

GAMBIA



Source: esri

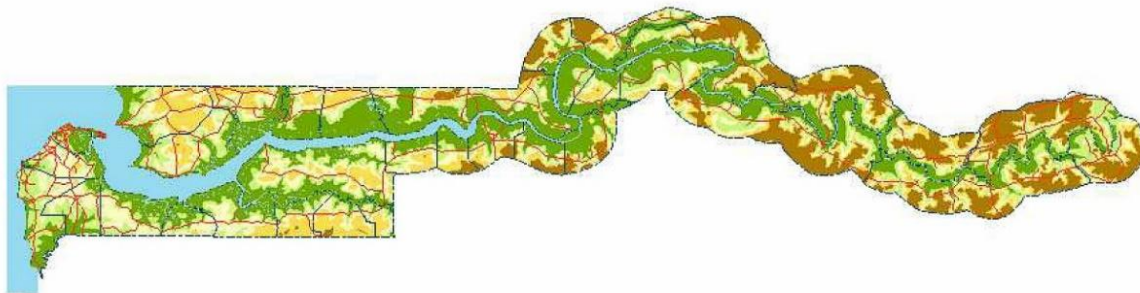
General

Gambia - officially the Republic of The Gambia - in West Africa is entirely surrounded by Senegal except for its coastline on the Atlantic Ocean at its western end. It is the smallest country in mainland Africa, whose borders mirror the meandering Gambia River. The area of the country is 1.07 Mha (million hectare) with, in 2024, a population of 2.8 million, or 2.7 persons per ha (Wikipedia and United Nations, 2024).

Climate and geography

Gambia has a tropical climate. The hot and rainy season normally lasts from June until November, from then until May, cooler temperatures predominate, with less precipitation (source: Wikipedia). Marius (1982) stated that in 1972 climate drying started.

The distribution in elevation of the country is shown in Figure 1. Tidal currents exist up to 526 km from the mouth of the Gambia River. Mean tidal amplitudes are of the order of 1.0 to 1.5 m, with spring tide amplitudes up to 2.5 m (Marius, 1982). Sylla (1994) described that in the Gambia River the tidal amplitude varies from about 1.7 m at the mouth till 0.10 m 350 km upstream. Ten to twenty percent of the country is seasonally, or diurnally flooded (Global Environmental Facility (GEF), Government of The Gambia (GOTG) and United Nations Environment Programme (UNEP), 2007). In Table I the areas at or below mean sea level in relation to the sea level rise are shown.



	Land area (sq. km) within specified elevation category (meters above sea level)				
	<10	10 - 20	20 - 30	30 - 40	>40
Banjul	11	0	0	0	0
Kanifing	52	27	1	0	0
Brikama	560	477	512	202	11
Mansakonko	615	284	332	228	101
Kerewan	924	383	405	446	39
Kuntaur	413	223	188	196	475
Janjangbureh	567	270	203	170	254
Basse	373	371	287	329	681

Figure 1. Elevation map of Gambia (GEF, GOTG and UNEP, 2007)

Marius (1982) described that in Gambia and Senegal the areas with mangroves are concentrated along the banks and beaches in the estuaries of the Senegal, Saloum, Gambia and Casamance rivers at a total area of about 500,000 ha (Figure 2). Parts of the mangrove areas have been replaced by *tannes*, that are areas where the mangroves were cleared for paddy fields or salt pans. After reclamation these soils became acid and are since then without or with only low herbaceous vegetation. Since 1972 systematic soil surveys have been conducted in the three estuaries, resulting in soil maps and relevant physiographic background information. Detailed maps have been made for specific reclamation projects.

Table I. Area at or below mean sea level (ha) for different sea level rise scenarios within local government authorities across Gambia (GEF, GOTG and UNEP, 2007)

Local Government Authority	Total local area (ha)	Sea level rise (cm)		
		0	50	100
Banjul	1,100	570	650	700
Kanifing	8,000	3,420	3,500	3,600
Brikama	176,000	18,400	21,900	24,000
Mansakonko	156,000	9,300	15,400	19,700
Kerewan	220,000	25,400	32,600	38,500
Kuntaur	150,000	4,100	5,500	7,100
Janjangbureh	147,000	5,100	8,600	12,400
Basse	205,000	900	1,000	1,000

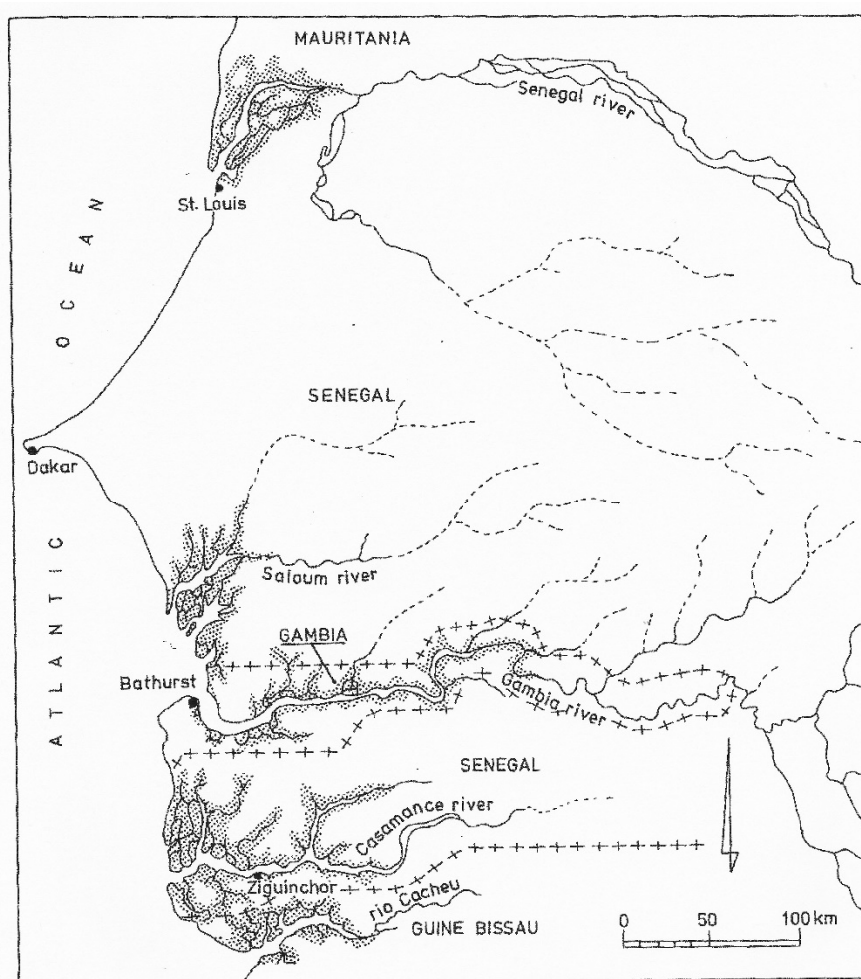


Figure 2. Mangrove areas in Gambia and Senegal (Marius, 1982)

Sylla (1994) described that mangrove rice growing started in the middle of the 18th century in Guinea and Sierra Leone. Traditional systems are still the most widespread. They are applied, for example in Gambia, Guinea, Guinea-Bissau (Bolanha system), Senegal (Diola system) and Sierra Leone. The tidal rice cultivation system practiced in Gambia, Guinea and Sierra Leone consists of flooded rice cultivation during the seasonal period of fresh water flows in 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 some extent Guinea.

GEF, GOTG and UNEP (2007) also showed a map with the area liable to permanent flooding under a 100 cm sea level rise scenario (Figure 3).

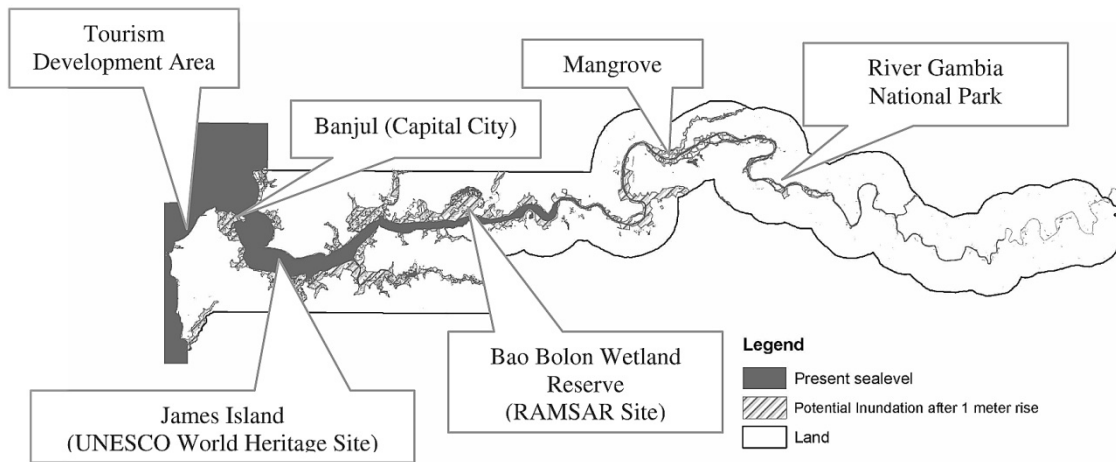


Figure 3. Area liable to permanent flooding under a 100 cm sea level rise scenario. The total area flooded also depends on diurnal tidal cycles and seasonal flooding. Erosion of beaches and potential breaching of barrier dunes on the Atlantic seaboard, as a result of increased wave activity could further aggravate the degree of flooding in coastal areas (GEF, GOTG and UNEP, 2007)

Marius (1982) described that the intertidal clay flats facilitated the construction of small polders. He also mentioned that even before 1972 large-scale reclamation projects for paddy production have been realised. In line with this in the Credit Agreement of the Republic of the Gambia and the International Development Association (1972) mention is made of swamp rice cultivation and the design and construction of flood control works in one or two swamps. In the Performance Assessment Report by the World Bank (1977) mention is made of identification of areas suitable for swamp rice production, ground survey of selected swamps, design of flood control works and related cost estimates, and the implementation of such works in one or two swamps to test the proposals in practice. In the framework of the project 794 ha have been developed for rice production (Figure 4). Reference is made of underperformance of the project due to lack of a drainage system.

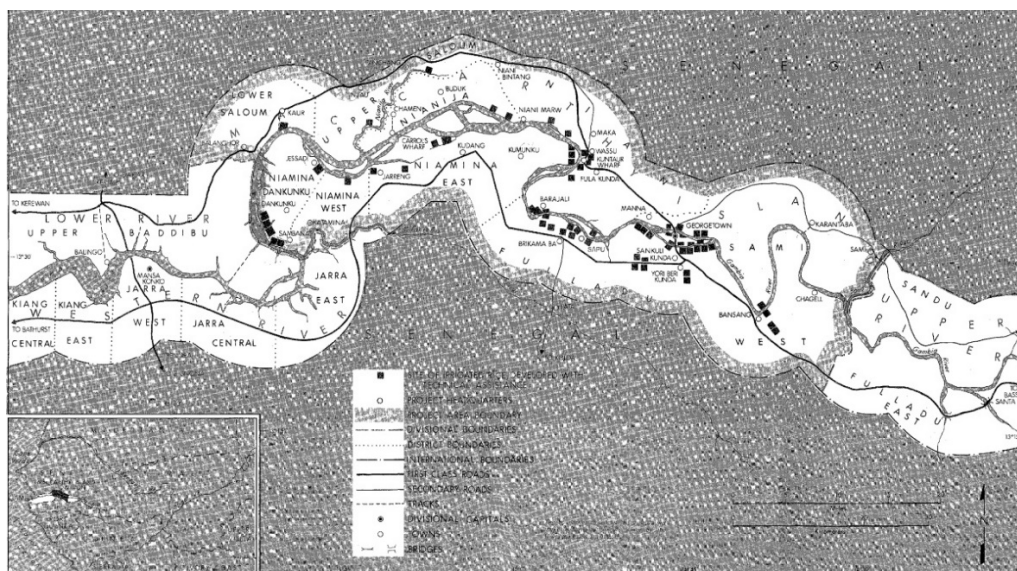


Figure 4. Sites of irrigated rice developed with technical assistance (World Bank, 1977)

In the World Bank report of 1984 it is mentioned that deep flooded swamp rice is grown particularly in the inland depressions of MacCarthy Island Division, which are persistently flooded in the wet season up to a height of more than one metre. However, this is probably under natural conditions and not in the polders.

Existing polders

Various small polders

Along the Gambia river there are various small polders as described above. It is, however, quite complicated to determine their exact size and location, even from Google Earth. It also can be observed that several of these polders are not really in a good state anymore. The clearly defined area is 794 ha. However, the exact area is most probably significantly larger.

Polder near Tendaba

The Government of Gambia has received funds from the Global Environment Facility's (GEF) Least Developed Countries Fund (LDC-F) to implement the project titled '*Strengthening resilience of climate change vulnerable coastal areas and communities in The Gambia*'. The project is being implemented by the National Environment Agency (NEA) in partnership with the United Nations Development Programme (UNDP). The GEF-sponsored Gambia Government Project has chosen Tendaba as a pilot site for the demonstration of measures to control climate related problems (UNDP, 2015). The consultancy relates to a pilot activity in Tendaba village in the Lower River Region. The project pilots the construction of a polder at the foreshore of the village through sediment deposition techniques that will eventually add to the creation of earth embankments that will be stabilized through the introduction of vegetation or cropping. The polder is 500 m to 1 km long. A tidal study has determined the width. The location of this polder is shown in Figure 5.



Figure 5. Location of the polder near Tendaba (UNDP, 2015)

General characteristics of the polders in Gambia are shown in Table II.

Proposed polders

No proposed polders could be identified.

Location of the polders in Gambia as shown on the World polder map

The location of the polders in Gambia is shown in Figure 6.



Figure 6. Location of the polders in Gambia (source: esri – Batavialand)

References

- Global Environmental Facility (GEF), Government of The Gambia (GOTG) and United Nations Environment Programme (UNEP), 2007. *Gambia National adaptation programme of action (NAPA) on climate change*. Banjul, Gambia
- Marius, C., 1982. *Acid sulphate soils of the Mangrove area of Senegal and Gambia*. In: Dost, H. and N. van Breemen (eds.). *Proceedings of the Bangkok Symposium on Acid Sulphate soils*. Bangkok, Thailand. International Institute for Land Reclamation and Improvement (ILRI), Wageningen, the Netherlands.
- 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.
- The Republic of the Gambia and International Development Association, 1972. *Development Credit Agreement (Agriculture Development Project)*. September 29.
- United Nations, Department of Economic and Social Affairs, Population Division. 2024. *World population prospects, medium prognosis. The 2024 revision*. New York, USA.
- United Nations Development Programme (UNDP), 2015. http://procurement-notices.undp.org/view_notice.cfm?notice_id=24033
- World Bank, 1977. *Performance assessment report. The Gambia - Agriculture development project. Phase I*. Washington D.C., USA.
- World Bank, 1984. *Staff appraisal report. The Gambia agricultural development project. Phase II*. Report no. 4416-GM. Washington D.C., USA. *Note: in this report there is no reference to polders.*

Bart Schultz

Lelystad, August 2024

Table II. General characteristics of the polders in Gambia

Name	Reclamation	Area in ha	Type *)	Latitudes	Longitudes	Elevation in m+MSL	Land use
Various small polders	1972-1977	794	RLL	13° 41' N	14° 59' W	2	Agriculture, rice
Polder near Tendaba	2015 - present	3,725	RLL	13° 26' N	15° 48' W	0	Agriculture
Total		4,519					

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