

TEMPLATE FOR COMPLETION WHERE PhD/MSc PROJECTS CONTRIBUTE TO SWITCH DELIVERABLES

Name of SWITCH theme:

Theme: Urban Water Environments and Planning

Subtheme: Resource Recovery and Re use Urban Agriculture

Work package title and number: WP 5.2 Use of Urban Water for Urban Agriculture

Identification of Deliverable (name and number):

5.2.4 Ad3 / Ad2 Demonstration on Urine

Accra MSc research

Details of contributing PhD/MSc theses (including title, date, author, abstract, details of where thesis can be accessed):

MSc: **Mark Kwame Ofei**

Title: **The feasibility analysis of producing a urine-based fertiliser for vegetable farming in Accra, Ghana**

Date finalised: 2009

Availability

Report Due

Abstract:

Vegetable farming in the city of Accra is a predominant feature sustaining many livelihoods. As a result of urbanization most farming lands (usually ranging between 0.01-0.02 ha) are continually getting smaller and smaller due to land lost to estate developers and construction of drains. The limited land becomes over dependent and plant nutrients depleted leading to low yielding. In other for farmers to sustain and improve production, they use poultry manure and chemical fertilisers. Poultry manure is found in peri-urban areas and access to them is a problem and several amounts are however required to make any significant impact on the soil. Chemical fertilisers on the other hand are expensive (Danso et al, 2005, Quansah et al, 2001). Also the quantity of fertiliser that farmers are able to afford is inadequate and application is always at the suboptimal level as compared to the recommended dose required to maximize production.

The value of human urine as nutrient is however well known and its application has been advocated on many platforms on sustainable sanitation worldwide (Cofie et al 2006). In the city of Accra, Ghana, the availability of urine is not a problem and its source unlimited. Then why are farmers not using it. Assuming farmers are willing to use urine for production, it becomes very important for it to be up-scaled and would therefore be necessary for an investor to appreciate the profitability of investing in such a urine collection and reuse venture. Would the Return on Investment (ROI) for using urine by farmers be better than the poultry manure and chemical fertiliser currently being used?

This report shows how the Cost Benefit Analysis (CBA) framework and the Partial Budgeting Analysis technique were used to ascertain the feasibility of the use of human urine as an alternative fertiliser in the city of Accra, Ghana.

If put into practice the impact would include:

- Informing entrepreneurs, the municipal assembly and investors of the brisk business that could be made out of the urine-based fertiliser production system.
- Sensitising farmers of urine use as an alternative low-cost fertiliser.
- Helping alleviate the sanitation burden in the city while controlling eutrophication.

Contribution to Deliverable:

Comprehensive description of how the content of the PhD/MSc thesis contributes to achieving the goals/objectives of the Deliverable

The MSc research contributes to overall theme of 5.2, *Use of water for urban agriculture and other livelihood opportunities*.

Work package 5.2 aims to contribute to a paradigm shift in wastewater management and sanitation towards a recycling-oriented closed loop approach. Water, sanitation and food problems affect people directly, and call for sustainable management of urban resources. The aim of the work package is to effect significant improvements in agricultural production, processing and marketing, and other livelihood activities, using freshwater, storm and waste-water. Changes sought include positive actions (e.g. integrated planning) and mitigating actions necessary to reduce risks to the environment and health of producers and consumers. The work-package involves working in Accra, Beijing and Lima and (to a lesser extent in Hamburg) to start up multi-stakeholder processes for action research on productive use of water and wastewater.

In Accra research focused on the availability of water, and the (productive) use of waste-water by urban farmers. Research has been undertaken by two PhDs, and several MSc students who have contributed to demonstration area in Dzorwulu area and its watershed in Accra.

Under the Sub Theme of Resource Recovery and Reuse, joint studies have been undertaken with the Work package on Ecosanitation (4.1). The demonstration in Accra was a collaborative undertaking of both, WP 5.2 and 4.1.

This document is targeted at stakeholders aiming at promoting urban sanitation, empowering small scale vegetable farmers in rapidly growing cities in developing countries. In particular policy makers, entrepreneurs, agricultural oriented research organization, donor agencies and financial institutions.

The purposes were

- To identify the logistic needs of the entrepreneur who will invest in urine-based fertiliser production.
- To determine the financial profitability of the urine-based production system.
- To estimate the savings made by farmers when they use urine as an alternative fertiliser.

The resulting knowledge will contribute to further thinking and planning towards resource recovery and sustainable re-use, by reducing health risks, enhancing

livelihoods, supporting urban farmer organisations, and stimulating business development, as part of transitioning towards the city of the future. It will add to the other research and feed information to the LA and support the further implementation of the new policy on urban sanitation in Accra.

Results/Recommendations.

More urine demonstration projects should be carried out under different planting seasons in the city. This will help sensitise farmers of the urine of the sanitised urine use as an alternative fertiliser.

An economic feasibility should be undertaken to ascertain the full benefit of the sanitised reuse in urban agriculture.

This project is capital intensive and it benefits is way beyond financial gains but rather environmental sanitation and together with its allied health benefits, therefore developmental oriented banks should enable entrepreneurs who are interested in exploring this venture obtain loans at lower interest rates and grants to promote this business.

Related products

(and deliverable number)