

GUINEA



General

Guinea - officially the Republic of Guinea – was formerly known as French Guinea and is sometimes referred to as Guinea-Conakry. It is bordered by Guinea-Bissau, Senegal and Mali in the North, Ivory Coast in the East, Liberia and Sierra Leone in the South and the Atlantic Ocean in the West. Its area is 24.6 Mha (million hectares) with in 2020 a population of 13.1 million, or 0.53 persons per ha (Wikipedia and United Nations, 2019).

Climate and geography

Source: esri

The coastal region and much of the inland area have a tropical climate with a rainy season of six months, a relatively high and uniform annual temperature, and high humidity (source: Wikipedia).

In West Africa, rice farming is the main mode of exploitation in the mangrove plains, which stretch over 3.5 million hectares, from Senegal to Sierra Leone. Some of the marshes have seen their natural productivity decline as a result of drought or inadequate development. Despite favourable natural conditions, mangrove rice fields in Guinea provide only 16% of the country's production. The modest performance of the rice fields in the coastal plains is due to inadequate strategies of intensification of production and to the constraints of traditional developments.

Sylla (1994) describes that mangrove rice growing started in the middle of the 18th century in Guinea and Sierra Leone. Traditional systems are still the most widespread and they are applied, for example in Guinea, Gambia, Guinea-Bissau (bolanha system), Senegal (diola system) and Sierra Leone. The tidal rice cultivation system practiced in Guinea, Gambia and Sierra Leone consists of flooded rice cultivation during the seasonal period of fresh water flows of the major rivers. The traditional systems of rice cultivation have functioned well until the persisting droughts started in 1969. The most affected zones are mainly in the northern, and drier part of coastal West Africa, including Senegal, Gambia, Guinea-Bissau and to a some extent Guinea.

The Institute de Recherche pour le Développement (IRD) (2000) describes that over the last half century, large-scale rice-growing projects have been undertaken for several thousand hectares in the coastal area. These developments were often unsuited to the particular characteristics of the ecosystem (diversity of soil facies, instability of water and sediment conditions). The cultivation and maintenance of these cultivated areas also required substantial civil engineering work. In the more or less long-term, productivity dropped to yields similar to those of the traditional rice fields, bougouni. The bougouni, which belong to a secular tradition, require a large workforce, but their operating cost is low. However, their cultivation practices lead to soil acidification, causing nutrient deficiencies (especially nitrogen and phosphorus) necessary for plant growth. The fertility of the land then decreases and the yields decrease. The rice farmers are finally forced to abandon them and to clear new mangroves.

A check on Google Earth shows that there should be various polders in the coastal zone. However, so far no documentation could be found on these polders.

Existing polder

Polder experimental Yangoha. The only polder for which documentation could be found is the experimental polder of Yangoha (IRD, 2000). Researchers from the Boussoura National Fisheries Science Centre (CNSHB) with scientific support from the IRD and financial support of the French Development Cooperation carried out a rehabilitation trial in this polder with promising results. As a modernized version of the traditional bougouni rice fields, this original ten hectare development not far from Conakry is based on the principle of alternate management of sea water and fresh water. Simple and inexpensive, it allowed a significant improvement in production. Three years after its establishment, yields reached nearly three tons per hectare, five times that of the surrounding rice fields. In the dry season seawater enters the compartments by means of valves and is retained by means of a non-return

valve in the inlet/outlet. The intrusion of seawater makes it possible to neutralize the excessive acidity of the soils. Moreover, thanks to the mud supplied by the tide and the mineral salts contained in the sea water, the fertility of the soils is naturally reconstituted without the addition of a mineral fertilizer. During the rainy season, when the rainfall is over four metres in six months, the rains leach the seawater and desalinate the soils, allowing a good growth of the rice. If the rainfall is excessive, the water is discharged through the valves. If, on the contrary, it is insufficient, a reservoir of water upstream of the polder and connected to the fields by canals can activate the desalination of the soils or irrigate the rice fields.

This trial showed that well managed sea water is a determining factor for the rehabilitation and fertilization of rice fields. The development allowed a significant improvement in yields. In addition, the experimental polder induced other beneficial effects: development of fish farming in ponds, market gardening around the reservoir, restoration of canoe transport allowing a better disposal of agricultural products.

Beyond its agronomic repercussions, the polder has changed farmers' practices. A new production system, more lucrative and based on pluri-activity, has emerged in the region.

- inlet of the sea entering the interior and at the edge of which the mangrove grows;
- plots cultivated and separated by small dikes that retain water.

The general characteristics of the Polder experimental Yangoha. are shown in Table I.

Proposed polders

No proposed polder could be identified.

References

- Institut de Recherche pour le Développement (IRD), 2000. *Réhabiliter la mangrove: un polder expérimental en Guinée*. <http://www.ird.fr/la-mediatheque/fiches-d-actualite-scientifique/126-rehabiliter-la-mangrove-un-polder-experimental-en-guinee> (in French).
- Sylla, M., 1994. *Soil salinity and acidity: spatial variability and effects on rice production in West Africa's mangrove zone*. PhD thesis Wageningen University. Wageningen, the Netherlands.
- United Nations, Department of Economic and Social Affairs, Population Division. 2019. *World Population Prospects, medium prognosis. The 2019 revision*. New York, USA.

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Table I. General characteristics of existing polders in Guinea

Name	Reclamation	Area in ha	Type *)	Latitudes	Longitudes	Elevation in m+MSL	Land use
Polder experimental de Yangoha	1997	10	LGS				Nature and agriculture
Total		10					

*) RLL = reclaimed low-lying land; LGS = land gained on the sea; DL = drained lake