



Technische
Universität
Braunschweig



EXCELLENCE CENTER FOR
DEVELOPMENT COOPERATION
SUSTAINABLE WATER MANAGEMENT

Summer School on

New Alternative Sanitation Systems (NASS)

October 28 – November 8, 2013
Braunschweig, Germany



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Funded by



DAAD

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Overview

The global community faces huge challenges such as climate and demographic change, increasing world population and commodity prices as well as water shortage. All these aspects are closely related to the water and wastewater sector.

Our common centralised sewer and wastewater treatment systems are so called *end-of-pipe* systems with the objective to prevent the environment from negative impacts. But by the operation of these systems valuable resources like organic compounds (renewable energy) as well as fertilizing nutrients like nitrogen and phosphorus are eliminated while the treatment plants are consuming high amounts of resources and energy for their construction and operation.

New alternative sanitation systems (NASS) aim to recover the valuable wastewater compounds in order to reuse them for the setup of new production processes like energy production and agricultural production in order to create new value-added chains. The technical portfolio of NASS shows a high variety for the different system components (e.g. toilet systems for the collection of different partial streams, new storage-and/or transportation systems for the different mass flows as well as adapted technologies for the treatment of the partial streams and recovery of the valuable compounds) which leads to a high variety in the resulting NASS-systems as well.

The seminar therefore intends primarily to provide an overview of the most important key factors of new alternative sanitation systems regarding technical, economical as well as social aspects. Furthermore a deeper understanding of new alternative sanitation systems and their interactions with all different levels of society and technical applicability shall be communicated by the interactive form of the seminar.

Objectives

On successful completion of the seminar each participant will be equipped with the essential state-of-the-art knowledge on

- new alternative sanitation systems and their different technical components,
- different options for the recovery and reuse of valuable wastewater compounds as well as
- the most important economical and social key factors, drivers and constrains regarding NASS.

Moreover, the participants will also get the opportunity to discuss/present their own developed NASS-concepts (case studies) with the aim of identifying, together with the group, the most appropriate solutions for the selected specific cases.

Topics

- Different types of sanitation systems and their technical components
- Characteristics of different partial streams within NASS-systems
- Adapted processes and technologies for an adequate treatment of the different partial streams
- Recovery and reuse options for energy and nutrients including the potentials of new value-added chains
- Economical and social key factors, drivers and constrains regarding NASS
- Development of new alternative sanitation concepts for selected case studies

Schedule

The summer school consists of an introductory session with key note lectures, three main lecture parts, an interactive teamwork and an excursion to a NASS pilot-project site. **In connection with the summer school the participants will take part in the DWA-seminar on Water Reuse and the International Symposium Re-Water.** Thus the entire summer school spans over two weeks from the arrival on Sunday, 27th of October 2013 until the departure on Friday, 8th of November 2013.

SCHEDULE

Day	Date	Time	Activity
Sunday	27/10/2013		Arrival
Monday	28/10/2013		Introductory session <ul style="list-style-type: none"> - Key Note No. 1: Do we need new alternative sanitation systems? - Key Note No. 2: Nutrient flows and resource management - Key Note No. 3: Economy of wastewater systems
			Lectures <ul style="list-style-type: none"> - Types of Sanitation systems - Mass flows within different sanitation systems - Composition of mass flows - Source separation techniques
Tuesday	29/10/2013		Lectures <ul style="list-style-type: none"> - Water and waterless toilet systems - House installations - Transport systems for wastewater streams - Sewer and pipe systems - Vacuum systems - Road transportation - Storage of mass flows - Treatment processes for grey, yellow and brown water
Wednesday	30/10/2013		Lectures <ul style="list-style-type: none"> - Anaerobic treatment for energy recovery - Recycling of nutrients - Products and qualities - Pharmaceuticals and micropollutants - Reuse options and value- added chains - Drivers and constrains for NASS - Stakeholders and acceptance - Costs and economic aspects
Thursday	31/10/2012		Teamwork The participants will work out detailed case studies on NASS concepts in five different teams for selected specific scenarios
Friday	1/11/2013		Teamwork <ul style="list-style-type: none"> - Continuation and completion of the teamwork - Presentation and discussion of the developed case studies. The teams will present their case studies to the other participants and discuss the results comparatively.

Saturday	2/11/2013		Excursion: Visit of a NASS pilot-project
Sunday	3/11/2013		Free time
Monday, Tuesday	4/11/2013 5/11/2013		Participation at the DWA Seminar on Water Reuse
Wednesday Thursday	6/11/2013 7/11/2013		Participation at the International Symposium Re-Water
Friday	8/11/2013		Departure

Workshop Organization

The summer school will take place in Braunschweig, Germany at University of Braunschweig. The Technische Universität Braunschweig, Institute of Sanitary and Environmental Engineering will host the summer school within the framework of Exceed project that is funded by the German Academic Exchange Services (DAAD).

Lecturers and Course Material

For each of the main related topics, leading scientists/practitioners will be invited to provide lectures. A brief summary of each lecture/exercise and of the expected learning outcomes, including a list of the supporting course material (lecture notes, related publications) will be handed to all participants. At the end of the seminar, a memory stick will be distributed to each participant including a copy of the lectures, the supporting course material, the photographs taken during the excursion, etc.

Target Audience

The participants expected are preferably advanced master students, PhD-students, post-doctoral researchers and practitioners with sufficient engineering and scientific background (M.Sc., M.Eng.) interested in acquiring knowledge and competence in NASS.

Number of Participants

The number of participants is limited to 20. Candidates from the DAAD-EXCEED partner universities are to be given first priority. Practitioners, decision-makers and trainers intending to transfer the acquired knowledge and skills directly into engineering of new alternative sanitation systems will also be given priority. Selected candidates shall be inspired to submit contributions for oral presentations in the specific field of NASS.

DAAD-EXCEED will cover the following costs: flight, accommodation.

Application:

Please apply online until **May 10, 2013**.

<http://www.exceed.tu-braunschweig.de/apply/summerschool>

Among all applicants, 20 will be selected till May 14, 2013, so that every candidate will be informed about the outcome of his/her application before End of May 2013.

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