

# WATER MANAGEMENT IN RICE FIELDS ON ACID SULPHATE SOILS OF INDONESIA

R.J. SEVENHUYSEN<sup>1</sup>, SURYANTO SARAGIH<sup>2</sup> AND R.A.L. KSELIK<sup>1</sup>

- 1) International Institute for Land Reclamation and Improvement (ILRI); The Netherlands
- 2) Banjarmasin Research Institute for Food Crops, Indonesia.

## ABSTRACT

Of the estimated 12 million ha of potential and actual acid sulphate soils in the world, 6.7 million ha are in South East Asia. For a great part, these soils are in swamp coastal plains. They are rich in pyrite ( $\text{FeS}_2$ ) that, upon exposure to the air, oxidizes to sulphuric acid ( $\text{H}_2\text{SO}_4$ ). Toxic amounts of aluminium, hydrogen, manganese, and ferric-ion in the soils, in combination with the related low levels of phosphorous can restrict - or even inhibit - plant growth. Under flooded conditions (rice cultivation), toxic levels of ferrous-ion, hydrogen-sulfide, and carbon dioxide prevail.

In 1988, Indonesian and Dutch institutes started a research program to find practical solutions to the problems inherent in the reclamation of acid sulphate soils. The first stage of the program will concentrate on the conditions in the humid tropics and will continue till 1990. The research area is in the Barito River Delta, Kalimantan, where some 300,000 ha have been reclaimed since 1930. One of the research components focuses on water management in tidal areas.

Water management as a method of increasing agricultural productivity is related to the cropping systems in and the hydrological and soil conditions of the area. Under the hydrological conditions of Kalimantan, where acidity problems are severe, practical water management techniques are limited to :

- Direct irrigation from tidal rivers and high tides;
- Irrigation with water stored on the surface of unreclaimed areas;
- Water conservation during months of surplus rainfall;
- Land drainage to levels corresponding to low tides.

The water management research concentrates on experiments in test fields and the monitoring of water management in farmers' fields. To evaluate the water

management systems, periodic analyses are made of soil and water quality, leaf samples, crop yields, and the field water balance. The results of the first cropping season will be presented at the symposium.