

Centre for Environmental Science and Engineering

(Annual Report 2012-2013)

Introduction and an Overview of the Centre

The Centre for Environmental Science and Engineering (CESE) was established in 1985. The Centre has a core group of 9 faculty members (8 regular and 1 emeritus) with multi-disciplinary background and diversifying research interests. In addition to the above 9 faculty members, two visiting faculty also joined CESE. Apart from this, the professionals from consultancies and government organizations come for delivering the lectures time to time. Currently, the centre is expanding teaching and research activities and has started a new dual degree M.Sc. – Ph.D. programme since July 2010 in addition to already existing M. Tech. and Ph.D. programmes. In addition to these three programmes, the centre is running a minor in Environmental Science and Engineering for undergraduates studying in other departments at IIT Bombay. In near future, a dual degree B. Tech.- M. Tech. programme will also be started. In addition to the above listed programmes, CESE offers an Institute core course “Environmental Studies: Science and Engineering” to undergraduates and M. Sc. – Ph. D. students. Besides, the centre runs several elective courses for sensitizing students across all disciplines towards the urgent need for protection and restoration of environment by adapting environment friendly life styles.

The on-going research activities of the Centre are focused towards addressing the priority areas (local and global) set by major national agencies like MHRD, CPCB, SPCB, MNRE, DBT, MoEF, CSIR, DST, AICTE. In addition, the Centre has already established strong links and collaborations with leading industries, academic institutions and national/international agencies by conducting sponsored research and offering consultancy and technical services. The research activities of CESE are supported by excellent experimental and computational facilities, competent and dedicated technical staff and high quality students. The centre is also actively engaged in organizing workshops and CEP courses for benefiting the professional from other academic institutions, industries and governmental sectors.

Academic Programmes

CESE currently offers M. Tech., Ph. D. and M.Sc.-Ph. D. programmes in Environmental Science and Engineering with a strong focus in teaching and research.

Degrees Awarded last year	
M. Tech.	: 15
Ph. D.	: 2

Scholarships: Information is provided in the table given below.

Category	Number of Students Admitted Under Each Programme in 2012		
	<u>M. Tech</u>	<u>Ph.D</u>	<u>M.Sc.-Ph.D.</u>
Institute Teaching Assistance (TA)	21	6	6
External sponsored College Teacher (CT) Industry	-	-	-
Project sponsored (PS)	-	-	-
UGC/CSIR/DBT / QIP/CPHEO fellowship holders	-	1	-

R&D Activities

Two new projects have been awarded in 2012-2013. The details of the projects are given below.

Sponsored Research Projects

Sponsored Research Projects:

New : 3
Ongoing : 10
Completed : 4
Faculty Involved : 8

New Projects

“Improvement in Biodegradability of Cresylic Spent Caustic Waste Stream (Generated From Petroleum Refinery) Using Catalytic Wet Oxidation in Combination with Adsorption Process” by CSIR, New Delhi

“Evaluation of Trophic State of Lakes in Thane City” by Thane Municipal Corporation.

“Funding for Research Collaboration”, by Washington University in St. Louis

Ongoing Projects

“Characterization and Treatment of Wastewater from Large /Small Scale Biomass Gasification Systems” by IIT Bombay, under ACCESS Scheme

“Biological Treatment of Biomass Gasifier Wastewater Using Algal-Bacterial System in Rotating Biological Contactor” by DBT, New Delhi

“Environmental Quality and Pollution: Ganga River Basin Management Plan” by MoEF, New Delhi

“Preventive Technological Interventions for Improving Environmental Attributes of Ship Recycling in Alang” *i.e. Green Alang Initiative* by Gujarat Maritime Board, Govt. of Gujarat, Gandhinagar

“Enhancement of natural water systems and treatment methods for safe and sustainable water supply in India” by European Commission, Brussels, Belgium

“Multivariate Flood Frequency Analysis: Nonparametric Approach” by Department of Science and Technology, Govt. of India, New Delhi

“Continuous Arsenic Removal Using Zero-valent Iron Filter (ARUZIF) from Drinking Water” by Department of Science & Technology

“Design and Development of Vacuum Pyrolysis Plant to Process Various Agricultural and Agro-Industrial Biomass to Demonstrate Its Technical and Economical Feasibility” by Ministry of New and Renewable Energy

“Sustainable Technology for Removal of Arsenic from drinking water: Principles and performance of Electrocoagulation” by MCDONNELL Academy, St. Louis, USA.

“Development of continuous mode arsenic removal technology for drinking water based on indigenous zerovalent iron” by Department of Science & Technology.

Completed Projects

“Climate Change Research: Atmospheric Aerosol Characterization using Multi-Sensor Data from Satellite and Ground Observations” by Lloyd Register Engineering Education and Research Trust

“Wastewater Minimization in Batch Plants Through On-Site Treatment, Reuse and Recycle Processes” by DST, New Delhi.

“Energy Recovery Options From Municipal Solid Waste and Control/Treatment Measures of Carbon Emissions From Landfills” by DST, New Delhi.

“Simultaneous Nitrification/ Denitrification of Fertilizer Wastewater Using Sequencing Batch Bioreactor with Mixed Biomass Containing *Thiosphaera Pantotropha*” by DBT, New Delhi.

Consultancy Projects :

A total of on consultancy jobs were undertaken by 3 faculty members. Total income generated from consultancy work was Rs. 11338371/-..

Patents

“Site Remediation Technology” (Remediation Technology for Soils, Sediments and Aquifers Solids at Sites Contaminated by Oil Spills or Hazardous Wastes)
Authors: Shyam R. Asolekar and IIT Bombay
US, European and Indian Patent Applications (In progress)

Extension Activities

Dikshit, A.K.

Chief Guest for Civil Engineering Forum at Bapuji Institute of Engineering and Technology, Davangere, September 2, 2012.

Chief Guest for Institute Welcome Function for Fresh UG Students at Bapuji Institute of Engineering and Technology, Davangere, September 3, 2012.

Chief Guest for the National Seminar on “Bioseparation and Downstream Processing” at Thadomal Shahani Engineering College, Bandra, Mumbai, October 23, 2012.

Distillery Wastewater Management at Continuing Education Programme on Industrial Wastewater Management organized by CESE, IIT Bombay on April 24, 2012.

Asolekar, S.R.

1st meeting of “Powai Lake Rejuvenation Committee” set-up by the MCGM and IIT Bombay held on 25th March, 2013 in Victor Menezes Convention Centre (VMCC), IIT Bombay.

Member of “Syllabus Review Committee” of Civil and Environmental Engineering Department, IIT Patna”

“World Environment Day Celebration and Book Release” Function held on 5th June, 2012 in Jal Vihar, Ground Floor Conference Hall, Indian Institute of Technology Bombay

Garg, A., Mukherji, S.

Training programme on “Industrial Wastewater Management” 24-25 April, 2012, CESE , IIT Bombay.

Karmakar, S.

CEP and QIP course titled as: “Advanced Hydrologic Modeling for Climate Change Impacts Assessment” (18 – 22 February 2013), venue – IIT Bombay, Conveners: Subhankar Karmakar (CESE) and Subimal Ghosh (Civil Engg.)

Patil, R.S.

SERB School on Air Quality Management, IIT Bombay, Dec. 6-7, 2012, Sponsored by DST, GOI, Coordinator, V. Sethi and Co-Coordinator R.S. Patil.

Workshop on Air Quality Modelling and Management for Urban and Industrial Areas in India, IIT Bombay, May 10-12, 2012, Coordinator V. Sethi and Co-Coordinator R.S. Patil.

Visitors to the Department

Prof. Yoram Krozer, University Twente – CSTM in Enschede and Sustainable Innovations Academy (SIA) in Amsterdam, Netherlands has visited CESE to deliver a set of lectures on "Toward Sustainable Innovations" during 25th Feb, 2013 and 1st March, 2013 in CESE Seminar hall.

Conferences/ Symposia/ Workshops/ Seminars (Participated/Papers Presented)

National

Dikshit, A.K.

Delivered keynote on "Membrane Filtration and Wastewater Treatment" in the National Seminar on "Bioseparation and Downstream Processing" organised by Thadomal Shahani Engineering College, Bandra, Mumbai, October 23, 2012.

Asolekar S.R.

Workshop on "Coastal, River Zone Management, Regulations and Development" held on 10th and 11th Jan, 2013 in Victor Menezes Convention Centre (VMCC), IIT Bombay; jointly organized by CESE, IIT Bombay, NEERI's Mumbai Zonal Centre and Mahad Manufacturers' Association.

Asolekar S.R.

Workshop on "Sustainable Innovations, Eco-efficiency in Business Decisions, Greening of Supply Chain and CSR" held on 27th Feb, 2013 in CESE, IIT Bombay.

Mukherji S.,

Presented a paper "Water Disinfection using Free and Immobilized Silver Nanoparticles and Elucidation of Mechanism of Antibacterial Activity" Workshop on "Nanoparticles: Chemistry & Toxicity" held during March 15, 2013, IIT Delhi, New Delhi, India.

Yadav, B.R., Garg, A.

The student presented a paper "Ferulic Acid Degradation by Wet Oxidation Process" in the International Conference on *Global scenario in environment and energy (ICGSEE 2013)* held on 14-16 March 2013, MANIT Bhopal, Bhopal.

Gupta, A., Garg, A.

The student presented a paper "Utilization of Sewage Sludge Derived Adsorbent in Wastewater Treatment" in International Conference on *Advances in Chemical Engineering (ACE 2013)* held on 22-24 February 2013, IIT Roorkee, Roorkee.

Garg, A.

Delivered invited talk on "Sustainable Water Management in Industries" in Indo-French Seminar on *Recent Advances and Innovations for Sustainable Water Management* held on 3 – 6 December 2012 at IIT Delhi, Delhi.

Garg, A.

Delivered invited talk on "Mechanical Biological Treatment for MSW," *1st International Brainstorming Workshop on Waste to Energy in India* held on 25 – 25 August, 2012, Mumbai

Deodhar, N.M., Patil R.S., Sethi V.

Participated in the National Conference on ACRECONF held on 5-6 Feb., 2013 at ISHRAE, New Delhi.

Bherwani, H.B., Patil, R.S., Kumar R.

Participated in the 2nd Nat. Conf. on Environment and Biodiversity (EBI) in India, 29-30 Dec., 2012, New Delhi.

Adsul P., Patil R.S., Kumar R.

Participated in 2nd Nat. Conf. on Environment and Biodiversity (FBI) in India, 29-30 Dec., 2012, New Delhi.

Deodhar, N.M., Patil, R.S., Sethi V.

Participated in 8th National Conference ACR Trendz, 5-6 Oct., 2012, ISHRAE Pune

International

Asolekar, S.R.

Invited by UN CEO Water Mandate to speak at the CEO Water Mandate's Multi-Stakeholder Working International Conference on "Corporate Water Stewardship and the Post-2015 Development Agenda" during 5th and 7th March, 2013 in Mumbai.

Asolekar, S.R.

Invited by Central Advisory Board-WaterEX World Expo 2013, Mumbai, to speak on the topic "Managing Ganga and Other Water Bodies" at the "International Exhibition and Conference Waterex World Expo 2013" held during 15th and 18th January, 2013 in Bombay Convention and Exhibition Centre, Goregoan (east), Mumbai

Asolekar, S.R.

Invited by Naushad Ali Sarovar Samvardhini (NASS) to speak on the topic "Principles of Preventive Environmental Management for Aquatic System" at the "International Conference on "Urban Lakes, Ecology, Rejuvenation and Technology and Economics" held in the Shipping Corporation of India, Powai, Mumbai during 7th and 8th September, 2012.

Madav, V., Bhusnoor, S.S., Bhandarkar, U.V., Sethi V.

"Hot Gas clean up studies in a small scale low temperature down draft Gasifier", Paper published in conference proceedings of 5th International Freiberg conference on "IGCC & XtL Technologies", Leipzig, Germany 21- 24, May 2012.

Sharma, R., Deodhar, N.M., Patil, R.S., Sethi, V.

"Ventilation Design for Indoor Air Quality Management as per Indian Climatic Conditions" 10th International Conference, 8-12 July 2012, ISIAQ, Brisbane

Menon R., Sethi V., Husar, R.B.

An iterative fitting algorithm for matching aerosol size distributions to spectral extinction data", Visibility and Air pollution, Air & Waste Management Association, Whitefish, MT, 24-28, September, 2012.

Menon, R., Sethi, V., Husar, R.B.

“Multi-sensor view of atmospheric aerosol patterns over India”, Poster presented at McDonnell International Scholars Academy 4th International Symposium on Energy & Environment: ACCESS (Abundant Clean Cost-effective Energy Systems for Sustainability) held in Mumbai, during 9 - 12, December, 2012.

Husar, R.B., Hoijarvi, K., Westphal, D., Scheffe, R., Keating, T., Poirot, R., DuBois, D.W., Bleiweiss, M.P., Eberhard, W.L., Menon, R., Sethi, V., Deshpande, A.

"Applications of satellite observations to aerosol analyses and forecasting using NAAPS model and the DataFed distributed data system", Fall meeting, American Geophysical Union, San Francisco, 3-7, December, 2012.

Agnihotri, S., Mukherji, S., Mukherji, S.

Presented a paper “Antimicrobial Activity of Silver Nanoparticles Immobilized on a Surface Functionalized SU-8 Polymer”, *3rd International Conference on Multifunctional Hybrid and Nanomaterials*, held during March 3-7, 2013, at Sorrento, Italy.

Mukherji, S., Chavan, A., Jeswani, H.

Presented a paper “Algal Bacterial Biofilm in Rotating Biological Contactor for Removal of Organic Contaminants from Wastewater: Advantages and Challenges” *International Conference on Algal Biorefinery: A Potential Source of Food, Feed, Biochemicals, Biofuels and Biofertilizers (ICAB 2012)*, held during Jan 10-12, 2013 at IIT Kharagpur, Kharagpur, India.

Kargupta, W., Ganesh, A., Mukherji, S.

Presented a paper “Assessment of Carbon Sequestration Potential of Microalgae, *Chlorella pyrenoidosa* and *Scenedesmus abundans* in a Tubular Batch Photobioreactor and Effect of Gas Flow Rate” *International Conference on Algal Biorefinery: A Potential Source of Food, Feed, Biochemicals, Biofuels and Biofertilizers (ICAB 2012)*, held during Jan 10-12, 2013 at IIT Kharagpur, Kharagpur, India.

Mukherji, S., Sethi, V. Mahajani, S., Giammar D., Fortner, J.

Presented a paper “Characterization and Treatment of Wastewater from Large/Small Scale Biomass Gasification Systems” *4th International Symposium on Energy and Environment: Abundant, Clean, Cost Effective Energy Systems for Sustainability*, held during Dec 9-12, 2012 at Mumbai, India.

Madhav, V., Panchratna, D. Jeswani, H., Sethi, V., Mahajani, S., Giammar D., Fortner, J., Mukherji, S.

Presented a paper “Gas Cleaning and Wastewater Treatment for Small Scale Gasification Systems” *4th International Symposium on Energy and Environment: Abundant, Clean, Cost Effective Energy Systems for Sustainability*, held during Dec 9-12, 2012 at Mumbai, India.

Mukherji, S.

Presented a paper “Advances in Bio-Transformative Processes and Toxicity Evaluation Techniques for Complex Organic Pollutants”, *Second International Conference on “Drilling Technology 2012 (ICDT-2012)” and First National Symposium on “Petroleum Science and Engineering 2012 (NSPSE-2012)”* held during Dec 6-8, 2012, at Department of Ocean Engineering, IIT Madras, Chennai, India.

Agnihotri, S., Mukherji, S., Mukherji, S.

Presented a paper “Development of Nanoparticle based Systems for Disinfection of Water” 3rd MRS Trilateral Workshop on Nanotechnology Applications in Energy, Water and Healthcare, held during Nov 19-21, 2012 at IIT Bombay, Mumbai, India.

Mukherji, S., Mohanty, S.

Presented a paper “Bioavailability Enhancement During Uptake of Multicomponent Non-Aqueous Phase Liquids in Presence of Rhamnolipids” SETAC-Asia Pacific 2012 “Learning from History and Applying Advancing Science to Build a Safer and Sustainable Environment” held during September 24-27, 2012, at Kumamoto, Japan.

Jasmine, J., Mukherji, S.

Presented a paper “Characterization of Oily Sludge from an Oil Refinery in India and Biodegradability Assessment” SETAC-Asia Pacific 2012 “Learning from History and Applying Advancing Science to Build a Safer and Sustainable Environment” held during September 24-27, 2012, at Kumamoto, Japan.

Jeswani, H., Mukherji, S.

Presented a paper “Treatment of simulated biomass gasification wastewater using an Algal-Bacterial System” *Ecotechnologies for Wastewater Treatment*, held during June 25-27, 2012, Santiago de Compostela, Spain.

Singhal, D., Garg, A.

Presented a paper “Prediction of Environmental Impacts from Using Municipal Solid Waste Derived Material as Co-fuel in Cement Kiln” in *The Twenty-Eighth International Conference on Solid Waste Technology and Management* held on 10-13 March 2013, Philadelphia, PA, USA.

Phatak, P., Gupta, S.K., Garg, A., Mukherji, S.

The student presented a paper “Impact of Cycle Time on Nitrogen Removal in SBR for Simulated Fertilizer Industry Wastewater” in *Nutrient Removal and Recovery 2012: Trends in NRR* organized by IWA, UK held on 23-25 September 2012 in Harbin, China.

Adekola, O., Stamp, J. D., Majozi, T., Garg, A., Bandyopadhyay, S.

One of the co-authors presented the paper “A Unified Approach for the Optimization of Energy and Water in Multipurpose Batch Plants” in the *11th International Symposium on Process Systems Engineering* held on 15-19 July 2012, Singapore.

Bherwani, H.B., Patil, R.S., Kumar R.

Participated in International Conference on Bioenergy, Environment and Sustainable Technologies (BEST), Thiruvannamalai : 27-30th Jan, 2013;

Sharma, R., Deodhar, N.M., Patil R.S., Sethi V.

Participated in 10th International Healthy Buildings Conference 2012, Brisbane 8-12 July 2012.

Conferences/ Symposia/ Workshops/ Seminars (Coordinated/Chaired by Faculty)

Dikshit, A.K.

Chairman for Awareness Initiative on Energy, Environment and Ecology (AIEEE 2013) organized by Environmental Science and Engineering Association, IIT Bombay, March 16, 2013.

Coordinator for the Technical session on the Energy-Water Nexus in the MAGEEP2012 4th International Symposium on Energy and Environment held at Bombay, December 9-12, 2012.

Invited Lectures

National

Dikshit, A.K.

Delivered keynote on “We Civil Engineers Build the Society” at Bapuji Institute of Engineering and Technology, Davangere, September 2, 2012.

Asolekar S.R.

Invited by Centre for Science and Environment (CSE) to speak on the topic "Wastewater Treatment and Reuse / Recycle - Challenges and Opportunities in Urban Areas" at the Rajasthan State Workshop jointly organized in partnership with Department of Urban Development, RUIFDCO and HMC RIPA and supported Ministry of Urban Development, Govt. of India under CCBP JnNURM programme on "Urban Water conservation and reuse and recycle" held in Jaipur on 7th February, 2013

Invited by MNIT Jaipur to deliver keynote address at the “National Conference on Water Quality Management ” on "Principles of Environmental and Ecological Systems Management in the Context of Continuum and Discontinuities" during 20th and 22nd December, 2012 in Jaipur.

Invited by Lucknow Management Institute to deliver keynote speak on "Water Crisis: What is in it for a Common Person" at SN Tripathi Memorial Lectures 2012 on "Climate Change, Water & Energy Crisis” held in Indian Railways Institute for Transport Management on " on 23rd August, 2012 in Lucknow.

Mukherji, S.

“Application of Microorganisms for Wastewater Treatment and Remediation” “Shodh - Inter Disciplinary Research Weekend” organized by Society for Promotion of Undergraduate Research (SPUR), held during November 3 - 4 Nov, 2012 at IIT Bombay, Mumbai India,

Karmakar, S.

Invited presentation in a Brain-storming session on Downscaling and Impact Assessment for River-basin Scale Studies, “Vulnerability, Hazard and Risk to Extremes,” Indian National Committee on Climate Change (INCCC), Ministry of Water Resources (MoWR), New Delhi, October 19, 2012.

Invited presentation in one-day workshop on *Building climate resilient cities: responding to the emerging water crisis*, “Risk management, floods and climate change,” Monash Sustainability Institute and TERI, New Delhi, January 30, 2013.

International

Asolekar, S.R.

Invited to speak in the 7th Ship Recycling Conference on "Greening of ship recycling in India: Upgrading facilities in Alang" during 19th and 20th June, 2012 in London, UK.

Invited to speak in the "4th Asia Ship Recycling and SNP Summit" held on "Green Ship Recycling" during 3rd and 4th July, 2012 in Shanghai, China.

Invited by World Maritime University (WMU) of International Maritime Organization (IMO), the member institution of the United Nations (UNO) to be a member of scientific committee and to deliver the keynote address at the "International Conference entitled: Ship Recycling" (SHIPREC-2013) on "The role, actions and Projects of the NGOs in Ship Recycling" during 7th and 9th April, 2013 in Malmo, Sweden.

Garg, A.

"Environmental Regulations in India – An Overview of Principles and Future Demands," *Scottish Contaminated Land Forum Meeting*, University of Strathclyde, Glasgow, UK, June 6, 2012.

Significant Awards/ Distinctions

Awards:

Dikshit, A.K.

Excellence in PhD Research Award to PhD student Sanjay S. Singh guided by Dikshit A.K.

Asolekar, S.R.

The best paper award for the paper "Towards Green Ship Dismantling: Scientific Assessment of Health, Safety and Environment Agenda" authored by Deshpande, P. C., Hiremath, A. M., Kalbar, P. P. and Asolekar, S. R. and presented by P. C. Deshpande at the International Conference on Ship Recycling SHIPREC2013 – in Malmö, Sweden, during 7th and 9th April, 2013.

Mukherji, S.

"IIT Bombay Research Paper Award," IRCC, IIT Bombay, September, 2012.

Member, Editorial Board for International Journal "Applied Nanoscience".

Distinctions:

Dikshit, A.K.

Member, Editorial Advisory Board, Journal of Environmental Science and Engineering, (Publishers: NEERI, Nagpur, India)

Member, Editorial Board, Journal of Environmental Science and Health, Part A (Publishers: Taylor and Francis Group)

Member, Editorial Board, Journal of Clean Technology and Environmental Policy (Publishers: Springer Verlag)

Garg, A.

Member, Advisory committee, An International Conference “Chemical, Biological and Environmental Sciences” held on 8 – 10 January 2013, Taipei, China.

Member, Organizing committee, Ist International Brainstorming Workshop on “Waste to Energy in India” held on 24 - 25 August 2012, Mumbai, India.

Honorary Work**Dikshit, A.K.**

Reviewed papers for Journal of Environmental Engineering (ASCE); Bioresource Technology; Journal of Clean Technology and Environmental Policy; Waste Management; Environmental Modelling & Software; Journal of Environmental Engineering Science; Waste Management and Research; Water Science and Technology during April 2012-March 2013.

Delivered talk on Sustainable Water Management for Industries at Training Course on Rain Water Harvesting & Storm Water Management course for ONGC engineers organised by civil Engineering Department, IIT Bombay on April 4, 2012.

Member, Advisory Committee for Bio-Medical Rules, Govt. of Maharashtra since 2009

Member, Academic Advisory Committee, Nirma University, Ahmedabad since 2010.

Member, Selection Committee for Director of Regional Centre for Urban Development, Lucknow University.

Member, Selection Committee for Scientists, CSIR, NCL Pune.

Visitor’s Nominee for Faculty Selection, Jawaharlal Nehru University, New Delhi, 2012-2015.

Member, Sub-Committee for ‘Development of National Sustainable Habitat Parameters in the field of Storm Water Management’ constituted by the Carbon Credit Cell of the Ministry of Urban Development, Govt. of India since 2010.

Honorary Professor in the School of Civil Engineering, Faculty of Engineering, University of KwaZulu-Natal, Durban, South Africa.

Invited External Member to the Senate of the NIT Jamshedpur (Jharkhand).

Invitee Member on the Academic Board of the Government College of Engineering, Amravati (Maharashtra).

Asolekar, S.R.

Member of the Technical Expert Panel (TEP) for the World Bank aided “Capacity Building for Industrial Pollution Management Project (CBIPMP)”.

Member of “Project Review and Supervisory Group” Constituted by Ministry of HRD and Government of India for Establishing “E-Training Environment for Training Technical Teachers and Students”.

Member of the “Dahanu Taluka Environmental Protection Authority” (since 1997) constituted by the Honorable Supreme Court of India.

Member of “Steering Committee on Environment, Forests & Wildlife” for the 12th Five Year Plan constituted by the Honorable Planning Commission of India (2012-2017).

Member of “Expert Committee” formed for “Evaluation of Non Combustion Technologies Suitable for our Country for Remediation of Poly-Chlorinated Bi-Phenyls” under the Post National Implementation Project Sponsored by GEF and UNIDCO.

Mukherji, S.

Reviewed a paper for National Journal “Indian Journal of Biotechnology”, April, 2012.

Reviewed a paper for International Conference “International Conference on Metallurgical Coatings and Thin Films”, August, 2012.

Reviewed paper for International Journal, “Journal of Food Science & Technology”, July, 2012.

Reviewed papers for International Journal, “Journal of Hazardous Materials”, July, 2012 Aug 2012 and March, 2013.

Reviewed paper for International Journal, “Applied Biochemistry and Biotechnology”, September, 2012.

Reviewed paper for International Journal, “Reviews in Environmental Science and Biotechnology”, October, 2012.

Reviewed paper for International Journal, “Environmental Science and Technology”, October, 2012.

Karmakar, S.

Reviewed a paper Journal of Indian Society of Hydraulics, May 2012

Reviewed paper for Journal of Environmental Management, Elsevier, June 2012

Reviewed paper for Journal of Environmental Management, Elsevier, September 2012

Reviewed paper for Indian Journal of Geo-Marine Sciences, CSIR-NISCAIR, September 2012

Reviewed paper for Water Resources Research, AGU, September 2012

Reviewed paper for Water Resources Research, AGU, November 2012

Reviewed paper for Computing in Civil Engg., ASCE, December 2012

Reviewed paper for Hydrology Research, February 2013

Member, Editorial Advisory Board, Journal of Disaster Advances, India.

Garg, A.

Reviewed paper for Indian Journal of Chemistry, September 2012.

Reviewed paper for Journal of Environmental Management, December 2012.

Reviewed paper for International Journal of Environment and Waste Management, December 2012.

Reviewed paper for Asian Journal of Water, Environment and Pollution, March 2013.

Reviewed two project proposals submitted to Knowledge Foundation, Sweden in October 2012.

Reviewed a project proposal submitted to DST, New Delhi in October 2012.

Evaluated Ph.D. thesis submitted to Gauhati University, Gauhati University, Guwahati in April 2012.

Evaluated M. Tech. (Research) thesis submitted to National Institute of Technology Rourkela in April 2012.

Patil, R.S.

Member, Atmospheric and Space Science Board of Studies Committee, Pune University 19th April, 2012 for two years.

Member, Scientific Program Committee of the Environmental Health Conference in Basel; 19-23rd Aug. 2013; Organized by Swiss Tropical and Public Health Institute, Univ. of Basel, with Int. Soc. Of Exposure Sciences (ISES), Int. Soc. Of Env'tl. Epidemiology (ISEE) and Int. Soc. of Indoor Air Quality (ISIAQ).

Nominated as a member of MAPAN (Monitoring Air Pollution Automatic Network) Project Monitoring Committee (PMC), IITM, Pune, March 2013, 5 years.

Conference and Inauguration of Centre of Environmental Research and Training (CERT) Vashi, Navi Mumbai, 16th June, 2012; Honoured for Contribution to Research in Air Pollution.

Member, Expert Committee for Promotion Interviews at BARC, Trombay; 13/2/2012, 13/6/2012.

Member, Expert Committee for Civil Engineering Faculty Selection, IIT Kanpur, 12th March,

2013.

Examiner, MNIT, Jaipur Ph.D. Thesis of Ms. Parul Gupta, 2013.

Examiner, EAD, BARC, M.Tech. Thesis Dissertation Mr. Mahesh Tiwari, June 2012.

Examiner, Dept. of Space & Atmospheric Science, Pune University, Ph.D. Thesis of Mr. Sanjay D. More, Sept. 2012.

Review of Projects, Ministry of Earth Sciences, Delhi, 5/3/2013.

Reviewer, Research projects, Dept. of Science & Technology, Atmospheric Sciences under SERC, 2004 till date.

Faculty Members and their Specializations

Anil K. Dikshit

Professor & Head

Water and Wastewater Treatment Technologies; Urban Solid Waste Management; Environmental Systems Modelling and Optimization; Sustainable Environmental Management of Industries; Environmental Impact Assessment; GIS Applications for Environment.

Shyam R. Asolekar

Professor

Development and modelling of reactors for treatment of domestic sewage and industrial wastewaters for pollution control and reuse

Combination of tertiary treatment technologies (advanced solutions) with low cost natural treatment systems (ecological solutions) aimed at reuse of sewage and industrial effluents for:

- a. Rejuvenation of lakes (renewal of contaminated water bodies)
- b. Applications in green buildings, green habitats (renewal of urban environment)
- c. Development of strategies to minimize carbon footprint of an industry

Assessment of technologies aimed at development of appropriate and rational treatment strategy to achieve a given desirable application of reuse of treated effluent (Decision Support Tool based on “life cycle” approach and sustainability criteria)

Hazardous, solid, and biomedical wastes management including decontamination of soils and sediments (field assessments, reactor development and modelling)

Preventive environmental management and sustainable development incorporating waste minimization, cleaner and greener technologies, eco-industrial networking and corporate social responsibility

Application of remotely sensed data for monitoring and modelling of environmental systems; Environmental planning, policy and law

Virendra Sethi

Professor

Air Pollution Science and Engineering, Aerosol Transport Measurements, Aerosol Characterisation. Satellite Data Assisted Air Quality Management, Biomass Gasification Hot Gas Cleanup, Engineering Education.

Sumathi Suresh
Professor

- Remediation of Chlorinated Organic Compounds (pesticides), Textile Dyes, Heavy Metals using Bimetallic Systems, Immobilized Metals and Zero-valent Metals
- Microbiological Processes for Treatment of Industrial Pollutants (textile dyes, pulp and paper mill wastes, heavy metals, tannery wastes): Elucidation of the Mechanism of Pollutant Removal and Design of Bioreactors
- Microbial Remediation of Metabolites Formed from Chemical and Biological Treatment of Chlorinated Pesticides in Soil and Water
- Application of Biological Processes (whole cell and enzyme based) for Developing Cleaner Technologies (for example pulp biobleaching using microbial xylanases and ligninases)
- Microbial Toxicity Testing Assays for Biomonitoring Pollutants and Industrial Wastewaters
- Enzyme Catalyzed Bioremediation Reactions (Characterization of active site, inhibition of enzyme activity, structure-function relationship in enzyme catalysis)

Sanjeev Chaudhari
Professor

Arsenic removal from water, Biological nutrient removal from wastewater, Application of Natural coagulants for water and Wastewater treatment, Treatment of textile wastewater by biological and physicochemical processes

Suparna Mukherji
Professor

Biodegradation and Bioremediation of Complex Organic Pollutants, Toxicity Evaluation of Complex Mixtures, Environmental Application of Nanomaterials, Sorption Phenomena, Sampling and Analysis of Bioaerosols

Subhankar Karmakar
Assistant Professor

Environmental and Water Resources Systems Engineering, Uncertainty Modeling, Disaster Risk and Vulnerability Assessment.

Anurag Garg
Asst. Professor

Catalytic wet oxidation; Biological treatment processes for wastewater treatment, Municipal Solid waste characterization and treatment, Energy from solid waste; Decision support modeling for solid waste management.

Rashmi S. Patil
Emeritus Fellow

Air Pollution Modelling Monitoring and Management; Indoor Air Quality and Exposure Assessment; Environmental Impact Assessment

Rakesh Kumar
Visiting Professor
BARC, Mumbai

Ajay Deshpande
Visiting Professor
MPCB, Mumbai

Publications

a) Books

Books (Authored)

Arceivala, S. J. and Asolekar, S. R. (2012).
“*Environmental Studies: A Practitioner’s Approach*”,
Tata McGraw Hill Education (India) Pvt. Ltd., New Delhi

Chapter (Book)

Asolekar S.R., Kalbar P.P., Chaturvedi, M.K.M., Maillacheruvu, K
“*Rejuvenation of Rivers and Lake in India: Balancing Societal Priorities with Technological Possibilities*” in Volume 4 - Sustainability of Water Quality Ed. Jerald Schnoor in Comprehensive Water Quality and Purification Edited by Satinder Ahuj [Accepted, Elsevier Publication], (2013)

Karmakar, S. and Musthafa, O.M.
“Lakes and Reservoir: Pollution.” In Encyclopedia of Environmental Management, edited by Sven Gorgenson, Taylor and Francis, New York, ISBN: 9781439829271, 2012, pp. 1576-1587.

Adekola, O., Stamp, J.D., Majozi, T., Garg, A., Bandyopadhyay, S.
“A Unified Approach for the Optimization of Energy and Water in Multipurpose Batch Plants,” *Computer Aided Chemical Engineering*, vol. 31, pp. 1382-6.

Articles in Journals

National

Asolekar, S. R., Hiremath, A. M., Vasant S. C.
“Carbon Foot Printing of Ports in Mumbai”, *Indian Ports and Infrastructure Magazine*, February, 2013, 19-21

Asolekar, S. R., Hiremath, A. M.
“India’s Contribution in Preventive Environmental Management of Obsolete Vessels” *Indian Ports and Infrastructure Magazine*, August, 2012, 5-7

Garg, A.

“Wet Oxidation: A Promising Option for the Treatment of Pulp and Paper Mill Wastewater,” *Journal of The Institution of Engineers (India): Series A*, vol. 93, November 2012, pp. 137-41.

Patil, R.S., Kumar, R., Menon, R., Shah, M.K., Sethi, V.

“Development on Particulate Matter Speciation Profiles for Major Sources in Six Cities in India”, *Atmospheric Research*, 132-133 (2013) 1-11.

International

Singh, S.S., Dikshit, A.K.

“Decolourization of Polyaluminium Chloride and Fungal Sequencing Batch Aerobic Reactor Treated Molasses Spentwash by Ozone”, *American Journal of Environmental Engineering*, Vol. 2(3), 2012, pp. 45-48.

Lokeshappa, B., Dikshit, A.K.

“Fate of Metals in Coal Fly Ash Ponds”, *International Journal of Environment Science and Development*, Vol. 3(1), 2012, pp. 43-48.

Shabiimam, M.A., Dikshit, A.K.

“Adsorption of o-Cresol in Landfill Leachate using Activated Carbon”, *International Journal of Environment Science and Development*, Vol. 3(2) , 2012, pp. 189-193.

Pathak, R.K., Dikshit, A.K.

“Effect of Various Environmental Parameters on Biosorptive Removal of Atrazine from Water Environment”, *International Journal of Environment Science and Development*, Vol. 3(3) , 2012, pp. 289-193.

Lokeshappa, B., Dikshit, A.K.

“Management of Toxic Metals in Fly Ash”, *International Journal of Sustainable Innovations*, Vol. 2(1), 2012, pp. 81-88.

Nagabhushan, B.B., Dikshit, A.K.

“Sustainable Management of Wastewater from Distilleries”, *International Journal of Sustainable Innovations*, Vol. 2(1), 2012, pp. 89-96.

Shabiimam, M.A., Dikshit, A.K.

“Issues in Sustainable Leachate Control and Management in India”, *International Journal of Sustainable Innovations*, Vol. 2(1), 2012, pp. 97-103.

Hutchinson, T.J, Lokeshappa, B., Dikshit ,A.K., Luo, Y., Catalano, J.G., Giammar, D.E.

“Fate of Metals in Fly Ash during Aging in Laboratory-Scale Ash Impoundments”, *Environmental Engineering Science*, Vol. 29 (12), 2012, pp.1085-1091.

Pathak, R.K., Dikshit, A.K.

“Screening of Bacterial Biosorbents for Removal of Atrazine”, *Clean Technology and Environmental Policy*, Online October 2012, pp.1-9.

Gupta, S., Boojh, R., Dikshit, A.K.

“Environmental Education for Healthcare Professionals with Reference to Biomedical Waste Management-A Case Study of a Hospital in Lucknow, India”, *International Research*

Journal of Environmental Sciences (submitted). Vol. 1(5), 2012, pp. 69-75.

Deshpande, P., Tilwankar, A., Asolekar, S., R.

“A novel approach to estimating potential maximum heavy metal exposure to ship recycling yard workers in Alang, India”, *Science of The Total Environment*, 438, 304-311, 2012.

Kalbar, P.P., Karmakar, S., Asolekar, S.R.

“Selection of Appropriate Wastewater Treatment Technology: Scenario Based Multiple-attribute Decision-Making Approach”, *Journal of Environmental Management*, 113, 158-169, 2012. [Elsevier Publication; IF:3.245/2011].

Kalbar, P.P., Karmakar, S., Asolekar, S.R.

“Technology Assessment for Wastewater Treatment Technologies Using Multiple-attribute Decision-Making Technology in Society”, 34(4), 295-302, 2012. [Elsevier Publication].

Basu, D., Asolekar, S.R.

“Evaluation of substrate removal kinetics for UASB reactors treating chlorinated ethanes” *Environmental Science and Pollution Research* 19 (6) , 2419-2427, 2012.

Basu, D., Asolekar, S.R.

“Effect of carbon sources on the removal of 1,1,2-Trichloroethane and 1,1,2,2-Tetrachloroethane in UASB reactor”. *Journal of Environmental Science and Health - Part A Toxic/Hazardous Substances and Environmental Engineering* 47 (4) , 638-644, 2012.

Basu, D., Asolekar, S.R.

“Performance of UASB reactor in the biotreatment of 1,1,2-Trichloroethane”. *Journal of Environmental Science and Health - Part A Toxic/Hazardous Substances and Environmental Engineering* 47 (2) , 267-273, 2012.

Kalbar, P. P., Karmakar, S., Asolekar, S.R.

“Selection of Wastewater Treatment Alternative: Significance of Choosing MADM Method” [In press *Environmental Engineering and Management Journal* [Technical University of Iasi, Romania Publication, IF: 1.00/2011] 2012.

Kalbar, P. P., Karmakar, S., Asolekar, S.R.

“Comparative Assessment of Wastewater Treatment Technologies: Life Cycle Approach” [In press *Water and Environment Journal*, doi:10.1111/wej.12006, *Wiley Science Publication*, IF: 0.792/2011], 2012.

Kalbar, P. P., Karmakar, S., Asolekar, S. R.

“A Framework for Selection of an Appropriate Technology for Wastewater Treatment: Incorporation of Sustainability Criteria and Experts' Opinion”. *International Journal of Sustainable Innovations*, 2 (1), 11-17 [IGIDR, Mumbai Publication, 2012.

Jeswani, H., Mukherji, S.

“Batch Studies with *Exiguobacterium aurantiacum* Degrading Structurally Diverse Organic Compounds and its Potential for Treatment of Biomass Gasification Wastewater” *International Biodeterioration and Biodegradation*, Vol. 80, May 2013, pp. 1-9.

Mohanty, S., Mukherji, S.

“Surfactant Aided Biodegradation of NAPLs by *Burkholderia multivorans*: Comparison between Triton X-100 and Rhamnolipid JBR-515” *Colloids and Surfaces B: Biointerfaces*, Vol. 102, February 2013, pp. 644-652.

Mukherji, S., Chavan, A.

“Treatment of Aqueous Effluents Containing Non-Aqueous Phase Liquids in Rotating Biological Contactor with Algal Bacterial Biofilm” *Chemical Engineering Journal*, Vol. 200-202, August 2012, pp. 459-470.

Mishra, P.K., Mukherji, S.

“Biosorption of Diesel and Lubricating Oil on Algal Biomass” *3 Biotech*, Vol. 2, December 2012, pp. 301-310.

Agnihotri, S., Mukherji, S., Mukherji, S.

“Antimicrobial Chitosan-PVA Hydrogel as a Nanoreactor and Immobilization Matrix for Silver Nanoparticles”, *Applied Nanoscience*, 2, September 2012, 179-188.

Sahu, G.C., Garg, A., Majozi, T., Bandyopadhyay, S.

“Optimum Design of Waste Water Treatment Network,” *Industrial and Engineering Chemistry Research*, vol. 52, March 2013, pp. 5161-71.

B. R. Yadav, A. Garg.

“Efficacy of Fresh and Used Supported Copper Based Catalysts for Ferulic Acid Degradation by Wet Air Oxidation Process,” *Industrial and Engineering Chemistry Research*, vol. 51, November 2012, pp.15778-85.

Dhakhwa, S., Bandyopadhyay, S., Majozi, T., Garg, A.

“Efficacy of Chemical Oxidation and Coagulation for COD and Color Reduction from Pulp Mill Effluent,” *Journal of Environmental Engineering, ASCE*, vol. 138, August 2012, pp. 1194-9.

Garg, A., Mishra, A.

“Degradation of Organic Pollutants by Wet Air Oxidation using Non-noble Metal Based Catalysts,” *Journal of Hazardous, Toxic, and Radioactive Waste, ASCE*, vol. 17, April 2013, pp. 89-96.

Patil, R.S., Kumar, R., Menon, R., Shah, M.K., Sethi, V.

Development of Particulate Matter Speciation Profiles for Major Sources in Six Cities in India, *Atmospheric Research* 132-133(2013) 1-11.

Aggarwal, S.G., Kawamura, K., Umarji, G.S., Tachibana, E., Patil R.S., Gupta, P.K.

“Organic and Inorganic Markers and Stable C-, N-isotopic Compositions of Tropical Coastal Aerosols from Megacity Mumbai : Sources of Organic Aerosols and Atmospheric Processing”, *Atmospheric Chem. Phys.*, 13, 4667-4680, 2013.

Sonawane, N.V., Patil, R.S., Sethi, V.

“Health Benefit Modelling and Optimization of Vehicular Pollution Control Strategies” , *Atmospheric Environment*, 60,193-201,2012

Papers Published in Proceedings of Conferences/Symposia

National

Apte, R., Dikshit, A.K.

Fly Ash Reuse and Utilization Options, *NTPC-NETRA Workshop on Coal to Energy for Sustainable Development*, Power Management Institute, Noida, January 10-11, 2013.

Kumar, D., Prasad, P., Chaturvedi, M. K. M., Asolekar, S. R.

"Typologies of Failures of Constructed Wetlands and the way forward" presented in the National Conference on *Water Quality Management* organized by Department of Civil Engineering, Malaviya National Institute of Technology Jaipur, during 20th and 22nd December, 2012.

Ranjan, S., Kumar, D., Asolekar, S. R.

"Reflection of Sewage Treatment Technologies in the Context of Inlet and Outlet Quality Parameters" presented in the National Conference on *Water Quality Management* organized by Department of Civil Engineering, Malaviya National Institute of Technology Jaipur, during 20th and 22nd December, 2012.

Prasad, P., Kumar, D., Asolekar, S. R.

"Significance of Primary Treatment in Enhancement of Constructed Wetlands" presented in the National Conference on *Water Quality Management* organized by Department of Civil Engineering, Malaviya National Institute of Technology Jaipur, during 20th and 22nd December, 2012.

Kumar, A., Kumar, D., Asolekar, S. R.

"Kinetics of Waste Treatment in Constructed Wetlands" presented in the National Conference on *Water Quality Management* organized by Department of Civil Engineering, Malaviya National Institute of Technology Jaipur, during 20th and 22nd December, 2012.

Srivastava, A., Kumar, D., Asolekar, S. R.

"Tertiary Treatment of Post-Constructed Wetlands, Aimed at Reuse" presented in the National Conference on *Water Quality Management* organized by Department of Civil Engineering, Malaviya National Institute of Technology Jaipur, during 20th and 22nd December, 2012.

Hiremath, A. M., Asolekar, S. R.

"Ballast Water Management Current Status and Future Challenges: An Engineering Aspect" presented in the National Conference on *Water Quality Management* organized by Department of Civil Engineering, Malaviya National Institute of Technology Jaipur, during 20th and 22nd December, 2012.

Deodhar, N.M., Patil R.S., Sethi, V.

"Energy Conscious Air Conditioning Designs for Modern Retail" National Conference ACRECONF 5-6 Feb., 2013, ISHRAE, New Delhi.

Bherwani, H.B., Patil, R.S., Kumar R.

“City Size and Change in Temperature Profile : Study on Major Indian Cities”, 2nd Nat. Conf. on Environment and Biodiversity (EBI) in India, 29-30 Dec., 2012, New Delhi, Paper published in NeBIO Int. Jnl. (ISSN : 2278-2281).

Deodhar, N.M., Patil, R.S., Sethi, V.

“IAQ and Energy : A Nexus” 8th National Conference ACR Trendz, 5-6 Oct., 2012, ISHRAE Pune

Rathod, M.K., Mishra, H., and Karmakar, S.

“Leachate characterization and assessment of water pollution near municipal landfill site,” *National Conference on Environmental and Energy Aspects for Sustainable Development*, Department of Chemical Engineering, Shri Guru Gobind Singhji Institute of Engineering and Technology, Vishnupuri, Nanded, Maharashtra, India, pp. 186-199. March 2013

International

Lokeshappa, B., Dikshit, A.K.

Metals in Cement Fly Ash Mixtures, *4th International Symposium on Energy and Environmental*, IIT Bombay, India, December 9-12, **2012**.

Deval, Animesh, Dikshit, A.K.

Construction, Working and Standardization of Microbial Fuel Cell, *4th International Conference on Environment and Sustainable Development (ICESD2013)*, Dubai, January 19-20, 2013.

Pandey, S. K., Hiremath, A. M., Salve, A. B., Asolekar, S. R.

“What Difference Can Hong-Kong Convention Make to Ship Recycling in India?” Proceedings of the International Conference on Ship Recycling SHIPREC2013 – Malmö, Sweden, 7th to 9th April, 2013

Hiremath, A. M., Pandey, S. K., Salve, A. B., Asolekar, S. R.

“Integrated Risk Assessment Framework for Ship Recycling Sector” Proceedings of the International Conference on Ship Recycling SHIPREC2013 – Malmö, Sweden, 7th to 9th April, 2013

Hiremath, A. M., Salve, A. B., Pandey, S. K., Asolekar, S. R.

“Comprehensive Account on Dismantling & Recycling of an Oil Tanker Ship in Alang, India” Proceedings of the International Conference on Ship Recycling SHIPREC2013 – Malmö, Sweden, 7th to 9th April, 2013

Starkl M., Amerasinghe. P., Essl L., Jampani M., Kumar D., Asolekar S. R.

“Potential of Natural Technologies for Decentralized Wastewater Management in India”, *Decentralized Wastewater Management*, International Water Association, 20th to 22nd November, 2012, Nagpur.

Kalbar, P. P., Karmakar, S., Asolekar, S. R.

“Estimation of Environmental Footprint of Municipal Wastewater Treatment in India: Life Cycle Approach” Proceedings of International Conference on a *Environmental Science and Technology*, Chennai, India, 10th to 11th March, 2012.

Kalbar, P. P., Karmakar, S., Asolekar, S. R.

“Selection of Appropriate Technology for Wastewater Treatment: Incorporation of Sustainability Criteria and Experts' Opinion in a Multiple Attribute Decision Making Framework” Proceedings of *International Symposium on a Sustainable Future (ISSF-2012)*, IGIDR, Mumbai, India, 19th to 21st January, 2012.

Vittal, H., Karmakar, S., and Ghosh, S.

"Detection of Spatio-temporal variations of rainfall and temperature extremes over India.", *American Geophysical Union (AGU) meet*, San-Francisco, USA, December 2012.

Musthafa, O.M., Karmakar, S. and Harikumar, P.S.

“Evaluation of River Water Quality Monitoring Network: A Multi-variate Statistical Approach to Kabbini River Catchment (India)”, *IWA World Water Congress and Exhibition 2012*, International Water Association (IWA), Busan, Korea, September 2012.

Mishra, H., Rathod, M., Karmakar, S., Singh, D.N., and Kumar, R.

“Assessment of Human Health Risk to MSW Landfill Leachate Contamination”, *Environmental Health 2013 – Science & Policy to Protect Future Generations*, Elsevier, Boston, USA, March 2013.

Karmakar, S., Kumar, P., and Varekar, V.

“Multivariate Flood Frequency Analysis: A Comparative Study of Nonparametric, Parametric and Copula-based Approaches.” *AOGS – AGU (WPGM) Joint Assembly*, Singapore, August 2012.

Varekar, V., Karmakar, S., and Jha, R.

“Seasonal Evaluation and Redesign of Surface Water Quality Monitoring Network: An Application to Kali River Basin, India.” *AOGS – AGU (WPGM) Joint Assembly*, Singapore, August 2012.

Singhal, D., Garg, A.

“Prediction of Environmental Impacts from Using Municipal Solid Waste Derived Material as Co-fuel in Cement Kiln.” Proceedings of *The Twenty-Eighth International Conference on Solid Waste Technology and Management*. Philadelphia, PA, USA, March 2013.

Bherwani, H.B., Patil, R.S., Kumar R.

“Urbanization and Its Impact on Climate : Indian Scenario”, *International Conference on Bioenergy, Environment and Sustainable Technologies (BEST)*, Thiruvannamalai : 27-30th Jan, 2013; Proceedings pp. 86-87.

Bherwani, H.B., Patil, R.S. , Kumar R.

“Impact of Urbanization on Regional and Local Climate”, *International Conference on Climate Change and Humanity (ICCH)*, Rome, Italy : 24-25th Feb., 2013, Full paper accepted.

Sharma, R., Deodhar, N.M., Patil, R.S., Sethi, V.

“Ventilation Design for Indoor Air Quality Management as per Indian Climatic Conditions” *10th International Healthy Buildings Conference 2012*, Brisbane 1A1; 8-12 July 2012.

