Water Quality Study and Cost-Benefit Analysis of Rainwater Harvesting in Kuttanad, India

Christina Tang
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Executive Summary

Clean water access is a basic human right. However, at present, about 1.9 million children die, 20% from diarrheal disease in India per year. In India, 1 person dies from water-related disease every minute and 4 people die across the globe (UNICEF 2005). Eighty percent of the 700,000 citizens of Kuttanad, a region in the coastal state of Kerala in India, have no access to clean water. In the Kuttanad region of Kerala, intensive untreated human sewage and agricultural activities have caused severe surface water contaminations. At the same time, other sources of fresh water are unreliable for drinking: ground water is acidic due to the soil conditions and iron leaching; fresh water from public tap is infrequent; and water supply from private vendors is extremely expensive. Of all water sources, rainwater alone satisfies the WHO Guidelines for drinking-water quality. Using both primary and secondary data from water samples and community surveys, this study analyzes the costs and benefits of rainwater harvesting in the Kuttanad region of Kerala, India. The major costs include the initial construction cost of rainwater harvesting system and the maintenance costs. The major benefits include an increase in household dispensable income, time and energy saved from collecting water, and reduction of epidemic outbreaks and associated medical costs. The objective of this thesis is to ascertain the net benefits or costs from rainwater harvesting under a variety of scenarios for households in different existing water supply conditions. It is concluded that households with different existing water consumption pattern will benefit positively in various degree from investing in domestic rainwater harvesting systems. Continuous data collection and research are needed to validate the benefits and costs of rainwater harvesting in Kuttanad.