

Composting of undewatered public toilet sludge in peri-urban settlements of Ghana

Posted by Eugene - 07 Feb 2013 17:28

Hi,

Am a student from Ghana and want to conduct a research on Composting of undewatered public toilet sludge in peri-urban settlements. The composting will be done using public toilet sludge and organic bulking materials (sawdust, coconut fibre, rice husk and palm fruit fibre) in lined trenches.

Any comments and suggestions before i kick start my research?

Thanks

Re: Composting of undewatered public toilet sludge in peri-urban settlements of Ghana

Posted by muench - 11 Feb 2013 01:08

Dear Eugene,

You have posed a very broad question here. Better if you first give us more background, such as:

- what have you read already for your literature review?
- what are your research questions?
- who is funding this, who is supervising the research?
- what is the ultimate aim of this research?
- and so forth.

I assume you have already read the SuSanA case study on co-composting of sludge (have you visited the site in Kumasi yet?):

Cofie, O., Koné, D. (2009). Co-composting of faecal sludge and organic solid waste in Kumasi, Ghana - Case study of sustainable sanitation projects. Sustainable Sanitation Alliance (SuSanA).

www.susana.org/lang-en/case-studies?view...mp:type=2&id=113

Also have you looked at all the papers and presentations from the recent faecal sludge management conference in Durban:

www.susana.org/lang-en/conference-and-tr...conferences/781-fsm2

Hope this helps.

Kind regards,

Elisabeth

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Re: Composting of undewatered public toilet sludge in peri-urban settlements of Ghana

Posted by Samsonfoli - 13 Feb 2013 09:36

Dear Eugene,

It is a very interesting topic that you are going to research; especially from our point of view! We are Safi Sana; a total sanitation and waste management company in Ghana. We currently produce biogas from faecal waste and organic market waste in Accra. Our activities also include research into co-composting of dewatered faecal sludge (after biogas production) and market waste to produce organic fertilizer. The aim is produce a product for commercialisation in Accra and Ghana as a whole. Kindly find more information on www.safisana.org

With this said, it would indeed be interesting to meet you once in Accra. We are building on knowledge and experience on waste management so I think there are opportunities for collaboration. Please contact me on

This e-mail address is being protected from spambots. You need JavaScript enabled to view it

All the best in your research

Samson

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Re: Composting of undewatered public toilet sludge in peri-urban settlements of Ghana

Posted by joeturner - 13 Feb 2013 14:39

When you say 'lined', what do you mean? Co-composting requires the maximum amount of air to reach the materials, so you'd most likely be better not to try it in a trench of any kind (unless you mean it is 'lined' with a pipe forcing air through the pile).

If you have not dewatered the sludge, I'd think you'd be needing a lot of bulking material and it will be hard to handle and aerate. You might be able to dry the sludge out in situ, but you might also encourage volatilisation of the nitrogen, which in turn may affect the value of it as an agricultural amendment.

It kinda-of depends what your objectives are, but in order to get the most efficient pathogen destruction, you need to dry the sludge out and stack it up into tall windrows and turn it frequently.

Advice: get the sludge as dry as you can mechanically, add as much carbon-rich material as you can get hold of - ideally at least 4 parts carbon-rich to 1 part sludge - stack it up as tall as it will go and turn it every week for at least the first few weeks.

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Re: Composting of undewatered public toilet sludge in peri-urban settlements of Ghana

Posted by Funke - 14 Feb 2013 09:38

Hi Eugene,

Elizabeth asked you some interesting questions which you should respond to. I guess you know that in your department alone, we've had up to five M.Sc and one PhD theses on the Buobai co-composting project in Kumasi. Have you reviewed these theses? If yes, what are the gaps that you are trying to address and what specific questions do you have so we can better advice you?

Best,

Olufunke Cofie

Re: Composting of undewatered public toilet sludge in peri-urban settlements of Ghana

Posted by Eugene - 14 Feb 2013 15:28

Dear Elisabeth and Olufunke Cofie,

Thank you very much for your comments. At the moment am still reviewing the literature available to me. I have reviewed the study on by Cofie, O., Koné, D. (2009). Co-composting of faecal sludge and organic solid waste in Kumasi, Ghana and other literature as well.

From literature i realised that composting was done for dewatered sludges. However, my study area which is the peri-urban settlements mostly rely on public toilets and other onsite toilet facilities. Faecal sludge from such facilities are not dewaterable.

Therefore the aim of my study is to come up with a low tech technology (Trench system) for composting the undewatered sludge.

At the moment, i have not come across any research work carried out on composting UNDEWATERED faecal sludge (public toilet sludge). After the study i will compare the findings with that of dewatered sludge.

I am still at the proposal writing stage and so all your comments and suggestions are very much welcomed to streamline my steady.

Am already feeling good to be part of this platform.

Regards

Eugene

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Re: Composting of undewatered public toilet sludge in peri-urban settlements of Ghana

Posted by joeturner - 14 Feb 2013 15:49

At the moment, i have not come across any research work carried out on composting UNDEWATERED faecal sludge (public toilet sludge)

That'll be because dewatered sludge composting is not possible. As the others have said, read the reports linked to above - they show that even 'dewatered' sludge required additional dewatering to get it to the point where composting was possible.

Why do you want to do it in a trench?

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Re: Composting of undewatered public toilet sludge in peri-urban settlements of Ghana

Posted by Eugene - 14 Feb 2013 16:05

Hi,

Thank you very much for your comment. Am at the proposal stage and will consider your comments. I will update you when i get a good draft proposal.

Regards

Eugene

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Re: Composting of undewatered public toilet sludge in peri-urban settlements of Ghana

Posted by Eugene - 14 Feb 2013 16:15

Dear Samson,

Thanks for your encouragement

Regards

Eugene

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Re: Composting of undewatered public toilet sludge in peri-urban settlements of Ghana

Posted by Funke - 28 Feb 2013 10:32

Hi Eugene,

Indeed, it is difficult to dewater public toilet sludge. In our studies we mixed it with more stabilized sludge from household septic tanks and dewater the mixture in drying beds.

In Tamale, northern Ghana, farmers already use the trench system to store FS in the dry season and later use it during the growing season. Usually, they place plant straw in the trench before FS is discharged. I will not call it exactly co-composting because it is not a controlled set up. It is rather an extended storage of FS before use. Because of the trench, the pathogens are not completely inactivated at the point of use, usually after 3-4 months of storage. Perhaps you can improve on this system? For more information, read:

(1)Cofie, et al.(2005) The use of human waste for peri-agriculture in northern Ghana. Renewable Agriculture and Food Systems: 20(2); 73–80.

(2)Razak Seidu. (2010). Disentangling the risk factors and health risks associated with faecal sludge and wastewater reuse in Ghana. PhD Thesis. Department of Mathematical Sciences and Technology. Norwegian University of Life Sciences. Norway.

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Re: Composting of undewatered public toilet sludge in peri-urban settlements of Ghana

Posted by Florian - 28 Feb 2013 11:22

Hi Eugene,

just generally speaking, without knowing the exact reasons on why you aim at composting:

For fresh sludge from public toilets, a good treatment strategy would be to first stabilise/mineralise the sludge in anerobic treatment (ideally with biogas recovery and use), and then dewater and sanitise the sludge.

Fresh sludge has the disadvantage to be difficult to dewater. However, on the other hand, the "freshness" has also the advantage that biogas can be recovered from digestion of the sludge. (with sludge from septic tanks its the other way round: easy to dewater, but little potential for energy recovery).

The digestion residue can be relatively easy dewatered (e.g. in drying beds) and then stored for hygienisation.

Best, Florian

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