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"Development on the margin"

Analysis of Water Footprint in Bangladesh Dairy Farms: An Implication of Food Security

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Abstract

Water availability is the world's most emerging issue as this is the most precious life-sustaining element which cannot be substituted by others. Thus, the competition for scarce agricultural water resources is becoming intense partly due to burgeoning population growth, with changing eating pattern for better-tasting food and a concomitant increase in water use for agriculture. The value for water use in agriculture ranges between 67–87 % of total water withdrawals. This value varies from continent to continent. The World Water Development report stated that the poorer countries use 82% of thier total water withdrawals for agriculture.

Dairying significantly consumes water and decreases its availability thereby risking food security. This is a big challenge for countries like Bangladesh (BD), India and China where excessive ground water is withdrawn through irrigation. The aim of this study is: i) to analyse different segments of "water use" (WU), ii) identify the main drivers of WU and to quantify the dependence of irrigation water and imported "virtual water" (VW) in BD dairying.

An extended version of the TIPI-CAL (Technology Impact Policy Impact Calculations) of the International Farm Comparison Network (IFCN) was used for this analysis. To calculate VW consumed from purchased feed, the co-efficient was used as VW trade concept as farmers import feed and fodder from interregional and outside of the country. The statistical methods were employed to quantify rain-fed and irrigation WU to grow home-grown concentrate and roughage. In BD, most of the feed and fodder is used from by-products of cereal crops (*e.g.* rice straw) as input for milk production. Total water used is allocated between the main and the by-product in proportion to the revenue generated from these products.

The results show the total water foodprint (WF; litres/kg milk) of 1924 and 2297 for a 2-cow farm and a 14-cow farm respectively. More than 95 % water is used through feeds and <5 % through others like drinking and servicing. Irrigation water has the biggest share of water (45 %) when considering sources. Finally, large farm need more WF/kg milk as they rear more animals but productivity per animal is not significantly higher than small typical farm. WF is an important indicator for efficient water resource utilisation that augments food production. Further research is necessary to do an impact assessment based on WF related to regional water scarcity and objective way to manage water that will increase efficiency in dairy production.

Keywords: Bangladesh, dairy production, food security, typical farm, virtual water, water footprint

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