

CURRICULUM VITAE



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Professional Qualifications:

- i) Ph. D. (Water Resources Development) from University of Roorkee
- ii) M.E. (Water Resources Development) from University of Roorkee
- iii) P.G. Dip. (Water Resources Development) from University of Roorkee
- iv) B.E. (Civil Engineering) from Gauhati University

Professional Career:

- **Adjunct Professor, CTRANS, IIT Roorkee, 2019-**
- **Distinguished Professor, Shiv Nadar University, Greater Noida, 2019 – 2022**
- **Chief Advisor, Innovante Water Solutions Pvt. Ltd., 2019-**
- **Former Honorary Professor of River Science, University of Nottingham, UK, 2016–2019**
- **Professor, (Senior HAG Level), Indian Institute of Technology (IIT) Roorkee, 2012 - 2015 & Emeritus Fellow, IIT Roorkee 2015 - 2018**
- **Professor, IIT Roorkee, 2001 - 2011**
- Associate Professor, Univ. of Roorkee, 1998 – 2001
- Assistant Professor, Univ. of Roorkee, 1995 – 1998
- **Reader, Univ. of Roorkee, 1983-1995**
- Asst. Executive Engineer / Asst. Engineer, Flood Control & Irrigation Dept., Assam State Govt., 1973 – 1983

Administrative Experience:

- Head of the Department, Water Resources Development and Management, IIT Roorkee during 2010-2012.
- Chief Warden, Khosla International House, IIT Roorkee during 1996-2001.

[A] PROFESSIONAL FIELD EXPERIENCE (From 1973 to 1983):-

In Assam Govt. Flood Control & Irrigation Department (10 years)

- ❖ *Joined as Assistant Engineer on 15.3.1973 and later on promoted in 1983 as Assistant Executive Engineer.*
- ❖ *Acquired first-hand experience of preparation of design and working drawings of several barrages and appurtenant hydraulic structures, canal structures; preparation of project reports, and supervision of construction of barrages in the tributaries of the Brahmaputra.*
- ❖ ***Prepared Hydraulic and Structural designs of the following major river hydraulic structures during 1973-83 period in Assam on the tributaries of the Brahmaputra River which had been implemented.***
 - i) Dhansiri Barrage and River Training Works.
 - ii) Champamati Barrage and River Training Works.
 - iii) Sukla Head works and River Training Works.
 - iv) Longa Head works and River Training Works.
 - v) Kollonga Head works and River Training Works.
 - vi) Bardikrai Barrage and River Training Works.
 - vii) Dekadong Head works and River Training Works.
 - viii) Dikharu Head works and River Training Works.
 - ix) Kaldiya Barrage and River Training Works.
 - x) Rupahi Head works and River Training Works.
 - xi) Boroliya Barrage and River Training Works.
 - xii) Golondi Aqueduct and River Training Works.
 - xiii) Hydraulic Design of By-pass arrangements of Canal Power House of Dhansiri and Bardikrai Projects.

[B] TEACHING EXPERIENCE AT POST GRADUATE LEVEL (Since 1982):-

- I As a Guest Lecturer in Assam Engineering College (One year) During 1982-83 session, engaged in teaching in the Post graduate course on Flood Control and Watershed Management.
- II In Department of Water Resources Development & Management (formerly WRDTC), Indian Institute of Technology, Roorkee, India (1983 – 2018).

The following courses have been taught since 1983 in The M. Tech Programme of Water Resources Development and Irrigation Water Management courses in Department of WRD&M, IIT-Roorkee.

Subjects Taught And Their Course Content In Brief

1. **River Engineering:** Mechanics of sediment transport, river morphology, river training structures, river survey and investigations, mathematical and scale models, flood management, Application of remote sensing technique for river analysis.
2. **WR Structures Design I:** Design of Barrage, Sediment exclusion and desilting devices, stable channel design.
3. **Hydro Power:** Design of anchor blocks, water conductor system (open channel) along with appurtenant works.
4. **WR Structures Design II:** Design of spillways & energy dissipation devices.
5. **Irrigation System Design:** Layout and design of irrigation distribution system, Irrigation outlets, on farm water measuring devices, estimation and measurement of conveyance and seepage losses, Design of channel and water courses Lining etc.
6. **Drainage and Land Reclamation:** Surface and sub-surface drainage of agricultural land its investigation and design reclamation techniques.
7. **Design of Irrigation Works:** Open channel flow, Irrigation structures design including Barrage Raft, discharge measurement, regulation methods.
8. **Principles of Irrigation:** Soil water plant relationship crop water requirement, soil moisture stress, timing of irrigation, irrigation efficiencies, problems of irrigated agriculture irrigation scheduling, canal automation.
9. **Irrigation, Water Use Management & Flood Control:** Hydraulic flow over weir and sluices, energy dissipation systems for low heads, raft foundations, abutment and pier designs, irrigation management including canal operation methods, flood control structures.
10. **Water Use Management:** Problems of irrigated agriculture, evaluating soil and land for irrigation water distribution systems and management of farm irrigation intensities and cropping pattern, drainage criteria, optimal timing of irrigation, reclamation of water logged and saline lands etc.
11. **Numerical Methods:** Numerical algorithms for computer programmes, solution of simultaneous equations, Iterative methods, polynomials, finite difference formulations for differential equations, applications to engineering problems etc.
12. **Masonry and Concrete Dam:** Gravity Dams: Forces acting on a dam including uplift and wave forces; Design criteria for stability; Determination of dam profile; Computation of stresses by gravity analysis; Elastic analysis by finite element method and structural modelling techniques; Seismic design and analysis. Foundation treatment: Preparation of foundation including consolidation; Curtain grouting and treatment of faults and weak zone; Foundation cutoffs and drainage arrangements; Layout and location of spillway; Powerhouse and other appurtenances. Hollow and buttress dams: Principles of hollow gravity dams; Stability criteria. Arch dams: Classification, principles of layout and factors affecting layout; Theories for arch dam analysis. Roller Compacted Concrete dam.

- 13. (CT-615) Inland Navigation and Water Transport (in Centre For Transportation Systems (CTRANS)):****Inland Navigation Waterways:** Definitions & classifications of waterways, Navigation requirements, Waterway alignment and cutoffs, Multipurpose utilization of waterways; **River Training Techniques:** Erosion control structures, Drifting channel closure methods, Bandalling, surface panels, Bottom panels, submerged vanes, Case studies of river training; **Canalization and Navigation Canals:** Canalization, Navigation Canals; **River Modelling:** Numerical modelling techniques for fairway, Physical modelling of waterways; **Locks:** Locks with direct filling, Locks with indirect filling and emptying, Hydraulics of locks, Lifts and inclined planes, Lock approaches; **Dredging:** Dipper dredges, Hydraulic suction dredges, Cutter head dredges; **Transport on Inland Waterways:** Utilization of inland waterways, Traction, push tow barges, Resistance of ships; **Economics of Water Transport Systems:** Inter-model system, Private Public Partnership; **Inland Ports and Terminals:** Site selection, Physical infrastructure & design.
- 14. WR-552: Construction Planning and Management:** Network systems in project planning; use of CPM in planning scheduling and controlling of construction projects. Network development and monitoring of construction projects. Use of PERT in construction planning- PERT analysis; project evaluation and construction planning and management.

❖ Diagnostic Analysis Of Irrigation Systems

Conducted Diagonistic Analysis of irrigation systems along with the M. Tech students of Irrigation Water Management course during April, 1998; Jan-Feb. 1989 and in April 1990, April 1991, April 1992, April 1993 and April 1994 in the Command Area of Upper Ganga Canal (near Roorkee)

[C] LIST OF Ph.D. THESES SUPERVISION:-

| Sl. No. | Ph.D. Topic | Name of Ph.D. Student | Name of Co-Guides | Status |
|---------|---|---------------------------|---|-----------|
| 1. | Study of scour around permeable spurs | Ms. Shagoofta Rasool Shah | CSP Ojha IIT-R, India | Completed |
| 2. | Experimental study on mechanics of braided stream and their characteristics | Mohd. Abdullah | CSP Ojha IIT-R, India | Completed |
| 3. | Optimal water utilization and intra-basin water transfers in Cauvery basin, India | M.D. Patil | D. K Srivastava IIT-R, India | Completed |
| 4. | Study of performance of submerged vanes with collar | U.P. Gupta | CSP Ojha IIT-R, India | Completed |
| 5. | Experimental Investigation into flow around island | Utpal Kumar Mishra | CSP Ojha IIT-R, India | Completed |
| 6. | ANN based spatio-temporal morphological model of the river Brahmaputra | R. N. Sankhua | P. K. Garg & A. D.Pandey IIT-R, India | Completed |

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| 7. | Analysis of Seepage from Irrigation Furrows | Ms. Kshyana Prava Samal | G. C. Mishra IIT-R, India | Completed |
| 8. | Experimental Study of Piano Key Weir | Gopal Das Singhal | CSP Ojha IIT-R, India | Completed |
| 9. | Energy Dissipation using Block Ramps | Ng. Romeji Singh | Z. Ahmad IIT-R, India | Completed |
| 10. | Runoff and Sediment Modelling in part of the Brahmaputra Basin | Archana Sarkar | R. D. Singh NIH, India | Completed |
| 11. | Land use and Land cover modelling in a part of Brahmaputra basin using Geoinformatics | Md. Surabuddin Mondal | P. K. Garg IIT-R, India & Martin Kappas Goettingen, Univ., Germany | Completed |
| 12. | 2-D Depth Averaged Modelling for Curvilinear Braided Stretch of Brahmaputra River | Md. Parwez Akhtar | CSP Ojha & R. P. Singh IIT-R, India | Completed |
| 13. | Experimental Study of RCC Jack Jetty Systems for River Training | Ms. Anupama Nayak | Kerry Mazurek Univ of Saskatchewan Canada | Completed |
| 14. | Experimental Investigations on channelization of River Kosi from Chatra to Nirmali | Sanjay A. Burele | Z. Ahmad & I.D. Gupta IIT-R, India | Completed |
| 15. | Study of Climate Change and Its Impact on a part of Brahmaputra Basin | Ms. Pratibha Warwade | Bodo Ahrens Goethe-Univ. Germany & A. Pandey IIT-R, India | Completed |
| 16. | Hydrological Modelling of a River Basin Using Multi-Satellite Precipitation Estimates | Dheeraj Kumar | A. Pandey IIT-R, India & Wolfgang Albert Fluegel FSU, Germany | Completed |
| 17. | Simplified Derivation of UH and SUH for Runoff Estimation | Patil Pravin Rangrao | S. K. Mishra IIT-R, India | Completed |
| 18. | Experimental Study of Turbulence Characteristics near Piano Key Weir in Open Channel | Harinarayan Tiwari | Sébastien Erpicum Univ. of Liege Belgium | Completed |

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| 19. | Experimental Study on Braiding and Its Control in a Brahmaputra River Reach | Md. Amir Khan | A. Jacob Odggard, IIHR Univ. of Iowa USA | Completed |
| 20. | Study of Hydropolitics in South Asian Transboundary Rivers | Subash Prasad Rai | Aaron T. Wolf Oregon State Univ. USA | Completed |
| 21. | Landscape Evolution and Flood Inundation Modelling in Large, Complex Braided River Brahmaputra, A Case Study of Majuli Island, North-East India | Prasujya Gogoi* | Colin Thorne Nick Mount The University of Nottingham, UK | Completed |
| 22. | Environmental Sustainability Assessment of Inland Water Transport Infrastructure In INDIA | Akshay Nayak | B. R. Gurjar, IIT-R | Continuing |

*As an External Supervisor for the Ph.D. student registered in The University of Nottingham, UK.

[D] EXTERNAL EXAMINER OF THE FOLLOWING Ph.D THESES:-

| Sl. No. | Topic | Name of Candidate | University/Year |
|---------|---|----------------------|--------------------------|
| 1. | Study of two-dimensional flow propagating from an opening in the river dike | Arup Kumar Sarma | Gauhati University, 1999 |
| 2. | Finite element analysis of the effect of impervious core wall inclination on the behaviour of steady state phreatic line (In isotropic and homogeneous earth dam) | Preetam Kumar Pathak | Gauhati University, 2003 |
| 3. | Water quality modelling in an untreated dominated urban river | Ms. Girija T. R. | IIT Guwahati 2007 |
| 4. | Downstream local scour and sediment flushing characteristics of river diversion barrages | Malay Kanti Ghosh | IIT-Kharagpur 2008 |
| 5. | Modification of infiltration characteristics of natural ground formations using Horton's model | Saroj Kumar Verma | NIT, Patna 2008 |
| 6. | Effect of exceptional flow conditions on river diversion barrages and performance improvement using depressed secondary aprons | Kapileswar Mishra | IIT Kharagpur 2009 |

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| 7. | Evaluation of scour depth around bridge piers | Pankaj Goswami | Guwahati University 2013 |
| 8. | Assessment and Management of Soil Erosion under Land and Climate Change Scenarios in the Nan River Basin, Thailand | Pheerawat Plangoen | Asian Institute of Technology (AIT) Bangkok, Thailand 2014 |
| 9. | Deterministic Approach for Reservoir Inflow Forecasting Using Geospatial Tools | Suryawanshi Ramakrishna Kisan | Indian Institute of Technology, Bombay 2015 |
| 10. | Multiobjective Optimization of Urban Drainage Network | Sandeep Vivek Kanitkar | College of Engineering Pune, 2016 |
| 11. | Assessment of Innovative Technology Intervention in Livelihood Strategies for Sustainable Rural Development: an Exploratory Study of District Rudraprayag, Uttarakhand | Rekha Dhanai | Dept. of Rural Technology School of Agriculture & Allied Sciences, H. N. B. Garhwal Univ. Srinagar |
| 12. | Performance of MGNREGA in Sustainable Livelihood of Rural Community in District Pauri Garhwal Uttarakhand | Santosh Singh | Dept. of Rural Technology School of Agriculture & Allied Sciences, H. N. B. Garhwal Univ. Srinagar |
| 13. | Integrated Remote Sensing and GIS Based Study on Urban Storm water Flooding in Guwahati | Ruby Das | Department of Civil Engineering, Assam Engineering College, Guwahati |
| 14. | Study on the effect of climate change on the integrated flood vulnerability index | Dilip Kumar | Department of Civil IIT Guwahati |

[E] DELIVERED INVITED LECTURES / TALKS:-

1. Delivered the inaugural Kavita Goswami Memorial Invited Lecture on "*Erosion By The River Brahmaputra In Dibrugarh District- A New Look At The Problem*" in **Dibrugarh University** on 30th December, 2002.
2. Delivered invited talk on *Morphology of the Brahmaputra River* in **Central Water Commission, Govt. of India**, New Delhi on 12th February 2003.
3. Delivered keynote address on *Interlinking of Indian rivers and the Brahmaputra* in **Indian Science Congress Association Workshop, Guwahati**, 28th March, 2005.
4. Delivered keynote address on *Modelling of the Brahmaputra River* in National Workshop on "*Geology of the Sub-Himalayan Alluvium and Numerical Simulation of River Dynamics*" organized by **Indian Statistical Institute in Kolkata** during June 24-25, 2005.

5. Delivered invited talk on invited paper on *“Management of Bank Erosion of the river Brahmaputra”* at International Water Management Institute – **TATA Annual Meet** held at Anand during Feb. 24-26, 2005.
6. Delivered invited talk on *“Modelling and Management of the Brahmaputra River in India”* in **EPFL, University of Lausanne, Switzerland** on 11th October 2005.
7. Delivered invited talk on *“Mathematical Modelling and Managing the Brahmaputra River in India”* in Civil & Environmental Engg. Deptt., **The University of Edinburgh, Scotland** on 21st August, 2006
8. Delivered invited talk on *“Mathematical Modelling and Managing the Brahmaputra River in India”* in Deptt. of Civil & Environmental Engg., **The Imperial College, London** on 23rd August, 2006.
9. Delivered invited presentation on *“Water conservation and management with reference to Brahmaputra River in India”* in **21st Indian Engineering Congress held in Guwahati** during December 22-24, 2006.
10. Delivered invited presentation on *“Submerged Vanes – A Recent Development In Stream Bank Erosion Control”* in the Seminar on “River Erosion Control & Use of Gabions/Geosynthetics held in New Delhi on 8th June 2007 organized by **Bureau of Indian Standards**.
11. Delivered invited presentation on *“Some Core Issues on River Linking in India”* in the **Indo-French Seminar on “Water” held in Ahmedabad** during January 29-31, 2008.
12. Delivered invited talk on *“Morphodynamics: navigation and river training of Brahmaputra and Ganga Rivers in India”*, in **EPFL, University of Lausanne, Switzerland** on 26th June 2008.
13. Delivered Key Note lecture on *“Modelling and Management of Channel Instability of Brahmaputra and Ganga Rivers”*, in the **Workshop on Inflow Forecasting Hydrology held in IIT Delhi, New Delhi** on 29th August, 2008.
14. Delivered invited special presentation on *“Tackling Flood and Erosion problems of the Brahmaputra River”*, for **Thirteenth Finance Commission, Govt. of India, New Delhi** on 4th February 2009.
15. Delivered invited talk on *“Morphodynamics and Management of Brahmaputra and Ganga Rivers in India”* in **University of Southampton, UK** on 20th July 2009.
16. Delivered invited talk on *“Performance Evaluation of Piano Key Weir for Dam Safety”*, in **IIHR, University of Iowa, USA** on 24th July 2009.
17. Delivered **Dr. K. L. Rao Memorial Lecture** on *“Climate Change and Some Adaptive Technology for Water Resources Sector”*, in the **26th National Convention of Civil Engineers, Institution of Engineers (India), held in Guwahati** on Oct. 9-10, 2010.
18. **INNO-ASIA kickoff meeting** dated Feb. 07-10, 2011, held in **Friedrich-Schiller-University, Jena (FSU-Jena), Germany**.
19. **Himalayan Climate Change Adaptation Programme (HICAP)**, International Centre for Integrated Mountain Development (ICIMOD), 28-30 March, 2011 Kathmandu, Nepal.
20. Delivered Key Note lecture on *“Water Resources Potential Of Brahmaputra And Barak Basins”*, in the **National Conference on Water, Energy and Biodiversity**

with special reference to North Eastern Region Institution of Engineers (India) held in Agartala, Tripura on 20-22 August, 2011.

21. Delivered Talk on *“Morphodynamics and River Training of the Brahmaputra River in India”* in **University of Gottingen, Germany** on 2nd October, 2012.
22. Delivered expert talk on *“Study of Climate Change and Certain Adaptation Technologies in Water Resources Sector”* in **National Institute of Technology, Kurukshetra** on 30th October, 2012 as part of Golden Jubilee Celebration of the Institute.
23. Presented Invited Talk on *“Prospects and Imperatives for Water Management in South Asia”* in **ASEAN Delhi Dialogue V**, held in Delhi during February 19-20, 2013 organized by Indian Council of World Affairs, and FICCI.
24. Delivered 2nd Dr. Sailadhar Gogoi Memorial Lecture on *“Some Advances in Hydraulic Structures and River Engineering”*, in **Assam Engineering College Alumni Association, Guwahati, Assam** on 27th April, 2013.
25. Delivered Key-Note Address on *“Use of Technology for Accelerated Development of Assam and NE Region”*, in the National Conference on ‘Emerging Global Trends in Engineering and Technology’ held in **Assam Don Bosco University, Guwahati** on 7th March, 2014.
26. Delivered Invited talk on *“Novel Unified Technology for Hazard Mitigation with Water Management for Mountain Streams”* in **INAE-Engineers Conclave-2014 at Indian Institute of Science, Bangalore** during October 30 – Nov. 1, 2014.
27. Delivered Invited talk on *“Harnessing the Brahmaputra: Key to Northeast India’s Economic Regeneration”* organized by Centre for Development and Peace Studies, in **Tezpur Central University**, during March 16-17, 2015.
28. Delivered Invited talk on *“Applications of Advances in Hydraulic Structures and River Engineering – (Also Potential Use for Jiadhah River)”* in **Tezpur Central University**, during May 8-9, 2015.
29. Delivered Key Note Lecture on *“Prime Environment and Sustainable Development Issues in The Brahmaputra River Basin”* in National Conference on Social Sector Development and Governance Issues in the North East, held during November 28-29, 2015 in **Krishna Kanta Handiqui State Open University, Guwahati Assam**.
30. Delivered Key Note Lecture on *“Musing of Policy and Governance Issues for Ganga River”* in National Seminar on **‘R & D Perspective for Rejuvenation of River Ganga’ during December 16-17, 2015 at National Institute of Hydrology, Roorkee**.
31. Delivered Invited Talk on *“Wetland Study for Brahmaputra Plains and Kashmir Highlands”* in International Conference on **‘Geospatial Technologies and Wetland Management, during February 25th to 27th, 2016 at Centre for Studies on Bay of Bengal, Andhra University, Visakhapatnam**.
32. Delivered S. N. Gupta Memorial Lecture on **“Some critical research areas in water resources management”** in **HYDRO-2016 INTERNATIONAL Conference** held in CW&PRS, Pune during December 8-11, 2016 organized by **The Indian Society of Hydraulics**.
33. Delivered Key Note Lecture on **“Prime Sustainability Issues on Brahmaputra River Management”** in 1st International Conference on Civil Engineering for Sustainable Development - Opportunities and Challenges (CESDOC 2016), 19-21 December, 2016 at Civil Engineering Department, Assam Engineering College, Guwahati, Assam India.

34. **Delivered PRABODH CH. SARMA MEMORIAL** Lecture on “*Sustainable Development, Hydro Power Created Flood and Its Remedies For North East Region*”, on 26th October, 2018 in Institution of Engineers (India), Guwahati.
35. Delivered Key Note Address on “Some Key Issues and Their Solutions for Flood and Erosion Control in Brahmaputra Basin - Need for A Paradigm Shift” at the **National Conference on River for the People River against the People in CNESPR, Jamia Millia Islamia** on 23rd September, 2019.
36. Delivered Invited Talk on “*Use of Innovative Low-Cost Technology for Sustainable Fairways By Harnessing Stream Energy*” in **6th India Water Week-2019 during 24-28th September, 2019 at Vigyan Bhawan, New Delhi.**
37. Delivered Keynote Talk on “*TECHNOLOGY UPGRADE IN VITAL SECTORS TO USHER IN ECONOMIC REVOLUTION IN ASSAM*” in COSVARD 2021 – 4th **International Conference on Smart Villages and Rural Development on 13th December 2021, organised by University of Melbourne, Australia along with Assam Engg. College.**
38. Delivered Keynote Lecture on “*IMPERATIVES TO OVERHAUL STANDING DAMS FOR SPILLWAY CAPACITY AND FLOOD STORAGE TO TAKE ON CLIMATE CHALLENGES*” in **26th HYDRO – 2021 INTERNATIONAL CONFERENCE** at VNIT Surat organised by **The Indian Society for Hydraulics** during December 23 – 25, 2021.
39. Presented Keynote **20th Water Tech Talk** on “*OVERHAUL WATER CONSERVATION IN INDIA BY TECHNOLOGY PROGRESSION TO TACKLE FORMIDABLE CLIMATE CHALLENGES*” organised by **National Water Mission, Ministry of Jal Shakti, Govt. of India** on 13th May, 2022.
40. Presented Talk on “*BRAHMAPUTRA RIVER FLOOD-EROSION - CHALLENGES AND PROSPECTS*” in **EWRI Congress 2022 World Environmental & Water Resources Congress, June 5 – 8, 2022, Atlanta, GA, USA.**

[F] VISITING PROFESSORSHIP / ACHIEVEMENTS / ACTIVITIES / AWARDS:-

- (i) Awarded Visiting Professorship in **Swiss Federal Institute of Technology (EPFL)**, Lausanne, Switzerland during June – July, 2008 to further develop hydraulically efficient Piano Key Spillway, under Indo-Swiss Bilateral Research Initiative (ISBRI) Award.
- (ii) **The University of Nottingham, UK** has conferred the **Honorary Professorship** of River Science in recognition of eminence in the field for three years starting from August, 2016 – 2019.
- (iii) **Distinguished Professor (Visiting), Centre for Environmental Sciences & Engineering, School of Natural Sciences, Shiv Nadar University, Greater Noida, 2019 – 2021.**
- (iv) Adjudged **STAR PERFORMER** & awarded EXCELLENT rating on overall performance for the year 2005-06 by IIT_Roorkee (evaluation made in 2008).
- (v) Chairman Organizing Committee, **International Workshop on River Management (IWRM-2010)** held in NASC Complex, New Delhi during Dec. 14-16, 2010.

- (vi) Chairman Organizing Committee, **International Workshop on Piano Key Weir for In-stream Storage and Dam Safety (PKWISD-2012)** held in India Habitat Centre, New Delhi during May 30 – June 1, 2012.
- (vii) **Prof. Nayan Sharma**, IIT Roorkee has been conferred **S. N. Gupta Memorial Award** by *The Indian Society of Hydraulics* in their HYDRO-2016 INTERNATIONAL Conference held in CWPRS, Pune during December 8-11, 2016.
- (viii) In HYDRO-2016 INTERNATIONAL Conference held in CWPRS, Pune during December 8-11, 2016. *The Indian Society of Hydraulics* awarded **JALVIGYAN PURASKAR** jointly to **Mohammad Aamir & Nayan Sharma** for their research paper "**Riverbank protection with Porcupine systems: development of rational design methodology**", published in **ISH Journal of Hydraulic Engineering**.
- (ix) The Springer published book title "*River System Analysis and Management*" by Prof. **Nayan Sharma**, WRD&M is adjudged as the **Top Downloaded Title and Performing as a Leader in 2017 by Springer, Germany** among its all-global book publications made during the year 2017.
- (x) Govt. of Assam awarded Sports Pension for his excellence in Table Tennis in 2017.
- (xi) THE INDIAN SOCIETY FOR HYDRAULICS conferred '**ISH Lifetime Achievement Award for Year 2020**' for his contribution to water resources engineering and hydraulics.

[G] BOOK PUBLICATIONS:-

1. V. P. Singh, Nayan Sharma & C.S.P. Ojha, Jointly Edited a book titled "***The Brahmaputra Basin Water Resources***", Published by **Springer (Kluwer) Publishers, P.O. Box 17,3300 AA Dordrecht, The Netherlands, Feb. 2004.**
2. Nayan Sharma & Rajpal Singh jointly authored a book titled "**History of Irrigation in Uttar Pradesh**" published by **INCID, Ministry of Water Resources, Govt. of India in 2011.**
3. Nayan Sharma and Wolfgang Albert Flugel jointly Edited book titled "**Applied Geoinformatics for sustainable Integrated Land and Water Resources Management (ILWRM) in the Brahmaputra River basin. Results from the EC-project BRAHMATWINN**" – published by **Springer Publishers, Heidelberg, Germany, 2015.**
4. Nayan Sharma edited book titled "**River System Analysis and Management**" published by **Springer publishers in 2016-17.**

[H] LIST OF RESEARCH PAPERS / PUBLICATIONS:-

JOURNAL PAPERS

1. Sharma Nayan (1992): Flood Flow Characteristics of the Brahmaputra River, Jalvigyan Sameeksha published by *Indian National Committee on Hydrology*, Vol. VII, No.1, June 1992.
2. Supanat Pariyachat and Sharma Nayan (1996): Evaluation of Water Distribution Practice of an Irrigation System in Thailand, *Journal of India Water Resources Society*, Vol 2 No. 3, July 1996, pp.65-72.

3. M. D. Abdullah, Nayan Sharma & C.S.P. Ojha, (1999): Performance Evaluation of Certain Braiding Indicators Using Data of a Reach of The Brahmaputra River in Bangladesh, *Journal of Indian Water Resources Society*, Vol 19 No. 3, July 1999, pp.21-27.
4. Rasool Shagoofa, Nayan Sharma & C.S.P. Ojha (1999): Re-estimation of Equilibrium Scour Depths for Single Solid Spurs, *Journal of Indian Water Resources Society*, Vol 19 No. 4, Oct. 1999, pp.32-39.
5. Kumar Venkatesh, Sharma Nayan, and Pandey A. D. (2002): Modelling of Brahmaputra River Cross-Sections Using ANN Technique, *Water and Energy International Journal, CBIP, New Delhi*, Vol. 59, No 3, July-Sept. 2002, pp.20-29.
6. Sharma Nayan (1982): A Broad Appraisal of the Exploitable Water Resources and the Projected Water Needs of the Brahmaputra Basin, India's North East – A Multi-Faced View pp. 169-177, *Prakash Publishing House*, 1982.
7. Nayan Sharma, A. D. Pandey & Kumar Venkatesh (2004): ANN Model Development for Bank-line Migration of River Brahmaputra Using Remote Sensing Data, *Journal of Hydraulic Engineering, Indian Society of Hydraulics*, Vol. 10 No. 1, March -2004, pp. 56-64.
8. Sharma Nayan (2004): Spatio -Temporal Morphological Features, The Brahmaputra Basin Water Resources, pp. 214-228, *Water Science and Technology Library*, Vol. 47, *Kluwer Academic Publishers, Dordrecht, The Netherlands*, Feb. 2004.
9. Sharma Nayan (2004): Mathematical Modelling and Braid Indicators, The Brahmaputra Basin Water Resources, pp. 229-260, *Water Science and Technology Library*, Vol. 47, *Kluwer Academic Publishers, Dordrecht, The Netherlands*, Feb. 2004.
10. Sharma Nayan (2004): Scour Around Spurs at Gumi Site, The Brahmaputra Basin Water Resources, pp. 274-298, *Water Science and Technology Library*, Vol. 47, *Kluwer Academic Publishers, Dordrecht, The Netherlands*, Feb. 2004.
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109. Nayan Sharma, Subhash Gottumukkala, and Gopal Das Singhal (2020): Appraisal of Spillway Capacity and Storage Augmentation for Dam Safety using Piano Key Weir and Fuse Plug for Climate Change Effects" International Commission on Large Dams 2020 Congress, Delhi, 25th March 2021.

[I] ATTENDED TRAINING PROGRAMMES:-

- (i) Attended a 7-day training programme at Delhi organized during October, 1998 by NIIT-ESRI INDIA on GIS ARC-INFO & ERDAS Image Processing software.
- (ii) Attended a 4-day training programme at Roorkee organized during September 5-8, 2001 by Civil Engg. Deptt. IIT, Roorkee on Global Positioning System.

[J] MEMBER / OFFICE BEARER OF PROFESSIONAL BODIES:-

1. Secretary, **Indian Water Resources Society** during 1990-92.
2. Executive Vice President **Indian Water Resources Society** during 2010 - 2012
3. Fellow, **Indian Water Resources Society**.
4. Member, **Indian Geotechnical Society**.
5. Member, **Indian Society of Hydraulics**.
6. Member of **International Association of Hydrological Sciences**, U. K.

[K] MEMBER OF TECHNICAL COMMITTEES

1. Member of the **Barrages and Weirs Sectional Committee**, RVA 20 Bureau of Indian Standards, Govt. of India.
2. Member of Sectional Committee on **Spillways Including Energy Dissipators**, WRD10 of Bureau of Indian Standards, Govt. of India.
3. Member of Sectional Committee on **Water Conductor System**, WRD14 of Bureau of Indian Standards, Govt. of India.
4. Member of Sectional Committee on **Canals and Cross Drainage Works**, WRD-13 of Bureau of Indian Standards, Govt. of India.
5. Member of Sectional Committee on **River Training and Diversion Works**, WRD-22 of Bureau of Indian Standards, Govt. of India.
6. Member of Sectional Committee on **Lakes & Reservoirs**, WRD-10 of Bureau of Indian Standards, Govt. of India.
7. Member of Sectional Committee on **Water Resources Planning, Management and Evaluation** WRD 6 of Bureau of Indian Standards, Govt. of India.
8. Member of Panel - 3 for revision of IS 6966 (Part 2), WRD 22/P3, Hydraulic Design Of Barrages And Weirs – Guidelines, Part 2 Gravely And Bouldery Reaches of **Bureau of Indian Standards, Govt. of India, 2011**.
9. Member of Panel - 1 for revision of IS 8408:1994 Guidelines for Planning and design of permeable spurs in alluvial river, WRD 22/P1, of **Bureau of Indian Standards, Govt. of India, 2011**.

10. Member of Panel - 6 for revision of IS 10751, IS 12094 & IS 14262 WRD 22/P6, of **Bureau of Indian Standards, Govt. of India, 2011.**
11. Member of **Dams and Spillways** Sectional Committee, WRD 9, **Bureau of Indian Standards, Govt. of India, 2011.**
12. Member of Panel for preparation of draft for **Guidelines for Planning and Design of River Power Houses integrated with Barrages**, Part 2 Design Criteria (as part 2 of IS 14592), WRD 22/P2 of Bureau of Indian Standards, Govt. of India.
13. Member of Panel for preparation of draft for **Criteria for Selection of type of Anti erosion works**, WRD 22/P4 of Bureau of Indian Standards, Govt. of India.
14. Member of Panel for revision of IS 10084(Part 2):1994 **Design of Diversion Works - Criteria: Part 2 Diversion channel and Open cut or Conduit in the body of Dam**, WRD 22/P5 of Bureau of Indian Standards, Govt. of India, 2011.
15. Member of Panel for revision of IS 10751:1994, IS 12094:2000 & IS 14262:1995, WRD 22/P6 of **Bureau of Indian Standards, Govt. of India, 2011.**
16. Member of Hydrometry Sectional Committee, WRD 01, **Bureau of Indian Standards, Govt. of India, 2013-.**
17. Member of Hydraulic Structures Instrumentation Sectional Committee, WRD 16, **Bureau of Indian Standards, Govt. of India, 2013-.**
18. Member of **High-Power Committee on Inter Linking of Rivers**, constituted by Govt. of Assam in 2003.
19. Member of **Committee on Morphological Studies of River Brahmaputra**, constituted by Central Water Commission, Govt. of India, 2004.
20. Member of International Program Committee for **EMS 2004** held in Virgin Islands, U. S. A. during November, 2004 organized by The International Association of Science & Technology for Development, Calgary, Canada.
21. Member of International Research Working Group on **Disaster Reduction and Ecosystem for Mekong River Basin Development**, constituted by United Nations University, Tokyo, during 2005.
22. Member, Editorial Board of **Assam Science Society** Journal.
23. Member of **Panel Of Experts** constituted by Himachal Pradesh State Electricity Board for Uhl State-III HEP, Sawra-Kuddu HEP, & Sainj HEP, 2008 -
24. Member of Technical Committee on **Inland Water Transport** constituted by Inland Waterways Authority of India 2008-2009.
25. Member of International Program Committee for **EMS 2006** held in St. Thomas, United States Virgin Islands during December, 2006 organized by The International Association of Science & Technology for Development, Calgary, Canada.

26. Member of **Core Group on Floods of National Disaster Management Authority**, Govt. of India 2006-2007.
27. Team Leader of **River Expert Committee** constituted for Protection of Tezpur Central University from Flood & Erosion by Jia Bhoreli River in Assam in 2007.
28. Member of **High-Level Steering Committee for National Water Mission**, Ministry of Water Resources, Govt. of India 2009-2010.
29. Member of **Sub-Committee on Basin Level Planning & Management**, National Water Mission, Ministry of Water Resources, Govt. of India 2009-2010.
30. Member of **High-Level Expert Team** constituted by Ministry of Water Resources for advising on the flood and course change of Kosi river in Bihar 2009-.
31. Member of Management Committee of Bharat Singh Chair for **Water Resources of IIT_Roorkee**.
32. Member of **Task Force on Restoration of Sunderbans Embankments** damaged by the cyclone "Aila" in West Bengal, constituted by Ministry of Water Resources, Govt. of India 2009-2010.
33. **Charter Member of High Himalayan Forum (HHF)**, New Delhi
34. **Nomination Council Member for Infosys Prize** constituted by Infosys Science Foundation 2010-.
35. Member of **International Scientific Committee for International Workshop on Labyrinth and Piano Key Weirs**, 9-11 February 2011, Liege, Belgium.
36. **Member of Assam Flood and Erosion Management Commission, Govt. of Assam, 2010-2012.**
37. **Panel Expert for Kosi Bandh Katan Judicial Enquiry Commission, Govt. of Bihar, 2010 - 2012.**
38. **Member of Core Group on Climate Change Related to National Water Mission, State Water Resources Agency, U. P. Govt., 2011.**
39. **Member of Committee on water harvesting projects for Ranthambhore Tiger Reserve, constituted by Govt. of Rajasthan, 2011.**
40. Member of **Advisory Board of National Water Academy**, CWC, Govt. of India, 2010.
41. Member of **Apex Advisory Committee on R&D** for Planning/ Monitoring, of various R&D activities related to Hydro Sector, **Tehri Hydro Development Corporation India Ltd. (THDCIL)**, Rishikesh, 2012.
42. Member of **Board of Studies for Department of Rural Technology**, Hemvati Nandan Bahuguna Garhwal University, Srinagar, Uttarakhand (A Central University) 2012

43. Member of **Expert Committee for Scientific Assessment of Flood Prone Areas in India**, Constituted by Ministry of Water Resources (Ganga Wing), Govt. of India 2012.
44. Member of **Technical Expert Committee** for Review of Asiganga-I and Asiganga-II Small Hydro Projects in district Uttarkashi, Uttarakhand State, constituted by **Uttarakhand Jal Vidyut Nigam Ltd.**, August 2012.
45. Member of **Indian National Committee on Surface Water (INCSW)**, constituted by Central Water Commission, INCSW Secretariat, New Delhi, September 2012.
46. Member of **Advisory Group of Experts on Flood and Erosion and Water Management**, constituted by Govt. of Assam on November 2012.
47. Member of the **Expert Committee for Preparation of Bihar Flood Hazard Atlas**, constituted by National Disaster Management Authority, Govt. of India in 2012
48. Member of **ITRA – Water Review Panel under initiative entitled IT Based Innovations to Sustainability of Water Resources**, constituted by Information Technology Research Academy (ITRA), Govt. of India, 2013 -.
49. Member of the **International Scientific Committee** for Workshop on Labyrinth and Piano Key weirs – PKW 2013 held in Paris during November 2013.
50. Member of **Committee to Review the Procedure of Project Appraisal in Central Water Commission (CWC)**, constituted by Ministry of Water Resources, Govt. of India, April 2013.
51. Member of Faculty Selection Committee for Civil Engineering Department, **IIT Guwahati** during 2007.
52. Member of Faculty Selection Committee for Water Resources Development & Management Dept., **IIT Roorkee** during 2010-2012.
53. Member of International Advisory Committee of the **4th International Conference on Water and Flood Management (ICWFM-2013)**, organized by Institute of Water and Flood Management (IWFM), Bangladesh University of Engineering and Technology (BUET) held during 9-11 March, 2013 in Dhaka, Bangladesh.
54. Member of International Advisory Committee of the **5th International Conference on Water and Flood Management (ICWFM-2015)**, organized by Institute of Water and Flood Management (IWFM), Bangladesh University of Engineering and Technology (BUET) to be held during 6-8 March, 2015 in Dhaka, Bangladesh.
55. Member of Committee to Suggest Remedial Measures on **Flood Problem of Guwahati**, Constituted by Govt. of Assam, 31st July, 2014.
56. **Distinguished Fellow of Centre for Development and Peace Studies**, Guwahati.
57. Expert Advisor to DHI for **Uttarakhand River Morphology study and design of river bank protection**, 2016.

58. Member of **Committee constituted on Ganga Act**, by National Mission of Clean Ganga, Ministry of Water Resources, River Development & Ganga Rejuvenation, Govt. of India, 2016.
59. Member of **Committee for suggesting measures for Revival of River Bhagirathi**, by National Mission of Clean Ganga, Ministry of Water Resources, River Development & Ganga Rejuvenation, Govt. of India, 2016.
60. Panel Member of WRD22/ P1&6 dealing with revision of IS:8408 (Planning and design of Groynes/ spur in Alluvial River), IS 10751 (Planning and design of Guide banks for Alluvial River) and IS 14262 (Planning and design of Revetments), **constituted by Bureau of Indian Standards, Govt. of India, 2016.**
61. **Chairman** of the Expert Committee on Long Term Management of Ara-Chapra Bridge over river Ganga, **constituted by Bihar Rajya Pul Nirman Nigam Ltd., Govt. of Bihar, India, 2017.**
62. Member of the Committee “Outcome review /third party evaluation of the two Plan schemes FMP & RMBA implemented during XII Plan” constituted by **Ministry of Water Resources, River Development and Ganga Rejuvenation, Govt. of India, 2017.**
63. **Chairman** of the Stakeholder Review Committee on Development of Brahmaputra Riverfront under **Guwahati Smart City Limited, Govt. of Assam, 2017.**
64. Member of the **Panel of Experts (PoE)** for Right Bank Slope Stabilization of **Shongtong Karcham HEP** (450 MW), constituted by **Himachal Pradesh Power Corporation Limited, 2018 –.**
65. Appointed as Individual Contractual Consultant (ICC) by the **Assam Inland Water Transport Development Society (AIWTDS), 2021 –**
66. **Member of Advisory Board of VKS Infratech Management Pvt Ltd., Delhi, 2022.**
67. **Expert Group Member for Development of Bihar State, constituted by NITI Aayog, Govt of India, 2022.**

[L] REVIEWER / EDITORIAL BOARD MEMBER OF JOURNALS / PROJECTS

1. Reviewer of the Journal of the **American Water Resources Association.**
2. Reviewer of Research Proposals for **Indo-U.S. Science and Technology Forum**
3. Referee of Leverhulme Trust, London, U. K. for evaluation of project proposal.
4. Reviewer of **Flood and Erosion Protection Works in Assam**, executed under National Rural Employment Guarantee Act (NREGA).
5. Reviewer of **Institution of Engineers (India) Journal**

6. Expert Reviewer of IGCS Research Proposal on “Modeling the effects of land use and climate change upon in-stream hydraulics in mountainous streams in rapidly urbanizing regions (close to Pune) of the Western-Ghats” of **Indo-German Centre for Sustainability, IIT Madras**, January 2014.
7. Reviewer of Geocarto International Journal, **Taylor & Francis Group, London UK, 2014.**
8. Review of Manuscript "Beyond the Transboundary River -Issues of Riparian Responsibilities" **Journal of The Institution of Engineers (India): Series A, Springer, India**
9. **Member of Editorial board of "Journal of Ecology"** STM Publications, Noida, India
10. Member of **Editorial Board in The Agriculturist International Journal**, Nigeria
11. Member of **Editorial board of "Journal of Advance Research in Civil and Environmental Engineering"**, India.
12. Reviewer of **Sky Journal of Agricultural Research (SJAR)**, Ghana / Kenya.
13. Reviewer of **Universal Journal of Geosciences, Horizon Research Publishing, USA.**
14. Reviewer of **Journal of Earth Science Informatics**, Springer Publishers.
15. Reviewer of **Journal of Flood Risk Management, John Wiley & Sons, Inc., UK**
16. Reviewer of Book Manuscript for **OXFORD University Press.**
17. Reviewer of **Journal, Civil Engineering and Architecture**, Horizon Research Publishing, USA.
18. Reviewer of **Asian Journal of Atmospheric Environment**, Korea
19. Reviewer of **Journal, Neural Computing and Applications**, Springer Publishers.
20. Reviewer of **Journal, Sādhanā** published by Springer Publishers.
21. Reviewer of **Applied Geography Journal**, Elsevier.
22. Reviewer of **Geomorphology Journal**, Elsevier
23. Reviewer of **International Journal of River Basin Management**, Taylor & Francis, Australia.
24. Reviewer of **Journal of Hydrological Processes, John Wiley & Sons, Inc., UK.**
25. Reviewer of **Journal of Marine Georesources & Geotechnology**, Taylor & Francis, UK.

26. Reviewer of **Arabian Journal for Science and Engineering**, Springer Publishers.
27. Reviewer of **Indo-US Science and Technology Forum (IUSSTF)**.
28. Reviewer of **International Journal of Sediment Research**, Elsevier.
29. Reviewer of **Environmental Science and Policy**, Elsevier.
30. Reviewer of **Journal of Indian Society of Hydraulics, ISH**
31. Reviewer of **Journal on Applied Water Engineering and Research, Taylor and Francis Ltd., UK.**
32. Reviewer of **Journal on Flow Measurement and Instrumentation, Elsevier.**
33. Reviewer of **Journal on Civil Engineering and Architecture, USA**
34. Reviewer of **Journal of Hydrological Processes, Wiley, UK**

[M] LIST OF CONSULTANCY PROJECTS (COMPLETED):-

1. Principal Investigator of Consultancy to **Engineers India Ltd./Inland Waterways Authority of India** for the Project on Improvement of Navigation of the River Ganga Between Patna and Munghyr - Stage I 1997.
2. Members of Consultancy Team on Planning & Design of Micro/Mini Hydel Projects Deo Right (1.0 lakh) Projects for **Orissa Power Generation Corporation – 1996.**
3. Members of Consultancy Team on Planning & Design of Micro/Mini Hydel Projects Deo Left (1.0 lakh) Projects for **Orissa Power Generation Corporation – 1996.**
4. Members of Consultancy Team on Planning & Design of Micro/Mini Hydel Projects Baghua (1.0 lakh) Projects for **Orissa Power Generation Corporation – 1996.**
5. Member of Consultancy Team on Planning & Design of Mini Hydel Station at the Balancing Reservoir of Ramagundam Super Thermal Power Station of **National Thermal Power Corporation, India** (1.1 lakh) – 1995.
6. Member of Consultancy Team for Development of Digital Terrain Model for **Arunachal Pradesh Power Department** (0.3 lakh) – 1995.
7. River Training of the Beas River at Manali (SASE) for **Defence Research Development Organization, Govt. of India** (1.5 lakh) 1996-97.
8. Upgradation for Improved Generation of Maniyar Small Hydro Project of Carborundum **Universal Ltd., Chennai** (Rs. 10.3 lakhs) 1998-2000.
9. River Training Works in the Beas River for Safeguarding Bhuntar Airport and Runway Extension near Kullu, for **Airports Authority of India** (Rs. 4.5 lakhs) 1998-1999.

10. Investigations for Locating Intake and Desilting Chamber for Jaldhaka Hydroelectric Project of **WBSEB** (Rs. 1.15 lakhs) 2001.
11. Design of Diversion Headworks on the Dilli River for Water Intake of Namrup Plant of **Hindustan Fertilizer Corporation Ltd.** (5.55lakhs), 2000.
12. Scale Model Experiments of Stepped Spillways for Rammam Stage - II Hydrel Project of **W.B.S.E.B.** (Rs. 6.62 lakhs), 1998-2002.
13. Design of Stepped Spillways and Energy Dissipator Arrangements for Rammam Stage – II Hydrel Project (Rs. 6.00 lakhs) of **W.B.S.E.B.**, 2000-2003.
14. Renovation of Suringad SHP, sponsored by **Uttaranchal Jalvidyut Nigam Ltd.** Pithoragarh, 2003-2004.
15. River Training Works for Chor Nallah Near SASE Manali sponsored by **AGE, MES, R&D, Manali.** (0.80 lakh) 2003-2004.
16. Structural Analysis of Barrage for Larji Hydroelectric Project, sponsored by **H.P.S.E.B**(Rs. 5 lakhs) 2000-2004.
17. Hydraulic Model Study for Uhl Stage-III Hydro-Electric Project sponsored by **HPSEB,** Sundernagar (Rs. 7.85 lakhs) 2003-2004.
18. Feasibility Study on Runway Extension for Kullu-Manali Airport sponsored by **Airports Authority of India,** New Delhi (Rs. 9.03 lakhs) 2003-2004.
19. Flood Protection Works Along Beas River At SASE Manali sponsored by **AGE, MES, R&D, Manali** (Rs. 3.2 lakhs) 2003-2004.
20. Structural Design of Stepped Spillways for Rammam Hydrel Project Stage –II, sponsored by **W.B.S.E.B.** (Rs. 7.00 lakhs), 2003-2006.
21. Consultant to Williamson Magor Co. Ltd. from 1989 to 2000 for protection of **Tea Estates** from bank erosion in several tributaries of the Brahmaputra River in Assam.
22. Consultant to Tata Tea Ltd. in 1996 to provide protection of their **Namroop Tea Estate** from bank erosion by Disang River near Dibrugarh.
23. Consultant to Assam Company Ltd. in 2000-2001 to protect their **Rungagorah Tea Estate** from bank erosion by Brahmaputra near Tinsukia.
24. Consultancy Project on Spillway Model Studies for Assessment of Erosion & Abrasion Resistance of Fibre Reinforced Concrete & Ordinary Concrete, sponsored by **Reliance Industries Limited, Mumbai** (Rs. 2.74 lakhs).
25. Numerical Model Studies with Field Data Observation for Sarda Sahayak Remodelling Project sponsored by **Tahal Consulting Engineers Ltd., Lucknow** (Rs. 9.58 lakhs) 2005-2006.

26. Hydraulic Model Studies with Laboratory Analysis of Field Data Samples for Sarda Sahayak Remodelling project sponsored by **Tahal Consulting Engineers Ltd., Lucknow** (Rs. 17.57 lakhs) 2005-2006.
27. Hydraulic Analysis of Tail Race Tunnel of Baglihar Hydroelectric Project sponsored by **Jaiprakash Associates Limited, New Delhi** (Rs.2,24,720) 2007
28. Renovation and Design of Bottom Intake Structure and Desilting Chamber for Jaldhaka Hydro Electric Project, sponsored by **W.B.S.E.B**(Rs. 30 lakhs) 2001-2007
29. Development of Digital Terrain Model (DTM) of Kullu Airport for **Airports Authority of India**, (Rs. 9.12 lakhs) 2006 -2008.
30. Consultancy project on Evaluation Study of Completed Research Schemes under **R&D Programme of Ministry of Water Resources, Govt. of India**, (Rs. 1.5 lakhs) 2006-2008.
31. Hydraulic analysis of flow in Lodhoma Interconnection tunnel and construction planning for tunnel excavation of Rammam Hydel Project, Stage -II,, for **W.B.S.E.B.** (Rs. 5.38 lakhs) 2006-2008.
32. Physical model studies of the interconnection zone of Lodhoma and Rammam tunnels of Rammam Hydel Project, Stage -II, for **W.B.S.E.B.** (Rs. 14.59 lakhs)2006-2008.
33. Physical model study for modified layout of diversion barrage for Sawara Kuddu Hydel Project (111 MW), sponsored by **HPSEB**, (Rs. 35.75 Lakhs), 2007-2008.
34. Hydraulic Model Study for Water Conductor System & Spillway Of Thiroth Hydro Electric Project, **HPSEB**, Pandoh, (Rs.14.61 Lakhs), 2009-2010.
35. Hydraulic study of Piano Key Weir for Lhasi Irrigation Project, sponsored by **Water Resources Department Rajasthan**, (Rs.4.96 Lakhs), 2009-2010.
36. Pre-feasibility report for Rehabilitation of Upper Ganga Canal for Inland Navigation, for **Water Resources Department, U. P.**, (Rs.10 lakhs), 2010.
37. Preparation of DPR for “In stream water storage” on River Brahmani near Kharagprasad using Piano Key Weir (PKW) Barrage in Orrisa, sponsored by **LANCO Babandh Power Private Ltd.**, Phase – 1, (Rs.28.38 Lakhs), 2009-2011.
38. Analytical design and physical modelling of the river Gandak for the construction of the RCC Bridge (under construction) between Dhanha Ghat and Ratwal Ghat in West Champaran District of Bihar, sponsored by **Bihar Rajya Pul Nirman Nigam Ltd., Patna**, (Rs.24.37 Lakhs) 2009-2011.
39. Physical Model Study for RCC Gandak Bridge in Bishunpur Panchayat of Gopalganj District of Bihar, sponsored by **Bihar Rajya Pul Nirman Nigam Ltd., Patna**, (Rs.17.60 Lakhs) 2010-2011.
40. Mathematical Modelling of Pollavaram project, for **C & Q C S & Dam Safety, Govt. of Orissa**, (Rs.9.50 Lakhs), 2010-2011.

41. River training measures to control drifting behaviour of the Gandak river for the Bridge near Gopalganj – Bettiah in Bihar for **State Bridge Corporation Ltd., Bihar**, (Rs.27Lakhs), 2010-2011.
42. Study of the Brahmaputra River erosion and its control, sponsored by **National Disaster Management Authority of India**, Govt. of India, (Rs. 32 Lakhs), 2008-2011.
43. Vetting Of Revised Cost of Karcham Hydro Electric Project, Sponsored by **J. P. Karcham H.E. Ltd.**, (Rs.15 Lakhs), 2011.
44. Hydraulic model study for Desanding arrangements of Sawra Kuddu Hydro Electric Project, sponsored by **HPPCL**, Shimla (Rs.11.75 Lakhs), 2009 – 2011
45. Mathematical & Hydraulic Model Studies for Surge Shaft & Tail Race System of Sawra Kuddu Hydro Electric Project, sponsored by **HPPCL**, Shimla (Rs.28 Lakhs), 2009 –2011
46. Assessment of carrying capacity for the conveying system of ECPL and evaluation of the structural stability, sponsored by **Ms ECPL, Vadodra** (Rs.6.34 Lakhs) 2011-2012.
47. Hydrological Analysis and Design of Hydrualic Structure at River Nandna Choe and Lake at Panchkula, Sponsored by **HUDA, Panchkula** (Rs.10 Lakhs), 2011- 2012.
48. Mathematical Modeling for Reservoir Sedimentation of Wangchu Dam Project in Bhutan, Sponsored by **SJVN Limited Shimla**, (Rs.10 Lakhs) 2011-2012.
49. Model Study for Silt Flushing Intake Gate of Sawra Kuddu HEP, sponsored by **Director Project, Aarti Infra Project Pvt. Ltd.** (Rs. 1 Lakhs), 2011-2012.
50. Design of Kanhar Dam and Spillway along with structural details, sponsored by **HES Infra Pvt. Ltd.** (Rs.14 Lakh), 2011-2012.
51. Expert Opinion on Hydro Power Components, Sponsored by **J. P. Karcham H.E. Ltd.**, (Rs.10 Lakhs), 2011-2012.
52. Mathematical Modelling for Bridge (Aarah-Chhapra) on Ganga River, Sponsored by **M/s S. P. Singla Constructions Pvt. Ltd., Panchkula, Haryana**, (Rs.1.00 Lakhs) 2011-2012.
53. Mathematical Modelling for Bridge Over River Koshi at Vijay Ghat, Sponsored by **M/s S. P. Singla Constructions Pvt. Ltd., Panchkula, Haryana**, (Rs.1.00 Lakhs) 2011-2012.
54. Vetting of designs and drawings of Aqueduct cum viaduct of Kanhar Project Sponsored by **HES Infra Pvt. Ltd, Hyderabad**, (Rs.20.40 Lakhs) 2011-2012.
55. Solani River Training for Solar Power Plant Near Roorkee Sponsored by **M/S RV Akash Ganga Infrastructure Ltd.** (Rs. 2.02 Lakhs) 2012-2013.

56. Short term river training measures for river Brahmani at IPH, for **NALCO, Govt. of India**, (Rs.2.25 Lakhs), 2010-2012.
57. Flood Routing studies for release of water through Tehri Dam, sponsored by **THDCIL, Risikesh** (Rs.4.5 Lakh), 2011-2012.
58. Hydraulic model studies for Dam spillways of Chandan reservoir Sponsored by **APRL, Ranchi** (Rs. 36 Lakhs) 2012-2012.
59. Kaliganga-11 SHP- Examination of Changed Proposal From Those In The DPR, Sponsored by **DGN (ADB Projects), UJVNL, Rishikesh** (Rs. 2.2 Lakhs) 2012-2013.
60. River Training for Right Guide Bund HL Bridge over River Gandak between Gopalgunj and Bettiah, Sponsored by **Bihar Rajya Pul Nirman Nigam Ltd., Bettiah, Bihar**, (Rs.10.67 Lakhs), 2013.
61. Mathematical model studies for Reservoir Sedimentation and Reservoir Flushing of Luhri HEP, Sponsored by **SJVN Limited Shimla**, (Rs.10 Lakhs) 2012- 2013.
62. Comprehensive and Flume Hydraulic Model Studies for Chhatru Hydroelectric Project (126 MW) in Chenab River Basin, Sponsored by **DCM Shriram Infrastructure Ltd. New Shimla** (Rs. 55 Lakhs) 2012-2013.
63. Comprehensive River Engineering Study for River Diversion of Beas River for Proposed Runway Extension of Kullu Manali Airport Sponsored by **Dept. of Tourism & Civil Aviation, Himachal Pradesh** (Rs.33.7 Lakhs), 2013.
64. Vetting of Design and Drawings for Bhaoni Dam in Lalitpur, U. P., Sponsored by **HES Infra Pvt. Ltd., Hyderabad**, (Rs.18 Lakhs), 2013.
65. River Protection Works along Subansiri River, Sponsored by **National Hydropower Corporation Ltd. (NHPC)**, (Rs. 25 Lakhs), 2013-2014.
66. Mathematical Modelling of Brahmaputra River Study reach to help fix Intake well location for JICA funded Guwahati Water Supply Project, Sponsored by **M/S Prescient Flow Control India Private Limited, New Delhi** (Rs. 14.04 Lakhs), 2013.
67. Physical model study for Telwa Bridge on Bahti River, Sponsored by **Bihar Rajya Pul Nirman Nigam Limited, Patna** (Rs.37.07 Lakhs), 2013-2014.
68. Design of Apron for Guide Bund Protection for H. L. Bridge across Gandak at Sattarghat, Sponsored by **Bihar Rajya Pul Nirman Nigam Ltd., Bettiah, Bihar**, (Rs.13.50 Lakhs), 2013-2014.
69. Design & Monitoring of River Training Measures for Navigation Development in River Ganga at Six locations between Farakka – Varanasi stretch of National Waterway - 1 for Navigation Channel Development, sponsored by **Inland Waterways Authority of India**, (Rs. 1.53 Crore) 2007-2014 .
70. Satellite Imagery and analytical study for construction of CD works on Rapti Main Canal at Ch.Km. 7.180, Sponsored by **Saryu Nahar Khand –III, Bahraich, U. P. Irrigation Department**, (Rs. 5.618 Lakhs), 2014.

71. Satellite Imagery and analytical study for construction of CD works on Rapti Main Canal at Ch.Km. 14.680, Sponsored by **Saryu Nahar Khand –III, Bahraich, U. P. Irrigation Department**, (Rs. 5.618 Lakhs), 2014.
72. Comprehensive River Hydraulic Study & Mathematical Modelling for Gandak river Bridge connecting Gopalganj & Bettiah with River Training Works, Sponsored by **Bihar Rajya Pul Nirman Nigam Ltd., Patna**, (Rs.89.88 Lakhs), 2014-2015.
73. Koshi Mahasetu Bridge built by NHAI in Dist. Supaul on Koshi River – regarding review & vetting of protection works of eastern guide bund, Sponsored by **Water Resources Department, Bihar Govt.**, (Rs.22.47 Lakhs), 2014 - 2015.
74. Vetting of Drawings of Spillway, Earth Dam and Two Head Sluices for Bandai Dam Project by **HES Infra Pvt. Ltd., Hyderabad**, (Rs.6.74 Lakhs), 2014- 2015.
75. Gandak Bridge at Ratwal Ghat – Protection of Left Guide Bund with Modelling, Sponsored by **S. P. Singla Construction Pvt. Ltd., Panchkula** (Rs. 13.50 Lakhs), 2015.
76. Physical Model Study for Ganga River Bridge near Sultanganj, Bihar Sponsored by **S. P. Singla Construction Pvt. Ltd., Panchkula** (Rs. 33.14 Lakhs), 2015.
77. Study for Impact of multi modal terminal on Ganga River near Varanasi, Sponsored by **Inland Waterways Authority of India, Noida** (Rs.7.8 Lakhs), 2015.
78. Study for Opinion regarding Piano Key Weir (PKW) option for Subansiri Dam (SLHEP), Sponsored by **National Hydro Power Corporation Limited, SLP** (Rs.2.28 Lakhs), 2015.
79. Construction of Kanhar Project – LKC & RKC aqueduct (10nos) and Sluice (1 No) Design and Drawing Vetting sponsored by **HES Infra Pvt. Ltd., Hyderabad**, (Rs.5.15 Lakhs), 2016.
80. Vetting of Design of Surplus Weir for Storage Reservoir 1 & 3 – PMIS – Gandikota, Sponsored by **Megha Engineering & Infrastructures LTd., Hyderabad**, (Rs.6.87 Lakhs), 2016.
81. Vetting of Design of Stability Calculations for Storage Reservoir 2 near Yallanur Reservoir, Sponsored by **Megha Engineering & Infrastructures Ltd., Hyderabad**, (Rs.6.87 Lakhs), 2016.
82. Rehabilitation & Upgradation of NH-216 from Raigarh to Saraipalli section in Chhattisgarh state & scour modelling of bridge over Mahanadi River, **Era Infra Engineering Limited, Noida**, (Rs. 5.75 Lakhs), 2016.
83. Vetting of By-pass Canal Based drawings of 2MW and 1.5MW Power Project in Orissa, sponsored by **Indravathi Power Private Limited, Guntur, A. P.**, (Rs.12.595 Lakhs), 2016.
84. Field Study of Anti Erosion works using Woven Geobags, Sponsored by **Techno Fabrics, Surat, Gujarat**, (Rs.11.45 Lakhs), 2016.

85. Vetting of Pre-feasibility study for Identification of Water Bodies in the Periphery of KNIC, Sponsored by **Sutra Consulting Pvt. Ltd.**, (Rs.2.30 Lakhs), 2016.
86. Analytical Study on High Level Bridge over River Teesta with approaches near Haldibari, connecting Mekhliganj with Par-Mekhliganj/Haldibari in the district of Coochbehar, West Bengal Sponsored by **S. P. Singla Construction Pvt. Ltd.**, (Rs.23Lakhs), 2016.
87. Physical Model Study on High Level Bridge over River Teesta with approaches near Haldibari, connecting Mekhliganj with Par-Mekhliganj/Haldibari in the district of Coochbehar, West Bengal Sponsored by **S. P. Singla Construction Pvt. Ltd.**, (Rs.17.25Lakhs), 2016.
88. Preparation of Vision Document for Dal Lake in Srinagar Sponsored by **J&K Lake & Waterways Dev. Authority**, (Rs. 1.10 Crore), 2016.
89. DPR on Upgradation of 3 Old STP Sponsored by **J&K Lake & Waterways Dev. Authority**, (Rs. 36 Lakhs), 2016.
90. River Bank Erosion Control Measures on Barnadi River (Tributary of Brahmaputra River) for Protection of Nagirjuli T. E., **Rossel Tea Pvt. Ltd.**
91. Mathematical Model Study for Proposed Bridge over river Teesta at Haldibari in Cooch Behar, District- West Bengal, Sponsored by **NBCC-I, PWD, West Bengal**, (Rs.21 Lakhs), 2017.
92. Hydraulic Model Study for Proposed Bridge over river Teesta at Haldibari in Cooch Behar, District- West Bengal, Sponsored by **NBCC-I, PWD, West Bengal**, (Rs.17 Lakhs), 2017.
93. Physical modelling studies for Kosi river covering the proposed bridge over near Supaul under Bharat Mala Project of NHAI in Bihar, Sponsored by **VKS Infratech Management Pvt. Ltd.**, (Rs. 49.56 Lakhs), 2017.
94. Vetting of Structure Drawing of 12.5 MLD Common Effluent Treatment Plant, Sponsored by **M/s SPML Infra Limited**, (Rs.4.6 Lakhs), 2016-2018.
95. Examining and vetting the computational modelling report for Performance Accreditation of TechRevetment System, Sponsored by **M/S Floodkon Consultants LLP, Roorkee, Uttarakhand**. (Rs.1.18 Lakhs), 2018.
96. Model Study for Water Intake Structure on Ganga River at Sahibganj for 2x800 MW Godda Thermal Power Project, Village: Motia, District: Godda, Jharkhand, India, Sponsored by **ADANI POWER (JHARKHAND) LTD.** (Rs. 25.37 Lakhs), 2018.
97. Study Related to Brahmaputra River Bank Protection for Guwahati Riverfront Development, Sponsored by **Tata Consulting Engineers Ltd.**, (Rs. 26.45 Lakhs), 2017- 2018.
98. Mathematical Model Study on River Kosi at Bheja – Supaul, Sponsored by **VKS Infratech Management Pvt. Ltd.**, (Rs. 35.40 Lakhs), 2018.

99. Computational modelling of Tech Revetment System, Sponsored by **Reinforced Earth India Pvt Ltd.** 2017-2018.
100. Design Discharge Calculations for Four laning of Bhojpur to Buxar from Km.27.370 to Km 75.00 of NH-84 (Design Chainage Km 77.100 to Km.125.00) in the State of Bihar under NHDP Phase-III on EPC mode, Sponsored by **M/s S. P. Singla Constructions Pvt. Ltd.**2018.
101. Preparation of Design and Drawing of Environment Friendly Foundation & Scour Protection Works at Abutment and Pier of Major Bridge at Km. 50+000 Over Satluj River for Shahkot - Moga Section of NH-71 in the State of Punjab, Sponsored by **DILIP BUILDCON LIMITED, Punjab,** 2018.
102. Consultancy Services for Study, Preparation and Submission of Disaster Mitigation Plan for 2 x 800 MW Ultra Super-critical Coal Based Thermal Power Project, Village Motia, Dist. Godda, State: Jharkhand. Sponsored by **ADANI POWER (JHARKHAND) LTD.**2018.
103. Design and Drawing for Design of Landslides and Slope Protection works in existing road from Km 379+100 to Km 380+275 (approx. 1.175 km) on Gholteer Landslides of NH-07 in the State of Uttarakhand, **Sponsored by Bharat Construction, Dehradun, 2019.**
104. Design and Drawing for Design of Landslides and Slope Protection works in existing road from Km 458.900 to Km 459.475 (Design Ch. 456.200 to Ch. 456.800) (Design Length = 0.600 km) on Patalganga Landslides of NH-07 in the State of Uttarakhand, **Sponsored by Bharat Construction, Dehradun, 2019.**
105. Design Consultancy for Barrage of Naitwar-Mori HEP Sponsored by **SJVNL, Shimla, Himachal Pradesh,** (Rs.82.60 Lakhs), 2018 - 2020.
106. Eco-friendly flood management/ waterway/ protection of embankment with reason of breach of Kamla-Balan river embankment, Sponsored by **Water Resources Dept., Govt. of Bihar, Patna,** (Rs.85 Lakhs), 2019-2020.
107. Vetting of Hydrology report for Gandak River stretch, Sponsored by **M/S Darbhanga Motihari Transmission Company Limited, Bihar** (Rs. 5 Lakhs), 2019-2020.
108. Study of Ganga Bridge for Four Lanning of Haridwar -Nagina Section Of NH-74 From Km 0.000 (Design Chainage 0.000) To Km 73(Design Chainage Km 71.614) in the State of Uttarakhand and Uttar Pradesh Under NHDP Phase -IV on EPC Mode, Sponsored by **M/S Ram Kumar Contractor, Dehradun,** (Rs. 6.50 Lakhs), 2020.
109. Emergent Design for Protection work at Kundil Bridge related to project "Construction of 12.9m wide bridge between Dhola and Sadia ghats along with 2 lane connecting roads from near about Dhola to Islampur tinali in Assam" Sponsored by **M/S Navayuga Dhola Infra Projects Limited,** (Rs. 7.00 Lakhs), 2020.
110. Kanhar Irrigation Dam Project - Vetting of design and drawings of Composite Bridge over Spillways, Sponsored by **HES Infra Pvt. Ltd., Hyderabad,** (Rs. 3.54 Lakhs), 2021.

111. Vetting of Structure Drawing of Project for Planning, Design, Engineering, Procurement, Construction, Installation, Testing, Commissioning, Trial Run (3 months) O & M for 60 months of CETP of 30 MLD capacity and MPS of 30 MLD capacity based on Physico–Chemical, Biological (Extended Aeration Process), Tertiary Treatment and allied works on Trunkey basis after dismantling existing structures in all respect under ASIDE / SIIDS at MIE, Sector 21 -22, Bahadurgarh, Sponsored by **SPML Infra Ltd. Gurgaon**, (Rs. 5.31 Lakhs), 2020.
112. Project For Revetment/Protection of Katariya-Chandpur Embankment Between KM. 3.650 to KM. 4.200 on Left Bank of River Ghaghra in Dist:-Basti, **Sponsored by Uttar Pradesh Irrigation & Water Resources Department**, Year 2020-21
113. Flood Protection Work on Pandey Majha Jogiya Bund near Pandey Majha Village Between KM. 0.900 to 1.150 & Near Village Sheetal Majha between KM. 3.000 to 3.200 on Left Bank of River Gurra in Distt – Deoria Sponsored by **Uttar Pradesh Irrigation & Water Resources Department**.
114. Topographical Survey, Geo-Technical Investigation and Physical Hydraulic Modelling of the Yamuna River Reach Near Proposed Site of New India Garden (NIG) Project Sponsored by **National Institute of Hydrology Roorkee**, Roorkee - 247667, Year 2021.
115. Detail analysis of Hydrological data and vetting of HFL in line of points raised by NHA regarding overtopping of the Road at two locations of Gorakhpur Bypass Project, Sponsored by **Montecarlo Limited**, Year 2021-22.

[N] LIST OF CONSULTANCY PROJECTS (NEW / IN PIPELINE)

1. Consultancy Services for Replication of Eco-friendly River Environment Training techniques for Sustainable Fairway Development in the Ganga River (National Waterway - 1) – Jayprakash Nagar to Doriganj i.e., Ghoghra - Ganga Confluence from Ch.1028 – 1021Km, Sponsored by **Inland Waterway Authority of India, Noida** (Rs. 25 Lakhs), 2019-2020.
2. Consultancy Services for Replication of Eco-friendly River Environment Training techniques for Sustainable Fairway Development in the Ganga River (National Waterway - 1) - Haldi Site with Ch. 1078Km, Sponsored by **Inland Waterway Authority of India, Noida** (Rs. 25 Lakhs), 2019-2020.
3. Consultancy Services for Replication of Eco-friendly River Environment Training techniques for Sustainable Fairway Development in the Ganga River (National Waterway - 1) – Srirampur P.B. site with Ch. 1083Km, Sponsored by **Inland Waterway Authority of India, Noida** (Rs. 25 Lakhs), 2019-2020.
4. Consultancy Services for Replication of Eco-friendly River Environment Training techniques for Sustainable Fairway Development in the Ganga River (National Waterway - 1) - Arjunpur near Buxer with Ch.1120 Km, Sponsored by **Inland Waterway Authority of India, Noida** (Rs. 25 Lakhs), 2019-2020.

5. Consultancy Services for Replication of Eco-friendly River Environment Training techniques for Sustainable Fairway Development in the Ganga River (National Waterway - 1) - Khalishpur to Ghazipur reach with Ch. 1173 – 1171Km, Sponsored by **Inland Waterway Authority of India, Noida** (Rs. 25 Lakhs), 2019-2020.
6. Consultancy Services for Replication of Eco-friendly River Environment Training techniques for Sustainable Fairway Development in the Ganga River (National Waterway - 1) - Raghunathpur site with Ch. 1194Km, Sponsored by **Inland Waterway Authority of India, Noida** (Rs. 25 Lakhs), 2019-2020.
7. Consultancy Services for Replication of Eco-friendly River Environment Training techniques for Sustainable Fairway Development in the Ganga River (National Waterway - 1) – Chattarpur site with Ch. 1197Km, Sponsored by **Inland Waterway Authority of India, Noida**. (Rs. 25 Lakhs), 2019-2020.
8. Consultancy Services for Replication of Eco-friendly River Environment Training techniques for Sustainable Fairway Development in the Ganga River (National Waterway - 1) - Mathara site with Ch. 1200Km, Sponsored by **Inland Waterway Authority of India, Noida** (Rs. 25 Lakhs), 2019-2020.
9. Measurement of Green House Gas (GHG) emission from Reservoir of Chamera- I Power Station (Himanchal Pradesh) Sponsored by **NHPC**, (Rs. 60.14 Lakhs), 2020.
10. Anti-erosion work near Silhata village on Pidra-Karanpur Bund at Km. 2.740 To Km. 3.190 on L/B of Gurra River in District Deoria Sponsored by **Uttar Pradesh Irrigation & Water Resources Department**,
11. Technical assessment for Failure of bank protection works near diversion tunnel of Subansiri Lower HE Project, Sponsored by **The New India Assurance Co. Ltd. Guwahati**, Year 2020-.
12. Consultancy for Remodelling of Dadri Feeder from RD 0 to 42700 offtaking at RD 107200 Bhiwani Sub Branch, Sponsored by **Haryana Irrigation & Water Resources Department**, 2022 -.
13. Consultancy for Remodelling of Loharu Canal from RD 0 to 11550 Sponsored by **Haryana Irrigation & Water Resources Department**, 2022 -.
14. Rehabilitation and Improvement of **Bhandardara Dam** using Piano Key Weir Technology and Structural Strengthening, Sponsored by **Maharashtra Water Resources Department**, 2022 -.
15. Mathematical Model study of complex hydrodynamic behaviour at tidal inlet for investigation of stability of the bridge connecting Port Blair-Chatham Island and bamboo flat in the Union Territory region of Andaman Nicobar Islands Sponsored by **National Highways & Infrastructure Development Corporation**, 2022 - .
16. Mathematical Modelling and Satellite Image Analysis Studies for Four Laning Project from Km 65/000 (Munger) to Km 190/000 (Mirzachauki) of NH-80 including Bhagalpur Bypass in Bihar State, Sponsored by **Montecarlo Limited**, 2022 - .

[O] LIST OF SPONSORED RESEARCH PROJECTS (COMPLETED):-

1. Research project on “*Remote Sensing Aided Idealisation of Space Time Variant Behaviour of Channel Geometry of the River Brahmaputra*”, sponsored by **Ministry of Water Resources, Govt. of India** for **Rs. 13,33,200**.
2. Research project on “*Performance Evaluation of Piano Key Weirs*” with sponsorship and **collaboration of HYDROCOOP, Paris, France** for **US \$11,500**.
3. Research project on “*History of Irrigation in Uttar Pradesh*”, sponsored by **Ministry of Water Resources, Govt. of India** for **Rs. 4,06,743.00**.
4. **BRAHMATWINN International Research Project on “Integrated Study of the Brahmaputra and European Rivers (Rhine & Danube)”**, funded by **European Commission** in research collaboration with Friedrich-Schiller University of Germany and 17 International Partners from Europe and Asia for **Euro1,27,000**, 2005-2010.
5. Research Project on “*Experimental Study on Labyrinth Spillway*” sponsored by Indian National Committee on Hydraulics, **Ministry of Water Resources, Govt. of India. Rs. 17.79 Lakh**, 2006-2010.
6. Research Project on “*Preparation of Action Plan for Improvement of Irrigation Water Use Efficiency*” sponsored by **INCID, Ministry of Water Resources, Govt. of India. Rs. 2.53 Lakhs**, 2010-2011.
7. Indian Team Leader of International Project on **Assessing Health, Livelihoods, Ecosystem Services and Poverty Alleviation in Populous Deltas** sponsored by **Natural Environment Research Council, DFID & ESPA, UK**; with Univ. of Southampton as the Project Coordinator and Univ. Of Oxford, Univ. Of Dundee, Univ. Of Exeter, Univ. Of East Anglia, Normal Univ. Shanghai, BUET and IITR as partners of the International Research Consortium 2011-2013. (**£242,196.17**)
8. **INNO-Asia Networking Project Consortium** sponsored by **Federal Ministry of Education and Research (BMBF), Germany 2010- 2014**.

[P] LIST OF RESEARCH PROJECTS ONGOING / IN PIPELINE:-

1. Research Project on “*Experimental Study of Jack Jetty and Porcupine Systems for River Training*” sponsored by **Indian National Committee on Hydraulics, Ministry of Water Resources, Govt. of India (Rs. 29.35 Lakhs)** 2011- 2019.
2. Development of AI based DSS for Improved Crop Water Use Efficiency under Regulated Deficit Drip Irrigation Regime in the Backdrop of Climate Change, Submitted to **Department of Science and Technology, New Delhi**, on behalf of Shiv Nadar University, India (Rs. 118.41 Lakhs), 2020-
3. Study on dam safety remediation for spillway capacity and reservoir storage using Piano Key Weir and Fuse Plug technologies Submitted to **Ministry of Water Resources, Govt. of India** on behalf of Shiv Nadar University, India (Rs. 96.90 Lakhs), 2020-

[Q] DRAFTING OF NEW INDIAN STANDARDS GUIDELINES UNDER DAMS AND SPILLWAYS SECTIONAL COMMITTEE, WRD 9, FOR BUREAU OF INDIAN STANDARDS (BIS), GOVT. OF INDIA:-

- On request of BIS, drafted new draft IS Guidelines on ***“Preliminary Design of Stepped Spillways”*** for Sectional Committee on **Dams and Spillways, 2021.**
- On request of BIS, drafted new draft IS Guidelines on ***“Hydraulic Design of Piano Key Weir”*** for Sectional Committee on **Dams and Spillways, 2021.**

[R] LIST OF MASTER’S DISSERTATIONS SUPERVISED:-

| S. No | Title of M. Tech Thesis | Name of MTech Student | Country |
|--------------|---|------------------------------|----------------|
| 1. | On farm water use pattern in Salawa command | S. S. Ghosh | India |
| 2. | Study of variation of roughness coefficient in canals | Bachtarudin | Indonesia |
| 3. | Design of irrigation games | P. P. Changkakati | India |
| 4. | Evaluation of regulation of a canal system with special reference to Eastern Yamuna Canal | Ajit Bujarbarua | India |
| 5. | Computer aided gaming simulation for main canal operation | A. K. Ingle | India |
| 6. | Main Canal operation model-A case study | D. K. Sawant | India |
| 7. | Effect of land consolidation on irrigation water management- A case study | M. K. Sharma | India |
| 8. | Simulation of soil moisture status with reference to wheat crop | Fauzi Putra | Indonesia |
| 9. | Evaluation and improvement of operation of Bordikrai irrigation system in Assam | R. Kakati | India |
| 10. | Computer programming for crop water requirement | G. P. Soni | India |
| 11. | Reclamation of swampy areas to support transmigration programme in South Sumatra | E. Sembiring | Indonesia |
| 12. | Organizational framework for effective irrigation water management in Assam | K. G. DebKrori | India |
| 13. | An estimation of projected irrigation water requirement of the Brahmaputra basin | B. N. Goswami | India |
| 14. | Analysis of transient flow in canal | D. N. Kumar | India |
| 15. | Feasibility study of automatic regulation of an irrigation canal-A case study | P.V. Purandare | India |
| 16. | Hydraulic computations for automated irrigation | Shyam Sunder | India |

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| | canal | | |
| 17. | Study of Looseness factor for barrages | N. C Mohanty | India |
| 18. | Causes of failure of Kankai Headworks –A case study | Ashok Kumar | Nepal |
| 19. | Comparative analysis of raft foundations for barrages | C. S Mathur | India |
| 20. | Earth pressure distribution on barrage abutment | P. G. Rochlani | India |
| 21. | Estimation of kentledge requirement for sinking of well foundations | S. C. Sahu | India |
| 22. | Computer aided design of barrage | M. K. Hamed | Sudan |
| 23. | Design and construction problems of deep well foundation of New Solani Aqueduct | K. Ravindran | India |
| 24. | Watershed modelling of Pagladiya – A tributary of the Brahmaputra | A. K. Sharma | India |
| 25. | Study of watershed characteristics between Hirakud Dam and Manibhadra using LANDSAT imageries | S. Behera | India |
| 26. | Implicit modelling of flood wave propagation | Md. J. A. Hye | Bangladesh |
| 27. | Case study of flood routing in a selected reach of the Brahmaputra | A. Kalita | India |
| 28. | Implicit flood routing for movable bed channel - A case study | U. K. Chaudhary | India |
| 29. | Study of solution techniques used in river Modelling | S. M Hidayatullah | India |
| 30. | Sedimentation study of Sree Ramsagar reservoir using satellite imageries | G. Devdas | India |
| 31. | Flood Plain study of Brahmaputra River using Satellite imageries | P. R Murty | India |
| 32. | Study of the effects of river training works on the Brahmaputra | Dwipen Bhagawati | India |
| 33. | Spacing of spurs as bank protection measure - A case study | D. K. Singh | India |
| 34. | Evaluation of the changes in channel configuration of the Brahmaputra River from Kobo to Tezpur using satellite imageries | M. Kalita | India |
| 35. | Investigation of morphological changes of the Brahmaputra river from Tezpur to Dhubri using satellite data | Iltaf Hussain | India |
| 36. | Study of plan form changes in a selected reach of an alluvial river (Ganga) using remote sensing data | Ashok Kumar | India |

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| 37. | Off-line and on-line of a conceptual rainfall run-off model-tank model | Zhang Jian Min | China |
| 38. | Computer aided hydraulic design of spillways and appurtenant structures | G. V. Surendra | India |
| 39. | Silting performance of solid and permeable spurs | A. K. Singh | India |
| 40. | Morphological study in a reach of river Ganga using satellite data | A. K. Kher | India |
| 41. | Computer application of entropy-based river morphological studies | Md. Nazrul Islam | Bangladesh |
| 42. | Entropy-based analysis of sediment discharge predictors | Sultan Ahmed | Bangladesh |
| 43. | Computer aided design of some structural components of Hydro Electric Project | P. C. Pradhan | India |
| 44. | Drainage of irrigated agriculture lands –A Case Study | D. K. Bhagoria | India |
| 45. | Development of expert system for canal Management | C. D. Gulhane | India |
| 46. | Computer modelling of alluvial stream for levee spacing | V. Shanker | India |
| 47. | Implementation of interactive data management software for hydrological modelling | S. K. Balabantaray | India |
| 48. | Socio-economic evaluation of an irrigation system with special reference to farmers organisation – A case study | S. K. Manandhar | Nepal |
| 49. | Performance evaluation and effective irrigation project management of Kraseio Project in Thailand | Supanat Pariyachat | Thailand |
| 50. | Analysis of satellite derived maps and hydrological data for identification of navigation problems in the river Brahmaputra | H. P. Ishar | Nepal |
| 51. | Mathematical modelling of gravel bed rivers | S. K. Sharma | Nepal |
| 52. | Design of stable channel for non-uniform alluvial sediments | Rajesh Gupta | India |
| 53. | Critical analysis of steel liner design for pressure shaft with special reference to Nathpa Jhakri Hydro Electric Project | A. K. Sood | India |
| 54. | Mathematical modelling of curved channels | C. S. Padhi | India |
| 55. | Study of river behaviour and control with suitable training works–A case study for the Disang river in Assam | S. K. Talukdar | India |
| 56. | Sedimentation studies for lower Maniar and Kaddam reservoirs in Andhra Pradesh | Bhoopal Reddy | India |

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| 57. | Spatio-temporal idealisation of typical cross-sections of a large braided alluvial river | G. P. Singh | India |
| 58. | Dam breach flood wave analysis | S. Sah | India |
| 59. | Morphological analysis for identification of river training sites in a stretch of the Ganga River using satellite imagery | Mohd. Arsad | India |
| 60. | Techno-economic appraisal of hydropower plants – A case study (Disang river) | N. Subramanian | India |
| 61. | A case study of drainage problem for tea garden in Assam | P. Goswamee | India |
| 62. | Effect of sediment on channel dimensions- A case study of Chatara canal in Nepal | P. Paudel | India |
| 63. | Computer modelling for border irrigation | A. C. Debnath | India |
| 64. | Mathematical modelling for alluvial river with secondary flow | Samanta Deb | India |
| 65. | Design analysis of river training works for gravel bed river- A case study | Krishna Raj Timilshena | Nepal |
| 66. | Computer aided analysis of substructure of Surface power house | Kumud Goswami | India |
| 67. | Computer aided design of desilting arrangements for river valley projects | Suresh Chandra Dalai | India |
| 68. | Study of scour around spurs at Gumi in the Brahmaputra river | Vinod Kumar Talwar | India |
| 69. | Hydro-morphological study of the river Kosi in a selected reach using extremal hypotheses and satellite data | Kaushal Kishore Mishra | India |
| 70. | Mathematical modelling of hydraulic transients in power channel | Niranjan | India |
| 71. | Dynamic regulation study for a reach of Upper Ganga canal | Rajesh Kumar | India |
| 72. | Developing interface of drip irrigation in canal command in Maharashtra | Pradeep Bhalage | India |
| 73. | Mathematical modelling of gravel bed river with armouring | Keshab Dhoj Adhikari | Nepal |
| 74. | Study of watershed management of Kholanadong basin in Assam | M. Talukdar | India |
| 75. | A case study of sprinkler irrigation application for tea plantation in Assam | Arup Kumar Sharma | India |
| 76. | Numerical modelling of river flow simulation with embankment breach | Kankan Goswami | India |
| 77. | Unsteady flow modelling of alluvial streams with flow curvature | Z. R. Khan | India. |

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| 78. | Modelling of braided streams | R. P. Poddar | India |
| 79. | Estimation of resistance to flow in gravel bed streams | Sanjay Sharma | Nepal |
| 80. | Evaluation of stochastic models of sediment transport | Dinesh Prasad | India |
| 81. | Pakhangoung irrigation project: role of farmer's association in Lao PDR | Khamphat Sourinphoumy | Laos |
| 82. | Optimal waterway of Barrage | A. B. Nayak | India |
| 83. | Role of farmers organisation in irrigation water management – A case study of Western Gandak Project (Nepal) | B. K. Thapa | Nepal |
| 84. | Analysis of river control measures in gravel bed streams - A case study | H. P. Hemchuri | Nepal |
| 85. | Experimental investigation of submerged vanes as anti bank erosion measures | P. K. Manandhar | Nepal |
| 86. | GIS based analysis of fluvial landform changes of a large braided river | R. N. Sankhua | India |
| 87. | Analytical study for remodelling of water conductor system of a small hydel project – A case study | S. P. Mishra | India |
| 88. | Experimental study of flow resistance in gravel bed streams | S. Upadhyay | Nepal |
| 89. | Computer simulation analysis of tailwater level in a small hydel project – A case study | T. K. Bhadury | India |
| 90. | Modelling of advance phase in border irrigation using dimensional approach and kinematic wave approximation | M. S. Alam | India |
| 91. | Modelling of infiltration characteristics through Soil | S. K. Verma | India |
| 92. | Numerical modelling for snow avalanche motion | Rakesh Kumar Gupta | India |
| 93. | Morphological analysis for management of boulder bed stream – A case study | Ajeet Kumar Jain | India |
| 94. | Design analysis of diversion head-works for water intake of HFCL at Namrup | D. Venugopal | India |
| 95. | Hydraulic analysis for high head water conveyance system and energy dissipater for Rammam Stage-II Hydel Project | Tushar Kanti Sarkar | India |
| 96. | Case study of drainage problem of plantation area using remote sensing and GIS techniques | K. Vamsikrishna Naidu | India |
| 97. | Use of uplift pressure in design of floor and rib foundation of barrage | Junaedi | Indonesia |

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| 98 | Design of vortex settling basin for Jaldhaka Hydro Electric project- A case study | Alfan Rianto | Indonesia |
| 99. | A study of morphological behaviour of Brahmaputra river from Dibrugarh to Majuli island | U. P. Gupta | India |
| 100 | Artificial neural networks based spatio temporal study for a typical reach of Brahmaputra River | T. S. Patil | India |
| 101 | Study of water logging within a flood plain area using remote sensing data | Vijai Shanker Jauhari | India |
| 102 | Study on erosion control using jute geo-textile | Desta Eshete | Ethiopia |
| 103 | F. E. M. analysis of barrage with varying sub-soil condition | Subrata Sarkar | India |
| 104. | Spatio-temporal morphological analysis using satellite data for a reach of River Brahmaputra | Mithilesh Kumar Singh | India |
| 105. | Analysis of flow resistance in braided river -A case study | Christoforus Mardjono T. Lasmono | Indonesia |
| 106. | Analysis of model studies for desilting basins | Manoj Kumar Verma | India |
| 107 | Modelling on river morphology using remote sensing techniques | Gopi Madana | India |
| 108. | Study of simulation models to analyze stream bed variations | Moti Raj Gautam | Nepal |
| 109. | Development of numerical model for alluvial streams with multi-channel configuration | Binod Kumar Sinha | India |
| 110. | Morphological analysis of Brahmaputra river using GIS and satellite data | Lakshman Singh | Nepal |
| 111. | Experimental study of hydraulics of labyrinth weir with different shapes | Rajive Nandan Mourya | India |
| 112. | Study of river channel modification using numerical technique | Patitpaban Das | India |
| 113. | A Comparative study of analytical methods for raft foundation | Moushami D. Kulkarni | India |
| 114. | Channelisation in a reach of Beas river – A case study | R. B. Shrestha | Nepal |
| 115. | Experimental study of flow pattern in multi-slope stepped spillways | P. C. Pokharel | Nepal |
| 116. | A case study on dam break for inundation analysis | H. Mahanty | India |
| 117. | Assessment and management of water utilisation in Mahanadi basin | R. K. Biswal | India |
| 118. | Application of Geo-synthetics in river bank erosion control | A. K. Biswas | Bangladesh |
| 119. | Flood plain modelling of the Brahmaputra | Ambuj Dwivedi | India |

river in Assam

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| 120. | Study on vortex type sediment extractor for Jaldhaka Hydel Project | Monirul Islam | Bangladesh |
| 121. | Neuromorphic study of Longitudinal profile of the River Brahmaputra | Raghunath Shrestha | Nepal |
| 122. | Hydrologic response of Kankaimai watershed in Eastern Nepal | Mekh Nath Sharma | Nepal |
| 123. | Fluvial regime of the Manipur River basin and Loktak Lake with study of backflow | Ng. Romeji Singh | India |
| 124. | Computer Based Flow Simulation of Sarda Feeder Channel | Adesh Kumar | India |
| 125. | Study Environmental Impacts and Climate Change in Aral Sea Basin Using GIS | U. B. Maratovich | Uzbekistan |
| 126. | Numerical model studies of river Ganga for fairway development between Allahabad & Sirsa | Md. Parwez Akhtar | India |
| 127. | Study erosion and protection of river bank | Ngliyen Ha Thanh | Vietnam |
| 128. | Experimental studies on channel improvements through use of submerged vanes | Deepak Kumar | India |
| 129. | Remote sensing-based study of River Avulsion of Brahmaputra near Dibrugarh | Ajay Kumar | India |
| 130. | Analytical study for sediment control and discharging capacity of water intake | Binod Kumar Chapagain | Nepal |
| 131. | Harnessing of fresh water in western ghat regions – A proposal for interconnected | Sudheer S. Chavan | India |
| 132. | Hydraulic modelling and sediment inflow forecasting to newly constructed Almatty reservoir on river Krishna | R. Azhagesan | India |
| 133. | Study for navigation development at six locations in river Ganga | Anupama Nayak | India |
| 134. | Study of morphology and river management of Ganga and Koshi rivers at few sites | Md. Perwez Akhtar | India |
| 135. | Neural network model for runoff and sediment yield | Md. Zakaullah | India |
| 136. | Fixation of bridges on alluvial braided river – A case study, Kosi river | S. A Burele | India |
| 137. | Role of numerical models in designing the feasible layouts for ports and harbours | V. K. Shukla | India |
| 138. | Ecological modelling of oxidation pond | Sushil Chandra Devkota | Nepal |
| 139. | Flow simulation of Brahmaputra river using 2D modelling approach | Deepak Swami | India |
| 140. | Study off in-stream storage system | Dipali Ramesh | India |

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| | using Piano Key Weir | Harpale | |
| 141. | Silt control in reservoir using diversion Tunnel & Blank Panels | Mohd. Ziaul Qamar | India |
| 142. | Numerical Modelling and Simulation of River Channel Improvement for Flood Moderation | Belay Zeleke Desta | Ethiopia |
| 143. | Experimental Study on Spatial Flow Characteristics of Piano-Key Weir | Himanshu Arora | India |
| 144. | Remote Sensing Based Sedimentation for Sheravati Reservoir Karnataka | Harsha M. Chaudhary | India |
| 145. | Design Analysis for Channel Rectification Of Gandak River in Bihar | Anirban Dutta | India |
| 146. | Investigation of Artificial Channelization for Brahmaputra River in selected reaches by Numerical modelling | Afewerk Ashagrie | Ethiopia |
| 147. | Experimental Study of Flow Resistance in Alluvial Channel | Harinarayan Tiwari | India |
| 148. | Mathematical Model Studies for Reservoir Sedimentation and Reservoir Flushing Techniques (A case study for Luhri Hydroelectric Project) | Eskinder Tadesse Esubalew | Ethiopia |
| 149. | Sediment control in an estuarine harbour basin using Submerged Vanes and a Current Deflecting Wall | Adrian Montero Banuelos | Mexico |
| 150 | Experimental study of Blunt Nosed Chevron for Channel Improvement in Fairway | Amanda Devianty | Indonesia |
| 151 | Design analysis for river diversion of the Beas river near Kullu | Ahmad Shadab | India |
| 152 | Development of Water Sharing Model for Trans-boundary rivers – A Fuzzy Logic Approach | Subash Prasad Rai | India |
| 153 | Investigation of Jack Jetty field for River Channelization | Abhigya Shrewastava | India |
| 154 | Experimental Study of Triangular and Prismatic Porcupine Systems for River Training | Mohd. Aamir | India |
| 155 | Modeling of River Restoration Analysis – A Case Studies | Nilanshi Gupta | India |
| 156. | Experimental Study on Effect of Chevron System | Pooja Singh | India |

On Channel Changes

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| 157 | Modelling of a Reach of Gandak River | Aditya Gupta | India |
| 158 | Performance Analysis of Trail Dyke and Jack Jetty systems using laboratory and field data in Solani river | Alok Kumar | India |
| 159 | Snowmelt Runoff Modelling for an Indian Himalayan river basin | Arun Kumar Soni | India |
| 160 | Assessment of Jiadhal river along with its watershed to achieve river channelization | Nangtiaki Tariang | India |
| 161 | Analytical Study of selected reach of Ganga River for harnessing its water resources | Ritesh Kumar Jaiswal | Nepal |
| 162 | Analysis of cloud burst events using archived multi-satellite precipitation estimates | Ashish Chaudhary | India |
| 163 | Design analysis of Fuse Gates applications for dam safety and storage enhancement | Mukti Narayan | India |
| 164 | Evaluation of TRMM precipitation estimates Vis-à-vis terrestrial measurements | Neha Rathore | India |
| 165 | Analysis of multimodal inland navigation system on Ganga River | Ujjwal Singh | India |
| 166 | Comparative study and performance analysis Of Roller Compacted Concrete dam (RCC) | Md. Faizan Khan | India |
| 167 | Study of Pump Storage Schemes | Prakhar Mishra | India |
| 168 | Development of Lake hydrodynamic Model – Case Studies | Sunil Kumar S | India |
| 169 | Ground Validation of GPM data – A Case Study | Anil Kumar | India |
| 170 | Performance of Woven Geosynthetic Products for Stream Bank Erosion Control – Case Study | Saurav Patwal | India |
| 171 | Computer Simulation Study on Dredging and Dyking in a Brahmaputra River Reach | Deepak Dhakal | Nepal |
| 172 | Experimental Study of Piano Key Weir for Sand And Gravel Bed Fluvial Condition | Pawan Adhikari | Nepal |
| 173 | Application of Jack Jetty and Trail Dyke in River Training Works | Vishnu Bhandari | Nepal |
| 174 | Computer Simulation Studies for River Restoration and Sustainability | Manoj Prasad Patel | Nepal |

[S] LIST OF SPECIAL PROBLEM REPORTS: -

The Topics of Special Problem Reports are listed below

1. Critical review of water measuring devices.
2. On farm measuring devices.
3. Analysis of drainage system by simulation method.
4. Evaluation of Jagiroad lift irrigation scheme in Assam.
5. Economics of crop production - A comparative study of Indonesia.
6. Study of performance of Chatra canal in Nepal.
7. Operation and maintenance problems of Eastern Yamuna Canal.
8. Operation and maintenance of irrigation canal system under Cotton Barrage on the Godavari.
9. Techno-economic analysis of Gravity and Raft floor of a barrage.
10. Comparative study of barrage abutment wall.
11. Unconventional approach of design of raft foundation for barrages.
12. Performance of spur as an Anti-Erosion measure for the Brahmaputra river near Dibrugarh.
13. Performance evaluation of Anti-Erosion measures of the Brahmaputra River near Gumi.
14. Problems of energy dissipation in spillways.
15. Design of A system of measuring devices for the demonstration farm of WRDTC (Indian Institute of Technology, Roorkee).
16. Calibration of Replogle Flume on the computer.
17. Design of Anti water logging measures of the Tawa Command in Madhya Pradesh.
18. Study of irrigation practices for Tea crop in Assam.
19. Unconventional design of spur.
20. Critical review of sediment discharge predictors.
21. Study of channel processes of Gravel - Bed Rivers.
22. Critical review of solution techniques used in river modelling.
23. Computerized design of well foundations.
24. Problems of hill slides of power channel of Micro Hydel Project in Arunachal Pradesh.
25. Feasibility study of application of dynamic regulation method to Jagiroad Irrigation Scheme in Assam.
26. Computer aided design of bottom intake structure for Mountain streams.
27. Computer aided analysis of river bank stability
28. Computer modelling of river channel changes.

29. Computer programming for dam degradation model.
30. Computer aided design of run-of-river mini hydel scheme.
31. Remote sensing application for crop yield assessment.
32. Study of gauge discharge relation of a alluvial river (Ganga).
33. Restructuring of irrigation project management in Indonesia.
34. Compute programming for load calculations of barrage raft foundation.
35. Pre-investment feasibility study of Cisapane river basin development project in Indonesia.
36. Stream bed profile modelling Using Legendre Polynomial.
37. Computerized design of cross-drainage Works.
38. Study of land use in and around Roorkee using satellite data.
39. Design of suspension bridges on hilly rivers.
40. Mekong river morphological study Vientione Nongkhai reach.
41. Gabions maccaferri in earth retaining works and as lining for channelized water channelized water course.
42. Design of stable channel - recent advances.
43. Review of drainage design works.
44. Design of sprinkler irrigation system.
45. Irrigation through underground C. C. Pipe.
46. Optimal design of head race channel for small hydro-electric projects.
47. Analysis of hydrographic data of the Brahmaputra River in India
48. Hydrological analysis and water budgeting of a Peninsula sub catchment - A case study.
49. Design of canal transition to reduce scour downstream of hydraulic structures.
50. Hydrological data analysis of the Brahmaputra River as Pandu.
51. Modernization of Mortand Canal in Kashmir
52. Hydrological study and hydraulic design of urban drainage channels for Papang area flood control project in Indonesia.
53. Computerized design of IOWA vanes for river bank protection.
54. Problems in design construction and maintenance of trench weirs lin Hilly streams with reference to Nepal.
55. Case study of simulation for reservoir sedimentation characteristics.
56. Interactive computerized design of vortex settling basin.
57. Design of barrage for sub-surface flow with drainage arrangement - A case study of Polavaram barrage.
58. Experimental study of surface pannel.
59. Experimental study of flow separation solid and permeable groyne.
60. Experimental study of bottom panel.

61. Experimental study of velocity distribution with solid spurs in series.
62. Computerized design of silting basin.
63. Critical review of energy loss phenomenon in water conductor system.
64. Review of design of raft foundation for hydraulic structures.

[T] LABORATORY RESEARCH INFRASTRUCTURE DEVELOPED IN IIT ROORKEE

➤ In WRD&M Dept., IIT Roorkee the following laboratory infrastructure developed since 1998 - .

- **Indoor River Engineering Lab with following experimental infrastructure**
 - ❖ 20 m long, 2.4 m wide, 2 m deep brick flume with perspex wall, sediment feeder, sediment collector, recirculating & storage tanks
 - ❖ 3 nos. of tilting steel experimental flumes with perspex side walls
 - ❖ Acoustic Doppler Velocimeter for 3D velocity measurements.
 - ❖ Laser Doppler Velocimeter for non-intrusive 3D velocity measurements.
 - ❖ Fluorometer for discharge measurement by fluorescent dye
 - ❖ Electronic bed profiler
 - ❖ Electronic multipoint water level indicator
- **Outdoor River Engineering Lab / Demonstration Farm with following experimental infrastructure developed in 2009**
 - ❖ Deep tubewell water source
 - ❖ Large underground water storage tank
 - ❖ Surface tanks with discharge measuring V-Notch weir
 - ❖ Large experimental tray for comprehensive model studies
 - ❖ Surface channel network for water recirculation

[U] AREAS OF RESEARCH INTEREST:-

1. River Engineering compatible with eco-friendly aquatic habitat
2. Stepped Spillways
3. Piano Key Weir
4. Submerged Vanes / Jack Jetty & other River Training Works
5. Desilting Basin / Vortex Type Sediment Extractor
6. Braided Stream Morphology and Modelling
7. Watershed Management and Modelling
8. Remote Sensing & Neuromorphic Techniques for Water Resources Development
9. Hydraulic Structures / Dams / Barrages in Hydel and Irrigation Projects
10. Irrigation Science

11. Ecosystem Services / Wetlands
12. Climate Change
13. Inland Navigation
14. Concrete Dams
15. Urban Flooding

[V] EXTRA CURRICULAR ACTIVITIES:-

1. Member of the Assam State Table Tennis Team in the National Inter-State Table Tennis Championships held during 1967, 1968-69, 1969-70, 1972 & 1974.
2. Member of the Gauhati University Table Tennis Team in the Inter-Varsity Table Tennis Tournament held during 1967 and 1971.
3. Junior Table Tennis Champion of Assam in 1967.
4. Awarded "College Colour" for proficiency in Table Tennis by Assam Engineering College.
5. Staff Adviser for Table Tennis of I. I. T. Roorkee in 2003-2004.

[W] COUNTRIES VISITED:-

U.S.A., MEXICO, NEPAL, ENGLAND, FRANCE, BELGIUM, LUXEMBOURG, GERMANY, SWITZERLAND, CANADA, THAILAND, SCOTLAND, CHINA, AUSTRIA. PORTUGAL, BANGLADESH, BHUTAN, MALDIVES.

[X] INNOVATION GRANT ON IPR:

The *Commissioner of Patents of Australian Govt. IP* has granted the patent on 3rd November 2021 for eight years, and certifies that the below particulars have been registered in the Register of Patents.

Name of Inventor: *Nayan Sharma*

Title of invention: ECO-FRIENDLY RIVER TRAINING SYSTEM FOR FLUVIAL INLAND WATER BODIES

June - 2022

Professor NAYAN SHARMA, Ph.D.