Source Separation, Treatment and composting of human excreta for soil enrichment, pesticides, economic and social empowerment: Experience and practice.

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Introduction

The presentation is about 7 years lessons, experiences and practices on source separation, treatment and compositing of human Excreta for soil enrichment, pest control and the attainment of economic and social empowerment.

Brief history

2 acre plot of land acquired in 1995 in Nyabikoni, a semi- urban area, semi - planned residential area for middle class.

- Formerly the land was used for Eucalyptus plantation. Eucalyptus a heavy feeder left the soil very badly depleted of fertility, no food crop could grow.

Nyabikoni became a prime area for residence due to its proximity to social services the expansion of the Municipal area.

Eucalyptus uprooted forth with

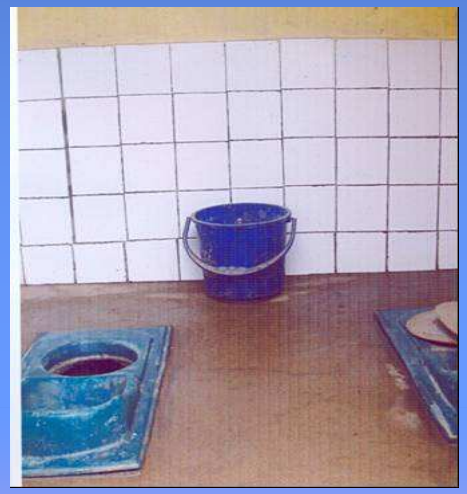
Industrial fertilizer was and is too expensive and for the good of environment it is known that these end up in the water table and hence pollute the water systems which is not the good option

Treatment of faeces

- Faeces often contain diseases causing pathogens. Pathogens require a medium of moisture and temperature to survive Separation of faeces and urine and addition of ash to faeces eliminates the smell and flies from the toilet (Schönning and Stenstrom, 2004).
- This dehydrates the faeces and hence deprives the pathogens of the vital moisture needed for growth (Jo Smet and Sugden 2006).
- The faeces and the dehydrating ash contain vital soil enriching elements N, P and K (Niwagaba et el,2005).

- **2002 an Ecosan toilet was constructed due to its salient advantages e.g. replacement of industrial fertilizers which were highly needed but expensive with toilet products.**

The toilet



The toilet is a DV UDDT (Double Vault, Urine diverting dry toilet).
Every user (about 5 persons and 8 day laborers) adds ash after use.
It takes between 8 – 12 months to fill.
It's the only option/toilet available
Urine is collected into a urine 40L tank.
Charts on use are hang in the toilet and first time users are shown how to use it.

In Nyabikoni:

1. **Faeces and urine are not allowed to mix with urine in the processing chamber. Through a pipe (1/4 size) urine is diverted to a urine retaining container.**
2. **Ash is used as the dehydrating material**
3. **Retention period is minimum 6 months**
4. **The toilet material is composted for further treatment and betterment of the final fertilizer.**

Application in the garden (Faeces)

- When the chamber in use is filled up the contents are retained there for 6+ months.
- After 6+ months, the faeces are removed from the chamber and put in the compositing pit of about 2x2x1 fro 2-3 months.
- To improve quality, aeration and temperature, foliage of *Tithornia* plant is added. Final compost is a dark soil.
- Composted material is very suitable for the broadcasting technique preferred by local communities in planting maize, bush beans, Pease etc
- For vegetables, straight shallow trenches are made, manure applied and crops planted.

- Fruit trees like avocado, apples, pears, banana plants e.t.c; pits of 2ft*2ft*2 ft dimension , manure mixed with top soil of about 1:2 ratio is put into the pit, then left for two weeks before planting.

Urine

- Studies show that urine has less pathogens than faeces (Winblad et el 2004), and
- has a wide range of mineral salts and urea that are not only beneficial to man and animals but also to plants. (Niwagaba et el 2005).

1. Urine can be used alone; however, due to its volatile content urea, used immediately from the container can scotch crops if applied on leaves (folier feed).

What we do is keep the urine in the container for up to 21 days then it is diluted I unit of urine to 6 units of water.

NB On my Nyabikoni backyard, we dilute according to whether it is a wet or dry season for also scotching can be less in the wet season than in the dry, so more dilution in the dry season is rational.

Garden application: Urine

2. **Pest control:**

Mixture: 20L urine ,1kg ash ,1kg Tephrosia fresh leaves and or Tithornia, 2 handfuls of red pepper.

Other rich foliage can be used

- **Store for 21 days**
- **Filter the contents. Use a spray pump for folier feeding. Here again it is very necessary to dilute as said above. (wet or dry season) . It kills aphids and banana weevil. Trials on fungus is being done.**
- **This mixture (though filtering is not required here) can be used very much like the liquid manure around roots of crops e.g. fruit plants like apples and vegetable crops**

Observed results/Lessons

- Crops, where the faeces manure has been used become greener and luxuriant
- The yields are higher and non indigenous fruits (apples) are now grown
- Separation makers handling of the resources very easy and non repugnant
- Regular foliar feeding once a week or more depending on the season enhances growth particularly of vegetables.
- Application on apple plants and avocado trees, aids in stopping loss of inflorescence (fruit abortion which is due to lack of sufficient mineral salts).

results/Lessons cont´d

- For replication of a technology to take place, demonstration of success is very important. Success stories must be told!!
- Sharing of information is a vital part in knowledge transfer. (200 Members KAFNA which started with about 50 members).
- Ecosan becomes a cheaper way of achieving soil fertility, managing and treating excreta.
- Urine is a natural and available pesticide, generated at a household.
- Training of farmers at individual and group level is done, and NGOs e.g. Africa 2000 etc have made it a focal home.

preparing a maize garden. The broadcasting method.

Sugarcane grown using the acquire compost

An apple plant in bloom

Some members of KAFNA on farmer exchange visits

The 'forest' of fruit trees and fruits in Nyabikoni

Conclusion

- People should recognise God's creation/ nature of mankind, where urine and faeces are not mixed upon exit from the body.

- Ecosan is cheap, manageable, improves the sanitation at household, household income and food security.