CURRICULUM VITAE

Name : **ARUN KUMAR**

Designation: Emeritus Fellow

Specialization: Hydropower Development, Environmental Management, Energy Economics and Policy, Sand Erosion, Hydraulic Turbine, Pumped Storage Plants, Floating Solar, Regulatory Affairs

Education: B.E.(Civil) University of Roorkee, Roorkee (Now IIT/R) M.E.(Civil) Indian Institute of Sciences, Bangalore Dip. in Hydro Power Development, Trondheim (Norway) Ph.D., IIT Roorkee.

Employment: As Professor till June 2024 after joining the institute as Scientist in Nov 1981, presently working as Emeritus Fellow in IIT Roorkee since July 2024.
Additionally
NEEPCO Chair Professor at IIT Roorkee Feb 2022 – June 2024
MNRE Chair Professor at IIT Roorkee July 2013 – April 2018
Independent Director, Kerala State Electricity Board (since March 2024 onwards)
Independent Director (non-official) of NHPC Ltd. By Govt of India (Nov 2015 – Nov 2019).

Intuitional Administrative Responsibilities:

- Head Alternate Hydro Energy Centre May 1998 – Dec 2011 (14 Years)
- Coordinator Institute Green Campus Committee from Jan 2014 onwards.
- Member of Governing council of Council for Green Energy Jobs, Oct 2015 onwards
- Member of IITR Smart Committee, 2007 – 2012
- Member of governing body as faculty member for Technology Incubation and Entrepreneurship Activity (TIEDA) of IIT Roorkee 2010 – 2016
- Deputy Director, Science & Technology Entrepreneurship Park Roorkee, University of Roorkee, (additional) July 90 - May 1998

Outreach: Contributed significantly in the establishment and national and international recognition of Department of Hydro and Renewable Energy (HRED) (formerly Alternate Hydro Energy Centre), conceptualized and established national facilities for hydropower simulator, performance evaluation of hydro projects, hydraulic turbines, standards for SHP and environmental management of lakes and rivers, comprehensive use of solar energy at IIT Roorkee campus (1.81 MW SPV, 0.34 Mlpd SWH and 61 dishes ST), water for welfare-Uttarakhand initiative

Teaching: Teaching various PG/UG courses in HRED and students of other departments of the institute regularly Designed two M.Tech. Programmes at HRED “Alternate Hydro Energy Systems" and “Environmental Management of Rivers and Lakes”
Designed 3 optional courses for UG students

Collaboration: **International:** Instrumental in Arranging MOU with International Organisations: Voith Hydro Germany, University of Itijuba (Brazil), University of Peradeniya (Sri Lanka), The Water Resources University - Hanoi (Vietnam), ICIMOD, WEC-HMG (Nepal), IN-SHP (China), REMC-AIT (Thailand), SCP Gestion Conceil (Canada), IH (UK), ITECO (Nepal) Kathmandu, HTA Switzerland
National: MNRE, Uttarakhand Govt., Bihar State. Hydro Corporation, HimUrja (HP Govt.), J&K PDC, BIS, NHPC, NEEPCO.

Publications: Technical/Research Papers Journal 86, Conferences: 180, National, Books/Guidelines - 39, SHP Guidelines – 28, Engg. design and project reports – 60, BIS guidelines for Small Hydro Stations 1.

Research: Doctoral: 16 (awarded) and 2 (ongoing)
M Tech Dissertation: 110 (completed) and 2 (ongoing) M Tech Projects: 37

Personal Details : DOB June 13, 1959 at Meerut, UP, India, Married, 2 Sons

Contact Details: Arun Kumar, Department of Hydro and Renewable Energy, Indian Institute of Technology Roorkee, Roorkee - 247 667, India, Tel: +91 1332 285821; E-mail: arun.kumar@hre.iitr.ac.in; aheciitr.ak@gmail.com

Membership/Awards/Honours/On committees/ International Collaboration

A. Membership of Professional Bodies/Societies:

International:

1. Fellow – American Society of Civil Engineers (F-1023418)
2. Fellow – International Hydropower Association since January 2020
3. Life Member – International Commission on Irrigation and Drainage (DM/IND/2020/3017)
4. Member – American Water Works Association(M-01081163)
5. Member – American Society of Mechanical Engineers (M-100173557)
6. Member – International Association for Hydro – Environment Engineering and Research (M – 43744)
7. Member – IEEE (Institute of Electrical and Electronics Engineers) (M-97458982)

National:

1. Life Fellow Institution of Engineers (India) (F-015964-2)
2. Life Fellow Indian Water Resources Society (F-1103)
3. Life Fellow Indian Water Works Association
4. Life Fellow Indian Hydraulic Society (F-758)
5. Life fellow – Institution of Public Health Engineers, India (LF 734)
6. Member International Association of Hydraulic Research (CN-9943)
7. Life member Indian Association of Hydrologists (LM-170)
8. Life member- Solar Energy Society of India (LM-1136/2005)
9. Life member – Indian National Hydropower Association (INHA/LIFE/013)
10. Individual Life Member – Central Board of Irrigation and Power (ILM-73)

B. Awards/ Honours:

National:

1. CBIP Individual Award 2024 for Outstanding Contribution for Development of Water Resource, Power and RE Sector
2. NEEPCO chair Professor at IIT Roorkee Feb 2022 – June 2024
3. IIT Roorkee Research Award "HRED Hydro and Renewable Energy Award 2021"
4. Award of Excellence from Himalaya Power Producers Association in July 2017.
5. Eminent Engineer Award from The Institution of Engineers (India) Dehradun in 2017
6. Uttarakhand Excellent Engineer Award – 2015 from The Institution of Engineers (India) Dehradun.
7. Surya Award (III) by Indian Institute of Rural Development and Social Services, Delhi (2001),
8. CBIP "Cash your ideas Award - 1991" for innovative and indigenous solution for Weirs in hills,
9. UGC fellowship (1979-81)
10. National Scholarship (1973-79)

International:

1. NORAD fellowship (1988-89).
2. Coordinating lead author for the chapter 5 on Hydropower for IPCC Special Report on Renewable Energy during 2009-11.

C. On National Committees:

- Ministry of New and Renewable Energy, constituted committee Chairman on Cost estimation for Village hydro project
- Member (Alternate) of Bureau of Indian Standard (BIS) RVD Committee 15.4 on Small Hydro (1984-92).
- Member (convener) of Civil Engg. Aspects - New Technology Committee of Ministry of Non-Conventional Energy Sources, Govt. of India (1997 -1998).
- Member of `Project Executive Committee' for UNDP-GEF Hilly Hydro Project, MNES, Govt. of India (1995-1999)
- Member of High level "Project Implementation Committee" for UNDP GEF Hilly Hydro Project of Ministry of Non-Conventional Energy Sources, Government of India (1998 -2000).
- Member of "Purchase Committee" for UNDP GEF Hilly Hydro Project of MNRE GOI (1998 -2000).
- Member of "Renewable Energy Cell" of UP State Government since Aug. 2000
- Nominee Director of IREDA for its funded project (July, 2000- 2003).
- Member of "Rural Electrification Committee' of Uttaranchal – since Aug. 2001.

- Member of Project Evaluation Committee of Uttaranchal Jal Vidyut Nigam, since July 2002.
- Member CII – GBC Godrej Renewable Energy Committee, (2003 till date).
- Chairman of the committee constituted by MNES for village hydro cost estimation, 2004.
- Member of Uttaranchal state committee for CDM projects 2005
- Member, Advisory Committee, Uttarakhand Electricity Regulatory Commission (2006 – 2011).
- Chairman, Hydropower seminar, ASSOCHAM and Royal Norwegian Embassy, 2006
- Member of Planning Commission Sub-Committee on rivers, lakes and aquifer for 11^{th} plan, 2006
- Member of Planning Commission Sub-Committee on R&D Research, Design and Development in renewable energy, 2006
- Member of International Scientific Committee constituted by MoEF for World Lake Congress, 2007
- Member, Expert member of committee for State S+T Intervention Projects, DST, Govt. of India, 2007
- Member, Expert member of committee for selection of site for IIT Patna from hydrology aspects.
- Member of Standing Committee for Border Area Illumination, Govt. of India, MNRE 2008.
- Member of FICCI Renewable Energy Committee 2009
- Member of examination of small hydropower site offers constituted by Uttarakhand government 2008 till date
- Member of Uttarakhand state environment impact of hydropower project committee constituted by Uttarakhand government 2008 till date
- Member of Consultative committee for mid-term evaluation of MoEF constituted by Planning Commission 2009.
- Member of expert committee for examining the special issues related to Varanasi sewage on river Ganga constituted by MoEF 2010.
- Member of expert committee for examining the issues of Loharinag Pala hydro project constituted by MoEF 2010 and again in 2011.
- Member of governing body as faculty member for Technology Incubation and Entrepreneurship Activity (TIEDA) of IIT Roorkee since Dec 2010,
- Member- 12th Plan proposals preparation for small hydro sub group of Ministry of New and Renewable Energy (2011)
- Chairman Expert Committee of MoEF for Srinagar Project – April – May, 2013.
- Member - CWC committee for longitudinal connectivity of river 2017
- Member – MNRE Standardization od RE systems since 2018
- Member- Ministry of Water resources, River development and Ganga Rejuvenation for Karcham Wangtoo Hydro project capacity enhancement review 2019
- Member- MOEFCC committee for study on impact of desilting and Dredging from Reservoirs and Barrages 2020
- Member- Ministry of Power- increasing peaking mode operation of Hydropower Projects 2017-18
- Member- Ministry of Water resources, River development and Ganga Rejuvenation for Karcham Wangtoo Hydro project capacity enhancement review 2019-20
- Member- MOEFCC committee for study on impact of desilting and Dredging from Reservoirs and Barrages 2020
- Member- Bureau of Indian Standard committee for Research Advisory Committee 2020 onwards
- Chairman- MNRE Committee to formulate the ITI course curriculum in Small Hydro Power. 2020-21
- Board member – International Hydropower Association, 2021-23
- Ministry of Power, member, Committee to increase viability for hydropower projects 2021
- Niti Aayog, member Advisory group, Increasing viability of hydropower projects in North eastern region by the year 2047, June 2022
- Member, Central Advisory Committee, CERC since Sept 2023
- Chairman, Hydro Research Committee Ministry of Power with CPRI Coordinator since July 2023
- Member, Bureau of Indian Standards Sectional Committee WRD-10, WRD-22 and ME-22.
- Chairman, Small Hydropower Plants Sectional Committee WRD 29, Bureau of Indian Standards, since Jan 2024. The committee is replica of International Eletro-technical Commission committee TC 339.
- Member, Research and Development Appraisal Committee (RDPAC) of Tidal/Wave Energy, Ministry of New and Renewable Energy, Government of India, 2025

D. On International Committees/Assignments:

- Member of Long Duration Energy Storage Council Advisory Board since May 2024
- Associate Editor ASCE Journal of Pipeline Systems Engineering and Practice since Jan 2020
- Resource expert for small hydropower in developing countries for IRENA meeting in Jan 2013 and workshop in Zambia (2013).
- Expert for preparing report on Establishing SHP technology centre in Tanzania, UNIDO (2012)
- Coordinating lead author on intergovernmental panel for climate change report on renewable energy – Hydro chapter (2009-2011)
- Member of Science Planning Group (SPG) in the area of Sustainable Energy by International Council for Science Regional Office for Asia and the Pacific Kuala Lumpur (Malaysia) 2008
- Development report on Capacity Building on small hydropower development in Cambodia (UNIDO), Implementing Small Hydro Power in particular in rural off grid areas of Sudan (UNIDO),
- UNDP-GEF Hilly Hydro project,
- REFRESHA with IH of UK,
- WB: New Small Hydro Options,
- R&M DPR with Canada,
- WIDP-WECS-HMG of Nepal for GIS database in SHP,
- Centre for Ecology & Hydrology: Training and Drainage Study for lean flow,
- CIDA – SHP Technology Transfer.
- Prepared a document for a SHP development for Nias island in Indonesia (UNIDO),
- Prepared a document for privatisation of SHP in IRAN for Iran water and power co, Ministry of Energy,
- Prepared sector report on hydropower development in India for Norwegian embassy

E. Institutional Collaboration: Worked for designing and executing the institutional MoUs

International:

Instrumental in Arranging MOU with International Organisations: Voith Hydro Germany, University of Itijuba (Brazil), University of Peradeniya (Sri Lanka), The Water Resources University - Hanoi (Vietnam), ICIMOD, WEC-HMG (Nepal), IN-SHP (China), REMC-AIT (Thailand), SCP Gestion Conceil (Canada), IH (UK), ITECO (Nepal) Kathmandu, HTA Switzerland,

National:

Ministry of New and Renewable Energy (MNRE), Uttarakhand Govt., Bihar State Hydro Corporation, HimUrja (HP Govt.), J&K PDC, NHPC

Details of Papers/books Published/Research Work — Dr Arun Kumar

1. Journal Peer reviewed Publication

1. Kirti Goyal & **Arun Kumar** (26 Mar 2025): Establishment of determinants to influence community acceptance towards water reuse in India, African Journal of Science, Technology, Innovation and Development, DOI: 10.1080/20421338.2025.2471114

2. Singhal, P. Arora, **A. Kumar**, H. Jain, A.K. Sharma, A.C. Bhosale, R. Singh, S.K. Saini, D. Rakshit, A.K.S. Parihar, S. Arora, Integrated life cycle assessment and techno-economic analysis of grid-scale energy storage alternatives for India, Sustainable Production and Consumption, Volume 54, 2025, Pages 404-422, ISSN 2352-5509, https://doi.org/10.1016/j.spc.2025.01.011.

3. Rode, B. R., **Kumar, A.**, Segoufin, C., & Laurant, Y. (2025). Investigation of rotor-stator interaction and vortex rope in the high-head variable speed reversible pump-turbine operating at minimum head. Physics of Fluids, Volume 37, Issue 3, p. 035108. DOI: https://doi.org/10.1063/5.0253717

4. Arya, S., & **Kumar, A.** (2024). Green Infrastructure for Sustainable Stormwater Management in an Urban Setting Using SWMM-Based Multicriteria Decision-Making Approach. Journal of Hydrologic Engineering, 29(1), 04023044, https://doi.org/10.1061/JHYEFF.HEENG-6080

5. Arora, N., **Kumar, A.,** & Singal, S. K. (2024). Spatial Variation in Hydrosedimentary Characteristics of the Alaknanda River Basin in the Indian Himalayas: A Field Study. Journal of Irrigation and Drainage Engineering, 150(3), 06024001, https://doi.org/10.1061/JIDEDH.IRENG-10237

6. Rode, B. R., & **Kumar, A.** (2024). Effects of vortex rope formation in draft tube of reversible pump-turbine–A review. Journal of Energy Storage, Volume 99(A), p. 113250. DOI: https://doi.org/10.1016/j.est.2024.113250

7. Arora, N., **Kumar, A.,** & Singal, S. K. (2024). Spatial variation of suspended sediment properties in the Sutlej river basin of Indian Himalayas. Acta Geophysica, 1-18, https://doi.org/10.1007/s11600-024-01322-6

8. Arya, S., & **Kumar, A.** (2024). Green Infrastructure for Sustainable Stormwater Management in an Urban Setting Using SWMM-Based Multicriteria Decision-Making Approach. Journal of Hydrologic Engineering, 29(1), 04023044, https://doi.org/10.1061/JHYEFF.HEENG-6080

9. Bhushan R. Rode and **Arun Kumar** (2024) "Rotor–stator interaction investigations in variable speed reversible pump-turbine at higher head", Physics of Fluids, 36 (3)

10. Jhankal NK, Kumar A (2024), “Experimental Investigations of Pressure Fluctuations in Low-Head Francis Turbine Model”, Proceedings of the Institution of Mechanical Engineers, Part A. 2024; 238(8):1321-1337. doi:10.1177/09576509241272804

11. Jhankal N K, Kumar A (2024), “Evaluation of Uncertainties in Pressure Fluctuations Measurement on Low-Head Francis Turbine Model During Part-Load Operation”. Measurement Science and Technology 35:025303. https://doi.org/10.1088/1361-6501/ad0d75

12. Jhankal N K, **Kumar A**, Mangla M; Establishment of correlation for the pressure fluctuations on the low-head Francis turbine in the draft tube cone from the model test, Flow Measurement and Instrumentation 91 (2023) 102360, https://doi.org/10.1016/j.flowmeasinst.2023.102360, March 2023

13. Bhushan R. Rode and **Arun Kumar**. (2023) "Unstable pressure fluctuations in the vaneless space of high-head reversible pump-turbines – A systematic review", Journal of Energy Storage, 72

14. **Kumar, A.**, Goyal, K., & Pande, P. K. (2023). Insights for lake restoration and water supply management in hilly regions. Lakes & Reservoirs: Research & Management, 28, e12427. https://doi.org/10.1111/lre.12427

15. **Arora, N.,** Kumar, A. & Singal, S. K. (2023). Matrix flushing approach-based sediment mineralogical composition of Bhagirathi river basin in Indian Himalayas, Journal of Environment, Development and Sustainability, pg. 1-16, https://doi.org/10.1007/s10668-023-04005-2

16. Firoz Khan, **Arun Kumar**, and Thomas Staubli. "Measurement of the jet deflector torque for model Peltonturbine and associated uncertainties in test rig development." *Measurement Science and Technology* 34, no.12 (2023): 125302.

17. Arya, S., **Kumar, A.** (2023) "Evaluation of stormwater management approaches and challenges in urban flood control." Urban Climate. Elsevier. 51. https://doi.org/10.1016/j.uclim.2023.101643

18. Arya, S., **Kumar, A.** (2023). "AHP GIS-aided flood hazard mapping and surface runoff estimation in Gurugram, India." Natural Hazards. Springer. 117: 2963–2987. https://doi.org/10.1007/s11069-023-05973-4

19. Jhankal N. K. and **Kumar, A.**, "Evaluation of Uncertainties in Pressure Fluctuations Measurement on Low-Head Francis Turbine Model During Part-Load Operation, Journal of Measurement Science and Technology, Volume 35, Number 2, 025303, https://doi.org/10.1088/1361-6501/ad0d75.

20. Akshita Gupta, **Arun Kumar**, 2022. Two-step daily reservoir inflow prediction using ARIMA-machine learning and ensemble models, Journal of Hydro-environment Research, Volume 45, 2022, Pages 39-52, ISSN 1570-6443, https://doi.org/10.1016/j.jher.2022.10.002

21. Kirti Goyal, **Arun Kumar,** 2022. A comprehensive view of existing policy directives and future interventions for water reuse in India. *Water Policy* 1 July 2022; 24 (7): 1195–1207. doi: https://doi.org/10.2166/wp.2022.073

22. Ali Abbas, **Arun Kumar**, 2022. Optimisation of Francis turbine draft tube using response surface model, Progress in Computational Fluid Dynamics, An International Journal, 2022 Vol.22 No.6, pp.343 – 359, DOI: 10.1504/PCFD.2022.10052391

23. Arora, N., **Kumar, A.**, Singal, S.K., 2022. Technological advancement in measurements of suspended sediment and hydraulic turbine erosion. Measurement 190, 110700.https://doi.org/10.1016/j.measurement.2022.110700

24. **Kumar A.**, Dhiman S.K. and Sharma N.K., 2022. Benchmarking the operational and financial performance of hydro plants, Hydropower & Dams, 29(1), 42 – 51. https://www.hydropower-dams.com/articles/benchmarking-the-operational-and-financial-performance-of-hydro-plants/

25. **Kumar A.,** Panda DMR, Saha H., Singh S., Gupta A. and Dash PP, 2021. Floating PV in India: Progress, Challenges and Opportunities, International conference "Solar-Hydro 2021", July 07 – 08, 2021 organised by International Journal of Hydropower & Dams and ICOLD, https://www.hydropower-dams.com/solar-hydro/

26. Gupta, A., Kumar, A. and Boopathi, K. (2021). Intraday wind power forecasting employing feedback mechanism. Electric Power Systems Research. 201. https://doi.org/10.1016/j.epsr.2021.107518

27. Goyal, K., & Kumar, A. (2021). Development of water reuse: a global review with the focus on India. Water Science and Technology. 84 (10-11): 3172-3190. https://doi.org/10.2166/wst.2021.359

28. Rajesh Kumar & **Arun Kumar** (2021) Optimal scheduling of variable speed pumped storage, solar and wind energy system, Energy Sources, Part A: Recovery, Utilization, and Environmental Effects, DOI: 10.1080/15567036.2021.1892243

29. Rajesh Kumar & **Arun Kumar** (2020) Optimal scheduling for solar wind and pumped storage systems considering imbalance penalty, Energy Sources, Part A: Recovery, Utilization, and Environmental Effects, DOI: 10.1080/15567036.2020.1841854

30. Manish Kumar, **Arun Kumar** and Rajesh Gupta, degradation analysis of different photovoltaic technologies on experimentally simulated water bodies and estimation of evaporation loss reduction, Photovoltaics: Research and Applications, John Wiley & Sons, Ltd., 2021, pp 357–378, DOI: 10.1002/pip.3370

31. **Arun Kumar** and Kirti Goyal, Global Perspectives On Water Reuse: North America and India, Journal American Water Works Association, October 2020 pp 62-68, https://doi.org/10.1002/awwa.1596.

32. Kirti Goyal and **Arun Kumar**, Multi-criteria analysis to identify the factors affecting water reuse scheme in India, Water and Environment Journal, Wiley, 24 September 2020, doi:10.1111/wej.12642

33. Anant Kumar Rai, **Arun Kumar**, Thomas Staubli and Xiao Yexiang, "Interpretation and application of the hydro-abrasive erosion model from IEC 62364 (2013) for Pelton turbines", Renewable Energy 160 (2020) 396-408, https://doi.org/10.1016/j.renene.2020.06.117

34. Garg R.K., **Kumar A**., (2020), Experimental and numerical investigations of water hammer analysis in pipeline with two different materials and their combined configuration. Int. Journal of Pressure Vessels and Piping. Vol. 188, pp. 1-11. DOI: https://doi.org/10.1016/j.ijpvp.2020.104219

35. Kirti Goyal and **Arun Kumar**, A modelling approach to assess wastewater reuse potential for Delhi city, May 2020, , water supply, International Water Association https://doi.org/10.2166/ws.2020.080

36. Singh, P., **Kumar, A**. & Mishra, S. Performance evaluation of conservation plan for freshwater lakes in India through a scoring methodology. Environ Dev Sustain (2020), April 2020 Springer https://doi.org/10.1007/s10668-020-00744-8

37. Rai, A. K., **Kumar, A**. and Staubli T. (2020), Effect of concentration and size of sediments on hydro-abrasive erosion of Pelton turbine, Renewable Energy 145, 893-902

38. Anant Kumar Rai and **Arun Kumar** (2019); Determination of the particle load based on detailed suspended sediment measurements at a hydropower plant, International Journal of Sediment Research, Volume 34, Issue 5, October 2019, Pages 409-421,

39. Akshita Gupta, **Arun Kumar**, Dheeraj Kumar Khatod; Optimized scheduling of hydropower with increase in solar and wind installations, Energy, Volume 183, 15 September 2019, Pages 716-732,

40. M. Kumar and **A. Kumar**, "Performance Assessment of Different Photovoltaic Technologies for Canal-Top and Reservoir Applications in Subtropical Humid Climate"; IEEE Journal of Photovoltaics, Vol. 9, No. 3, May 2019, pp 722–732.

41. M. Kumar and **A. Kumar,** (2019) Experimental Characterization of the Performance of Different Photovoltaic Technologies on Water-bodies. Progress in Photovoltaics: Research and Applications, 1, pp. 25-48

42. M. Kumar and **A. Kumar,** 2019. Performance Assessment of Different Photovoltaic Technologies for Canal-Top and Reservoir Applications in Subtropical Humid Climate. IEEE Journal of Photovoltaics, 9, pp. 722-732.

43. M. Kumar and A. **Kumar**, 2019. Experimental validation of performance and degradation study of canal-top photovoltaic system. Applied Energy, 243, June 2019, pp. 102-118.

44. **Rai, A. K.**, Kumar, A. and Staubli T. (2019) "Analytical modelling and mechanism of hydro-

abrasive erosion in Pelton buckets", **Wear**, Volumes 436–437, 203003

45. Rai, A. K., **Kumar, A**. and Staubli T. (2019), "Financial analysis for optimization of hydropower plants regarding hydro-abrasive erosion: A study from Indian Himalayas"; 29th IAHR Symposium on Hydraulic Machinery and System, Earth and Environmental Science 240 (2019) 022025, doi:10.1088/1755-1315/240/2/022025

46. **Arun Kumar**, R. P. Saini, B.K. Gandhi, R.K. Srivastava, Pradeep Chandra and A.K. Dubey, "Experiences in Discharge Measurements at Small Hydropower Stations in India", Flow Measurement and Instrumentation, Special Issue, Measuring Hydro Power Plants, Elsevier, (Accepted)

47. Abbas, A. and **Kumar, A.**, 2019, "Evaluation of uncertainty in flow and performance parameters in Francis turbine test rig." International Journal of Flow Measurement and Instrumentation, Vol. 65, pp. 297-308.

48. Rai, A. K., **Kumar, A.** and Staubli T. (2019) "Optimization of hydropower plants regarding hydro-abrasive erosion" International Journal of Fluid Machinery and Systems, Volume 10, No. 2 (April-June), pp. 146-153.

49. Epari Ritesh Patro, Thomas J. Voltz, **Arun Kumar** & Thomas Grischek (2018): Micro-hydropower in drinking water gravity pipelines: a case study in Uttarakhand, India, ISH Journal of Hydraulic Engineering, DOI: 10.1080/09715010.2018.1492977, 11 page.

50. Rai, A. K. **and Kumar, A**. (2017) Sediment monitoring for hydro-abrasive erosion: A field study from Himalayas, India, International Journal of Fluid Machinery and Systems 10 (2), 146-153

51. Rai, A. K., **Kumar, A.** and Staubli T. (2017) Hydro-abrasive erosion in Pelton buckets: Classification and field study, Wear, 392, 8-20.

52. M. Kumar and **A. Kumar**, 2017. Performance assessment and degradation analysis of solar photovoltaic technologies: A review. Renewable and Sustainable Energy Reviews, 78, pp.554-587.

53. M. Kumar and **A. Kumar**, 2017. An efficient parameters extraction technique of photovoltaic models for performance assessment. Solar Energy, 158, pp.192-206.

54. **Kumar and** M. Kumar, 2017. Solar energy in irrigation. Journal of Indian Water Resources Society, 37, pp. 13-20.

55. **Kumar Arun**, Gandhi B. K. and Kulkarni Praveen Kumar (2017), "Effect of Misalignment of Penstocks on Head Loss", ASCE, J. Pipeline Syst. Eng. Pract., 2017, 8(4): -1—1.

56. Harish, V. S. K. V., & **Kumar, A.** (2016). A review on modelling and simulation of building energy systems. Renewable and Sustainable Energy Reviews, 56, 1272-1292.

57. **Kumar Arun**, "Ignored value of Small hydro power projects", Energy Next, New Delhi, March 2017, pp 25 – 29.

58. Rai, A. K**.** and **Kumar, A**. (2016) "Analyzing hydro abrasive erosion in Kaplan turbine: A case study from India", **Journal of Hydrodynamics**, Volume 28, Issue 5, pp 863–872

59. Mohit Chaudhary M, Saurabh Mishra S and **Kumar A**, Estimation of Water Pollution and Probability of Health Risk Due to Imbalanced Nutrients in River Ganga, India, International Journal of River Basin Management, DOI: 10.1080/15715124.2016.1205078

60. Shahid ul Islam and **Arun Kumar**; Inflatable Dams For SHP Projects, Renewable & Sustainable Energy Reviews, 57 (2016), pp. 945-952

61. Singh Gurdeep and **Kumar Arun**; Performance Evaluation Of Desilting Basins Of Small Hydro Power Projects; ISH Journal of Hydraulic Engineering, Volume 22, Issue 2, 2016, pp 135 – 141

62. Harish VSKV and **Kumar Arun;** Reduced order modeling and parameter identification of a building energy system model through an optimization routine, Applied Energy 162 (2016) 1010–1023

63. Ali Abbas & **Arun Kumar** ,Development of draft tube in hydro-turbine: A review , International Journal of Ambient Energyn October 2015 , DOI:10.1080/01430750.2015.1111845

64. Rai, A. K. and **Kumar, A.** (2015) "Continuous Measurement of Suspended Sediment Concentration: Technological Advancement and Future Outlook", **Measurement**, Volume 76, pp 209–227.
65. Singhal M. K., **Arun Kumar**, Optimum Design of Penstock for Hydro Projects, International Journal of Energy and Power Engineering, Vol. 4, No. 4, 2015, pp. 216-226. DOI: 10.11648

66. Tomar N. and **Kumar Arun,** "Performance Analysis of Fish Passes at Hydraulic Structures Constructed on River Sutlej", Water & Energy International Journal, Vol. 58, No. 2, May 2015, pp 51 - 61.

67. Pandey MK. and **Kumar Arun**, 2015 "Pumped Storage Hydropower in India for Integration of Intermittent Renewable Energy", Water & Energy International Journal, Vol. 58, No. 3, June 2015, pp 49 - 57.

68. Harish VSKV and **Kumar Arun**, "Demand side management in India: Action plan, policies and regulations: Renewable and Sustainable Energy Reviews, 33(2014), pp 613–624

69. Javed Dhillon, **Kumar Arun** and Singal SK; "Stochastic approach for providing the operation of Wind and pumped storage under Deregulated Environment", International Journal of Green Energy: Volume 13, Issue 1, 2016 (DOI: 10.1080/15435075.2014.909358)

70. Dhillon J, **Kumar Arun** and Singal SK; "Optimization methods applied for Wind–PSP operation and scheduling under deregulated market: A review, Renewable and Sustainable Energy Reviews 30 (2014) 682–700

71. Dhillon J, **Kumar Arun** and Singal SK; "Operation of Wind and Pumped Storage Plant under Deregulated Environment, W & E International (Renewable Energy Section), Water & Energy International, November 2012, pp 30 - 34.

72. Kawade S, **Kumar A**, Sharma M P. (2013), GHG emissions from hydropower reservoirs: Review on CO_2 and CH_4 emission measurements, International Journal of Applied engineering research, Vol 8, No 9, PP 84-90

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    12. General 1.12 - Site Investigations
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    14. Civil Works 2.4 - Maintenance of civil works (including hydro-mechanical)
    15. Civil Works 2.5 - Technical specifications for Hydro Mechanical Works
    16. Electro Mechanical works 3.1 - Selection of Turbine and Governing System
    17. Electro Mechanical works 3.2 - Selection of Generator and Excitation systems
    18. Electro Mechanical works 3.3 – Design of switchyard and selection of equipment, main SLD and layout
    19. Electro Mechanical works 3.4 – Selection of Control, Automation, Protection and Monitoring system
    20. Electro Mechanical works 3.5 – Design of Auxiliary systems and selection of equipment
    21. Electro Mechanical works 3.6 - Technical Specifications for procurement of generating equipment
    22. Electro Mechanical works 3.7 - Technical Specifications for procurement of auxiliaries
    23. Electro Mechanical works 3.8 - Technical Specifications for procurement and installation of switchyard equipment
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66. Kumar A., "E-flows: A Beginning is required", workshop on Assessment of Environmental Flows, NIH Roorkee, Oct 02 – 03, 2013

67. Kumar A., "Geo-meteorological Analysis of the Event and Technological Needs" State level workshop on "Responsibility Sharing and Work Distribution on Uttarakhand Disaster – Lesson for Future planning in the Indian Himalayan Region" in FRI Campus, Dehradun on Sept 19, 2013.

68. Harish, V S K V and Kumar, A, "Managing electrical energy in buildings for energy conservation," National congress on science and technology, DAV Institute of Engineering & Technology Jalandhar Punjab, India, 30-31 May. 2013.

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72. Dhillon J., Kumar A. and Singal S. K., Optimal Operation of Wind-PSP under Grid Connected Day ahead Market, IEEE International Conference on Research and Development prospects on Engineering and Technology, E.G.S Pillay Engineering college, Nagapattinam, Tamil Nadu, India, March, 2013.

73. Bhatt, Utsav, Verma, H.K.; Kumar, A., Automation and remote control of volumetric calibrator using RS-485/MODBUS protocol, 2nd International Conference on Power, Control and Embedded Systems (ICPCES) Allahabad, 17-19 Dec. 2012, 10.1109/ICPCES.2012.6508038

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75. Dhillon J, Kumar Arun and Singal SK; "Short term Wind-PSP Scheduling using MINLP approach", 6th International Multi Conference on Intelligent System, Sustainable, New and Renewable Energy Technology and Nanotechnology (IISN-2012), Klawad, pp. 71-75, March 16-18 , 2012.

76. Kumar A, "Hydropower in Rural Development - Overview of solutions in India" at International symposium on "The Place of Water Power in the Renewable Energy Panel held during November 20 – 21, 2012, in Grenoble, France". (Invited)

77. Kumar A, "Small Hydro Resource Assessment" ASEAN-India Workshop on Cooperation in New and Renewable Energy by Ministry of New and Renewable Energy on Nov 06, 2012 at New Delhi. (Invited)

78. Kumar A, "Small Hydro In India", Indo Swiss Symposium on Renewable Energies and Rational Energy End-use held at EPFL, Lausanne, Switzerland from October 22 – 25, 2012. (Invited)

79. Kumar A, "Environmental and Social Impact of SHP Projects" in the Conference on "Small Hydro in India - Issues and Opportunities" during Oct 15 –16, 2012 at New Delhi (Invited)

80. Swati Kawade, Kumar A and Sharma MP (2012), "Methodologies use for GHG emissions from Tehri Hydropower reservoir", International workshop for inter- comparison of reservoir GHG flux measurement technologies, Beijing, China, hosted by Institute of remote sensing applications Chinese academy of science during 18-24 June 2012

81. Kumar, A "Establishing The Role Small Hydro Can Play In Developing Countries Through Case Study Analysis", 4th annual Small Hydro 2012 conference , 25th – 26th April 2012 in Toronto, Canada (Invited)

82. Kumar, A, Challenges in carrying out CIA of hydropower projects: absence of data, Cumulative Impact Assessment of Hydropower Development in Nepal, March 12-13, 2012 , Kathmandu, Nepal (Invited)

83. Kumar, A, "Shp Development In India", National Seminar "Implementation of Hydro Projects through Private Participation" Jan 10, 2012, Pune, India (Invited)

84. Kumar A, "Indian Experience in Micro/small hydro development", Regional Workshop on Micro Hydropower Development: Prospects & Challenges in South Asia September 12 - 14, 2011 in Kathmandu, Nepal(Invited)

85. Kumar Arun, Small Hydropower: Social and Environment service , presented at Second World Renewable Energy Technology Congress-2011, New Delhi Apr 21-23, 2011 (Invited)

86. Kumar Arun, “Challenges in Implementing Hydropower in India and Relevant Technology Development”, International Symposium on Energy Materials: Opportunities and Challenges, Kolkata, March 1-2, 2011(Invited)

87. Swati KM, Sharma MP and Kumar A, “Green-House Gas From Hydropower Reservoirs”, In proceedings of International Conference on Sustainable Water Resources Management and Climate Change Adaptation, organized by National Institute of Technology Durgapur, Durgapur (West Bengal), pp 405-420, Feb.17-19, 2011.

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92. Kumar Arun, “Hydropower : Sustainable Energy Hydropower”, World Renewable Energy Technology Congress-2010, 18– 20 March 2010, New Delhi (Invited)

93. Kumar Arun, “Introduction to Low Head Hydropower Technology and its' Potential”, Workshop on Low-Head Hydropower Development, Colombo Feb 18-20, 2010, (Invited)

94. HK Verma & Kumar Arun; “Performance Testing of SHP Stations: A Guide for Developers, Manufacturers and Consultants”, Dec 2009.

95. Kumar Arun, “Status of SHP Development In India”, National Seminar Hydro Power Stations-Advancement In Harnessing & Up-Keeping July 2 – 3, 2009, Dehradun (Invited)

96. Kumar Arun and Vinay Shankar, “SHP Development In India”, 5th Hydro Power for Today Forum, May 11-12 2009, Hangzhou, China

97. Kumar Arun, “Small Hydropower Development: Recent Indian Initiatives”, International Conference Water India-V, New Delhi (India) on 3-4 November, 2008, (Invited)

98. Kumar Arun and Vinay Shankar, “Preparation Of A Plan Of Interventions For Conservation Of Vembanad Lake, Kerala, India”, International workshop on Sustainability of Lake Remediation and Interventions Hyderabad, India

99. Kumar Arun and Vinay Shankar, “Human Resource Development For Sustainable Remediation and Interventions”, International workshop on Sustainability of Lake Remediation and Interventions Hyderabad, India

100. Maity D, Sinvhal H and Kumar Arun, “Comprehensive Management Plan of Rabindra Sarovar, Kolkata” presented in International workshop on "Sustainability of Lake Remediation and Interventions", July 22-25, 2008, Hyderabad.

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106. Kumar Arun,, H. K. Verma, Indian initiative to develop standards, guidelines and manuals for small Hydropower, International Conference on Small Hydropower Kandy, Sri Lanka,22-24 October 2007

107. J. D. Sharma, Kumar Arun,, M. K. Singhal, Real time digital simulator for small hydropower plants, International Conference on Small Hydropower Kandy, Sri Lanka,22-24 October 2007

108. H. K. Verma, Kumar Arun, Performance testing and evaluation of small hydropower plants International Conference on Small Hydropower Kandy, Sri Lanka,22-24 October 2007

109. R. P. Saini, Kumar Arun, Water mills for multipurpose applications, International Conference on Small Hydropower Kandy, Sri Lanka,22-24 October 2007

110. Kumar Arun, SMALL HYDROPOWER DEVELOPMENT: Non-Fossil Energy for Sustainable development, 7th renewable energy, summit, Sept 12, 2007, New Delhi (invited)

111. Kumar Arun & Mk Singhal, Small Hydropower Development National Seminar On Recent Advances In Wind And Hydro Energy Generation September 20, 2007 Jammu (invited)

112. Kumar Arun, "Small Hydro Power: Growth, Prospects, Barriers And Mitigations", Capacity Building Initiative Workshop For Financial Institutions In India To Address Risks And Barriers Associated With Re Projects, May 18-19, 2007, Mumbai (Invited)

113. Kumar Arun, "Training and Education in Small Hydropower and other Renewable Energy", Strategy for Quality focused training in Renewable Energy and Distributed Generation in India, Feb 21, 2007, New Delhi. (Invited)

114. Kumar Arun, "Small Hydropower: Potential And Devlopmnet", National Seminar On Hydropower: Harnessing The Untapped Potential, January 04, 2007, New Delhi (Invited)

115. Kumar Arun, "Small Hydro Power – Resource Assessment & Technology Development", Workshop On India-Asean Cooperation In Renewable Energy 18-19 December 2006, New Delhi (Invited)

116. **Kumar Arun** & Verma HK, "Standards And Guidelines For Small Hydropower Development: The Indian Initiative", International Himalayan Small Hydropower Summit, October 12-13, 2006, Dehradun

117. Saraf AK & Kumar Arun, "Spatial Technologies In Himalayan Small Hydropower Development", International Himalayan Small Hydropower Summit, October 12-13, 2006, Dehradun

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119. Saini RP & **Kumar Arun**, "Development Of Standard Water Mills In Uttaranchal", International Himalayan Small Hydropower Summit, October 12-13, 2006, Dehradun

120. Kumar Arun, "Standards and Performance Testing of Small Hydropower" Workshop on "Development of Small, Mini & Micro Hydropower Plants – Challenges & Related Issues" 16th June, 2006, CBIP, New Delhi, (Invited)

121. Kumar Arun, "Sustainable Conservation of Lakes" National Consultation on Water Management in Fisheries and Aquaculture, June 23-24, 2006, Pussa, New Delhi. (Invited)

122. Kumar Arun, M.K. Singhal, Sejal Kunchwar Small Hydro Power Projects – Issues, Constraints and Suggested Measures during Aug. 23-25, 2005, Shimla, Himachal Pradesh. (Invited), (Invited)

123. Kumar Arun, "DDG Technologies – Potential, Constraints, Application and Relevance to Uttaranchal"

124. workshop on Renewable Based DDG From Commissioning to Viability, March 18, 2006, Dehradun. (Invited)

125. Kumar Arun, Small Hydropower - Untapped Potential, 5th ASSOCHAM Renewable Energy Summit on Commercialization of Renewable Energy Technologies, Aug. 25-26, 2005. (Invited)

126. Kumar Arun, Saini, R.P., Gandhi B.K., and Verma, H.K., "Performance Testing of Hydropower Stations: Need, Scope and Recommendations", Conference on Development of Hydropower Projects – A Prospective Challenge, April 20-22, 2005, Shimla. (Invited)

127. Kumar Arun, "Small Hydropower: Option for Electricity Generation", International Seminar on Non-conventional Energy, Renewables Energy Efficiency and Conservation", Feb. 20-21, 2005, Thiruvananthapuram. (Invited)

128. Kumar Arun and Verma H.K., "Standards and Testing of Small Hydropower Stations", International Congress on Renewable Energy, Jan. 20-22, 2005, Pune. (Invited)

129. Kumar Arun, "Existing Micro Hydro Standards and Quality Programmes in India", South Asia Regional Workshop on Developing Standards for Micro-Hydro Sector, Colombo, Sri Lanka, Sept. 5-7, 2004. (Invited)

130. Verma, H.K. and Kumar Arun, "Instrument Networking for Efficiency Measurement in Small Hydro Power Stations", international conference on Advances in Hydraulic Efficiency Measurements at Lucern, Switzerland, July 14-16, 2004. (Invited)

131. Kumar Arun, "Technical issues and design of structure for low head projects", International seminar on Renewable Energy, June 10-12, 2004 at Colombo, Sri Lanka. (Invited)

132. Kumar Arun, “Small Hydropower in Hilly Regions” Presented at International Congress on “Renewable Energy for Sustainable Development”, Jan. 21-23, 2004 at Bangalore. (Invited)

133. Kumar Arun, “Small Hydropower Development - Potential and Rural Electrification”, Presented at Regional Seminar on “Small Hydropower”, Nov. 11-15, 2003 at Thiruvanathapuram, Kerala. (Invited) – also included in IREDA news (Jan. 2004).

134. Kumar Arun, “Rural Electrification: Small Hydro”, Presented at Round Table Meet on “US India Initiative for Hydropower Development”, April 14, 2003, New Delhi. (Invited)

135. Kumar Arun, “Distributed Generation : Technologies for Power Supply in Rural Areas” Presented at National Workshop on “Rural Electrification: Small Mini/Micro Hydel – Technology Overview” held on Jan. 24-25, 2003 at New Delhi (Invited)

136. Kumar Arun, “Small Hydropower Development Potential, Technology & Environment”, Presented at National Conclave on “Small Hydropower” held on July 18-19, 2002 at New Delhi. (Invited) – also included in IREDA news and SHP News (China)

137. Rees, G.H., Kumar Arun, Saraf, A.K., Singhal, M.K., “Application of Regional Flow Estimation method in the Himalayas”, 4th International Conference on FRIEND in Cape Town, South Africa, Mar. 18-22, 2002.

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139. Kumar Arun, Rees, G., Raghuvanshi, T.K., “Small Hydropower assessment through HP Software”, Annual International Conference Map India 2002, New Delhi, Feb. 6-8, 2002. (Invited).

140. Kumar Arun, “Selection of sites and low head turbines for Small hydro power development”, business meet on Small Hydro Power Projects 2000-2001, Hyderabad Dec. 14, 2000. (Invited)

141. Raghuvanshi AK and Kumar Arun, “GIS Based Assessment of Small Hydro Power Potential in Himachal Pradesh” National Seminar on small Hydro, Shimla, Dec. 09, 2000 (Invited).

142. Kumar Arun, “Small Hydro Power Potential in Uttarakhand Region” Seminar on Harnessing of Uttarakhand Resources for Development of the Himalayas, Dehradun, September 10, 2000. (Invited)

143. Kumar Arun, Testing and certification of Small Hydro Equipment national Conference on renewable energy, Indore Dec. 20-22, 2000. (Invited)

144. Kumar Arun and Singal SK, Low Head small hydro power development', national workshop, Chandigargh Jan. 17, 2000. (Invited)

145. Kumar Arun, "Assessment of Small Hydro Scheme in India", IEA Workshop on Review of Assessment Methodologies and Possible Improvements, Nice, France, Oct. 13-14, 1998. (Invited)

146. Kumar Arun, "Small Hydro Power - Technology R&D Areas", IEA Workshop at Nice, France, Oct. 13-14, 1998 .(invited)

147. Kumar Arun, "Small Hydro - A National Perspective", ANERT National Conference, Thiruananthapuram, Feb. 10-11, 1999. (Invited)

148. Kumar Arun, "Private Sector Participation in SHP Development in India - An Introspection", ANERT National Conference, Thiruananthapuram, Feb. 10-11, 1999.

149. Kumar Arun, "Reviving the Small Hydro Potential in Uttar Pradesh", National Seminar on Development Needs of Uttarakhand Region", Dehradun, Feb. 20-22, 1999. (Invited)

150. Kumar Arun, "Small Hydro Schemes in Hilly Areas with Limited Hydrological Data", International Symposium on "Hydrology of ungauged streams in Hilly Region for SHP Development, March 9-10, 1998, New Delhi.

151. Singh RD, Chaudhary H and Kumar Arun, "Regional Flow Duration for Himalayan Region of the Indian State of Uttar Pradesh", 5th International Conference "Hydroenergia 97", Dublin, Ireland, Sept. 29-Oct.1, 1997.

152. Kumar Arun, "Regional Flow Duration Model for Planning Small Hydro Power Projects in Himalayan Catchments of a North India State", 3rd International Conference of Hydro Power, 1997, Trondheim, Norway, June 30-July 2, 1997.

153. Kumar Arun, "GIS in Small Hydro Planning and Resource Management", Issue Sept - Oct.' 1997, GIS Development, New Delhi PP 30-37.

154. Kumar Arun, "Small Hydro Status" CII organised International Conference on Investment Opportunities in Renewable Energy, Mumbai, Sept. 11-12, 1997. (Invited)

155. Kumar Arun, "Small Hydro Power Scenario in Uttar Pradesh", All India Seminar on Development of Hydro Power Potential in India, April 22, 1997, Lucknow. (Invited)

156. Kumar Arun, "Survey and Assessment of Small Hydro Potential" International Conference on Small Hydro Power System, Mar 13-14, 1997, New Delhi. (Invited)

157. Kumar Arun, "Technology Selection Challenges for Small Hydro Power" International Conference on Small Hydro Power System, Mar 13-14, 1997, New Delhi.

158. Kumar Arun, "Remote Sensing and GIS Application in Small Hydro Projects Planning & Development. International Conference on Small Hydro Power System, Mar 13-14, 1997, New Delhi.

159. Kumar Arun, "Small Hydro Power Technology", All India Peoples' Technology Congress, Calcutta, Feb. 21-23' 97. (Invited)

160. Kumar Arun, "Selection of member and size of unit of Small Hydro Plant"; First International Conference on Renewable Energy and Small Hydro, Feb. 3-7 1997, Hyderabad.

161. Kumar Arun, "Resource Assessment-Resource assessment", International workshop for NAM and developing countries on Renewable Energy Application, Photovoltaic, Wind & Small Hydro, New Delhi, Dec. 3-7, 1996. (Invited)

162. Kumar Arun, "Small Hydro Power Status, Technology and R&D Areas, Seminar on S&T Inputs to Renewable Energy, Proceeding and Legislation, IIT, New Delhi, Nov. 22, 1995. (Invited)

163. Kumar Arun, "Small Hydro Potential of India', National Symposium on Renewable Energy, Bangalore Mar 6-7, 1995. (Invited)

164. Kumar Arun, "Small Hydro Power -Issues and Constraints" National Seminar on Small Scale Hydro Power, New Delhi, Jan 20-21, 1995. (Invited)

165. Kumar Arun, "Small Hydro Power and Role of consultant", National Seminar, Triputhi, Sept. 02,1994.

166. Kumar Arun, and Singal SK "Sadani Small Hydro Electric Project - a case Study", National Seminar, Ranchi, Mar 1994. (Invited)

167. Panesar PS and Kumar Arun, "Ganga - Small Hydro Development", Seminar on Ganga in the Service of Nation", Roorkee, Sept, 1993.

168. Kumar Arun, "Economic & Financial Analysis of Small Hydro Power Projects", Urja bharati, Journal of Ministry of Non-Conventional Energy Sources, Vol. 3, No.2, Aug. 1992.

169. Kumar Arun and Jain MP "Potential of Entrepreneurship in Small Hydro Generation", International Conference on "Science Park Movement, Tiruchirapalli, Dec. 1990.

170. Kumar Arun, and Sinvhal H "Entrepreneur, Science Parks and Communication Through Video Media", International Conference on Science Park Movement, Tiruchirapalli, Dec. 1990.

171. Kumar Arun, "Civil Engineer as Manger of Hydraulic Project" 5th National Convention of Civil Engineers, Institution of Engineers, Calcutta Jan. 1990.

172. Kumar Arun, and Saxena NK "Design Aid on Desilting Tanks for Micro Hydro Stations", Seminar on Potential & Development of Small/Micro Hydel Energy Systems in the Himalayan regions at Roorkee, Dec. 1987. (Invited)

173. Kumar Arun and Saxena NK, "Steel Fibre Reinforced Concrete Penstock for Small Hydro Projects", Seminar on Potential & Development of Small/Micro Hydel Energy Systems in the Himalayan Regions at Roorkee, Dec. 1987.

174. Chauhan G, Kumar Arun and Singhal MK, "Design and Construction of Gates for Small Scale Hydropower III International Symposium on Wave, Tidal, Otec & Small Scale Hydro Energy by British Hydraulic Research Association at Brighton, England, May 1986.

175. Kumar Arun and Das D, "Environmental Impacts on Small Scale Hydropower Stations" International Seminar on Environmental Impacts Assessments of Water Resources Projects of WRDTC at Roorkee, Dec. 1985.

176. Kumar Arun and Thapar OD, "Inexpensive Renewable Energy System for Rural Areas" International Water Resource Association V World Congress on Water for Development at Brussels, Belgium, June 1985.

177. Kumar Arun and Thapar OD, "Integrated Small Hydro Energy Development" Speciality Conference on Water for Resource development by American society of civil Engineers at Idaho, USA, Aug. 1984.

178. Thapar OD, Das D and Kumar Arun, "Small Hydro Power System Technology and Rural Development", Seminar on Small Hydro Power by Central Board of Irrigation & Power", at Delhi, India, Jan. 1983. (Invited)

179. Kumar Arun and Thapar OD, "Manali Mini Hydro Power Project : A Case Study, World Conference on Water Power-1985, by American Society of Civil Engineers and US Army Corps of Engineers at Las Vegas, USA, Sept. 1985.

180. Thapar OD, Das D and Kumar Arun, "Kakroi Fall Ultra Low Head Hybrid Hydro Energy Development" an international conference Energex-82, by Ministry of Energy, Canada, Aug. 1982. (Invited)

IV. Software

1. Hydra-HP – Flow regimes Estimation for Small Hydropower Estimation alongwith Centre for Ecology and Hydrology, UK (sold 42copies).

B. OTHERS (NATIONAL PUBLICATIONS/RESOURCE PAPERS/REPORTS)

1 Team member of National team on MMHP for writing the country report for ICIMOD Nepal's Regional Training Programme on Mini and Micro hydropower.

2 Presented Resource paper on Small Hydro-Technology, Potential and Economics in business Meet on Renewable Energy use in Plantation Industry, Guwahati March 1994. **(Invited)**

3 Presented Resource Paper on Small Hydro-Technology, Potential and Economics in Business meet on Renewable Energy Use in Darjeeling Hills, Darjeeling June 6-7, 1994. **(Invited)**

4 Team Member "SHP - Private Sector Participation" Nov., 1996 and Nov., 1999 and April 2003.

5 Presented Resource Paper on Small Hydro-Technology, Potential and Economics in Ladhakh Region in workshop at Leh Aug. 06,1994. **(Invited)**

6 Presented Resource Paper on "Potential for Hydro Energy" Seminar on International Prospectives in Water Resources Planning for students of University of Iowa (USA), Jan. 13, 1998, Roorkee. **(Invited)**

7 GIS based Identification of sites for Small Hydro Power Development, Workshop for Hilly states, Jan. 30-31, 1998 at Roorkee and Feb. 20-21, 1998 at Guwahati. **(Invited)**

8 Prepared Country resources paper on Small Hydro Power and presented at "Experts' Consulation on Private MMHP Development in the Hindu Kush Himalayan Region - A Review of Inputs and Methodologies", Kathmandu, Nepal, Feb. 9-13, 1998. **(Invited)**

9 Prepared as Team Coordinator Pre - Investment Report for New Options in Small Hydro Power, for IREDA, Jan, 198 for their submission to World Bank for 2nd line of credit.

10 Prepared as Team leader the Report "Identification of sources for irrigation, drinking water and Small Hydro Power in Tea Estates of Darjeeling Hills", for Darjeeling Planters' Association, March, 1998.

11 Presented Resource Paper on "Civil Engg. consideration for Design of Diversion and Desilting works" at "Workshop on SHP - State of Art", IIT Delhi, Dec. 10-12, 1998. **(Invited)**

12 Prepared as Team Leader the Report “GIS based data base of Small Hydro Power sites in Himachal Pradesh)” April 2002.

13 Prepared as Team Leader the Report “GIS based district inventory of SHP sites in Nepal”, Dec. 2001.

14 Prepared as Team Leader the Report” Zonal Plan covering 13 Hilly states of India for SHP Development” UNDP-GEF Hilly Hydro Project April 2002.

15 Presented Resource Paper for distributed generation through SHP in Ministry of Power National Workshop in Jan 2003. **(Invited)**

16 Presented Resource Papers for remote village electrification through SHP for State Nodal Agency Officers at Guwahati & Delhi in National Training Programme during June & Aug. 2004. **(Invited)**

17 Presented resource paper on Feasibility, planning, designs and procurement lowest coast with high quality in Workshop at Colombo, Sri Lanka in June 2004. **(Invited).**

18 Prepared as Team Leader the Report on “Conservation of River Kshipra at Ujjain” Municipal Corporation, Ujjain, Govt of Madhya Pradesh, April 2009.

19 Prepared as Team Leader the Report on “Review of Water Quality Monitoring”, Ministry of Environment & Forests, National River Conservation Directorate, Govt of India, Feb 2010.

20 Master plan on "State Level Identification Plan of Small Hydropower Potential Sites in Punjab", Punjab Energy Development Agency, Chandigarh, April 2006

21 Master plan on "Assessment of Cumulative Impact of Hydropower Projects in Alaknanda and Bhagirathi Basins up to Devprayag", Ministry of Environment & Forests, National River Conservation Directorate, Govt. of India, March 2011

22 Master Plan on "Small Hydropower for Ladakh Region of Jammu Kashmir", Ministry of New and Renewable Energy, Govt. of India, Dec 2009

Supervision and Guidance of the students by Dr Arun Kumar

A. Doctoral Students Guidance:

1. Greenhouse gas emissions from reservoirs, (Kawade Swati Manoharrao) – awarded in April 2014
2. Scheduling of Wind - PSP Generation Under Day-Ahead Market (Javed Dhillon) – awarded in 2015
3. Optimal planning of medium head hydro power projects, (Mukesh Kumar Singhal) –awarded in April 2016
4. Modelling and simulation of building energy systems using intelligent techniques (HKVK Harish) – awarded in March 2017
5. Hydro-Abrasive Erosion of Pelton Turbines (Anant K Rai)– Awarded in Feb 2018
6. Investigations of parameters affecting draft tube performance (Abbas Ali)– Awarded in Feb 2019
7. Solar generation on water bodies and impact on water (Manish Kumar) awarded in Sept 2019
8. Hydraulic Transient in Penstock of Mild Steel and Glass Fibre Reinforced Plastic for Hydro Power Plants (Rahul Garg) Awarded in April 2021
9. Decision Support System for Treated Wastewater Reuse (Kirti Goyal) Awarded in April 2022
10. Integrated Scheduling of Solar and Wind Energy with Pumped Storage (Rajesh Kumar) Awarded in Nov 2022
11. Renewable Energy Forecasting Based Hydropower Scheduling (Akshita Gupta) Awarded in Dec 2022
12. Investigations on Pelton Turbine Jets and Deflectors (Firoz Khan) Awarded in June 2024
13. Urban Stormwater Resilience Analysis Using GIS Mapping and Development of Multi-Criteria Decision Analysis Framework (Saumya Arya) Awarded in May 2024
14. Assessment of Sediment abrasive potential in Himalayan Rivers (Naman Arora) – Awarded in April 2024
15. Experimental Analysis of Pressure Fluctuation in Hydro Turbine (Nitin Kumar Jhankal – Part time) Awarded in July 2024
16. Evolution of Rotor-stator Interaction and Vortex Rope in Reversible Pump-turbine (Bhushan R Rode) since Jan 2021 – Awarded in April 2025
17. Performance Analysis of Desilting Basins (Udit Batra) since July 2023
18. Kinetic turbines (Nitish Prasad) July 2022

B. Master degree Dissertations

MTECH AHES

1. Development of SHP on Existing Facilities in Eastern Maharashtra (Surendra Pimparkhedkar 2002)
2. Automated Test System for Efficiency of Turbine and Generator (Abhinay Mohan 2002)
3. Rural Electrification Model Based on Integrated Renewable Energy systems (Braj Bhushan 2002 – 03)
4. Model Testing for SHP Hydro Turbines (Sh. Debasis Mitra 2002 – 03)
5. Field Testing of Hydro Mechanical Equipments of SHP Stations (Sh. Prakash Mishra 2002 – 03)
6. Development of a model for testing of SHP electro mechanical machines (Sh. M. Bala Subrah-manyam 2003-04)
7. Modeling of hydraulic transients in small hydropower plant operation (Sh. Medidi V.M. Kishore 2003-04)
8. Energy modeling for off grid electrification of clusters of villages (Sh. Prasant Kumar Das 2003-04)
9. Performance & Design of Transmission and Distribution System in Rural Areas (Sh. Rakesh Sharma 2003-04)
10. Renewable Energy Development of Andhra Pradesh using GIS software (Shri D. Ravindra Naik 2004-05)

11. Flow Analysis of a SHP station (Shri K. Sridhar Reddy 2004-05)
12. Quality improvements in wind energy generation (Shri Shrinivas U. Jawdekar 2004-05)
13. Performance Evaluation of Hydro Turbine Using CFD Analysis (Shri Anil Kumar 2004-05)
14. Performance Evaluation of Hydro Turbine Using CFD (Anil Kumar 2005-06)
15. GIS Based Asset Management of Transmission & Distribution System (Janmejay Upadhyay 2005-06)
16. Flow Analysis of Multipurpose Low Capacity Turbines Using CFD (Khalid Razi 2005-06)
17. Optimum design of low head small hydro power plant (P. Satya Naga Harshada 2006-2007)
18. Internet based small hydro plant database (Gaurav Bhatiwada 2006-2007)
19. Transmission pricing under open access (Mohan K.S. Rao Potala 2006-2007)
20. GIS based master plan of small hydro power for Maharashtra state (Bhale Ganesh Shankarrao 2006-2007)
21. Rural electrification expansion under CDM (Nitesh Kumar Srivastava 2006-2007)
22. CFD based flow analysis of hilly small hydropower station (Sanjay Kumar VK Jain 2006-2007)
23. Evaluation and Sensitivity analysis of small hydro policy of different states (Devesh Goyal 2007-2008)
24. Sensitivity of different clearances in SHP development (Panugothu Ramaswamy 2007-2008)
25. Web based monitoring of electricity distribution system (Santosh Ghosh 2009)
26. Cost effective hydropower generation (Suresh Kumar Vengali 2009)
27. Technical and Financial Evaluation of Automation of Shp Stations (Anubhuti Agarwal 2010)
28. Erosion Analysis of Hydro Turbine Materials (Kuldeep Singh Shekhawat 2010))
29. Economic Analysis of Silt Erosion In Hydro Turbines (Rahul Sinha 2010)
30. Hydro Turbine Efficiency Measurement By Thermodynamic Method (Patil Shantaram Subhash 2008-2009)
31. Scheduling of Wind-Pumped Storage Hydro Power Plants (Kiran Kumar Dondapati 2011)
32. Turbine Efficiency Measurement By Thermodynamic Method (Sasank Sekhar Patnaik 2011)
33. Design of Smart off Grid Energy System (M.D. Farman 2011)
34. Optimal selection of low head hydro turbine. (Amit Kumar 2012)
35. Economic analysis of automation of small hydropower plants (Pise Prafulla Krishnant 2012)
36. Performance Evaluation of Desilting Devices For SHP sites (Gurdeep Singh 2012 – 13)
37. Smart Grid Application in Nigerian Electric Power Grid (Temitope Aremu 2012 – 13)
38. Analysis of Sediment Monitoring Techniques (Nitin Swarnkar 2012-13)
39. Hydropower Development in Laos (Sybounheuang Phimmasenh 2012 – 13)
40. Hydropower at drinking water supply scheme (Ritesh Partro 2013 – 14)
41. Investigation on inflated weirs (Shahid ul Islam 2013 – 14)
42. Optimal combination of desilting devices for Small Hydropower (Shiri Dhiman 2013 – 14)
43. Performance Analysis and design of the Fish Passes (Nikunj Tomar 2014 -15)
44. Pumped Storage Hydropower in India and its Integration with Renewable Energy (Mantosh Kumar Pandey 2014 – 15)
45. Analysis and ptimum design of Forebay Tank (Santosh Chaudhary 2014-15)
46. Comparative analysis of Energy and Water use in Irrigation Practices and water availability for other uses (Vineet Kaur 2014-15)
47. SHP Development in West Africa (Eliezer Mawuli Ahorlu 2015-16)
48. Pump Storage and its integration with renewable energy sources (Jyoti Gupta 2015-16)
49. Hydraulic transient analysis for small hydropower (Manoj Kumar 2015-16)
50. Planning access to hydropower projects (Raju Mandal 2015-16)
51. Performance evaluation of SHP development in Nepal (Sagar Shrestha 2015-16)
52. Risk Assessment in Hydro Power Projects (Anjan Mahajan 2016-17)
53. Economic Supporting Structure Design for Canal Top Solar Energy (Karthick Ramanathan K 2016-17)
54. Performance Evaluation of Trench Weirs (Naman Arora 2016-17)
55. (Sarthak Atul 2016-17)
56. Investigations on impact of River Sediment on Hydropower Development (Udit Batra 2016-17)

57. Cumulative Environmental Impact Assessment of Hydro Projects on Ecosystem (Vaishali 2016-17)
58. Policy Development of Renewable Energy in South Sudan (Victoria Apiou Benjamin Ajongo 2016-17)
59. Performance Evaluation of Hydrokinetic Turbines (Anand P.J. 2017-18)
60. Comparative Analysis of Hydrocyclone With Vortex Settling Basin and Settling Basin (Harihar Bhatta 2017-18)
61. Assessment and Mapping of SHP Potential in Zambia using GIS (Karsten Matabishi Mulenga 2017-18)
62. Optimal Power Evacuation for Hydro Projects In Nepal (Shaligram Bhandari 2017-18)
63. Parametric Study of SHP (Ayush Sharma 2018-19)
64. Siphon Intake for SHP (Gautam Narula 2018-19)
65. Study of Technical Parametric in different Hydropower schemes in Nepal (Guja Raj Khanal 2018-19)
66. Active Power Control of Photovoltaic Systems and Electric Vehicle Charge Optimization.(Puja Saha 2018-19)
67. Investigation of Abrasive Erosion of WC-COCR Coated Pelton Buckets of Different Bucket Materials (Anshul Vats 2019 - 20)
68. Pumped Storage Hydropower Development in India (Vishwaranjan Kumar 2019 - 20)
69. Hydro power development in cote D'ivoire (Kouadio Amani Felix 2019 – 20)
70. Sustainability Analysis of Small Hydro Development (Sanjib Kumar Lal 2020-21)
71. Monetising Hydropower Systems (Shashank Dwivedi 2020-21)
72. Floating Solar Photovoltaic (Pronit Prajwal Dash 2021-22)
73. Performance analysis for implementation of Environmental flows (Srisha Gupta 2022-23)

M. Tech. (CRL/EMRL)

1. Water quality assessment and conservation of Umkhrah river (Bantehsonglang Blahwar 2004-05)
2. Conservation of Thane Creek and Ulhas River Estuary (Vinay Nikam 2004-05)
3. River Conservation Plan For River Cauvery From Mettur Dam to Erode (T. Natarajan 2005-06)
4. Resource Recovery From Sewage Treatment Plants (STPs) (D. Suresh Kumar 2005-06)
5. Conservation plan for lakes in West Bengal (Diganta Maity 2008)
6. Conservation plan for Kshipra river (Yogendra Kumar Giri 2008
7. Conservation plan of Anshupa Lake (Biranchi Narayan Das 2007-08)
8. Conservation of Noyyal River in Tamil Nadu (Nallathambi Kannammal 2009)
9. Impact of JNNURM on Ganga River at Haridwar (Chandra Bhan 2010)
10. Impact Analysis Of Conservation Works Of Hussainsagar Lake In Hyderabad (G. Deepak Kumar 2010)
11. Impact of hydro projects on water quality (Sravan Kumar Kota 2012)
12. City sanitation plan (Rafik Abdelfatah 2012)
13. Environmental Management Plan of River Brahmani (Prasanta Kar 2012 – 13)
14. Bioremediation for Conservation of lakes (Neeraj Gahlawat 2012 – 13)
15. City sanitation plan for the city of Dhanbad, Jharkhand (Aparna Dutta 2013 – 14)
16. Cumulative Impact Assessment of Development on River Ganga from Haridwar to Garh (Mohit Chaudhary - 2013 – 14)
17. Plan for Conservation of Aquatic Eco System (Prashant Singh 2013 – 14)
18. Integrated Water Resources Management of a River Stretch using GIS & Ground Water Flow Modeling (Pooran Singh Patwal 2014-15)
19. Conservation Plan for Adyar River (Karthik Kumar C 2014-15)
20. Analysis of Disinfection Systems for Waste-water Treatment with Special Reference to THM (Surbhi Tak 2014-15)
21. Impact Analysis of Environmental Flow and Economic and Financial Analysis (Bhargab Das Sharma 2015-16)
22. Urban Wastewater Management (Krishna Kumar Yadav 2015-16)

23. City Sanitation Plan of Khartoum (Walaa Abdalhalim Ahmed 2015-16)
24. Impact of Riverfront Development Including Weed and Solid Waste Management (Mohit Gupta 2016-17)
25. Assessment of Assimilative Capacity of a River for Pollution Loads (Sohil Sisodiya 2016-17)
26. Multi-Storey Decentralized Waste Water Treatment Plant (Anurag Mishra 2017-18)
27. Impacts of Urbanization on Water Bodies (Maansi Suresh Shah 2017-18)
28. Modelling of Urban Water Management (Rajeev Ranjan Rathour 2017-18)
29. City sanitation plan of Saharanpur (Naveen Jeet Pal 2018-19)
30. City Sanitation Plan of Gorakhpur (Shailesh Kumar Gupta 2018-19)
31. Conservation Plan of Matsyagandha Lake (Aamod Kumar Karmaksh 2019-20)
32. An adaptive approach to surface water pollution regulation in Zimbabwe (Mgcini Ncube 2019-20)
33. An Assessment of The Potential Impact of Climate Change on Water Resources Specifically For Agriculture and Food Security in Liberia (Darlington F Doe 2020-21)
34. Community Based Natural Resources Management (CBNRM) institutions for water resources management (Luclas Mujuru 2020-21)
35. Performance Analysis of Air Injection for Conservation of water bodies (Shivjeet Singh Rana – 2020-21)
36. Strategic Environmental Impact Assessment of Urban River Management (Vaibhav Bisla – 2022-23)
37. Impact of quality of E-Flow in ganga River from Devprayg to Bijnore (Meenakshi Mittal – 2023-24)
38. Integrated River Quality Assessment and Conservation Plan for Gurupura (Phalguni) River, Mangaluru, Karnataka (Ms Prameela 2024-25 ongoing)
39. Land use and land cover changes and its impact on water quality of Chikkatumakuru Lake, Doddaballapura Taluk, Bengaluru Rural District, Karnataka (Ms Vishalakshi – 2024-25 ongoing)

Details of Professional Travel

International:
Austria (2005, 2011, 2015, 2016), USA (1983, 1997, 2010, 2016, 2018), Canada (1997& 2012), Nepal (2018, 2013, 2011, 2008, 2007, 2003, 2000,1999, 1998, 1997, 1996 & 1994), Norway (1988-89, 1995, 2000, 2009), Belgium (1985), Czech (2005), The Netherlands (1985), UK (1985, 2000, 2002, 2010 & 2016), China (1986, 1998, 2014, 2015, 2018, 2019), Thailand (1998), Bangladesh (1999, 2003), France (1998, 2006, 2012, 2016, 2019), Germany (2009, 2011, 2015, 2016), Switzerland (2000, 2004, 2006, 2012, 2016), Sudan (2004) , Sri Lanka (1999, 2004, 2006, 2007 & 2010), Mexico (2010 &2013), Malaysia (2008 & 2014), Iran (2005), Rwanda(2007), Brazil (2008, 2009 &2014), Nigeria (2008) Equatorial Guinea (2008), Cambodia (2010), Abu Dhabi (2011, 2013 & 2014) and Japan (2013 & 2014), Tanzania (2012), Zambia (2013, 2018), Turkey (2009 &2014), Poland (2012) and Ethiopia (2012), Korea (2015, 2016), Myanmar (2015), Vietnam (2018)

National:

To the states of Arunachal Pradesh, Mizoram, Nagaland, WB, A&N Islands, Orissa, Bihar, Assam, Tripura, Meghalaya, Sikkim, MP, Gujarat, Karnataka, Maharashtra, Ar.P., Kerala, Tamil Nadu, J&K including Ladakh, HP, Uttarakhand, Jharkhand, Punjab, Gujarat, Chhattisgarh and Rajasthan.

Details of Visits to Foreign Countries for Training/Education tour/Workshops/Seminars

1. Participated in ASCE pipe conference at Nashville July 21-24, 2019.
2. Invited and attend as expert for small hydro ISO standard preparation, Hangzhou, June 16-18, 2019
3. Invited and Participated in the Internation water congress, Paris, May 13-15, 2019
4. Participated in Hydro Vision 2018 at North Charlotte, USA during June 26-28, 2018
5. Participated in IGHEM and presented two papers at Beijing, Sept 10-13, 2020
6. Invited and chaired session on SHP at ASIA 2018 –Seventh International Conference on Water Resources and Renewable Energy Development In Asia during March 13–15, 2018 at Danang – Vietnam
7. Invited and delivered an expert talk in the International Conference Hydro2016 Hydropower &

Dams during Oct 10 – 12, 2016 at Montruex, Switzerland

8. Invited and participated in the International Conference of IGHEM during Aug 24 – 27, 2016 at Linz, Germany.
9. Invited and participated in the International Conference of HYDRO2016 – Achievements, Opportunities and Challenges during Oct 10 – 12, 2016 at Montreux, Switzerland and present paper.
10. Invited and participated in 28th IAHR Symposium on Hydraulic Machinery and Systems during July 5-8, 2016 at Grenoble France as member of scientific committee and presented two research paper.
11. Invited and participated in annual conference on Managing Global Changes for Sustainability organised by International Network for Advancing Transdisciplinary Education (INATE), Tokya Japan held July 2-4, 2016 at Busan, South Korea.
12. Invited by UK government to be part of India-UK Water Security Exchange delegation to the UK (London and Oxford) during Feb 13 – 20, 2016 organized by British High Commission.
13. Invited by UNIDO and attended Vienna Energy Forum meeting during June 18 – 20, 2015 at Vienna, Austria.
14. Invited by UP Government and visited with the delegation China, South Korea, Austria and Germany for rubber dams manufacturers and design institutes during June 07 – 17, 2015.
15. Invited by International Center on Small Hydropower (ICSHP) of UNIDO and Hangzhou China and participated in meeting as a member of the Editorial Board on Nov 26, 2014 at Hangzhou, China. Also visited Three Gorges hydropower plant in Yichang and Hydro turbine laboratory of China Institute of Water Resources and Hydropower Research at Beijing.
16. Invited and delivered the expert talk in the workshop on off-grid electrification during Jan 28–29, 2015 at Nay Pyi Taw, Myanmar organized by The World Bank.
17. Invited and participated as the member of conference organizing committee and to paper in 10th International Conference for Hydraulic Efficiency Measurement during Sept 16 – 18, 2014 at Itajuba–MG–Brazil
18. Invited and participated in annual conference of University Network for climate and Ecosystems change and Adaptation Research (UN-CECAR) scheduled on May 30, 2014 and Planning Workshop during May 31–June 01, 2014 at Kuala Lumpur, Malaysia.
19. Invited and participated in the hidroenergia 2014, international conference organized by European Small Hydropower Association (ESHA) during May 21 – 24, 2014 at Istanbul, Turkey as member of scientific committee, Chaired the session on New turbine technology and presented the paper.
20. Invited and delivered lectures as resource person for small hydropower under UN-CECAR postgraduate course on Renewable Energy being organized by United Nations University Institute of Sustainability and Peace (UNU-ISP), Tokyo, Japan during April 08 – 09, 2014.
21. Invited and participated in consultative meeting on International Renewable Energy Agency proposed capacity building programmes being held on Jan 19, 2014 at IRENA Headquarters, Abu Dhabi.
22. Invited by UNIDO, to organize training workshop in Dec 09 – 19, 2013 on Small hydropower Development in Monrovia, Liberia.
23. Invited and participated in workshop on "A Comprehensive Assessment of the Hindu Kush Himalayas: Action to Sustain the Global Asset" during 02-03 Sept, 2013, ICIMOD, Kathmandu, Nepal
24. Invited by UNIDO, to organize training workshop in July 03 – 13, 2013 on Small hydropower Development in Freetown, Sierra Leone.
25. Invited by Kafue Gorge Regional Training Centre (KGRTC), as resource person in the training workshop for capacity building to develop small hydropower development during May 27 – 31, 2013 at Namalundu, Zambia.
26. Invited by International Council for Science (ISCU), to participate in ICSU Regional – Global integration Workshop on Sustainable Energy, Mexico City, April 08-09, 2013.
27. Invited as resource person for deliver 2 lectures for the UN-CECAR postgraduate course on Renewable Energy being organized by United Nations University Institute of Sustainability and Peace (UNU-ISP), Tokyo, Japan on March 04 & 05, 2013.
28. Invited to visit the facilities regarding Japanese technology in the field of small hydropower and to

attend few meetings with organization members and METI in Japan during Feb 18 – 21, 2013.

29. Invited as resource person for small hydro development during IRENA General Assembly meeting on Jan 13 – 14, 2013 and presented two themes at Abu Dhabi, UAE.
30. Invited and delivered as guest speaker on Hydropower in Rural Development - Overview of solutions in India at symposium on "The Place of Water Power in the Renewable Energy Panel held during November 20 – 21, 2012, in Grenoble, France". Also visited Lucerne University of Applied Science and Arts School of Engineering and Architecture and Laboratory of Hydraulics, Hydrology und Glaciology (VAW) of ETH, Zürich, Switzerland.
31. Invited as member of delegation of DST, Govt. of India for the 'Indo Swiss Symposium on Renewable Energies and Rational Energy End-use" and presented "Small Hydro In India" held at EPFL, Lausanne, Switzerland from October 22 – 25, 2012.
32. Invited by UNIDO to visit and prepare a report for building and visited Dar es salaam, Tanzania during June 6-11, 2012.
33. Invited by Ethiopian Electricity Agency to visit them and discuss on collaboration for capacity building , Addis Ababa, Ethiopia June 12-13, 2012
34. Invited by Arena International as key speaker at 4th annual Small Hydro 2012 conference being organized by Arena International during 25th – 26th April 2012 in Toronto, Canada
35. Invited to chair the first plenary session on "Small hydro in Europe and worldwide" at hidroenergia 2012, international conference being organized by European Small Hydropower Association (ESHA) and the Polish Association for Small Hydropower Development (TRMEW) during may 23-26, 2012 at Wrocław, Poland
36. Invited by World Bank Washington and presented Cumulative Impact Assessment of Hydropower Development in Nepal, March 12-13, 2012 , Kathmandu, Nepal
37. Invited by USAE and AEPC for regional workshop on Micro Hydropower Development: Prospects & Challenges in South Asia (September 12 - 14, 2011) in Kathmandu, Nepal and presented country paper on Micro hydro power
38. Invited by Intergovernmental Panel on Climate Change (IPCC), a scientific intergovernmental body setup by World Meteorological organization (WMO) and United Nations Environment Programme (UNEP), working group III as "Coordinating Lead Author" for preparing special report on Renewable Energy Sources and Climate Change Mitigation preparing – chapter 5 on Hydropower. The global report is released on June 14, 2011. Attended first meeting at São José dos Campos, SP, Brazil, During Jan 26-29, 2009, second meeting at Oslo Norway during Aug 31 – Sept 04, 2009, Expert meeting At Washington DC, USA during Feb 1-2, 2010) and Third meeting at Oxford UK during Feb 28- March 05, 2010., fourth meeting at Mexico city Sept 17-24, 2010, fifth meeting and fifth meeting at Potsdam Jan 17 – 20, 2011 and Final concluding meeting at Abu Dhabi May 3-8, 2011
39. Invited by UNIDO, Vienna to prepare a Strategy Document for small hydropower development (2011)
40. Invited by UNIDO, Vienna to prepare a report on Capacity Building on small hydropower development in Cambodia and visited April 01-07, 2010.
41. Invited by UNIDO, to organize two training programmes in July and Sept 2010 on SHP capacity building at Cambodia
42. Invited by DFCC bank, Sri lanka for Low Head Hydropower Development under World Bank fubded RERRED project Feb 18-20, 2010
43. Invited and visited leading hydro turbine manufacturer Voith Hydro, Heidenheim, Germany on Aug 28, 2009.
44. Invited by Koran International Turkey, to visit Turkey as shp expert to discuss with turkey Minister of Energy, govt agencies, Istanbul IU technical University and Temsan for small hydro development during March 01 – 04, 2009
45. Invited by to be member of Science Planning Group (SPG) in the area of Sustainable Energy by International Council for Science Regional Office for Asia and the Pacific Kuala Lumpur (Malaysia) and to contribute an article on Hydro Energy. Attended its meeting held at Kuala Lumpur (Malaysia) during Nov 14 – 15, 2008.

46. Invited by AIL to visit Equotorial Guinea for water supply project desugn work Sept 30 – Oct 2, 2008.
47. Invited by Minister of Mining and Energy of Brazil and the Director-General of the United Nations Industrial Development Organization (UNIDO) to participate as a speaker in the Global Renewable Energy Forum, being held in Foz do Iguaçu, Brazil, from 18 to 21 May 2008.
48. Invited to South Asia Regional Workshop on Developing Regional Standards for Micro-Hydro Sector, Colombo, Sri Lanka, March 25-27, 2006 for presenting on National micro hydro standards and quality programmes in India
49. Invited and visited as international specialist for small hydropower development in Indonesia (Nias Island) by UNIDO Feb 4-12, 2006
50. Participated in The first meeting of EU funded 10 institutions of 8 countries, research project review meeting at Brno, Czech Republic June 12-19, 2005. Also was invited by UNIDO, Vienna for discussion with them on small hydropower programme and related training activities on June 17, 2005.
51. Invited By Iran and Water Development corporation, Govt of Iran to visit and advise on small hydropower during may 13-21, 2005
52. Invited to South Asia Regional Workshop on Developing Standards for Micro-Hydro Sector, Colombo, Sri Lanka, Sept. 5-7, 2004 for presenting on Existing micro hydro standards and quality programmes in India.
53. Invited and participated in International Conference on Innovation in Hydraulics Efficiency Measurements at Lucern, Switzerland and visited other reputed international laboratories during July 13-21, 2004.
54. Invited and visited as international specialist for small hydropower development in Sudan by UNIDO, June 23-July 4, 2004.
55. Invited and delivered specialist lecture – International Seminar and Training Course on Small Hydropower at Columbo, Sri Lanka, June 9-12, 2004.
56. Invited and Delivered specialist lecture – International Training Programme on Power Generation, Dhaka, July 18-20, 2003.
57. Invited and Participated – UNESCO/DFID Sponsored, HKH – Friend Workshop at Kathmandu, May 7-9, 2003.
58. Invited and Visited Centre for Ecology & Hydrology, UK, Wallingford Hydraulic Research Institute, Dulas Engg, UK in Dec. 02-07, 2002.
59. Invited Member of Delegation of Ministry of Non-conventional Energy Sources, Government of India and visited Small hydropower related government institutions, manufacturers and sites in Norway, Switzerland and UK during Nov. 12-Dec. 02, 2000.
60. Invited and Participated in UNESCO sponsored Hindu Kush Friend Workshop at ICIMOD Kathmandu, April 12-14, 2000.
61. Organised International short-term course on SHP at Kathmandu during April 17-22, 2000.
62. Invited and Participated in the Energy Network Exchange visit to SHP sites in Sri Lanka by Intermediate Technology Development group, Sri Lanka during June 7-11, 1999.
63. Organised jointly an International Course on SHP at Dhaka/Bangladesh during May 6-9, 1999.
64. Invited and Participated in UNESCO Workshop on lean flows by ICIMOD, Kathmandu during April 23-25, 1999.
65. Visited Water & Energy Commission Secretariat, HMG Nepal, Kathmandu for Nepal district SHP - GIS database project during March 6-8, 1999.
66. Invited and Participated in the Small Scale Hydro Resource and Technology IEA sponsored Workshop at NICE, France, Oct. 13-14, 1998.
67. Invited and Visited 11 Small hydro stations in China (IN-SHP and ICIMOD), Aug. 30-Sept. 04, 1998.
68. Invited and Technical discussion with REMC, AIT Bangkok, Sept. 1998.
69. Invited and Participated in the "Experts' consultation on Private MMHP Development in the Hindu Kush Himalayan Region - A review of inputs and Methodologies, ICIMOD, Kathmandu, Nepal (Feb. 9-13, 1998).

70. Invited and Visited Canada, attended different meetings with SCP Gestion Conceil (Sherbrooke), EDC, CIDA, CANMET, financial institutions and visited 11 shp power stations with auto operations (Aug. 9-22'97).
71. Invited and Attended Indo-US Hydro Forum Meeting on Aug. 08'97 at Atlanta and delegated/participated in the Water Power' 97 International Conference (Aug. 3-8'97 at Atlanta, USA).
72. Represented AHEC at India Trade Exhibition during May 17-20'97 in Kathmandu, Nepal.
73. Invited and Attended International Meeting on Renewable Energy-Enet work at Bhutwal, Nepal during March 9-11'96.
74. Invited and Visited 8 Norwegian organisations for possible cooperation during April 23-29' 95 in Norway under NORAD support.
75. Invited and participated in Expert Consultative Committee meeting at ICIMOD, Kathmandu, Nepal during Jan 11-16'94.
76. P.G. Diploma cum Research Project in Hydro Power Development at Norwegian Institute of Technology, Trondheim, Norway, Aug. 1988-June, 1989.
77. Hangzhou Research Centre, China for SHP projects Aug. 18-29, 1986. Travelled across the country to visit 12 hydropower stations.
78. Invited by Twenty Technical Univ., Enschede, Netherlands June 1985 to study energy systems.
79. Delegate and presented a research paper in V World Congress on Water Resources, Brussels, June 1985.
80. Turlock irrigation district in California to see SHP installations, 1983.
81. Colorado State University, USA & Boston University for Indo-US collaborative research project 1983-84.

Sponsored Research and Industrial Consultancy Projects

SL. NO.	ITEM	NUMBERS
A.	**R&D/MONITORING/EVALUATION/TESTING**	
1.	R&D/Monitoring Projects for shp	50
2.	Techno-economic and Appraisal for shp	103
3.	Performance & RMU Related Testing for shp	18
4.	Performance Testing of Hydropower Stations for shp	247
5.	Regulatory Studies and Training for shp	18
6.	Lender's Engineer/Nominee Director for shp	6
7.	Serving as Technical Expert Organisation for SHP	4
		446
B.	**Planning/designs/execution**	
8.	Detailed Project Reports for shp	225
9.	Pre-Feasibility Reports for shp	218
10.	Planning, Designs and Execution for shp	19
11.	Detailed Engineering Designs and Construction Drawings and Review for shp	86
12.	Technical Specifications of turnkey execution/ equipment supply for shp	27
13.	Renovation and Modernisation of SHP Stations	74
14.	Drainage/Irrigation Related Projects	15
15.	Remote Sensing and GIS based Projects	13
16.	Environment Impact Assessment and Eco restoration of rivers and lakes	140
		817
C.	**PROJECTS WITH INTERNATIONAL COOPERATION**	
17.	Projects with International Inputs	29
D.	**Secretariat for Virtual Centre of Water for Welfare of Uttarakhand Govt.**	1