Chapter 10

Water Scarcity and Conflicts: Can Water Futures Exchange in South Asia Provide the Answer?

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ABSTRACT

This chapter presents the concept of the establishment of a futures market in water in the context of the risk of water availability that Indian agriculture has been facing in the recent years. In the process, the chapter argues how the development of such a market can actually reduce the scarcity value of water, and may help in reducing the intensity of conflicts over water resources.

INTRODUCTION

Water futures exchange is not a new concept in today’s world. While it is already in vogue in Australia, it is increasingly being thought of as a mode of risk management in water availability in arid and semi-arid regions of the world. The idea has already hit the academic strands, with a few papers emphasizing the role of markets in the resolution of water allocation problems (Ghosh and Bandyopadhyay 2009a, Bandyopadhyay and Ghosh 2009b, Ghosh 2010). Holden and Thobani (1996) talked of tradable water rights as an approach to resolve water shortages and promote investment. They expressed that a system of tradable water rights combined with effective institutional arrangements can solve many of the problems related to allocation that administered solutions fail to deal with. In another instance, Chile’s National Water Code of 1981 established a system of water rights that were transferable and independent of land use and ownership. The most frequent transaction in Chile’s water markets is the “renting” of water between neighbouring farmers with different water requirements (Gazmuri 1992).

However, cases and analyses have widely been documented on physical market transactions of water all over the world or transactions of tradable water rights, rather than on futures markets. Rosegrant and
Binswanger (1994) suggest that water markets provide a flexible and efficient way to allocate water while at the same time providing incentives that are beneficial for water users. When water savings can be traded, they provide extra income to farmers, while pricing leads to a reduction in income. They also suggest that markets lead to the highest value use of water. As shown by Holland and Moore (2003) in the context of the Central Arizona Project, a restrictive market mechanism on groundwater resources could result in inefficient solutions. According to Hearne and Easter (1995), markets should be recognized as providing a means of allocating water according to its real value, thereby leading to efficiency gains and conservation. Gardner and Fullerton (1968), Hartman and Seastone (1970), and Marino and Kemper (1999) suggest that markets can provide a means to allocate water according to its opportunity cost, resulting in efficiency gains.

Markets range from being formal to informal. Informal water markets are found in India (Saleth 1997), Pakistan (Bandaragoda 1998, Meinzen-Dick 1997), Chile (Hearne and Easter 1997), and Mexico (Thobani 1997). Transactions are typically small-scale and local, selling surplus water to neighbouring farmers or towns (Johansson 2000, Bosworth et al. 2002). Formal markets involve buyable and sellable water rights, permanent and seasonal transfers or transactions between sectors and jurisdictions. Examples exist for the western US (Colby 1998), California (Howitt 1998), Texas (Griffin 1998), and Spain (Garrido 1998). It is claimed that the most advanced form of tradable water rights exist in the Murray-Darling Basin in Australia, with seasonal and permanent states of diversion entitlements (Bosworth et al. 2002).

While there have been evidences of some experiments on the derivatives markets for water resources (Hadjigeorgalis 2006), there has rarely been any significant research or experiment in the developing nation documenting the utility of the water futures markets. More importantly, there has rarely been any worthwhile attempt in terms of academic research to inform the policy makers on the importance of water futures markets in resolving water conflicts at a regional level. While policy makers in many parts of the world have actually been contemplating of water markets in various forms, quite unfortunately, the feeling is not really prevalent in South Asia, where transboundary water conflicts exist in various forms, and across various river basins.

In this chapter, the term “transboundary water” refers to water crossing any kind of boundary – whether geopolitical (even at the most micro-level) or even sectoral, following the definition of Beach et al. (2001). All these types of “transboundary waters” characterize “hydropolitical” relations between stakeholders at various levels. This chapter is an attempt to address quite a few issues that have been missing from the literature so far. First, this chapter conceptualizes a futures market in water availability. In the process, it suggests that the unit of trading should be based on a weighted water availability index. Second, the chapter provides a definition of scarcity value of water in terms of the theoretical framework already developed by Ghosh and Bandyopadhyay (2009). Ghosh and Bandyopadhyay (2009) have already exhibited that scarcity value of water shapes up hydropolitical relations and can induce water conflicts. On the basis of the estimates of scarcity value computed on the Cauvery basin in India, the article shows the negative correlated movement of scarcity value and the water availability index. In other words, the scarcity value increases with a higher value of the water availability index. Thirdly, the chapter argues how the hedging mechanism can operate in the water futures exchange, and how it may compensate a participant (say a farmer) for his value loss due to scarcity (which is nothing but the scarcity value), thereby reducing his scarcity value and the consequent conflict potential.

Section 2 of this chapter relates the reader with the increasing risk of water availability in South Asia, as also alluding of the water-related conflicts in the region. In the same section, there is a short discussion talking of the fountainhead of the conflicts lying in scarcity value of water. Section 3 has
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