



Livestock roam near the Great Mosque of Djenné, Mopti, Mali  
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# Mopti Foodscape

Governance systems to manage land use conflicts and enable nature-based solutions



**LOCATION:** Inner Niger Delta, Mali  
**AREA:** 8 million hectares

MALI

## SUMMARY

The Mopti foodscape in Mali is a mixed-used landscape that supports pastoralism, rainfed cereal production, fish harvesting, and irrigated rice based on the annual rising and falling of the Inner Niger River Delta. Since 2011, ongoing and increased violent conflict in Mali has exacerbated the weakening of traditional methods for governing these multiple land uses.

Combined with environmental changes to the Inner Niger Delta, this weakening of institutions and long-standing traditions has caused, and is the result of, conflicts among ethnic groups associated with different land uses, specifically Fulani pastoralists and Dogon cereal farmers.

Short-term conflict management is essential, but to manage the Mopti foodscape for sustained and sustainable productivity, viable methods of land use governance to manage tensions must be reestablished. Planning and working at the foodscape level could help provide a flexible framework for identifying shared values and complementarities among different land uses and land users.

## MOPTI

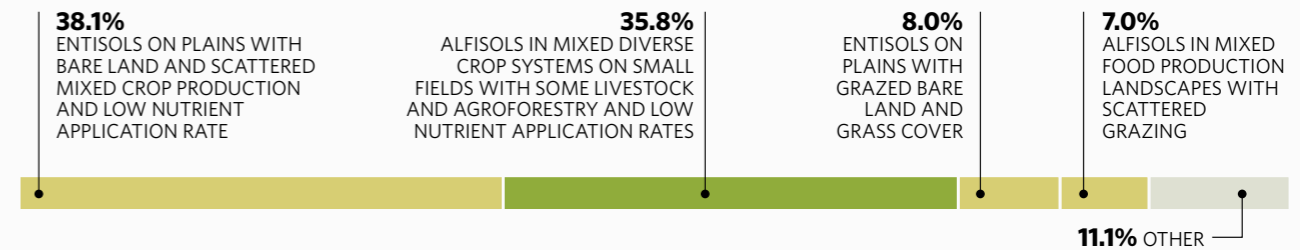


FIGURE 1. Map of Mopti foodscape. The bars represent the most extensive foodscape classes within the foodscape. The color of bars indicates the intensity groups corresponding to those classes: scattered cropland and grazing (yellow) and mixed mosaic food cultivation (light green). The other category includes the classes that each made up <5% of the foodscape area.

Equitable, stable governance within the foodscape is an essential precondition to scaling traditional and newer nature-based solutions, such as farmer-managed natural regeneration, that offer an opportunity to produce crops and livestock in ways that are both resilient to climate shocks and can lessen tensions among different land uses. Ultimately, scaling any solutions, including those based on nature, will require flexible tenure systems that incentivize exclusivity rights for farmers and seasonal access rights for pastoralists.

## DESCRIPTION OF FOODSCAPE

The Mopti foodscape (FIGURE 1) depends on the seasonal flooding and retreat of the Inner Niger Delta – the second-largest wetland in Africa after Botswana’s Okavango Basin. In the dry season, when the river is lowest, ethnic Fulani herders graze cattle on grasses that grow in the deeper waters, and Mandé and Dogon farmers cultivate rice in flooded areas. Bozo fishers also collect fish that have been stranded in dry areas after the river water has receded.

Bozo fisherman on the Niger River, Mali  
 © Reynald Schmid/Getty Images

The term Mopti, which is a political region of Mali, comes from the Fulani word for “coming together,” which conveys a sense of the plurality of production systems in this area, all affected by and dependent on the river.

When the river floods in the rainy season, the pastoralist Fulani move their livestock to plains elsewhere within the foodscape where they use pasture resources. This transhumance (moving livestock from one grazing ground to another in a seasonal cycle) has been the foundation of the Fulani livelihood for centuries. It has also benefitted farmers; when the livestock move, they leave behind well-fertilized areas that can be used for rice production. Farmers in the Inner Delta area grow mainly rice, while farmers in the drier plains grow rainfed crops such as millet, sorghum, groundnut, cowpea, and sesame.

The Inner Delta supports more than 67,000 ha of irrigated rice, Mali’s main cereal, mostly through dams that have been established along the river.<sup>35</sup> The river also supports an annual fishing harvest of 130,000 tons.<sup>35</sup> In the rainy season, Bozo fishers catch fish with nets in the flooded river areas. In addition to supporting diverse food livelihoods, the Inner Niger Delta is a unique and important ecological habitat.

**The third largest Ramsar site in the world, the Inner Niger Delta is a bright spot of green in an otherwise arid landscape. As such, it is crucial habitat for both endemic and migratory species. Every year, more than 1 million birds of more than 350 species use the delta. Important species include manatees, hippopotamus, and nearly 150 species of fish, of which 25 are endemic.<sup>35</sup>**

**The area is also an important cultural and historical center. While the universities and libraries of Timbuktu are relatively well known, major towns in the Inner Niger Delta (Youvarou, Tenekou) have libraries and learning centers dating back to the Middle Ages. The complex ecological and socio-occupational systems required sophisticated, adaptable, and democratic governance systems.**





A field of onions in the village of Doura, Segou, Mali

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For centuries, management of the region's resources was enabled by customary land use agreements. In Mopti, the Fulani were considered to have historical land use rights and thus held the role of political elites. The colonial and postcolonial era strongly affected power dynamics and resulting land use. The colonial and postcolonial period favored policies aimed at agricultural development and shifted emphasis away from pastoralism.

Between 2000 and 2010, the livestock sector in Mali received less than 8% of the spending on agriculture sector, despite contributing one-third of the country's agricultural GDP.<sup>36</sup> At the same time, technological innovations in agriculture, such as mechanization, have enabled expansion of cultivated area, up to the tripling of field sizes, thus exacerbating conflict with pastoralists.

### CHALLENGES

One of the key environmental changes affecting the Mopti foodscape, as well as other parts of Mali, is the extreme decrease – by 50% since the 1980s – in the amount of water flowing into the Inner Niger Delta. The causes for such a large decrease in water flow include declines in upstream rainfall as well as changes to natural waterflows associated with human uses, especially upstream dams and irrigation.

Consequently, the dwindling water flows have led to an associated decrease in the deeper-water areas where hippo grass (*Echinochloa stagnina*) – known locally as *bourgou* – has historically grown. *Bourgou* is an important food resource for grazers' livestock as well as other wildlife. A further complicating factor within the Mopti foodscape is that the loss of these deeper water areas has created opportunities for farmers to expand irrigated rice into traditionally *bourgou* areas.

One of the major social changes in the region is an increase in armed conflict since 2015. The Arab Spring led to a surge of arms and influx of armed groups into Mali from Libya, which exacerbated historical tensions leading to a coup in 2011. Insurgent groups spread and were active in Mopti by 2015. In this context, perennial land use disagreements began to escalate into violent conflict driven by the expansion of cultivated land into grazing reserves, animal movement corridors, and areas around wells. Such conflicts have led to many hardships in the Mopti foodscape, including human displacement and food insecurity.

Increased violence has also changed the way conflicts are now mediated within the foodscape. Instead of heads of community having the authority to mediate and resolve disputes, that power has now shifted to armed militias. This change of long-standing local and cultural norms further erodes the customary institutions that historically adjudicated land use disagreements and governed land and natural resources, especially those involving common property, within the Mopti foodscape.

For pastoralists, agriculture expansion may be a threat; for farmers, it represents a positive change. In the Mopti foodscape, both cropland expansion and contraction have occurred, but for different reasons. Expansion is a longer-term change due to public policy priorities, shifts in cultural power, and technical developments.

Despite increased climate variability, cereal production in the Mopti foodscape rose from around 400,000 tons in the early 2000s to 1.22 million tons by 2015, which is partially attributable to a 30%

increase in cultivated area. More recently, cropland has contracted due to the threats of violence, mainly from extremist groups. Because people do not want to travel far from their communities, cropland area has decreased by 25%.<sup>37</sup>

### BENEFITS AND VALUE OF NATURE-BASED SOLUTIONS IN THE MOPTI FOODSCAPE

Of foremost importance is immediate conflict management and de-escalation of armed tension among communities in the Mopti foodscape. Without this, long-term improvements to land use cannot be developed. There have been attempts at peace agreements brokered by the central government of Mali between the Fulani and Dogon, the most recent of which was signed in January 2021. However, a coup in May 2021 calls into question the role and effectiveness of the central government in lasting conflict resolution. Ultimately, the people of Mali and those of the Mopti foodscape require trusted mechanisms for resolving the underlying tensions among communities over land use.

Fortunately, within recent history there are long-standing examples of cooperative, mutually beneficial shared land use between pastoralists and farmers. For example, the annual Diafarabé crossing of thousands of livestock from upland pasture back to the Delta is an example of the success of traditional institutions and land uses. The crossing was not set on a fixed day but depended on when farmers south of the river had harvested, so herds could come across without damaging crops. Planning within the foodscape level here could offer avenues for creating new flexible and nature-based solutions that are sensitive to the needs both of farmers and pastoralists.

Crop fields mixed with parkland at the foot of the Bandiagara Escarpment, Mopti, Mali  
© Timothy Allen/Getty Images

For farmers, exclusive and private tenure security is a priority to incentivize investments in plots of land. Yet pastoralists require flexible systems so that livestock can access these lands at optimal times. Developing trusted, equitable, and effective processes for negotiation and conflict resolution are therefore more important than fixed inflexible or one-size-fits-all policies around tenure laws.

As the land uses in the Mopti foodscape shift in response to climate change, cultural shifts, and a pronounced decline in water flow, farmers and pastoralists increasingly seek more diverse forms of food production and sources of revenue. Because of declines in fish stocks in the Niger River, there is growing emphasis on stocking fish farms, which now account for around 10% of fish production in the Inner Niger Delta. Fish farming uses seasonal ponds as well as soil pits where soil has been excavated for other uses, such as brick making. With the emphasis on fish farms, there is also growing interest in fish processing techniques that capture more value, such as fish smoking practices that extend food storage life with less fuel wood. These fish are sold in local markets and dried and exported throughout the broader region.

The management of native trees, also referred to as farmer-managed natural regeneration (FMNR), is a nature-based solution used across the Mopti foodscape for centuries. Specifically, FMNR involves managing native species through coppicing naturally establishing trees and shrubs or

allowing the dormant seed and root bank to germinate. Species can be selected for specific land-management purposes, such as *Faidherbia albida*, a fast-growing deciduous tree, that has long been used for reducing erosion, improving soil fertility, and providing animal fodder and fuelwood. Other species, including *Zizyphus mauritania* and *Parkia biglobosa*, provide non-timber products like fruits and cooking ingredients.

FMNR is a nature-based solution for farmland management that also provides alternate revenue streams for farmers and more climate-resilient production that could lead to lower pressure on natural resources. The potential for growing fodder alongside other benefits may create opportunities for this solution to contribute to cross-sectoral land use planning within the Mopti foodscape. Successful FMNR requires tree and land tenure as well as collective action to minimize mortality of regenerating trees. Cultural shifts in the region, wherein Fulani become more sedentary and Dogon take on more livestock, potentially make this type of mixed land use approach more viable.



<sup>35</sup> Ramsar. Inner Niger Delta. [https://www.ramsar.org/sites/default/files/documents/library/wwd2004\\_rpt\\_mali\\_press\\_e.pdf](https://www.ramsar.org/sites/default/files/documents/library/wwd2004_rpt_mali_press_e.pdf) (2004).

<sup>36</sup> APESS. *Élément de bilan du soutien public à l'élevage au Mali depuis Maputo*. <https://doczz.fr/doc/1919455/%C3%A9%C3%A9ments-de-bilan-du-soutien-public-%C3%A0-l-%C3%A9levage-au-mali-d...> (2014).

<sup>37</sup> WFP. *Satellite imagery to support WFP emergency response*. <https://docs.wfp.org/api/documents/WFP-0000115730/download/> (2020).

This is a case study excerpted from the report *Foodscapes: Toward Food System Transition*. Please access the entire global report at [nature.org/foodscapes](https://www.nature.org/foodscapes).

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