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Prof. (Dr) N. K. Agarwal

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Teaching Experience : **27 years** (at UG & PG level in University Department)

Research Experience : **33 years**

Field of Research Interest : **Fish reproductive biology, Fish biotechnology, Aquatic Environment**

Google scholar Citation : **454 citations, h-index : 11, i10 index : 13**

Honors & Awards.

- Gold medal and fellow award of ASEA (Action for Sustainable, Efficacious development and Awareness) in 2007.
- Fellow Award from MANU- International Council for Man and Nature in Aug. 2010.
- Fish & Fisheries award of ASEA (Action for Sustainable, Efficacious development and Awareness) for the year 2010.

Professional recognition:

- Member (DG, ICAR Nominee) for DPC of ICAR-DCFR, Bhimtal 21 Jan.2019
- Subject Expert for DPC of ICAR-DCFR, Bhimtal 19-20 July 2019
- Member (UGC nominee) UGC-SAP advisory committee 2017, Jammu Univ., Jammu
- Member, Selection Committee of Uttarakhand Public Service Commission at the level of college teachers.
- External expert, RDC (Zoology) CCS Meerut University 2017
- Member, Board of Studies, Zoology and Biotech., HNB Garhwal Univ. since 2014
- Member, Faculty Board Life Science, MJP Rohilkhand University 2017
- Subject Expert, Uttar Pradesh Public Service Commission (UP PSC)
- Subject Expert, Uttarkhand Lok Seva Ayog in various committees.
- Subject Expert, Uttarakhand Subordinate Service Selection Commission, Dehradun
- Assistant Editor 'Himalokini- campus Magazine' for the session 2008-09 & 2009-10.
- Associate Editor of Environment Conservation Journal
- Associate editor, Environment conservation Journal
- Member in various selection committees, inspection committees of Sri Dev Sumen University
- Subject expert/external examiner for PG and Ph.D Programme of various universities including HNB Garhwal University, Kumaon University, CCS University Meerut, Aligarh Muslim University, IGNOU, Kurkhestra University, Devi Ahilya Vishwavidyalya Indore, CIFE Mumbai, RTM University Nagpur, Aurangabad University, Barkatullah University Bhopal, University of Jammu, University of Kashmir Srinagar, JNV University Jodhpur Rajasthan.

Membership of professional/academic bodies, societies, etc.,

- Life member Coldwater Fisheries Society of India, DCFR-ICAR, Bhimtal
- Life member of Inland fisheries society of India, Central Inland Capture Fisheries Research Institute, Barrackpore (WB).
- Life member of Indian Fisheries Association, CIFE Versova, Mumbai.
- Life member of Society of Bio-science, Mujaffarnagar.
- Life member of Action for Sustainable Efficacious Development and Awareness, NGO, at Rishikesh.

- Life member of Fresh water Biological Association of India , Bhagalpur
- Life member of Zoological Society of India, Bodh Gaya.
- Life member of Nature Conservators, Muzaffarnagar

Research Supervision: Students awarded Ph.D. Degree : **07** ; Registered for Ph.D. Degree : **02**

Research Projects successfully carried out: **04** funded by ICAR, UGC and DBT

S.N.	Title of the major research Project	Funding Agency	Total Cost	Completed/ Ongoing
1.	“Reproductive strategies of snowtrout <i>Schizothorax</i> sp.) with reference to environment of river Bhagirathi and Bhilangana of Tehri Garhwal” PI : Prof N. K. Agarwal	ICAR New Delhi	Rs 7.64 Lac.	Completed (1998 – 2001)
2.	Developing cryopreservation protocols for spermatozoa of snowtrout and other endangered cold water species. PI : Prof N. K. Agarwal	ICAR New Delhi	Rs 16.25 Lac.	Completed (2002-2005)
3.	Coldwater fish diversity and fisheries of the river Ganga and its tributaries in Garhwal Himalaya: Re-assessment and Inventorization in reference to habitat fragmentation PI : Prof N. K. Agarwal	UGC New Delhi	Rs 9.84 Lac	Completed (2010-2013)
4.	Genetic diversity molecular delineation and phylogenetic kinship in the declining population of four species of <i>Channa</i> from North India and possible conservation strategies. P.I. Prof. Iqbal Parwez, AMU, Aligarh Co-PI : Prof N. K. Agarwal	DBT New Delhi	Rs 54.29 lac for AMU &Rs 5.24 lac for HNBGU	Completed (2011-2014)

Consultancy project :

- Team member of the EIA study group of Prof H. R. Singh for the study on *Ecological parameters of the Bhagirathi River*. The study was conducted in 2008 from the viewpoint of environmental flow consideration for the riverine biota in context of Lohari-Nagpala Hydro Power Project on the river Bhagirathi.

Administrative Experience: Performed various administrative responsibilities as-

- Chief Election Officer, Student Union Election 2019-20 SRT Campus
- Convener, Admission Committee (B.Sc. I Bio group) session 2015-16, 2017-18, 2019-20
- Joint Secretary, HNB Garhwal Univ Alumni Association 2018-19.
- Convener, Admission Committee (B.Sc. III sem Bio group) session 2018-19
- In-charge Head, Department of Zoology, SRT Campus, Badshahithaul 2017-18
- Convener, Campus Purchase committee for the session 2017-18
- Deputy Proctor, HNB Garhwal Univ., Badshahithaul Campus during 2015-16
- Convener, Admission Committee (B.Sc. II Bio group) session 2014-15,
- Member, Admission Committee (M.Sc. Zoology) since 2014
- Deputy Dean Student Welfare DDSW (Badshahithaul Campus) session 2013-14
- Member Inspired Teacher Network (Badshahithaul Campus) 2013-14
- Member Campus Administrative Committee for the session 2009-10, 2011-12
- ADSW (Badshahithaul campus) for the period 2004-07 and 2009-2010, 2011-13)
- In-charge, Student Union during the session 2004-05, 2005-06, 2012-13, 2013-14

- Assistant Election officer, Student Union Election, Badshahithaul campus during the session 2006-07, 2008-09
- Programme officer NSS Unit Badshahithaul campus 2001-02
- Assistant Proctor (Badshahithaul campus) during the session 1995-96
- Centre Superintendent Exam, Assistant Superintendent Exam in SRT campus during different academic session

Research Papers Published : Total 61 research papers published in the peer reviewed, indexed journals of National and International repute. **Impact Factor ranging 0.00 - 4.816**

1. **Agarwal, N. K.**, Rawat, U. S. and Singh G. (2019). Fish assemblages and habitat ecology of River Pinder in central Himalaya, India. Iranian J. Fisheries Sciences.18 (1):1-14 DOI: 10.22092/ijfs.2018.118930. **ISSN:1562-2916 (Impact Factor 0.495)**
2. **Agarwal, N. K.**, Singh, H., Singh, A. and Singh, G. (2018). Bhilangana river regulation for hydro power project in central Himalaya: Impact on Planktonic Assemblages. Biojournal, 13(1):1-10. **ISSN:0970-9444.**
3. Alauddin A., Chaturvedi S., Malik, M.Y., Azmi L., Shukla I., Naseem Z., Rao C.V. and **Agarwal N K.** (2018). Formononetin and biochanin A protects against ritonavir induced hepatotoxicity via modulation of NfκB/pAkt signaling molecules. Life Sciences 213:174-182. <https://doi.org/10.1016/j.lfs.2018.10.023>. **ISSN: 0024-3205 (Impact Factor 3.448)**
4. Alauddin A., Chaturvedi S., Azmi L., Shukla I., Naseem Z., Rao C.V. and **Agarwal N K.** (2018). Gastroprotective Effect of Formononetin against Ethanol-Induced Gastric Ulceration in Rats via Augmentation of Cytoprotective Markers and Curtailing Apoptotic Gene Expression. Phcog Mag 14: pp S605-12. **DOI: 10.4103/pm.pm_205_18. ISSN : 0973-1296 (Impact Factor 1.525)**
5. **Agarwal, N. K.**, Singh G., Singh H., Kumar, N. and Rawat, U. S. (2018). Ecological impacts of Dams on the Fish Diversity of Bhagirathi River in Central Himalaya (India). Journal of Coldwater Fisheries 1(1): 74-84.
6. Charak S. R., **Agarwal N.K.** and Shah T. K. (2018). An Approach for determination of semen quality of golden mahseer (*Tor putitora*) from central Himalaya. The Pharma Innovation Journal. 7(1):83-86.
7. **Agarwal N. K.**, Singh H., Singh G. and Charak S. (2018). Bhilangana River Impoundment: Consequences to riverine environment. In: Water Biology (eds Khanna D. R. Bhutyani R.) Discovery Publishing House Pvt. Ltd., New Delhi (India). pp 82-94. (ISBN-978-93-5056-888-0)
8. Singh Gurnam and **Agarwal N. K.** (2017). Impact of hydropower project (RoR) on the ichthyofaunal diversity of river Birahiganga in central Himalaya (India). Journal of Fisheries. 5(2) : 507-512.
9. Gupta A., Ahmad I, Kureel J., John A.A., Sultan E., Chanda D., **Agarwal N.K.**, Alauddin, Wahajuddin, Prabhaker S., Verma A., Singh D. (2016). Differentiation of skeletal osteogenic progenitor cells to osteoblasts with 3,4-diarylbenzopyran based amide derivatives: Novel osteogenic agents. European journal of Medicinal Chemistry 121: 82-89. <http://dx.doi.org/10.1016/j.ejmech.2016.05.023> **(Impact Factor 3.9)**
10. Rawat U.S. and **Agarwal N.K.** (2015). Biodiversity: Concept, threats and conservation. Environment Conservation Journal. Vol. 16 (3): 19-28.
11. **Agarwal N. K.**, Singh Gurnam and Rawat U.S. (2014). Present status and threats to the Ichthyofaunal diversity of a snow fed river Nandakini in central Himalaya (Garhwal), India. In : Uttarakhand Disaster: Contemporary issue of Climate Change and Development with Holistic Approach (eds. Rawat U.S. & Semwal V.P.), Winsar Publication Dehradun, India. pp 173-182. **(ISBN 978-81-86844-58-8).**

12. Singh Gurnam and **Agarwal N. K.** (2014). Fishing methods in upper Ganga River system of Central Himalaya, India. *Journal of Fisheries*. Volume 2 Issue 3 Pages: 195-202-DOI: [dx.doi.org/10.17017/jfish.v2i3.2014.43](https://doi.org/10.17017/jfish.v2i3.2014.43)
13. Singh Gurnam and **Agarwal N. K.** (2014). Fish assemblage structure and habitat use of the snow fed stream Assiganga - a major tributary of river Bhagirathi in Central Himalaya (India). *International Journal of Aquatic Biology* 2(6): 305-312 (**Impact Factor, 0.326**)
14. **Agarwal N. K.**, Saini V. and Raghuvanshi, S. K. (2013). Characterization and short-term storage of semen of a coldwater Himalayan fish species. *Biojournal*, 8(1): 1-8.
15. Singh Gurnam and **Agarwal N. K.** (2013). Fish diversity of Laster stream, a major tributary of river Mandakini in Central Himalaya (India) with regard to altitude and habitat specificity of fishes. *Journal of Applied and Natural Science* 5 (2): 369-374.
16. **Agarwal N. K.** and Singh Gurnam (2012). Documentation of fishes and physico-chemical characters of a stream Indrawati- a spring fed tributary of River Bhagirathi at Uttarkashi (Central Himalaya, Garhwal) India. *Environment Conservation Journal*. Vol. 13 (3): 117-124.
17. Chaudhary D.K., Sood N., Swaminathan T.R., Rathore G., Pradhan P. K., **Agarwal N. K.**, Jena J. K. (2012). Establishment and Characterization of an epithelial cell line from thymus of *Catla catla* (Hamilton, 1822). *Gene*. [http://dx.doi.org/10.1016/j.gene.2012.09.081](https://doi.org/10.1016/j.gene.2012.09.081). (**Impact Factor 2.319**)
18. Chaudhary D. K., Sood N., Pradhan P. K., **Agarwal N. K.**, Rathore G. (2012). Production and characterization of monoclonal antibody against putative T lymphocytes of *Catla catla*. In *Vitro Cell. Dev. Bio.-Animal* DOI: 10.1007/s11626-012-9532-x (**Impact Factor= 0.971**)
19. Chaudhary D. K., Sood N., Rathore G., Pradhan P. K., Punia P., **Agarwal N. K.**, Jena J. K. (2012). Establishment and characterization of macrophage cell line from thymus of *Catla catla* (Hamilton, 1822). *Aquaculture Research*, 1-13 doi: 10.1111/j.1365-2109.2012.03227.x (12 July 2012). (**Impact Factor= 1.475**)
20. Chaudhary D. K., Sood N., Pradhan P. K., Singh A., Punia P., **Agarwal N. K.**, Rathore G. (2012). Establishment of a macrophage cell line from adherent peripheral blood mononuclear cells of *Catla catla*. In *Vitro Cell. Dev. Biol.- Animal*, 48(6): 340-348. DOI: 10.1007/s11626-012-9516-x. (**Impact Factor= 0.971**)
21. Ayoade, A. A. and **Agarwal N. K.** (2012). Preliminary analyses of physical and chemical parameters of Tehri dam reservoir, Garhwal Himalaya, India. *Zoology and Ecology*, 22 (1): 72-77. DOI: 10.1080/21658005.2012.674656.
22. **Agarwal N. K.**, Singh Gurnam and Singh Harpal (2011). Present status of Ichthyofaunal diversity of Garhwal Himalayan river Bhilangna and its tributaries with reference to changing environment. *Environment Conservation Journal*, 12(3): 101-108.
23. **Agarwal N. K.** (2011). Cryopreservation of Fish Semen. In : *Himalayan Aquatic Biodiversity Conservation & New Tools in Biotechnology* (eds. J.P.Bhatt, Madhu Thapliyal & Ashish Thapliyal), pp 104-127. Transmedia Publication, Srinagar (Garhwal) Uttarakhand.
24. Ayoade, A. A., **Agarwal, N. K** and Chandola-Saklani, A. (2009). Changes in Physico-chemical Features and Plankton of Two Regulated High Altitude Rivers, Garhwal Himalaya, India. *European Journal of Scientific Research*, 27 (1): 77-92. (**Impact Factor, 0.713**)
25. **Agarwal N. K.** and Raghuvanshi S. K. (2009). Spermatocrit and sperm density in snowtrout (*Schizothorax richardsonii*): Correlation and variation during the breeding season. *Aquaculture*, 291: 61-64. DOI 10.1016 / j. aquaculture.2009.03.002(**Impact Factor, 1.893**).
26. **Agarwal N. K.**, Raghuvanshi S. K. and Saini V. (2009). Cryopreservation of snowtrout (*S.richardsonii*) milt as a means for propagation and ex-situ conservation of species. In: *Fish Genetic Resources*, (eds. W.S. Lakra, A.K., Singh & P.C. Mahanta), pp 273-284. Narendra Publishing House, New Delhi.

27. **Agarwal N. K.** and Singh Harpal (2009). Snowtrout Fishery in Uttaranchal: Causes of Depletion & Strategy for Propagation. *Environment Conservation Journal*. Vol. 10(1&2): 135-140.
28. **अग्रवाल एन० के०**, रघुवंशी एस० के० एवं वन्दना सैनी (2008). गढ़वाल हिमालय की भागीरथी नदी का बदलता पर्यावरणीय परिदृश्य : शीतजल मात्स्यिकी विकास तथा संरक्षण की दशा एवं दिशा In: उत्तरी पर्वतीय राज्यों की मत्स्य विविधता : संरक्षण एवं प्रबंधन. W. S. Lakra, L. K. Tyagi (eds). National Bureau of Fish Genetic Resources, Lucknow pp. 211-217.
29. **अग्रवाल एन० के०**, रघुवंशी एस० के० एवं वन्दना सैनी (2008). शीतजलीय स्नोट्राउट (*साइजोथोरेक्स रिचार्डसोनी*) के संवर्धन एवं संरक्षण हेतु वीर्य परिरक्षण की अतिहिमिकरण तकनीक का विकास: (II) अतिहिमिकृत वीर्य परीक्षण – शुक्राणु गतिशीलता, कृत्रिम निषेचन एवं मत्स्यबीज परिवर्धन. In: उत्तरी पर्वतीय राज्यों की मत्स्य विविधता : संरक्षण एवं प्रबंधन. W. S. Lakra, L. K. Tyagi (eds). National Bureau of Fish Genetic Resources, Lucknow pp. 245-254.
30. **Agarwal N. K.**, Thapliyal B. L. and Raghuvanshi S. K. (2007). Induced Breeding and artificial fertilization of snowtrout, *Schizothorax richardsonii* through the application of ovaprim. *J. Inland Fish. Soc. India* 39(1):12-19.
31. Kathait J.S., Joshi V., **Agarwal N.K.** and Jagwan J.S. (2007). Phytochemical examination of *Pittosporum nepaulense* and its effect on micro-organism as an antibacterial agent. In:(eds. Chopra A.K., Khanna D.R., Prasad G., Malik D.S. and Bhutiani R.) Medicinal plants: conservation, cultivation and Utilization. Daya Publishing House, Delhi. 127-131.
32. **Agarwal N. K.** and Thapliyal B. L., Raghuvanshi S. K. and Saini V. (2007). Hydrobiological environment of river Bhilangana and its impact on the reproductive potential of snowtrout (*Schizothorax richardsonii*). In: Mitigation of Pollutants for clean Environment (Proc. of the 15th National Symposium on Environment –NSE-15), Puranik *et al.* (eds.) Macmillan India Ltd. pp 552-558.
33. **Agarwal N. K.** and Thapliyal B. L. (2005). Pre-impoundment hydro-biological study of the Bhilangana river from Tehri Dam reservoir area in Uttaranchal. *Environmental Geochemistry*, 8 (1&2):143-148.
34. **Agarwal N. K.**, Khanna D. R., Thapliyal B. L. and Rawat U. S. (2005). Resource assessment of hill fisheries in Garhwal Himalayan region of Uttaranchal: a Perspective. In D. R. Khanna, A. K. Chopra. and G. Prasad (eds.), Aquatic Biodiversity in India: The present scenario. Daya Publishing House, New Delhi: 81-97.
35. **अग्रवाल एन० के०**, खन्ना डी० आर०, थपलियाल बी० एल० एवम् रघुवंशी एस० के० (2005). शीतजलीय मत्स्य (स्नोट्राउट) बीज उत्पादन तकनीक का विकास , **उत्तरांचल में मात्स्यिकी** , केन्द्रीय मात्स्यिकी शिक्षा संस्थान 69.77
36. **अग्रवाल एन० के०**, रघुवंशी एस० के० एवं वन्दना सैनी (2005). शीतजलीय स्नोट्राउट मत्स्य प्रजाति के संवर्धन एवं संरक्षण हेतु वीर्य परिरक्षण की अतिहिमिकरण तकनीक का विकास, **उत्तरांचल में मात्स्यिकी**, केन्द्रीय मात्स्यिकी शिक्षा संस्थान, 117-122.
37. बंगवाल के० के०, बहुगुणा बी० के०, **अग्रवाल एन० के०** एवं गुसाईं एस० एस० (2005). गढ़वाल हिमालय में मौण (मत्स्य) मेले का सामाजिक-सांस्कृतिक स्वरूप : मत्स्य संरक्षण व संवर्द्धन की आवश्यकता एवं उपाय **उत्तरांचल में मात्स्यिकी**, केन्द्रीय मात्स्यिकी शिक्षा संस्थान, 130.134
38. **Agarwal N. K.**, Raghuvanshi S. K., Vandana Saini, and Rawat U. S. (2004). Milt Quality and short term storage of snowtrout (*Schizothorax richardsonii*) sperm. *J. Inland Fish. Soc. India*, 36(2):13-18.
39. **Agarwal N. K.**, Rawat U. S., Thapliyal B. L. and Raghuvanshi S. K. (2004). Breeding biology of snowtrout, *Schizothorax richardsonii*, inhabiting the Bhagirathi river of Garhwal Himalaya. *J. Inland Fish. Soc. India*, 36(1) : 1-8
40. **Agarwal, N. K.**, Rawat, U. S., Thapliyal, B. L. and Raghuvanshi, S. K. 2003. Seasonal variation in physico-chemical characteristics of the river Bhagirathi and its impact on phytoplankton and benthic entomofauna. In: Raj, V.V., Puranik, V.D., Mahadevan, T.N., Saradhi, I.V., Gurg, R.P., and Ramola R.C. (Eds.), *Proc. of XII National Symposium on Environment (NSE-12)*. BARC, India. June 5-7, 2003, p.430-437.
41. **Agarwal N.K.**, Thapliyal B.L., Rawat U.S. and Raghuvanshi S.K. (2003): Egg Production Potential of *Schizothorax richardsonii* in relation to two Riverine Environments. *Proc. Nat. Symp. Ecol. & Biodi. Aqu. Envi.*

42. **Agarwal N.K.**, Thapliyal B.L., and Rawat U.S.(2001) : Artificial breeding of a snowtrout, *Schizothorax richardsonii*, inhabiting the Bhilangana river of Garhwal Himalaya." J.Inland Fish. Soc. 33 (1) 77-80
43. **Agarwal N.K.** and Singh H.R. (1996). Yolk nucleus in the developing oocyte of snowtrout *Schizothorax plagiostomus*-A cytological and cytochemical approach. J. Anim. Morphol. Physiol. Vol. 43 (1) pp133-135.
44. Jauhri R K., Sexena A.K. and **Agarwal N.K.** (1995). Mosquito problems in irrigation system in Doon Vally.In "Recent researches in aquatic Environment" (eds., A. Gautam and N.K. Agarwal). Daya Publishing House, Delhi. pp 119-123.
45. Singh H.R., Nautiyal P., Dobriyal A.K., Pokhriyal R.C., Negi M., Baduni V., Nautiyal R., **Agarwal N.K.** and Gautam A. (1994). Water quality of river Ganga (Garhwal Himalaya). Acta Hydrobiol.36(1):3-15
46. Singh N., **Agarwal N.K.** and Singh H.R. (1993): SEM investigation on the adhesive apparatus of *Garra gotyla gotyla* (Family: Cyprinidae) from Garhwal Himalaya. In: "Advances In Fish Biology" (ed., H.R. Singh). Hindustan Publishing Corporation, Delhi: 281-291.
47. Singh N and **Agarwal N.K.** (1993). Organ of adhesion in four hillstream fishes: A comparative morphology study. In: "Advances in Limnology"(ed., H.R. Singh). Narendra Publishing House, Delhi: 311-316.
48. Nautiyal P., **Agarwal N.K.** and Singh H.R. (1993). Certain abiotic components of the fluvial system and their inter-relationship as evidenced by statistical evolution. In: "Advances in Limnology" (ed., H.R. Singh). Narendra Publishing House, Delhi: 181-186.
49. **Agarwal N.K.**, Singh N. and Singh H.R. (1992). Post-ovulatory follicle (Corpus luteum) histology of a snowtrout *Schizothorax plagiostomus* (Heckel) of Garhwal Himalaya. Acta Ichthyologica et. Piscatorial Vol. XXII (1): 141-150.
50. **Agarwal N.K.**, Singh N. and Singh H. R. (1992). Histological and Histochemical study of the steroid synthesizing cellular sites in the testes of a hill-stream fish *Schizothorax plagiostomus*. Acta Ichthyologica et. Piscatorial Vol. XXII (1): 113-118.
51. Singh N., Bhatt K.C. and **Agarwal N.K.** (1992). The Alaknanda catchment area (Garhwal Himalaya): A case study of developmental strategies vis-à-vis Ichthyofauna and environmental imbalances. In "Aquatic Environment" ed. A. Gautam. Ashish Publishing House, New Delhi.
52. Singh N and **Agarwal N.K.** (1991). The SEM surface structure of the adhesive organ of *Pseudoecheis sulcatus* McClelland (Teleosti: sisoridae) from Garhwal Himalayan hillstream. Acta Ichthyologica et. Piscatorial Vol. XXI (2): 29-35.
53. Singh N and **Agarwal N.K.** (1991). The SEM surface structure of the adhesive organ of hillstream fish *Glyptothorax pectinopterus* (Teleosti: sisoridae) from Garhwal Himalaya. Functional and Developmental Morphology Vol.1 (4): 11-13.
54. **Agarwal N.K.** and Singh H.R. (1991). Ovarian Structure, Development and Cyclicity in *Schizothorax plagiostomus* (Heckel) of Garhwal Himalaya. Ad. Bios. 10 (1): 33-48.
55. **Agarwal N.K.** and Singh H.R. (1990). Pre-ovulatory follicular atresia (Corpora atretica) in snowtrout *Schizothorax plagiostomus* (Heckel) of Garhwal Himalaya. J. Anim. Morphol. Physiol. 37 (1-2): 29-33.
56. Singh N., Singh H.R. and **Agarwal N.K.** (1990). Histo-enzymology of the mesencephalon of hillstream teleost *Barilius bendelisis* (Ham.) from Garhwal Himalaya. J. Freshwater Biol. 2 (3): 233-240.
57. **Agarwal N.K.**, Bahuguna S.N. and Badola S.P. (1990). Seasonal variation in the gut contents of a snowtrout *Schizothoracichthys progastus* (McClelland) from the River Ganga in Garhwal Himalaya. Indian J. Anim.Sciences 60(6):750-752.
58. **Agarwal N.K.**, Dobriyal A.K., Pokhriyal R.C., Bahuguna A.K. and Singh H.R. (1988). Fecundity of a hill-stream loach *Noemacheilus montanus*. Him. J. Environment. Zool. 2: 133-135.

59. **Agarwal N. K.**, Singh W. and Singh H.R. (1988). Fecundity of the snowtrout *Schizothorax plagiostomus* (Heckel) from Garhwal Himalaya. J. Indian Fish. Assoc.18: 537-548.
60. Lakra W.S., **Agarwal N.K.** and Singh H.R. (1987). Present status of snowtrout in Garhwal Himalaya. U.P. J. Zoology 7 (1): 85-88.
61. Singh H.R. and **Agarwal N.K.** (1986). Spawning ecology of *Schizothorax plagiostomus* from Garhwal Himalaya. *Proc. Symp. Fish.*: 82-85.

Books/Monograph Published: 03

- **‘Water Biology.** (2018). ISBN-978-93-5056-888-0
(Eds) Khanna D. R., Bhutyani R., Gautam A., Pathak S. K. and **Agarwal N.K.**
Discovery Publishing House Pvt. Ltd., New Delhi (India). P.379
- **Fish Reproduction** (2008) ISBN 978-81-313-0357-3
Agarwal, N. K.
APH Publishing Corporation, New Delhi p157.
- **Recent Researches in Aquatic Environment** (1996)
(Eds. Gautam A. and Agarwal N.K.)
Daya Publishing House, Delhi. p.190

Project reports : 04

- **‘Reproductive strategies of snowtrout (*Schizothorax* sp.) with reference to environment of river Bhagirathi and Bhilangana of Tehri Garhwal’** Final report ICAR project (1999-2001) pp 90 P.I., **N. K. Agarwal**
- **‘Developing cryopreservation protocols for spermatozoa of snowtrout and other endangered coldwater species.’** Final report ICAR Scheme. pp. 104.(2002-2005). P.I., **N. K. Agarwal**
- **‘Ecological parameters of the Bhagirathi’** Final report submitted to NTPC (Oct.2008), Singh H.R., Neeraj Kumar and **N. K. Agarwal**
- **‘Coldwater fish diversity and fisheries of the river Ganga and its tributaries in Garhwal Himalaya: Re-assessment and Inventorization in reference to habitat fragmentation’** Final Technical Report UGC Research Project (2010-2013) pp 135, PI, **N. K. Agarwal**

Conferences/Seminar/Workshops/Symposia attended and papers presented:

Participated in **6** International Seminars and More than **70** national seminars / workshop / conferences at various universities and national institutes.

International :

1. Chaired technical session **‘Rivers & Dams’** and also presented a research paper entitled **‘River Fragmentations and their Impact on Fish Diversity in Upper Ganga River System, Central Himalaya (India)’** in International Seminar on **‘Himalayan Challenges: Towards Interdisciplinary Dialogues for Sustainability and Development** organized by SDS Uttarakhand University from 29th Nov.-1st Dec 2017.
2. Presented research paper on **‘Dams on the Bhagirathi river system: Impacts to fish diversity and fisheries’** in 3rd **International Geo-Hazards Research Symposium** organised by Deptt of Physics, HNB Garhwal University Campus Badshahithaul (10-14 June 2012).
3. Presented research paper on **‘The Environmental Impacts of Dams: Habitat fragmentation and cold water fish diversity.’** In International conference on **‘Recent Trends in Climate Change Researches vis-à-vis Biodiversity’** organised by Department of Animal Science, M.J.P., Rohilkhand University Bareilly from 3-4 December 2012.
4. Participated and presented a research paper entitled **‘Fertility of Cryopreserved snowtrout (*Schizothorax richardsonii*) sperm’** in International Conference **‘Asian Pacific**

Aquaculture 2011 organised by World Aquaculture Society, at Kochi, India from 17-20th January 2011.

5. Participated as resource person and also presented research paper on '*The Impact of Impoundment on the Physical and Chemical Hydrology of Bhilangana River, Uttarakhand, India*' in World Congress for Man and Nature "**Global Climate Change & Biodiversity Conservation**" Organized by Deptt of Zoology & Environment Science, Gurukul Kangari Vishwavidalaya Haridwar (11-13 Nov. 2011)
6. Delivered invited talk on '*Biodiversity Conservation*' and also chaired technical session in World Congress for Man and Nature "**Global Climate Change & Biodiversity Conservation**" Organized by Deptt of Zoology & Environment Science, Gurukul Kangari Vishwavidalaya Haridwar (11-13 Nov. 2011)

National

1. Participated and presented a research paper in National Seminar on '**Fish and their Environment**' held at Gurukul Kangari University Haridwar (Dec. 15-19, 1988).
2. Participated and presented a research paper in **74th Indian Science Congress**, Bangalore, 1987.
3. Participated and presented a research paper in II National Seminar on '**Fish and their Environment**' held at Kerala University, Trivendrum (21-23 Nov., 1988).
4. Participated and presented a research paper in National Seminar on '**Advances in Limnology and Conservation of endangered fish species**' held at HNB Garhwal University, Srinagar Garhwal, UP, India. (22-24 Oct. 1989).
5. Attended National Workshop on '**Himalayan Ecology**', held at Manali, organised by School of Entomology St. John's College, Agra (26-30 Sept. 1989).
6. Attended National Sangosthi on '**Role and responsibility of educated youth in Eco-regenerative and other developmental activity in the Himalaya on voluntary basis**', held at HNB Garhwal University, Srinagar Garhwal, (25-26 May, 1990).
7. Participated in National convention on '**Recent advances on Environmental Management for vector borne Diseases control**', held at D.A.V. (PG) College, Dehradun, (10-12 Feb. 1994).
8. Participated and presented a research paper in National Symposium on '**Recent Advances in Bio-sciences held at development of Bio-science**', M.D. University, Rohtak, (3-5 Nov. 1995).
9. Participated and presented a research paper in National Seminar on '**Prospective in Environmental Heterogeneity in the management of parasitic diseases**', held at D.A.V. (PG) College, Dehradun, (1996).
10. Participated and presented a research paper in Regional Conference on '**Sustainable Ecosystem and Environment from Sustainable, Efficacious Development and Awareness**' organised by Action for Sustainable Development and Awareness. NGO at Rishikesh (29-30 Nov. 1998).
11. Presented a research paper in National Symposium on '**Aquatic Biodiversity and Emerging Trends in Freshwater Biology**', held at HNB Garhwal University, Srinagar Garhwal. Organised by Department of Zoology, HNB Garhwal University, Srinagar Garhwal (22-24 Oct. 1999).
12. Presented a research paper in '**Fifth Indian Fisheries Forum**' held at Central Institute of fresh water aquaculture, Kausalyaganga, (C I F A) Bhubneswar- Orissa. (17-20 January, 2000).

13. Presented a research paper in '**First Indian Fisheries Science congress**' organised by Indian Society of fisheries Professionals, Mumbai held from 21-23rd September, 2000 at Panjab University, Chandigarh.
14. Participated and presented a research paper in Workshop on '**Development of research strategies for Aquafarming in Uttaranchal**' Organised by College of Fisheries sciences, G.B.P. University of Agriculture and Technology, Pantnagar on April 21, 2002.
15. Participated and presented a research paper in National seminar on "**Relevance of Biosphere Reserve, National Parks & Sanctuaries (Protected Habitats) in Present Context**" held at Gurukul Kangri University Haridwar, Uttaranchal from 25th - 26th, May 2002.
16. Participated and presented a research paper in "**Sixth Indian Fisheries Forum**" held at Central Institute of Fisheries education , Versova Mumbai (17-20 Dec. 2002)
17. Participated and presented a research paper in National Symposium on "**The Ecology & Biodiversity of Aquatic Environments**" held at Department of Zoology, Allahabad University, Allahabad. (15-17 Feb. 2003)
18. Participated and presented a research paper in National Symposium on "**Fish Genetics and Gene Banking**" held at Central Institute of Fisheries education , Versova Mumbai (29th & 30th, March 2003)
19. Participated and presented a research paper in Twelfth National Symposium on "**Environmental protection strategies for sustainable development**" held at department of physics. HNB Garhwal university campus Badshahithaul, Uttaranchal (5-7 June, 2003)
20. Participated and presented a research paper in **15th All India Congress of Zoology**' held at University of Jammu.(29th –31st Oct., 2004)
21. Participated and presented a research paper in National Seminar on "**New trends in fishery Development in India**" held at Department of Zoology, Panjab University Chandigarh (February 16 –18, 2005).
22. Participated in discussion in Brain storming session on "**Development of processing & value addition in fresh water fishes**" held at College of fisheries, G.B.Pant Univ. of Agri. & Tech. Pantnagar (April 25, 2005).
23. Participated and presented a research paper in Regional workshop on "मीठाजल मत्स्य विविधता: उत्तरी भारत के पर्वतीय राज्यों में टिकाऊ मात्स्यिकी हेतु संरक्षण एवं प्रबंधन" held at NBFGR, Lucknow (24-25th April, 06.)
24. Attended National Seminar on '**Medicinal plants: Conservation, Cultivation and Utilization**' held at Deptt. of Zoology & Environment Science, Gurukul Kangari Univ. Haridwar.(March 9-11, 2007)
25. Participated and presented a research paper in National Seminar on '**Recent Advances & rebuilding of Fish and Fisheries in North East India**' sponsored by North Eastern Council, Govt. of India, Shilong. Organised by Deptt. of Pisciculture, St. Anthony's College Shilong from 22-23 August, 2007
26. Participated as resource person in **4th National Teachers' Science Conference - 2007** 'Focal Theme- Environment Education for Better Life' A programme of RVPSP, DST, & NCSTC-Network at Dehradun (22-25 Sept., 2007)
27. Participated and presented a research paper in **2nd Uttarakhand State Science Congress** organized by Kumaon University Nanital organised at Uttarakhand Academy of Administration Nanital during 15-17th Nov., 2007

28. Participated and presented a research paper in National workshop on '**Development of Reservoir Fisheries and Conservation of Aquatic Biodiversity with particular reference to Tehri Dam Project**' organised by Deptt of Zoology, Govt. P.G.College New Tehri. from 1-2 December, 2007
29. National Seminar on '**Global Warming: It's impact on Environment, Economy, Society and Politics**' organized by SMJN P.G.College, Haridwar (27-28 December, 2008)
30. National seminar on '**Recent Advances in Vector Biology & Control**' and Prof. G.P.Agarwal Felicitation symposium ' held at DAV P.G. College Dehradun (3-4 December, 2008)
31. Attended regional seminar on '**Intellectual Property and Innovation Management in Knowledge Era.**' held at Govt. P.G. college Uttarkashi.(31st July, 2009).
32. National Seminar on '**Thrust Areas in Fish Biotechnology and Fish Conservation**' organised by Department of Zoology, Meerut College, Meerut (19th Sept., 2009)
33. Participated and presented a research paper in 4th Uttarakhand State Science Congress 2009 organized by UCOST, Dehradun at G.B.Pant Univ. of Agriculture & Technology, Pantnagar during 10-12th Nov., 2009.
34. Participated and presented a research paper in National Workshop on '**Fisheries Conservation and Enhancement in Northern Hill States**' jointly organised by NBFGR Lucknow & HNBGU Srinagar at Deptt. of Zoology, HNB Garhwal Univ. Srinagar Garhwal during 9-10th March, 2010.
35. Participated and presented a research paper in National Conference on '**Advances in Biotechnology and its Role in Aquatic Biodiversity Conservation & Fisheries**' organised by RCU Govt. P.G. College Uttarkashi from 17th -18th March, 2010.
36. Presented a research paper and actively participated in the discussion in National seminar on '**River Ganga & Water Conservation**' organized by MANU- International Council for Man & Nature, Haridwar on 5th August 2010.
37. Participated and presented a research paper in National Conference on '**Conservation of Aquatic Biodiversity, Development of Cold Water Fisheries, Fish Biotechnology and Emerging Trends in Fresh Water Environments**' organised by Deptt. of Zoology, Govt. P.G.College, New Tehri, from 25-27 November 2010.
38. Chaired the Session and also presented research paper in National Seminar on '**Environmental Management & Biodiversity Conservation**' jointly organised by 'Action for Sustainable Efficacious Development and Awareness' and 'MANU-International Council for Man and Nature' at Omkarananda Institute of Management and Technology, Rishikesh from 26-27th Feb.2011.
39. Participated and presented a research paper in National Seminar on '**New Innovations in Parasitological Research**' organized by Department of Zoology, D.A.V.P.G College, Dehradun from 29th -30th March 2011.
40. Participated and presented a research paper in the National Conference on '**Biodiversity vis-a-vis Environmental Degradation in Hilly Terrains**' organised by D.B.S. (P.G.) college, Dehradun from 15-16th May 2011.
41. Delivered invited talks 1. '*Induced breeding & Fry production*', 2. '*Fingerling stocking & Pond Management*', in a training Programme on '**Enhancement of Fish Production**' organized by Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut from 20-24 Sept. 2011.

42. Attended National workshop on '**Intellectual Property Rights/Patent Awareness**' Jointly organised by UCOST Dehradun and HNB Garhwal Univ. campus Badshahithaul on 26th Nov. 2011.
43. Chaired IV technical session and delivered a lecture in National Conference on '**Innovations in Modern Biology**' organized by Department of Zoology Meerut College, Meerut (16-17 March 2012)
44. Participated as resource person in National workshop on '**Expert Consultation on Academic Partnership for Excellence and Networks in Fisheries Education and Research**' held at Central Institute of Fisheries Education (CIFE), Versova, Mumbai (17-18 April 2012).
45. Delivered Plenary lecture on '*Cryopreservation of Fish Semen*' in National Seminar on '**Advanced Biology: Emerging Trends in Biological Galaxy**' Organized by Department of Zoology, CMP College, Allahabad from 6-7 Oct. 2012.
46. Chaired academic session and presented a research paper in National Seminar on '**Status of Environment and Biodiversity: RIO+20 and Role of Space Technology**' Organised by Department of Zoology & Environment Science Gurukul Kangari University, Haridwar, Uttarakhand from 2-3 Nov. 2012.
47. Participated as resource person and delivered lecture on '*Cryopreservation of fish semen: Protocol for snowtrout species*' to participants of **UGC refresher course** at Academic Staff College, **Dr. Babasahed Ambedkar Marathwada University Aurangabad** on 23rd Feb. 2013.
48. Chaired session and presented a research paper in National seminar on '**Environment and Biosciences & 17th Convention of U.P. Government Colleges Academic Society**' organised by Department of Zoology, Govt. Raza P. G. College Rampur (U.P.) from 2-3 March 2013.
49. Participated and Presented a research paper in National Seminar on '**Uttarakhand disaster: contemporary issues of climate change and development with a holistic approach**' organized by SDS University, Badshahithaul from 25th-27th Oct. 2013
50. Participated and delivered lecture in a NSS Workshop on '**AIDS Awareness**' organized by Red Ribbon Club at SRT Campus Badshahithaul, Tehri Garhwal on Dec.02, 2013
51. Participated as expert in Brain storming session on '**Occupational and Nutritional Health Hazard**' of 8th USSTC-2013 organized at Doon University Dehradun from 26th - 28th Dec. 2013.
52. Chaired technical session and presented as a research paper in National Seminar on '**Economic Up-gradation: Environmental Degradation**' organized by Omkarananda Institute of Management & Technology, Rishikesh from 24-25th Jan 2014.
53. Chaired session and delivered an invited lecture in National seminar on '**Biodiversity: Sustainable Development & Conservation**' organized by Jammu University Jammu from 6-8th March 2014.
54. Participated as resource person, delivered lectures and organized sessions under Zoology discipline in six days workshop jointly organized by School of Science, Uttarakhand Open Univ. at RCU Govt. PG College, Uttarakshi from 24-29th May, 2014.
55. Attended conclave on '**Renaissance of Science in Uttarakhand**' organized by School of Science, Uttarakhand Open Univ. at Doon University, Dehradun on 12th June 2014.
56. Participated as resource person and delivered lectures on '1. *Cryopreservation of fish semen* 2. *The Impact of Dams on Ganga river Ecosystem in Central Himalaya (India)*' to participants of **UGC refresher course** at Academic Staff College, **Kumaon University**,

Nainital on 7th Nov. 2014.

57. Chaired session and delivered an invited lecture in National seminar on '**Science and Technology for Human Development**' organized by Department of Zoology, Jammu University Jammu from 25-27th March 2015.
58. Chaired session and delivered an invited lecture on 'Cryopreservation of Fish Semen: Basic Principle for cold water fish species.' in National Symposium on '**The role of Classical Zoology in present day Scenario.**' organized by Department of Zoology, R.G.P.G. College Meerut from 19-20 December 2015.
59. Actively Participated in National Consultation on '**Rainbow Trout Farming: Prospects and Challenges for Strategic Development**' Organized by ICAR- Directorate of Coldwater fisheries Research, Bhimtal from 20-21 Sept. 2015.
60. Participated as Subject expert in the meeting held on 29th March 2016 for the implementation of E-Learning programme of RUSA Project at Directorate of RUSA Project, Dehradun
61. Delivered Lead lecture on '**Ecological impacts of Dams on the Fish Diversity of Bhagirathi River in Central Himalaya (India)**' in National Seminar on 'Strategies, Innovations and sustainable Management for enhancing coldwater Fisheries and aquaculture' organized by DCFR-ICAR, Bhimtal from 22-24 September 2017.
62. Chaired technical session and delivered Invited lecture on '*Ecological impacts of Dams on the Fish Diversity of Bhagirathi River in Central Himalaya*' in **International Seminar on Himalayan Challenges: Towards Interdisciplinary Dialogues for Sustainability and Development**' organized by Sri Dev Suman Uttarakhand University at Doon University Dehradun from 29th Nov-1st Dec 2017
63. Attended National Workshop on 'Role of Open Educational Resources in Higher Education' organized by Faculty Development Centre, H N B Garhwal University Srinagar Garhwal from 15-17th December, 2017.
64. Participated as resource person on 10th Jan 2018 and delivered lectures on '*Microscope Practical Demonstration: Calculating cell size*' in '**One week workshop on Basic Research Techniques**' organized by Department of Zoology, Jammu University Jammu from 8th 13th Jan 2018.
65. Delivered technical talk on 'Snow trout: Causes of Depletion and strategies for its propagation and conservation' at College of Fisheries, G.B. Pant University of Agriculture and Technology, Pantnagar on 17th April 2018.
66. Delivered invited lecture on "**The Hydropower Projects in Ganga river Basin: Environmental Aspects**" in one week short term course on 'Hydro Power Generation: Technologies and Policies' organized by THDC Institute of Hydro engineering and Technology from 27th Aug-01 Sept 2018.
67. Resource Person (Chaired technical session) and delivered lecture on '**Fish Community structure and functions along the altitudinal gradient in river Alaknanada of central Himalaya, India.**' in 11th National Conference of Medical Arthropodology on "**VECTOR-BORNE AND ZOONOTIC DISEASES: Surveillance & Control under dynamics of global warming, climate change and environment**" organized by DAV PG College Dehradun from 26-27th October 2018.
68. Delivered invited lecture on "**Effect of Water Withdrawals and Impoundments on Fish Assemblages in upper Ganga river system in central Himalaya**" in National Seminar on "**Challenges in Biodiversity Conservation & Management**" organized by Department of Zoology, University of Jammu from 20th to 21st December 2018.

69. Delivered invited talk on “**Effect of Water Withdrawals and Impoundments on Fish Assemblages in upper Ganga river system in central Himalaya**’ in National Seminar on “**Frontiers in Environment. Health & Biosciences**” organized by Institute of Biosciences & Technology, C.S.J.M. University Kanpur, U.P. from 16-17th February, 2019.
70. Resource person and delivered 2 lectures on ‘Environmental Issues’ in 3-week **UGC Refresher Course in Environment studies** at UGC Human Resource Development Center of **Kurukshetra University, Kurukshetra** on 9th Feb. 2019.

Seminar/ workshop organised:

Member organising committee of **International Seminar on Himalayan Challenges: Towards Interdisciplinary Dialogues for Sustainability and Development**’ Jointly organized by Sri Dev Suman Uttarakhand University and Doon University Dehradun from 29th Nov-1st Dec 2017.

PATENTS/ PRODUCTS/ TECHNOLOGIES DEVELOPED

- ⇒ **Snowtrout (*Schizothorax richardsonii*) seed production technique developed for the first time by artificial fertilization and Induced breeding through Ovaprim administration.**
- ⇒ **Spawning grounds of indigenous snowtrout in the Bhagirathi and Bhilangana Rivers are identified.**
- ⇒ In-depth studies was conducted on the breeding biology and reproductive environment of commercially important snowtrout sp. of different aquatic bio-tops.
- ⇒ **Low cost flow through hatchery and hatching boxes was designed for snowtrout seed production to ensure conservation in the wild.**
- ⇒ **Protocol for the Cryopreservation of Semen of Snowtrout sp. (*Schizothorax richardsonii* and *Schizothoracichthys progastus*) was developed**
- ⇒ **Gene sequences of 10 cold water fish species Submitted to NCBI GenBank USA (<http://www.ncbi.nlm.nih.gov/>).**