Tata Kelola Air dan Lingkungan-7
Performances of Sheet-Pipe Typed Subsurface Drainage on Land and Water Productivity of Paddy Fields in Indonesia

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Subsurface drainage technology may offer a useful option in improving crop productivity by preventing water-logging in poor drainage paddy fields. The present study compared two paddy fields with and without sheet-pipe type subsurface drainage on land and water productivities in Indonesia. Sheet-pipe typed is perforated plastic sheets with a hole diameter of 2 mm and made from high-density polyethylene. It is commonly installed 30–50 cm below the soil surface and placed horizontally by a machine called a mole drainer, and then the sheets will automatically be a capillary pipe. Two fields were prepared, i.e., the sheet-pipe typed field (SP field) and the non-sheet-pipe typed field (NSP field) with three rice varieties (Situ Bagendit, Inpari 6 Jete, and Inpari 43 Agritan). In both fields, weather parameters and water depth were measured by the automatic weather stations, soil moisture sensors and water level sensors. During one season, the SP field drained approximately 45% more water compared to the NSP field. Thus, it caused increasing in soil aeration and producing a more significant grain yield, particularly for Inpari 43 Agritan. The SP field produced a 5.77 ton/ha grain yield, while the NSP field was 5.09 ton/ha. By producing more grain yield, the SP field was more effective in water use as represented by higher water productivity by 20%. The results indicated that the sheet-pipe type system developed better soil aeration that provides better soil conditions for rice.