**Tropentag, September 14-16, 2022, hybrid conference**

"Can agroecological farming feed the world?
Farmers' and academia's views"

# Mapping the distribution of saline water below rice production systems in the Vietnam mekong delta by applying geophysical methods

Van Hong Nguyen[1], Jörn Germer[2], Van Nha Duong[3], Folkard Asch[4]

[1] *University of Hohenheim, Inst. of Agric. Sci. in the Tropics (Hans-Ruthenberg-Institute), Germany*
[2] *University of Hohenheim, Inst. of Agric. Sci. in the Tropics (Hans-Ruthenberg-Institute), Germany*
[3] *Kien Giang University, Viet Nam*
[4] *University of Hohenheim, Inst. of Agric. Sci. in the Tropics (Hans-Ruthenberg-Institute), Germany*

**Abstract**

The Vietnam Mekong Delta (VMD), home of over 20 million of people, where rice is a staple crop contributing more than half the rice production of the whole country. However, climate change, decreased river flow and land subsidence are leading to saltwater intrusion, which poses a significant threat to rice production in the delta. Soil salinity can be caused by seawater either intruding through tidal movements into the irrigation canal system or via seepage into near surface water tables from where it can intrude into paddy fields via capillary rise during dry season. In order to develop appropriate management strategies for the adaptation of rice production systems in the Mekong Delta to the increasing threat of soil salinisation, it is important to understand the spatial distribution of top soil salinity and the saline aquifers below rice production areas. The distribution of subsurface salinity was investigated by using integrated electrical methods, including Electrical Resistivity Tomography (ARES II) and Electromagnetic Induction Measurement (EM38). Top soil and sub-soil salinity of profiles approximately 300 m in length were measured at 40 locations following geological transects which illustrate salinity gradients in this case study in the VMD. The resulting resistivity profiles were interpreted via boreholes information available in the study area. Preliminary results show there is a dissimilarity in the distribution of salinity between top soil and sub-soil layers in the rice production system. Increased top-soil salinity was mainly observed in the centre of the study area, probably introduced via irrigation whereas salinity in the sub-soil layers increased with proximity to the saltwater sources. A potential link between the distribution of soil salinity, land-use, and salinity level of surface water will be discussed.

**Keywords:** Electrical conductivity, electrical resistivity tomography, shallow groundwater

**Contact Address:** Van Hong Nguyen, University of Hohenheim, Inst. of Agric. Sci. in the Tropics (Hans-Ruthenberg-Institute), Garbenstr. 13, 70599 Stuttgart, Germany, e-mail: van.nguyen@uni-hohenheim.de