Improving the overall economic well-being in Bangladesh through the provision of Safely managed Sanitation and Hygiene services in pursuit of SDG 6 â€“ An Integrated Circular Economy framework

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Background

Ensuring access to improved water, sanitation and hygiene facilities is paramount for achieving Sustainable Development Goal (SDG) 6 â€“ Clean Water and Sanitation. Bangladesh has one of the lowest urban sanitation access rates (52%) in South Asia. According to the World Health Organization (WHO), in 2022, 65.5 million people in Bangladesh (two in five) lacked good hygiene at home. Given that more than half of urban residents in Bangladesh, reside in informal settlements, improper faecal sludge disposal significantly impacts human health and the environment. Effective Faecal Sludge Management (FSM) will ensure utilizing treated faecal sludge in organic fertilizer production, thus establishing a circular economy framework. The overarching objective of this study is to ensure that government policies in Bangladesh are aptly aligned to support socio-economically equitable outcomes and the overall well-being of the population, with a focus on the sanitation and hygiene sectors.

Research Objectives

Given this background, the research objectives are presented below:

1) To study and analyse the impact of sanitation and hygiene sector investments on Output, GDP and Employment, along with the inter-sectoral impacts using an Input-Output (I-O) framework.

2) To conduct an economic valuation of FSM as a by-product of sanitation and hygiene services to produce organic fertilizers and the resulting environmental benefits through a Circular Economy (CE) framework.

3)Methodology and Data sources

An Input-Output (I-O) framework is used, by adopting the latest Bangladesh I-O table published by the Asian Development Bank. The IOT is modified to separate the sanitation, hygiene and organic fertilizer industries. The Bangladesh National Wash Accounts 2020 report was the key source referred for estimating the expenditure on Sanitation and Hygiene sectors.

4)Research novelty

The earlier studies conducted on the sanitation and hygiene services in Bangladesh are undertaken in a partial equilibrium framework, focusing on the direct impact on the environment and human health and the householdâ€™s income and expenditure levels at a micro-level. The whole economy (direct and indirect) impacts of various government policies in this sector are yet to be studied. Further, the economic valuation of FSM along with its co-benefits through organic fertilizer production from a macro-perspective has not been conducted. To the best knowledge of the authors, this study develops a first-of-its-kind integrated framework, constituting the sanitation, hygiene and FSM segments to study the overall economic and environmental impacts on the Bangladesh economy, using an Input-Output framework.

5)Results

The advancements in sanitation and hygiene services through investments provide evidence of socio-economic gains. Results indicate that the investment in sanitation and hygiene services could increase GDP per capita between US$1.4 - US$107 by 2030 across various scenarios. The female demographic over the age of 14 is projected to see greater benefits, with GDP per capita increases ranging from US$3.6 â€“ US$287. These effects are accompanied by notable growth in total industrial output, spanning from US$420 million to US$32,003 million, along with an increase in job opportunities that ranges from as few as 18,000 to as many as 3.9 million within the domestic supply chain by 2030. The Construction sector is poised to experience the most substantial growth due to infrastructure requirements for proper collection of faecal matter for treatment which includes

sewerage systems and drainage facilities, such that it does not lead to the spread of infectious diseases. The monetary benefits through positive spillover effects of cumulative expenditure for ensuring safely managed sanitation services from a macro-perspective lead to a benefit-cost ratio (BCR) of 3.33 by 2030. Effective faecal sludge management can boost total industrial production by $153 million and create 18,000 new jobs, while also reducing carbon emissions by 7.2 million tCO2eq, thus providing an opportunity to generate US$4.48 million through carbon credits. By aligning sanitation and hygiene policies towards achieving the aims of SDG 6, this study offers useful insights for policymakers. The outcome and findings of this research provide a potential blueprint for the Global South, aiming to assess the impact of sanitation investments.