

# MANAGEMENT PRACTICES FOR WATER CONSERVATION, ENHANCED PRODUCTIVITY AND METHANE MITIGATION IN IRRIGATED LOWLAND RICE

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## ABSTRACT

Rice production in India needs to increase to feed the growing population whereas water for irrigation is getting scarcer. Major challenges are to i) save water ii) increase water productivity and iii) produce more rice with less water. This study analyzes the ways in which water-saving irrigation can help to meet these challenges. For addressing these challenges experiment was conducted at Indian Institute of Rice Research (IIRR), Hyderabad, India for two consecutive years during 2012-13 and 2013-14. The treatments are continuous submergence, saturation and alternate wetting and drying (AWD). Water input was reduced by reducing standing water depths to soil saturation or by AWD. Water savings under saturated soil conditions were on average 33 and 36% over continuous submergence without yield reductions in *kharif* and *rabi* seasons, respectively. Water productivity in continuous submerged rice was typically 0.34 kg m<sup>-3</sup> during *kharif* and 0.38 kg m<sup>-3</sup> during *rabi*. Water-saving irrigation increases water productivity up to 0.67 kg m<sup>-3</sup> under saturated condition. Therefore produced more rice with less water apart from, saving irrigation water also curtails seasonal CH<sub>4</sub> emission by around 55 per cent as compared to continuously submerged conditions, without any decline in grain yield (4.8 and 5.3 t ha<sup>-1</sup> during *kharif* and *rabi*, respectively). Total rice production can be increased by using water saved in one location to irrigate new land in another. If this is not done, a strategy of saving water at the field level potentially threatens total rice production at large.

**Keywords:** Rice, Irrigation, Water saving, Water productivity and Methane emission

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