



Wastewater generation and use in urban Ghana: past, present and the future

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Introduction

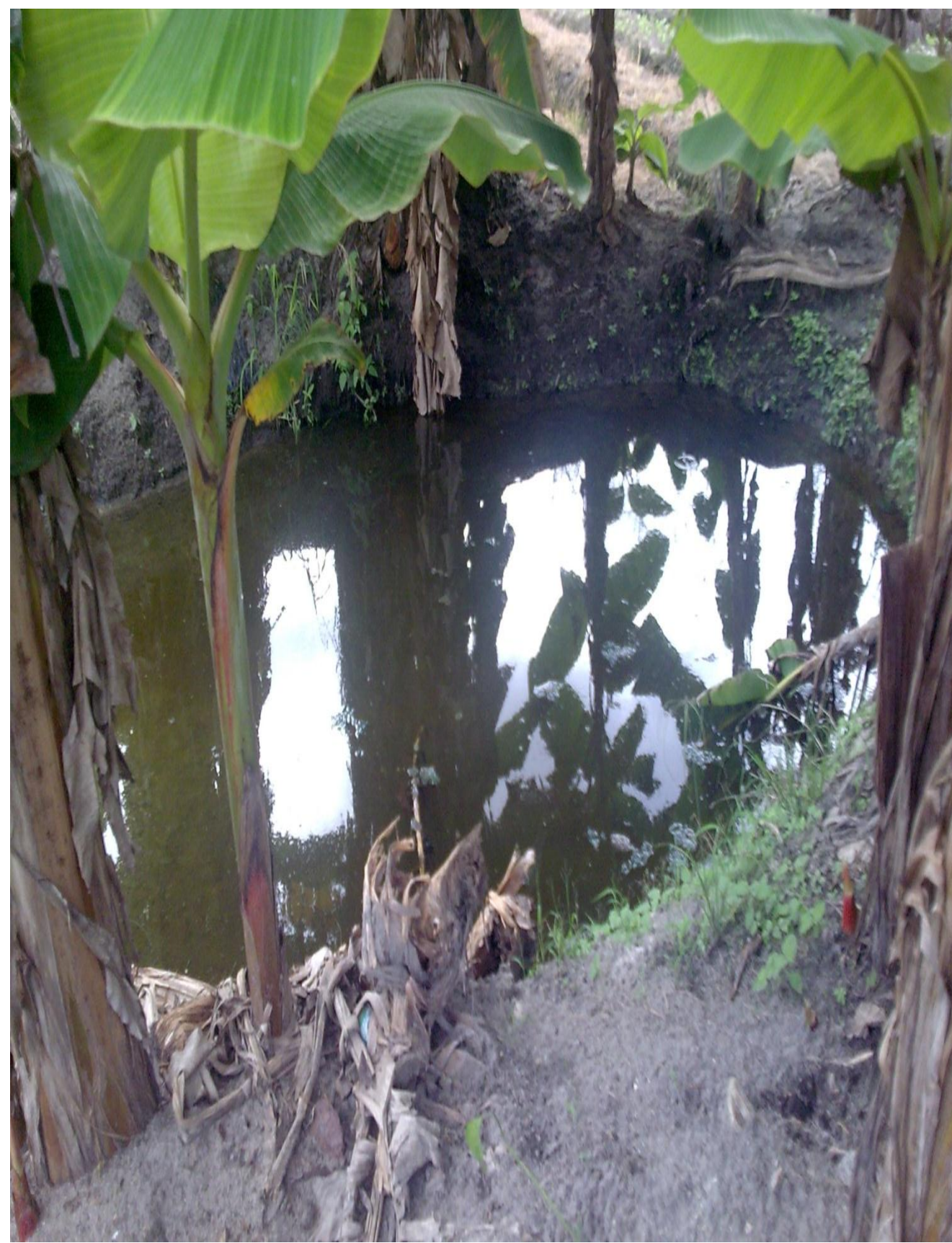


Figure1. Wastewater pool in Kumasi

At the present levels of technology, wastewater (Figure 1) treatment and reuse is common in many countries because of increased demand for water. Where the wastewater is untreated or partially treated, other beneficial uses (Figure 2) are found for such water. This includes urban and peri-urban irrigation. Ghana’s provisional population figure now stands at 24.23 million according to the 2010 population and housing census, averaging at a growth rate of 2.5 % for the period 2000 – 2010. Consequently, demand for water has increased with the resultant generation of wastewater. Without any real national plans for organized wastewater treatment, use and disposal, there are some scattered sewerage systems in mainly Accra/Tema and Kumasi, with Tema having the best yet underutilized system.



Figure 2. Beneficial use of wastewater

Results & Discussion

In addition to a desk study and interviews, some analyses were made on wastewater generation in Ghana. Some results of the study are presented as follows: The water demand levels have increased over the period, resulting in increased wastewater generation in urban Ghana from estimated values of 286.3 million m³ in 2000 through 482.9 million m³ in 2010 to 763.4 million m³ in 2020 (Table 1). It is further argued that having beneficial uses of wastewater such as urban and peri-urban irrigation and adopting the “polluter pays” concept could generate enough revenues of up to nearly US \$ 38 million (Table 2) per annum by 2020. This revenue could be used to develop more organized waste water disposal systems and improve sanitation in urban Ghana. Opportunities exist for the promotion of wastewater use in urban and peri-urban agriculture. The obvious ones will be in the areas of job creation and urban poverty reduction. Earlier analyses have shown that using only 10 % of the generated urban wastewater could generate income to the tune of between US \$ 6.44 and US \$ 17.8 million for the period 2000 and 2020 respectively.

Table 1. Urban wastewater generation in Ghana

Year	2000	2000	2010	2020
Ghana’s population	18,412,247 ^a	18,912,079 ^b	24,233,431 ^a	30,170,610 ^c
% Urbanisation ^c	37.9	37.9	45.4	52.9
Urban population ^c	6,978,242	7,167,678	11,001,978	15,960,253
Urban wastewater generation (m ³ /day) ^c	763,698	784,431	1,322,878	2,091,432
Urban wastewater generation (m ³ /year) ^c	278.7[10 ⁶]	286.3[10 ⁶]	482.9[10 ⁶]	763.4[10 ⁶]

^aprovisional and ^bfinal estimates; ^cAgodzo *et al* (2003)

Table 2. Proposed water pollution charges for urban Ghana

Urban Area	Number of Households		Pollution Tax (US \$/year)	
	2000	2020	2000	2020
Accra	331,583	980,645	1,293,174	9,370,063
Kumasi	203,449	424,926	793,451	4,060,168
Urban Ghana	1,395,648	3,990,064	5,443,027	38,125,062

Conclusions

There is the need to dispose of wastewater **safely** and **beneficially**. **Safely**, because we need to be conscious of our environmental health, such as disease and even nuisance; **beneficially**, because the growing pressure on such resources as water requires that we develop new technologies to reuse wastewater either in a treated, partially-treated or raw form. The beneficial uses of wastewater include urban agriculture, urban greening and even car washing. Some future interventions proposed under the African Development bank – funded Africa Water Facility (AWF) project includes pilot plants located in Greater-Accra, Sekondi-Takoradi and Kumasi will progressively transfer the “design for reuse” model to other cities in Ghana and Africa at large. The project will also train local engineers and planners to employ a reuse-oriented planning process for the design and implementation of future wastewater and fecal sludge treatment, with intended benefits as urban irrigation.

References

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The author will like express appreciation to the W4F – Wastewater Project of the Wageningen University, Netherlands for funding the study