



Deutscher Tropentag, October 9-11, 2002, Witzenhausen  
“Challenges to Organic Farming and Sustainable Land Use  
in the Tropics and Subtropics”

## A Preliminary Assessment of Characteristics and Long-Term Variability of Rainfall in Ethiopia — Basis for Sustainable Land use and Resource Management

MAHDI OSMAN<sup>1</sup>, PETRA SAUERBORN<sup>2</sup>

<sup>1</sup>*Ministry of Agriculture (MoA), Ethiopia*

<sup>2</sup>*University of Cologne, Seminar for Geography, Germany*

### Abstract

Ethiopia had a long history of agricultural and meteorological drought during the last century, and is still suffering the same in many regions. The consequent agricultural crisis exposed Ethiopia to reoccurring famine vulnerability. For example, in 1984/1985 Ethiopia lost annual agricultural production of about a million tons. Nonetheless, the impacts of past climate variability on the agro-ecosystems, the land resource management and the agricultural development strategies were not satisfactorily addressed. The primary reasons being a lack of systematically documented baseline information on the characteristics and long-term variability of rainfall, and the absence of preliminary studies into these.

This collaborative project between the universities of Bonn and Cologne and different institutions in Ethiopia (for example the Ministry of Agriculture), sponsored by the Friedrich-Ebert Foundation, aims to fill this crucial information gap. The output of the study is expected to generate useful input material to plan future agricultural development, food security and sustainable resource management. The study focuses on the central highlands of Ethiopia (7°02'–11°46'N and 36°27'–40°12'E). Precipitation data from 1898–1997 were analysed. Basic statistical analyses were made, normality and representativity tests were done. Trend and persistence analyses were conducted. Irregularities were noted in the original data set, due primarily to the lack of systematically documented agro-meteorological data. Summer rainfall in the study area tends to decrease. Yet, extremely high rainfall was noted. The area was predominantly characterised by positive rainfall deviations from the long-term mean in the first and negative deviations in the second half of the 20<sup>th</sup> century. Agricultural crisis and extreme soil erosion in Ethiopia coincide well with historical lows of precipitation. Data management should be improved. Reliable agro-meteorological stations should be established, with reasonable spatial distribution. Water resource management measures and supporting policies should be thoroughly designed and strictly implemented to tackle the challenges of agricultural crisis. Future agricultural research should incorporate agro-meteorological research, to ensure efficient resource management and sustainable agricultural development.

**Keywords:** Central highlands, Ethiopia, land use strategies, long-term rainfall, resource management, statistics, sustainable development