



Fig. 10. Agro-ecological regions in the humid and sub-humid zones of Nigeria.

**I. Basement Complex Regions (Cocoa/Forest)**

- IA Northern sub-humid zone (W. Nigeria)—pop. high
- IBa Central Humid, Sub-humid Uplands—(W. Nigeria)—pop. high.
- IBb Eastern Humid Uplands (E. Nigeria) basement complex/volcanic—low pop.
- IC Southern Humid Lowlands (W. Nigeria)—basement complex/colluvial, alluvial deposits—high pop.

**II. Sandstone and Coastal Sand (Oilpalm/Root Crops/Forest Complex)**

- IIA S.W. Sub-humid lowlands—sandy lowlands—medium pop.
- IIB Lagos and Adjacent Lowlands—sedimentary sands—high pop.
- IICa Benin Lowlands—Sedimentary sands—medium to low pop.

- IICb Cross River Basin—sedimentary sands—low pop.
- IID (Coastal) Sedimentary Sandy Plains—(E. Nigeria)—high pop.

**III. Niger Delta and Coastal Swamps**

- IIIA Middle-Upper Delta—medium to high pop.
- IIIB Lower Delta and Coastal Swamps—low pop.

**IV. Upland Moist Savanna**

- IVAa Western Moist Savanna—mostly Basement Complex, medium—high pop.
- IVAb Eastern Moist Savanna (sandstone hills)—high pop.
- IVAc Eastern Moist Savanna—medium pop.
- IVB. North Eastern (Guinea) Savanna—Sandstone medium to low pop.

**V. Mangroves/Coastal Sands**

## Land and soil management

Research on land and soil management includes the following areas: land clearing and development, tillage systems and small tools development and management of kaolinitic Alfisols and siliceous Ultisols.

### Land clearing and development

Hydrological investigations and characterization of soil physical properties as influenced by methods of land clearing and post-clearing soil management were continued in 1980 for cassava planted in the 1979 second season and harvested toward the end of 1980.

**Effect on soil bulk density.** Deforestation resulted in a significant increase in soil bulk density (Table 8), and there were slight differences in bulk density among various methods of land clearing. Maize, being an open-row crop grown immediately after deforestation, increased soil bulk density (data of 1979), while cassava, being a close canopy crop, decreased soil bulk density. Moreover, tuber development just beneath the soil surface may have contributed to decreasing the bulk density of the layer above the tuber and increasing the bulk density of the layer below the tubers. Differences in soil bulk density were also reflected in the infiltration rate and penetrometer resistance.

**Effect on total water yield.** Water yield from the cleared watershed treatment was 259 mm while the forested