

International Conference on Solid Waste Management (5IconSWM 2015)

Procedia Environmental Sciences Volume 35

Bangalore, India
24 - 27 November 2015

Editors:

Sadhan Kumar Ghosh

ISBN: 978-1-5108-3625-9

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© by Elsevier B.V.
All rights reserved.

Printed by Curran Associates, Inc. (2017)

For permission requests, please contact Elsevier B.V.
at the address below.

Elsevier B.V.
Radarweg 29
Amsterdam 1043 NX
The Netherlands

Phone: +31 20 485 3911
Fax: +31 20 485 2457

<http://www.elsevierpublishingsolutions.com/contact.asp>

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com



Contents

Editorial	
S.K. Ghosh, J. Li, M. MichaelNelles, R.L. Mersky	1
Waste Management in Germany – Development to a Sustainable Circular Economy? M. Nelles, J. Grünes, G. Morscheck	6
Swachhhaa Bharat Mission (SBM) – A Paradigm Shift in Waste Management and Cleanliness in India S.K. Ghosh.	15
Solid Waste Management Practices at a Private Institution of Higher Learning in Nigeria A.O. Coker, C.G. Achi, M.K.C. Sridhar, C.J. Donnett	28
Waste Generation and Management in Antarctica P.K. Bharti, B. Sharma, R.K. Singh, A.K. Tyagi	40
Modeling Indigenous Footpath and Proximity Cut-off Values for Municipal Solid Waste Management: A Case Study of Ilorin, Nigeria A.S. Aremu, R. Vijay	51
Survey on SWM for Sustainable Development and Public Health in Dutse Metropolis, Jigawa State, Nigeria M.B. Kazoure.	57
A Working Observation on the Dry Waste Collection Centers in Bangalore P. Chandran, S. Narayanan.	65
Tourism Induced Challenges in Municipal Solid Waste Management in Hill Towns: Case of Pahalgam S. Bashir, S. Goswami	77
A Facility Location Model for MSW Management Systems under Uncertainty: A Case Study of Nashik City, India V. Yadav, S. Karmakar, A.K. Dikshit, S. Vanjari	90
Case Study of Mumbai: Decentralised Solid Waste Management H. Iyer	101
Municipal Solid Waste Management, a Major Impacted Sector of Urban Environment Due to Residential Land Use Activities–Study of Kozhikode City K. Chithra, P.P. Anilkumar, M.A. Naseer.	110
Municipal Solid Waste Management A. Soni, D. Patil, K. Argade.	119
Municipal Solid Waste Management in Ho Chi Minh City, Viet Nam, Current Practices and Future Recommendation R.L. Verma, G. Borongan, M. Memon.	127
Towards Sustainable Waste Management through Technological Innovations, Effective Policy, Supply Chain Integration & Participation V. Durgekar	140
Sustainable Municipal Solid Waste Management in India: A Policy Agenda S. Mani, S. Singh	150
Managing of Solid Waste through Public Private Partnership Model G. Mohan, U.K. Sinha, M. Lal.	158
Municipal Solid Waste Management in India: A Few Unaddressed Issues T.K. Ghatak	169
Sustainable SWM in Developing Countries Focusing on Faster Growing Economies, India and China S.K. Ghosh.	176
A Mechanical Automatic Urinal-Toilet Flusher for Swach Bharat Mission S.B. Wath	185
Innovation in Solid Waste Management through Clean Development Mechanism in Developing Countries A. Potdar, A. Singh, S. Unnikrishnan, N. Naik, M. Naik, I. Nimkar, V. Patil	193
Prevalence of Health Hazards Associated with Solid Waste Disposal–A Case Study of Kolkata, India S. De, B. Debnath	201
Application of SWOT Analysis for the Selection of Technology for Processing and Disposal of MSW A. Aich, S.K. Ghosh.	209
Land Use Based Modelling of Solid Waste Generation for Sustainable Residential Development in Small/Medium Scale Urban Areas P.P. Anilkumar, K. Chithra	229
A Review on Prediction of Municipal Solid Waste Generation Models K.A. Kolekar, T. Hazra, S.N. Chakrabarty.	238

A Fuzzy Goal Programming Approach for Solid Waste Management under Multiple Uncertainties A. Biswas, A.K. De	245
A DEA/Goal Programming Model for Incineration Plants Performance in the UK K. Petridis, P.K. Dey	257
Analysing Efficiency of Waste to Energy Systems: Using Data Envelopment Analysis in Municipal Solid Waste Management P. Albores, K. Petridis, P.K. Dey	265
An Optimization Model on Construction and Demolition Waste Quantification from Building S.K. Ghosh, H.S. Haldar, S. Chatterjee, P. Ghosh	279
Recycling of Waste Water Collected from Automobile Service Station M.N. Asha, K.S. Chandan, H.P. Harish, S. NikhileswarReddy, K.S. Sharath, G. Mini Liza	289
Utilization of Micro Fibrous Carbon Matrix from Tannery Solid Waste for Making Pavement Materials K. Patchai Murugan, S. Swarnalatha, G. Sekaran	298
Bio-waste Recycling in Germany – Further Challenges A. Schüch, G. Morscheck, A. Lemke, M. Nelles	308
Landfill Mining as a Remediation Technique for Open Dumpsites in India A. Dubey, M. Chakrabarti, D. Pandit	319
Assessment of Groundwater Quality in and around the Jawaharnagar Municipal Solid Waste Dumping Site at Greater Hyderabad, Southern India R.M. Kurakalva, K.K. Aradhi, K.Y. Mallela, S. Venkatayogi	328
Methane Emission from Panki Open Dump Site of Kanpur, India A. Kaushal, M.P. Sharma	337
Opportunities & Challenges in Capturing Landfill Gas from an Active and Un-scientificallly Managed Land Fill Site – A Case Study R.K. Kashyap, P. Chugh, T. Nandakumar	348
Development of Landscaped Landfills Using Organic Waste for Sustainable Urban Waste Management P.K. Amritha, P.P. Anilkumar	368
Establishment of Energy Potential of Norio Landfill of Municipal Solid Waste of Tbilisi N.L. Dvalishvili	377
A New Fuzzy Model for Market Validation of Device Recycling Motor Oils M. Pavlović, D. Tadić, S. Arsovski, A. Tomović, A. Pavlović	381
Characterization of Leachate and Its Impact on Surface and Groundwater Quality of a Closed Dumpsite – A Case Study at Dhapa, Kolkata, India S.K. Maiti, S. De, T. Hazra, A. Debsarkar, A. Dutta	391
Quantification and Characterization of Size-segregated Bioaerosols at Municipal Solid Waste Dumping Site in Delhi S. Agarwal, P. Mandal, A. Srivastava	400
Sustainable Operation of Composting in Solid Waste Management S. Vigneswaran, J. Kandasamy, M.A.H. Johir	408
Possibility of Eco Friendly Post Consumer Waste Management V. Muthunarayanan, K. Arumugam, T. Duraisam	416
Effect on Growth of Earthworm and Chemical Parameters During Vermicomposting of Pressmud Sludge Mixed with Cattle Dung Mixture S.A. Bhat, J. Singh, A.P. Vig	425
Optimization of a Vegetable Waste Composting Process with a Significant Thermophilic Phase S. Sarkar, S. Pal, S. Chanda	435
Vermicomposting – Solution for Milk Sludge N. Desai, A. Tanksali, V.S. Soraganvi	441
Effects of Hg/Co Toxicity in Soil on Biomolecules of Earthworm, Eisenia Fetida C. Jatwani, R.K. Gupta, R. Rai, N. Bansal	450
Drum Composting of Food Waste: A Kinetic Study M.K. Manu, R. Kumar, A. Garg	456
Resource Recovery through RDF: Current Trends in Solid Waste Management in the Philippines G.P. Sapuay	464
Innovative Use of Membrane Technology in Mitigation of GHG Emission and Energy Generation S. Roy	474
Environmental Friendly Ways to Generate Renewable Energy from Municipal Solid Waste J. Rawat, S. Kaalva, V. Rathore, D.T. Gokak, S. Bhargava	483
Smelting of Waste Nylon and Low-density Plastics (ldps) in a Fluidized Bed System A.W. Ogunbiyi, A.O. Openibo, O.M. Ojowuro	491
For Waste to Energy, Assessment of Fluff Type Solid Refuse Fuel by Thermal Characteristics Analyses S.W. Park, J.S. Lee, W.S. Yang, J.J. Kang, J.H. Sung, M.T. Alam, Y.C. Seo, C.H. Sanjay Rao, A. Saravanakumar, K.V. Kumar, J.K. Lee, J.H. Oh	498
Effect of Variation in the Chemical Constituents of Wastes on the Co-processing Performance of the Cement Kilns U. Parlikar, P.S. Bundela, R. Baidya, S. Kr. Ghosh, S.K. Ghosh	506
Kinetics of Pyrolysis of Mixed Municipal Solid Waste – A Review V. Chhabra, Y. Shastri, S. Bhattacharya	513

A Review on Technologies of Removal of Dioxins and Furans from Incinerator Flue Gas A. Mukherjee, B. Debnath, S.K. Ghosh.	528
The Characteristics of Oxygen-Enriched Gasification for Fluff SRF J.H. Gu, Y.S. Park, S.B. Nam, Y.S. Yun, H.J. Sung, J.K. Lee, J.H. Oh, Y.C. Seo.	541
Progresses in Waste Biomass Derived Catalyst for Production of Biodiesel and Bioethanol: A Review R. Chakraborty, S. Chatterjee, P. Mukhopadhyay, S. Barman.	546
Production of Bioethanol from Waste Newspaper S.A. Byadgi, P.B. Kalburgi	555
Assessment of Composite Waste Disposal in Aerospace Industries N. Vijay, V. Rajkumara, P. Bhattacharjee.	563
Feasibility as a Potential Substitute for Natural Sand: A Comparative Study between Granite Cutting Waste and Marble Slurry S. Singh, A. Tiwari, R. Nagar, V. Agrawal.	571
Investigations on Physical and Chemical Properties of High Silica Sand, Fe-Cr Slag and Blast Furnace Slag for Foundry Applications I. Narasimha Murthy, J. Babu Rao.	583
High Carbon Ferro Chrome Slag – Alternative Mould Material for Foundry Industry I. Narasimha Murthy, N. Arun Babu, J. Babu Rao.	597
Minimization of Waste Spent Catalyst in Refineries T. Chiranjeevi, R. Pragma, S. Gupta, D.T. Gokak, S. Bhargava.	610
Eco-friendly Use of Granite Fines Waste in Building Blocks M. Lokeshwari, K.S. Jagadish	618
Solid Waste Sand Re-use from Swedish Metal Casting R. Carlsson, P. Nayström	624
Tensile Strength and Toughness Index of Flyash-lime – gypsum Mixed with Dry/Treated Tire Chips S.P. Guleria, R.K. Dutta	629
A Study on Environmental Assessment of Residue from Gasification of Polyurethane Waste in E-Waste Recycling Process J.J. Kang, J.S. Lee, W.S. Yang, S.W. Park, M.T. Alam, S.K. Back, H.S. Choi, Y.C. Seo, Y.S. Yun, J.H. Gu, A. Saravanakumar, K. Vinoth Kumar	639
Inventorisation of E-Waste and Developing a Policy – Bulk Consumer Perspective J.S. Mary, T. Meenambal	643
Electronic Components (EC) Reuse and Recycling – A New Approach towards WEEE Management B. Debnath, P. Roychowdhury, R. Kundu	656
E-Waste Management – A Potential Route to Green Computing B. Debnath, R. Roychoudhuri, S.K. Ghosh	669
Comparative Examining and Analysis of E-Waste Recycling in Typical Developing and Developed Countries A.K. Awasthi, X. Zeng, J. Li	676
An Overview on the Use of Waste Plastic Bottles and Fly Ash in Civil Engineering Applications S. Dutta, M.B. Nadaf, J.N. Mandal	681
Integrated Plastic Waste Management: Environmental and Improved Health Approaches P. Singh, V.P. Sharma	692
Toxic Pollutants from Plastic Waste – A Review R. Verma, K.S. Vinoda, M. Papireddy, A.N.S. Gowda.	701
Biodegradation of Low Density Polyethylene in Aqueous Media K.S. Veethahavya, B.S. Rajath, S. Noobia, B.M. Kumar.	709
Construction Waste – Potentials and Constraints S.E. Sapuay	714
Management and Recycling of Construction Waste in Taiwan Y.-Y. Lai, L.-H. Yeh, P.-F. Chen, P.-H. Sung, Y.-M. Lee	723
Partial Replacement of E-plastic Waste as Coarse-aggregate in Concrete B.T. Ashwini Manjunath	731
Dynamic Modelling and Simulation of Pilot Scale Anaerobic Digestion Plant Treating Source Separated Food Waste and Effect of Recycling Sludge P.G. Rathnasiri	740
Design, Fabrication and Experimentation of a Small Scale Anaerobic Biodigester for Domestic Biodegradable Solid Waste with Energy Recovery and Sizing Calculations R. Jyothilakshmi, S.V. Prakash	749
Study on Biogas Production of Joint Anaerobic Digestion with Excess Sludge and Kitchen Waste W.-b. Han, Y.-z. Zhao, H. Chen	756
Optimization of Process Parameters for Catalytic Conversion of Solid Bio-Waste During Thermophilic Anaerobic Digestion A. Ganguly, R. Blankchard, A. Wheatley, P.K. Chatterjee	763
Low Energy Rice Stubble Management through in Situ Decomposition N. Borah, R. Barua, D. Nath, K. Hazarika, A. Phukon, K. Goswami, D.C. Barua	771

Utilization of Biogas Digester Liquid for Higher Mushroom Yields R. Ashwath, H.N. Chanakya, S. Malayil	781
Biogas Production from Surplus Plant Biomass Feedstock: Some Highlights of Indo-UK R&D Initiative D. Patowary, H. West, M. Clarke, D.C. Baruah	785
Self-Circulating Biogas Generation for Swine Waste M.A. Mydeen, M. Venkateshwaran, S.S.S. Velan, C. Aarthy Vigneshwari, V. Kirubakaran	795
Physico-Chemical Properties and Heavy Metal Contents of Soils and Kharif Crops of Punjab, India S.S. Bhatti, V. Kumar, N. Singh, V. Sambyal, J. Singh, J.K. Katnoria, A.K. Nagpal	801
Evaluating the Potential of Wild Cocoyam “Caladium Bicolor” for Ethanol Production Using Indigenous Fungal Isolates O.C. Amadi, N. Onyema, T.N. Nwagu, A.N. Moneke, B.N. Okolo, R.C. Agu	809
Practical Achievements on Biomass Steam Gasification in a Rotary Tubular Coiled-downdraft Reactor R. Andrew, D.T. Gokak, P. Sharma, J. Sharma, N. Somkuwar, S. Gupta	818
Fungal Enzyme Cocktail Treatment of Biomass for Higher Biogas Production from Leaf Litter S. Malayil, H.N. Chanakya	826
Supply Chain of Bioethanol Production from Whey: A Review M. Das, A. Raychaudhuri, S.K. Ghosh	833
Opportunities for Bio Fuels – Indian Scenario N. Kaushik, S. Singh	847
Bioelectro Chemical Systems: A Sustainable and Potential Platform for Treating Waste S. Srikanth, M. Kumar, M.P. Singh, B.P. Das	853
Comparative Analysis of Combustion Vs Auto-gasification of Prosopis Juliflora Sticks for Rural Household Application K. Kamaleswaran, P. Harinath, S. Prabhakaran, V. Rajakumaran, M. Damini, V. Kirubakaran	860
A Study on the Potential of Moringa Leaf and Bark Extract in Bioremediation of Heavy Metals from Water Collected from Various Lakes in Bangalore K.S. George, K.B. Revathi, N. Deepa, C.P. Sheregar, T.S. Ashwini, S. Das	869
State of Development of Biogas Production in Europe M. Torrijos	881
Torrefaction Reaction Characteristic of Various Biomass Waste on Pilot Scale of Torrefaction Reaction System S.B. Nam, Y.S. Park, D.J. Kim, J.H. Gu	890
Utilization of Chicken Tallow for the Production of Cationic Biosurfactant and Thereof for Decontamination of Cr(III) Containing Soil C.J. Magthalin, A. Varadharajan, S. Swarnalatha, G. Sekaran	895
Biomass Supply Chain in Asian and European Countries A. Raychaudhuri, S.K. Ghosh	914
Fast Biodegradation of Waste Cotton Fibres from Yarn Industry using Microbes U. Mahitha, G. Dhaarini Devi, M. Akther Sabeena, C. Shankar, V. Kirubakaran	925
Sustainable Processes for Treatment of Waste Water Reverse Osmosis Concentrate to Achieve Zero Waste Discharge: A Detailed Study in Water Reclamation Plant S. Shanmuganathan, M.A.H. Johir, A. Listowski, S. Vigneswaran, J. Kandasamy	930
Up Gradation of Activated Sludge Process for Capacity Improvement by Using High Purity Oxygen A. Gulabani, V. Agarwal, Shuchi, A. Gupta	938
Disposal Problem of Arsenic Sludge Generated During Arsenic Removal from Drinking Water P. Mandal, S.R. Debbarma, A. Saha, B. Ruj	943
Characterization of Water Treatment Plant’s Sludge and its Safe Disposal Options T. Ahmad, K. Ahmad, M. Alam	950