Reuse of Wastewater in Agriculture in Bangladesh

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- Worldwide fresh water scarcity is compelling the reuse (combining water and nutrient recycling) of wastewater, greywater and fecal sludge in agriculture and aquaculture at a rapid pace.
- UNESCO estimates that 50 per cent of the population of developing countries depends on polluted water sources for various livelihood activities.
- **Objectives of this paper:** to identify: benefits, challenges, social acceptance and institutional arrangements of wastewater reuse in Bangladesh.

Fig. 1(a): Wastewater Reuse in the World(http://www.emag.suez-environnement.com/)

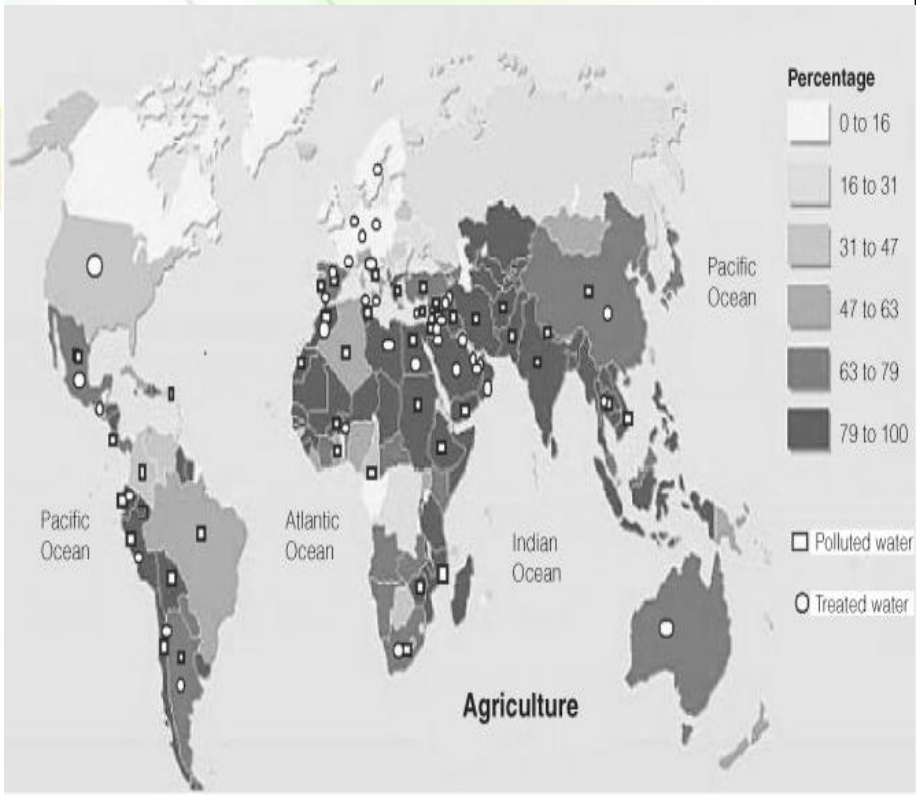

*Fig.1(b)Freshwater withdrawals for agricultural use in the year 2000 and countries reporting the use of wastewater or polluted water for irrigation(***Wastewater Irrigation and Health by International Water Management Institute)**

- In Bangladesh, wastewater, greywater and fecal sludge are being traditionally used in agriculture by the farmers in rural as well as in peri-urban areas, particularly in the drought-prone parts because they do not have access to any other reliable water source.
- The storm water drainage system also receives significant quantities of domestic and commercial wastewater.
- But this may pose risks to human health (Consumers, Farm workers and their families and Nearby communities) and ecosystem.

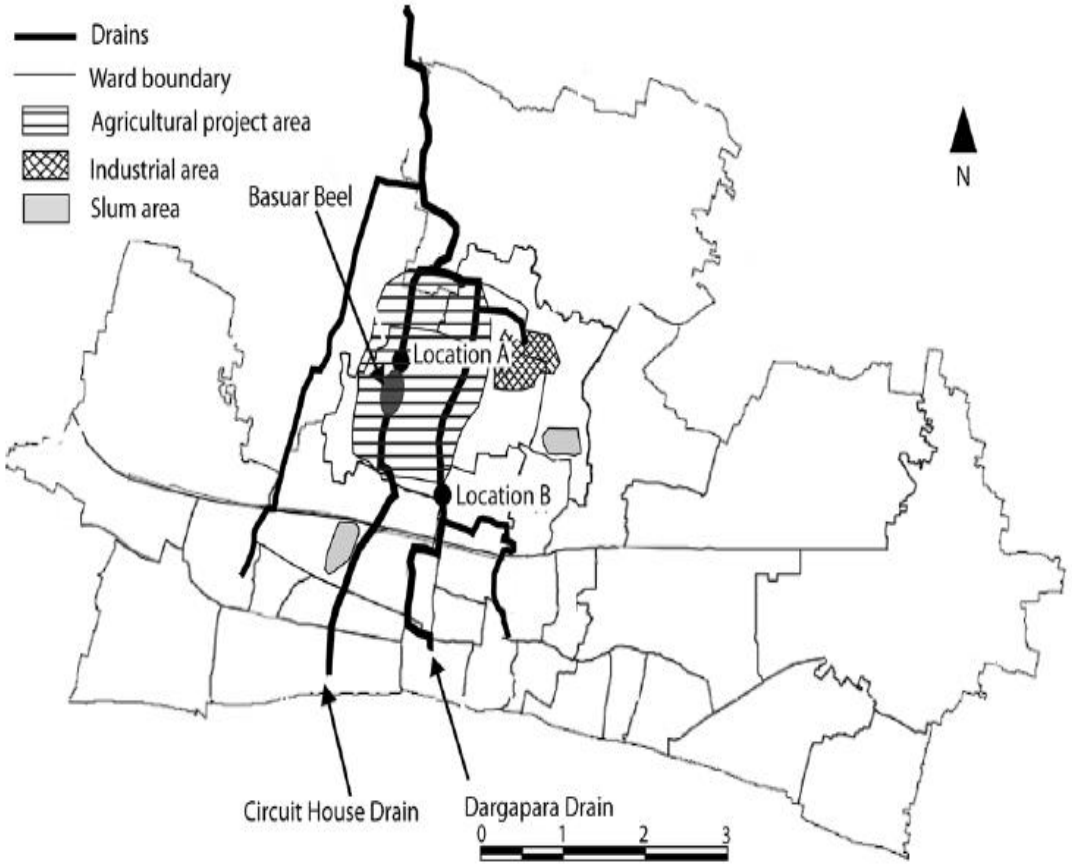

Fig 2 (a). Agricultural Project Area and Drainage System in Rajshahi

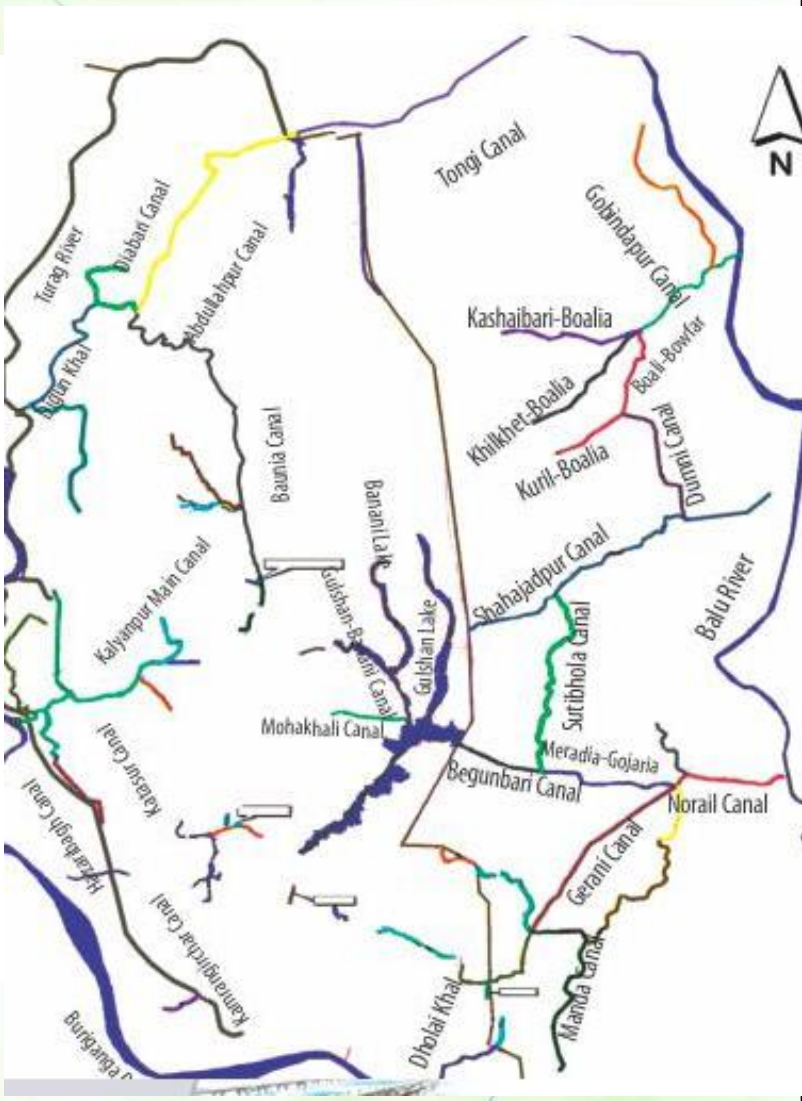

Fig. 2(b): Dhaka City

Table 1: Wastewater Quality in Rajshahi

Parameter	Location A	Location B	Circuit house drain
pH	6.69	6.96	6.91
TDS (mg/L)	1200	1080	1050
TSS (mg/L)	175	105	395
Total Nitrogen (as N) (mg/L)	28	53	21
BOD_5 (mg/L)	62	75	71
Total coliform (CFU/100ml)	1.1×10^7	1.9×10^7	2.3×10^7
Fecal coliform (CFU/100ml)	4.3×10^3	8.1×10^3	12×10^3

Table 2: Wastewater Quality in Dhaka

Parameter	Inlet of a (Gulshan) Lake	Inlet of another (HatirJheel) Lake
pH	6.95	7.53
TDS (mg/L)	365	480
TSS (mg/L)	101	175
Total Nitrogen (as N) (mg/L)	29	41
BOD_5 (mg/L)	155	165
Total coliform (CFU/100ml)	1.3×10^7	1.9×10^7
Fecal coliform (CFU/100ml)	8.8×10^3	9.9×10^3

Table 3: Views of Respondent (%) in Rajshahi

Parameter	WW	FW
Incidence of Skin diseases	56	21
More Weed	88	38
More Pest Attract	77	41
Use of more Pesticide	81	23

Table 4: Views About the Consequence of Fecal Sludge Disposal

Parameter	Dhaka	Rajshjahi
Contamination of water	60.5	46.5
Human Health	61.5	42.5
Environment	63.5	37.5

Conclusions

- Reuse of wastewater has an increased benefit due to higher crop production with minimum fertilizer cost in Bangladesh.
- But there are possibilities of incidents of pest and excess weed in the crop field and also increases health Risks(**Summary available in** Juan C. Durán–Álvarez and Blanca Jiménez–Cisneros (2014).
- Microbiological and biological quality parameters in the wastewater used in agriculture and aquaculture exceed US EPA-2012, FAO and WHO guidelines values.
- This demands much more attention on the implementation of simple yet cost-effective alternatives to wastewater treatment options including institutional arrangements of wastewater reuse in the country and identify the management initiatives for its sustainable reuse.

Thank You