



NEWSonREUSE

ISSUE 13 | VOLUME 3 | JANUARY 2017

Welcome to our first newsletter in the year of 2017. CDD Society recognizes this year as the 'year of outreach'. For the reuse context, this means making safe reuse of treated wastewater and fecal sludge possible for a larger group of farmers and other stakeholders. This is the third and final year of our Project Nexus that aims at closing sanitation, agriculture and nutrient loops. The team is excited and looks forward to establishing long-term collaborations and partnerships beyond the project period to further the vision of safe treatment and reuse of human waste in India. We hope this newsletter will give readers insight into the world of human waste reuse and challenges associated with it.

Welcome on Board!

The team is glad to introduce our new intern Gagana S. from SJCE Mysuru, where she is pursuing her Masters of Technology in Health Science and Water Engineering. As part of her studies, she is working with CDD Society to carry out her thesis on "Co-Composting of Treated Fecal Sludge with Municipal Wet Waste - Devanahalli". The main objective of her study is to understand the characteristics and effects of different parameters within the co-composting process, and to assess how co-composted sludge influences soil fertility and crop growth/yield.





Collaboration with University of Agricultural Sciences, Raichur, Karnataka

Our team members Girija, an agricultural specialist, and Nithin, a civil engineer, visited the University of Agricultural Sciences (UAS) Raichur in late December 2016. The aims of the visit were to discuss the installation of a Faecal Sludge Treatment (FST) facility in the agricultural research station of Gulbarga (a town in Karnataka) on the one hand, and to explore potential research collaborations between CDD Society and the University on the other hand. The discussions were fruitful and the university officials were convinced by the proposed planted drying bed-technology, which can take large loads of fecal sludge at once. The University agreed to grant the land for the construction, based on the potential of future reuse interventions and research opportunities for the college. The collaboration has culminated into a Memorandum of Agreement (MoA) between CDD Society and UAS (R) to initiate above-mentioned activities. We thank the University officials and look forward to a successful collaboration.

Preparations to Kick Off Agricultural Reuse at Devanahalli FSTP



The team is continuing its windrow co-composting operations of treated fecal sludge with municipal wet waste at the Fecal Sludge Treatment Plant Devanahalli. As of January 2017, the first windrow has completed all the four phases of composting, i.e. the mesophilic, thermophilic, cooling and maturation phase. Throughout the process, samples of the different composting stages were sent to Veterinary and Agricultural College Bengaluru to test for physical, chemical and biological parameters. While the results for the mature sample are not yet available, the 15 day-old compost sample already showed a significant reduction in pathogen loads when compared to the treated dried fecal sludge. Additionally, activities for agronomic trials are continuing at the site before the final compost is ready for application. Over the past two months, we had cultivated cover crops at the site to enrich fertility and to remedy for soil pollutants. These cover crops have now been harvested, and the team has started planning for the current cropping season. We are planning on experimenting with different soil treatments (e.g. application of dried sludge vs co-compost) and different farming practices to analyse how these treatments influence soil properties, and crop growth, quality and yields.



Household-Level Reuse Intervention at Eco-House, Bengaluru

The team members have initiated a systematic crop planning for vegetable cultivation in an ecologically built, individual household in Bengaluru. Amongst others, this building features an at-source urine-diversion system, an ideal antecedent condition for agricultural reuse. The crops planned are based on the requirement of sunlight (sun loving/shade loving/partial shade loving), and crop restrictions are followed according to safety measures relating to the reuse of human waste. The crop planning also takes into consideration other criteria like growing season, soil depth, root growth and available space that helps in deciding whether to go for perennials/non-perennials, climbers/non-climbers etc. The vegetables planned include okra, passion fruit, radish, tomato, cluster beans, brinjal, chilly and different varieties of spinach. The sowing has already been completed and the team is monitoring regular maintenance of these plants. The success of this intervention would prove that urban farming can be managed efficiently while reusing the waste generated at the source. This can have strong implications for ensuring availability of safely grown food and tackling food insecurity at the household level.

New Cropping Season and Long-Term Plans for our First Pilot Site, Beedi Worker's Colony

In 2015, we started our first intervention under the Nexus Project: reuse of treated wastewater for vegetable cultivation at Beedi Workers' Colony (BWC). Situated directly next to CDD Society's Bengaluru office, the site proved ideal for continuous monitoring and regular data collection to ensure produce safety. After successfully cultivating last year's Rabi season and this year's Kharif season crops, the team is now moving ahead with the third season of crop production in Beedi Workers' Colony, i.e. Rabi season 2017. The harvest from the last two seasons was distributed to around 45 children of Anganawadi (pre-school). Regular distribution of harvest to nearly 348 households of the colony has been ongoing to sensitize them for the potential of growing nutritious food in one's own household or community. The team will continue following organic farm management practices, such as the omission of chemical fertilizers and pesticides, the inclusion of more diverse crops, and a multi-cropping system. Simultaneously,



we are also in the process of handing over the intervention site to the local community. Therefore, the cropping plan also includes growth of several perennial crops (i.e. plants which live for several years). Moreover, we have started an aquaculture trial in our polishing pond: After reviewing the recommendations given by the Fishery Department on species which can survive in wastewater, we decided on starting our trial with common carp. This fish is known to tolerate high nutrient and pollutant levels, which facilitated its spread throughout Europe and Asia. For our trial, we are utilizing it as an indicator species* for water quality. Once we have ensured that common carp can thrive in our polishing pond, we will replace it with another species which also has the ability to purify the water further.



**(the presence, condition, and diversity of fish, algae, insects, plants and other aquatic lifeforms provides valuable information about presence of nutrients and/or environmental contaminants).*



Networking meeting and Boodheri visit with EcoPro

Our team member Clara, a soil scientist, traveled to Auroville in mid-January to coordinate with our project partner EcoPro on shared projects in and around Auroville. EcoPro has been our long-standing partner and is intervening in the field of organic farming by promoting reuse of urine and 'humanure' derived from Urine Diverting Dry Toilets. There have seen great successes on the field with tribal and rural communities, but are also facing many challenges considering policy regulations to enable reuse of human waste-based products in agriculture. This visit was done to plan for the year 2017 on how more of these challenges can be addressed and how CDD Society and EcoPro can jointly promote organic farming, UDDT construction and reuse of UDDT products in Tamil Nadu.

US-Based Reuse Researchers Visit CDD Society

Dr. Zachary Burt, post-doctoral research fellow at Columbia University, and Sharada Prasad, PhD candidate at University of California Berkeley, visited CDD Society to talk about their past, present, and future reuse-focused research projects in India and Rwanda, respectively. We thank both researchers for sharing their knowledge and experience in this sector with us and wish them success with their research projects.



[Dr Zachary Burt](#) is connected to India through his PhD research, parts of which he conducted in Hubli Dharwad, Karnataka. There, he assessed user preferences, willingness-to-pay and total net benefits of on-the-ground drinking water intervention projects. Currently, he is preparing for his post-doctoral research in Kigali, Rwanda, which will focus on optimizing fecal sludge reuse for energy generation. He outlined the current situation at the site, and his specific research interests in assessing collection and transport practices from households to incineration site.



[Sharada Prasad's](#) approach is interdisciplinary in nature, and encompasses sociological as well as environmental dimensions. His PhD research revolves around three focal points: (1) opportunities and barriers related to fecal sludge reuse, including truck operation; (2) health risks associated with collection, disposal, and reuse of fecal sludge in different sanitation scenarios, notably manual scavenging, manual servicing, mechanical servicing; (3) assessing phosphorous reuse potential under existing conditions of fecal sludge management and exploring how it can be increased, e.g. through policies and regulations and crop research.



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We welcome your comments, suggestions and queries! Please write to us:

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