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## Application of Soil Resistivity Measurements to Evaluate Subsoil Salinity in Rice Production Systems of the Vietnam Mekong Delta

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### Abstract

Rice is a major crop in the Vietnam Mekong Delta (VMD), contributing more than half the rice production of the whole country. Due to climate change induced sea level rise, soil salinity is increasingly threatening rice production in the VMD. Soil salinity in the Mekong Delta can be caused by saltwater intrusion into lowland areas through the canal system, or by capillary rise of salty water from near surface saline water table, both resulting in salt accumulation in the top soil. In order to develop appropriate management strategies for the adaptation of rice production systems of the Mekong Delta to climate change both in terms of water and salinity management, it is important to disentangle the two effects and their relative importance. Here we report on the possibility to use geoelectrical methods to evaluate the subsoil salinity threat to rice production. A case study was conducted in the Tra Vinh province of the VMD measuring subsoil electrical resistivity using an ARES II to a depth of 40 m to detect potential salinity threats to different rice production system. The electrical resistivity measurements were validated on a 1 m scale by drilling down to 40 meters depth and analysing soil type and electrical conductivity of the different layers. Preliminary results show no link between the production system (single, double or triple rice cropping) with the depth of the saline water table, but a clear link with the proximity to the sea. We discuss the applicability of the ARES II method on agricultural field scale and the implications for salinity management in VMD rice production systems.

**Keywords:** ARES II, electrical conductivity, electrical resistivity