

Techno economic feasibility of manual low lift pumps for irrigation in shallow water table areas of Brahmaputra valley of Assam

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■ **ABSTRACT** : A single cylinder manual hand pump of cylinder size 300mm x 225 mm fabricated at Assam Agricultural University, Jorhat and a double cylinder commercial pedal pump of cylinder size 300 mm x 88.9 mm was tested at laboratories at Assam Agricultural University, Jorhat, Assam and at farmer's field in 5 districts of Brahmaputra valley of Assam during 2011-13 for their techno economic feasibility for irrigation. Discharge head relationships on the basis of pumping test for both the pumps were established. Discharge variation in high head was found to be prominent in manual hand pump for single person operation. Pedal operated pump though producing less discharge, was found to be better preferred by farmers' because of ease of operation, water lifting capability in terms of head and field security. Discharge and power requirement estimated from equations developed also established superiority of pedal pump. This pump was further subjected to farmer's participatory action research in 5 districts of Brahmaputra valley of Assam. Total 21 units were tested for irrigating different crops of farmer's choice. Cultivation of tuberose in Nalbari district, Ridge gourd and cabbage in Sonitpur district recorded highest benefit cost ratio (8.50), highest increase in yield over farmer's practice (78.8 %) and highest field water use efficiency (3557.69), respectively.

■ **KEY WORDS** : Manual hand pump, Pedal pump, Head-discharge relation, Power requirement

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