Environmental Engineering and Management Journal *October 2016, Vol.15, No. 10, 2135-2136*
http://omicron.ch.tuiasi.ro/EEMJ/

"Gheorghe Asachi" Technical University of Iasi, Romania

EDITORIAL

Livestock Waste Management and Resource Recovery

1st International Conference on Recent Advances in Pollution Control and Resource Recovery for the Livestock Farming Industry
LivestockWaste 2013

The world population is estimated to increase from 7.96 to 10.46 billion in 2050. Population growth and urbanization will lead to an increase in the demand for livestock products by 2050, which inevitably will cause an increase in the generation of livestock waste. The production of livestock waste is much higher than human waste. One "animal unit" (1,000 lbs. of the live weight of an animal) of dairy cows produces 15.24 tons of waste per year, while one "animal unit" of humans produces 5.48 tons of waste per year. As livestock manures are rich in organic matter and nutrients, it is important to develop best available manure management techniques to recover these elements. Livestock manure is commonly disposed of by landspeading, composting and anaerobic digestion – the latter of which utilizes microorganisms to convert organic matter in manure to biogas and also produces nutrient-rich digestate as organic fertilizer. If these techniques are not available and the manure is not properly managed, manure may pollute surface water, ground water, soil and air. In China, according to the First National Survey on Water Pollution Sources issued by the Ministry of Environmental Protection, the Statistics Bureau and the Ministry of Agriculture on the 6th February 2010, the total chemical oxygen demand (COD), total nitrogen (TN) and total phosphorus (TP) discharged to the water environment by the agricultural sector has increased to 13.25, 2.70 and 0.28 million tons annually, which is equivalent to 43.7%, 57.2% and 67.4% of the total COD, TN and TP discharged to the water environment in the whole country. The COD, TN and TP discharges from the livestock farming industry in 2007 were equal to 12.72, 1.03 and 0.16 million tonnes, corresponding to 96%, 38% and 56% of the agricultural discharges. This shows that the livestock farming industry is the largest agricultural pollution source. Pollution caused by the livestock manure occurs not only in developing countries, but also in developed countries. In USA, at present, less than 60% of total livestock manure is properly treated by land-spreading, composting, or anaerobic digestion. In the European Union, the Nitrates Directive is implemented to reduce the pollution of livestock waste land application on ground water.

The improper management of animal manure may also cause other environmental and human health issues, such as the production of odor (e.g. H_2S and NH_3) and greenhouse gas (GHG) emissions during manure handling, transport and use. In the USA, the management of farm animal manure contributes to 25% of the agricultural methane emissions in the whole country. Manure-borne pathogens and parasites will affect farmers and animals' health and wellbeing if manure is directly applied to land. Much has been written recently about the presence of 'emerging contaminants', such as estrogen, antibiotics and antibiotic resistance genes, in animal manure, which, if not effectively removed, may have detrimental impacts on human health and the environment. Therefore, many opportunities exist for the design of manure management systems to address this issue.

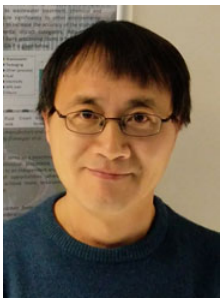
This special issue of *Environmental Engineering and Management Journal* (EEMJ) contains papers that were delivered at the LivestockWaste 2013 conference, which took place in Jiaxing City, Zhejiang Province, China in 25-26 October, 2013. The topic of the conference was on recent advances in resource recovery and pollution control for livestock waste management. The papers included in this special issue focus on the following areas: (1) policies and regulations on management of animal waste; (2) technologies for animal waste prevention; (3) pollution

control technologies; (4) resource recovery technologies and practice; and (5) greenhouse gas emission mitigation for livestock farming.

We would like to thank all the authors for their contributions to this special issue. In particular, we appreciate the support from Professor Maria Gavrilescu, Editor-in-Chief of EEMJ, for agreeing to dedicate a volume of EEMJ to papers from the *LivestockWaste 2013* conference.

We also wish to thank the reviewers. Their precious time and invaluable and detailed suggestions have been especially helpful in improving the quality of each paper and therefore this special issue.

Guest editors:
Prof. Xinmin Zhan
The National University of Ireland, Galway, Ireland
Prof. Lvjun Chen
Tsinghua University, China
Prof. Zhen-Hu Hu
Hefei University of Technology, China
Lect. Dr. Mark Healy
The National University of Ireland, Galway, Ireland



Dr. Xinmin Zhan is a professor at Civil Engineering Department in the National University of Ireland, Galway. He graduated from Tsinghua University, China in 1999 with a PhD degree in Environmental Engineering. Before working in the National University of Ireland, Galway, he had worked in Tokyo Institute of Technology (Japan), Gifu University (Japan) and Tsinghua University (China). His research interests include (i) development of cost-effective and efficient wastewater treatment technologies; (ii) recovery of organic wastes and biomass for use as a sustainable and clean energy source and for building a green agriculture industry; and (iii) development of novel environmental materials for recovery of phosphorus and metals from wastewater. He has published over 80 research papers in peer review journals.

Dr. Lvjun Chen is a professor at School of Environment in Tsinghua University, China, where he holds important academic roles, such as Deputy-Chairman of the Centre for Ecological Civilization, Chairman of the Centre for Cleaner Production and Industrial Ecology (CCPIE), Director of Department of Environment, Yangtze Delta Region Institute of Tsinghua University, and Director of Zhejiang Provincial Key Laboratory of Water Science and Technology. He has won the third prize of national technological innovation award and 3 first prizes, 7 second prizes, and 4 third prizes of the science and technology progress award at the provincial level. He has been awarded the national Hundred, Thousand and Ten Thousand Talent Programme. Prof. Chen has more than 10 patents and has published more than one hundred papers.

Dr. Zhen-Hu Hu is a professor and department head at the Department of Civil Engineering in Hefei University of Technology, China. He received his PhD degree in environmental engineering from the University of Science & Technology of China. He worked as a postdoctoral researcher at Virginia Polytechnic Institute and State University, USA. before spending two years as a Marie Curie researcher at National University of Ireland, Galway. Dr. Hu's research interests include biological wastewater treatment, bioenergy production from organic wastes, waste management, and emergent contaminants in wastewater and solid wastes. Dr. Hu has published over 50 papers in peer reviewed international journals and 3 book chapters, and owns 7 patents.

Dr. Mark Healy is a Senior Lecturer at NUI Galway and leads the Geo-Environmental Engineering Research Group (www.nuigalway.ie/gene/). His research interests include: surface and subsurface processes with a particular interest in erosion and surface runoff of nutrients, solids and metals, and the measurement and modelling of leaching of nutrients through soil; greenhouse gas emissions; soil fertility; nutrient and precious metal recovery; constructed wetlands; filtration; sequencing batch reactors; emerging contaminants (THMs, PCPs, microplastics); biosolids; composting; ecosystem services; and the effects of forestry activities, such as clearfelling, on the environment. To date, he has published 88 journal papers and 51 conference papers.