

# **Technologies for Smallholder Irrigation Appropriate for Whom – Promoters or Beneficiaries<sup>1</sup>?**

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## **Brief Biography of presenting author**

### **Abstract**

The introduction of low cost irrigation technologies such as treadle pumps resulted in a substantial poverty alleviation in Bangladesh during the 1980s and 1990s. From the mid-1990s onwards NGOs have tried to replicate this success story in neighboring India. Encouraged by initial successes in North Bengal, NGOs have stepped up their promotional efforts -with substantial financial backing from international donors- citing an increasing number of treadle pump sales to substantiate their assertion of high demand for treadle pumps. However, there is also evidence that smallholder farmers lost interest in this manual technology and access water through other means.

Fifteen years after the first introduction of treadle pumps the socio-economic and technological landscape in India has changed dramatically. Revisiting factors that contributed to its initial success this paper assesses if treadle pumps are an appropriate technology in the changed setting. It evaluates adoption rates, accessibility, extent of use and perceptions of manual and motorized water lifting technologies among a sample of 271 smallholder farmers in Cooch Behar district of West Bengal, India. The farmer surveys are complemented by interviews with local technology dealers and other key informants.

The results suggest that treadle pumps were successful initially because of a near technological vacuum and high cost of alternative technologies. However, over the years significant changes have taken place. With the advent of small affordable diesel engines, both Indian made and imported from China, motorized pumps became widely available and a large informal rental market for pumping equipment emerged. Growing availability of electricity in villages facilitated the installation of electric tubewells and the emergence of water markets. At the same time, rising labor wages and increasing concerns over drudgery hampered the uptake of labor intensive technologies such as treadle pumps. With the availability of affordable alternatives farmers started abandoning treadle pumps. Our surveys found that 92 percent of those who had once bought a treadle pump stopped using them in favor of pump rentals or water markets. Those who could not afford buying irrigation equipment were not interested in treadle pumps despite their low cost. Dealers confirmed that demand for treadle pumps has evaporated.

This study shows that technology adoption is a dynamic process. Technologies that are appropriate at one point in time and under certain conditions may not be appropriate at other times under different conditions. The adoption of technology does not necessarily follow a linear path from simple manual technologies to 'advanced' motorized technology. Low cost is not always the determining factor in farmers' willingness to invest. The availability of affordable alternatives such as rentals, water markets and other sharing arrangements may facilitate access to those who cannot afford to own equipment.

The study underlines the need for regularly revisiting technology choices and independent monitoring to better understand changing landscapes of smallholder irrigation. This will ensure that the technologies desired most by beneficiaries -not just by promoters- get the support and promotional backing of the donors and governments for effective poverty reduction.

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