Technological Adoption for the Sustainable Consumption of Water in Mexico City

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Abstract

It is well known that 98.5% of the water consumption in Mexican households is used for domestic consumption and the 1.5% is used for activities outside the home such as car washing, washing of sidewalks and garden irrigation. Of the percentage that is used inside the households, the 62% is used for personal hygiene, 22.7% for washing clothes, 9.43% for washing dishes, cleaning floors uses 1.51%, 2% for food preparation and only 0.22% is used for drinking. The problem is that the quality of the national water supply service in Mexico would probably worsen due to lack of water causing future social conflicts. The study focuses on the design and the implementation of a solution for sustainable use of water in the domestic sector in Mexico City. First, we review the literature on sustainable use of water in the domestic sector. Then, we design and implement a simulation agent-based model to analyze the mechanisms that contributes for a sustainable use of water in the domestic sector through adoption of technological solutions. Finally, we analyze plausible simulation scenarios to contribute to solve the unsustainable use of water in Mexico City.
Keywords: water; domestic sector; technological adoption; Mexico City.

1. Introduction

In 2016, the Water System of Mexico City indicated the water volume spent in domestic and public-urban (52% of the total) and industrial (47% of total) sectors. Unfortunately, the water supply is characterized by the lack of reliability in the supply-demand and use of the vital liquid. On the supply side, the sources show high signs of vulnerability that cause frequent cuts due to maintenance or scarcity, notably in the Lerma-Cutzamala System (due to environmental, infrastructure and social conflict problems). While, on the demand side, there is widespread mistrust about the quality of drinking water, and the authorities does not contribute to reverse it. On the user side, it is well known that 98.5% of the water consumption in Mexican households is used for domestic use and the 1.5% is used for activities outside the home such as car washing, washing of sidewalks and garden irrigation. Of the percentage that is used inside the households, the 62% is used for personal hygiene, 22.7% for washing clothes, 9.43% is used for washing dishes, cleaning floors uses 1.51%, 2% of the water is used for food preparation and only 0.22% is used for drinking.

In 2014, the National Water Commission indicated that under the actual conditions, the 2030 water projections show that, if no significant steps are taken, increasing challenges will be transferred to the next generation and approximately 27% of the current water supply will have to be found through new sources and if it does, serious and irreversible social problems can occur. Under the assumption that current water management practices in Mexico City are maintained, the current sustainable sources (45.6 m^3 / s)