

# Urban-Nexus: Dependency of urban agglomeration, Hyderabad, India, on external water resources in developing economy

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## Abstract:

Self-sufficiency in water, food, and energy become major concerns of cities in the global urbanization era. To reach the self-sufficiency goals of cities, they depend more on external water resources, in the form of trade and imports to satisfy the water demands, which came into the focus with rapid urbanization. In this scenario, cities must measure their consumption, to know their dependence on external resources, and to draft their trade policies. But, it is tough to scale the dependency of cities on external resources at the city scale, in scarce of city-level trade data.

Here we are proposing a framework using the consumer-centric approach to scale dependency of an urban agglomeration, from consumption and production perspectives when there is no city-level trade data. In the consumption perspective, we used survey data provided by the National Sample Survey organization of India to assess the consumption footprints. In the production perspective, we used production statistics of the study area to assess the production footprints. The difference between the consumption and production WF will give the dependency of agglomeration on external resources. From the consumption perspective, the consumption WF of the study area is 1041 m<sup>3</sup>/cap/year.

This framework is flexible and can be switched between any two or more entities to know the dependency of cities on external resources for their resources. Moreover, this assessment plays a key role in trade policy decisions and also in scaling the consumption and dependency of cities to achieve self-sufficiency and sustainability goals of smart cities.

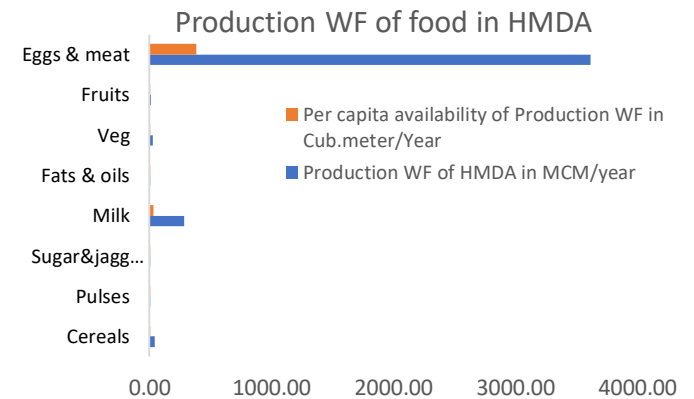
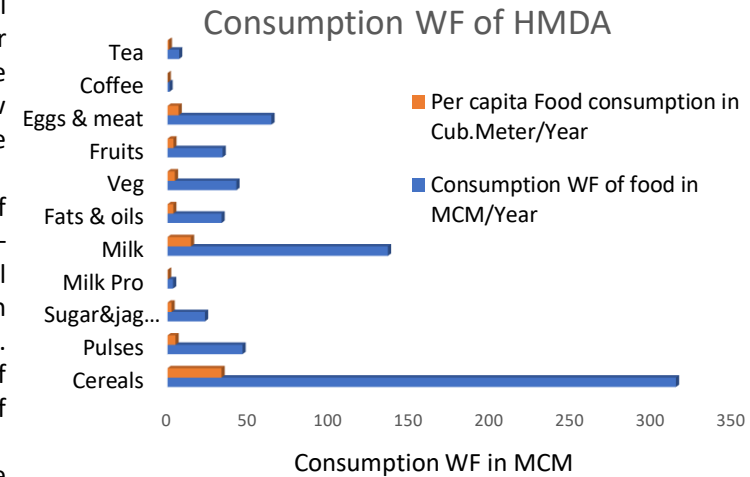
## Motivation:

Urban cities are centers for consumption and economy also. Most of the cities depend on their surrounding biomes, for their food, water and other needs. But, we don't know how much city's dependence on external water resources will impact the ecological environment and rises the resources security issues. For governments in cities its is necessary to know their dependence to plant their resources needs in future, sustainably.

## Material & methods:

Here, we accounted the dependence of Hyderabad Metro Development Region(HMDA). HMDA is one of the cosmopolitan city in India. HMDA's dependence on external water resources for food needs is assessed by calculating the difference between Consumption water footprint (CWF) and production water footprint (PWF).

Data: to assess the consumption WF, we used the consumer expenditure survey provided by National Sample Survey Organization in the year 2014. it provides the amount of food commodities used by the consumers. And, we assessed the agriculture production using agricultural statistics of Telangana from statistical year books.



**Results:** The consumption WF of HMDA is 1041 m<sup>3</sup>/cap/year and it's production WF is 424 m<sup>3</sup>/cap/year. The difference between consumption and production WF of HMDA shoes that, HMDA is more depended on external water resources to satisfy the food needs of HMDA.