WARDA's experimental farm

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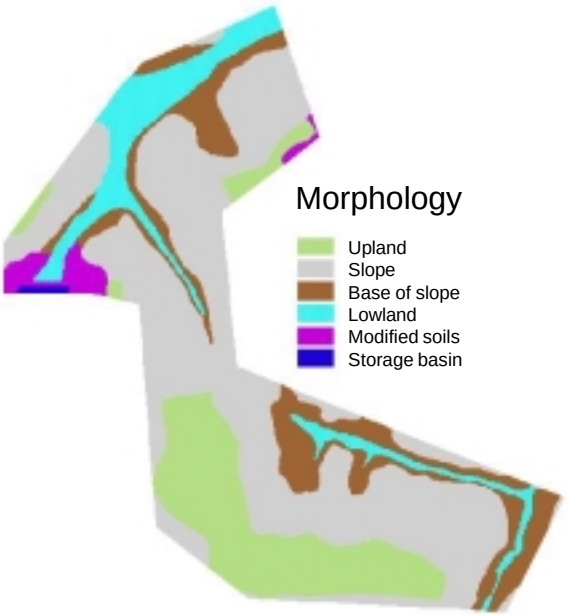
Creation and location

In 1987, the Government of Côte d'Ivoire granted an area of 1220 ha to WARDA where the principal research station of WARDA has been built. This area is situated between 7.5° and 8.5° N and between 4.5° and 5.5° W, about 35 km northwest of Bouaké and 7 km west from the PK 25 road Bouaké Katiola. In 1989, soil studies were conducted for 700 ha. Three ecologies of rice growing have been identified: lowlands, uplands and of inland hydromorphic or continuum valley.



Bio-physical conditions

Climate

The principal research station of WARDA is situated in the equatorial transition zone with a bimodal rainfall system characterized by:

- a long dry season from early November to mid-March
- a short rainy season from mid-July to mid-August
- an inter-season from mid-August to end of October.

The average rainfall is about 985 mm/year. Over many years, mean temperatures of 26.25°, 34.15° and 21.25° have been recorded for average, maximum and minimum. The average daily evapotranspiration (ETP) is 6.38 mm.

Rainfall 1992–2000.

Year	Total (mm)
1992	834
1993	985
1994	881
1995	949
1996	1171
1997	887
1998	1060
1999	912
2000	1186

Vegetation

The area is essentially covered by some semi-deciduous micro forests, galleries and grassy savanna that hardly survive the numerous annual bush fires jeopardizing the survival of most of the species. The ligneous species found here are: *Daniella olivieri, Khaya grandifolia, Chlorophora regia, Ceiba pentandra, Andansonia digitata, Parkia biglobosa, Lannea acida, Lannea barteri, Pterocarpus erinaceus, Bridelia ferrugina, Terminalia glaucenscens, Afromona laxiflora, Piliostigma thonningii.*

Description of the farm

Organizational structure

The research activities of WARDA in Côte d'Ivoire are executed on station at M'bé under the responsibility of the farm manager, and in three key sites located on-farm in the south, west and north of the country.

WARDA has a Farm Research Committee (FRC) assisting the farm manager in the setting of global objectives and of long-term strategic plan of the Research Farm Unit.

Farm resources

The farm resources include:

- human resources: a farm manager, two supervisors for the operations in the lowlands and uplands; two operators and three assistant-operators (machine drivers). The cultural maintenance works are carried out by daily laborers, with an average of 25 people a day
- material resources: machinery and agricultural equipment, infrastructure, buildings and drying floors and the irrigation systems
- water: the farm possesses a lake with a storage capacity of 5 million m^3, covering a surface of 140 ha, and four underground (not yet activated) bore wells. Despite the fact that it has some filling-up problems, the lake supplies most of the irrigation water for the lowland plots as well for the local farmers (80% of the water) as for WARDA (20%)
- land is the most vital resource of the farm; almost 600 of the 700 ha are reserved for research activities (the rest is for infrastructure).

Land distribution in terms of rice ecologies:

Upland:	339.17 ha
Inland valley:	206.20 ha
Lowland:	48.55 ha
Total:	**59.92 ha**
Infrastructure:	106.08 ha
Total :	**700.00 ha**

The area is protected by 18 km fence of wire netting

Classification of the management systems

As more than 60% of the population of the 17 member states of WARDA are resource-poor small-scale farmers with limited access to input and agricultural materials, it was necessary for the farm to adopt soil management systems taking into account the different capacity levels of the farmers. So, the farm plots have been classified according to the following management systems:

- ***high-input*** management system: intensification of the mechanized cultural practices, fertilization with high doses of nitrogen, phosphorus and potassium (up to 400 kg NPK/ha); application of other agricultural inputs and soil improvement operations. Soil fertility improving crops (legumes), are part of the rotation and are grown during fallow
- ***medium-input*** management system: mechanization of cultural practices is avoided as much as possible. This system fits the medium farmer able to afford animal traction and a minimum of top- dressing. If necessary, one may use only a lightweight disc harrow. The plow depth is not more than 10 -12 cm. Fertilizer application: 2 t of manure/compost and 30-15-15kg of NPK per ha. Cover crops can be sown during the fallow period

- ***low-input*** system: management system according to the limited capacities of the farmer. All the cultural practices are done by hand. No fertilizers or other chemical inputs are applied. Fallow is natural without cover crops.

The upland soils, especially the exonded tops of the sloops, are characterized by an underground water table always situated below the root level. Rice production is only possible during the rainy season. The soils are clayey—gravelly with roots reaching 60 cm depth.

The soils at the base of the sloops and those of the lowlands have a longer cultural (growth) period, as water can be available by

Plot distribution according to management system

Soil	High input	Medium input	Low input	Total (ha)
Upland	109,37	86,17	143,63	339,17
Inland valley/Hydromorphic	59,70	75,59	70,91	206,20
Lowland	26,65	15,00	6,90	48,55
Total/Input level	**195,72**	**176,76**	**221,44**	**593,92**
Infrastructures				106,08
Total				**700,00**

capillary raise at the colluvial slopes bases (sandy and deep) or by the permanent water table at the surface of the soil of the lowlands (clayey and deep).

Moreover the farm has established:

- a quarantine plot of 1 ha
- plots serving as ecology reference zones with the natural vegetation under the three ecologies (lowland, upland, inland valley).

Objectives and activities of the Research Farm Unit

The Research Farm Unit Manager is responsible for the management of the experimental area. The major objective of the management unit is to support the research programs by putting well-prepared, appropriated fields at their disposal.

As there is always water, it is possible to continue research activities and seed production through the year. To meet this objective the farm focuses on four major activities:

- preparation and management of plots (primary and secondary cultural activities, allocation of the plots to different programs, protection and conservation, improvement of soils based on a sustainable management system)
- irrigation of experimental plots (irrigation by gravity in lowlands and by sprinkler and mobile ramp in uplands). It should be noted that a complementary irrigation is only applied on upland trials
- seed multiplication for the research programs (multiplication of foundation seed)
- data gathering and management of databases concerning the history of the trial plots.