

CURRICULUM VITAE

GENERAL BACKGROUND

DR. GOUTAM KUMAR BANERJEE

BE (Civil, BE College, Shibpur); M.TECH (Env. Engg., IITKGP); PH. D (Civil Engg., IITKGP-self-guided)

PROFESSOR OF CIVIL ENGG. (ENVIRONMENTAL AND WATER RESOURCES DEVELOPMENT)

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PROFESSIONAL MEMBERSHIP: LMIPHE(I); LMASCE-IS; LMAIEM; LMIWWA, LMBRSI

Previous Affiliations: AIT, Bangkok (Visiting Professor); AIIH & PH (Gol), Kolkata (Assoc. Professor); IIT, Kharagpur (Assistant Professor); NIT-Durgapur (Lecturer); PH Engg. Dte. GoWB (Assistant Engr.)

Research Areas: WATER & WASTEWATER TREATMENT, WATER SUPPLY & SEWERAGE SYSTEM, INDUSTRIAL WASTE TREATMENT, HAZARDOUS SLUDGE MANAGEMENT, GROUNDWATER MANAGEMENT, EIA, WATER RESOURCES DEVELOPMENT & MANAGEMENT.

Research Publications:

A. Journals:

Year: 2010 – 2012

1. Adsorption of Methylene Blue using Green Peas Peels (Pisum Sativum): A Cost-Effective Option for Dye-Based Wastewater Treatment, G Banerjee Et al, Journal Biotech. & Bioprocess Engg., Springer & KSBB, 17:862-74; (*Impact Factor: 1.278*), 2012
2. Groundwater abstraction through river-bed collector well: a case study based on geophysical and hydrological investigation, G Banerjee, J. Clean Tech. & Env. Policy, Springer-Verlag, Germany, volume 14, issue 4 (*Impact Factor: 1.753*), 2012
3. Underground Pollution Travel From Leach Pits Of On-Site Sanitation Facilities: A Case Study, G Banerjee, J. Clean Tech. & Env. Policy, Springer-Verlag, Germany, Volume 13, Issue 3 (2011), Page 489-497 (*Impact Factor: 1.753 in 2011*)
4. Treatment of Arsenic-Laden Water Plant Sludge by Anaerobic Digestion, G banerjee; J. of Hazardous, Toxic, and Radioactive Waste Management, ASCE, Vol. 14, No.2
5. Sub-Surface Migration of Pollutants From Point Source, G Banerjee; Intl. Online J. of Water Resources & Protection (JWARP), Scientific Research Publication, USA; <http://www.scirp.org/Journal/jwarp>
6. Treatment of dying industry wastewater using activated carbon prepared from an agricultural by-product, G Banerjee et al; J. Our Earth, Vol.6:1.

Year: 2007-2009

1. Analysis of groundwater potential through pumping of river sub-surface bed: A case study on Kasai in West Bengal, G Banerjee; JIWWA, Vol.XXXI (2), Apr-June, 2009
2. Discarded Materials of Water and Sewage Treatment Plants as Low Cost Fluoride Adsorbents with a Special Reference to Bentonite, G Banerjee et al; Intl. Online J. of Water Quality Engineering, (ISSN : 1885-0719) 2009(1), pp. 01-16, Morpheus (UK) Association of Water Engineers (: <http://waterengineers.assocof.com>).

3. Adsorption of fluoride by Bio-adsorbent and its Hybrid products with Bentonite as reference adsorbent-a low cost approach to treatment of fluoride contaminated water, G. Banerjee et al; Intl. J. of water quality monitoring, Assoc. of water & Envir. Modeling, USA, 2009 .pp1-13.
4. Downflow-Upflow domestic filter model using low-cost adsorbent for fluoride removal – with assessment on geotechnical properties, G. Banerjee et al; Intl. J. of hydrologic experimentation (Assoc. Water & Environ-Modeling), Vol. I (1) [www.waterandenviromodeling.org].
5. Use of Bio-adsorbents blended with bentonite for defluoridation, G. Banerjee et al; Intl. J. of Water Engineering, Morpheus, U.K,vol-2009, issue1,pp17-28.
6. Reuse of Sludge of Sewage Treatment Plant(STP) as defluoridating adsorbents, G. Banerjee et al; Journal Of ASCE(India Section), Vol Nov 2008-July 2009 ,pp- 3.
7. Treatment of dyeing industry wastewater using activated carbon prepared from mutter peels, an agricultural by-product, G. Banerjee et al; Journal Environmental Pollution Control, New Delhi, Vol.12 (5), 2009, pp. 52-54.
8. Removal of dyes from aqueous solutions using non-conventional low cost adsorbents: A review, G. Banerjee et al; JIAEM, NEERI, 36(1), February Issue, 2009.
9. Reuse of sludge of water treatment plant (WTP) as defluoridating adsorbents, G. Banerjee et al; JIPHE, Vol. 2009-10, No.2, pp. 20-24.
10. Comparative study on various unconventional low-cost materials as defluoridating, G. Banerjee et al; International Online Journal of Engineering. New York, Article no.161, U.S.A. (www.enviro.phillica.com), 2009.
11. Performance of HRF as Pretreatment Unit before SSF against conventional Water treatment Systems, G. Banerjee et al; International Online Journal of Engineering. New York, Article no.133, U.S.A. (www.engi.phillica.com), 2008.
12. Performance evaluation of horizontal roughing filter, G. Banerjee, Mazumder, A., Mukhopadhyay, B. JIPHE, India, Vol.2007-08, No.1.

Some Major Earlier Publications:

1. Management of arsenic-laden water plant sludge by stabilization, G. Banerjee & R. Chakraborty; *Clean Technologies & Environmental Policy*, Vol.7(4). Springer, USA, 2005.
2. Pesticide (Acephate) removal in GAC : as case study, Dr. G. Banerjee & B. Kumar; *J. of Environ. Health, NEERI, India*, Vol. 44(2), 2002.
3. Fly ash removal in horizontal liquid-jet ejector scrubber: performance evaluation, G. Banerjee, *Ind. J. of Environ. Health*, Vol. 40, No. 3, pp 253-260, 1998.
4. Hydraulics of Bench - Scale Rotating Biological Contactor, G Banerjee, *J. Water Research (Impact Factor: 5.315)*, UK, Vol. 31, No. 10, 1997.
5. The role of salvinia rotundifolia in scavenging aquatic Pb (II) pollution: a case study, G. Banerjee & S. Sarkar, *J. bioprocess engineering, Germany*, Vol. 17, No. 5, 1997 **Impact Factor:1.3**.
6. Treatment of phenolic wastw water in RBC reactor, G Banerjee, *J. Water Research, (Impact Factor: 5.315) UK*, Vol. 31, No. 4, 1997.
7. Phenol - and thiocyanate based waste water treatment in RBC reactor, G Banerjee, *J. of Envir. Engg.*, Vol. 122(10), ASCE, USA, 1996.
8. Abatement of SO₂ from waste gas stream using horizontal co-current flow, G. Banerjee & Phani Kumar, *Journal of IAEM, Vol., 23(1), NEERI, Nagpur, India*, 1996.
9. Nomograms for hydraulic design of circular separate or combined sewers, G Banerjee & Gnanasegaran, *Journal of Institution of Engrs. (I), India*, Vol. 75, Feb, 1995.
10. Shallow well water and water borne diseases, G Banerjee et al, *Journal of Institution of Public Health Engineers (I), Vol. 2, Apr.-June, 1988*.

B. Publication in Conferences / Seminar / Symposia

Year: 2008-2012

1. Wastewater Treatment By Aquatic Plants In Pond System: Performance And Economy Evaluation in Indian Perspective, G Banerjee; Presented in Intl. Conf. on *Waste Management* 4 - 6 July, 2012 organized by WIT, New Forest, UK.

2. Removal of fluoride from water environment by adsorption using Water treatment plant (WTP) sludge, G Banerjee et al; Proc. Natl. Conf. Groundwater for Drinking: Issues and Options; Feb.11-13, 2011 Inst. Of Technology, BHU, Varanasi.
3. Arsenic Contamination in Ground Water: Technological Options for Removal, G Banerjee; Proc. Natl. Conf. Groundwater for Drinking: Issues and Options; Feb.11-13, 2011 Inst. Of Technology, BHU, Varanasi.
4. Role of geo-technical properties of non-conventional adsorbents in defluoridation, G Banerjee et al; 6ICEG 2010 Sixth International Congress on Environmental Geotechnics November 8 - 12, 2010, IIT, New Delhi, India.
5. Oil pollution control – an over view of Status & current practices, G Banerjee; MARTEC 2010 Accepted in International Conference on Marine Technology *Enhancing Shipbuilding through Research, Innovation and Collaboration* 11-12 December, 2010 Dhaka, Bangladesh Organised by Department of Naval Architecture and Marine Engineering (NAME), Bangladesh University of Engineering and Technology (BUET).
6. Removal of Methylene Blue from Aqueous solution through biosorption, R. Dod & G Banerjee; 5th Intl Conf. on Environmental Sc. & Tech., July 12-16, 2010, Org. by The American Academy of Science, Houston, USA
7. Role of Impregnated Bio-Adsorbent in Fluoride Removal with Impact Assessments for Its Geo-Technical Properties, G. Banerjee et al; Proc. INDO-ITALIAN Conference on Emerging Trends in Waste Management Technologies, organized by MIT Pune with The Embassy of Italy, New Delhi & Indian Association for Environment Management [NEERI], Nagpur during 3-4 Dec., 2009, Pune, India
8. Latest Trends In Municipal Solid Waste Management In Indian Perspective, G. Banerjee & Ramesh Dod; 1st International Conference on Solid Waste Management (IconSWM), Nov. 4-6, 2009, Jadavpur University, Kolkata, India
9. Environmental nanotechnology and its applications, G. Banerjee; Nanotech India 2009, Aug.14-16, 2009, Kochi, Kerala, India.
10. *Activated carbon from an agricultural by-product for the treatment of dying industry wastewater*, R. Dod, G Banerjee & DR Saini; National Conference on Recent Advances in Waste Management, February 20-21, 2009 IT-BHU.
11. *Invited talk on Application of Nano-particles in Water and Wastewater Treatment: An Overview*, G Banerjee; National Conference on Recent Advances in Waste Management, February 20-21, 2009 IT-BHU.
12. Removal of dyes from aqueous solutions using non conventional low cost adsorbents: A review, G Banerjee et al; Presented in IVth Intl. Conf. on Env. Sc. & Tech. (ICEST) 2008 organised by American Academy of Sciences at Houston, Texas, USA, July 28-31, 2008.
13. Treatment of arsenic-laden water plant sludge by anaerobic digestion, G Banerjee; Accepted in Intl. Conf. on Geo-Environment 2008 organised by WIT, Southampton, UK, June 16-18, 2008.
14. Healthcare waste management: critical issues and concerns in Indian context--with special reference to a case study for Kolkata (Key-note Lecture), G Banerjee; Indo-Italian Conf. on Green & Clean Environment (GCE) 2008, Organised by MIT College of Engg., Pune; March 20-21, 2008.

Year: 2003-2007

1. Downstream treatment of toxic water plant sludge by anaerobic digestion: An Indian case study, G Banerjee; International workshop on 'Arsenic sourcing and mobilization in Holocene deltas', Dec.12-13, 2007; Jadavpur University, Kolkata.
2. The need & potential of Rain water harvesting & Groundwater Recharging: An Indian Perspective, G Banerjee et al; February 4--5, ICCMWE 2005, Jadavpur University, Kolkata.
3. Horizontal coarse -slow sand filter application: a positive step towards conservation & utilization of traditional water sources in rural India, G Banerjee & B Bose; IWWA Conf., Ahmedabad, Jan.09-13, 2004.
4. The use of industrial-cum-municipal wastes in aquaculture & agriculture- An Indian perspective, G Banerjee; International Seminar on Reuse of wastewater through aquaculture & sanitation, Organised by International Centre of Ecological Engg., Kalyani University, Dec.11 -12, 2003.
5. The role of rain water harnessing in combating arsenic menace in West Bengal, G. Banerjee; Workshop organised by School of Fundamental Research, Dec., Kolkata.
6. Treatment of arsenic-laden water plant sludge by anaerobic digestion, G Banerjee & A Majumder; IPHE, Kolkata Conference, Dec.05, Kolkata.
7. Essence of Environmental Auditing in Production Sectors: A Case Study,. G Bannerjee & Mr. Pallab Chowdhuri; Intl. Conf. On Energy & Environment, ICEET 2003, October 8-10, 2003, Jaipur, India.
8. Assessment of relative toxicity of industrial effluents through bio-assay test, G. Banerjee & Mr. S. Chaudhuri; Presented in Intl. Conf. WATER POLLUTION 2003, Cadiz, Spain; June18-20, 2003.

Year: 1998-2002

1. Prospects of Rain water Harvesting in semi-arid areas: a case study, G. Banerjee & Shri A. Bajpeyi; Intl. Conf., WEDC, 18-20, November, 2002.
2. Prospects of Membrane-based desalination in semi-arid areas: A case study, G. Banerjee; *Kolkata Conf. On Desalination, CGCRI (CSIR), Jadavpur, Kolkata, Feb.15-16, 2002.*
3. Fly ash removal in horizontal liquid jet ejector scrubber performance evaluation, G Banerjee; *Presented in International conf. on AIR POLLUTION 2001, Wessex Institute of Tech., September 12-14, 2001, Ancona, Italy.*
4. EIA of water supply and sanitation project, G Banerjee; *National Conf. on Recent Advances in waste management, Feb 23-25, 2001, IT, BHU, Varanasi & IAEM, Nagpur*
5. Surveillance of water quality : need & potential with respect to Calcutta water supply system, G Banerjee; *Natl. seminal on water supply in Greater Calcutta : present & future project, School of Water Resources Engg., Jadavpur University, Calcutta, Feb. 05, 2000.*
6. Leachate management: present Scenario & Future Strategy wrt Dhapa LF Site of Calcutta, G Banerjee; *Natl. Conf. On Env. In Retrospect since Independence, Nov 26-27, 1999 Organized by Inst. Of Engrs. (I), Kolkata*
7. The role of salvinia rotundifolia in scavenging aquatic metal pollution: a case study, G Banerjee; *Presented in International Conf. On Environmental Management (ICEM), Wollongong Univ, Australia, February, 1998.*

Year: 1993-1997

1. Phenol shock on glucose biodegradation in anaerobic filter, G Banerjee; *Poster presentation in 8th Intl. Conf. on anaerobic biodegradation (AD-97), SENDAI, JAPAN, May 25-29, 1997.*
2. Kinetics of phenol removal in RBC reactor, G. Banerjee; *Proc. 3rd International Conf. on Appropriate Waste Management Technology for Developing Countries, NEERI, Nagpur (India), Feb. 1995.*
3. Treatment of industrial oily waste water by electrolytic demulsification, G Banerjee; *Proc. Seminar on Our Environment – Its challenges to Development Projects, organized by ASCE-IS, Calcutta, India, Sept. 9&10, 1994.*
4. Analysis of pump test data on Kasai River bed (WB) : A case study, G Banerjee et al; *Proc. International Conf. On Hydrology & Water research, New Delhi, Dec. 20-21, 1993.*

Year: 1985-1992

1. Solid waste management in developing countries – a case study, G Banerjee; *Proc. International Conf. On Solid waste management and secondary materials held at Philadelphia, USA in Dec., 1990 and accepted for publication in The Journal of Resources Management and Technology, USA.*
2. Bacterial degradation of coke – oven waste water, G Banerjee; *Proc. Seminar on Environmental Management held at Durgapur (India), Aug. 11-13, 1990.*
3. Low cost biological treatment for steel and fertilizer plants waste water, G Banerjee; *Proc. Seminar on impact of Industry on Environment, organized by Institute of Engrs (I) at Ranchi (India), June 5-6, 1987.*
4. Improvement of solid waste management in the Municipal Towns – a case study, G Banerjee; *Proc. National Convention of Environmental Engrs., Organized by Institute of Engrs. (I) at Nainital (India), April 6-8, 1987.*
5. Oxidation pond – an effective biological treatment process, G Banerjee; *Proc. Seminar on environmental pollution held at RE College. Durgapur (India), June, 1985.*

Research Guidance:

A. Doctoral: Year 1995 – 2012: 04 Nos.

1. Treatment of Phenol- and Thiocyanate-based wastewater in RBC Reactor, B. Gautam, IIT-KGP, 1995.
2. Performance Evaluation of roughing filters for Cost-Effective Rural Water Supply System, Mr.B. Mukherjee, Jadavpur University, 2008.
3. A Study on Removal of Fluoride From Water Environment By Low Cost Adsorbents, Mr. B. Bhattacharyya, Jadavpur University, 2010.
4. Removal of Dyes & Dye staff from water Environment by Novel Adsorbents, Ramesh Dod, Institute of Technology, BHU, 2011

B. Masters: Year 1988-2012: 37 Nos. (The details may be made available through email contact)

R & D and Consultative Projects:

A. R & D Projects

1. April, 2012 till date: **Water Supply & Sanitation Mission (WSSM), GoUP & MoRD (GoI) Monitoring & Management of Rural Water Supply Projects in UP as State Technical Agency**, About 25.77 lakhs.
2. 2003-05: **Rural Development Department, Govt. of Tripura (WHO sponsored)**, *Performance evaluation of Tripura Filter* Rs. 3.30 Lakhs.
3. 2001-02: **Ministry of Rural Dev., Govt. of India**, *Centre of excellence for fluorosis mitigation*; Rs. 12.05 Lakhs.
4. 1999-2000: **IDRC Canada**, *Water toxicity through Bioassay Test*; AIIH & PH, Kolkata, Rs. 8.0 Lakhs
5. 1998-2000: **Ministry of Non-conventional Energy Sources. Govt. of India**, *Development of designs suitable for processing of night soil mixed with garbage, agricultural residues, aquatic plants, etc. with special reference of pathogen survival & sanitary disposal of effluent*; Rs. 4.67 Lakhs, AIIH & PH, Kolkata.
6. 2000: **World Bank & Govt. of The Netherlands**, *Hydrology project on environmental pollution studies of surface and ground waters*, Rs. 2.0 Lakhs.
7. 2000: **Ministry of Rural Development, Govt. of India**, *Water Quality Surveillance: Manual preparation for implementation of community-based WQS in rural setting*, Rs. 6 Lakhs.
8. 1999-2000: **Indo-German (for GoWB)**, *Environmental Impact Assessment (EIA) Study of Bolpur & Raghunathpur water supply, sanitation & health education project*, Rs. 6.5 Lakhs.
9. 1999: **World Health Organization (WHO)**, *Healthy Cities Programme for urban civic bodies*, .Rs. 2.3 Lakhs.
10. 1997-1998: **World Bank**, *Preparatory Assignments on Capacity Building Project for Public Health*, Rs. 22 Millions (Proposed).
11. 1995-1998: **UNICEF**, *Study on an Integrated & Ecological Balanced Approach for Water Supply & Sanitation for the Improvement of Health, Hygiene & Environment of Rural Communities*, Rs. 59 Lakhs.
12. 1996-97: WB Pollution Control Board: *Hospital Solid Waste management*, Rs. 4.80 Lakhs.
13. 1988-1989: Ministry of Human Resource Development, Govt. of India *Infra-structural Development of Environmental Engg. Laboratory of IIT, Kharagpur*, Rs. 11 Lakhs

B. Consultative

1. 2012 till date: **UP JAL NIGAM**, *Monitoring of Sewerage works in the City of Allahabad under JNNURM & NGRBA.*
2. 2011: **UP Jal Nigam**, *Feasibility Study of Construction of Sewage Treatment Plant at Allahabad, UP*
3. 2009: *Heritage Hospital Complex Hydrological studies for proposed Heritage Hospital Complex, Mohan Sarai, Varanasi.*
4. 2007-08: **UP Jal Nigam**, *Upgradation of Existing Water Treatment Plant, Jaunpur, UP.*
5. 2007-08: **Planner India Pvt. Ltd.**, *Varanasi Technical design of storm drainage system for Varanasi under JNURM, Gol.*
6. 2006-07: **UP Jal Nigam, Allahabad Project (GPC) , Go UP**, *Process Design & Hydraulic Diagram for 29 MLD Sewage Treatment Plant at Salori Nala, Allahabad, UP.*
7. 2005: **M/s S Singh Pvt. Ltd., Varanasi**, *Design of 2.1 MLD Water Treatment Plant.*
8. 2000-2004: **Ministry of Rly., Govt. of India**, *Pollution control of integrated railway coach cleaning complex at Santragachi (WB).*
9. 1992-93: **P.H. Engg. Dte., GoWB**, *Design & Execution of Radial collector well on River Kasai, Midnapur (Phase I).*
10. 1995-95: **P.H. Engg. Dte., GoWB**, *Design & Execution of Radial collector well on River Kasai, Midnapur (Phase II).*
11. 1997: **M/s Emico Steel Pvt. Ltd.**, *Environmental Pollution Control Measures for Small Steel Plants.*
12. 1998: **Polution Control Board, GoWB**, *Monitoring of Air Quality Management of Foundry Shop, Howrah under Directives of Hon'ble High Court, Calcutta.*
13. 1995-1996: **Ministry of Defence, Gol**, *Design of Jack well at Bagdogra, West Bengal.*
14. 1997: **Stoop Consultants Ltd.**, *Water hammer & its mitigation in Manipur water supply scheme.*
15. 1995-1996: **Biji Consultants Pvt.Ltd.** for **Telco, Jamshedpur**, *Design of Treatment for Automobile Works Effluent at Jamshedpur.*
16. 1999: **Stoop Consultants Ltd.**, *Dispersion of wastewater at sea outfall*
17. 1991: **M/s Emami Paper Mills Ltd., Balasore, Orissa**, *Improvement of existing ETP for Emami Paper Mills Ltd., Balasore, Orissa. &*
18. *Testing & Analyses of Water, Wastewater, Industrial Effluents, Soil, Air, and Food Samples of several Organizations.*

Distinguished Positions

- i) *Visiting Professor, AIT, Bangkok, from Jan-May, 2010 under faculty secondment programme of MHRD, Govt. of India.*
- ii) *Editorial Board Member of International Journal and National Journal of Civil, Structural, Environmental and Infrastructure Engineering Research and Development (IJCSEIERD & IJCSEIERD)*
- iii) *Editorial Board Member of International Journal of Civil Engg. and Architecture, Science & Engg. Publishing Co., Indiana, USA (<http://www.ij-cea.org>).*
- iv) *Editorial Board Member of International Journal of Civil Engineering (IJCE) [<http://www.iaset.us/journals.php?type=2&id=11&details=editors>]; International Academy of Science, Engineering and Technology (IASET)*
- v) *Expert Member of Qatar National Research Fund, Doha, Qatar.*
- vi) *Regular Reviewer of International, J ASCE (Hazardous, Toxic, and Radioactive Waste Management) , USA; J Hazardou Materials, USA; Journal of Water Research, UK; J. Biodegradation, Springer, Germany; J. CTEP, Springer-Verlag, USA; Intl. J. of Env. Sc. & Tech., Springer, USA; JSIR (CSIR), India, etc.*
- vii) *Members of selection committee of IIT, MHRD, UPSC, NITs., PSCs, etc.*
- viii) *Expert Member of NBA of AICTE*
- ix) *Technical Expert Member appointed by Honourable High Court, Allahabad on Monitoring of Ongoing Sewerage Works at Allahabad.*
- x) *Ph.D Examiner of IITs, NITs, etc.*
- xi) *Coordinator, Refresher Courses, Ministry of Urban Dev., Govt. of India*
- xii) *Coordinator, State Technical Agency, Department of Drinking Water Supply, MoRD, Gol*

- xiii) *Ex-Adviser to Human Resources Wing, American Centre, Kolkata.*
- xiv) *Ex-Adviser to School of Water Resources Engg., Jadavpur University, Kolkata.*
- xv) *Formerly Industrial Pollution Control Expert of Pollution Control Board, West Bengal.*
- xvi) *Ex-Adviser to Govt. of Tripura (Department of Rural Development)*
- xvii) *Panel Member of Bureau of Indian Standards (BIS), Govt. of India, CHD32 & CED 24 & 12*
- xviii) *Member of task force of GWP-South Asia*
- xix) *Member of Academic Advisory Committee, IEC College of Engg. Tech., Greater Noida, UP*

Refresher Courses organized at various places:

1. "Recent Developments in Water Treatment Technologies" at BHU, Dec.11-20, 2006 & Dec.10-15, 2007
2. "Recent Development in water treatment technology, MUD, GOI, Dec.11-20, 2006 onwards at BHU, Varanasi
3. "Operation & Maintenance of water supply & Sanitation Projects" (September, 2002), Kumarghat, North Tripura.
4. "Ground Water Management" (May, 2002), Guwahati, Assam
5. "Water Supply & Sanitation in Hilly Areas" (November, 2001), Imphal, Guahati, Assam.
6. "Upgradation of traditional surface water sources" (June, 2001) at Guwahati. Govt. of Assam.
7. "Rain water harvesting " (November, 2000) at Itanagar, Arunachal Pradesh.
8. "Technology options for rural sanitation" (May, 2000) at Bhubaneswar, Orissa.
9. "Technology options for rural sanitation" (Feb, 2000) at Itanagar, Arunachal Pradesh.
10. "Technology options for rural sanitation" (Dec, 1999) at Imphal, Manipur.
11. "Water Quality Surveillance" (March, 1999) at Bhubaneswar, Orissa.
12. "Iron Removal Plant: Design, Operation, & Maintenance" (May, 1999), Orissa.
13. "Water Quality Surveillance" (May, 1998), at Shillong, Meghalaya.
14. "Gravity Feed Water Supply System in Hilly Areas" , at Shillong, Meghalaya.
15. "Water Supply & Sanitation in Hilly Areas (May, 1997) at Kohima, Nagaland.
16. "New development in water treatment technology" (10-day long) at AIIH & PH, Kolkata.
17. "Low-cost sanitation" (7-day long) at AIIH & PH, Kolkata.
18. "Waste stabilisation pond practices" (7-day long) at AIIH & PH, Kolkata.
19. "operation & Maintenance of water supply system" (7-day long) at AIIH & PH, Kolkata.
20. "Solid waste management " (7-day long) at AIIH & PH, Kolkata.
21. "Water analysis " (4-week long) at AIIH & PH, Kolkata.
22. "Wastewater analysis" (4-week long) at AIIH & PH, Kolkata.

Courses Developed / Tailored:

- 1) Water Supply and Treatment System
- 2) Sewerage and Wastewater Treatment Engineering
- 3) Design of Water and Wastewater Treatment Facilities
- 4) Industrial Waste Management
- 5) Air Pollution Control Engg.
- 6) Environmental Impact Assessment & Auditing
- 7) Environmental Hydraulics
- 8) Solid & Hazardous Waste Management
- 9) Ground Water Resources Development & Management

