

# **WATER-ENERGY NEXUS IN INDIAN AGRICULTURE: CAN WATER MANAGEMENT TECHNOLOGIES BE PANACEA FOR EFFICIENT MANAGEMENT OF WATER AND ENERGY?**

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## **ABSTRACT**

It is a well-known fact that water and energy are the two critical inputs in agricultural production which need to be properly managed. Improper management of these two inputs poses lot of challenges. In countries like India where water scarcity is a major concern coupled with highly subsidized energy policies, addressing the issues of managing water and energy is highly warranted. Realising the significance of water and energy in agricultural production, the present paper aimed at the following: (i) to understand the nexus between water and energy in agriculture and (ii) to examine whether water management technologies particularly drip irrigation could be a solution for the problem of water and energy nexus. The analyses are based on both secondary and primary data. The analysis of field survey data indicates that in drip adopting farms the energy consumption is 62.2 per cent less than that of farms do not adopt drip irrigation in over-exploited region and 77.7 per cent less power energy in semi-critical region. As the adoption of drip irrigation saves considerable water and energy, the water and energy productivity is significantly more in drip farms than the control farms where the flood irrigation is followed. In groundwater over-exploited region, the water productivity for banana is worked out to 7.4 kg/M<sup>3</sup> of water in drip farms and 4.9 kg/M<sup>3</sup> of water in non-drip farms. Similarly, the energy productivity is 28.6 kg/kwh and 7.2 kg/kwh. Significant difference in energy productivity is also noticed across regions. The returns per unit of water and energy used show that drip farms have significantly higher returns over the non-drip farms. Thus, one could conclude that the water management technologies (drip adoption) would be a viable solution for water-energy nexus in agriculture. Hence, continuing public support for the wider adoption and promotion of water management technologies particularly drip irrigation technologies appears warranted.