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Management of EcoSan System in Urban Areas:" EcoSan_UE Project Case Study" in four sectors of Ouagadougou, BF.

Chiaka Coulibaly [Mali]

Ecological sanitation is an alternative to linear sanitation approaches that often end up to carry waste to water bodies. It is based on an ecosystem approach where the nutrient and organic matter contained in human excreta are considered as a resource in food production. While this approach is relatively straightforward in rural areas where the households can use the fertilizers in agriculture, it is more complex in urban areas where the households generally do not engage in farming. In such a setting a collection, hygienization and reuse often need to be done off site. To show that EcoSan approach can be suitable also in urban areas, a pilot project in Ouagadougou called EcoSan_UE Project has been implemented during three years, 2006-2009.

The main objective was to facilitate access to ecological, sustainable, healthy and affordable sanitation systems for the populations of the disadvantaged, rapidly growing sectors of Ouagadougou. These systems should protect human health as well as contribute to food security and the protection of natural resources. The project should also strengthen the capacity of CBO¹ and SME² to engage in the EcoSan system. A total of 932 UDDT³ were built in the four sectors concerned by the project and in each sector a collection circuit and an Eco-Station was implemented as well as participative tests with urban farmers on the use of urine as liquid fertilizer.

*An institutional arrangement was set up to manage the EcoSan system put in place; which involves local associations at three levels: **collection and transportation, treatment and packaging as well as delivering of the EcoSan fertilizers**. This way the project has had a coordinating role, while the implementing activities are outsourced to the associations. The coordinating role is transferred to the municipality in 2009. The cost of the local associations can be reduced as they also benefit from a small collection fee from the household and an income from selling hygienized excreta to the farmers. The system thus becomes bearable from municipal point of view and provides jobs and business opportunities.*

Introduction

In the running of EcoSan_UE Project, an institutional arrangement is mounted to manage the EcoSan system put in place. This arrangement involves local associations at three levels in the system: collection and transportation of excreta, hygienisation excreta in the EcoStation and delivering the end product to urban farmers. These levels are managed by one local association in each sector. The arrangement has allowed the coordination of the project to be concentrated on the coordination activities and to have management done by local associations. In this case, the capacity of these associations should be reinforced to better carry out the activities.

Presentation of EcoSan_UE Project

EcoSan_UE Project is a pilot EcoSan Project in urban area developed by CREPA in cooperation with the GTZ as well as ONEA. It concerns four sectors in Ouagadougou capital of Burkina Faso, with the involvement of the municipalities of the concerned sectors. The cost of the project is 1497120 Euros sponsored at (74%) by the European Union, 14% by CREPA and 12% by GTZ for a limited time of three years starting in June 2006.

The specific goals of the project are:

- To develop a sustainable sanitation system adapted to local needs, socially acceptable.
- To create an institutional environment to facilitate the adoption of EcoSan approach.

- To Support and promote the future involvement of the private sector in the supply of sanitation services.

In order to reach these objectives, the following strategy was adopted by the project. It consists to put in place an EcoSan system which considers all the aspects of the project and secondly to find an institutional system to manage properly all the activities of the project.

Description of the system put in place

In the running of UDDT project in urban area, the involvement of the beneficiary at all step is imperative to take count all aspects (need of toilet, need of fertilizer, or both, etc). The system put in place by EcoSan_UE Project, contains six steps which contributed to reach of the result of the project.

Step1: generation excreta

Three different types of urine diverting dry toilets are proposed by the project and adopted by the households. The toilets are the levels where excreta (urine and faeces) are generated. The toilets' promotion is done by the sensitizers who go from household to household to present the toilets and create the demand. Those who are interested in or convinced can build it even if they already have a toilet or change the last one if that is possible technically. The households which don't have any toilets are in the need to get a new one and they don't hesitate to get the opportunity offered by the project that is the subsidy.

Step2: Collect and transport of excreta

Urine is collected in 20 litres jerry cans (yellow colour) and faeces from double vault have to be emptied after hygienisation in situ and then are collected in sacks. For single vault toilet, faeces are collected in bucket covered with rice sacks. Excreta are collected from the households twice a month by the collectors with a donkey cart. Two collectors conduct one cart; each one is wearing some protected materials like smock, mask, rubber boot and glove. Then they transport the excreta to EcoStation for hygienisation process.

Step 3: hygienisation and packaging

Once excreta arrived at EcoStation, they are emptied in some facilities and stored in it during a certain period of time called hygienisation time. This is a time necessary for the pathogens to be died off without any added product. During the research phase, we found out the hygienisation time at 30 days for urine and 6 months for faeces.

Urine is stored in 1m3 polytank for one month after being filled and closed hermetically. When it will be hygienised, the polytank is emptied into green jerry cans (20 litres) for packaging to differentiate with the yellow one. As for faeces, they are stored in the vaults until 2 to 6 months depending on the state of the faeces (fresh or dry). That means, faeces from double vault have to be sanitised for 2 additional months; while faeces from single vault, when the storage vault received enough fresh faeces (those are produced during 6 months), it will be closed for 6 months; after that the vaults are emptied. The sanitised faeces are broken to small pieces before being put in sacks (25 kg and 50kg of capacity).

Step 4: delivering to farmers

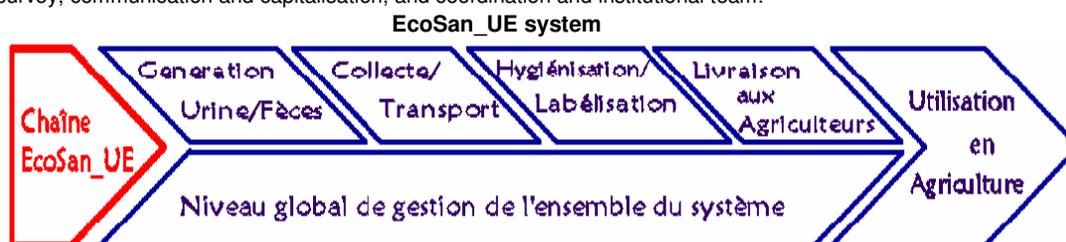
To convince the farmers that human excreta, urine in particular, are very rich in fertilisers component and they can replaced properly chemical fertilisers; the association in collaboration with the agronomist team of the project have to organise the product (hygienised excreta) delivering to the farmers for conviction test. Many sites were identified with the farmers to test different fertilisers and combination of fertilisers and with different crops. In most cases, the results have shown that urine is more efficient than other fertilisers. Now the delivering is based on demand from users. That concerns the urban farmers among the four areas of the project which are organised in committees. The associations have been paid for this offered service. When excreta are ready to be used, the farmers order the quantity wanted for their crops fertilisation. The other users (privates sectors out side of Ouagadougou) have to transport their order by they own means of transportation (lorry in general).

Step 5: reuse in agriculture

The urban farmers use the faecal matter as the first fertiliser before planting crop and urines as fertiliser for crop maintenance. They are trained for the application of the two kinds of fertilizers. They are used to use faecal matter in agriculture and their customers know that but not urine. Their fear was to lose their customers so they request project to sensitise their customers otherwise if they discover this new practise, they may abandon them. Which is done later by the agronomist team and sensitizer team (awareness rising) just as some consumers.

Step 6: global level of management of the whole system

This role is played by the team of the project which is organised by small team to include all aspects of the project. Seven (7) teams are set up which are: sensitizer team, technical team, private sector promotion, agronomist, risk survey, communication and capitalisation, and coordination and institutional team.



UDDT promoted by the project



Equipment for collect & deliver urine



Polytank for storing urine



Vault for storing faeces



Crops fertilised with Birg-koom

Description of institutional arrangement

In the institutional arrangement, the project sponsors the equipment of the beneficiary (household, farmers and associations). It also builds and equips EcoStation in each sector of the project. It signs management contract with the local associations and follows their activities. These associations are trained to be able to succeed their duties which are:

- Collect the filled jerry cans and the sacks of faeces that come from single vault (these sacks are stored in a barrel before being collected and transported to EcoStation)
- Replace the number of full jerry cans collected by empty ones
- Empty the filled vaults for double vault latrine, when it is necessary
- Transport the excreta to EcoStation
- Supervise excreta hygienisation in the centre (EcoStation)
- Ensure handling of excreta in the centre and delivering of the end products to the farmers if needed
- Recover the excreta collection's fee from the household.

EcoStation or centre of treatment

To decentralise the management of the system, it is built an EcoStation which is a centre where the excreta are gathered for sanitation before delivering to the user. The centre contains equipment and facilities like:

- Donkey carts (for collection and delivering),
- Working (protection) materials for workers.
- Poly tanks and vaults to store urine and faeces for hygienisation ,
- Warehouse for storing the final product (hygienised excreta)

Hence, the household do not have to store their excreta, the hygienisation is made properly, the excreta are homogenised (mixed in the facilities) and the users (farmers) are guided where to provide with fertilisers. These centres are become now stores (shops) of natural fertilizers for the farmers and other users.

Strategy of collect and transport

To facilitate the collection in the household, we have divided the sectors in small areas. The biggest sectors (17 and 30) are divided in 12 areas and the small ones (19 and 27) are divided in 6 areas.

The sensitizers who are in charge to promote the toilets at the households have to locate their latrines to the collectors. Each team of collector has to visit all latrines in 6 areas between fifteen days. If there is a new latrine in one sector (area), this sensitizer will inform the team collector who intervenes in this area, and will locate it to them. The collectors go from door to door until they finished in the area and then they go to the closest areas and so on. They have to finish visiting all the families in two weeks with six work days per week. It is supposed that three jerry cans, among the four provided for the households will be filled during two weeks. For big families where the four cans can be filled in two weeks, two supplementary jerry cans are provided. If this strategy is put in practice by the collectors, it will avoid problems of storage urine at household. To assess this strategy, two trainees have followed up the association activities, one trainee for two sectors. In order to monitor the activities of the associations and capitalize them, we provide the association with many records which contain all information wanted.

Finding of the following up the activities

To be sure that the associations play their duties properly, they have to be followed in the beginning otherwise there can be some annoyances notably when all jerry can at the household are filled. This follow up is ensured by the trainees and is permitted also to adapt the defined strategy.

The collectors of sectors 27&30 work three days instead of two weeks as expected by the strategy of collect. This explains by the fact of the low number of latrines in the sectors and the mastering of the areas, so they collect according their own experiences. The number of jerry cans collected in the households is variable between one to two cans, so lower than the expected number by the strategy. The strategy adopted by the collectors of sectors 17&19 is the same with difference they prefer collect six days in two weeks. For the management of EcoStation, when the collectors arrive to the centre, they decant jerry cans into poly tank and faeces sacks in the vault. When the poly tank is filled they mark the date corresponding and the expected day for hygienisation. It is the same for the vault which store the faeces.

Financial aspect

As the benefit from the activities of the associations doesn't cover their charges, the project has to support them during a certain moment. The support fixed price paid by the project for associations is \$US 280 per month. This sum is the minimum fee to run the activities just for the staff and the donkey. In addition to this support fee from the project, the association benefit from households \$US 0.60 per month as the collection fee, and also the income generated for selling product (\$US 0.20 per jerry can of 20 litres Birgkoom (liquid fertiliser) and \$US 0.10 per kg of Birgkoenga (solid fertiliser). For the sustainability of the activities, the subsidy must continue until all households pay their fee and the selling become more effective. With an average of 230 toilets by sector, the collection fee is about \$US 138 per month and \$US 92 per month for the selling of 460 jerry and about \$US 50 per month for the selling of 5 faeces sacks of 50 Kg. This total sum (\$US 280) can cover the support gave by the project; but the profitability of the system become obvious when the number of toilet will increase or the excreta is collected from other places as some associations have already engaged. Further more if the price of urine will increased because the present fee is due to the subsidy of the project and the starting of a new approach (new fertilizers).

Difficulties of the associations and finding solutions

- Long distance between latrines and also between latrines and EcoStation so long distance run by the collectors which is often near to 12 Km.

- Difficulties to access to households due to the bad quality of road in the sectors especially during the rainy season.
- Bad use of latrines (lack of ash, insertion of water in the vault, etc) particularly in the rented property the household where many families live together; generally they don't take care of the toilet.
- Collect of faeces sack form latrine (single vault) in cart without intermediate storage at household, they don't want to handle the faeces sacks even if they are filled and wait for the collectors to remove the sack and place it in the cart directly.
- Leakage of polytank, during the storage the polytank leaks out, due to the difficulty to waterproof the contact between the tank and the emptying pipe.
- Low level of demand of EcoSan's fertilizer by the farmers in certain sectors and high level in other so the long distance between EcoStation to equalise the demands.

In order to solve these difficulties, project has took different actions among them training, awareness rising.

Conclusion

Implementing urban ecological sanitation in cities like Ouagadougou, with all the aspects (generation of excreta to reuse in agriculture) is joined by many challenges. Among other: the need of toilet but not of fertiliser; the need of fertiliser but not of toilet; the need of both (toilet and fertiliser); the lack of money to contribute to the building, the unavailability to manipulate excreta; the lack of place to keep excreta up to be hygienised, etc. To overcome these challenges in order to satisfy all actors, EcoSan_UE Project has chosen to put in place its own institutional arrangement. In this arrangement, households are provided with UDDT, the excreta from these toilets are managed by the local associations. With this, the Project has created business opportunities for local association which will benefit from a stable income. The choice of local association to manage excreta has a positive impact in the running of the activities of the Project.

If the activities of the associations are going smoothly, the money collected at the households and the income from selling fertilisers remain too low to cover the charges. So the involvement of the municipality at the end of the Project to support the associations until they become self function. This will be effective when ONEA⁴ will continue the building in the four sectors in 2010.

Acknowledgements

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Note/s

¹Community Based Organisation; ² Small and Medium Enterprise; ³Urine Diverting Dry Toilet. ⁴National company of water and sanitation.

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Contact details

COULIBALY Chiaka	Name of Second Author
Address: CREPA 03 PB 7112 Ouagadougou 03	Address
Tel: 00226 50 36 6210/11	Tel:
Fax: 00226 50 36 6208	Fax:
Email: coulchi@yahoo.fr	Email:
www: reseaucrepa.org	www:
