

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 Af

Accra research

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

MSc: **Edmund Kyei Akoto-Danso**

Title: **Assessing Pollution and River Recovery Processes in the Middle Catchment of The Densu River Basin, Ghana.**

Date finalised: June 2010

Availability

Report available: deliverable 5.2.4 Af

Abstract:

The Densu River and its tributaries, apart from serving as a source of domestic and drinking water, also serve as a source of income and livelihood for many of the rural inhabitants in the basin. It is also one of the main sources of water for agricultural and industrial purposes for a section of the people in and around Accra.

The use of water for domestic purposes, agricultural and industrial production, power generation, and forestry can lead to a deterioration in water quality and quantity. The impact is felt not only on the aquatic ecosystem, but also on the availability of safe water for human consumption (UNEP, 2006).

The Densu River Basin is subject to anthropogenic activities, which contribute to water quality degradation. Pollution and prevalence of water-related diseases in the area has also been reported (Karikari and Ansa-Asare, 2006). Flowing water, such as that found in rivers, undergoes various physical, chemical and biological processes, which may result in an overall improvement of the water quality in spite of pollution. This is known as self-purification. Ensink, et al., (2006) recorded a dramatic improvement of water quality correlated with distance along the Musi River in Hyderabad, India.

It is expected that the rapid growth in population, without accompanying infrastructure development for treatment and disposal of wastewater, will lead to higher pollution levels within the basin. This in turn will cause further deterioration in water quality, ultimately restricting the full range of potential uses and potentially increasing the cost of water treatment. The study is therefore expected to provide

information on the current water quality of the Densu River basin, and also to contribute to understanding the processes that influence the variation in water quality in the basin. Such knowledge will also contribute to more informed decision-making regarding strategies for preventing all forms of polluting practices along the river course that negatively impact the river and the life that depend on it

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 all stakeholders of the Densu River catchment in Ghana, particularly, the water management authorities, policy makers, and the general public who benefit from this water resources

The purpose of the report are to:

Assess and classify the water quality of the Densu River with regards to its suitability for domestic, agricultural and industrial uses.

Identify the river processes that influence river recovery of the Densu River.

Investigate the socio-economic activities which may lead to pollution in the Densu River and how it affects water quality.

Recommend targeted options for minimizing pollution and strengthening river recovery processes. 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.

The study recommends the following measures to help minimize pollution and strengthen river recovery processes.

Awareness raising programmes on good sanitation practices should be intensified, and the provision of sanitation facilities in the riparian communities should be extended.

The location of public toilets and community refuse dumps should be critically assessed to prevent the possibility of faecal contamination of the river.

Though agricultural pollution is minimal presently but it is important to continue with extension work on the use of agrochemicals to minimize the level of future agricultural pollution in the basin.

There is already widespread awareness among the communities that live along the river of the consequences of their actions on the river environment. The study suggest the following;

Increasing rural population requires other livelihood opportunities and therefore, if the pressure on farming land in the basin is to be relieved, alternative income generating activities should be provided.

By enforcing existing bye-laws, farming along the river bank should be further restricted through stringent regulatory frameworks. Sufficient resources should be made available for their implementation.

Introducing buffer zones along the river banks, or alternatively protecting the banks to minimize land disturbances and soil loss with the full participation of community members. This will foster ownership of the initiative, and community members themselves will monitor and manage the programme

Related products

(and deliverable number)