Willingness to Invest in Rooftop Rainwater Harvesting: Evidence from Urban Areas of Hooghly District in West Bengal

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ABSTRACT

Water is increasingly becoming scarce across not only in India but also in World. This paper aims at bringing out the factors responsible for a household’s decision to invest in rooftop rainwater harvesting. The paper is based on cross sectional sample of 230 houses from Urban Areas of Hooghly District in West Bengal. The study is conducted in an area which has piped municipal water supply. The study finds that a large number of explanatory variables like income of the household, coping cost incurred by the household positively and significantly affect household’s decision to invest in rooftop rainwater harvesting. However, the household demand for water is negatively related to willingness of the household to adopt rooftop rainwater harvesting. Household heads that are educated are more likely to invest in rooftop rainwater harvesting. Houses which are comparatively new or constructed in last five years, as well as households who also undertake gardening are also more likely to invest in rooftop rainwater harvesting as compared to households without the features.

KEYWORDS
Coping Cost, Demand for Water, Rooftop Rainwater Harvesting, Water Management

INTRODUCTION

The scarcity of water resources is one of the most important natural resource allocation problem facing development planners. It has been widely speculated that the world would come under severe water strain by 2050. One of the most popular and widely used indicators to appraise the extent of water scarcity is the Falkenmark index, Falkenmark, Lundqvist and Widstrand (1989). They proposed 1700m³ (cubic metres) of renewable water resource per capita per year as the threshold based on the estimates of water requirement for household, agricultural, industrial as well as needs of the environment. At levels below 500 m³ per person per year it is a primary problem of sustenance Seckler (1999). Water availability per capita is fast declining all over the world as well as in India. This calls for a robust Sustainable management of water. Water management should aim at management of both fresh as well as virtual water Chowdhury and Adhikary (2010) for ensuring sustainability in future. Broadly speaking, management of water is basically of two types-supply side management and...
the other demand supply management. Many studies have been undertaken for assessing residential demand for water from the demand side management perspective. However, with falling per capita availability associated with falling groundwater levels, proper harvesting of rainwater is extremely important. The other important aspect is that water obtained from harvesting rainwater may be used by households for outdoor activities like washing, gardening etc and can be complemented with piped drinking water supply.

The present study is designed to bring out the factors responsible for households decision to invest in household rooftop rainwater harvesting. The area of study is restricted to urban areas of Hooghly district in West Bengal India. In the urban areas in the District of Hooghly there are eleven municipalities and one Municipal Corporation, Chandanangar. The urban areas in the district of Hooghly do not have a formal system of charging for water use based on consumption as measured by water meters. The various municipalities in Hooghly have fixed different charges for water based on annual valuation of property.

The most important question that arises is the financial burden of installation of rainwater harvesting system. Installation of rainwater harvesting system requires some amount of investment. It is required that there should be ability and willingness to pay for rainwater harvesting. It may be pointed out that installation of rainwater harvesting system on rooftops of individual household is quite costly. For example it was estimated in New Delhi in one study that approximately the average costs of installation of rainwater harvesting system in an individual household of average area 300-500 sq metres is about Rs.20,000 to Rs 25,000.(http://ccs.in/internship_papers/2003/chap35.pdf)

The motivation of the present study comes from the fact that the supply side management of water is equally important along with demand side management of water in the present scenario in Hooghly District of West Bengal. Residential demand for water can be divided into two main components-the indoor water use and outdoor water use. Water from rainwater harvesting can be used to meet the outdoor demand for water like Gardening, washing etc if not for drinking. Further, piped water supply in the region ranges between 8-12 hours a day. Harvested rooftop rainwater can be used to supplement piped water in the area as piped water supply is never continuous for 24 hours. The present study is therefore, designed to bring out the motivating factors behind willingness to invest in domestic rainwater harvesting.

Before discussing the data and the estimation methodology we first take a look at certain features of the region. Piped water supply by municipality is intermittent with supply varying between 8-12 hours a day. Some areas also experience inadequate water pressure. Households must cope with intermittent water supply by storing water in the overhead or underground water supply. In this present backdrop, we try to assess the factors responsible for households’ decision to invest in rooftop rainwater harvesting.

**REVIEW OF RELEVANT LITERATURE**

There have been numerous studies in developing countries related to willingness to pay for improved piped water supply and sanitation. Whittington et al (2002) conducted studies in Kathmandu, Nepal based on household survey of 1500 households and where government was considering private sector in provision of water supply. The study found conclusive evidence that the household’s willingness to pay for improved water supply was much higher than their water bills. However, such studies are important to execute because revenue earning of water utilities are low and insufficient to cover cost of provision of such services in developing countries Whittington (2003, 2010). However, studies pertaining to willingness to invest in rainwater harvesting have been few. This is because for adoption
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