**Entry No. IRRC-0295**

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| Category | : International Rice Research Conference |
| Select Theme | : Climate change and environmental sustainability |
| Endorsement email | : |
| Keyword 1 | : Water scarcity |
| Keyword 2 | : Scaling up and out |
| Keyword 3 | : Adaptation to climate change |
| Title of Entry | : Assessing the potential and versatility of the Water Evaluation and Planning System (WEAP) for upscaling AWD in irrigated rice |
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| Select only one type of presentation | : 15 minute oral presentation |
| Abstract | : Irrigated rice plays a major role for Asia´s food security. However, its production is increasingly challenged by freshwater scarcity. Water saving technologies like Alternate Wetting and Drying (AWD) could sustain production levels under reduced water availability. Before this innovation is implemented, it is advisable to estimate its hydrological impact on irrigation systems on landscape level. So far, there are very few modeling approaches for integrating irrigated paddy rice into the hydrology of a catchment, and moreover, considering the impacts of AWD. This study investigates the applicability and versatility of the water |

management tool WEAP (Water evaluation and planning system) for irrigated rice under continuous-flooded and AWD managed fields. Water savings and hydrological impacts caused by AWD implementations are evaluated at field and irrigation-system level. The Zeigler-Experimental Station (ZES) of the International Rice Research Institute was used for parameterization and assessing impacts on field-scale. This was followed by an impact assessment of AWD on the Angat-Maasim-River-Irrigation-System (AMRIS), where freshwater is stored in a reservoir, serving as the main supply of domestic water for Metropolitan Manila and as the irrigation water source for over 26000ha of rice production. In a simulation period of 10 successive dry seasons, AWD implementation reduced water requirements on ZES between 12.1% (± 4.46) on sandy clay loam and 27% (±11.4) on clay soils. In AMRIS, the average reduction was 34.3% (± 6.2) per dry season. Furthermore, AWD implementation enhanced streamflow in main and lateral canals, and thus increased water availability in downstream areas. Furthermore, a vulnerability assessment was conducted with WEAP and scenarios representing relevant threats to freshwater availability. As a result, water levels in the reservoir were substantially lowered, and- under sustained irrigation practice -, divisions in downstream areas of AMRIS had limited to no access to irrigation water. AWD implementation improved the downstream water availability by up to 50%, thus mitigating water scarcity. The results have proven the usability of WEAP as a holistic multi-scale planning tool, which could be useful in many large irrigation systems throughout Asia. Furthermore, the study also reveals weak points in application and calculation algorithms as well as suggested improvements.

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