

## **Evolution of Property Rights Regimes in the Groundwater Economy of India Constraints on moving towards a Common Property Regime**

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The open access regime of groundwater has resulted in the over-exploitation and near-depletion of the resource due to the negative externalities imposed by the self-interest maximising behaviour of individual agents on society, which increases the social cost. The pumping of ground water is estimated to be double the rate of aquifer recharge from rainfall. The International Water Management Institute (IWMI) estimates that Indias grain harvest could be reduced by upto one-fourth as a result of aquifer depletion. The institutional changes in the agricultural sector especially after the Green Revolution have only aggravated the situation of groundwater exploitation, which has led to a policy concern (GOI, 2000) that groundwater resources should be shifted to a Common Property Rights regime. However, the shift from the open access to a CPR regime would take place only if the perceived transaction costs are lesser than the perceived benefits. This is unlikely and therefore raises doubts whether a shift to a CPR regime would take place given the empirical constraints involved. Even if this transition does take place, the cost of negative externality is bound to persist because of bounded rationality and information asymmetry among the agents.

While policies towards undertaking community management of groundwater as a common property resource have been initiated in Spain and Mexico, this shift in the property right regime has not lead to much success in these countries due to resistance from the stakeholders. Similar problems would be encountered in the Indian context due to the coordination and collective action problems involved in regulating the behaviour of dispersed individual agents across geographical locations. However, this policy concern (GOI, 2000), although well-intended, will have to encounter the externality problem and in this context, the paper would examine (a) theoretical and empirical constraints involved in shifting the present regime to a CPR regime and (b) if the transition to a CPR regime does take place, what would be the transaction costs that such a regime would meet.

The lessons learnt from this exercise would help the Indian policy makers in making informed decisions in terms of devising appropriate rules of the game so that the self-interest maximizing behaviour and coordination problems involved in a CPR regime could be minimized. This is especially important in the long-term context wherein it is projected that by 2050, the countrys population is going to stabilize at around 1640 million and as a result the gross per capita water availability would decline from 1820 m<sup>3</sup>/ yr in 2001 to as low as 1140m<sup>3</sup>/yr in 2050. This is more than the current estimate of utilizable water resource potential (1122 km<sup>3</sup> per year) through conventional development strategies. When compared to the availability of 500 km<sup>3</sup>/yr at present, the water availability in 2050 needs to be almost trebled (Gupta and Deshpande, 2004).

The present study would provide some new insights into the current debate on property rights regimes for groundwater management, apart from providing some policy implications on this issue to help the decision makers devise appropriate strategies (in particular in developing appropriate institutional mechanisms) to facilitate the optimum use of this increasingly scarce resource.