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The Evolution of Wastewater Treatment in Norway

Thursday, October 26, 2017
2pm – 3pm
3540 Engineering Building



Abstract:

Norway, with its 5 million population and 6 million P.E. wastewater treatment capacity, has somewhat peculiar practices: Over 70% of wastewater goes through a coagulation stage; some plants have treatment requirements of over 97% on phosphates; no private ownership; many plants are constricted underground/rocks; over 80% of sludge is used in agriculture etc. Norwegian plants also show that removing over 80% organic matter without biological treatment is possible. Norwegian practices thereby stand out from both continental European and Scandinavian practices. Welcome to a quick journey through the evolution of Norwegian wastewater treatment.

Michigan State University is committed to providing equal opportunity for participation in all programs, services and activities. Accommodations for persons with disabilities may be requested by contacting Lori Lerner (lerner1@msu.edu).

Speaker's bio:



Harsha Ratnaweera is a Professor and Head of Research at the Faculty of Sciences and Technology, Norwegian University of Life Sciences (part time from 2001, full time from 2012). He was employed as the Director of International Projects and Innovation at the Norwegian Institute for Water Research (NIVA) 1991-2012, where he initiated and led NIVA's commercialization of research results. He has a Dr. Ing. degree in Civil Engineering (1992) from the Norwegian University of Science and Technology NTNU, and a MSc (Hons) Chemical Engineering (1987) from the National Technical University of Ukraine KPI, Ukraine.

Ratnaweera's research areas are on modelling and optimization of coagulation processes in water and wastewater treatment; Real-time monitoring and control of treatment processes; Holistic optimization of sewerage systems; virtual sensors and validation of measurements; membrane process; image analysis for sensor development; water resources management; and harmonization of water related graduate studies in Asia, Africa and Eurasia with Norway.

Ratnaweera is the Norwegian representative in the Council of the European Water Association and a member of the Management Committee (MC) of the International Water Association - IWA Specialist Group "Particle Separation". He has been a member of the Norwegian National Commission for UNESCO and serves as the Chairman and a Board Member in several water and environment related organizations in Norway. He has worked as an advisor/consultant to the World Bank, UNECE, Norwegian Ministry of Foreign Affairs, NORAD and SIDA. He has worked in many countries in Asia, Africa, Eastern and Western Europe and fluent in English, Norwegian and Russian languages.

Water Harmony (www.waterh.net) and Water and Society (www.wasoproject.org) are examples of projects where universities from Asia, Africa and Eurasia are involved and which are coordinated by Prof. Ratnaweera. He has also lead the organization of two international conferences in Oslo and Spitsbergen in June 2016 (www.iwa-ps2016.org, www.ewa-wmcc2016.org).