

MALI



Source: esri

General

Mali - officially the Republic of Mali - is the eighth-largest country in Africa. Mali consists of eight regions. Its borders in the North reach deep into the middle of the Sahara Desert, while the country's southern part, where the majority of inhabitants live, features the Niger and Senegal rivers. Mali is a land-locked country, with Algeria in the North, Niger and Burkina Fasso in the East, Ivory Coast and Guinea in the South, and Senegal and Mauritania in the West. Its area is just over 124 Mha (million hectares) with in 2020 a population of 20.3 million, or 0.16 persons per ha (Wikipedia and United Nations, 2019).

Climate and Geography

Mali lies in the torrid zone and is among the hottest countries in the world. The thermal equator, which matches the hottest spots year-round on earth crosses the country. Most of Mali receives negligible rainfall and droughts are very frequent. Late June to early December is the rainy season in the southernmost area. During this time, flooding of the Niger River is common, creating the Inner Niger Delta. The vast northern desert part of Mali has a hot desert climate with long, extremely hot summers and scarce rainfall, which decreases northwards. The central area has a hot semi-arid climate with very high temperatures year-round, a long, intense dry season and a brief, irregular rainy season. The little southern band possesses a tropical wet and dry climate very high temperatures year-round with a dry season and a rainy season (source: Wikipedia). The Inner Delta of the Niger River has an area of 4,1 Mha. As an example the inundated area at a level of 6.30 m at the Mopti scale is shown in Figure 1 (Marie, 2000).

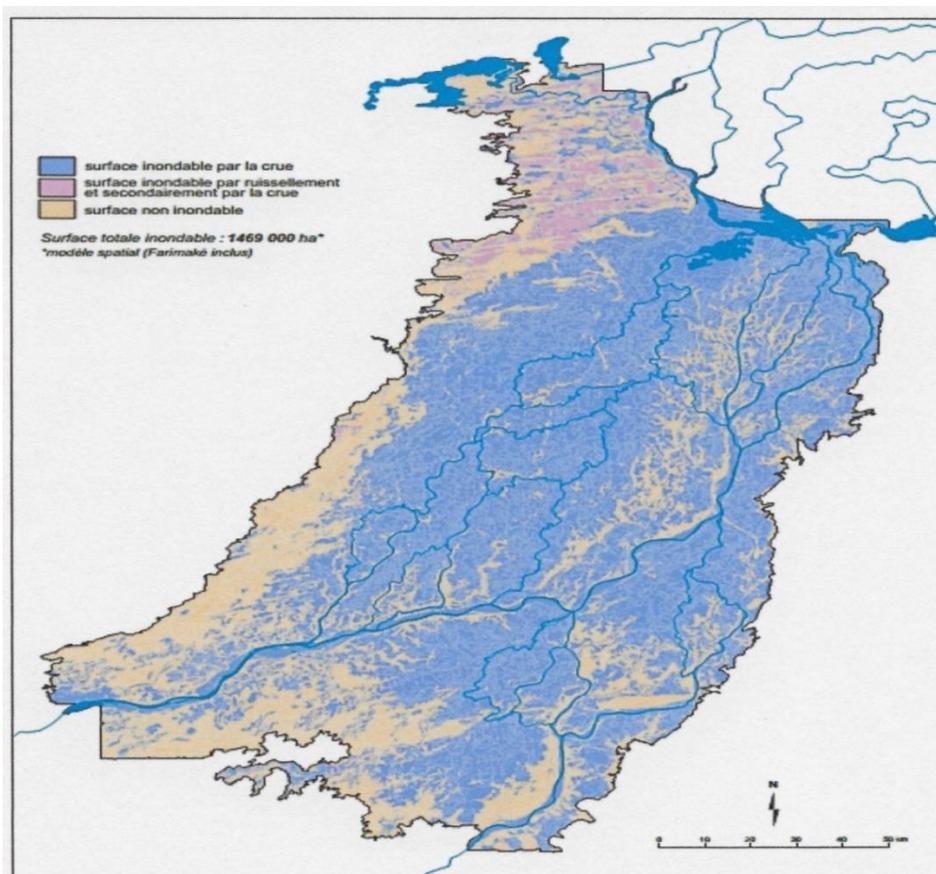


Figure 1. Inundated area at a water level of 6.30 m at the scale of Mopti (Marie, 2000)

The World Bank (1981) mentions that Mali had embarked on a programme to construct 120,000 ha rice polders in the inner delta of the Niger River, about 55,000 ha of which located in the Mopti area. In this area the Mopti I Rice Project comprised of (World Bank, 1981, 1987): i) construction of three polders, including land preparation, with a rice cultivated area of about 13,000 ha; ii) rehabilitation of five polders, including land preparation, with a rice cultivated area of about 18,000 ha; iii) land preparation on 2,000 ha of an existing polder; iv) construction of buildings for the project; v) establishment of a State Project Authority, Operation Riz Mopti (ORM), including provision of farm machinery and technical assistance to ORM. The ORM was established in 1972 to develop and exploit several rice polders located in the inner delta of the Niger and Bani rivers. Operation and maintenance of the polders, allocation of land in the new polders, production and distribution of selected seeds, and provision of credit and extension services by the project organisation in all areas mentioned above, plus in existing polders with a rice cultivated area of 2,700 ha; vi) establishment and operation of an agricultural research station; vii) preparation of a feasibility study for a second rice project in the Mopti area. The Mopti II Rice Project comprised of (World Bank, 1987): i) construction of four polders (together 8,800 ha); ii) improvement of polders developed under the Mopti I Rice Project; iii) deep ploughing of the newly developed polders and of 14,285 ha of polders developed under the Mopti I Rice Project; iv) construction of stores, workshops, offices, houses, and training centres; v) acquisition of vehicles, machinery, equipment, and two ferries; vi) an applied research and a credit program; vii) technical assistance. The Mopti Area Development Project is a follow-up of the Mopti II Rice Project. The project was approved at 21 May 1985 and completed at 31 December 1992. As far as the polders are concerned, the project concentrated on improvement works in existing polders (World Bank, 1994)

Moens and Wanders (1983) show a map with a Project of the Office du Niger. From this map several polder areas can be derived (Figure 2). They also mention the *ORM*. At the time of their report the total area of the 18 polders was 39,000 ha.

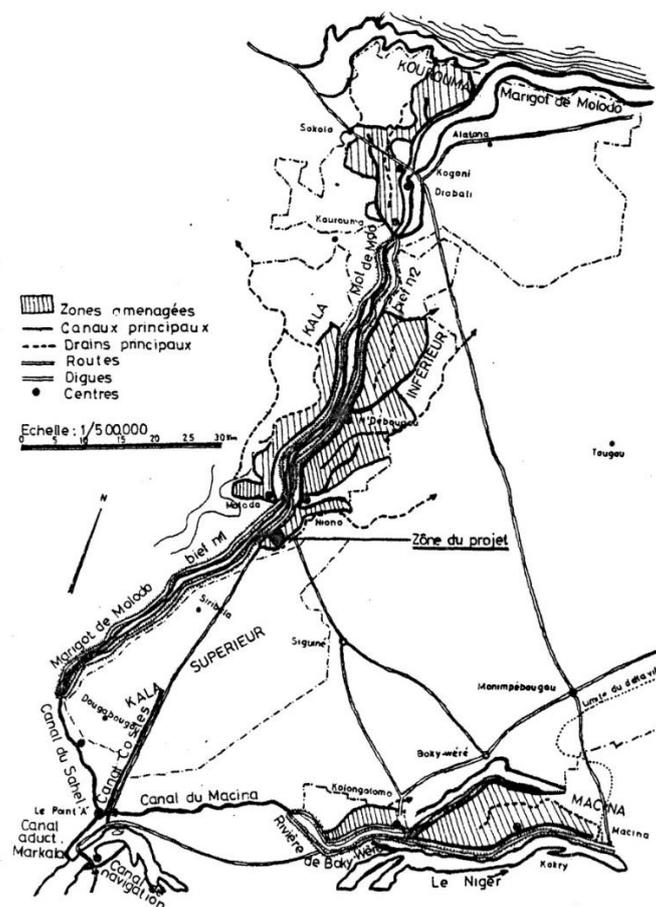


Figure 2. Project areas of Office Du Niger (Woens en Wanders, 1983)

Poncet and Troublet (1994) have published a map from which to a certain extent the polders in the Inner Delta of the Niger River can be derived (Figure 3).

Wymenga *et al.* (2002) and the International Union for Conservation of Nature (UICN) (2009) describe that the inner delta is also a Ramsar site and give information on the environmental values. Zwarts (2010) gives useful information on the rainfall, river flow, climatic and human induced impacts in the area of the Inner Delta. Dependent on the magnitude of the annual flood a large area will be inundated.

At 4 June 2016 the 4 km long Cornelis Lely Dike was inaugurated. The dike protects the city of Mopti against flooding by the Niger River (Figure 4) (Dutch Water Sector, 2016).

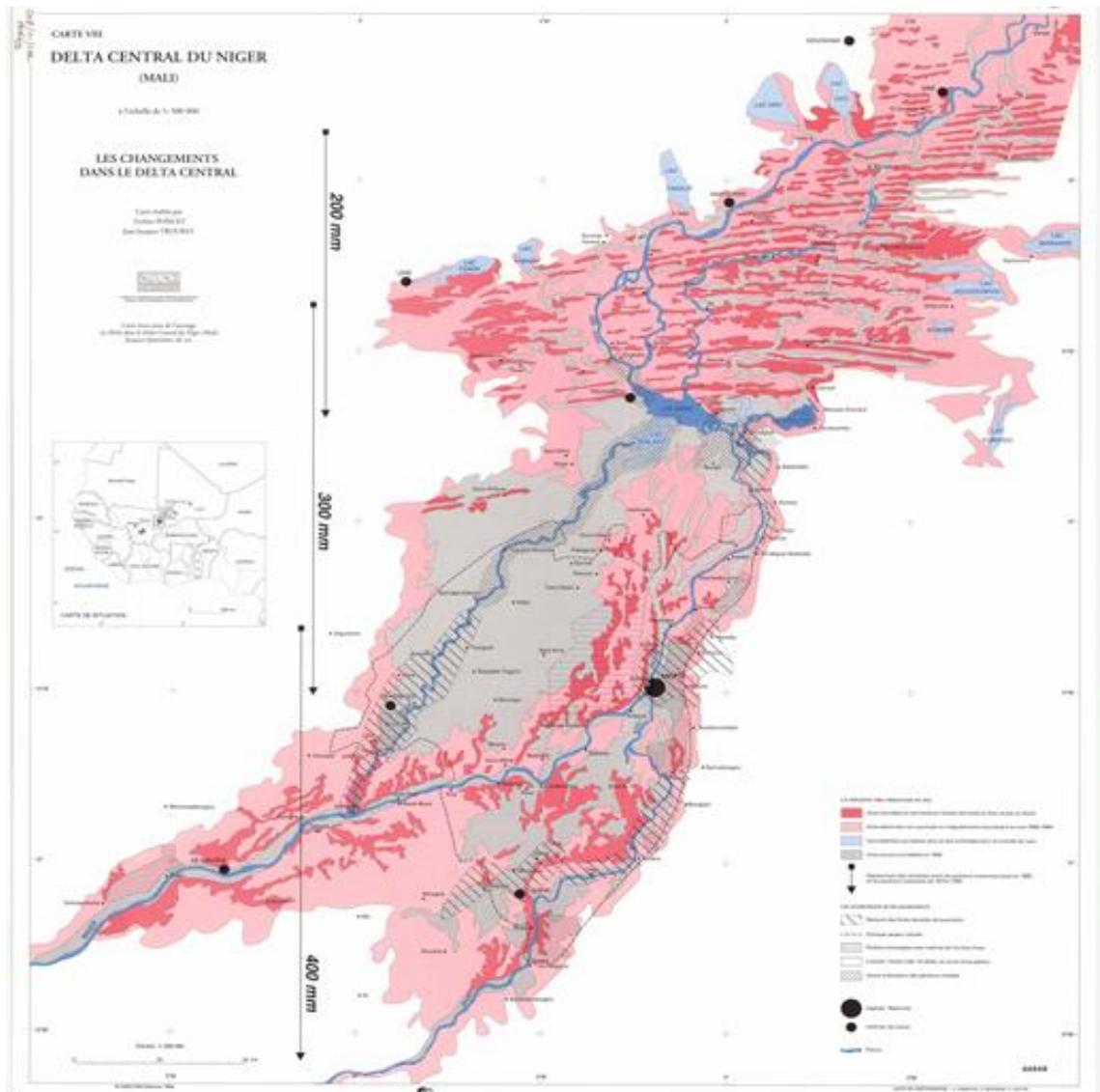


Figure 3. Map from which to a certain extent the polders in the Inner Delta of the Niger River can be derived (Poncet and Troublet, 1994)

Existing polders

Some names of polders, as mentioned by the World Bank (1981, 1987, 1994) are: Dia-Tenenkou Polders, Ibetemi Polder, Karbaye Polder, Mopti-Sud Polder, Sarantomo Syn Polder, Sofara Polder and Soufouroulaye Polder.

General characteristics of existing polders in Mali are shown in Table I.



Figure 4. Cornelis Lely dike at Mopti, Mali

Proposed polders

No proposed polders could be identified.

References

- Dutch Water Sector, 2016. *Massive 4 km levee along Niger river provides flood protection for city of Mopti, Mali* <https://www.dutchwatersector.com/news-events/news/19984-massive-4-km-levee-along-niger-river-provides-flood-protection-for-city-of-mopti-mali.html>. Posted on 28 June.
- Inner Niger Delta Centre. <https://rivers-and-heritage.com/inner-niger-delta-centre.html>.
- International Union for Conservation of Nature (IUCN), 2009. *Evaluation de l'efficacité de gestion d'un échantillon de sites RAMSAR en Afrique de l'Ouest. Evaluation de l'Effacité de la Gestion des Aires Protégées*. Ouagadougou, Burkina Faso (in French).
- Marie, J., 2000. *Hommes, milieux, enjeux spatiaux et fonciers dans le delta intérieur du Niger (Mali)*. Université Paris, Paris, France (in French).
- Moens, A. and A.A. Wanders, 1983. *Landbouwmecanisatie en Landbouwwerktuigenindustrie in Mali*. Wageningen, the Netherlands (in Dutch).
- Poncet, Y. and J.J. Troubllet, 1994. *Delta Central du Niger, Cate VIII Les changements dans le Delta Central*. Orstom. France (in French).
- United Nations, Department of Economic and Social Affairs, Population Division, 2019. *World Population Prospects, medium prognosis. The 2019 revision*. New York, USA.
- World Bank, 1971. *Mopti I Rice Project. Appraisal report*. PA-107a. 9 November 1971.
- World Bank, 1981. *Performance assessment report. Mali Mopti Rice Project*. Credit 277-MLI. Operations Evaluation Department. 25 June 1981.
- World Bank, 1987. *Mopti Rice II Project. Project completion report*. Report No. 6799. Western Africa Regional Office. May 29.
- World Bank, 1994. *Mopti Area Development Project. Project completion report*. Report No. 13445. Agriculture Operations Division, Sahel Department, Africa Regional Office. August 15.
- Wymenga, Eddy, Bakary Kone, Jan van der Kamp and Leo Zwarts (éds.), 2002. *Delta intérieur du fleuve Niger Ecologie et gestion durable des ressources naturelles*. Mali-PIN publication 2002-01 / A&W-rapport 388. Wetlands International, Sévaré / RIZA, Rijkswaterstaat, Lelystad / Alterra, Wageningen / Altenburg & Wymenga conseillers écologiques, Veenwouden. the Netherlands (in French).
- Zare, Aïda, 2015. *Variabilité climatique et gestion des ressources naturelles dans une zone humide tropicale: une approche intégrée appliquée au cas du delta intérieur du fleuve Niger (Mali)*. Sciences de l'environnement. Université de Montpellier, Institut International de l'Eau et de l'Environnement. Montpellier, France (in French).

Zwarts, L., 2010. *Le Delta Intérieur du Niger s-assechera-t-il du fait du changement climatique et de l'utilisation de l'eau en amont?* A&W rapport 1556. Feanwâlden, the Netherlands. (in French).

Bart Schultz

Lelystad, November 2020

Table I. General characteristics of existing polders in Mali

Name	Reclamation	Area in ha	Type *)	Latitudes	Longitudes	Elevation in m+MSL	Land use
Existing polders 18 polders exploited by <i>ORM</i>	1972-1983	>2,700 39,000	RLL RLL				
Mopti I Rice project: <ul style="list-style-type: none"> • construction of three polders • rehabilitation of five polders • land preparation of 2000 ha in an existing polder Bougala Polder Dia-Tenenkou Polders Ibetemi Polder Karbaye Polder Mopti-Sud Polder Sarantomo Syn Polder Sofara Polder Soufouroulaye Polder	1972-1978	13,300 13,200 10,300	RLL RLL RLL RLL RLL RLL RLL RLL	14° 30' N	4° 10' W		
Mopti II Rice project - construction of four polders: <ul style="list-style-type: none"> • Saré-Mala Polder • Ouronema Polder • Tiroguel Polder • Torokoro Polder 	1978-1983	8,800	RLL RLL RLL RLL	14° 30' N	4° 10' W		
Total		48,300					

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