



## **Benefiting from silicon in rice production – ecological, agronomical, and biogeochemical viewpoints**

Thimo Klotzbücher (1), Anika Klotzbücher (1), Reinhold Jahn (1), Doris Vetterlein (2), Klaus Kaiser (1), and Robert Mikutta (1)

(1) Martin Luther University Halle-Wittenberg, Soil Science and Soil Protection, Halle, Germany (thimo.klotzbuecher@landw.uni-halle.de), (2) Helmholtz-Centre for Environmental Research, Department of Soil System Science, Halle, Germany

Research on the ecology and biogeochemistry of silicon (Si) in paddy rice ecosystems is motivated by the importance of Si as a beneficial plant nutrient, its role in pedogenesis, and the tight links between the cycles of Si and those of other important nutrients and toxic elements.

The talk firstly will compile recent progress in understanding about the ecological functions of Si in rice ecosystems, including its role in improving the resilience of rice plants against a wide variety of stresses and in recycling of nutrients via rice straw decomposition. Secondly, knowledge about the multiple operating controls on Si cycling and availability is summed up. These include ‘natural‘ site conditions such as parent material, soil weathering status and climate as well as agricultural practices including irrigation and rice straw export from the fields. Here, the focus is on own results obtained during research on sustainable rice production in Vietnam and the Philippines within the interdisciplinary LEGATO project.

Several authors pointed out the potential importance of Si management as crucial factor for more sustainable rice production systems. For instance, better utilization of the benefits Si provides to rice plants, such as resistance against pests, may help to design production systems with reduced input of harmful pesticides. The talk will ponder on these ideas and on the knowledge gaps that currently limit the ability to efficiently manage Si balances and availability in rice ecosystems.