

# **Dr. Anupma Kumari**

## **Present Address**

**Environmental Biology Laboratory  
Department of Zoology  
Patna University, Patna  
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[:anupmakumari10@yahoo.com](mailto:anupmakumari10@yahoo.com)**

**Gender : Female  
DOB : 30<sup>th</sup> Dec 1968**

## **Academic Qualification**

- 2015-Present Associate Professor
- 2012-2015 Reader
- 2007-2012 Senior Assistant Professor
- 2003-2007 Assistant Professor
- 1996-2001 Ph.D. in Zoology, Patna University, Patna
- 1989- 1991 M.Sc. ( Zoology), Department of Zoology, P.U. Patna
- 1986-1989 B.Sc. Hon's (Zoology), Patna Science College, P.U. Patna

## **Fellowship and Eligibility for Lectureship**

- Qualified GATE (graduate test of engineering), 1996 and awarded fellowship by University Grants Commission, Delhi.
- Senior Research Fellowship – 1998 to 2000
- Junior Research Fellowship – 1996 to 1998
- Qualified BET (Bihar Eligibility Test) accredited by University Grants Commission, Delhi, 1996 for eligibility of lectureship in Zoology
- Held First position in the list recommended by Bihar State University (Constituent Colleges) Service Commission, Patna for appointment as lecturer in Department of Zoology in the year 2003.
- Joined as Lecturer in Department of Zoology, PU, Patna 26.06.2003
- Member in National Dolphin Research Center, P.U. Patna

## RESEARCH EXPERIENCE

- Analysis of organochlorine pesticide in water and sediment sample (1997), Central Pollution Control Board, New Delhi.
- Analysis of organochlorine pesticide in Biological sample (1998), Industrial Toxicological Research Center, Lucknow.
- Analysis of physico-chemical parameters of surface water and ground water samples (2000), Environmental Biology Laboratory, Department of Zoology, Patna University, Patna
- Estimating toxic metals in water, sediment and biological samples of aquatic ecosystems (2001), Environmental Biology Laboratory, Department of Zoology, Patna University, Patna
- Hydrogeochemical analysis of surface water and ground water using physic-chemical parameters.

## INSTRUMENTS AND SOFTWARE HANDLED

- Trained in analysis of toxic metals in different components of aquatic ecosystems using Atomic Absorption Spectrophotometer.
- Trained in analysis of mercury in different components of aquatic ecosystems using Mercury analyser.
- Trained in analysis of cations and anions of water samples using UV-Visible Spectrophotometer and Flame Photometer.
- Sound Knowledge of various softwares such as Excel, SPSS, XL-Stat etc.

## LIST OF RESEARCH PAPER PUBLISHED

1. Saima Anjum, **Anupma Kumari**. Evaluation of Noise Pollution in Bengaluru city, India during Covid-19 pandemic. Accepted in Archives of Acoustics, Vol.47, Issue 2, 2022, **Impact factor 0.913**.
2. Mohammad Masroor Zafar, Mohammed Aasif Sulaiman, Ravi Prabhakar, **Anupma Kumari**. Evaluation of the suitability of groundwater for irrigational purposes using irrigation water quality indices and geographical information systems (GIS) at Patna (Bihar), India. Accepted in International Journal of Energy and Water Resources (**Springer Publication**), 2022.
3. Mohammed Aasif Sulaiman, Mohammad Masroor Zafar, Nishat Afshan, **Anupma Kumari**. Impact of Lockdown on Air Pollutants during COVID-19 at Patna, India. Asian Journal of

Atmospheric Environment. Vol. 15(4), 62-77, (2021), ISSN (online) 2287-1160, ISSN (Print): 1976-6912, **Impact Factor 2.0**.

4. **Anupma Kumari**, Samir Kumar Sinha, Nipunika Rani, Ravindra Kumar Sinha. Assessment of heavy metal pollution in water, sediment, and fish of the river Ganga at Varanasi, India. *Arabian Journal of Geosciences*. Vol. 14, (2021), Electronic ISSN: 1866-7538, Print ISSN: 7866-7511, **Impact factor 1.827**.
5. Nipunika Rani, **Anupma Kumari**, R. K. Sinha. Designing a river water quality monitoring network using multivariate analytical techniques: A case study of the Ganga River, India. *ISER International Conference Patna*, (2020).
6. Neetu, **Anupma Kumari**, Ravi Prabhakar, Dilip Kumar Kedia, Ravindra Kumar Sinha. Rotifers Abundance, Species Composition and Temporal Distribution in a Sewage Fed Fish Pond at Pahari, Patna. *Environment and Ecology*. Vol. 38(2), 140-151, (2020), ISSN: 0970-0420.
7. Ravi Prabhakar, **Anupma Kumari**, Neetu, Ravindra Kumar Sinha. Impact of Sand Mining on Zooplankton of River Ganga in and Around Patna, Bihar, India. *Environment and Ecology*. Vol. 37(4A), 1301-1308, (2019), ISSN: 0970-0420.
8. Neetu, **Anupma Kumari**, Dilip Kumar Kedia, Ravindra Kumar Sinha. Assessment of Benthic Macro-Invertebrates to Assess Water Quality of Treated Sewage Fed Pond at Pahari, Patna. *Environment and Ecology*. Vol. 37(4A), 1380-1389, (2019), ISSN: 0970-0420.
9. Ramesh Kumar, Rajesh Kumar, Atar Singh, Ravindra Kumar Sinha, **Anupma Kumari**, Akhilesh Gupta, Jagvir Singh. Distribution of trace metal in Shaune Garang catchment: evidence from particles and nanoparticles. *Materials Today: Proceedings*. Vol. 15, 586- 594, (2019), ISSN: 2214-7853, **Impact Factor 1.24**.
10. Ramesh Kumar, Rajesh Kumar, Atar Singh, Shaktiman Singh, Anshuman Bhardwaj, **Anupma Kumari**, Ravindra Kumar Sinha, Akhilesh Gupta. Hydro-geochemical analysis of meltwater draining from Bilare Banga glacier, Western Himalaya. *Acta Geophysica*. Vol. 67, 651-660, (2019), Electronic ISSN: 1895-7455, Print ISSN: 1895-6572, **Impact Factor 2.058**.
11. Rajesh Kumar, Ramesh Kumar, Shakti man Singh, Atar Singh, Anshuman Bhardwaj, **Anupma Kumari**, S.S Randhawa, Ashok saha. Dynamics of suspended sediment load with respect to summer discharge and temperatures in Shaune Garang glacierized catchment, Western Himalaya. *Acta Geophysica*. Vol. 66, 1109-1120, (2018), Electronic ISSN: 1895-7455, Print ISSN: 1895-6572, **Impact Factor 2.058**.
12. Ramesh Kumar, Rajesh Kumar, Atar Singh, Ravindra Kumar Sinha, **Anupma Kumari**. Nanoparticles in glacial melt water. *Materials Today: Proceedings*. Vol. 5, 9161-9166, (2018), ISSN: 2214-7853, **Impact Factor 1.24**.
13. **Anupma Kumari**, A. K. Singh, G. P. Purusharthi, Samir Sinha, Ravindra Kumar Sinha. Avian Diversity of the River Ganges and Gandak in the Stretch of Bihar, India. *Rivers for Life: Proceedings of the International Symposium on River Biodiversity: Ganges-Brahmaputra-Meghna River System*. 84-97, (2014).
14. Ravindra Kumar Sinha, Dilip Kumar Kedia, **Anupma Kumari**. Overview of Higher Vertebrates in the Ganges-Brahmaputra-Meghna River Basin: Their Status, Threats and Conservation. *Rivers for Life: Proceedings of the International Symposium on River*

Biodiversity: Ganges-Brahmaputra-Meghna River System. 105-123, (2014).

15. Shaishta Jabeen, S. Madhuja & **Anupma Kumari**. Residential traffic exposure and pregnancy related birth outcomes- a prospective birth cohort study. IRIS- Journal for Young Scientists, 10-14,(2011), Print ISSN: 2278-618X, Online ISSN: 2278-6384.
16. Preeti Singh, Neelam Rani, Deepti Shahi & **Anupma Kumari**. Study on the Animal behavior of *Macaca mulatta*, *Macaca silenus*, *Selenarctos thibetanus* and *Melursus ursinus* at Sanjay Gandhi Biological Park, Patna. IRIS- Journal for Young Scientists, Vol. 2, 28-32 (2012), Print ISSN: 2278-618X, Online ISSN: 2278-6384.
17. Shalini, Arsha Fatima, & **Anupma Kumari**. Respiratory symptoms in children living near busy road and their Relationship to Vehicular Traffic, Explore, Vol. 3, 9-12, (2011), Online ISSN: 2278-6414, Print ISSN: 2278-0297.
18. Namrata Mehta, Renuka Kumari, & **Anupma Kumari**. Impact of Socio-economic condition on the birth weight in Children, IRIS, Vol. 1, 15-18, (2011), Print ISSN: 2278-618X, Online ISSN: 2278-6384.
19. **Anupma Kumari**, Kakoli Ghosh Roy, Supriya Nath, Nisha Gupta, Puja Pallavi, Shreya Singh, Sweta Kumari, Shahla Yasmin, Nidhi Rastogi. Occupational Health Hazards in Painters, Journal of Ecophysiology and Occupational Health. Vol. 10, 129-133, (2010), Online ISSN: 0974-0805, Print ISSN: 0972-4397, **Impact factor 0.68**.
20. Shahla Yasmin, Garima, Jyoti, Nidhi Rastogi, **Anupma Kumari**, Doris D'Souza. Haematological Biomarker Detection of Occupational Health Hazards in X-Ray Technicians. The Bio Scan. Vol. 4 (3), 409-412, (2009), Print ISSN: 0973-7049.
21. Ravindra Kumar Sinha, Samir Sinha, Dilip Kumar Kedia, **Anupma Kumari**, Nipunika Rani, Gopal Sharma, K. Prasad. A holistic study on mercury pollution in the Ganga River system at Varanasi, India. Current Science. Vol. 92(9), 1223-1228, (2007), ISSN: 0011-3891, **Impact Factor 1.102**.
22. **Anupma Kumari**, R K Sinha, Krishna Gopal, Swarn Lata. Concentration of organochlorines in Ganges River dolphins from Patna, Bihar. Journal of Environmental Biology. Vol. 23(3), 279-281, (2002), Online ISSN: 2394-0379, Print ISSN: 0254-8704, **Impact Factor 0.781**.
23. **Anupma Kumari**, R.K Sinha, Krishna Gopal. Organochlorine contamination in the fish of River Ganges, India. Aquatic Ecosystem Health and Management. Vol. 4(4), 505-510, (2001), Online ISSN: 1539-4077, Print ISSN: 1463-4988, **Impact Factor 0.86**.
24. **Anupma Kumari**, Ravindra Kumar Sinha, Krishna Gopal. Quantitative Estimation of DDT Residues in Some Freshwater Fishes of River Ganga at Patna, Bihar. Environment & Ecology. Vol. 19(2), 396-399, (2001), ISSN: 0970-0420.
25. **Anupma Kumari**, Ravindra Kumar Sinha & Krishna Gopal. Concentration of Organochlorine Pesticides Residues in Ganga Water in Bihar, India. Environment & Ecology. Vol. 19(2), 351-356, (2001), ISSN: 0970-0420.
26. **Anupma Kumari**, Ravindra Kumar Sinha & Krishna Gopal. Concentration of HCHs in the Sediments Samples from the River Ganges in Bihar., India. Research Journal of Chemistry and Environment. Vol. 5(1), (2001), Electronic ISSN: 2278-4527, Print ISSN: 0972-0626, **Impact factor: 0.247**.
27. **Anupma Kumari**, Ravindra Kumar Sinha & Krishna Gopal, K. Prasad. Dietary Intake of

Persistent Organochlorine Residues through Gangetic Fishes in India. International Journal of Ecology and Environmental Science. Vol. 27, 117-120, (2001), Online ISSN: 2320-5199, Print ISSN: 0377-015X.

## **List of Paper Published in Proceedings**

1. **Anupma Kumari**, Mohammed Aasif Sulaiman, Mohammed Masroor Zafar, Ravindra Kumar Sinha. Multivariate statistical analysis for the assessment of hydrogeochemical characteristics of River Ganga at Patna, India. Accepted in Proceedings of the Mediterranean Geosciences Union, Istanbul, 25-28 November, 2021.
2. **Anupma Kumari**, Mohammed Aasif Sulaiman, Mohammed Masroor Zafar, Ravindra Kumar Sinha. Assessment of ecological quality based on benthic macro-invertebrates assemblage in River Ganga, Patna using multivariate analysis, Accepted in Proceedings of 3<sup>rd</sup>Euro-Mediterranean Conference for Environmental Integration, Tunisia, 10-13 June, 2021
3. **Anupma Kumari**, A. K. Singh, G. P. Purusharthi, Samir Sinha, Ravindra Kumar Sinha. Avian Diversity of the River Ganges and Gandak in the Stretch of Bihar, India. Rivers for Life: Proceedings of the International Symposium on River Biodiversity: Ganges- Brahmaputra-Meghna River System. 84-97, (2014).
4. Ravindra Kumar Sinha, Dilip Kumar Kedia, **Anupma Kumari**. Overview of Higher Vertebrates in the Ganges-Brahmaputra-Meghna River Basin: Their Status, Threats and Conservation. Rivers for Life: Proceedings of the International Symposium on River Biodiversity: Ganges-Brahmaputra-Meghna River System. 105-123, (2014).

## **List of Paper Published in Book chapter**

1. Assessment of Heavy metals pollution in the sediment of the River Ganga at Varanasi, India, ASTI Series, Springer Publication.

## **Editor of e-book**

1. Basics of Air Pollution, ISBN: 9798886413199, Notion Press

## **RESEARCH AND GUIDANCE**

### **PhD awarded**

**Name** – Ravi Prabhakar

**Title of Thesis-** Impact of sand mining on Ecology of River Ganga in Bihar

**Date of Award-** 29-09-2020

### **P.G.Dissertation Awarded**

## **LIST OF DISSERTATION WORK**

1. Sandhya and Vishal Kumar. **Assessment of Catch Per Unit Effort and Abundance of Fish in River Ganga, Patna.** Session: 2019-2021.
2. Kajal Farhin. **Assessment of Physico-Chemical Parameters of Mangal Talab at Patna City, Bihar.** Session: 2019-2021.
3. Zainab Fatma. **Assessment of Nutrient Loading in Mangal Talab at Patna City, Bihar.** Session: 2019-2021.
4. Ashwani Pathak and Prashant Raj. **Availability of Commercially Important Fishes in River Ganga and Socio-Economic Condition of Fishermen at Patna, Bihar.** Session: 2019-2021.
5. Durgesh Nandni. **Assessment of Benthic Macro-Invertebrates as Indicator Organism of Water Quality in Mangal Talab, Patna.** Session: 2019-2021.
6. Prity Nishad. **Assessment of Zooplankton Species as Indicator of Water Quality in the Mangal Talab, Patna (Bihar).** Session: 2019-2021
7. Neha Tabassum. **Effect on ozone concentration during lockdown in Patna.** Session: 2018-2020. Degree Awarded:08.03.2021.
8. Shaista Naaz. **Effect of COVID-19 on human beings.** Session: 2018-2020. Degree Awarded:08.03.2021.
9. Richa Thakur. **Effect of COVID-19 on aerosol concentration.** Session: 2018-2020. Degree Awarded:08.03.2021.
10. Saumya Narayan. **Effect of COVID-19 pandemic on biomedical waste production and management in India.** Session: 2018-2020. Degree Awarded:08.03.2021.
11. Priya Kashyap. **Changes in concentration of major air pollutants in European countries during COVID-19.** Session: 2018-2020. Degree Awarded:08.03.2021.
12. Sofiya Yasmeen. **Effect of COVID-19 on air quality of India.** Session: 2018-2020. Degree Awarded: 08.03.2021
13. Dabshan Chandini.**Effect of COVID-19 on fauna.** Session: 2018-2020. Degree Awarded:08.03.2021

14. Suhani Shradha. **Effect of COVID-19 lockdown on physico-chemical characteristics of river Ganga at Patna.** Session: 2018-2020. Degree Awarded: 08.03.2021.
15. Mohammad Masroor Zafar. **Physico-chemical characteristics of groundwater away from the bank of river Ganga in Patna.** Session: 2017-2019. Degree Awarded: 02.08.2019.
16. Mohammed Aasif Sulaiman. **Physico-chemical characteristics of groundwater along the bank of river Ganga in Patna.** Session: 2017-2019. Degree Awarded: 02.08.2019.
17. Deepshikha. **Physicochemical analysis of different soil sample.** Session: 2017-2019. Degree Awarded: 02.08.2019.
18. Shalvika Nanda. **Determination of physico-chemical parameters of three different sites of Ganga and three different ponds of Patna.** Session: 2017-2019. Degree Awarded: 02.08.2019.
19. Umme Tahira Waris. **Estimation of Dissolved Oxygen, Biochemical Oxygen Demand and Chemical Oxygen Demand in Ganga river and pond waters of Patna.** Session: 2017-2019. Degree Awarded: 02.08.2019.
20. Madhumita. **Physicochemical analysis of different soil samples.** Session: 2016-2018. Degree Awarded: 25.07.2018.
21. Khushboo Rani. **Qualitative and quantitative study of rotifers (zooplankton) in the river Ganga at Patna (Bihar).** Session: 2016-2018. Degree Awarded: 25.07.2018.
22. Monika Kumari. **Qualitative and quantitative analysis of benthic macro-invertebrate in river Ganga.** Session: 2016-2018. Degree Awarded: 25.07.2018.
23. Manisha Gupta. **Determination of nitrite, sulphate and phosphate by spectrophotometer in Ganga river at Patna (Bihar).** Session: 2016-2018. Degree Awarded: 25.07.2018.
24. Kumari Hrithika. **Determination of physico-chemical parameters in river Ganga of Gandhi Ghat at Patna.** Session: 2016-2018. Degree Awarded: 25.07.2018.
25. Nazeya Khatoon. **Monitoring of Physico-chemical parameters of water sample, Patna.** Session: 2016-2018. Degree Awarded: 25.07.2018.
26. Saifuddin Ahmad. **Study on Mercury pollution in urban surface water, Patna, India.** Session: 2015-2017.
27. Surbhi Kumari. **Physicochemical analysis of different soil samples.** Session: 2015-17.
28. Kirti Kumari. **Macro-invertebrates of Gangetic plain of India.** Session: 2015-17.
29. Beauty Kumari. **Estimation of Dissolve Oxygen, Biochemical Oxygen Demand and Chemical Oxygen Demand in water of river Ganga and STP, Patna.** Session: 2015-17.
30. Khushboo Kumari. **Estimation of Total Alkalinity of river Ganga and STP water.** Session: 2015-2017.
31. Nandni Kumari. **Determination of Total Hardness, Calcium and Magnesium in river Ganga and STP at Patna.** Session: 2015-2017.
32. Sonalika and Rashmi Priya. **Study on Mercury pollution in the Ganga river at Patna (Bihar).** Session: 2013-2015. Degree Awarded: 11.07.2015.

## INVITED LECTURE

- **Impact of sand mining on water quality and benthic fauna of River Ganga in and around Patna**, International Conference on Applied Biology, 2019 and First Annual Convention of the society of Biologist, 2019, Sri Mata Vaishno Devi University, Kakryal Katra, Jammu and Kashmir, India.

## LIST OF PAPER PRESENTED IN SEMINAR AND CONFERENCES

1. **Multivariate statistical analysis for the assessment of hydro-geochemical characteristics of River Ganga at Patna, India.** Paper presented at the Mediterranean Geosciences Union (MedGU) annual meeting, November 2021.
2. **Assessment of Ecological Quality Based on Macro-Invertebrates in River Ganga, Patna.** Paper presented at the 3<sup>rd</sup> Euro Mediterranean conference for Environment Integration (EMCEI), June 2021.
3. **Impact of Sand Mining on Water Quality and In-Stream Biota of Ganga River in Patna (Bihar), India.** Paper presented at International Conference on Harmony with Nature in Context of Biotechnological Intervention & Biodiversity, National Environmentalist association (NEA), India. December 2020.
4. **Hydrogeochemical characterization and assessment of groundwater quality in Patna (Bihar), India.** Paper presented at the 3<sup>rd</sup> Conference of Arabian Journal of Geosciences (CAJG), November 2020.
5. **Assessment of Heavy metals pollution in the sediment of the River Ganga at Varanasi, India** Paper presented at the 3<sup>rd</sup> Conference of Arabian Journal of Geosciences (CAJG), November 2020.
6. **Designing a river water quality monitoring network using multivariate analytical techniques; A case study of Ganga River, India,** Paper presented at the International Conference on Researches in Science and Technology- (ICRST-20), Patna, November, 2020.
7. **Impact of Sand Mining on Benthic Fauna in River Ganga in and around Patna,** Paper presented at National seminar on issues pertaining to sustainable management of water quality March 2019.
8. **Zooplankton Diversity of Sewagefed- Fish Pond at Pahari, Patna,** Paper presented at the Zoological Survey of India, Patna, February, 2016.
9. **Avian Diversity of the River Ganges and Gandak in the stretch of Bihar,** Paper presented at the International symposium on the River Biodiversity: Ganga-Brahmaputra-



Meghna (GBM) River System, sponsored by IUCN, jointly organize Patna University, Patna (India) and University of Chittagong (Bangladesh), April, 2014.

- 10. Occupational Health Hazards in Fisher Women**, paper presentation at the UGC sponsored National Seminar on ‘Women and Occupational Health: Stress, Hazards and Safety’ at Patna Women’s College, Patna University, Patna, 17-18 January 2012.
- 11. Nature of Jobs and Reproductive Health**, paper presentation at the UGC sponsored National Seminar on ‘Women and Occupational Health: Stress, Hazards and Safety’ at Patna Women’s College, Patna University, Patna, 17-18 January 2012.
- 12. Deleterious Effects of Endosulfan on Reproductive health of Female Swiss Albino Mice *Mus musculus***, paper presentation at the DST sponsored National Seminar on ‘New Frontiers in Environmental pollutants, Health & Application of Molecular. Genetics’ at Mahavir Cancer Sansthan, Patna, 21-22 January, 2012.
- 13. Endosulfan Exposed Histopathological Changes in the Ovary of Swiss Albino Mice and its Bioremediation with *Curcuma longa***, paper presentation at the UGC sponsored National Seminar on ‘Chemistry is Life’ at Magadh Mahila College, Patna University, Patna, 23-24 February 2012.
- 14. Poster Presentation in IEPHF – 2010**, National Symposium on Impact on Environmental Pollutants on Health and Fertility at Mahavir Cancer Sansthan, Patna, 14 March 2010.
- 15. Toxic Metals in the Ganga River system at Varanasi, India**, paper presented in the International Conference on the “Majestic River Ganga, Health, Integrity and Management” organized by the Department of Zoology, Patna University, Patna. India and Aquatic Ecosystem Health and Management Society, Canada, 13-15 Nov, 2006.
- 16. Sustainable development and role of scientists**, poster presentation at the UGC sponsored National Conference on “Environmental education for sustainable life style” organized by the Department of Zoology, Patna Women’s College, 11-12, February 2006

### **REFRESHER COURSE**

1. Refresher Course in Environmental Science held at Science College, Patna University, Patna from 1<sup>st</sup> December to 21<sup>st</sup> December, 2008.

2. 3<sup>rd</sup> Refresher Course in Life Science held at Science College, Patna University, Patna from 10<sup>th</sup> March 2010 to 30<sup>th</sup> March 2010.

## **MEMBER IN CONFERENCES AND SYMPOSIUM**

- **Member** in the **Organizing committee** of National Symposium on Emerging Trends in Material Science, organized by Department of Physics and Department of Computer Science. Patna Women's College, Patna University, 27<sup>th</sup> September, 2011.
- **Joint Organizing Secretary** of UGC sponsored National Seminar on 'Women and Occupational Health: Stress, Hazards and Safety' at Patna Women's College, Patna University, Patna, 17-18 January, 2012.
- **Member** in the **Organizing committee** of IUCN sponsored International Symposium on River Biodiversity: Ganges-Brahmaputra-Meghna River System at Department of Zoology, P.U. Patna, November, 2014.
- **Joint Organizing Secretary** of Department of Environment, Forest and Climate Change sponsored International Conference on "Issues and Challenges in Conservation and research of Freshwater cetacean in Asia at Aranaya Bhawan , Patna, 5-6 October, 2021.
- **Joint Organizing Secretary** of International Conference on Emerging Bioscience Research for Rural and Urban Development-2021, 21-22 December 2021.

## **MEMBERSHIP**

- Member of Editorial Board of Earth Sciences
- Life Member of Journal of Ecophysiology and Occupational Health.
- Life Member of Indian Science Congress Association.

## **TRAINING PROGRAMME**

- Computer Programming Course of six months with "A" grade-organized by New Government Polytechnic, Department of Science and Technology, Government of Bihar, 1997

- Direct Trainer Skills by Bihar Institute of Public Administration and Rural Development, Walmi Campus, Phulwarisarif, Patna, 24<sup>th</sup>-30<sup>th</sup> June, 2007.
- Training Programme on 'Ground Water Issues and Artificial Recharge' Organized by Central Ground Water Board, Mid-Eastern Region at Sri Krishna Science Center, Patna 30<sup>th</sup> and 31<sup>st</sup> March, 2009.