecasts with wavelet-neural network based error-updating schemes and ECMWF meteorological predictions in Variable Infiltration Capacity model", Journal of Hydrology, Elsevier, 575, 890-910, DOI: 10.1016/j.jhydrol.2019.05.051 (Impact Factor: 3.727)

6. Beria, H., Nanda, T., Bisht, D. S., **Chatterjee, C**. (2017) "Does the GPM mission improve the systematic error component in satellite rainfall estimates over TRMM? An evaluation at a pan-India scale", Hydrology and Earth System Sciences, European Geosciences Union, 21:6117-6134. DOI: 10.5194/hess-21-6117-2017 (Impact Factor: 5.064)

7. Nanda, T., Sahoo, B., **Chatterjee, C.** (2017). "Enhancing the applicability of Kohonen Self-Organizing Map (KSOM) estimator for gap-filling in hydrometeorological timeseries data", Journal of Hydrology, Elsevier, DOI: 10.1016/j.jhydrol.2017.03.072 (Impact Factor: 3.73)

8. Bisht, D. S., **Chatterjee, C.**, Kalakoti, S., Upadhyay, P., Sahoo, M., and Panda, A. (2016). "Modeling urban floods and drainage using SWMM and MIKE URBAN: a case study", Natural Hazards, Springer, 1-28, DOI: 10.1007/s11069-016-2455-1 (Impact Factor: 1.72)

9. Nanda, T., Sahoo, B., Beria, H., **Chatterjee, C.** (2016). "A wavelet-based non-linear autoregressive with exogenous inputs (WNARX) dynamic neural network model for real-time flood forecasting using satellite-based rainfall products", Journal of Hydrology, Elsevier, 539, 57-73, DOI: 10.1016/j.jhydrol.2016.05.014 (Impact Factor: 3.05)

10. Samantaray, D., **Chatterjee, C.**, Singh, R., Kumar, P., and Panigrahy, S. (2015), "Flood risk modeling for optimal rice planning for delta region of Mahanadi river basin in India", Natural Hazards, Springer, 76(1), 347-372, DOI: 10.1007/s11069-014-1493-9 (Impact Factor: 1.72)

11. Kneis, D., **Chatterjee, C.**, and Singh, R. (2014), "Evaluation of TRMM rainfall estimates over a large Indian river basin (Mahanadi)", Hydrology and Earth System Sciences, European Geosciences Union, 18(7), 2493-2502, DOI: 10.5194/hess-18-2493-2014 (Impact factor: 3.59)

12. Jena, P. P., **Chatterjee, C.**, Pradhan, G., and Mishra, A. (2014), "Are recent frequent high floods in Mahanadi basin in eastern India due to increase in extreme rainfalls?", Journal of Hydrology, Elsevier, 517, 847-862, DOI: 10.1016/j.jhydrol.2014.06.021 (Impact factor: 2.96)

13. Mani, P., **Chatterjee, C.**, and Kumar, R. (2014), "Flood hazard assessment with multi-parameter approach derived from coupled 1D and 2D hydrodynamic flow model", Natural Hazards, Springer, 70(2), 1553–1574, DOI: 10.1007/s11069-013-0891-8 (Impact factor: 1.64)

14. Tiwari, M. K., **Chatterjee, C.** (2010), "Development of an accurate and reliable hourly flood forecasting model using wavelet–bootstrap–ANN (WBANN) hybrid approach", Journal of Hydrology, Elsevier, 394(3), 458-470, DOI: 10.1016/j.jhydrol.2010.10.001 (Impact factor: 2.96)

15. Tiwari, M. K. and **Chatterjee, C.** (2010), "Uncertainty assessment and ensemble flood forecasting using bootstrap based artificial neural networks (BANNs)", Journal of Hydrology, Elsevier, 382(1), 20-33, DOI: 10.1016/j.jhydrol.2009.12.013 (Impact factor: 2.96)

16. Patro, S., **Chatterjee, C.**, Singh, R., and Raghuwanshi, N. S. (2009), "Hydrodynamic modelling of a large flood prone river system in India with limited data", Hydrological Processes, John Wiley and Sons Ltd., 23(19), 2774-2791, DOI: 10.1002/hyp.7375 (Impact factor: 2.50)

17. Mukerji, A., **Chatterjee, C.** and Raghuwanshi, N. S. (2009), "Flood forecasting using ANN, Neuro-Fuzzy and Neuro-GA models", Journal of Hydrologic Engineering, American Society of Civil Engineers, 14(6), 647-652, DOI: 10.1061/ (ASCE)HE.1943-5584.0000040 (Impact factor: 1.38)

18. **Chatterjee, C.**, Förster, S., and Bronstert, A., (2008), "Comparison of hydrodynamic models of different complexities to model floods with emergency storage areas", Hydrological Processes, John Wiley and Sons Ltd., 22(24), 4695-4709, DOI: 10.1002/hyp.7079 (Impact factor: 2.50)

19. Förster, S., **Chatterjee, C.**, and Bronstert, A., (2008), "Hydrodynamic simulation of the operational management of a proposed flood emergency storage area at the middle Elbe River using MIKE 11", River Research Applications, John Wiley and Sons Ltd., 24(7), 900-913, DOI: 10.1002/rra.1090 (Impact factor: 2.43)

20. Kumar R. and **Chatterjee C.**, (2005), "Regional flood frequency analysis using L-moments for North Brahmaputra region of India", Journal of Hydrologic Engineering, American Society of Civil Engineers, 10(1), 1-7, DOI: 10.1061/(ASCE)1084-0699(2005)10:1(1) (Impact factor: 1.38)

SPONSORED RESEARCH and **CONSULTANCY PROJECTS** ***(Details in Annexure-IV)***

- ✓ 4 Ongoing and 20 completed research projects
- ✓ 1 Ongoing and 8 completed consultancy projects

The total grant as PI/Co-PI till now amounts to more than Rs. 128 million. ***Funding agencies include*** European Commission, Europe; DFG, Germany; Department of Science and Technology, New Delhi; Ministry of Water Resources, New Delhi; Ministry of Human Resources Development, New Delhi; Ministry of Agriculture and Farmers' Welfare, New Delhi; Ministry of Electronics and Information Technology, New Delhi; Indian Space Research Organization, Bangalore; Space Application Centre, Ahmedabad; Indian Council of Agricultural Research, New Delhi; ITRA, Mumbai; DAAD, Germany; The World Bank, New Delhi; National Thermal Power Corporation, Kahalgaon; Soil Conservation Dept., Damodar Valley Corporation, Hazaribag; Govt. of Andhra Pradesh and Odisha, India; Greenthink Ventures Pvt. Ltd., Kolkata; National Tea Research Foundation, Kolkata.

Significant Projects as Principal Investigator:

1. "Development and management of surface water resources and soil moisture in different agro-ecological regions of India using Geo-informatics and Nano Technology" sponsored by ICAR-Indian Institute of Water Management, Bhubaneswar; Duration: 5 years (09-11-2021 to 08-11-2026); Fund: Rs. 52.50 lakhs
2. "Impact of climate change on flood risk" sponsored by DST, Ministry of Science and Technology, New Delhi; Duration: 5 years (30-03-2017 to 29-03-2022); Fund: Rs. 58.51 lakhs

3. "An integrated autonomous UAV and WSN - based system for crop management and crop condition monitoring" sponsored by MHRD and MoA&FW, New Delhi; Duration: 5 years (08-02-2017 to 31-03-2022); Fund: Rs. 195 lakhs

4. "Development of optimal crop planning model based on flood risk" sponsored by ICAR, MoA&FW, New Delhi; Duration: 1 year (13-01-2016 to 31-03-2017); Fund: Rs. 34.925 lakhs

5. "Flood inundation zoning for different return periods in Mahanadi river basin" sponsored by INCSW, Ministry of Water Resources, New Delhi; Duration: 6 years (01-04-2011 to 31-03-2017); Fund: Rs. 36 lakhs

6. "Flood risk modelling using satellite remote sensing data for optimal crop planning" sponsored by ISRO, Bangalore; Duration 3 years (2008-2011); Fund: Rs. 10.78 lakhs

7. "Probable maximum flood estimation for Nagarjunasagar Dam" sponsored by Govt. of Andhra Pradesh; Duration: 2 years (2009-2011); Fund: Rs. 29.10 lakhs

RESEARCH GUIDANCE *(Details in Annexure-V)*

✓ Guidance at doctoral level: 13 completed; 6 in progress
✓ Guidance at master's level: 67 completed and 3 in progress
✓ Guidance at bachelor's level: 30 completed

COLLABORATIONS and VISITS ABROAD *(Details in Annexure-VI)*

Collaborations:

1. Research collaboration with "Institute of Earth-and Environmental Sciences, University of Potsdam, Germany" (Collaborators: Prof. Axel Bronstert, Dr. Gerd Bürger, Ms Lisei Koehn) in a project funded by Deutsche Forschungsgemeinschaft (DFG) – (i) Publication of research papers in high impact journals, (ii) Development of collaborative research proposals, and (iii) Developed a flood forecasting model for Mahanadi river basin

2. Research collaboration with "Department of Biological Systems Engineering, Virginia Tech, Blacksburg, Virginia, USA (Collaborator: Prof. V Sridhar) - (i) Publication of research papers in high impact journals, (ii) Development of collaborative research proposals

Visits Abroad:

1. Institute of Earth and Environmental Science, Potsdam University, Germany during May 2005 to July 2006 for conducting Post-Doctoral research in the area of 'Flood Modeling' as an Alexander-von-Humboldt Research Fellow

2. Civil and Environmental Engineering Section (GITS Sediment Transport Research Group), Universitat Politècnica de Catalunya, Barcelona, Spain during April 2006 for conducting Post-Doctoral research in the area of 'Flood Modeling' as an Alexander-von-Humboldt Research Fellow

CONFERENCES/SHORT-TERM COURSES ORGANIZED *(Details in Annexure-VII)*

1. International Conference on "Food Security and Environmental Sustainability (FSES-2009)" at IIT Kharagpur in 2009.

2. International Short-term course on "Advanced Training in Land and Water Resources Engineering" for BE students of Tribhuvan University, Nepal from 20 to 22 June, 2019 (Sponsorship Amount: Rs. 3.4 lakh)

3. International Short-term course (International Summer and Winter Term (ISWT)) on "Modeling River Catchment Interactions" from 01 to 12 June, 2015 (Sponsorship Amount: Rs. 3 lakh)

4. International Short-term course (International Summer and Winter Term (ISWT)) on "Geospatial Technologies in Hydrological Modelling" from 16 to 27 June, 2014 (Sponsorship Amount: Rs. 3 lakh)

ADMINISTRATIVE ACTIVITIES *(Details in Annexure- VIII)*

1. Professor-in-Charge, Institute's Water Works, 2016-2019
2. Professor-in-Charge, Institute's Sanitation, 2016-2019
3. Assistant Warden, Meghnad Saha Hall of Residence, 2007-2009
4. Chairman, Departmental Under Graduate (UG) Committee, 2020 to date
5. Prof-in-Charge, Agricultural Engineering Society (AES), 2008-2020

OTHER PROFESSIONAL ACTIVITIES *(Details in Annexure- IX)*

1. Member of High Level Expert Committee on "Flood Management" formed by 'Flood Management Improvement Support Centre (FMISC)' Water Resources Department, Govt. of Bihar, 2011-2014

2. Convener of the Committee for revising syllabus of 'Agricultural Engineering and Technology' discipline for Agricultural Research Service (ARS) examination conducted by the Indian Council of Agricultural Research (ICAR), 2022

3. Member of the following professional bodies:
   - ✓ Life Member: International Association of Hydrological Sciences (IAHS), Wallingford, U.K. (Membership No. 2318)
   - ✓ Life Member: Indian Society of Remote Sensing (ISRS), Dehradun, India (Membership No. L-1872)
   - ✓ Life Member: Indian Society for Hydraulics (ISH), Pune, India (Membership No. LM/351)
   - ✓ Life Member: Indian Association of Hydrologists (IAH), Roorkee, India (Membership No. LM-1064)

(Chandranath Chatterjee)

Annexure-I

Educational Qualifications:

Degree	Institution	Year	Specialization	Division	% Marks	Rank
Ph.D.	IIT Kharagpur	1999	Hydrometry	-	-	-
M.Tech.	IIT Kharagpur	1994	Soil & Water Cons. Engg.	-	9.52/ 10	First in Specialization
B.Tech.	CAET, OUAT, Bhubaneswar	1992	Agricultural Engg.	First (Hons)	8.65/ 10	Univ. Gold Medalist
H.S.	BJB College, Bhubaneswar	1988	PCM, English, Stats	First	88.9%	-
AISSE	D. M. School, Bhubaneswar	1986	Science, Engl., Maths	First	76.4%	-

Annexure-II

Teaching Feedback

Average Teaching Feedback: 4.33 (Since 2009 when ERP based feedback became operational)

(On a scale of 1 to 5: 1 = Poor, 2 = Fair, 3 = Good, 4 = Very good, 5 = Excellent)

Subject-wise Year-wise Teaching Feedback:

#	Session	Semester	Subject Number	Subject Name	Credits	No. of Students	Feedback Response
1	2009-2010	Autumn	AG31003	Land & Water Resources Engineering	4	21	4.33
2	2009-2010	Autumn	AG39003	Land & Water Resources Engineering Lab.	2	21	4.50
3	2009-2010	Spring	AG60064	Systems Approach in Agriculture	4	6	4.00
4	2009-2010	Spring	AG60042	Water Resources System Analysis	4	14	4.50
5	2010-2011	Autumn	AG31003	Land & Water Resources Engineering	4	26	3.96
6	2010-2011	Autumn	AG39003	Land & Water Resources Engineering Lab.	2	22	3.91
7	2010-2011	Autumn	AG60203	Geo-Informatics for Land &Water Resources	4	16	4.50
8	2010-2011	Autumn	AG69039	Geo-Informatics for Land &Water Resources Laboratory	2	12	4.85
9	2010-2011	Spring	WM60004	River Basin Management	4	5	4.40
10	2010-2011	Spring	AG60064	Systems Approach in Agriculture	4	7	4.86
11	2011-2012	Autumn	AG31003	Land & Water Resources Engineering	4	42	4.46
12	2011-2012	Autumn	AG39003	Land & Water Resources Engineering Lab.	2	38	4.42
13	2011-2012	Autumn	AG60203	Geo-Informatics for Land &Water Resources	4	24	4.46
14	2011-2012	Autumn	AG69039	Geo-Informatics for Land &Water Resources Laboratory	2	14	4.50
15	2011-2012	Spring	WM60004	River Basin Management	4	7	4.57
16	2011-2012	Spring	AG60064	Systems Approach in Agriculture	4	13	3.43
17	2011-2012	Spring	AG60042	Water Resources System Analysis	4	21	4.43
18	2012-2013	Autumn	AG31003	Land & Water Resources Engineering	4	28	4.23

19	2012-2013	Autumn	AG39003	Land & Water Resources Engineering Lab.	2	25	4.04
20	2012-2013	Spring	AG60064	Systems Approach in Agriculture	4	9	4.78
21	2013-2014	Autumn	AG31003	Land & Water Resources Engineering	4	64	3.84
22	2013-2014	Autumn	AG39003	Land & Water Resources Engineering Lab.	2	59	4.12
23	2013-2014	Autumn	AG60203	Geo-Informatics for Land &Water Resources	4	19	4.84
24	2013-2014	Autumn	AG69039	Geo-Informatics for Land &Water Resources Laboratory	2	14	4.86
25	2013-2014	Autumn	AG60099	Remote Sensing for Land and Water Resources	4	22	4.59
26	2013-2014	Spring	AG60064	Systems Approach in Agriculture	4	12	4.42
27	2013-2014	Spring	AG60042	Water Resources System Analysis	4	14	4.65
28	2014-2015	Autumn	AG60099	Remote Sensing for LandAnd Water Resources	4	13	4.38
29	2014-2015	Autumn	AG60203	Geo-Informatics for Land &Water Resources	4	22	4.64
30	2014-2015	Autumn	AG69039	Geo-Informatics for Land &Water Resources Laboratory	2	18	4.61
31	2014-2015	Spring	AG60064	Systems Approach in Agriculture	4	35	4.23
32	2014-2015	Spring	AG60042	Water Resources System Analysis	4	22	4.40
33	2015-2016	Autumn	AG60203	Geo-Informatics for Land &Water Resources	4	20	4.26
34	2015-2016	Autumn	AG69039	Geo-Informatics for Land &Water Resources Laboratory	2	17	4.04
35	2015-2016	Spring	AG60042	Water Resources System Analysis	4	18	3.67
36	2015-2016	Spring	AG60064	Systems Approach in Agriculture	4	41	3.66
37	2016-2017	Autumn	AG60203	Geo-Informatics for Land &Water Resources	4	29	4.48
38	2016-2017	Autumn	AG69039	Geo-Informatics for Land &Water Resources Laboratory	2	19	4.60
39	2016-2017	Spring	AG60042	Water Resources System Analysis	4	21	4.39
40	2016-2017	Spring	AG60064	Systems Approach in Agriculture	4	15	4.78
41	2017-2018	Autumn	AG31003	Land & Water Resources Engineering	4	61	4.21
42	2017-2018	Autumn	AG60203	Geo-Informatics for Land &Water Resources	4	27	4.29

43	2017-2018	Autumn	AG69039	Geo-Informatics for Land &Water Resources Laboratory	2	19	4.19
44	2017-2018	Spring	AG60042	Water Resources System Analysis	4	21	4.27
45	2017-2018	Spring	AG60064	Systems Approach in Agriculture	4	29	3.98
46	2018-2019	Autumn	AG31003	Land & Water Resources Engineering	4	60	4.11
47	2018-2019	Autumn	AG39003	Land & Water Resources Engineering Lab.	2	62	3.91
48	2018-2019	Spring	AG60042	Water Resources System Analysis	4	19	4.64
49	2018-2019	Spring	AG60064	Systems Approach in Agriculture	4	26	4.55
50	2019-2020	Autumn	AG31003	Land & Water Resources Engineering	4	55	4.15
51	2019-2020	Autumn	AG39003	Land & Water Resources Engineering Lab.	2	58	3.85
52	2020-2021	Autumn	AG60203	Geo-Informatics for Land &Water Resources	4	23	4.44
53	2020-2021	Spring	AG60042	Water Resources System Analysis	4	19	4.86
54	2020-2021	Spring	AG60064	Systems Approach in Agriculture	4	24	4.13
55	2021-2022	Autumn	AG31003	Land & Water Resources Engineering	4	22	3.75
56	2021-2022	Autumn	AG39003	Land & Water Resources Engineering Lab.	2	22	3.63
57	2021-2022	Spring	AG60042	Water Resources System Analysis	4	4	4.75
58	2021-2022	Spring	AG60064	Systems Approach in Agriculture	4	29	4.35
59	2022-2023	Autumn	AG31003	Land & Water Resources Engineering	4	67	4.45
60	2022-2023	Autumn	AG39003	Land & Water Resources Engineering Lab.	2	69	4.46
61	2022-2023	Spring	AG60042	Water Resources System Analysis	4	18	4.56
62	2022-2023	Spring	AG60064	Systems Approach in Agriculture	4	47	4.41

Annexure-III

Publications

Google Scholar Citations (https://scholar.google.com/citations?user=3wMSIbIAAAAJ)

Citations	**4094**
h-index	**35**
i10-index	**58**

(A) Refereed Journals: 99

1. Khatun, A., Sahoo, B., **Chatterjee, C.** (2023) "Two novel error-updating model frameworks for short-to-medium range streamflow forecasting using bias-corrected rainfall inputs: Development and comparative assessment", Journal of Hydrology, Elsevier, 618, DOI: 10.1016/j.jhydrol.2023.129199 (Impact Factor: 6.708)

2. Barbetta, S., Sahoo, B., Bonaccorsi, B., Nanda, T., **Chatterjee, C.**, Moramarco, T., Todini, E. (2023) "Addressing effective real-time forecasting inflows to dams through predictive uncertainty estimate", Journal of Hydrology, Elsevier, DOI: DOI: 10.1016/j.jhydrol.2023.129512 (Impact Factor: 6.708)

3. Swain, S.S., Kumar, S.B., Mishra, A., **Chatterjee, C.** (2023) "Sensitive or resilient catchment?: A Budyko-based modeling approach for climate change and anthropogenic stress under historical to CMIP6 future scenarios", Journal of Hydrology, Elsevier, DOI: 10.1016/j.jhydrol.2023.129651 (Impact Factor: 6.708)

4. Bera, A., Misra, S., **Chatterjee, C.** (2023) "Channel-state information-driven data rate optimization for multi-UAV IoT networks", IEEE Internet of Things Journal, IEEE, DOI: 10.1109/JIOT.2023.3280964 (Impact factor: 10.238)

5. Biswal, S., **Chatterjee, C.**, Mailapalli, D.R. (2023) "Damage assessment due to wheat lodging using UAV-based multispectral and thermal imageries", Journal of the Indian Society of Remote Sensing, Springer, DOI: 10.1007/s12524-023-01680-6 (Impact Factor: 1.894)

6. Khatun, A., **Chatterjee, C.**, Sahu, G., Sahoo, B. (2023) "A novel smoothing-based long short-term memory framework for short-to medium-range flood forecasting", Hydrological Sciences Journal, Taylor & Francis Online, 10.1080/02626667.2023.2173012 (Impact Factor: 3.942)

7. Mondal, K., **Chatterjee, C.**, Singh, R. (2023) "An analytical framework for state level water-energy-food nexus analysis in India: Insight from implemented policies", Environmental Science & Policy, Elsevier, 141, 33-49, DOI: 10.1016/j.envsci.2022.12.018 (Impact Factor: 6.424)

8. Kumar, U., Rashmi, Srivastava, A., Kumari, N., **Chatterjee, C.**, Raghuwanshi, N. S. (2023) "Evaluation of standardized MODIS-Terra satellite-derived evapotranspiration using Genetic Algorithm for better field applicability in a tropical river basin", Journal of the Indian Society of Remote Sensing, Springer, 51, 1001–1012, DOI: 10.1007/s12524-023-01675-3 (Impact Factor: 1.894)

9. Mondal, K., Tantuway, R. B., **Chatterjee, C.**, Singh, R. (2023) "Development of a water-energy-food nexus model for multiscale studies", Irrigation and Drainage, John Wiley and Sons Ltd., DOI: 10.1002/ird.2800 (Impact Factor: 1.424)

10. Khose, S.B., Mailapalli, D.R., Biswal, S., **Chatterjee, C**. (2022) "UAV-based multispectral image analytics for generating crop coefficient maps for rice", Arabian Journal of Geosciences, Springer, 15 (22), 1681, 1-17, DOI: 10.1007/s12517-022-10961-2 (Impact Factor: 1.827)

11. Saha, R., Misra, S., Chakraborty, A., **Chatterjee, C.**, Deb, P.K. (2022) "Data-centric client selection for federated learning over distributed edge networks", IEEE Transactions on Parallel and Distributed Systems, IEEE, 34 (2), 675-686, DOI: 10.1109/TPDS.2022.3217271 (Impact Factor: 3.757)

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Annexure-IV

Sponsored Research and Consultancy Projects

(A) Sponsored Research Projects:

No.	PI/ Co-PI	Project Name	Sponsored by	Date & Period	Funds (Rs. Lakh)
On-going: 4 Nos.					
1	PI	Development and management of surface water resources and soil moisture in different agro-ecological regions of India using Geo-informatics and Nano Technology	ICAR-IIWM, ICAR, Bhubaneswar	09-11-2021 to 08-11-2026	52.50
2	Co-PI	Development and field implementation of a conceptual hydrological model for efficient river basin planning and management	SERB, Department of Science and Technology, New Delhi	15-03-2023 to 14-03-2026	20.02
3	Co-PI	AI based imaging solution for detection of pest attack in tea leaves using aerial imaging	National Tea Research Foundation, Kolkata	03-04-2023 to 02-04-2026	34.58
4	Co-PI	AI for agriculture and food sustainability	Ministry of Electronics and Information Technology, New Delhi	01-07-2020 to 30-06-2023	131.2
Completed: 20 Nos.					
3	PI	An integrated autonomous UAV and WSN - based system for crop management and crop condition monitoring	MHRD and MoA&FW, New Delhi	08-02-2017 to 31-03-2022	195
4	PI	Impact of climate change on flood risk (Vulnerability and risk assessment due to various environmental drivers in a climate change scenario over eastern India)	DST, Min of Science and Tech., New Delhi	30-03-2017 to 30-04-2022	58.51 (690.36)
5	Co-PI	Development and testing of a large scale conceptual hydrological model	NIH, Min. of Water Res., Roorkee	29-03-2018 to 31-03-2022	55.548

6	Co-PI	Climate change impact and adaptation options for sustaining rice-wheat crop production in India	DST, Min of Science and Tech., New Delhi	30-03-2017 to 29-03-2022	37.248
7	PI	Development of optimal crop planning model based on flood risk	ICAR, Min of Agril., New Delhi	13-01-2016 to 31-03-2017 (1 year)	34.925
8	PI	Flood inundation zoning for different return periods in Mahanadi river basin	INCSW, Min. of Water Res., New Delhi	01-04-2011 to 31-03-2017 (6 years)	36
9	PI	Estimation of crop coefficients from remotely sensed data to improve irrigation scheduling in India	MHRD, New Delhi	01-04-2014 to 01-04-2017 (3 years)	43.22
10	PI	Design of drainage system and multi-purpose detention pond for storm water management of IIT Kharagpur campus	IIT Kharagpur	24-12-2013 to 23-12-2016 (3 years)	45
11	Co-PI	Effect of climate change & land use/land cover changes on spatial and temporal water availability in Subarnarekha basin	Min. of Water Res., New Delhi	23-03-2018 to 22-03-2021	25.256
12	Co-PI	Ensemble modeling of rainfall-runoff transformation process	INCSW, Min. of Water Res., New Delhi	01-04-2012 to 31-12-2016 (4 years)	26
13	Co-PI	Development of a conceptual water balance model for various ecosystems of India	SAC, Ahmedabad	01-01-2014 to 31-12-2016 (2 years)	20.3
14	Co-PI	Measurement to management (M2M): improved water use efficiency and agricultural productivity through experimental sensor network	ITRA, Mumbai	21-10-2013 to 20-10-2016 (3 years)	156
15	Co-PI	Development of a GIS based decision support system for irrigation system management	INCSW, Min. of Water Res., New Delhi	2012-2016 (4 years)	42
16	Co-PI	Adaptation to changing water resources availability in northern India with Himalayan glacier retreat and changing monsoon pattern.	European Commission	2009-2012 (3 years)	155

17	Co-PI	Distributed hydrological modeling to analyse sediment and nutrient status of Brahmani-Baitrani delta	SAC, Ahmed-abad	2008-2011 (3 years)	20.83
18	Co-PI	Hydrological modeling of a watershed to evaluate impacts of watershed structures on surface flow & groundwater recharge	DST, New Delhi	2007-2010 (3 years)	19.33
19	PI	Flood risk modelling using satellite remote sensing data for optimal crop planning	ISRO, Bangalore	2008-2011 (3 years)	10.78
20	Co-PI	Geo-spatial resources management with computer simulation of flood inundation for Mayurakshi and Ajoy river basins Jharkhand and West Bengal using RS & GIS	DST, New Delhi	2006-2009 (3 years)	13.77
21	PI	Flood hazard mapping & flood risk zoning for a river reach	SRIC, IIT Kharagpur	2004-2009 (5 years)	3
22	PI	Remote Sensing and GIS based management model for waterlogging and drainage congestion problem of Mokama group of Tals in Central Bihar	DST, New Delhi	2002-2004 (3 years)	7.72

(B) Consultancy Projects:

No.	PI/ Co-PI	Project Name	Sponsored by	Date & Period	Funds (Rs. Lakh)
On-going: 1 No.					
1	Co-PI	Testing of Nano liquid complex fertilizers (N-K and P-K) for cereals	Aarshanano Composite Technologies Pvt. Ltd., AP	21-02-2022 to 20-08-2022	3.605
Completed: 8 Nos.					
2	PI	Validation of remote sensing technology based crop yield estimation	Greenthink Ventures Pvt. Ltd., Kolkata	15-02-2021 to 02-08-2021	1.534
3	PI	Probable maximum flood estimation for Nagarjunasagar Dam	Govt. of Andhra Pradesh	2009-2011 (2 years)	29.10

4	Co-PI	Setting-up RiverWare model for operational management and climate change impact assessment of Damodar river basin reservoirs	The World Bank, New Delhi	16-02-2018 to 31-07-2018 (1.5 years)	5.46
5	Co-PI	Testing and evaluation of the Internet of Things (IOT) based prototype designed for water management in Alternate Wetting and Drying (AWD) rice	The World Bank, New Delhi	14-02-2018 to 31-07-2018 (1.5 years)	9.13
6	Co-PI	Intervention analysis of the IGB basin focal project	IWMI, Sri Lanka	2008-2009 (1.5 years)	6
7	Co-PI	Evaluation study on the activities of Soil Conservation Department of DVC	DVC, SCD, Hazaribagh	2007-2009 (2 years)	31.5
8	Co-PI	Preparation of Perspective Plan under NFFWP	DRDA, Mayur-bhanj, Orissa	2005-2005 (6 months)	7
9	Co-PI	Hydrological study of NTPC Kahalgaon power station area	NTPC	2000-2000 (4 months)	10

Annexure-V

Details of Research Guidance

(a) Guidance at Doctoral Level:

Number Completed: 13 (Single: 2 and Joint: 11)

Sl. No.	Title of Project	Name of Student & Roll. No.	Name of Co-Supervisor	Year
1	Flood inundation modeling and hazard assessment for lower Bharathapuzha basin	Xavier K Jacob 05AG9502	Prof. N. S. Raghuwanshi	July, 2009
2	River flow forecasting using wavelet transformation and bootstrap based neural networks	Mukesh Kumar Tiwari 07AG9402		Aug, 2011
3	Flood risk modeling using MIKE FLOOD and remote sensing data for optimal rice planning	Dibyendu Samantaray 08AG9708	Prof. R. Singh	Dec, 2014
4	Ensemble modeling of rainfall-runoff transformation process	Arun Kumar 12AG91P03	Prof. R. Singh	2017
5	Flood risk management of nuclear power plant site using coupled 1D-2D hydrodynamic model	Pankaj Mani 10AG9501	Dr. Rakesh Kumar, NIH	Dec, 2018
6	Real-time flood forecasting using variable infiltration capacity model and neural networks	Trushnamayee Nanda 13AG90J01	Prof. B. Sahoo	Dec, 2018
7	Assessing the impacts of conservation measures on watershed hydrology using MIKE SHE	Gajanan K. Ramteke 08AG9701	Prof. R. Singh	July, 2019
8	Development of flood forecasting system for Mahanadi river basin using a coupled rainfall-runoff hydrodynamic model	Mohite Archana Ramchandra 11AG91R06	Prof. R. Singh	Nov, 2019
9	Multi-UAV Communication Networks: Quality-of-Experience, Quality-of-Service, and Coverage	Abhishek Bera 16AT91R01	Prof. S. Misra	Mar, 2021
10	Flood hazard assessment under changing flood regime in Mahanadi river basin	Prachi Pratyasha Jena 11AG92P01		June 2021
11	Impact of climate change on droughts and river flow regime	Deepak Singh Bisht 14AG91P02	Prof. N. S. Raghuwanshi	September 2021
12	Impact of climate change and human activities on catchment response in Brahmani and Baitarani River basins of Eastern India	Sushree Swagatika Swain 17WM91R03	Prof. A. Mishra	June 2023
13	Flood forecasting and risk assessment in Mahanadi Basin considering climate change	Amina Khatun 17AG92P02	Prof. B. Sahoo	June 2023

Number in Progress: 6 (Single: 0 and Joint: 6)

Sl. No.	Title of Project	Name of Student & Roll. No.	Name of Co-Supervisor	Year
1	Application of UAV for crop condition monitoring	Rituparna Saha 17AT92P07	Prof. S. Misra	Ongoing
2	Development of UAV image based analytics for crop water management	Sudarsan Biswal 18AG91R08	Prof. D. R. Mailapalli	Ongoing
3	Sustainable assessment of water-energy-food nexus in Kangsabati catchment	Krishna Mondal 20AG91R05	Prof. R. Singh	Ongoing
4	Machine learning for Agriculture and water resources	Somrita Sarkar 21CD91P03	Prof. P. Mitra	Ongoing
5	AI/ML based flood forecasting in Mahanadi river basin	Roshan Suryakant Mohanty 22WM91R01	Prof. B. Sahoo	Ongoing
6	Development and management of surface water resources and soil moisture in	Saidutta Mohanty 22AG92P01	Prof. B. Sahoo	Ongoing

(b) Guidance at Masters Level:

Number Completed: 67 (Single: 40 and Joint: 27)

Sl. No.	Title of Project	Name of Student, Specialization & Roll. No.	Name of Co-Supervisor	Year
1	Flood forecasting in upper Mahanadi River basin using deep learning models	M N Nisha (LWRE) 21AG62R07		2023
2	Estimation of yield and nitrogen status in wheat crop using UAV-based multi-spectral imageries	Arukonda Laxmi Priyanka (LWRE) 21AG62R16		2023
3	Assessment of rainwater harvesting potential in upper Bhima basin	Gourav Kumar (WEM, SoWR) 21WM60R07		2023
4	Small water body detection using remotely sensed images and machine learning approaches	Yash Vardhan Agarwal (ASM-Dual Degree) 18AG36013		2023
5	Flood forecasting in Basantpur River basin using deep learning models	Rajan Prasad (ASM-Dual Degree) 18AG36010		2023
6	Development of a flood forecasting model for the Mahanadi river basin using Long Short-Term Memory (LSTM) networks	Gaurav Sahu (LWRE) 20AG62R20		2022
7	Assessment of rainwater harvesting potential using high-resolution Sentinel data and SCS-CN in Google Earth Engine	Tarun Agarwal (LWRE) 20AG62R15	Dr. Deepak Singh Bisht, Scientist (NIH, Roorkee)	2022

8	Estimation of above ground biomass of paddy crop by integrating spectral and textural information of UAV based multispectral imagery	Navneet Pathak (LWRE) 20AG62R13		2022
9	Disease detection in paddy using deep learning on images acquired by Unmanned Aerial Vehicle (UAV)	Srushti Suresh Thorat (ASM-Dual Degree) 17AG36015		2022
10	Multi-model ensembling of Cordex future climate data for extreme event analysis: A machine learning approach	Narpat Ram Kalwaniya (ASM-Dual Degree) 17AG36012		2022
11	Detection of crop water stress using UAV based multispectral and thermal imageries	Korat Ankitkumar Ratilal (LWRE) 19AG62R16		2021
12	Flood forecasting using MIKE model and wavelet based neural networks	Manbhalang Dakermi Shylla (LWRE) 19AG62R02		2021
13	Assessment of crop nitrogen using UAV with multispectral camera	Pralipta Pani (LWRE) 18AG62R03		2020
14	Development of flood forecasting model in upper Mahanadi, Jaldhaka and Torsa basins using MIKE 11 model	Bajitborlang L Chyne (LWRE) 18AG62R01	Mr. A. K. Kharya, CE, CWC (NWA, Pune)	2020
15	Development of crop coefficient (Kc) maps for paddy using UAV based multispectral imagery	Khose Suyog Balasaheb (LWRE) 18AG62R16	Prof. D. R. Mailapalli	2020
16	Crop Condition Monitoring using Unmanned Aerial Vehicle (UAV)	Suraj Goswami (LWRE) 17AG62R08		2019
17	Crop damage assessment using Unmanned Aerial Vehicle (UAV)	Peeta Govinda Lakshmi Priya (WM) 17WM60R04		2019
18	Trends and shifts in the timing of flood peaks across Mahanadi river basin, India	Nandamuri Yamini Rama (LWRE) 17AG62R07	Prof. P. Ganguly	2019
19	Impact of climate change on streamflow in Mahanadi basin using HEC-HMS model	Sushant Kumar (LWRE) 17AG62R10	Prof. A. Pathak	2019
20	Impact of climate change on streamflow in upper Mahanadi river basin	Gavit Paurnima Vithoba (16AG62R04)	Prof. Renji Ramessan	2018
21	Development of cartosat-1 DEM for flood inundation modeling & optimal rice planning in Mahanadi delta	Abhishek Patel (16AG62R09)		2018
22	Crop condition monitoring using unmanned aerial vehicle (UAV)	Sudesh Singh Choudhary (16AG62R11)		2018
23	Statistical downscaling of Global Circulation Model generated precipitation data using machine learning algorithms	Hitesh Prasad Thakur (13AG38004)	Prof. Bhabagrahi Sahoo	2018

24	Flood inundation modelling using MIKE FLOOD and CARTOSAT-1 derived DEM	Jyoti Ranjan Swain (LWRE) (15AG62R14)		2017
25	Estimation of actual evapotranspiration using satellite remote sensing data	Utkarsh Kumar (LWRE) (15AG62R11)		2017
26	Flood forecasting in the upper reaches of Mahanadi river basin using MIKE 11 models	Amit Kumar Behera (LWRE) (14AG62R17)		2016
27	Statistical and hydrologic evaluation of satellite precipitation estimates and numerical weather forecasts at a pan-India scale	Harsh Beria (LWRE) (11AG38001)		2016
28	Hydrological modeling of IIT Kharagpur campus using MIKE URBAN model	Shivani Kalakoti (LWRE) (Roll No. 13AG62R18)		2015
29	Hydrological modeling of IIT Kharagpur campus using SWMM model	Ambarnil Panda (LWRE) (Roll No. 13AG62R14)		2015
30	Design of surface drainage system and retention cum detention pond for southern region of IIT Kharagpur campus using SWMM	Deepak Singh Bisht (LWRE), 12AG62R07		2014
31	Flood inundation modelling and design of surface drainage system of a part of IIT Kharagpur campus using MIKE FLOOD and SWMM	Pawan Upadhyay (LWRE), 12AG62R12		2014
32	Flood inundation modeling of the watershed of IIT Kharagpur using Mike 21	Manaswinee Sahoo (LWRE), 12AG62R13	Prof. R. Singh	2014
33	Evaluation of shifting characteristics of river Brahmaputra between Guwahati to Goalpara using LandSat and IRS-P6 LISS-III data	Sanjay Kumar (WM), 12WM60R04	Dr. Ranjit Galappatti, DHI	2014
34	Determination of appropriate irrigation schedule to maximize the yield and water use efficiency of Maize using CERES-Maize model	Swayam Prava Singh (LWRE), 12AG62R11	Prof. R. K. Panda	2014
35	Flood forecasting in the Mahanadi river basin using artificial neural networks	Trushnamayee Nanda (LWRE), 11AG62R13	Prof. B. Sahoo	2013
36	Effect of DEMs generated from different sources on flood inundation modelling	Banamali Panigrahi (LWRE), 11AG62R16		2013
37	PMF estimation of Nagarjunasagar dam and effect of upstream dam break on PMF	Samyadeep Ghosh (LWRE), 10AG62R11		2012

38	Trend analysis of annual extreme rainfall and flood events over Mahanadi river basin	Gouri Rani Pradhan (LWRE), 10AG62R05	Prof. A. Mishra	2012
39	Flood forecasting in Mahanadi river basin using ANFIS and bootstrap based ANFIS models	Pranmohan Kr. Suman (LWRE), 09AG6511	Dr. P. C. Nayak	2011
40	Dam break analysis of Hirakud dam using 1D and coupled 1D-2D models	Mohite Archana Ramchandra (LWRE), 09AG6508		2011
41	Probable maximum flood estimation for Nagarjunasagar Dam	Rajeev Roushan (WRDM), 08AG6509		2010
42	Flood risk modelling for optimal crop planning for delta region of Mahanadi river basin	Natkar Suraj Rajaram (SWCE), 08AG6203		2010
43	Runoff estimation using bootstrap based artificial neural networks (BANNS) and HEC-HMS model	Rucha Rajivkumar Dakave (WM), 08WM6003		2010
44	Hydrological modelling of catchments in Mahanadi river basin using ArcSWAT	Sagar Pachpande (SWCE), 08AG6207	Prof. A. Mishra	2010
45	Design flood estimation using HEC-HMS and L-Moment based regional flood frequency analysis	Siddhartha Biswas (SWCE), 07AG6212		2009
46	Development of a hybrid intelligence system combining ANN and FIS for flood forecasting	Piyush Kumar Singh (WRDM), 07AG6508	Dr. P.C. Nayak	2009
47	Flood inundation modelling and hazard assessment using satellite remote sensing and MIKE FLOOD for the delta region of Mahanadi river basin	Shete Yogesh B (SWCE), 07AG6211		2009
48	Hydrological modelling of a watershed using MIKE SHE	Vinod Sharma (SWCE), 06AG6210	Prof. R. Singh	2008
49	Flood inundation modeling using MIKEFLOOD for the Delta region of Mahanadi River basin	Shivananda Patro (SWCE), 06AG6209		2008
50	Design flood estimation using HEC-HMS	Dibyendu Samantrai (WRDM), 06AG6505		2008
51	Flood forecasting using soft computing techniques	Sagarika Rath (SWCE) 06AG6207	Dr. P. C. Nayak	2008
52	Hydrological modelling of Barakar catchment using AVSWAT-X	Bidhan Sardar (SWCE), 06AG6201	Prof. N. S. Raghuwanshi	2008
53	Hydrological modelling of Damodar catchment using AVSWAT-X	Sane Girish Achyut (SWCE), 06AG6208	Prof. N. S. Raghuwanshi	2008
54	Development of user friendly software for at-site and regional flood frequency analysis using L-moments	Pardeep Kumar (WRDM) 05AG6508		2007

55	Development of optimal water allocation scheduling using OptAll	Chandrashekhar D. Shirwadkar (WRDM) 05AG6502	Prof. R. Singh	2007
56	Performance evaluation and comparison of canal hydraulic models	Shishu Pal Kumar (SWCE), 05AG6208	Prof. R. Singh	2007
57	River flow simulation using MIKE11 and SRTM data	Manoranjan Kumar (WRDM), 05AG6507		2007
58	River flow modeling using HEC-RAS	Rajesh Meena (WRDM) 05AG6510		2007
59	Flood Inundation modeling using MIKE FLOOD and remote sensing data	Biplov Kumar Dan (WRDM), 04AG6503	Prof. N. S. Raghuwanshi	2006
60	Flood inundation simulation for the Mahanadi Delta region using HEC-RAS and GIS	Shifa T. D. (WRDM) 04AG6510	Prof. N. S. Raghuwanshi	2006
61	Flood Forecasting using Neuro-Fuzzy and Neuro-GA Models	Aditya Mukherjee (WRDM-Dual Degree) 01AG3007	Prof. N.S. Raghuwanshi	2006
62	Flood inundation simulation for the delta region of Mahanadi river basin using MIKEFLOOD	Niranjan Pramanik (SWCE), 03AG6202		2005
63	Sensitivity and uncertainty analysis of GIUH based Clark and Nash models	Mahendra Singh Lodhi (WRDM), 03AG6506		2005
64	Development of DSS for design of hydraulic ram using algebraic modeling and transient analysis	Madhav Kumar Mishra (WRDM), 03AG6202	Prof. R.K. Panda	2005
65	Development of a software for regional flood frequency analysis using L-moments	Yavarna Chandrasekhar (WRDM-Dual Degree) 00AG3007		2005
66	Some applications of the Artificial Neural Networks in the fields of hydraulics and hydrology	Manoj Raghuwanshi (WRDM), 02AG6502	Prof. N.S. Raghuwanshi	2004
67	Flood estimation using GIUH based Clark & Nash models	Bhabagrahi Sahoo (WRDM), 01AG6502	Prof. N.S. Raghuwanshi	2003

Number in Progress: 3 (Single: 3 and Joint: 0)

Sl. No.	Title of Project	Name of Student, Specialization & Roll. No.	Name of Co-Supervisor	Year
1	Flood forecasting in Mahanadi river basin using GNN models	Ashish Kumar (LWRE) 22AG62R13		On-going
2	Development of UAV based image analytics for crop condition monitoring	Telu Giri Vardhini (LWRE) 22AG62R15		On-going

3	Assessment of rainwater harvesting potential in Krishna river basin using SWAT model and high resolution Sentinel data in Google Earth Engine	Shobhit Choubey (LWRE) 22AG62R17		On-going

(c) Guidance at B.Tech Level:

Number Completed: 30

Sl. No.	Title of Project	Name of Student, Specialization & Roll. No.	Name of Co-Supervisor	Year
1	One-Dimensional (1D) unsteady flow analysis using HEC-RAS in IIT Kharagpur campus	Lakavath Aravind Kumar (19AG36019)		2023
2	Identification of small water bodies in Mahanadi River basin using Sentinel-1 SAR data from Google Engine	Ankit Sharma (19AG10006)		2022
3	Identification of small water bodies in Mahanadi River basin using Sentinel-2 data from Google Engine	Dale Rajhans Narayan (19AG10010)		2022
4	Classification of diseased and healthy paddy using CNN on UAV based multispectral imageries	Srushti Suresh Thorat (17AG36015)		2021
5	Optimal reservoir operation for flood control and flood forecasting	Jakendra Somarwal (17AG10015)		2021
6	A comparative analysis between extreme gradient boosting and light gradient boosting for real time flood forecasting	Monica Marmit (16AG36006)		2020
7	Real time flood and temperature forecasting using ensemble learning and prophet model	Shubham Patidar (16AG36008)		2020
8	Dynamic neural network model integrated with DWT and MODWT algorithms for real time flood forecasting using different rainfall products	Devjyoti Chandra (15AG36009)		2019
9	Flood forecasting using Recurrent Neural Networks and Gradient Boosting Regressor	Tanay Jagani (15AG36017)		2019
10	Flood forecasting using Support Vector Regression (SVR) and Recurrent Neural Network (RNN)	Prem Shankar (14AG10020)		2018
11	Flood forecasting using seasonal autoregressive integrated moving average model with exogenous inputs	Sudhanshu Vashisht (14AG10030)		2018

12	Flood forecasting using random forest and gradient boosting algorithm	Shubham Sonu (05AG1011)		2018
13	Analysis and simulation of water distribution piping system of IIT Kharagpur campus	Rachit Madhukar (13AG3FP05)		2017
14	Analysis and simulation of water distribution piping system of IIT Kharagpur campus	Vardhman Chhajed (13AG36011)		2017
15	Comparison of random forest and artificial neural network approach for flood forecasting	Vikas Kumar (12AG32002)		2016
16	Flood forecasting using support vector machines	Anil Kumar Jangid (12AG10007)		2016
17	Bivariate flood frequency analysis using copula method	Yash Singh Chauhan (11AG32017)		2015
18	Flood frequency analysis using copula	C R Sandeep (11AG10013)		2015
19	Estimation of crop coefficient from remotely sensed images to improve irrigation scheduling in India	Nayan Mallick (11AG32008)		2015
20	Regional flood frequency analysis of Mahanadi subzone by L-moments and ANN	Ashutosh Kumar Agarwal (11AG10009)		2015
21	Development of a GUI based software for real time flood estimation using TRMM precipitation data	Pranjal Kumar Raut (11AG32007)		2015
22	Development of software for climate change studies using ANN-based coupled VIC model	Sameer Ranjan Rana (11AG32009)		2015
23	Development of a mobile application for flood forecasting in India	Ramendra Prasad (11AG10026)		2015
24	Temporal and spatial trend analysis of rainfall for Mahanadi basin	Kumar Raj (10AG10016)		2014
25	Temporal trends in rainfall in Kharagpur and surrounding areas	Bipasha (10AG1000)		2014
26	Development of a GIS database for Mahanadi river basin	Rohan Jain (08AG1016)		2012
27	Comparison of MOENN, ANFIS and BNN for flood forecasting	Amal Kant (07AG3304)		2011
28	Bivariate flood frequency analysis using Gumbel Hougaard method for copula computation	Akshay Sogani (06AG1020)		2010
29	Bivariate flood frequency analysis using Ali-Mikhail-Haq copula method	Rohit Singh (06AG3809)		2010
30	Development of software for at-site flood frequency analysis using method of MOM and MML	Biranchi Prasad Sahoo (05AG1011)		2009

Annexure-VI

Collaborations and Visits Abroad

(a) Collaborations:

1. Research collaboration with "Institute of Earth-and Environmental Sciences, University of Potsdam, Germany" (Collaborators: Prof. Axel Bronstert, Dr. Gerd Bürger, Ms Lisei Koehn) in a project funded by Deutsche Forschungsgemeinschaft (DFG) – (i) Publication of research papers in high impact journals, (ii) Development of collaborative research proposals, and (iii) Developed a flood forecasting model for Mahanadi river basin.

2. Research collaboration with "Department of Biological Systems Engineering, Virginia Tech, Blacksburg, Virginia, USA (Collaborator: Prof. V. Sridhar) - (i) Publication of research papers in high impact journals, (ii) Development of collaborative research proposals.

(b) Visits Abroad:

1. Institute of Earth and Environmental Science, Potsdam University, Germany during May 2005 to July 2006 for conducting Post-Doctoral research in the area of 'Flood Modeling' as an Alexander-von-Humboldt Research Fellow.

2. Civil and Environmental Engineering Section (GITS Sediment Transport Research Group), Universitat Politècnica de Catalunya, Barcelona, Spain during April 2006 for conducting Post-Doctoral research in the area of 'Flood Modeling' as an Alexander-von-Humboldt Research Fellow.

3. Adelaide, Australia (03-10 October, 2022) to present research paper entitled "Quantitative and spatial-scale Water-Energy-Food nexus analysis in India – Insight from implemented policies" in the 24th International Commission on Irrigation & Drainage (ICID) Congress & 73rd IEC meeting at Adelaide, Australia.

4. Colombo, Sri Lanka (3-7 January, 2016) to present paper in an International Conference organized by ASCE and EWRI.

5. Potsdam University, Germany (2-9 September, 2012) to participate in a workshop to develop a BMBF and DST sponsored collaborative project.

6. Singapore (4-6 January, 2011) to present paper in International Conference on Water Resources and the Environment (IPWE 2011).

7. Pattaya, Thailand (31 March - 1 April, 2011) to present paper in International Conference on Agricultural Engineering.

8. Wageningen University, Netherlands and Potsdam University, Germany (28 May to 19 June, 2011) to carry out research work for European Union project and to participate in a workshop.

Annexure-VII

Conferences/Short-Term Courses Organized

(a) Seminar/Conference/Workshop Organized:

1. First Indo-German Workshop on "HydroRiceTech" at IIT Kharagpur in 2010.

2. Workshop on "Climate change impacts on agriculture and water resources & adaptation strategies" at IIT Kharagpur in 2010.

3. International Conference on "Food Security and Environmental Sustainability (FSES-2009)" at IIT Kharagpur in 2009.

4. A one day Seminar on "Shifting characteristics of rivers using remote sensing" at the Centre for Flood Management Studies, National Institute of Hydrology, Patna on May 02, 2003.

5. A five day training Workshop on "Processing of surface water data" at Centre for Flood Management Studies, National Institute of Hydrology, Patna from January 07-11, 2002.

6. A three day training Programme on "Organization and methods" in collaboration with Ministry of Water Resources, Govt. of India, at the Centre for Flood Management Studies, National Institute of Hydrology, Patna from November 08-10, 2001.

7. A five day training Workshop on "Application of remote sensing and GIS in hydrology and water resources" at Ganga Plains North Regional Centre, National Institute of Hydrology, Patna from August 03-07, 1998.

(b) Short-Term Courses Organized:

1. International Short-term course on "Advanced Training in Land and Water Resources Engineering" for BE students of Tribhuvan University, Nepal from 20 to 22 June, 2019 (Sponsorship Amount: Rs. 3.4 lakh)

2. International Short-term course (International Summer and Winter Term (ISWT)) on "Modeling River Catchment Interactions" from 01 to 12 June, 2015 (Sponsorship Amount: Rs. 3 lakh)

3. International Short-term course (International Summer and Winter Term (ISWT)) on "Geospatial Technologies in Hydrological Modelling" from 16 to 27 June, 2014 (Sponsorship Amount: Rs. 3 lakh)

Annexure-VIII

Administrative Activities

(a) Institute Administrative Activities:

1. Professor-in-Charge, Institute's Water Works, 2016-2019
2. Professor-in-Charge, Institute's Sanitation, 2016-2019
3. Member of Institute's "Campus Master Plan Committee (CMPC)", 2016-2019
4. Advising Civil Construction and Maintenance Section on "Drainage Plan" of IIT Kharagpur campus, 2015 till date
5. Senate Nominee, Central Library Advisory Committee, 2015-2017
6. Question paper setter for GATE 2009, 2010, 2014, 2019, 2020
7. Rector nominee, Gymkhana, 2011-2012
8. Centre-in-charge, Examination Centre for conducting JEE, 2005, 2007-2012
9. Centre-in-charge, Examination Centre for conducting GATE, 2007-2009, 2011, 2013
10. Assistant Warden, Meghnad Saha Hall of Residence, 2007-2009

(b) Departmental Administrative Activities:

At IIT Kharagpur

1. Chairman, Under Graduate (UG) Committee, 2020 till date
2. Chairman, Space Committee, 2020 till date
3. Chairman, New Curriculum Committee, 2021
4. Member, Departmental Administrative Committee (DAC), 2006, 2020 till date
5. Member, Departmental Academic Committee (UG), 2017-2020
6. Member, Departmental Faculty Recruitment Committee, Agricultural and Food Engineering Department, 2017-2020
7. Member, Departmental Faculty Recruitment Committee, Center for Rural Development and Innovative Sustainable Technology, 2017-2020
8. Member, Departmental Faculty Recruitment Committee, School of Water Resources, 2015 till date
9. Chairman, Non-Faculty Scrutiny Committee, 2018-2019
10. Prof-in-Charge, PG Tabulation, 2017-2020
11. Co-coordinator, Agri-Expo, 2015-2016
12. Faculty Co-ordinator, "Project based learning", 2016
13. Member, Departmental Academic Committee (Post-Graduate Research), 2006-2013
14. Member Secretary, Departmental Administrative Committee (PG), 2008-2010
15. Faculty advisor, M.Tech. (Land and Water Resources Engineering), 2010-2013
16. Faculty advisor, Dual Degree (MBA), 2010
17. Faculty advisor, Dual Degree (WRDM), 2010
18. Faculty advisor, M.Tech. (Soil and Water Conservation Engineering), 2009
19. Member, "Sustain-Aqua 2007", 2007
20. Member, "ICFOST-2007", 2007

21. Member, “EDART-2008”, 2008
22. Member, “ACOSINE-2007”, 2007
23. Member, “Krishi O Khadya Mela”, 2005
24. Member, “ETAE-2004”, 2004.

At Centre for Flood Management Studies, NIH, Patna

25. Drawing and Disbursing Officer, 2003-2004
26. Scientist-in-Charge, Remote Sensing Laboratory, 1998-2003
27. Scientist-in-Charge, Computer Laboratory, 1998-2003

(c) Students’ Administrative Activities:

1. Prof-in-Charge, Agricultural Engineering Society (AES), 2008-2020
2. Prof-in-Charge, "PRAKRITI" – A student fest organized by "AES", 2015-2020
3. Member, Gymkhana Elections, 2012
4. Member, Inter IIT Sports Meet Committee at IIT Kharagpur, 2011
5. Observer, Gymkhana Elections, 2010-2011
6. Member, Spring Fest, 2007, 2009
7. Co-chairman, Kshitij, 2008
8. Member, Kshitij, 2007
9. Member, Inter IIT Sports Meet Committee at IIT Guwahati, 2007

Annexure-IX

Other Professional Activities

(a) Members in Committees/Professional Bodies:

1. Member of Assessment/Selection Committee for the recruitment of Scientists in the Institute for Climate Change Studies (ICCS), Kottayam, Kerala constituted by Kerala State Council for Science, Technology and Environment (KSCSTE), 2023

2. Convener of the Committee for revising syllabus of 'Agricultural Engineering and Technology' discipline for Agricultural Research Service (ARS) examination conducted by the Indian Council of Agricultural Research (ICAR), 2022

3. Member of Assessment Committee for the Assessment Promotion for Scientist upto 'F' in Centre for Water Resources Development and Management (CWRDM), Kozhikode, constituted by Kerala State Council for Science, Technology and Environment (KSCSTE), 2021-2022

4. Member of High Level Expert Committee on "Flood Management" formed by 'Flood Management Improvement Support Centre (FMISC)' Water Resources Department, Govt. of Bihar, 2011-2014

5. Member of Board of Studies of Agricultural Engineering under the Faculty of Engineering for Curriculum Development of B.Tech. (Agricultural Engineering) for Biju Patnaik University of Technology, Odisha, 2019-2021

6. Member of the following professional bodies:
   - ✓ Life Member: International Association of Hydrological Sciences (IAHS), Wallingford, U.K. (Membership No. 2318)
   - ✓ Life Member: Indian Society of Remote Sensing (ISRS), Dehradun, India (Membership No. L-1872)
   - ✓ Life Member: Indian Society for Hydraulics (ISH), Pune, India (Membership No. LM/351)
   - ✓ Life Member: Indian Association of Hydrologists (IAH), Roorkee, India (Membership No. LM-1064)

(b) Reviewer of Journals:

1. Journal of Hydrology, Elsevier
2. Water Resources Research, AGU
3. Advances in Water Resources, Elsevier
4. Journal of Hydrologic Engineering, ASCE
5. Journal of Geophysical Research, AGU
6. Hydrological Processes, John Wiley and Sons Ltd.
7. Water Resources Management, Springer

8. Journal of Flood Risk Management, John Wiley and Sons Ltd.
9. Neural Computing and Applications, Springer
10. CATENA, Elsevier
11. Journal of Hydroinformatics, IWA
12. Journal of Environmental Management, Elsevier
13. Journal of Water and Climate Change, IWA Publishing
14. Biosystems Engineering, Elsevier
15. Hydrology Research, IWA
16. Computers & Geosciences, Elsevier
17. Journal of Indian Society of Remote Sensing, Springer

(c) PhD Thesis Examined:

1. Ph.D. thesis entitled “Flash Flood Vulnerability, Susceptibility & Modeling for Himalayan Mountain River Basins in Uttarakhand” of the Department of Water Resources Development and Management, Indian Institute of Technology Roorkee in 2023.

2. MS thesis entitled “Analysis of Compound Dry and Hot Events Over the Indian Sub-continent” of the Department of Civil Engineering, Indian Institute of Technology Palakkad in 2023.

3. PhD thesis entitled “A Comprehensive Analysis of Extreme Climate Events over India Focusing on Precipitation Extremes and Heatwaves” of the Environmental Science and Engineering Department, Indian Institute of Technology Bombay in 2022.

4. Ph.D. thesis entitled “Hydrologic Characteristic Analysis in Glacierized Basin Considering Climate Impact, Land Use Changes and Elevation Dependent Behaviour of Meteorological Data” of the Department of Water Resources Development and Management, Indian Institute of Technology Roorkee in 2022.

5. PhD thesis entitled “A Novel "safe-fail" Framework for the Design of Urban Storm Sewers with Minimal Flood Consequences” of the Department of Civil Engineering, Indian Institute of Technology Madras in 2022.

6. PhD thesis entitled “Risk Assessment and Mitigation Strategies for Urban Floods under Climate Change” of the Department of Civil Engineering, Birla Institute of Technology and Science, Pilani (Hyderabad) in 2022.

7. Ph.D. thesis entitled “Comprehensive Hydrologic Impact Assessment of Land Use/ Land Cover and Climate Change” of the Department of Water Resources Development and Management, Indian Institute of Technology Roorkee in 2021.

8. PhD thesis entitled “Improved Parameterization in Hydrological Models for better Simulations” of the Department of Civil Engineering, Indian Institute of Technology Madras in 2021.

9. PhD thesis entitled “Climate Extreme Studies in Changing Climate over India” of the Department of Hydrology, Indian Institute of Technology Roorkee in 2021.

10. PhD thesis entitled “Hydro-meteorological Simulations and Projections under Changing Environments” of the Department of Civil Engineering, Indian Institute of Technology Bombay in 2020.

11. PhD thesis entitled “Streamflow and Soil Moisture Forecasting with Hybrid Data Intelligent Machine Learning Approaches: Case Studies in the Australian Murray-Darling Basin” of the University of Southern Queensland, Australia in 2018.

12. PhD thesis entitled “Climate Change Studies over parts of India” of the Department of Hydrology, Indian Institute of Technology Roorkee in 2018.

13. PhD thesis entitled “Development of a Spatially Distributed Snowmelt Runoff Model and its Application in an Eastern Himalayan Watershed under Projected Climate Scenarios” of the Department of Agricultural Engineering, North Eastern Regional Institute of Science and Technology, Nirjuli in 2018.

14. MS thesis entitled “Potential of Graphical Modelling Approach in Multivariate Hydroclimatic Applications: Analysis and Forecasting” of the Department of Civil Engineering, Indian Institute of Technology Kharagpur in 2018.

15. MS thesis entitled “GIS based Landslide Susceptibility Mapping in Darjeeling-Sikkim Himalaya with a view to Understanding Slope Failure Mechanism under both Static & Dynamic Loading” of the Department of Geology and Geophysics, Indian Institute of Technology Kharagpur in 2018.

16. PhD thesis entitled “Calibration of Hydrologic Model Using Remotely Sensed Land Surface Variables” of the Department of Infrastructure Engineering, The University of Melbourne, Australia in 2017.

17. PhD thesis entitled “Statistical Downscaling and Assessing Uncertainty for Regional Projections of Indian Monsoon” of the Department of Civil Engineering, Indian Institute of Technology Bombay in 2016.

18. Ph.D. thesis entitled “Watershed Sustainability Index Framework and its Estimation for a Watershed” of the Department of Water Resources Development and Management, Indian Institute of Technology Roorkee in 2016.

19. PhD thesis entitled “Geoinformatics based Spatial Decision Support System for Flood Disaster Management in Urban and Peri Urban Areas” of CEPT University, Ahmedabad in 2015.

20. PhD thesis entitled “Flood Estimation and Forecasting in Mahanadi River Basin using Soft Computing Techniques” of the Department of Hydrology, Indian Institute of Technology Roorkee in 2011.

(d) Invited Lectures:

1. Keynote Lecture on “Recent advances in mathematical modeling for flood risk management” in an International Conference on Climate and Weather-related Extremes (ICCWE- 2022) organized by IIT Roorkee from 19th to 20th September 2022.

2. Lecture on “Application of RS and GIS for drainage planning of township and industrial areas” in a training programme (online) on "Mine Closure & Post Mining Liability Management: Remote Sensing, GIS and Photogrammetry based Planning & Monitoring" organized by Department of Mining Engineering, IIT Kharagpur during 24-28 January 2022.

3. Key note address on “Recent advances in mathematical modeling for flood risk management” in a National Webinar on “Floodplain analysis and mapping” organized by Department of Civil Engineering, The National Institute of Engineering, Mysuru in association with DHI on 8th October 2021.

4. Key note address on “Recent advances in mathematical modeling for flood risk management” in an International Conference (online) on “Recent Advances in Civil Engineering for Sustainable Development (RACESD-2021)” organized by Department of Civil Engineering, Maulana Azad National Institute of Technology, Bhopal during 13-14 February 2021.

5. Lecture on “Application of RS and GIS for drainage planning of township and industrial areas” in a training programme (online) on "Mine Closure & Post Mining Liability Management: Remote Sensing, GIS and Photogrammetry based Planning & Monitoring" organized by Department of Mining Engineering, IIT Kharagpur during 18-22 November 2020.

6. Lecture on “Reservoir sedimentation survey” in a training course on “Hydrologic and Sediment Monitoring” organized by Damodar Valley Corporation, Soil Conservation Department, Hazaribagh in August, 2008.

7. Lecture on “Application of remote sensing and GIS in watershed and flood management” in a training course on “Application of Geomatics in Soil Conservation” organized by Damodar Valley Corporation, Soil Conservation Department, Hazaribagh in December 2008.

8. Lecture on “Irrigation Water Measurement” in “Advanced Training in Agricultural Engineering (ATAE 2005)” for final year BE students of Tribhuvan Univ., Nepal organized at IIT Kharagpur (every year during June 2005-2017).

9. Lecture on “Application of remote sensing and GIS in hydrological evaluation” in a training course on “Hydrologic and Sediment Monitoring” organized by Damodar Valley Corporation, Soil Conservation Department, Hazaribagh on 21 August 2004.

10. Lecture on “Use of GIS, remote sensing in flood management” in a training program on “Flood Forecasting and Management” organized by WALMI, Patna on 30 January 2003.

11. Lecture on “Role of remote sensing and GIS in flood management” in a training program on “Flood Forecasting and Management” organized by WALMI, Patna on 09 November 2001.

12. Lecture on “Role of remote sensing and GIS in flood management” in a training course on “Flood forecasting and management” organized by WALMI, Patna on 22 March 2001.

13. Lectures on “Ground truth data collection for remote sensing and data analysis” and “Application of remote sensing for land use and land cover mapping” in a training workshop on “Application of remote sensing and GIS in hydrology and water resources” organized by GPNRC, NIH, Patna during 03-07 August 1998.

(e) Trainings Received:

1. Advanced training program on “MIKE 11” organized by Danish Hydraulic Institute, Water and Environment, Denmark at Central Water Commission, New Delhi during 01-03 February 2005.

2. 11-week training course on “Remote sensing and GIS” at National Remote Sensing Agency, Hyderabad during 24 July to 5 October 2000.

3. 5-day training course on “Use of DELPHI computer programming software” organized by MOWR at CWPRS, Pune during 11-15 February 2002.

4. 3-day training course on “ERDAS Imagine 8.5” at NIH, Roorkee during 10-12 December 2001.

5. 5-day training course on “ERDAS IMAGINE 8.3.1” at NIH, Roorkee during 27 April to 02 May 1998.