Marketing excreta in order to create a sustainable system for slum sanitation?

Posted by ennoschroeder - 10 Nov 2011 18:01

Dear all,

some time ago (about one month) we had an interesting discussion around the issue of marketing human excreta on the EcoSanRes Forum.

Even though this will be quite a long post, I decided to transfer some issues of that discussion to make it accessible to a broader audience:

The whole discussion was triggered by a study I did about the marketing of human excreta as fertiliser. The idea here, was basically to develop an economically sustainable logistics systems for separated human excreta which are generated in Urine-Diversion-Dehydration-Toilets (UDDTs) or similar devices, in slum areas of the capital of Uganda, Kampala.

In order to finance the logistics, the generated human excreta should be marketed as fertiliser and used in agricultural areas around the city. Various interviews have been conducted with stakeholders, data was collected and literature was reviewed in order to design the logistics systems. After drafting them, cost calculations were carried out in order to test their economical feasibility.

To give you a rough idea about the outcomes I compiled a few results and key recommendations here:

- The logistics of human excreta can be feasible and even profitable.

- The scale of the systems modelled ranged between 67,000 and 430,000 people covered (600,000 to 3,870,000 litres of urine; 140,000 and 903,000 kg of faeces)

- The calculations showed that, the larger the systems are designed, the higher is the profitability

- The profitability of the systems can be influenced significantly by a variety of factors. Among them transport distance, project lifetime and nutrient/fuel prices showed the largest effects.

- The distance between slum and agricultural area should be minimised.

- High socio-cultural barriers towards handling and using human excreta as fertiliser exist.

- Sensitisation is capable to change people's perceptions and behaviours considerably. It has to be applied to prepare and accompany the process of implementation. (All stakeholders involved)

- The assistance of economical tools like the incentives applied in this study are likely helping to change people's perceptions and behaviours sustainably and present an option to increase the implementation efficiency of the proposed systems. (Residents)

- A combination of household-, shared landlord- and public units has to be implemented to achieve maximum sanitation coverage.

- If not being competitive in terms of nutrient content and plant availability, handling/managing efforts/costs and product price, a fertiliser will not be purchased and used by farmers.

- The best service regarding the logistics of human excreta can be provided by a private company that is established for that type of business. Alternatively an existing company could enlarge its portfolio by investing in infrastructure especially designated for the logistics of human excreta.

- As large scale consumer of urine in its liquid state flower farmers have been investigated. Organic producers and medium scale farmers would also utilise certain amounts of urine in its liquid state.

- Operating a supply chain for urine as proposed in this study poses considerable risks (e.g. bad road conditions, truck breakdowns and accidents).

- The best option for marketing dried and sanitised faeces is by selling them upon collection. Hence no vulnerable and cost intensive supply chain has to be applied. Further tests regarding the practicability of the sanitisation and pick up method are necessary.

(If interested in the details, the study can be downloaded here: www.susana.org/lang-en/library?view=ccbk...mp;type=2&id=752)

Now, different people reacted to that announcement. Here is a selection of the replies:

1. Clouet Benjamin:

Thanks for sharing!

My question might be stupid as I never worked on slums before ... but from our experience in Cambodia, and some informal studies we did on the collection-treatment and reuse of sludge from pit latrines (more complicated to collect and far less nutrient recovery than you system) we realised that for the sustainibility of the system the price of collection was far more important than the potencial sales of the compost.

Secondly, the time that a proper downstream market for compost is created, branded and solid, how do you make live the collecting company. On the other hand if you base your income on collection the system can start to live meanwhile and the reuse would be extra later.

So here are my questions

Would that sound crazy to make pay someone from a slum to empty his toilet, even small amount?

What is the distance from small farmers to the slum, can collection system be done by just a small scale famer with a bicycle/moto and a kart of 200l ? I mean very decentralised system. What always put

problems of expenses / managment is big trucks no?

Could there be any service provided when collection to justify the price, cleaning of the toilet / a bag of vegetables against the jerrycan of urine etc ...?

Again I am neither familiar with slums nor Uganda so don t be offened if all that sounds stupid, it´s more personal curiosity. I´m just always surprised that most project on human compost bases the financial plan on end product rather than the collection service.

2. Kent Madin:

Ben, IMHO you hit on a very important point. It's silly to try and start from the notion that you will convince people that shit=gold. on the other hand, a scheme which gets the excreta out of their backyard or out of the open trench running down the street is a self evident benefit.

Also I am always struck by this logic of treating human SOLID waste as if it were so incredibly valuable. There is nothing magical about human solid waste that makes it a superior component of compost for fertilizer. Quite the contrary, it is a fundamental problem to render it pathogen free. Urine, yes, of course. But take the example of Mongolia where people have little use for fertilizer (one interesting exception is a garlic farmer in Mongolia who likes the idea of composted human waste because it doesn't contain weed seeds that livestock compost has). Mongolians don't need fertilizer so trying to sell composted waste is ridiculous. They just want it and the flies and smell and contamination gone. So it makes more sense to burn the semi-dried waste while focusing on collecting the more valuable urine and looking for ways to make urine's use more widely acceptable. Why not just focus on ways to collect and sterilize human sold waste? If people understand, for instance, that being dilligent about UD toilet use so that solid waste is fully or partially dessicated (and volume lowered) then it is conceivable that you could charge so amount to remove that waste and burn it looking at the issue of one of purely public health.

3. Enno Schroeder (me):

Regarding your remark about the importance of the price of collection or the potential sales for the overall sustainabilty I have to say, that my idea was to market the excreta fertiliser in order to create an income in order to 1) cover the logistics, 2) create profit for a private company taking care of the logistics and 3) cover incentives paid out to residents of informal settlements to motivate them to take part in the sanitation system by delivering their excreta (in properly sealed containers) to a collection point. So, I tried to come up with a system with sustainability along te whole sanitation chain.

To answer your questions:

Would that sound crazy to make pay someone from a slum to empty his toilet, even small amount?

>This is a tough question. Because on the one hand the emptying can't and shouldn't be for free, since someone would have to take care of it (like a private company or the local authority) and this consumes money. Otherwise there would be no sustainability in place and the service could not be provided. But one the other hand I think there is little willingness to pay for those services, because of alternative ways of emptying the pit even if this causes major health risks. So, what to do instead? And there we are again with this incentive driven collection scheme, where people receive money for the excreta they deliver to collection points (cf. above)...

What is the distance from small farmers to the slum, can collection system be done by just a small scale famer with a bicycle/moto and a kart of 200l ? I mean very decentralised system. What always put problems of expenses / managment is big trucks no?

>Based on my calculations the logistics system has to be large scale. We have to think big regarding the system as economies of scale are also valid here. The problem about the whole issue of fertilising with human excreta is, that the fertilising value to weight ratio is considerably bad. So distances should always be minimised. The same is applicable for the times a truck commutes between source and destination to do the transport (example: a pick up truck would need to go 10 to 20 times whereas a 10000 l tank truck only needs to go one time).

Could there be any service provided when collection to justify the price, cleaning of the toilet / a bag of vegetables against the jerrycan of urine etc... ?

>I think this is already answered with the incentives isn't it? Otherwise when we talk about public units the user fee could be used for paying the operator and this one also takes care of the cleaning. I hope this clarifies it a bit. Don't hesitate to ask more!

Carol McCreary:

Hi,

Enno's work has been an eye-opener for me because of the way he makes clear the entire value chain in excreta treatment and reuse and the fact that things fall apart when scrupulous attention is not paid to every aspect. And Ben's and Kent's contribution to the discussion are superb.

I'm connected with the Sustainable P Initiative at Arizona State University, where we're looking at all the issues of P recapture, recovery and reuse in a whole spectrum of systems from wastewater treatment to decentralized UDDTs.

Yes, indeed it's hard to make the case that SHIT=GOLD. As Kent says, there are situations when it's okay to say just throw it out, just dispose of it safely. But this also focuses attention on urine. Ultimately food security issues - as well as the immediate food safety ones that people here in the US pay huge attention to - bring us to dealing with voluminous urine and the logistics challenges that Enno

has underlined.

I really appreciate this discussion.

So, that was kind of the end of that discussion there.

Feel free to continue it here - let's see where this leads us to!

Have a nice evening,

Best regards,

Enno

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Re: Marketing excreta in order to create a sustainable system for slum sanitation?

Posted by NPreneta01 - 07 Nov 2012 11:56

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Chris,

Thanks for picking up on that and apologies for the slow reply. Definitely not hitting 175C, that should be read as [b]175 F,[b] which you are right in saying it is plenty hot to kill off pathogens. Any higher, however, and you start killing off the microorganisms that you need to have around.

In terms of marketing compost, Dominic, I'm sure you are aware of the market analysis done in Ghana by IWMI, who are selling their compost in bulk to companies involved in housing/landscape projects where the risks associated with using compost is extremely low. Perhaps you are working with this group?

Thanks for putting those resources up, I will take a look at them.

Nick

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Re: Marketing excreta in order to create a sustainable system for slum sanitation?

Posted by Massimo - 07 Nov 2012 12:13

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Hi Guys, have been following this discussion for a while now. We have a plant that we designed specifically for the processing of human waste. The idea is to heat the product up sufficiently to kill off the pathogens, etc, and have an output product that can be used as a ground conditioner (fertilizer). You may want to have a look at our website. Also, I am attaching a brochure here.

The machine can be built in various sizes, to accommodate specific through put, and with variable MIR's, depending on the water content of the product. For rural use, the machine is built inside a container (easier to transport, and lock up at night) and comes complete with a second container which houses the diesel / petrol generator, and electrical controls. Finally, it's a South African invention, built in South Africa, for African conditions! Low maintenance costs, easy to run, and the out put can be sold to defray some of the costs. In optimum conditions (with the right throughput) the operation can be run at a profit!

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