Construction of an aggregated indicator of access to water: A compositional point of view

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Abstract

The aim of this work is to present and test a novel approach to describe access to community drinking water points for planning purposes. The technical limits and possible benefits of including compositional population description based on service level into water and sanitation sector-related planning is illustrated with a simplified case example.

New conceptual frameworks, such as the human right to water and sanitation and the Sustainable Development Goals, consider in addition to physical access to the infrastructure the explicit inclusion of availability, affordability, acceptability and quality criteria. These approaches also point the identification of vulnerable groups with respect to the provision of a minimum level of service (1).Typically, regional planners compare the situation between local administrations through the average value of service-based indicators at the household level (2). However, the suitability of this planning approach may be questioned as it will hardly identify vulnerable groups when they are not relevant in number. In these cases, the use of average values will probably mask poor level of service accessed by these population groups.

In this work, we first propose to identify household typologies based on the level of service related to water and sanitation. Then, we assess communities through their compositional description in terms of service level, i.e. using the vector of percentages of household typologies as a characterization of the communities. The assessment of communities is done using an aggregated index. The selection of indicators and weights is based on PCA/FA techniques, i.e, based on the capacity of explanation of the variability of the studied communities, as usually done in the sector (3). However, these techniques are applied in this study to transformed data, and the results are back transformed to original variables to define the aggregated index.

A simple example is presented to test the proposal. Data from two real household surveys carried out in Mozambique and Kenia is used (2), but only including in the analysis those households with no piped connection into the dwelling. The samples are considered proportional to the population for simplicity. The variables considered are: Time to the water point (in minutes), per capita water consumption (in litres/day); number of people in the household; typology of the person in charge of picking water (adult/child) and the suitability of the path to access the water point (adequate/inadequate). The results based on compositional description of communities are compared with a standard aggregated indicator defined in terms of a weighted geometric mean (3). First results show that there is room to further analyze the applicability of this novel approach in more complex case studies.

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