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Research on paddy rice soils in different regions of the Ivory Coast

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Introduction

Rice, along with yarn, cassava and maize, ranks among the basic foods in great parts of the Côte d'Ivoire. The cultivation of rainfed upland rice has been practiced for centuries and yields about 5 tons/ha. In order to meet the growing requirement caused by the increasing population and urbanization, efforts are undertaken to enlarge the rice production of the country. The introduction and support of the much more yield-rich flooded rice cultivation is an important step towards this intensification.

Within this procedure, special attention is payed to the cultivation of the so-called "Bas-Fonds". The Bas-Fonds are flat, swampy valley bottoms with a small longitudinal slope (inland valleys). According to the different morphodynamic processes, the inland valleys in the dryer North of the Ivory Coast are not as deep as the ones in the South. Due to periodical flooding, the cultivation of other fruits is impossible and the Bas-Fonds are still more or less uncultivated or only extensively used areas. On opposite, large parts of the still very agricultural country are covered with food-crops (subsistence fanning) or cash-crops (mainly cocoa, palm-oil and coffee in the South, and peanuts and cotton in the North), and therefore the Bas-Fonds represent the last important land reserves of the Ivory Coast. The aim of the still on-going study is the to prove the suitability of some Bas-Fonds for the cultivation of flooded rice.

The Study

In August/September 1998, intensive field studies have been carried out in various regions of the Ivory Coast. The Bas-Fonds under study are located in two different working regions:

1. **The Southwest:** examination of 9 Bas-Fonds in cooperation with PACPNT *(Projet Autonome pour la Conservation du Parc National de Tai, San Pedro, Ivory Coast).*
2. **The North (Korhogo region):** examination of 4 Bas-Fonds in cooperation with GTZ (Gesellschaft für Technische Zusammenarbeit, Eschborn, Germany).
3. **The Northwest (Odienne region):** examination of the Bas-Fonds Feremandougou.

During the field studies, 178 soil samples have been taken and some of them still have to be analyzed at the geomorphological laboratory of the Department of Geography, Mainz University. The following parameters were analysed:

1. physical parameters (grain size, salinity, humic substance, water storage capacity)
2. chemical parameters (pH, cation exchange capacity, nutrients balance, agrochemical residues)

Discussion

Both catenas represent soil- and land use-formations typical for West Africa. The ridges, acting as water-sheds, and the upper slopes carry ferralsols which are mostly covered with cash-crops. The central slopes are characterized by indurated plinthit/pisolith enrichments which are more compact in the dryer North. They sometimes cause a decreased interflow in these parts of the slopes. Cambisols are typical for downslopes. In the South, cocoa plants are planted on the fertile land right to the edge of the valley bottoms; in the North, these parts of the valleys are widely weeded fallow fields used as pastureland. The soils of the valley

bottoms contain very low skeleton proportions but very high sandy proportions; the clay proportions are also very low (esp. in Sagboya) and don't vary much. The sandy texture is responsible for the high water permeability of the substratum; apart from the high evaporation, this also causes a further loss of water because of the infiltration. The skeleton proportions in the upper soil of Foro represent colluvial material while the coarse parts of the lower soil horizons at Sagboya are of saprolithic origin. Due to their physical soil condition, the suitability of the presented examples for the intensive cultivation of flooded rice has to be regarded as limited.