

## Symposium Proposal

### 1. Title

Integrated management strategies for As and Cd in rice paddy environments

### 2. Type

Inter-Divisional Symposium

### 3. Organizer(s) & convener

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### 4. Rationale

Arsenic (As) and cadmium (Cd) have been identified as the major metal(loid)s reaching the food chain through various geogenic and anthropogenic activities. In many Asian countries,

As and Cd accumulation in rice (*Oryza sativa* L.) and subsequent transfer to food chain is a major environmental issue. Paddy soils have been affected by As and Cd accumulation by irrigation water, fertilizer, and mine tailings. Arsenic and Cd contamination threatens food security, food safety and quality, and long-term agricultural sustainability of rice crops. Excessive intake of As and Cd into the human body is detrimental to human health causing serious illnesses such as Itai-itai and Blackfoot diseases. Arsenic is immobilized under oxidizing conditions and solubilized under reducing conditions whereas it is vice-versa in Cd. Prolonged submergence for keeping paddy soils under reducing condition has been shown to successfully decrease Cd concentration in rice grains, but leads to increased uptake of As. Managing low concentrations of As and Cd together in rice plants have always been a serious issue. Therefore, in this symposium, the need to discuss and share the existing remediation or management techniques, its pros and cons, and to establish new and practically feasible mitigation methods to reduce the As and Cd contents in rice ecosystem is very critical.

## **5. Objective**

The objective of this symposium is to put forward the major issues concerning the bioavailability of As and Cd in rice ecosystems, to interpret the available management strategies and to reveal the attainable remediation/management techniques. The symposium will focus on various sources of As and Cd in rice paddy, biogeochemical processes that regulate their bioavailability, and risk management methods including water management techniques, soil amendments, practical rice cultivars for metal(loid) tolerance or phytoextraction. Major successes, challenges, limitations and opportunities within As-Cd risk assessment and remediation research will be explored. This symposium will bring together leading research experts and professionals from around the world in order to share their knowledge and expertise, and to propose suitable management and remediation solutions.

## **6. Description**

The symposium will provide a scope for critical discussion about As and Cd in rice ecosystems, the biogeochemical processes that regulate their bioavailability to soil organisms, plants, animals and humans and the management strategies to mitigate the metal(loid)s. Practical solutions for managing As and Cd in paddy soils and rice will be shared extensively between experts and those interested in this field. An integrated approach that employs a combination of remediation technologies, with the aim of securing methods that are economically and technologically feasible will be outlined during the symposium. The symposium will also provide a networking opportunity for domestic/early-career soil scientists as well as established international soil scientists.