

Factsheet

Learning Event: Organic waste to energy through anaerobic digestion

Training for Nepalese and Indian students and postdocs
23 to 28 January 2017, Kathmandu, Nepal



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Science and Policy
Platform of the Swiss Academy of Sciences
Commission for Research Partnerships
with Developing Countries KFPE

 University of Applied Sciences and Arts Northwestern Switzerland
School of Life Sciences

Description of the learning event

The learning event ‘Organic waste to energy through anaerobic digestion (AD)’ was held in Kathmandu City, Nepal, from 23 to 28 January 2017. Municipal solid waste management (MSWM) faces many challenges in Nepal and India. This learning event promoted a coordinated development and management of solid waste to allow biogas production from its organic components. Apart from knowledge transfer and introduction to relevant tools, the learning event aimed to foster interdisciplinary thinking and communication skills through exercises, group work, problem-based learning and discussions.

Outline of the learning event

The learning event was composed of six modules, each lasting for approximately one day. The **module 1 ‘MSWM and waste-to-energy in Nepal, India and Switzerland’** provided an overview of MSWM and practices from Nepal, India and Switzerland. This intended to set the scene and assure that all participants were familiar with basic concepts to be discussed in more detail during subsequent modules. **Module 2 ‘Technologies for organic waste to energy’** discussed technologies, current trends and innovations in the field of AD and solutions for the rural and urban context were presented using examples from an on-going research on biogas from organic solid waste in India between the organizing research institutes from Nepal (Kathmandu University), India (National Environmental Engineering and Research Institute, NEERI) and Switzerland (University of Applied Sciences and Arts Northwestern Switzerland, FHNW). Two site visits in Kathmandu allowed critical reflections and discussions by the participants and resource persons. **Module 3 ‘Estimating and visualizing organic waste resources’ availability using GIS and MFA for planning and stakeholder interaction’** built a hands-on training using the established freely available open source software: QGIS (www.qgis.org) for GIS and STAN (www.stan2web.net) for Material Flow Analysis (MFA). Environmental and economic aspects of organic waste to energy options as well as relevant tools including the concepts of Life Cycle Analysis (LCA) and Life Cycle Costing (LCC) were introduced in **module 4 ‘Sustainable production and use of biogas.’** In **module 5 ‘Alignment of organic waste to energy with Nepalese and Indian MSWM and energy policies as well as Sustainable Development Goals (SDGs)’** current policies were discussed, highlighting links to SDGs. In parallel to these activities, in **module 6 ‘Group projects and discussions’** participants carried out supervised group work on organic waste to energy in Nepal, applying tool and approaches learned during other modules and held a final presentation.

Added value to participants

The participants of the learning event could benefit from lectures by Nepalese, Indian and Swiss researchers and external experts. This was complemented with hands on experiences in the field, which allowed discussing real-life examples of MSWM and AD. Interactive components of the training and the exchange with external resource persons were well received by the participants. Similar to a learning event on water resources conducted in India in 2015 (http://www.naturalsciences.ch/organisations/kfpe/learning_events: *Integrated Water Resources Management*), this close interaction between resource persons and participants were noted as a new and important experience by various participants. To illustrate a few comments from the participants: *'Thank you very much for conducting such intensive workshop; it was indeed a great learning experience for us. We really appreciate your hard work and guidance throughout'*, by Ms. Sheila Dangol, University of Kathmandu. *'It was very informative, very well presented, plus enjoyable. I have learned so much from this event that will assist me in my workplace and I have already started to use some of the strategies and tools you gave us to use'* by Mr. Subash Dhakal, University of Kathmandu.



Impressions from Learning Event; left: group picture in front of an anaerobic digester for organic waste from households at a waste treatment facility in Kathmandu; right: composting facility in the vicinity of Kathmandu

Conclusions and lessons learnt

Similar to the aforementioned learning event on water resources, organizers, resource persons and participants expressed that this learning event was successful in conveying a useful and relevant training on anaerobic digestion (AD). Again, interactive elements with hands on trainings on open source tools and group work were most appreciated and should be a substantial part of similar courses.

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