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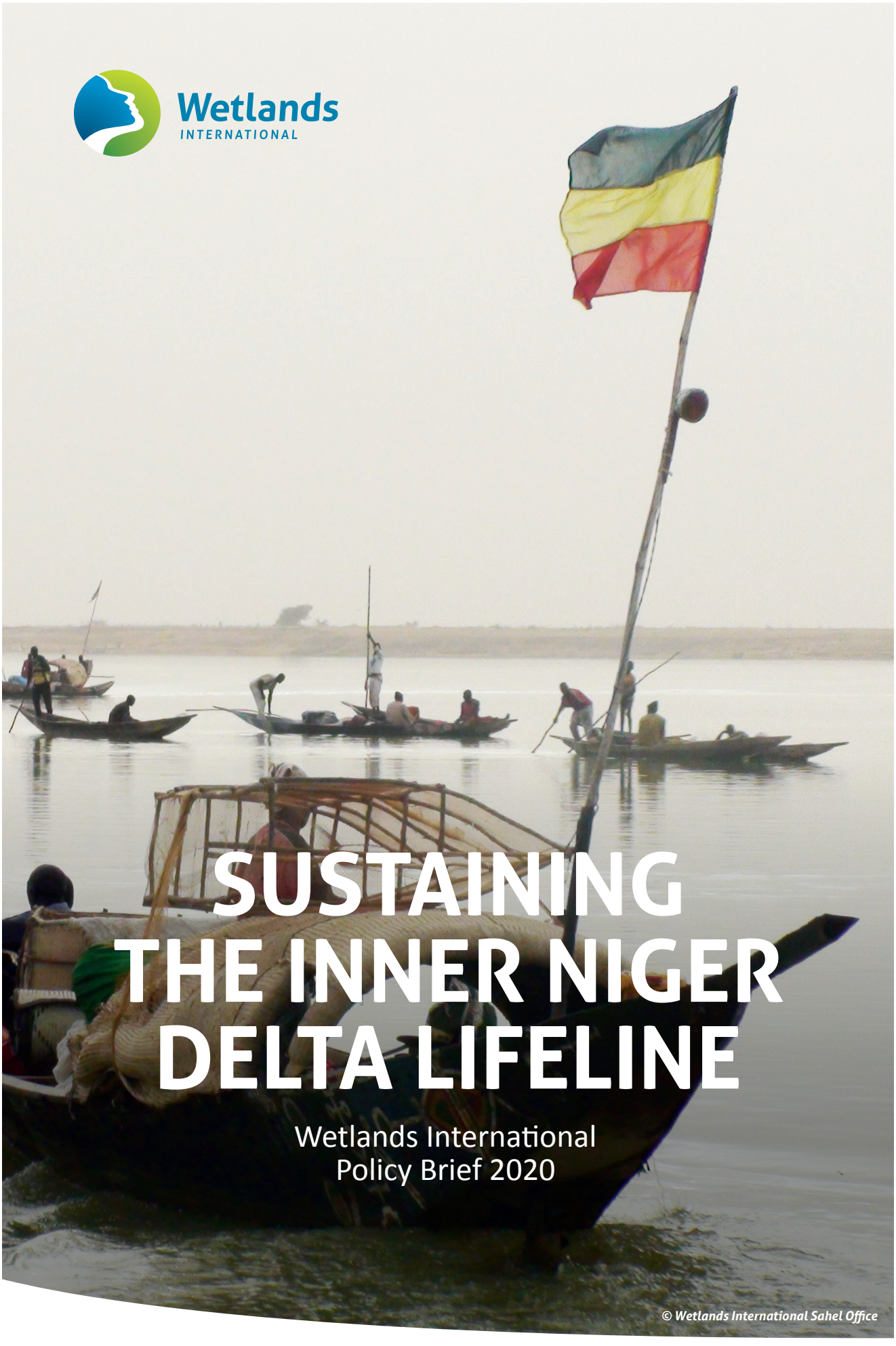

SUSTAINING THE INNER NIGER DELTA LIFELINE

Wetlands International
Policy Brief 2020

Introduction

Boosting food production and supporting livelihoods are key for Mali. The country is faced with the immense challenge of securing the prospects of a growing population in a safe and healthy environment. The Inner Niger Delta (IND), a vast riverine floodplain located in the centre of Mali, plays an essential role in relation to this challenge. The wetland is vital for food security both nationally and in the region, supports the livelihoods of up to two million people, and is important to the national and regional economy.

Development choices currently being made may dramatically change the face of the region. Plans to increase food and energy production upstream will have major impacts on production and livelihoods in the IND. Now, more than ever, there is a need to make the right choices that underpin sustainable development.

This policy brief shines a light on the issues at stake, drawing on the report *Sustaining the Inner Niger Delta Lifeline. How do proposed dam development and irrigation expansion affect this?*[i], which provides an in-depth analysis of the IND and the impact of development plans. The brief is written for national (Malian and Guinean), regional (Niger Basin Authority [NBA], the Economic Community of West African States [ECOWAS]) and international authorities (World Bank, donor governments, foreign direct investors), as well as for civil society organisations active in Mali. It calls for action to sustain livelihoods and enhance security in the IND, while at the same time increasing food and energy production in a very fragile region.

A vital resource for food security and human well-being

Up to two million people depend on the IND for their living: smallholder farmers, migrant and sedentary fishers, and herders of goats, sheep and cattle. Women play an important role in food production as well as in processing and trading goods at local markets. Food production in the IND is directly related to the size of the inundated area and the water flow in the wet season, which is inseparable from the strong seasonal flood pulse of the Niger River.

The IND is not only vital for the local economy, it is also important for the national and regional economy. While the IND covers only 3% of Mali's surface, it provides 15% of the country's grains[ii] and accounts for 80% of national fish trade.[iii] About 90% of the national livestock population is found in the Niger River basin.[iv] Cattle from some neighbouring countries move into the IND in the dry season and fish from the IND is exported across West Africa.

The wetland also has global ecological and cultural importance. The seasonal floodplains, lakes, tributaries and flood forests host a diverse ecosystem that is vital for many wetland species such as crocodiles, hippos, manatees and millions of migratory water birds from Europe and Asia.[v] Globally, the IND is designated as a Wetland of International Importance by the Ramsar Convention.[vi] Wetland-related cultural activities are part of UNESCO's Representative List of the Intangible Cultural Heritage of Humanity.[vii]

UN Photo / Harandane Dicko

A cornerstone of Malian human security under threat

There are several major drivers of threats in the IND. Estimated population growth stood at 3% in 2018, suggesting that the population in Mali will have more than doubled by 2050.[viii] Poverty levels in Mali are high and the rate is projected to remain unchanged at 41.3% in 2020.[ix] Climate change is an emerging threat, with its full implications likely to manifest themselves in the medium term. While climate models do not yet agree on projected levels of precipitation in West Africa, they do agree that temperatures will increase and rainfall will become more variable, making the Niger River basin more prone to extreme droughts and floods.[x] The well-being of the IND and the benefits it provides will be under increasing pressure in the years to come, both from the direct impacts of climate change and the human response but also from policy and investments designed to tackle these issues.

Increasingly, the pressures on the IND are becoming part of a difficult socio-political context. Violent conflict is now a daily reality not only for Mali,[xi] but also for the region more broadly. The Mali government acknowledges the links between the management of natural resources, increasing community conflicts, intervention of terrorist groups and emergence of militias. The multidimensional crisis that the country is facing has resulted in major displacements of people both within Mali as well as to neighbouring countries,[xii] with Mopti housing the largest number of internally displaced people in the country.[xiii] The challenge for policy makers is to manage natural resources so as to help reduce risks in this explosive mix.[xiv]

Multiple policies and competing stakeholders along the Niger River

There are many actors with different stakes along the Niger River. These interests are sometimes competing and while there are many good policies and plans for the IND, good intentions do not always materialise. This poses a risk for the future of the IND.

Just upstream of the IND, the Office du Niger (ON), a semi-autonomous Malian government agency, manages a large area of irrigated land for agriculture. Most of the water is used for the large-scale production of rice and sugarcane, while only some of it benefits small-scale producers. In the wet season, there is enough water to irrigate the land. In the dry season, irrigation continues to be possible over a smaller area because dam managers of the upstream reservoir at Sélingué release additional water. Mali's Ministry of Agriculture has elaborated an ambitious programme to expand current irrigation by the ON (Box 1), driven by the need to raise food security in the country. This will expand the overall irrigated area threefold and enable more extensive double-cropping. Construction of the long-envisaged multifunctional Fomi dam upstream in Guinea is integral to this double cropping (Box 2). Up-to-date impact assessments for both projects are not publicly available.

Downstream of the ON, the water used for agriculture serves mostly non-irrigated rice production, crop and vegetable farming in the IND. The vast majority of the rice cultivated in the IND is grown on the floodplains with natural but controlled flooding, through traditional farming practices.

BOX 1

Expansion of the ON

The Ministry of Agriculture is responsible for the development of the Étude du Programme d'Aménagement Hydro-Agricole de la zone Office du Niger (PAHA). The study elaborates a programme to expand the irrigated area of the ON, the largest irrigation scheme in West Africa. In total, about 3,300 km² will be added to the 1,200 km² already being irrigated. The goal is to expand the total irrigated agricultural area to almost 4,600 km2 by 2045. This will need strong involvement from the private sector, including foreign direct investment such as the Malibya project (Libya) and N-SUKALA (China). The strategic environmental assessment for PAHA has never been published.

BOX 2

Fomi project

The Fomi project is a multipurpose dam located in the headwaters of the Niger River in the Guinean highlands. The dam was originally scheduled to be built near the village of Fomi. From there, its proposed location moved to Moussako, 20 km upstream, and from there again it moved to the current location of Folon, a village 30 km upstream of Fomi.

The Fomi Environmental and Social Impact Assessment evaluates the impacts of a dam built at Fomi and Moussako.[xv] It does not look at the cumulative impacts of both operating the dam and expanding irrigation. A summary of the assessment is available on the website of the NBA.[xvi] The full report refers to current studies by Wetlands International to better assess downstream impacts of the Fomi project. The assessment finds that a dam at a height of 396 m above sea level will decrease the inundated area of the IND by 13% in an average year, 22% in a dry year and 38% in a very dry year. This is higher than the level NBA finds acceptable (see Box 4).

The Ministries responsible for Water and Energy in Mali and Guinea meet regularly to discuss the progress of the Fomi project. In 2017, the Government of Guinea announced that it would work with China to develop the dam. The Chinese company YREC is currently preparing the construction site. The Guinean government also announced that a new impact assessment would be carried out related to the new site, but this has not happened yet. The Ministries of Energy and Water of Guinea and Mali have already decided that the new dam to be built at Folon will have a height of 396 m above sea level. How exactly the dam will be operated is yet to be decided.

Water and water-related ecosystems in the IND are not only important for agriculture, they are also essential for fisheries, livestock farming and biodiversity. Bourgou, a floating grass species on the floodplains of the IND, grows in deep water, forming large fields. Both fishermen and pastoralists benefit from these grasslands. During the wet season, they are essential breeding grounds for the fish underpinning the IND's fisheries. During the dry season, bourgou provides a vital food resource for the region's cattle, which move there to benefit from the green meadows. The IND's flood forests are nurseries for fish, and moist forests provide firewood that is typically collected by women. The Schéma Directeur de la Restauration et la Conservation de la Biodiversité et des Ressources Naturelles du DIN (Masterplan, 2019) of the Ministry of Energy and Water aims to consolidate bourgou fields, develop fish production and improve forest management. The Masterplan, which has a budget of USD 670 million over 20 years, supports the implementation of the Schéma Directeur d'Aménagement et du Développement Durable du DIN developed under the responsibility of the Ministry of Environment, Sustainable Development and Sanitation.

Downstream of the IND, the Niger River is key for the provision of water to the neighbouring country of Niger. While the NBA and the governments of Mali and Niger have agreed on minimum water flows downstream of the ON's irrigation area for the dry season, these agreements are not always met.[xvii] The Mali Ministry of Energy and Water's plans to revise the minimum flow and to carry out a study on an environmental flow have not materialised (Box 3). An agreement on an environmental flow would offer the chance to embed all IND stakeholder needs in relation to volume and seasonality in one key policy instrument.

BOX 3

Minimum and environmental flows

Following the extreme dry season of 1985, the governments of Mali and Niger agreed on a minimum water flow to address drinking water problems in Niamey. This city relies totally on the Niger River for drinking water. The minimum flow of the Niger River was set at 40 m^3/sec downstream from Markala. Faced with difficulties in meeting minimum flow requirements, in 2016 the Ministry of Energy and Water reached out to the European Union (EU) to carry out a study to evaluate environmental flow. This has not yet materialised.

The minimum flow, as agreed in the 1980s for the Niger River, aimed to meet one specific management goal: the provisioning of drinking water in Niamey. Its implementation would not safeguard the future of the IND. An environmental flow (e-flow) is different from a minimum flow because it aims to meet multiple goals. An e-flow aims to sustain both ecosystems and human cultures, economies and livelihoods, and the well-being of the people sharing water resources. E-flows describe the quantity, quality and timing of water flows required to sustain ecosystems and the human livelihoods and well-being that depend on these ecosystems.[xviii] This definition acknowledges the linked variables of quantity, quality and timing that together constitute an environmental flow regime of sufficient quality to meet management goals. It also highlights the social component of these flows. An e-flow for the IND will safeguard its ecosystems and help to sustain its food production.

The challenge of integrated policy making

Integrated policy making around water is a challenge everywhere: both at national as well as at regional and at global level. The Programme National de Gestion Intégrée des Ressources en Eau 2019-2030, coordinated by the Ministry of Energy and Water, brings together all Malian actors and sectors with a stake in the Upper Niger Basin (UNB), the Bani River and the IND, including agriculture, fisheries, pastoralism and navigation. Balancing the drive for food security and safeguarding resilience in the face of climate change is a major responsibility of the government. The question is whether it should be the role of a sectoral ministry to convene other ministries to speak up about an issue as important as water.

At regional level, the NBA and ECOWAS bring together different players in relation to the IND (Box 4). While they have developed laudable initiatives, not all national and international decisions are made in the spirit of these multilateral frameworks. For example, the decision about the height of the new Fomi dam by the Guinean and Malian Ministries of Energy and Water seems inconsistent with the existing policies of the NBA about reducing the area of the IND that is inundated. This undermines the future food production of the wetland.


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BOX 4

Regional plans and policies

The NBA's Schéma Directeur d'Aménagement et de Gestion du Bassin du Niger (Masterplan, 2012) focuses on the development of infrastructure, the protection of natural resources and integrated water resources management. The NBA underlines the need for a nexus approach given intrinsic links between water, energy and agriculture. The Masterplan states that with respect to the IND, an 11% reduction of the inundated area in an average year is the maximum that is acceptable. The Fomi Environmental and Social Impact Assessment predicts a decrease of 13% in an average year (see Box 2), which is higher than what the NBA finds acceptable.

The ECOWAS Council of Ministers have adopted the Directive sur le Développement d'infrastructures hydrauliques en Afrique de l'Ouest (2017).[xix] The directive aims to ensure that ecological, economic and social considerations are taken more into account in the implementation of cross-border water infrastructure projects in West Africa to guarantee their sustainability and ensure the sustainable development of the region. It confirms the major role of River Basin Organisations in the development of transnational projects.

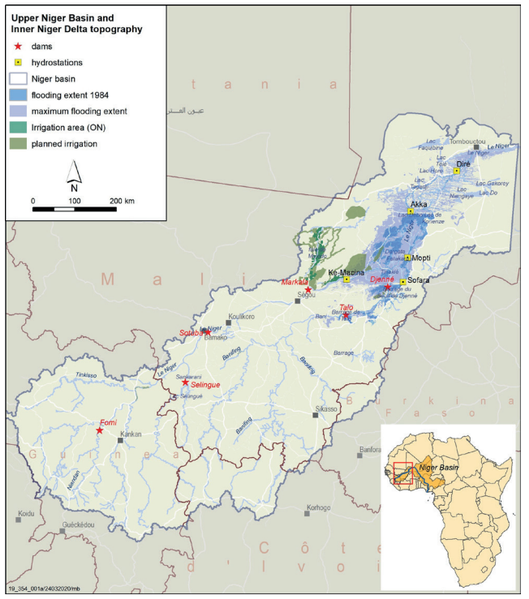
At global level, policies and plans shaping the future of the IND are not always in sync either. Implementing plans and programmes in Mali and Guinea strongly relies on external funding. The World Bank's International Development Association, the EU and the United States Agency for International Development (USAID) are Mali and Guinea's top three providers of Official Development Assistance. China is a major investor in both countries. This support also relates to the IND and the Niger River. Examples of water-related investments are the World Bank's Economic and Environmental Rehabilitation of the Niger River project (PREEFN) and Chinese investments in large-scale sugarcane plantations in the ON.. Sometimes these investments are at odds with each other, even within the same institution. In the PREEFN project, for example, the World Bank notes that the construction of the Fomi dam upstream makes it challenging to optimise water allocation among competing users while trying to preserve the integrity of ecosystems. But at the same time, the Bank has been supporting a feasibility study for the dam.[xx]

Prospects for the IND in light of ambitions for food and energy security

Food security, agricultural commodity production and energy security are high priorities, both in Mali and upstream Guinea. They are seen to be essential building blocks for socio-economic development. While the IND is already a cornerstone for agricultural production, much investment focuses on how to further use the Niger River to meet these goals. There are multiple irrigation schemes upstream of the IND and five existing dams (Figure 1). Construction of a new dam through the Fomi project will allow the expansion of dry season irrigation downstream, notably in the ON's area. Next to irrigation, the dam also aims to generate electricity for the region. This is expected to generate 90 MW from hydropower that will then be delivered via the West Africa Power Pool grid.

While the new dam and irrigation plans bring benefits, they also carry substantial costs, especially for the IND and the wetland-dependent communities there. Reduced water flows in the wet season will have a direct impact on the flood extent and on the productivity of the IND, which will have an impact on poverty, the livelihoods of men and women living in the IND, and conflict around natural resources and decisions to migrate.

Figure 1. Overview of the Upper Niger Basin and Inner Niger Delta and location of key dams and irrigation areas



Source: Sustaining the Inner Niger Delta Lifeline. How do proposed dam development and irrigation expansion affect this? (Wetlands International 2020)

The biggest future impact of new development plans is attributable to expanded irrigation activities. Operation of the Fomi dam, without new irrigation, will result in a reduction of 3% in average rice production in the floodplains, a decrease of 5% in traded fish catch in Mopti, and a decrease of 2% in the cattle population in Mopti (Table 1). If the dam is combined with full irrigation expansion (as planned for by 2045), average rice production in the IND is estimated to decrease by 11%, the traded fish catch in Mopti is estimated to decrease by 20%, and the cattle population in Mopti is expected to decrease by 7%. On top of this, navigation will be severely affected. Expanding irrigation combined with operation of the Fomi dam will thus have tremendous impacts on local livelihoods.

In addition, there are economic impacts. The combined economic value of recorded rice and livestock production, fishing (Mopti only) and fluvial transportation is currently estimated at about 238 billion FCFA per year. If the current level of agricultural production is maintained by the ON, the operation of the Fomi dam is expected to decrease the total value by 2% in an average year. If irrigation is maximised, as planned by 2045, an average reduction of 10% in the value of these economic activities is expected.

Table 1. Economic value of ecosystem services in the IND per year (in billion FCFA) and average changes under different dam and irrigation scenarios

Ecosystem service	2015 irrigation			FOMI +2015 irrigation			FOMI +2045 irrigation		
	Value (billion FCFA)	Production	Change in production	Value (billion FCFA)	Production	Change (compared to 2015 irrigation	Value (billion FCFA)	Production	Change (compared to 2015 irrigation
Rice, IND (tonnes)	70.1	220,330	0%	68.3	214,720	-3%	62.1	195,215	-11%
Fish traded, Mopti (tonnes)	20.6	17,612	0%	19.7	16,800	-5%	16.4	14,021	-20%
Cattle, Tombouctou	20.7	845,151	0%	20.3	825,109	-2%	18.6	755,482	-11%
Cattle, Mopti	68.8	2,234,092	0%	67.5	2,200,344	-2%	63.9	2,083,101	-7%
Sheep and goats, Tombouctou	19.6	4,092,841	0%	19.1	3,987,182	-3%	17.3	3,620,116	-12%
Sheep and goats, Mopti	34.9	5,142,499	0%	34.5	5,088,086	-1%	33.3	4,899,050	-5%
Navigable days, Koulikoro - Mopti	2.1	111	0%	2	107	-4%	1.8	95	-14%
Navigable days, Mopti - Gao	1.6	78	0%	1.4	73	-6%	1.1	56	-28%
Total value (billion FCFA)	**238.2**			**232.8**			**214.5**		
change in value	0%			-2%			-10%		

Source: Sustaining the Inner Niger Delta Lifeline. How do proposed dam development and irrigation expansion affect this? (Wetlands International 2020)

The average numbers above mask the potential seriousness of the situation. The IND sits in a region characterised by a highly variable and unpredictable climate. Production in dry years can range from 0% to 60% of that in a wet year. In years with a low river discharge, the need to service the water needs of upstream irrigation and infrastructure will have a more pronounced impact on water level, flood extent and this production (Table 2). In extremely dry periods the IND's rice production and the livestock sector will be even more severely affected and fish trade and fluvial transportation may even collapse.

Currently, one out of every four years is considered a very dry year or worse (Table 3). If the Fomi dam alone is operating, the frequency of very dry years is estimated to increase to 29%. When the expansion of the ON to its fullest extent is added to the picture, the frequency of very dry years and worse could increase to 42% – almost once every two years.

Table 2. Relation between water height and flooded area in wet and dry years

Year classification	Akka max. water level (cm)	Flooded area (km²)
Wet year	> 500	> 20,000
Average year	450 - 500	15,000 - 20,000
Dry year	400 - 450	9,000 - 15,000
Very dry year	350 - 400	8,000 - 9,000
Disaster year like 1984	< 350	< 8,000

The year 1984 is often used to illustrate the destructive forces of drought conditions. Nationally, it led to famine and a mass livestock die-off. In the IND it was a disaster year, much worse than the average very dry year in which water levels drop to rarely seen levels. While the IND played a key role in keeping many people alive in this period it was heavily damaged due to overuse and exploitation of its resources. In many areas it is yet to fully recover.

The envisaged development plans will substantially increase the probability of such water levels recurring in the IND. In the current situation, disaster years are projected to occur once every 50 years. In the scenario with the Fomi dam and expanded ON irrigation, the frequency increases by a factor of four – to once every 12.5 years. Since the Malian population has grown significantly since 1984, the occurrence of such a disaster year will affect many more people than before, and the pressure on the IND will be even more significant. Furthermore, were this to happen in the current unstable socio-political context, it could spark a serious escalation of conflicts as competition for scarce resources will be significantly higher.


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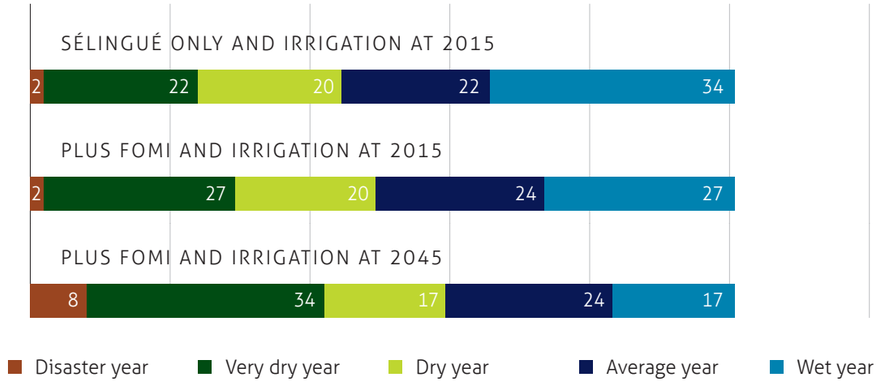
Figure 3. Frequency of disaster years, very dry, dry, average and wet years under different irrigation and dam scenarios



Source: Sustaining the Inner Niger Delta Lifeline. How do proposed dam development and irrigation expansion affect this? (Wetlands International 2020)

A reduction in the inundated area of the IND will have global implications for the conservation of nature. Key habitats such as bourgou fields and flood forests are expected to decline by one third. This will have a huge impact on fish stocks and on international populations of birds, and will lead to the partial disappearance of colonial breeding water birds in the IND.

Faced with decreasing water levels, more and more inhabitants of the IND are considering migration as an alternative livelihood strategy. Research shows that in development scenarios resulting in a higher occurrence of (very) dry years, attitudes tend towards permanent outmigration as a preferred sustainable livelihood strategy.

Conclusion and call to action

Increasing food and energy production in the Sahel is essential to address the needs of a growing and insecure population. The current strategy, predominantly focused on the realisation of large-scale irrigation and hydropower, will bring undoubted benefits but also carries substantial risks and associated costs, including to the IND. Foreseeable consequences range from diminished livelihoods and biodiversity loss to an increase in instability, heightened risk of conflict and increased outmigration from the region. The current plans require serious and urgent attention from national, regional and international authorities as well as from civil society. Safeguarding and optimising the role of the IND needs to be central in their thinking. Furthermore, this demands measures to ensure that water-related investment, strategy and policy work to maintain such critical natural systems as part of development solutions rather than risking depleting them and creating risks and problems.

Recommendations to national and regional authorities

Investment in alternatives and improved development plans

The Government of Mali should rethink its current plans to expand ON irrigation and to support the Fomi dam's development. There is a need for innovative ways to spur food and energy production in the region. Authorities should carry out a full analysis of different possibilities and select those options that make the sustainable development of the IND as a naturally productive system part of strategies and plans to secure food and energy security. Specifics options for consideration could include:

- Improving the productivity and reliability of the IND as a food producer. There are many fine examples of local-scale solutions worth upscaling, e.g. "irrigation de proximité", soil improvement, women's gardens, development of value chains and measures to avoid food loss.
- Improving the ON's irrigation efficiency and choosing less water-intensive crops to reduce the need to expand the irrigated area. Other options are improving soil management, reducing post-harvest losses and smartly combining ecological functions in the irrigated schemes through landscaping techniques.
- A strategic study needs to identify which mix of energy sources would be optimal for Guinea and Mali, taking into account major developments, notably in solar energy.

Strategic environmental and impact assessments

Timely and transparent preparation of environmental assessments is needed to foster a balanced, inclusive dialogue on the best choices for realising food and energy security. Decisions about water allocation upstream and development projects in the UNB and IND should be subject to robust strategic environmental assessments, taking a system-level analysis, followed by social and environmental impact assessments looking at specific projects. Specific actions should include:

- Publishing the strategic environmental assessment carried out for the plans to expand the irrigated area of the ON.
- Updating the Fomi social and environmental impact assessment so that it can inform the government before new decisions are taken on construction of the dam and dam management. The updated assessment should account for the new location of the project and include current research by Wetlands International to assess cumulative impacts on the IND. It should be informed by an adequate consultation process and include impacts on conflict, disaster risk and migration.

Governance

Development choices should be guided by genuinely integrated and multisectoral water resource management involving all stakeholders, implicating all key sectors and actors whose development planning implies use of the UNB's water resources, including groundwater. This requires an effective governance structure both laterally – between ministries within Mali and between countries – and vertically, so that the voices of people in the IND are included. Specific suggestions are:

- Accelerate integrated decision making in Mali by putting integrated water resources management in the national priorities and setting up an inter-ministerial task force led by the representative of the Prime Minister, while keeping technical coordination with the Ministry of Energy and Water. This will increase lateral ownership of other ministries.
- Develop an environmental flow for the UNB and IND, connecting economic, social and environmental goals to provide the means to support integrated decision making. This should be developed and implemented through a multi-stakeholder dialogue involving actors at different levels, and will help to set joint priorities for all stakeholders.

Recommendations to international actors

Financial and technical support

International governmental organisations such as the World Bank, bilateral donors, and investors such China need to appreciate the importance of and understand the linked common risks driven by their separate actions and take responsibility for their proper communication and coordination. International actors need to ensure that the projects they finance do no harm. They can play an important role, for instance by:

- Highlighting the importance of the IND and underlining the implications of different development scenarios for the IND, in dialogue with the Malian and Guinean governments, regional institutions and other international actors.
- Providing technical and financial support to regional authorities and the governments of Mali and Guinea in order to:
  - implement programmes for sustainable development of the IND, such as the Masterplan developed by the Malian government
  - explore and implement best options to ensure food and energy security while assuring sustainable development of the IND and beyond
  - update the Fomi impact assessment
  - develop and implement an e-flow regime for the IND and UNB

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