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WASH REFLECTIONS

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Growing the waste re-use idea: The business opportunities

The time has come for authorities to recognise the business aspect of the concept of design for re-use by organizing series of fora where the business community will engage in identifying possible areas for investment.

This will help improve the present state of liquid waste and faecal sludge treatment and address concerns that treatment plants in Ghana are poorly operated and maintained. Financial constraints for operation and maintenance (O&M) of these facilities have often been cited as the main reason for this situation.

The suggestion was made at the 48th edition of the National Level Learning Alliance Platform (NLLAP 48).

The 48th NLLAP took place on 29th January 2015 at Erata Hotel in Accra under the theme "Design For Re-Use - Approach to Sustaining Operation and Maintenance of Sanitation Facilities." The discussion was led by a team of experts from International Water Management Institute (IWMI) - Dr. Philip Amoah; and Kumasi Polytechnic - Ing. Edem Bensah. This edition of NLLAP was organized jointly by RCN, IWMI, WRC and TREND with the support of Africa Water Facility/African Development Bank. The session was used to share the results of the Design for Re-use project with stakeholders. This reflection paper is to share the key issues that came up from the session with WASH sector stakeholders.

The Design For Re-Use Concept

Delivering the first presentation for the day, Dr. Philip Amoah of IWMI highlighted the inadequacy of treatment plants in Ghana, mentioning, for instance, that over 90% of existing liquid waste treatment plants do not function. This situation has led to the indiscriminate dumping of faecal matter, waste water and refuse with consequences for the environment.

Fixing these challenges, according to Dr. Amoah, requires that waste is not seen as a problem; rather, it should be considered a resource which can solve problems.

He then identified four main modules through which waste can be reused for revenue generation, namely:

- Effluent from wastewater treatment plant reuse for irrigation
- Incorporation of aquaculture into maturation ponds
- Large-scale land application of faecal sludge compost
- Biogas recovery

These concepts of Design for Re-usewhich were piloted in a project introduced in 2011 in Accra, Kumasi and Takoradi and supported by African Water Facility/African Development Bank. The project sought to improve public health and environmental integrity in urban and peri-urban Ghana by reducing the incidence of waterborne diseases and mitigating water pollution. Specifically, the project aimed at rehabilitating one wastewater treatment plant including reuse for irrigation, develop knowledge products based on action research for aquaculture, composting, and biogas value chains, and train local planners on design for reuse. The approach was to integrate profitable resource recovery into treatment systems and transform them from disposal plants to production facilities.

The Magical effect of Waste Water on Aquaculture

Dr. Amoah reported that as part of the project, experimental trials were carried out at Ahinsan and K.N.U.S.T. The objective of the trials was to test the survival levels of fish species; assess the pathogen level on the fish (quality of fish); and find out the metal concentration in the fish. Findings from the Project revealed that Clariasgariepinus (African catfish) were more likely to survive in treated waste water fed ponds due to their robust nature compared to tilapia. The pathogen levels and metal concentration were found to be within levels that can be handled appropriately through processing before consumption.

The team of researchers also conducted a Demand Assessment, Hazard Analysis and Critical Control Points (HACCP) and Cost Benefit Analysis (CBA) to assess the project viability in terms of its revenue generation capabilities. The demand assessment for example revealed that most buyers (74) considered the price of fish before buying followed by taste (48), size (43) and safety (43). This implies that the source of fish (that is whether from natural water fed ponds or waste water treated ponds) is not a primary consideration in consumer demand for the product.

Consequently, an Implementation Plan regarding the production of Cat fish in waste water treated ponds was being prepared and would be shared with the wider stakeholder when completed, Dr. Amoah indicated.

Using Faeces for Cooking and Electricity Generation

Taking his turn to make a presentation was Ing. Edem Bensah of the Kumasi Polytechnic, whose paper was on findings from the University of Ghana Sewage Treatment Plant feasibility study on Biogas as a source of fuel for cooking and electricity generation.

The aim of the study, he said, was to assess the technical and economic feasibility of setting-up a functional biogas plant within the sewage treatment plant, which received sewage and grey water from about 35,000 people at the time. The system treats liquid waste from University of Ghana, Institute of Professional Studies, Presbyterian Senior High School, and surrounding communities (Haatso and Madina).

He indicated that one of the challenges with the treatment plant is that it is not climate-friendly as methane (CH_4) is released into the atmosphere.

Nonetheless, Ing Bensah outlined three main options in terms of utilization of biogas – supply of power to the grid; piping and sale of biogas to households and institutions; upgrading, bottling and sale of biomethane.

According to Ing Bensah, given these options, the supply of power to the grid is more technically feasible; and that negotiation with PURC for appropriate feed-in tariff is crucial. Otherwise, the option of piping and sale of biogas to households and institutions is recommended.

He also advised that prospective investors in biogas production should check the viability of the project through a series of analyses such as financial analysis and sensitivity analysis. He added that implementation challenges may include leakages in biogas, which may cause fire; and sophistication of biomethane technology.

Ing. Bansah then closed his presentation with a call on government to support the biogas sector, which needs to be strengthened to reduce the waste in the system; emphasising that the need for Government to engage stakeholders on ways of revamping the biogas sector is crucial.

The Way Forward

Arising from the 48th NLLAP were the following recommendations:

1. Researches that have been conducted on Design for Reuse concept should be shared with funding organizations for further technical and financial support in implementing.
2. Institutions that are heavily populated such as universities, Senior High Schools and prisons should be designed in such a way waste water and faecal sludge that can be easily accessed for aquaculture, irrigation, composting and biogas.
3. Estate developers must be required to develop community systems where they can accumulate waste for reuse.
4. The business aspect of the concept of design for re-use should be touted. Sanitation business forum could be organized where researchers engage with the business community/private people on plausible areas to invest.
5. There is the need for Public Private Partnership (PPP) with the right regulation for viable business options.
6. It is important to put up plans to ensure that investment in any treatment plant go with implementation of sustainable technical training for operators and managers.
7. It is essential for AMA to abide by orders issued concerning banning of people from dumping sludge into sea.
8. Stakeholders should meet with Energy ministry, share with them information about such projects for an enabling environment to be created for smooth running of projects.
9. Policies/laws on sustainable management of waste must be enforced.
10. The decentralization reform must be critically looked at to ensure that heads of institutions who flout the laws regarding waste management are punished.

The NLLAP is a WASH sector multi stakeholder platform with the overall goal of improving sector learning and dialogue. It is hosted by the Ghana WASH Resource Centre Network (RCN). The platform offers learning and sharing opportunity for sector players as one of the practical approaches to improving sector engagements/sharing with the long term aim of achieving a knowledge driven WASH sector that delivers quality and sustainable services in Ghana. NLLAP meetings take place on the last Thursday of every month and opened to all interested parties. The discussions of each NLLAP meeting are summarized and shared with the wider WASH community. The topics of upcoming meetings are decided on by the RCN secretariat and a list of upcoming meetings can be found on the RCN website www.washghana.net.

If you are interested to propose a topic for a meeting please contact us on,
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