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1. Background

In the aftermath of independence, Uzbekistan, Central Asia introduced economic reforms. Being one backbone of the economy, key reforms needed to target the agricultural and agricultural-related sectors. Given that these sectors consume even more than 90% of all available water resources, reforms should be guided by ecological and economical principles alike.

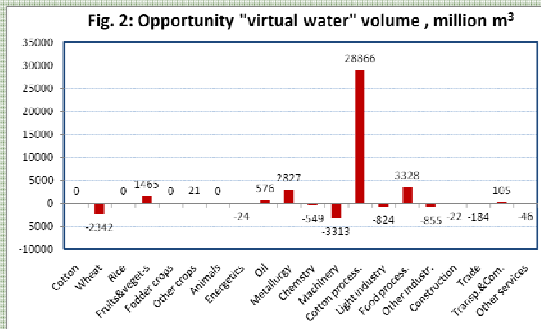
2. Objective

To combine the concept of virtual water with economic impact indicators for better-informed decision-making on economic reforms and investment policies in Uzbekistan.

4. Results

Virtual water input. Direct virtual water use in producing in particular rice, wheat, and cotton is higher compared to all other crops and sectors. Indirect virtual water use in livestock production and cotton and food processing is high, although direct water use in these sectors are extremely low, compared to cotton, wheat and rice production. Although wheat production requires lesser amounts of water per ha compared to several crops, it demands more water per output than fruits&vegetables (Fig. 1).

Opportunity „virtual water“ volume. In spite of being a water-scarce region, Uzbekistan is a net exporter of virtual water due to a substantial share of virtual water in cotton fiber. The share of virtual water in the export of fruit&vegetables and livestock is extremely low due to among others poor farmer-to-market linkages and restrictive state regulations and the promotion of cotton production and export (Fig. 2).

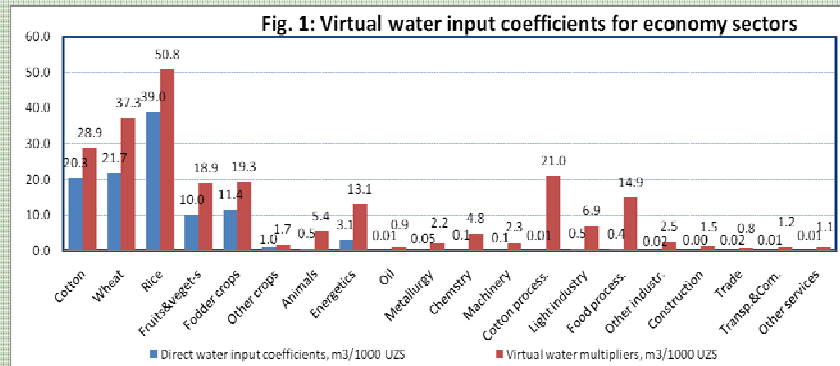


5. Conclusions

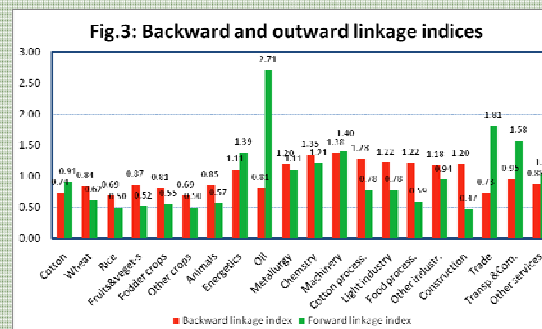
Analysis of virtual water use by economic sectors combined with economic impact efficiencies can increase decision-making and plan reforms in water-scarce regions. The production of crops which use large amounts of virtual water but generate relatively low economic gains such as cotton, wheat and rice presently dominate the agricultural sector of Uzbekistan. In contrast for example, the fruit & vegetable and the related processing industries showed a high water use and concurrently an economic impact efficiency.

3. Methodology

Economic impact efficiency was assessed by backward (BLI) and forward linkage indices (FLI) for all economic sectors according to Leontief's Input-Output model. BLI indicates how a sector demands intermediate inputs from other sectors and FLI how much it is important to the performance of all other sectors supporting them with needed intermediate inputs. Direct water input coefficients is determined as the amount of water in a certain sector required to produce its output equivalent to 1000 UZS. Virtual water multipliers for each sector was estimated by multiplying the Leontief's matrix with direct water requirements of each sector.



Economic impact. The industrial sectors as well as the livestock and processing sectors showed higher backward linkage indices compared to cotton, wheat and rice. When comparing crop production, the forward linkage index was the highest for raw cotton production. The present policy of crop differential subsidies has prioritized cotton, and disfavored food processing (Fig. 3).



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