

OXFAM
RESEARCH BACKGROUNDER

Policy Landscape for the Scaling-Up of Agroforestry in Mali

Faye Duan



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Series editor: Kimberly Pfeifer

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Author information and acknowledgments

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ACRONYMS AND ABBREVIATIONS

AEDD	Agence de l'Environnement et du Développement Durable (Environment and Sustainable Development Agency)
DNA	Direction National de l'Agriculture (National Agricultural Directorate)
COFO	Commission Foncière (land commission)
CDF	Code Domanial et Foncier (State and Private Land Code)
CSI-GDT	Cadre Stratégique d'Investissement en matière de Gestion Durable des Terres du Mali (Strategic Investment Framework for Sustainable Land Management)
FAO	Food and Agriculture Organization of the United Nations
FMNR	Farmer-managed natural regeneration
GHG	Greenhouse gas
LFA	Loi sur le Foncier Agricole (Agriculture Land Law)
LOA	Loi d'Orientation Agricole (Agriculture Orientation Law)
PANA	Programme d'Action National d'Adaptation aux Changements Climatiques (National Action Plan for Adaptation to Climate Change)
PAPAM	Programme d'Accroissement de la Productivité Agricole au Mali (Promoting Agricultural Production in Mali)
PDA	Politique de Développement Agricole (Agricultural Development Policy)
PDSEC	Plan de Développement Social, Économique et Culturel (Social, Economic, and Cultural Development Plan)
PFN	Politique Forestière National (National Forest Policy)
PNAE	Plan National d'Action Environnementale (National Environmental Action Plan)

PNCC	Politique Nationale sur les Changements Climatiques 2011 (National Climate Change Policy)
PNISA	Plan National d'Investissement dans le Secteur Agricole 2014 (National Agriculture Sector Investment Plan)
PNIP-SA	Plan National d'Investissement Prioritaire dans le Secteur Agricole au Mali, 2011–2015 (Priority National Agriculture Sector Investment Plan)
PNPE	Politique Nationale de Protection de l'Environnement (National Policy for Environmental Protection)
REDD+	Reducing Emissions from Deforestation and Forest Degradation
SNCC	Stratégie Nationale Changements Climatiques (National Climate Change Strategy)
SRI	System of Rice Intensification
SDDR	Schéma Directeur du Secteur du Développement Rural 2000– 2010 (Rural Development Master Plan)
USAID	United States Agency for International Development

I. EXECUTIVE SUMMARY

Agroforestry, which has traditionally been practiced in Mali, encompasses a variety of land use management methods and technologies that integrate trees and shrubs into farming and pastoral systems in ways that complement and enhance the sustainability, productivity, and resilience of those systems. In 2016 agroforestry products accounted for 5.1 percent of Mali's primary sector GDP. Agroforestry has benefits for soil fertility, water availability, microclimate buffering, and greenhouse gas mitigation and has been shown to enhance rural food security, income, and health. Despite their benefits for farmers, agroforestry parklands are on the decline. To promote agroforestry, Oxfam and its partners are undertaking Regreening Africa, a five-year program that includes policy engagement as an explicit objective. This research was requested to analyze the national policy landscape in Mali, identify policy and implementation gaps and challenges that constrain the upscaling of agroforestry practices, and provide recommendations to inform policy advocacy.

Mali does not have a stand-alone, designated national policy or strategy to guide legislation and programs specifically meant to support and promote agroforestry or related practices. Therefore, this research assesses policies across various key domains on how they promote favorable institutional and regulatory environments to enable agroforestry.

The research identifies barriers to agroforestry adoption, acknowledging that policy is one among numerous barriers. Then it proceeds to a sectoral policy analysis of land management (section IV), climate change (section V), decentralization (section VI), land tenure (section VII), forestry (section VIII), and agriculture (section IX). It concludes with recommendations.

This research found that while there are policy gaps, Mali already has many policies supportive of agroforestry. However, gaps in implementing those existing policies, as well as a disconnect between national policies and local conventions, pose a significant challenge to the effectiveness of current and future policy initiatives.

In Mali's context of weak local governance systems and precarious and complicated land rights systems, farmers do not feel secure in their future ability to own and use the land on which they currently operate. Furthermore, local communities do not believe they have the power or responsibility to plan and implement sustainable land and natural resource management systems to retain long-term benefits. These problems present important policy challenges for agroforestry and rural livelihoods. If these barriers are not addressed, the positive impacts of policies that support agroforestry—of which there are already many—could be significantly diminished. The following recommendations are designed

to establish a national policy landscape that can scale up agroforestry and agroecological solutions:

1. Decentralization must be fully administered, with an emphasis on enabling local capacity for sustainable land management.

Decentralization presents an opportunity to optimize land management through locally based solutions. The decentralization process, however, has not been fully realized, resulting in further governance weakness: local government structures lack funding and capacity, and their presence has weakened traditional authorities. Efforts need to be made to secure financing for the operations of the *commissions foncières* (land commissions, or COFOs) and municipalities or to develop revenue generation and management capacities for these bodies. It is also important to recognize and encourage *conventions locales* between municipal governments and local traditional leaders around collaboration and responsibilities for resource management, and these *conventions* could greatly benefit from stronger local government. The collective elaboration of Mali's Social, Economic, and Cultural Development Plan (PDSEC)¹ presents an important opportunity to strengthen local governance capacity and community natural resource management.

2. Women must be included in natural resource management decision making, and gender analysis should be better integrated into policies across the board.

Land use decision-making and policies must include women and incorporate their perspectives and needs. While forestry policies have sought to increase local-level autonomy over trees as an agricultural resource, they inadequately acknowledge the differences in how women and men benefit from different species of trees and women's lack of decision-making power over natural resources. Customary land rights systems should be considered in terms of their benefits and drawbacks for women and integrated with concepts of gender-inclusive land use planning and management. Reinforcement of women's inclusion in groups like the COFOs and in the PDSEC can help ensure that land use changes do not devastate their livelihoods.

3. Policies governing land titling and registration must be clarified and streamlined, and support for proper administrative management complying with those policies must be prioritized.

The statutory system administering land tenure presents a threat to farmers' land rights and systematically enables land speculation and the exploitation of vulnerable people. Solutions could include defining and streamlining the authority

¹ Plan de Développement Social Économique et Culturel

of different government entities to administer land titles; clarifying and communicating the process and costs of registration and titling; harmonizing land conflict arbitration mechanisms within judiciary systems; and strengthening social and environmental safeguards for land titling. Customary land rights must be reconciled with the statutory system. Continued advocacy is needed to ensure the sound rollout of the Agriculture Land Law (LFA)².

4. Forestry policies and regulations should be clarified and broadly communicated, and implemented.

The Code Forestier (Forest Code) and forest regulations should continue to clarify the roles and responsibilities of tree managers on farmlands and agroforestry parklands as well as the rules around permitting systems, especially with regard to protected species. Pruning, harvesting, and other use of trees on agricultural lands should not be impeded by prohibitive rules, including cumbersome authorization-of-use requirements. Within recently updated land policies, the relevant connection should be ensured between forestry policy and the measures for additional rural tenure security. Policies and regulations should enable farmers to profit from the use of sustainably managed trees and tree products, giving particular attention to tree-based resources that are important to women's resilient livelihoods. Finally, these policies need to be better communicated to the local level.

5. Agricultural programs need to align their financing and priorities with their purported social and environmental objectives.

Smallholder farmers in dryland areas tend to receive little support. Agricultural development policies favoring irrigated regions do so because such areas have the highest productive and market-side potential, but this approach needs to be reconsidered in light of the many farming families it excludes. More attention should be redirected to rain-fed and dryland regions.

While Mali's agricultural policies emphasize sustainability, in reality systems that lead to soil erosion are prioritized. Sustainable agricultural systems that align government investments in agriculture with goals for food security, poverty alleviation, and environmental protection should receive higher priority, as should the development of forestry sector products.

6. Fiscal and market policies should support agroecological production, women, and equitable supply chains for farmers.

More investments are needed in agroforestry research, and subsidies should give greater incentives to farmers to practice agroforestry and to produce

² Loi Foncier Agricole

agroforestry products. Market development for non-timber forest products is a priority because of their potential impact on women's livelihoods. The potential for increased income from the sale of agroforestry products may be a powerful financial driver for tree protection, management, and regeneration.

7. Agroforestry solutions should be prioritized within climate adaptation efforts.

Climate change policy holds promise as a vehicle for better supporting agroforestry. However, advocacy is needed to overcome the challenges in implementing and mainstreaming climate policies, which remain a barrier to its ability to impact the wider policy landscape. Efforts to promote agroforestry should act in synergy with efforts to advocate for climate change policies. Overall, agroforestry could be better integrated into climate policies and recognized as one of the most important ways to meet adaptation and reforestation goals.

II. INTRODUCTION

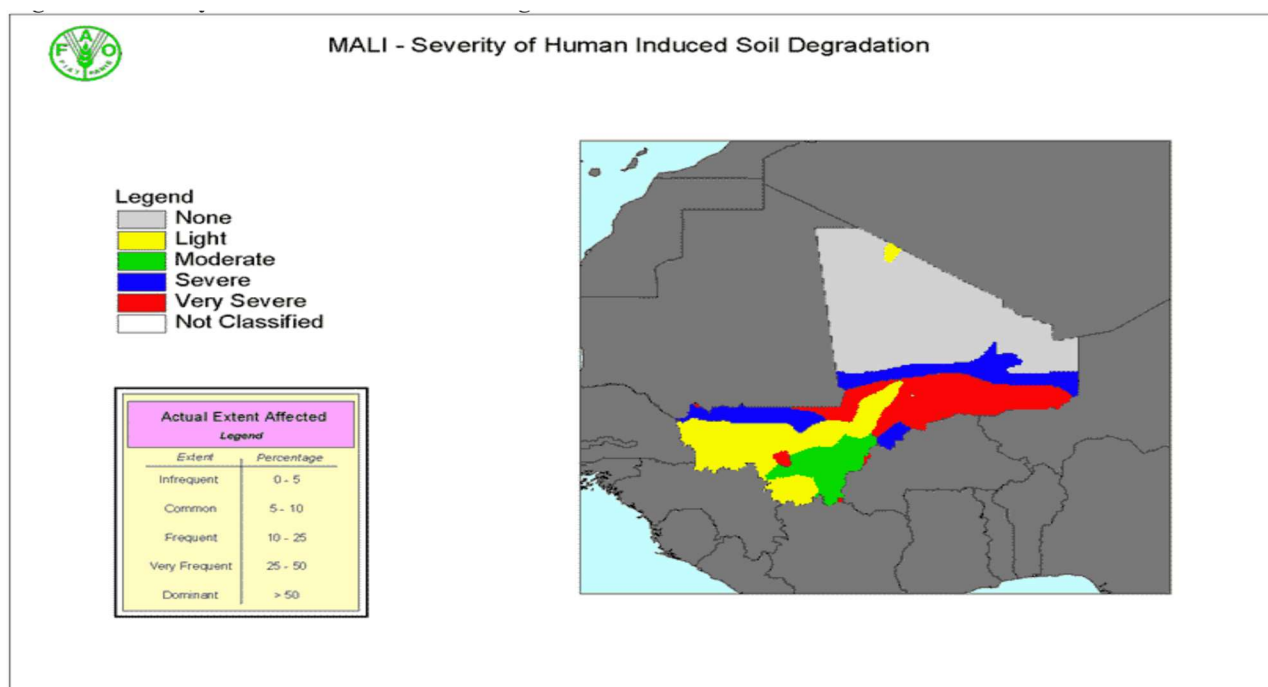
Land degradation and climate change threaten agriculture and rural livelihoods around the world. In Mali, where agriculture occupies 73 percent of the labor force (FAO 2017), 90 percent of all poor live in rural areas, and 42.7 percent of the population lives in extreme poverty (World Bank 2020b), the gravity of these threats is further elevated by a high rate of population growth and persistent food insecurity and malnutrition (USAID 2018a). To help restore soil health, improve livelihoods, increase food security, and increase resilience to climate change for smallholder farmers, Oxfam and its partners are undertaking Regreening Africa, a five-year program that aims to promote the agroecological farming practices of agroforestry and evergreen agriculture among 80,000 small-scale producers and to restore 160,000 hectares of land.³ Agroforestry encompasses a variety of land use management methods and technologies that integrate trees and shrubs into farming and pastoral systems, thereby complementing and enhancing the sustainability, productivity, and resilience of those systems. It is practiced by an estimated 1.2 billion rural people in the developing world for its benefits for soil fertility, water availability, microclimate buffering (through, for example, shade and wind breaks), and greenhouse gas mitigation (Mbow et al. 2014; Zomer et al. 2016). It has been shown to enhance rural food security, income, and health (Garritty et al. 2010; Waldron et al. 2017). The Regreening Africa initiative will promote tree planting, farmer-managed natural regeneration (FMNR), assisted natural regeneration, and *aménagement des courbes de niveau* (ridge tillage along contour lines) in the areas of Koutialia, Yorosso in the Sikasso region (Oxfam), Koutialia in the Sikasso region (Catholic Relief Services), San in the Ségou region (World Vision), and Tominian in the Ségou region.

Mali is a geographically diverse country composed of the little-populated Sahara Desert across its northern region and the Sahel drylands across its center, which transition into the wetter agroecological zones to the south. While Mali is rich in land and water, the agricultural potential and activities are clustered in the better-resourced zones around the Niger and Senegal Rivers, rather than in the arid desert and drylands of the Sahel and Sahel/Saharan zones, which make up 65 percent of the total land area. The Sahel and Sahel/Saharan zones are critical areas of intervention where land degradation is most severe (Figure 1) and where people face the highest vulnerability to climate change and poverty (AEDD

³ Agroecological farming is not a specific production system. Rather, it applies ecological concepts and principles to optimize the interactions between plants, animals, humans, and the environment while taking into consideration the social aspects. Its goal is to maximize ecological processes for production systems that support biodiversity, ecosystem services, food security, resilience, and climate change adaptation for a sustainable and fair food system (FAO 2020). Evergreen agriculture is “the integration of trees with food crops and livestock to create more sustainable and productive agricultural systems for smallholder farming families. Included trees provide fuel, fertilizer, food, fibre (timber) and fodder” (Rinaudo et al. 2019, 184). The policy analysis presented in this research can apply to both agroforestry and evergreen agriculture, but this report will use the term “agroforestry.”

2010; World Bank 2012; Ministry of Foreign Affairs of the Netherlands 2018). Farmers in these zones face a dynamic climate characterized by high interannual and interdecadal variability. Historically, numerous food crises caused by droughts (and floods) of varying degrees have been recorded (Ministry of Foreign Affairs of the Netherlands 2018; AGCC-Mali 2 2019).

Figure 1. Severity of human induced soil degradation in Mali



Source: World Bank (2012).

Climate Change, Land Degradation, and Agriculture in Mali

While a harsh climate of extended dry and wet periods is typical of the Sahel ecological zone, the increasing severity and irregularity of its climate aggravate the risk of large human consequences. Climate change in Mali and the West African Sahel is observed as a clear and significant increase in average temperatures (by more than 0.7°C in Mali during the June–September rainy season) and a 12 percent decline in average rainfall since the 1970s for crop-growing regions, and increasing variability is projected for the future (Funk et al. 2012). Rural populations, especially those who practice agriculture and raise livestock on eroding drylands, are the most affected by climate change (Ministry of Foreign Affairs of the Netherlands 2018).

The resilience of Mali’s ecological landscape to climatic volatility is further weakened by the degradation of natural resources. This degradation is caused by numerous factors, including weaknesses in land tenure and local governance,

which lead to poor land management. Massive agricultural expansion driven by population growth, and shifts in agricultural practices driven by agricultural development efforts have also led to loss of vegetation cover and soil erosion (Zamudio 2016; Ministry of Foreign Affairs of the Netherlands 2018; USAID 2018b; Cotillon and Tappan 2016).

Traditionally, to replenish soil fertility, farmers used long fallow periods (Boffa 2000; Kaya et al. 2000) in rotational practices that often incorporated agroforestry through the intentional selection, management, and use of valuable tree species. This land use type was defined as agroforestry parkland. Agroforestry parklands make up 39 percent of Mali's total land area and 90 percent of agricultural land area (Zomer et al. 2009; Lovett and Phillips 2018). In 2016 agroforestry products accounted for 5.1 percent of Mali's primary sector GDP (Pernechele et al. 2018). Despite their benefits for farmers, agroforestry parklands are on the decline. Numerous causes have been identified, including reduced or eliminated field fallow periods, a shortage of agricultural land, male land managers' preference for more profitable crops, farmers' lack of bargaining power for industry-value tree products, the systematic elimination of young trees from fields, and climate change (Bidou et al. 2019; Boffa 2000; Maranz 2009; Sanogo et al. 2017).

Agricultural development programs operated by the government and by international development agencies have neglected to prioritize the agroforestry parklands. Following disastrous droughts and famine in the 1970s and 1980s, the government and donors prioritized agricultural development, and their programs sought to intensify production and narrow yield gaps by focusing on technology-based solutions aimed at both smallholder and industrial-scale farming (Bidou and Pierre 2013). Many of their efforts involved improved crop varieties, increased mechanization, large-scale fertilizer subsidies (Bidou and Janin 2013; Ollenburger et al. 2019; Traoré et al. 2019), and large investments in irrigation (Bidou et al. 2013; Djiré 2013; AEDD 2010). However, these types of solutions are questionable in terms of their actual benefits for food security and their environmental, economic and social equity outcomes (Traore et al. 2015; Ollenburger et al. 2019; Traoré et al. 2015; Kone et al. 2020).

Box 1. Office du Niger

The Office du Niger is an extensive irrigation system begun in the 1930s in Segou. Since independence, the Malian government has prioritized the development of this system for its agricultural development objectives. It has greatly expanded its area, dominated by rice production and, to a lesser extent, sugar cane, especially through foreign investments and land leases. Land leases last either 30 or 50 years and are renewable. A separate set of policies govern this area, and a separate secretary of state oversees land tenure issues within the Office du Niger zone.

For instance, despite the fact that the Office du Niger is known as one of the largest irrigation development zones in West Africa (see Box 1), irrigation is concentrated around the Niger River delta and represents only 3 percent of total cropland (Funk et al. 2012). Even with continued expansion, there is high pressure on the irrigated land, and households must pay 67,000 CFAF per hectare for the upkeep of the irrigation system (Dixon and Holt 2010). The high cost and limited geography of irrigated land exclude many farmers. Besides having limited access to irrigated lands, many smallholder farmers are extremely financially constrained and have difficulty

obtaining agricultural inputs such as mineral fertilizer, improved seeds, or machinery (MAFAP 2013). These disadvantages are exacerbated by many farmers' insecure land tenure. Those smallholder farmers who have been able to overcome resource constraints have greatly increased their yields and production of cash crops like cotton, rice, peanuts, and maize thanks to support from development initiatives for access to resources like fertilizer and plows (Beaman et al. 2013; Laris and Foltz 2014; Cooper and West 2017). Critics point out, however, that this cropping system has many detrimental effects on natural capital. Rather than promoting systems and capacity for sound land planning and management, development programs have incentivized dependence on mineral fertilizers (Magrath 2019; Brescia 2017). The shift toward the popularly promoted cash crops has meant a shift away from fallow practices that foster many (although not all) key agroforestry parkland trees (Boffa 2000; Place and Dewees 1999; Kaya et al. 2000). Kaya et al. (2000, 51-52) claim that in Mali "the input of nutrients as fertilizers is far less than the quantity exported through erosion, leaching, and crop harvest." The ecological price paid by this agricultural development pathway is questionable given that in many cases the adoption of mineral fertilizers and other costly inputs to increase the yields of cash crops has not reduced poverty and food insecurity (Beaman et al. 2013; Ollenburger et al. 2019; Cooper and West 2017). Analysis by Ollenburger et al. (2019, 288) concludes that a "broader view of smallholder agriculture in the context of rural livelihoods suggests that technological solutions alone are unlikely to" meet the

goals of feeding an increasing population and reducing rural poverty.

Box 2. Some Agroforestry Techniques Defined
Farmer-managed natural regeneration (FMNR): FMNR is the systematic regeneration, management, and maintenance of farmer-selected trees from living stumps or seeds that already exist in the soil; it is characterized as a low-cost, simple way for farmers to increase the number of trees interplanted with crops in their fields.
Contour trench: A contour trench, a constructed depression across the slope of the ground without a spillway, is designed to trap rainfall runoff, sediment, nutrients, and organic matter to allow more time for the collected runoff to infiltrate the soil (Kurothe et al. 2014).
Contour bund: A contour bund is a stone or earth line built along the contours of the ground to trap rainfall runoff, thereby increasing water infiltration into the ground and reducing erosion. In wetter years contour bunds help reduce the climate-induced risk of runoff and erosion; in drier years they contribute to effective rainwater harvesting.
Improved fallows: Short-duration fallows are now being tried as an alternative to traditional fallows in lands under pressure. These improved fallows are planted to leguminous, fast-growing tree species for shorter periods (three to four years) than traditional fallows (Kaya et al. 2000).
Fertilizer trees: These nitrogen-fixing woody perennials are used to improve soil fertility in arable lands and pastures.
Zāi pit: Zāi pits are a traditional West African soil conservation technique in which holes are dug in rows and filled with manure. Crops are planted in each pit, which provides improved water filtration, water retention, and nutrient availability in severely degraded land where water cannot penetrate (Danjuma and Mohammed 2015).

Promotion of Agroforestry

Regreening Africa and other initiatives are promoting agroforestry to address some of the ecological and equity challenges faced by the mainstream agricultural development efforts described above. Efforts to use agroforestry for the unique natural, economic, and social capital it provides have focused on revitalizing traditional agroforestry parklands, but farmers and researchers are also experimenting with improved fallows and cultivation of tree crops such as cashew and mango as high-value cash crops with relatively low labor demands (Ollenburger et al. 2019). One of the most promising techniques for establishing or reestablishing agroforestry systems in West Africa is farmer-managed natural regeneration (FMNR).⁴ FMNR is often promoted along with complementary practices such as zāi pits, contour trenching, stone lines or bunds, and fertilizer trees (Reij and Winterbottom 2015; Rinaudo et al. 2019; AEDD 2010; see Box 2 for definitions of these agroforestry practices). One of the most frequently

⁴ FMNR is similar to assisted natural regeneration, and the two terms are sometimes used interchangeably.

promoted techniques in Mali, FMNR is more cost-effective than direct tree planting, well suited to revitalize declining agroforestry parklands, and particularly beneficial in drylands where rain-fed agriculture dominates and vulnerability is high (Weston et al. 2015; Ward 2016; Reij and Winterbottom 2015). Although agroforestry is not a stand-alone solution to Mali's agricultural and rural livelihood challenges, restoring the economic and ecological benefits provided by these parklands could have a significant impact. Such technologies are attractive to farmers because they require low levels of financial investment, improve yields (while generating important products like livestock fodder and fuelwood), restore degraded cropland, and provide other benefits that have been shown to increase smallholder household resilience (Brescia 2017; Rinaudo et al. 2019; Place and Dewees 1999).

The most notable example in West Africa of successful agroforestry adoption at scale is Niger, where farmers have used FMNR to regenerate at least 4.8 million hectares (Reij et al. 2010). Farmers' efforts have halted desertification and reversed deforestation. FMNR has resulted in the production of more than 500,000 additional tons of cereal per year, raised agricultural income, and enhanced food security. This kind of remarkable transformation has also occurred in some areas of Mali, though to a smaller extent (Reij and Winterbottom 2015; Cotillon and Tappan 2016).

PURPOSE AND OBJECTIVE

Policy engagement is an explicit objective of Regreening Africa, which asserts that "successful adoption of agroforestry is dependent not only on designing appropriate technologies but upon ensuring an enabling policy, legal and institutional environment to underpin the scaling-up process" (Bernard et al. 2019, 2). This research was requested to inform the policy advocacy of Oxfam and its partners working to promote agroforestry in Mali.

The objectives of this research report are to analyze the national policy landscape in Mali, identify policy and implementation gaps and challenges that constrain the upscaling of agroforestry practices, and provide recommendations.

RESEARCH METHODS AND SCOPE

This research was undertaken using literature reviews, primary document analysis, and interviews. The literature review included English and French publications from journals, local news websites, nongovernmental organizations (NGOs), government agencies, donor-financed projects, and universities. Official

policy and legislative documents were also analyzed. All French-English translations quoted in this report are the author's.

To validate and supplement the findings from the desk review, the researcher conducted in-person and remote interviews with experts and practitioners in agroforestry and policy-related fields in Mali. Interviews were conducted with 14 experts from 11 organizations and a range of backgrounds. They were identified and selected by Oxfam colleagues of the Regreening Africa program in Mali and included advocates for sustainable agriculture and land rights from civil society organizations; managers of a government project on climate change adaptation; experts on resilience and agroecology in the Sahel; Malian research institutions, and climate change experts directly involved in Mali's national adaptation plan. One government official at the national level was also interviewed via email.

In addition, interviews of four female farmers and five male farmers from a diverse range of regions (San, Segou, Tomininian, Yorossou, Koutiala, and Sikasso) were conducted with Bambara-French translation provided by an Oxfam program staff⁵ in Mali. A single one-on-one interview was conducted with one female farmer to start, following which, due to unanticipated time limitations, the same questions were posed to the remaining three female farmers in a focus-group format (separate from the men). A similar set of questions were posed separately to the group of male farmers. Each individual farmer, with the exception of one male farmer, gave plentiful responses to the interview questions. All farmer interviews were completed in the span of a half-day, and each farmer received reimbursement for travel, lodging and meals to attend the interview.

All in-person interviews were conducted in December 2019, and three remote interviews were conducted between June 2019 and June 2020.

Mali does not have a stand-alone, designated national policy or strategy to guide legislation and programs specifically meant to support and promote agroforestry or related practices. This is an obvious gap when it comes to harmonizing institutional mandates (Ashley et al. 2006). Nonetheless, some policy experts argue that

often the solution is not to have a specialized institution or policy for agroforestry, but to enhance support for it by using existing policy mechanisms or regulatory frameworks. In many cases, the shadow effect of economic or agricultural policy is far more important than the impact of measures specifically aimed at promoting agroforestry systems (Buttoud 2013, 13).

⁵ An enormous thanks to Fatoumata Traoré

Therefore, this research assesses policies based not solely on their direct support for agroforestry, but also on how well they promote favorable institutional and regulatory environments that can enable agroforestry across various key domains. **It was found that while there are many policy gaps, many policies supportive of agroforestry already exist. However, gaps in implementing these existing policies and a disconnect between national policies and local conventions pose significant challenges to the effectiveness of current and future policy initiatives.** Therefore, identifying the relevant policy implementation gaps also became an important objective of the research.

Agroforestry is a multisectoral concept. The analysis for this research is not an exhaustive account of all the sectoral policies that could relate to agroforestry. Rather, sectoral policies were given priority for review based on the sectors and issues commonly noted in the literature around agroforestry policy.

Table 1 identifies whether agroforestry is directly or indirectly mentioned in various relevant policies and gives an overview of some key sectors and relevant policies. Further examination of the effects of laws and regulations in each sector helps identify the policy “gaps” where sectoral policies can be made more relevant to agroforestry.

Table 1. Mention of agroforestry in relevant national policy documents

Domain	Policy document	Mention of agroforestry	Remarks
Climate change, agriculture, food security, natural resources, livestock, forestry	Programme d'Action National d'Adaptation aux Changements Climatiques 2007 (PANA)	Direct	PANA promotes several agroforestry projects as priority adaptation actions.
Climate change	Politique Nationale sur les Changements Climatiques 2011 (PNCC)	Indirect	The adaptation and resilience of ecological systems and climate mitigation are among the priorities of the PNCC. It also mentions stopping deforestation and soil erosion in its list of “political orientations.”
Environment	Politique Nationale de Protection de l'Environnement (PNPE)	None	PNPE identifies the disconnect between legality, legitimacy, and practice as a major barrier for forest resources. It identifies decentralized and participatory natural resource management as an objective.
Agriculture	Loi d'Orientation Agricole (LOA)	None	

Table 1. Mention of agroforestry in relevant national policy documents

Agriculture, environment, natural resources, livestock	Politique de Développement Agricole (PDA)	Direct	Under strategies and measures related to the environment subsector, PDA lists sustainable land and water management practices and FMNR as "priority environmental and social mitigation measures." Under strategies and measures relating to forest and wildlife, it says it will "promote the sectors of forest products and improve the performance of specific forestry sectors (shea, gum arabic, néré, medicinal plants, palm, etc.)."
Agriculture	Plan National d'Investissement dans le Secteur Agricole 2014 (PNISA)	Direct	PNISA targets FMNR and community forest management to address desertification under "Action 6: Climate change adaptation" of its agricultural productivity program. It includes investment cost estimates for reforestation, nurseries, and other agroforestry inputs.
Agriculture, food security	Plan National d'investissement Prioritaire dans le Secteur Agricole au Mali, 2011–2015 (PNIP-SA)	Indirect	PNIP-SA briefly mentions agroforestry as a complementary activity under the responsibilities of other actors.
Agriculture	Le Schéma Directeur du Secteur du Développement Rural, 2000–2010 (SDDR)	Indirect	Agroforestry is acknowledged only once as an activity that contributes to NGO-led rural development efforts. Reforestation is mentioned in the context of trying to transfer capacity and responsibility for production of tree germplasm to the community level.
Agriculture, land	Loi sur le Foncier Agricole (LFA)	None	
Livestock	Politique Nationale de Développement de l'Élevage	None	Policy does not mention the role of trees for fodder supply.
Governance	Politique de Décentralisation	None	
Water	Politique Nationale de l'Eau 2007 (PNE)	None	Policy does not mention the role of forests and trees for watershed protection and prevention of erosion.
Forest	Politique Forestière Nationale 2007	Direct	Policy acknowledges the importance of agroforestry parklands and trees outside of forests for protection against erosion, culture significance, food security, and poverty reduction. It emphasizes the need to support and finance community forest resource management and to mobilize markets for agroforestry products. It explicitly recognizes the right of rural tree stewards to the use of their trees.

Source: Author.

Following a broad discussion of barriers to agroforestry adoption, this report examines specific sectoral policies related to land management (section IV), climate change (section V), decentralization (section VI), land tenure (section

VII), forestry, (section VIII), and agriculture (IX), ending with a set of recommendations.

III. BARRIERS TO AGROFORESTRY ADOPTION

Experts assert that “policy plays an important role in distinguishing countries and regions which have benefited greatly from agroforestry from those who have not” (Place et al. 2012, 115). This research sets out to identify how policies can better enable agroforestry, acknowledging that policy is one of many barriers to agroforestry adoption.

Compared with more conventional practices, agroforestry has several advantages, such as low upfront investment costs and decreased dependence on costly agricultural inputs (thus low reliance on financial credit), increased household resilience, and nutritional and cultural value benefits. Nonetheless, some farmers find agroforestry unattractive for reasons that may include the following:

- Some technologies (such as *zāi* pits) require high amounts of labor that are no longer easily or cheaply available; rotational group labor or family labor has been largely replaced by paid labor.
- Farmers may lack land or land tenure because of urbanization, fragmentation of landholdings as a result of increased population and inheritance, and other reasons as discussed in section VII.
- Given that agroforestry systems may take some time to establish and become productive, the return on investment can be delayed. The long-term commitment needed is especially a challenge if the farmer lacks tenure security over the land and resources.
- The land itself may have limiting physical conditions (such as a lack of water).
- There may be a limited market for agroforestry outputs.
- Farmers may lack awareness, knowledge, or training.
- Germplasm such as tree seeds or seedlings may be unavailable.
- Farmers may have easy access to mineral fertilizer to improve yields, which reduces their incentive to seek out alternative soil management practices.
- Agroforestry may conflict with other land uses (such as livestock raising).

- Women, not men, may be the main beneficiaries of agroforestry outputs, but women have less authority over land use.

Some of these barriers are not easily addressed by policy, especially lack of water or changing trends in landownership and land use impacted by population growth, urbanization, and globalization. But it is helpful to acknowledge these trends and how they affect incentives for agroforestry. For example, Place et al. (2012, 119) write that “while historically the planting of trees was used by farmers to increase tenure security where it was low, this phenomenon is decreasing as inheritance and purchase of land become much more common than allocation by a traditional chief.” This report attempts to acknowledge how the multiple systems of law and the multiple sources of legal and social authority driving individuals’ resource use and access are shifting. This understanding will be important for addressing emerging barriers to agroforestry adoption.

In other areas, the policy aspects of barriers to adoption are more obvious. In Mali and other Sahel countries, land tenure challenges are largely a direct result of glaring discrepancies between provisions in the law and practice on the ground (Ashley et al. 2006; Place et al. 2012; Yatich et al. 2014). Policies that neglect to take agroforestry into account also inadvertently discourage agroforestry, such as when governments try to address declining soil health by subsidizing fertilizers while neglecting other solutions, or when policies disqualify farmers for crucial subsidies if they integrate trees into their system (Place and Prudencio 2006). In other cases one landscape is subject to contradictory laws, often related to environmental conservation and rural development policies. This occurs in Tanzania, for example, “where agricultural, environmental and forest policies promote tree planting, but the Forest Act protects species and restricts felling; and where agriculture policy promotes small scale stream-fed irrigation while the Environmental Act promotes riverbed protection and cropping bans” (Msuya and Kideghesho 2012, 135).

For policymakers, the barriers to enacting agroforestry-friendly policies may come from the misconception that agroforestry is a low-output subsistence system with weak potential to generate income, and low awareness of the drawbacks of more conventionally promoted farming methods (Buttoud 2013; Mbow et al. 2014; Place et al. 2012). They also face institutional challenges that undermine coordination of efforts to integrate agroforestry. Institutional and coordination issues are also a significant barrier for Mali’s climate change policies (interviews, 2019; Sogoba et al. 2014), which otherwise provide a good policy entry-point for mainstreaming agroforestry. Ambiguity and lack of coordination in policies and the mandates for governance at the local and national levels create conditions that prevent the multifunctional land management needed for agroforestry. For example, agriculture ministries and agricultural extension departments seem to be best positioned to support agroforestry at the local level, but they are disconnected from forestry and

environment ministries. With a lack of institutional coordination, no particular ministry has clear responsibility for measurement, reporting, and verification activities, making it difficult to account for and incentivize agroforestry under climate initiatives such as Reducing Emissions from Deforestation and Forest Degradation (REDD+) (Rosenstock et al. 2018) or other platforms that could compensate farmers for the delay in returns on agroforestry investments (Msuya and Kideghesho 2012). Institutional strengthening and coordination are also needed to improve research and extension. Particularly in many African countries, research and extension services are inadequate to support farmer uptake of new practices and technologies. The lack of institutional infrastructure for exchange and coordination between technical knowledge holders (that is, forestry staff and research institutions) and agricultural extension staff impedes the integration of silviculture techniques like tree seedling production with existing horticulture practices (Mbow et al. 2014; Place et al. 2012). Even though many agroforestry species have shown promise, the lack of communication between researchers at the Institut d'Économie Rurale and agricultural extension agents is leading to slow uptake (reviewer comment, 2020).

Several nongovernmental experts interviewed for this research cited institutional challenges. They acknowledged that **even when policies are reformed or adopted, dissemination of policy from the national to subnational and local levels is another big challenge for policymakers, officials, and state institutions**. One such expert emphasized that a system to convey national policies to local officials does not exist or is not easily applicable given local realities: “When a policy change happens, oftentimes [local officials] will only hear of it from news on the radio, or not at all” (interview, 2019).

The following sections discuss these policy gaps, barriers, and implementation issues specifically.

IV. SUSTAINABLE LAND MANAGEMENT POLICY

While Mali does not have a stand-alone policy to guide agroforestry legislation and practices, the Cadre Stratégique d'Investissement en matière de Gestion Durable des Terres du Mali (Strategic Investment Framework for Sustainable Land Management in Mali) (CSI-GDT) embodies the type of agroecological transformation that agroforestry is meant to achieve. It seeks to reverse land degradation, protect agricultural productivity, support adaptation to climate change, reduce poverty, and promote local-level natural resource management.

The CSI-GDT cites the urgent need to break the “vicious circle between poverty and land degradation” by giving rural actors the means to ensure their subsistence while improving their living conditions (increasing incomes) and promoting sustainable agro-sylvo-pastoral activities. It states that the government recognizes that sustainable land management (SLM) constitutes the foundation of sustainable agriculture as well as a key component of sustainable development and poverty reduction. Introduced in 2010 and approved by the government in 2014, this framework coordinated by the Agence de l'Environnement et du Développement Durable (AEDD) specified how Mali, with the support of partner institutions, aims to make priority investments under six strategic pillars (Table 2) that address the scaling up of sustainable land management projects in the field (objective 1). It also seeks to “strengthen the technical and financial institutional capacities of the actors concerned with a view to integrating SLM into the country's development policies” (objective 2).

Table 2. Six strategic pillars of priority investments to support sustainable land management for the first phase of the CSI-GDT, 2011–2015⁶

Strategic pillars	Total financing needed (US\$)	Financing acquired (US\$)	Financing sought (US\$)
1. Support upscaling of sustainable land management practices in the field	218,816,155	18,528,756	200,287,399
2. Strengthen the favorable environment for sustainable land management (institutional, financial, and political frameworks)	16,620,000	2,100,000	14,520,000
3. Strengthen advisory and commercial support services	15,200,000	4,083,778	15,200,000

⁶ Note: The first five-year phase spanned 2011–2015, but the researcher was unable to obtain details regarding finances for the next two phases anticipated for 2016–2024.

4. Develop an effective system promoting knowledge acquisition and management, monitoring and evaluation (M&E), and the dissemination of information	13,100,000	2,000,000	11,100,000
5. Implement a communications strategy	1,728,000	373,000	1,355,000
6. Build capacity for all actors	5,800,000	586,000	5,214,000

Source: AEDD 2010.

Under the first strategic pillar of the CSI-GDT (“Support upscaling of sustainable land management practices in the field”), nine investment programs include agroforestry either directly or indirectly (AEDD 2010). These programs are ranked by their priority for Mali’s climate adaptation needs. **The first and highest priority of these national priority investment programs is to significantly augment the area under FMNR⁷ and agroforestry systems.** The programs target the most critical areas in terms of land degradation, production potential, or biodiversity (AEDD 2010).

The use of *zāi* pits, contour trenching, stone lines/bunds, leguminous companion planting, and dune stabilization—practices used in agroforestry systems, are promoted in the second priority program aimed towards soil and water conservation, and promoting the System of Rice Intensification (SRI; see Box 3)

Box 3. System of Rice Intensification (SRI)

SRI is an agroecological, knowledge-based crop management approach that allows plants to better express their genetic potential, which leads to improved plant growth and productivity. SRI fields adapt better to climate change, give off fewer greenhouse gas emissions, and allow farmers to increase productivity while using less seed, water and purchased agrochemical inputs. Proponents argue that full adoption of SRI by West African rice farmers would allow the region to achieve rice self-sufficiency. Since its introduction to Mali in 2007, SRI has grown and demonstrated great success, yet it still faces challenges to adoption (Styger and Traoré 2018).

Although rice competes with agroforestry parklands for land, it is a crucial staple crop in Mali, and its importance cannot be minimized. In Asia rice production and SRI have been integrated with agroforestry, but there is little information about the potential for SRI agroforestry systems in West Africa.

in the Inner Niger Delta zones.

The third priority program aims to reforest 500,000 hectares (100,000 of which will be under the Great Green Wall initiative⁸) focusing on propagation and

⁷ In the document, FMNR is referred to as *régénération naturelle assistée*.

⁸ The Great Green Wall is a large, transnational Sahelian afforestation and land restoration program launched in 2007.

planting of jatropha⁹ and gum arabic as well as development of natural gum arabic stands.

The remaining six priority programs do not explicitly promote agroforestry but have the potential to integrate agroforestry. The production of perennial fodder crops in sylvopastoral agroforestry systems could be integrated into the fourth priority program, which targets the management and development of pasture. The fifth priority program addresses a key challenge for agroforestry—secure land rights—but it seems to be limited to the Office du Niger zone. The programs of lesser priority involve the management of forest and protected spaces, the fight against bushfires, the fight against soil and water pollution, and fish and aquaculture (AEDD 2010).

It is possible that financing of the priority investment programs may face some difficulties. At its time of introduction, the CSI-GDT had not yet identified sources for funding for a significant portion of its identified financial need (Table 2). While the Medium-Term Financing Plan for Sustainable Land Management 2011–2015 sought to set up a mechanism for mobilizing financial resources and develop a donor partnership platform (AEDD 2010), the researcher was unable to clarify its progress in recent years. The sole source of financing for FMNR was under Component 1 of a larger development program called Promoting Agricultural Production in Mali (PAPAM).¹⁰ Since PAPAM focused on smallholders in the Office du Niger zone (World Bank 2020a), it is unclear whether funding was secured for FMNR and related land and water management activities outside of the Office du Niger.

The second strategic pillar of the CSI-GDT (“Strengthen the favorable environment for sustainable land management”) identifies important institutional, financial, and policy needs for the realization of sustainable land management goals. This includes integrating SLM into various related sectoral policies¹¹. Notably, it claims the CSI-GDT will be the “preferred tool for adaptation to climate change. It also aims to integrate SLM at the local management level into Social, Economic, and Cultural Development Plans (PDSEC). It integrates sustainable land management into agriculture policy by making the CSI-GDT the only

9 Jatropha seeds can be used to make soap, provide a source of income for women, and make biofuel. Projects focusing on jatropha use for rural electrification can improve households’ access to fuel and other conveniences. Although, availability of processing equipment remain insufficient for these benefits to materialize, and biofuel production could shift land use away from food crops (Favretto et al. 2014).

10 The Programme d’Accroissement de la Productivité Agricole au Mali (PAPAM), 2011–2018, coordinated by the Direction Nationale Agricole, has been the primary delivery mechanism for public extension and advisory services. Activities under PAPAM focus on irrigation, water management, and sustainable land management (USAID 2018b). Through its sustainable land management component, the Sustainable Land and Water Management Program, PAPAM aims to adopt and disseminate SLM technologies and increase public and private advisory services for producers.

11 The CSI-GDT calls for integrating investments in land management into the Strategic Framework for Growth and Poverty Reduction, the National Policy for Environmental Protection, the National Action Program to Combat Desertification, the Action Plan for Integrated Soil Fertility Management, the Master Plan for the Rural Development Sector, and the Special Program for Food Security (AEDD 2010).

framework for the implementation of component 1 of the National Agriculture Investment Program (PNISA). While finances linked to sustainable land management represent only 4% of the state budget, the CSI-GDT intends to increase the amount allocated to SLM in the national budget by 8%, mobilizing innovative US\$10,000,000 of “innovative funding” (AEDD 2010).

Strengthening the favorable environment for sustainable land management will also support a favorable environment for agroforestry. **Despite the intersectoral approach demonstrated by the CSI-GDT, it acknowledges that integrating sustainable land management into sectoral and intersectoral policies is the main policy weakness.** SLM is not well mainstreamed into general understandings of environmental protection and natural resource management sectors and consequently not included in their objectives and investment pillars. The CSI-GDT cites a public expenditure review that confirms this financing gap.

According to the CSI-GDT, another government study identified that policy texts inadequately address local realities—they are unconcise, ambiguous, and do not clearly identify the roles and responsibilities of the actors. In addition, weakness in the process to decentralize governance, insufficient human resources, lack of coordination and lack of texts to guide policy application are identified as challenges. These challenges cut across many of the policy areas described in the following sections. The CSI-GDT affirms that policy and legal reforms are needed to better integrate SLM into sectoral policies. In particular, it points to need to revise the national forest policy, the State and Private Land Code (Code Dominal et Foncier), and the Pastoral Charter and the need for policy to address agricultural land rights issues (AEDD 2010).

V. CLIMATE CHANGE POLICIES

Agroforestry is widely praised as a practice that contributes to climate mitigation, resilience, and adaptation. Agroforestry systems support farmers' ability to use land and other natural resources to manage shocks like climate change effects (Padgham et al. 2015; Mbow et al. 2014; (What is Agroforestry? n.d.). Agroforestry and associated practices are also proven to significantly increase carbon sequestration in the soil and plant biomass (Doraiswamy et al. 2007; Mbow et al. 2014; Verchot et al. 2007; Reij and Winterbottom 2015).

Climate change policy offers a major opportunity to incorporate agroforestry into the policy landscape and to draw on climate-related financing opportunities. Increasingly, agroforestry is given attention in national climate change adaptation and mitigation strategies, which are themselves also gaining increasing attention. In Mali, the Ministry of Environment identifies sustainable agriculture (FMNR, agroforestry, and conservation agriculture), stone lines/bunds, contour trenching, and *zaï* pits as among the most pertinent climate adaption options for Mali (AEDD 2010).

At the national and international policy level, the government has engaged vigorously in the fight against climate change. This is evident in the collection of policies and frameworks specifically targeted toward this issue, including the Programme d'Action National d'Adaptation aux Changements Climatiques (National Adaptation Program of Action, or PANA), the Politique Nationale sur les Changements Climatiques (National Climate Change Policy, or PNCC), the Stratégie Nationale Changements Climatiques (National Climate Change Strategy, or SNCC), the Plan d'Adaptation aux Changements Climatiques (Climate Change Action Plan 2010–2017, or PACC), and the Mali Climate Fund.

AGROFORESTRY IN NATIONALLY DETERMINED CONTRIBUTIONS (NDCS)

In 2017 the government revealed its Third National Communication under which the preparation of a road map and the development of an investment plan are underway to ensure implementation of Mali's nationally determined contributions (NDCs). NDCs are official declarations of each country's committed actions toward meeting the Paris Agreement for climate change, to which Mali is a signatory. Mali's NDCs reflect the importance of preserving soils, promoting reforestation, and stopping deforestation as solutions for climate change. Those NDCs identify energy, agriculture, forestry, and land use change as the main sectors emitting greenhouse gasses (GHGs) in Mali, and they target emissions

reductions of 32, 29, and 21 percent, respectively, in those sectors by 2030 (Climate Watch 2018).

While the NDCs recognize some elements of agroforestry (and related agroecological solutions) as steps toward climate adaptation and mitigation, they fall short of their potential to fully drive these types of solutions.

Although the NDCs identify the main agricultural GHG emitters as mineral fertilizer (74 percent), livestock (22 percent), and irrigated rice (4 percent), the targeted measures fail to address these emitters by promoting agroecological practices such as the use of fertilizer trees or silvopastoral systems (Climate Watch 2018).

At the World Summit on Climate in New York in September 2014, Mali announced that its adaptation priorities include “forest management to restore degraded ecosystems to reforest 325,000 hectares, promote assisted natural regeneration and silt control, and strengthen protection of protected areas on 9 million hectares” (UNFCCC 2016). In the forestry sector, Mali’s NDC mitigation commitments devote \$31 million to assisted natural regeneration out of a total budget of \$12.92 billion¹². However, it devotes a much greater percentage of funds to forest plantations and management of classified forest and protected areas (Climate Watch 2018). An opportunity is lost when tree plantations are favored over strategies geared toward improving local resource stewardship and climate resilience through agroforestry, especially since plantation projects have sometimes fallen short in terms of long-term sustainability and impact (interviews, 2019).

Finally, Mali’s NDCs devote a small portion of adaptation funds for 2020–2030 (\$1.5 billion out of \$12.624 billion) reforestation and planting of thousands of hectares of fruit trees to protect against land erosion (Republic of Mali 2016). While this activity is commendable, these resources may not reach agroforestry practitioners in the drylands since it appears to be implemented through a sustainable development program focused in the Niger Delta. Furthermore, it is not clear whether the fruit trees would be planted in a diverse system that takes advantage of agroecological practices; monocultural tree plantation (in contrast to agroforestry, which is a diversified, complementary system) can actually deplete the soil and reduce biodiversity (Liu et al. 2018).

¹² The commitments and budget are conditional, meaning these measures are dependent on additional funding from external partners.

AGROFORESTRY IN THE NATIONAL ACTION PLAN FOR ADAPTATION TO CLIMATE CHANGE (PANA)

Mali has launched a number of projects to meet its various goals and commitments around climate change adaptation. Of these, the PANA actively integrates agroforestry solutions into national climate change adaptation measures. In 2005 Mali began developing the PANA under the National Meteorological Directorate¹³ as part of the Natural Resources Preservation Program—one of the nine priority programs of the National Environmental Action Plan (PNAE)¹⁴. It was aligned with the Strategic Framework against Poverty¹⁵ and the Rural Development Strategy¹⁶. Experts were convened to develop this national action plan, which identifies the key sectors, zones, and communities most vulnerable to climate change and clarifies priority criteria determining for climate adaptation actions. Following these criteria, the PANA defined 18 priority project options, of which 5 support agroforestry directly and 3 support agroforestry indirectly by targeting related activities, such as controlling brush fires, planting native species for erosion control, and helping women gain access to land (Republic of Mali 2007a). Of the PANA's 18 projects, 15 are also included in the CSI-GDT (Table 3).¹⁷

Table 3. PANA priority options and CSI-GDT priority investments

Priority (ranked)	PANA priority options defined through local consultation	Included in the CSI-GDT
1	Adoption of improved, climate-adapted crop varieties and animal and plant species	x
2	Diversification of sources of income (income-generating activities: market gardening, fish farming, microcredit)	x
3	Creation of cereal banks	
4	Agro-meteorological advice	
5	Construction of hydraulic micro-dams and development of floodplains lowlands, lakes, and ponds	x
6	Creation of drills equipped with solar or wind pumps	x
7	Promotion of butane gas and wood fuel substitutes	x
8	Collection of runoff and restoration of water sources (backwater, ponds, and lakes)	x
9	Information for and awareness raising of populations living near watercourses against the construction of housing near watercourses and water pollution	x

¹³ Direction Nationale de la Météorologie

¹⁴ Plan National d'Action Environnementale

¹⁵ Cadre Stratégique de Lutte contre la Pauvreté

¹⁶ Stratégie de Développement Rurale

¹⁷ One of these is a jatropha production project that may or may not constitute agroforestry.

10	Awareness, regulation, and organization of populations for the preservation of natural resources (development of local reforestation and agroforestry conventions)	x
11	Fight against bush fires	x
12	Adoption of water and soil conservation /soil protection and restoration farming techniques	x
13	Dissemination of composting techniques	x
14	Promotion and restoration of fodder species	x
15	Development of a technological package to train populations in simple practices to adapt to climate change	x
16	Promotion of intensive livestock farming	x
17	Promotion of <i>Jatropha curcas</i> oil	x
18	Monitoring of climate-sensitive diseases	

Source: AEDD 2010

The PANA is a useful, research-based framework that identifies and institutionalizes the necessary investment areas for climate adaptation. If carried out in full, the PANA has the potential to realize a strong commitment to agroforestry and similar sustainable agriculture practices. The PANA is one of the eight policy orientation pillars of the PNCC, although it is still a voluntary mechanism. Development actors are invited to elaborate full proposals based on the priority project options. They can use the PANA as a mechanism to align projects with Mali's national priorities and policies and to access or solicit funding opportunities for the projects. Project proposals are currently in development (Interview, 2019).

AGROFORESTRY IN THE NATIONAL CLIMATE CHANGE POLICY (PNCC)

To achieve its climate commitments and to leverage the fight against climate change through sustainable development, the government developed National Climate Change Policy¹⁸ (PNCC) in 2011. The PNCC has eight policy orientation pillars (see Box 4; the PANA is incorporated into pillar no. 3). Notably, the PNCC is oriented toward decentralizing land management. It calls for “the establishment of conditions and incentives for participatory and decentralized management of natural resources; promotion of income-generating forest species; the promotion of reforestation intended to meet the need for wood energy; the conservation of the diversity of plants

¹⁸ Politique Nationale sur les Changements Climatiques

and animals; and ecosystem restoration” (Republic of Mali 2011).

Box 4. Policy orientation pillars of the PNCC
Pillar no. 1: Implementation of forward-looking and better-organized governance on climate change.
Pillar no. 2: Integration of climate change into sectoral policies and strategies and into development planning at national and territorial levels.
Pillar no. 3: Strengthening of actions to adapt to the impacts of climate change.
Pillar no. 4: Prevention and management of risks and natural disasters.
Pillar no. 5: Promotion of actions to mitigate greenhouse gas emissions.
Pillar no. 6: Strengthening of research for the development, popularization, and transfer of technologies, and the generation of appropriate information and data.
Pillar no. 7: Public awareness, education, training, and capacity building on climate change.
Pillar no. 8: Promotion and strengthening of international and subregional cooperation.

While the PNCC demonstrates support for agroecological solutions to climate change, it gives deference to conventional farming systems favored in national agriculture policies. This can create contradictions when prioritized systems of production are not necessarily aligned with sustainable principles of climate change mitigation, soil management, or resilience building for vulnerable populations. For example, **while rice production is identified as the third-largest source of agricultural emissions in the NDCs, a quarter of Mali’s national budget dedicated to agriculture is spent on rice production, with a focus on irrigation and input subsidies** (MAFAP 2013). Although rice is a crucial staple crop prioritized for national food security, agroecological rice production (that is, SRI) is inadequately supported despite proven higher yields and GHG reductions in irrigated and non-irrigated areas of Mali (Styger and Traoré 2018).

The PNCC is well integrated with the PNISA, which reports that 74,666 hectares (ha) were reforested between 2013–2014. To support national climate change targets, the PNISA seeks to reforest 100,000 ha a year to achieve 1,000,000 ha of reforestation by 2024 (Republic of Mali 2014). National agricultural policies prioritize irrigated crops and the development of “modernized” industrial agriculture, and in line with this approach, the PNCC focuses on enhanced water management to secure agricultural production: two flagship projects aim to develop irrigated crops to address food security through water management. Reflecting the intent of the PNISA and the PDA to pursue agricultural

development through foreign investment, “the PNCC will place particular emphasis on public-private partnerships, in particular with foreign investors, to attract foreign public and private investment to achieve its objectives” (Republic of Mali 2011, 23; FAO 2017).

As the examples above show, certain elements of the PNCC are favorable to agroecological smallholder farming. However, the government’s attention and resources go toward promoting mechanized, industrial agricultural development. Although the PANA is a pillar of the PNCC, which lists adaptation and resilience of ecological systems among its objectives, the PNCC does not mention agroforestry directly. Within mitigation actions, the PNCC often mentions tree plantations and forest protection without identifying agroforestry as a strategy for achieving emissions mitigation goals.

AGROFORESTRY IN THE NATIONAL CLIMATE CHANGE STRATEGY (SNCC)

Working toward the year 2025, the Stratégie Nationale Changements Climatiques (National Climate Change Strategy, or SNCC) consists of eight pillars corresponding to eight key barriers to action against climate change. They include the implementation of a national institutional framework on climate change, organization of access to international climate funds, national capacity building, and incorporation of climate change considerations within activities in different sectors and at all administrative levels.

Like the PNCC, the SNCC does not mention agroforestry. It gives little emphasis to the importance of soil and land management to water quality and availability. The single mention of promoting good land management practices including reforestation for sustainable agriculture, is dwarfed by the large number of actions geared toward conventional agricultural production, such as improving irrigation, developing improved crop varieties, boosting cereal food stocks, and promoting mineral fertilizer (Republic of Mali 2011). While most actions proposed for the forestry sector target reforestation, the SNCC misses the chance to meet reforestation targets through agricultural landscapes by regenerating agroforestry parklands.

CHALLENGES IN MAINSTREAMING AND IMPLEMENTING CLIMATE POLICY

While there is potential for climate policy to integrate agroforestry as a climate solution and to be a point of entry for agroforestry actions, fulfilling this potential

in a meaningful way requires that climate policy be effectively integrated at the subnational and institutional level so that it can be implemented on the ground (NDC Partnership 2017, 2019). Yet climate policies themselves struggle with mainstreaming and implementation (Zamudio 2016; Zougmore et al. 2019). Some experts point out that the Ministry of Environment, for example, does not have a strong influence over other ministries, such as the Ministry of Agriculture, which have much more sway over the national budget and activities on the ground (Republic of Mali 2011; interview, 2019). Unfortunately, this research was unable to directly solicit the perspectives of ministry officials about this challenge.

A study of Mali's climate change adaptation policies and the State and civil society actors involved finds that "there is a satisfactory institutional framework required for each sector of activity to be supported toward more sustainable development," but implementation is still a challenge owing to operational problems and capacity of institutions (Sogoba et al. 2014, 40). These problems include a lack of national expertise on climate change and inadequate capacity in related structures to produce and share research and knowledge with policymakers (Sogoba et al. 2014; interview, 2019; Republic of Mali 2011). Another gap relates to the lack of inclusion of women stakeholders and lack of gender analysis on the impacts of climate change for women's economic, political, and social status (Djoudi and Brockhaus 2014). Over the years, the National Climate Change Committee, created to address these needs, has managed to meet only a few times (interview, 2019).

Finally, lack of access to finance is a major barrier that needs to be addressed (Republic of Mali 2011). **Though the PANA identifies many agroforestry activities as priority projects, financing for implementation is still needed.** To this day, most of the priority projects have not been funded. The PANA's weakness remains that the creation and implementation of these projects are conditional on access to climate finance, much of which is expected to come from bilateral or multilateral donors in order to match limited domestic resources (Republic of Mali 2011). While this platform facilitates access to and coordination of funds for climate adaptation, overall financing is limited, as donors currently favor capacity support and institution building rather than project implementation (interview, 2019). Given this approach, opportunities may remain piecemeal and climate adaptation actions diffused.

Hope for funding for agroforestry and climate projects may come from Mali's Ministry of Economy and Finance, which has made recent efforts to identify priority investment plans for the NDCs. This development may indicate a move to include climate spending in national development plans. In addition, Mali is a leader in decentralizing climate finance, and various organizations in Mali are

seeking Green Climate Fund accreditation to implement crosscutting climate change projects¹⁹ (Republic of Mali 2017; NDC Partnership 2017, 2019).

¹⁹ They include the National Agency for Investment of Local Governments, which funds projects at the regional and local levels; the Mali Folk Center; and Mali's Development Bank.

VI. DECENTRALIZATION OF GOVERNANCE: AN UNFULFILLED OPPORTUNITY FOR SUSTAINABLE NATURAL RESOURCE MANAGEMENT

Some claim that the central state's priority ownership and governing authority over all natural resources have enabled land degradation in Mali. A legacy of the colonial era, top-down control by the central state often has contravened locally established customary laws. Though customary legal systems may have been imperfect, the displacement of traditional land stewardship systems by centralized rule left a gap in local governance, resulting in a relationship of neglect and exploitation between farmers and the resources they depend on. The ecological consequences for agricultural production and farmer resilience were disastrous (Brescia 2017).

As of 2015, more than 24 pieces of legislation aimed at decentralizing governance to local governments in Mali exist (Padgham et al. 2015). Decentralization is a key policy initiative that strongly influences local-level governance and thus rural communities' relationship with land and trees, as well as local initiatives on climate change adaptation.

WHY IS LOCALIZED GOVERNANCE IMPORTANT?

Although Mali's efforts toward decentralization have not been fully realized, they are often seen as opportunities for sustainable local stewardship of natural resources, including stronger land tenure (Jones-Casey et al. 2011; Umtoni et al. 2016; USAID 2010). Proponents of FMNR vow that government reforms to enable greater decentralization and local control of natural resources have been significant enablers of its success in the Sahel (Bayala 2011). Sustainable and resilient systems such as agroforestry are designed to respond to diverse socio-technical conditions and biophysical environments and to the different needs and objectives of farmers in various demographic groups (Padgham et al. 2015; Kimengsi and Balagh 2017; Umtoni et al. 2016). The theory is that those users

whose livelihoods depend most directly on the quality of natural resources should have the greatest interest in protecting the long-term quality of such resources, and greatest knowledge on how best to do so. Local government structures are best positioned to address the needs of groups within specific local contexts. This local knowledge and control strengthen community resilience (Mentz-Lagrange and Gubbles 2018; Umtoni et al. 2016).

In *Fertile Ground*, Brescia (2017) describes the Barahogon, a local institution that monitors and enforces natural resource management and environmental protection rules at the community level in the Dogon region. The Barahogon, which began 900 years ago, was disenfranchised under colonial rule, and communities gradually stopped implementing conservation actions such as fallowing and protection of important trees species. In the past decade the Barahogon was revived and succeeded in reversing soil and environmental decline. In alliance with civil society, it recently reinstituted resource management activities such as communicating guidelines around tree cutting, supporting the uptake of new practices to address climate change (such as FMNR in agroforestry systems), and mediating resource conflicts.

Improved local-level ownership and involvement in stewardship of natural resources have been demonstrated in Niger, where the decentralization of tree ownership from the state to traditional authorities in the 1990s was an important factor in catalyzing the reforestation and afforestation of croplands across over a million hectares. “Localized tree ownership in turn catalyzed the emergence of markets for urban fuelwood and fodder-producing tree products” (Padgham et al. 2015, 47).

Because localized natural resource management is a principle of agroforestry, decentralization becomes a crosscutting theme when examining the policies that impact agroforestry.

MALI’S LONG HISTORY OF DECENTRALIZATION EFFORTS

Decentralization initiatives in African countries have various drivers. One aim is to regain the advantages of localized governance to better accommodate the needs of diverse stakeholders and to use local knowledge and institutions to improve the efficacy and equity of resource governance, recognizing that customary resource users have had well-established norms guiding natural resource management since before colonial rule (Jones-Casey et al. 2011). Another driver is the fact that national governments have struggled to meet the management responsibilities of central ownership and control, leaving land and

forests victim to the tragedy of the commons (Kimengsi and Balagh 2017; Brescia 2017; Padgham et al. 2015).

Efforts to decentralize governance began in earnest in 1993, when President Alpha Oumar Konaré created the Mission de Decentralization to design and implement the reforms. To this day, however, **important components of Mali's decentralization exist only in the legal texts. Many aspects of governance, including legislative decision-making authority over the environment, remain centralized, and the transfer of authority to local governments is incomplete.**

Decentralization was conceived as a political process to reinforce democratic government. The Mission de Decentralization succeeded in creating locally elected municipal governments (Pollard 2014). This effort was rolled out in a locally driven process in which existing villages banded together to form their own municipalities. Each one has a municipal council whose members are elected for five-year terms by eligible citizens in the territory, and the council members in turn elect a mayor. The result was 703 municipalities (of which 667 are rural) that are grouped into 42 *cercles* that make up Mali's 10 regions. Municipalities, *cercles*, and regions constitute the local government²⁰. The local government are responsible for land planning and management of land, the environment, and natural resources under decentralization legislation (Mentz-Lagrange and Gubbles 2018; Idelman 2009).

Specifically, Law 93-008 of February 11, 1993, provided the general framework for decentralization and made local authorities responsible for the “design, programming and implementation of economic, social and cultural development activities of social interest.” In addition, Law 95-034 of January 27, 1995, conferred on municipal councils responsibility for deliberating on the protection of the environment and the organization of rural activities and agro-sylvo-pastoral production. Under this law municipalities and elected councils are responsible for management of natural resources: “The municipal council is required to take the opinion of the village council or councils . . . to deliberate on the protection of the environment and the management of natural resources” (Article 17).

How decentralization weakened local governance

The big gap in decentralization efforts undoubtedly lies in the neglected technical aspects of local governance. Priority was not given to providing subnational governments with financial resources so they could fulfill the governance responsibilities transferred to them (Pollard 2014; Gaasholt 2004).

²⁰ Referred to as *collectivités territoriales* in French

Law 93-008 is the foundation of decentralization, under which municipal councils are named as elected councils that freely administer subnational (local) governments. The law also mandates that “every transfer of responsibility to the subnational governments must be accompanied by a concomitant transfer . . . of resources necessary to the normal exercise” of those responsibilities (Article 5). This mandate remains unachieved; the central government failed to redistribute financial resources to subnational governments. Thus, many municipalities have little capacity to generate their own revenues and provide public services (Jones-Casey et al. 2011; USAID 2010).

A 2004 case study in southern Mali reported that almost a year after the municipal elections, council staff was not hired, trained or paid and little information was provided to people outside urban areas. The only substantial transfer of resources from the central government consisted of certain categories of taxes that the state had had difficulty collecting in the past. “Meanwhile, the state retained all the most valuable categories of land whose natural resources, such as firewood, would constitute important sources of income if handed over to the municipalities” (Gaasholt 2004, 84). The failure to ensure adequate funds and capacity support to the newly formed local institutions was a foundational failure. As a result, the municipalities received responsibility for providing local services but were unable to deliver them. To make matters worse, prefects of the central administration, who approved municipal budgets and plans, tended to impose their will on municipal councils rather than helping to interpret and implement national law (Gaasholt 2004).

Some local governments have been able to use external funds to make sectoral investments. For example, the European Union funds the Malian National Investment Agency of Local Government²¹ to provide grants to municipalities for development projects. Increasingly, however, the governments of communes have relied on land development,²² land taxes, or higher fines for land infractions to generate revenue (Jones-Casey et al. 2011; USAID 2010). While these have been effective fundraising strategies, they have fueled land speculation and struggles between local factions over control (and diversion) of public and other external resources (from NGOs and donors, for example) and overall elite capture at the local level. The consequence is increased vulnerability of already marginalized rural people and alienated customary leaders, who feel the elected municipal councils²³ undermine their authority (Gaasholt 2004; Jones-Casey et al. 2011; Umtoni et al. 2016). In some parts of Mali, rural people perceive decentralization as a threat that may transfer power over community resources to the local government (Umtoni et al. 2016). These people may perceive the elected municipal councils and the traditional authorities as existing in separate

21 In French: Agence Nationale d'Investissement des Collectivités Territoriales

22 This land development involves subdividing land into *parcellements*.

23 These are known as *conseils communales*.

spheres of power that are not necessarily coordinated, and may place higher trust in the traditional village leaders than in the mayor (interview, 2019). As a study showed, “Despite their expected roles to support better management of natural resources at community level, the local administrative authorities and technical services had almost no knowledge of existing local natural resource institutions in the communities they are supposed to support” (Umtoni et al. 2016, 11).

Regardless of whether governance is top-down or bottom-up, strong and capable institutions are necessary for implementation. In this regard, even though some of the process has been praised as truly participatory and bottom-up, the decentralization process did not succeed (Pollard 2014). While decentralization in Mali has created structures for increasing local participation in governance and natural resource management, actual participation of community members in decentralized natural resource management remains insignificant (Umtoni et al. 2016).

Increased degradation of forests and rangelands has ironically been attributed to the lapse in governance resulting from major gaps in the decentralization process (Padgham et al. 2015). Natural resource management in Mali was left in a more chaotic, if not weaker, state than before. And Thus, while the legal conditions materialized to promote sustainable management of trees and land by individuals and communities, such policies have not created the desired reality.

THE UNFULFILLED OPPORTUNITY

Stronger local institutions are needed to enable better resource management. Although the decentralization policies have had unsuccessful outcomes, the issue is mostly framed as good policy that suffers from incomplete implementation. The next step for decentralization is to support local institutions in planning for, managing, and developing their natural resources. This support must include connecting and aligning government institutions with customary institutions.

To enable sustainable land management, the CSI-GDT repeatedly stresses the need to support the completion of the decentralization process. It emphasizes the crucial role of thoroughly implementing the decentralization policy for sustainable land management at scale and it notes that the allocation of adequate resources is essential for the implementation of policies at the local level and for fully empowering communities to manage natural resources (AEDD 2010).

In the Barahogon example described earlier, success was attributed to the local community and non-profits’ work with the new decentralized local government authorities in Bankass, to its push for legal recognition of the Barahogon

associations, and to official agreements (*conventions locales*) between local government authorities and the Barahogon defining the communities' responsibilities for managing natural resources. Through these *conventions locales*, farmers significantly improved community management of forests and eventually established a Union for Inter-community Forest Management. In addition, local government officials expressed great enthusiasm for the work and a strong sense of local ownership over it. They created more transparency in the sale of licenses for cutting and using trees, increased municipal revenues from the sale of licenses, and reinvested these resources in local development (Brescia 2017).

This example demonstrates how important *conventions locales* are as a tool for local-level natural resource management and mitigation of conflicts that arise around fishing, grazing, and village lands between local actors. Although these agreements are informal, greater support from the government to enforce or incentivize compliance could greatly support long-term stewardship (Andrieu et al. 2017) and encourage solutions to the conflicts between land use for livestock and land use for agroforestry.

VII. LAND TENURE

Lack of secure land tenure for farmers in Mali is a major disincentive to the long-term commitments to the land required by sustainable resource management and agroforestry (Padgham 2015; interviews, 2019; Jones-Casey et al. 2011; Andrieu et al. 2017). The policy landscape underlying farmers' access to land is complicated, fragmented, and contradictory, especially given that there are two concurrent systems of land tenure that hold power: one anchored in pre-colonial customary practices, and another based in the post-colonial legal system in which landownership revolves entirely around land titles and registration (Djiré 2007; USAID 2010).

The majority of farmers' customary landholdings are not legally recognized (meaning farmers do not have official deeds for proof of ownership), and farmers face serious barriers to registering their customary holdings—leaving them vulnerable to displacement by other interests who are able to register them. Under both statutory and customary legal systems, land rights are a greater barrier for women than for men since, on top of the overall declining availability of land for smallholders, land rights go primarily to men (Meinzen-Dick 2006). While legally, women and men in Mali have the same access to land. In practice, women are often entitled only to the less fertile land and obtain usage rights rather than ownership (Djoudi and Brockhaus 2011). Women must often obtain permission to use lands through their male relatives but may not have the final say on how that land is used (Budlender and Alma 2011; Jones-Casey et al. 2011). To improve land tenure, women often form associations through which they legally obtain land for collective use (USAID 2010).

Women's exclusion from land-related decision-making is apparent from the interviews conducted for this research. In contrast to the male farmers, who spoke animatedly about their concerns about threats to land rights, the women farmers had little to say about land tenure. When pressed, one woman farmer admitted that her husband technically has the right to redirect the land for her garden, where she grows fruit and medicinal trees. She concluded, however, that she did not feel concern given a strong relationship of trust and her expectation that he would not be socially permitted to repurpose her plot without her agreement (Interview, 2019).

THE THREAT TO RURAL LAND TENURE FROM URBAN EXPANSION

In Mali, there is rampant land grabbing in peri-urban areas and increasingly in rural areas by urban elites engaging in speculation (Neimark et al. 2018; Djiré 2007; Djiré et al. 2013). For expanding urban areas like Koutiala, this trend has a serious impact: farmers, who often do not have official titles or deeds, face the threat of losing their customary landholdings. Indeed, the evaluation of a program to expand FMNR in the Mopti region found that the impacts were stronger in villages in dryland areas than in peri-urban areas owing to commercial pressures and insecure land tenure (Brescia 2017). The law is supposed to give rural concessionaires permanent land titles once the land has been put to “productive use.” However, studies in peri-urban areas near Bamako show that the land registration process is long, complex, and ineffective for this purpose. Rural people know little or nothing about concessions in their areas, which are happening without consultations, and they lack the know-how to obtain legal ownership of their lands. Instead, land titles, often fraudulently registered, go to the urban elite, a large portion of whom are state employees (Djiré 2007; Djiré et al. 2013).

THE THREAT TO RURAL LAND TENURE FROM AGRICULTURAL DEVELOPMENT

The government prioritizes agribusiness growth and the development of highly mechanized agricultural systems in its approach to national development and food security. It sees foreign investment as an important vehicle for agricultural development (Coulibaly 2017). Agricultural policies such as the Loi d’Orientation Agricole (LOA) and the Politique Nationale d’Investissement Agricole (National Agricultural Sector Investment Program, or PNISA) demonstrate the national government’s preference for large-scale, long-term agricultural land leases. To attract investors to realize the underexploited potential of Mali’s most fertile agricultural lands, the government even set up an international cooperation office within the Ministry of Agriculture (USAID 2010), offering generous incentives.²⁴

Rising agricultural investments obviously represent important opportunities for Mali’s development, but they also come with serious risks. **In the past several cases of long-term land acquisition for large-scale production of export**

²⁴ Depending on the size of the investment, incentives to investors included three-year exemptions from import duties and taxes on materials, machines, parts, and other items as well as five- to eight-year exemptions from corporate tax and tax on industrial land and commercial profits. The 2012 update of this law included additional investment incentives allowing large companies (exporting up to 80 percent of their production) to receive 30-year total exemptions from duties and taxes related to the exercise of their activities (Coulibaly 2017).

crops have resulted in the displacement of local communities without proper public consultation or compensation (USAID 2010; Padgham et al. 2015; Djiré et al. 2013).

While the national interest behind such projects is to increase GDP and state revenue, in the current environment of weak land governance policies and institutions, farmers and the poor lose out on land rights. The policies favoring large-scale investments, combined with a lack of rigor and transparency in social and environmental safeguard mechanisms, open a window of opportunity for the elite to profit from land speculation at the expense of farmers.

Like the cases of peri-urban land grabbing, the administrative processes around agricultural land leases fall victim to weak governance. “Legal requirements on managing the environmental and social impacts of investment projects are often sidestepped or ignored. ‘Letters of intent’ and even actual land leases are given out in the absence of strategic planning.” (Djiré et al. 2013, 3) Investigations into applicants for letters of intent, which are the first step to obtaining land lease rights, show that **most of the investors active in the Office du Niger are more interested in speculative acquisition of high-value land rather than in cultivation itself** (Djiré et al. 2013). These investors clog the land-titling administrative process with requests for titles without any intention of undertaking agricultural production, while actual farmers are left out. With a lack of transparency in land registration processes, policies meant to support farmers’ land rights are coopted by those seeking fraudulent registrations (Djiré 2007; Djiré et al. 2013). As one land rights advocate wryly characterized the situation, “Another problem is that today in Mali, everyone has become a farmer” (interview, 2019).

POPULATION GROWTH AND LAND FRAGMENTATION

Finally, population pressure is commonly cited as a driver of decreasing land availability, increasing land degradation, and increasing land conflict for farmers, even as the total area of land cultivated has grown in response to the growing population (AEDD 2010; USAID 2018a). A USAID (2010) assessment of Mali’s land tenure asserts that customary land inheritance practices have fragmented farmer landholdings to a size that is insufficient even for subsistence farming. In 2018 Mali’s population growth rate was 3 percent—the eighth highest globally (World Bank 2020c). As of 2014, land cultivated per inhabitant (farmer or other) was only 0.38 hectare, while 73 percent of the labor force is agricultural (FAO 2017). Although increasing population no doubt imposes heavy pressures on land, it is also true that approximately 44 million hectares of land are suitable for

agriculture and livestock and only 12 percent²⁵ (5 million ha) of total cultivable land is cultivated (Republic of Mali 2014). The broader inequalities of access are apparent from the fact that 33 percent of farmers cultivate less than 1 hectare of land (USAID 2010). The farmers we interviewed perceived land grabs rather than growing family sizes as the main threat. Interestingly, one man described his preemptive effort to secure his land in the anticipation that he will only be able to claim a limited area of his current landholding under the legal system.²⁶ He has parceled out his holdings across his extended family network, with informal agreements that they will pay rent for the use of the land (interview, 2019). This single anecdote does not negate the fact that population pressure has impacted land use trends, but it suggests that other factors related to unclear perceptions of policy may also affect the observed fragmentation of individual landholdings. Overall, it should be expected that new trends and pressures drive evolving tenure arrangements.

POLICY SOLUTIONS FOR RURAL LAND RIGHTS

Given the complexity of land governance and the conflicts that result, it is no surprise that many laws and institutions exist to address this issue. Over the years numerous policy efforts have been made, with the acknowledgment that rural people are vulnerable to land grabs because customary land tenure is not well integrated into the statutory system.

The Loi sur le Foncier Agricole (Agriculture Land Law, or LFA) of 2017, the most recent land law, has been hailed as a long-awaited policy initiative specifically for resolving rural land challenges. Its arrival on the policy landscape is important because it reflects a recognition that previous land laws were more relevant to municipal lands. This lack of alignment with the rural setting resulted in policy ambiguity and marginalized rural habitants. To start, the LFA took lands recognized under customary rights out of the state's domain—a significant improvement. Previously, even while decentralization laws devolved natural resource management responsibilities to the local government, under the State and Private Land Code of 2000, any unregistered rural lands fell under the central state's ownership. With the new LFA, unregistered land held under customary law truly belongs to villages and herding groups in rural communities (Republic of Mali 2017). This change is meant to reinforce rural residents' right to make management decisions about these lands and ensure that village land

²⁵ According to USAID (2019), only 7 percent of 43.7 million arable hectares of land is currently cultivated.

²⁶ The researcher could not confirm a specific figure for the size limit, the original size of this farmer's landholding, or where a size limit was indicated in the land policies.

cannot be taken without proper consent and compensation just because no one holds a title to it.

Under the LFA, village land is now legally recognized as a type of land tenure in addition to individual land, collective land, and state land. Entire villages can organize to register their rights to their village territory. Two new land registration tools emerging from this law are in pilot development: the *attestation de détention coutumière* (Customary ownership certificate) and the *attestation de position foncière* (Land position certificate). The former allows a head of family to make a formal request for recognition of the family's ancestral land claims. The latter supplements the former by allowing customary land to be recognized by banks that offer credit and financing for agricultural inputs. While these tools are not land titles and may not provide the same security of tenure (interviews, 2019), they can be passed on to heirs, sold, rented, and used as collateral for loans (Republic of Mali 2017).

Under the LOA, which governs agricultural policies in Mali, *commissions foncières* (land commissions, or COFOs) were charged with mediating land conflicts at the municipal level. The LFA added village-level land tenure commissions to the local structures charged with managing land and its resources and resolving land conflicts. COFOs now exist at the village, *cercle*, and municipal/communal levels and are composed of traditional community leaders and civil society members. **With the support of the COFOs, and with customary lands now recognized under statutory land laws through the LFA, the way is paved for customary land claims to stand a chance in the formal judiciary system.** Whereas courts had previously ruled against claims of customary land tenure in land conflicts, the LFA legally defines the COFOs as mechanisms for confirming the legitimacy of rights to traditional landholdings. COFOs also provide an official structure for negotiating local conventions to prevent conflicts, which could be especially helpful in addressing barriers to agroforestry related to livestock conflict (Leonhardt 2019). While promising, the COFOs face challenges in carrying out their functions because funds have not been allocated to them. Since their creation in 2006, they have awaited the *arrêté ministériel*²⁷ for allocation of funds (interviews, 2019), and in some areas they are not yet functional.

Finally, Article 13 of **the LFA includes a bold measure calling for allocation of at least 15 percent of land in the state or collective domain specifically to women and youth**, recognizing that these groups tend to have the most difficulty in accessing land. This measure, which augmented the 10 percent mandate given in previous policies (Republic of Mali 2017), has caused some controversy owing to conservative attitudes about women's ownership of lands. Others claim it will weaken the social fabric since youth are already part of the family (USAID

²⁷ Administrative act taken out by a minister to execute a decree or law.

2010; interviews, 2019). Land rights advocates acknowledge that the results of this attempt at equity are still uncertain. Many questions related to implementation and accountability are unresolved:

“Youth” is defined to include boys and young men, but the policy does not define how allocation to women and youth should be shared within the 15 percent. Similarly, the law lumps state and collective domains together in the 15 percent.

The impact is geographically limited since the 15 percent applies only to *terre aménagée* (land developed for agriculture).

The ability of this measure to ensure equitable long-term tenure security is questionable. It grants not a land title but a use permit, under which beneficiaries are expected to pay a fee of 70 CFAF per hectare per season.

Reporting on progress against this objective lacks clarity: while the state has counted the percentage of women by the number of individuals, the law designates that the allocation should go toward women and youth “groups and associations.”

This new stipulation in the LFA is inconsistent with existing law governing the Office du Niger, which targets 10 percent of land to women and youth. Revisions are expected to eliminate this inconsistency (interview, 2019).

The LFA holds promise for more equitable land rights in general. A key opportunity for the future of agroforestry is to follow its development in the coming years to ensure that the opportunities to benefit smallholder farmers, women, and youth are fulfilled.

REMAINING POLICY GAPS AND ISSUES IN LAND

Male farmers expressed dismay about land tenure security and generally perceive the formal system of land tenure as a threat rather than an opportunity. Their feelings are due to (1) lack of clarity about the policies and rules for securing their property, (2) strong distrust that they will be properly compensated if municipal zones, or other public works like roads, expand into their holdings, and (3) a perception that cost of formal land registration is an insurmountable barrier (interview, 2019).

Land rights experts agree that farmers’ concerns are warranted. Given that there have been many instances of land grabbing and land speculation, wherein villagers were not compensated or informed and legal environmental and social safeguarding requirements were perfunctory, the distrust of formal land management institutions is no surprise (Coulibaly 2017; Djiré et al. 2013; interview, 2019). While authorities can ameliorate part of this concern by better

communicating with farmers and educating them on their rights, the reality is that even some state administrators do not clearly understand the policies. Also, the procedures for registering land rights and titles are opaque to most people—a case in point is the lack of formally defined fees for land registration (interviews, 2019; Umtoni et al. 2016).

The multitude of actors and laws governing land overwhelms the policy landscape, and land governance is made less effective by a lack of communication and coordination (interview, 2019). Several institutions and agencies are involved in governing tenure: the head of state and the prime minister work in collaboration with the Council of Ministers and the High Council on Agriculture. A permanent secretary based within the Ministry of Agriculture follows up on decisions from the High Council on Agriculture. A separate secretary of state oversees land tenure issues within the Office du Niger zone, and the Ministry of Housing, Land Affairs, and Urban Planning focuses on urban land tenure (USAID 2010). The involvement of different offices and agencies at different levels of government in giving out land titles leaves room for error or corruption that results in land being mistakenly titled multiple times to different people (interview, 2019).

In this uncertain policy context, male farmers are not complacent about land tenure threats but are actively attempting a variety of strategies to secure their holdings without high hopes that they will succeed. One example was the farmer who fragmented and distributed landholdings among his extended family, mentioned earlier. Another male farmer said, “We can plant trees in our land in the hope that when they take the land we will get a higher compensation value by having the trees, but in the end we can only try, and we are not sure if we will really get compensated” (interview, 2019). Policies need to be clarified and made known to the public. Government agencies must build the capacity to meet administrative and bureaucratic demands for land titling or leasing. Institutional capacity needs to be strengthened so that additional social and environmental safeguards can be effectively reinforced. Sustainable land management practices could be formally integrated as a condition for securing land tenure. Addressing the gaps in the decentralization process and the local governance issues described in the section on decentralization will also be important. If dysfunctions in local leadership and the dynamics of local elite capture persist, the measures in the LFA to devolve land governance to the local level may inadvertently put rural lands at greater risk for exploitation.

Equity and gender concerns in individual and customary land systems

Given the strong trends toward land development for urbanization and industrial agriculture, the advancement of formalization of land tenure seems an obvious future trend. Increasing monetization of land and the further development of Mali’s land market will no doubt continue to change tenure arrangements and, if

left unchecked, incentivize land grabs. To prevent unintended impacts of land registration and titling efforts on rural land rights, problems and solutions should be assessed based on gender and other intersecting equity challenges (such as poverty and ethnicity). Many authors warn that **while privatizing rural land and natural resources is one way for rural people to establish long-term investment in sustainable management, it is not a certain route toward better environmental management or secured livelihoods** (Place et al. 2012; Budlender and Alma 2011; Buttoud 2013; Djoudi and Brockhaus 2011). A potentially important impact of formalizing and privatizing land tenure, which has not been extensively measured, is the growth of short-term land transactions, even in rural and peri-urban areas, due to the monetization of land and other factors (interviews, 2019; USAID 2010). Some marginalized landless groups, such as migrants, women, and the very poor, rent land, but renting is a limited and often insecure form of land tenure that disincentivizes agroforestry systems and may drive unsustainable land use practices (USAID 2010).

“Modern” initiatives for land titling can allow women to own land whereas traditionally they could not. In urban and peri-urban areas of Mali, titling has already improved for women and youth, but in practice this benefit is available only to those who are financially privileged and has not extended significantly to rural areas (USAID 2010). Customary systems for providing women with secure rights and access should not be overlooked. Echoing the female Malian farmer cited in the beginning of this section, focus groups of rural women in Cameroon also affirm that “while wives obtain land through their husband’s kin groups, these groups have an obligation to protect the women’s claims” (Budlender and Alma 2011, 35). Evidence from South Africa also contradicts the popular narrative that customary systems greatly disadvantage never-married or widowed women (Budlender and Alma 2011).

Management of common property resources can provide more equitable benefits by allowing for superimposition of users and access where land is scarce (Buttoud 2013; Brescia 2017). In areas **where rural women rely on customary usage rights, even without ownership, for access to communal resources such as tree fruits, leaves, and nuts, these important sources of income and food security can be lost if land and its resources are privatized** (Meinzen-Dick 2006; Meinzen-Dick and Mwangi 2009). By allowing village land to be recognized and registered collectively, the LFA could protect rural people from land grabbing under the statutory legal system while accommodating their customary rules and norms around resource sharing and management. Although women could benefit from communal resource access, **recognizing rural communities’ right to collectively own land based on customary laws means that women are still subject to discrimination embedded in traditional or customary practices**. Similarly, the *attestation de détention coutumière* and *attestation de position foncière* are registered formally by the head of the family, who is normally male. Women’s tenure security then depends

on the healthy functioning of the social fabric and on appropriate behavior on the part of men (Djoudi and Brockhaus 2011).

Considering that rural women's equity under modern land law has basically been fictional (despite equal legal recognition of land titling for men and women, most women are in reality limited to rights given by custom and tradition), one can argue that recognizing customary ownership, despite the risks described above, is a helpful option made available by the LFA. Even if recognizing village land or family land does not ensure women's land tenure, by improving rural communities' tenure as a whole, the LFA can enable the collective management of communal natural resources like trees grown on the village's collective land. The opportunity remains for efforts to advocate for the involvement of women and their interests in these collective management arrangements.

Findings from literature and interviews point to the conclusion that current policies and tools for land rights do not do nearly enough to ensure secure land tenure for rural women. It is not easy to identify the ideal policy solution given the complex and diverse landscape of issues, policies, and customary laws regarding women's rights and access. One can only weigh the pros and cons of different land rights systems recognized in the LFA. **What is more important, and most needed perhaps, is not any specific land tenure system, but rather policies that promote the inclusion of women's needs in decision making around land use in all of these systems.** For instance, women's participation in COFOs could receive much stronger support. While the policy requires one women's representative in each COFO,²⁸ that woman's contribution is constrained in a predominantly male space by disparities such as education and literacy level (interviews, 2018).

²⁸ Decree N° 2018-0333/P-RM du 04 avril 2018.

VIII. FORESTRY POLICIES

Forests and trees are critical resources in Mali, but they face extreme pressure from humans. The government estimates that more than 500,000 hectares per year of tree-covered area disappear owing to various human activities (AGCC Mali 2 2018), greatly surpassing the reforestation rate of 70,000 ha per year²⁹ (interview, 2020). Since the first forestry policy of 1982, the state has attempted to control the overexploitation of this valuable resource.

Like land tenure, the use of forests and tree-based resources is in practice subject to both customary and statutory legal systems, which sometimes come into conflict. Customary laws around trees are complex and vary across localities. Different sets of customary usage rights overlap across properties. In customary rules around trees, usage rights often differ from ownership rights. Customary laws protect certain species of importance to the community from unjustified cutting. Like customary law, the Forestry Code protects species of socio-cultural, medicinal, scientific, and especially economic interest (Republic of Mali 1995b, 2010a). Both the National Directorate of Water and Forests³⁰ and local communities have an interest in protecting tree and forest resources, and the forestry enforcement authorities play an important role in preserving agroforestry parklands. Nonetheless, there is often tension with local communities around control over and rights to these resources (USAID 2010; Ashley 2004; Ly et al. 2006; Yatich et al. 2014). **In Mali, disconnects between customary laws and statutory laws governing tree protection and usage rights, in addition to conflicts and ambiguity within the statutory laws, are major disincentives for farmers to sustainably manage trees in the agricultural landscape. Furthermore, confusion and inconsistency in the enforcement of the laws and regulations disincentivize tree conservation and create tensions between communities and enforcement officers** (Yatich et al. 2014; Boffa 2000; Toure and Kanoute 2006).

In some cases the trees protected by the Forestry Code are not the same trees protected by customary by-laws (Yatich et al. 2014). In another instance, a study by Ly et al. (2006) found that local administrators were not always able to correctly list the protected species. This means that even the cutting of species not protected by the law can sometimes be subject to fees. In addition, while the strict enforcement of the Forestry Code measure requiring permits for firewood (on which the majority of Malians depend for their energy needs) is important for protection against deforestation, some authors point out that timber harvesting is an important direct source of funds for foresters and that harvesting of woody

²⁹ This is the rate since 2009.

³⁰ Direction Nationale des Eaux et Forêts

material can sometimes be indiscriminately regulated (Ly et al. 2006; Boffa 2000). The possibility that forestry officers will enforce these rules even on trees that farmers have planted on their own land discourages farmers from adopting agroforestry. Finally, villagers are required to purchase permits to exploit, transport, and sell wood and wood products. Following natural resource conservation and species protection measures, permits are also required for villagers to cut or prune trees on their own fields (Republic of Mali 2010a). However, the costs of permitting were never defined by the relevant government decrees and varied depending on the agent (Interviews 2020; Toure and Kanoute 2006). Even in instances where villagers should have the legal right to obtain free permits to cut trees they own, in practice this is not easy to do without implicit costs paid to the forestry officer. In 1990, foresters granted free cutting permits to an estimated less than 1 percent of households in the *cercles* of Mopti, Bandiagara, and Koro (Ly et al. 2006), but more recent estimates were not found. Permit costs reduce the profit margin, particularly for women who are the primary gatherers of fuelwood for home use and sale on the market (Ashley 2004; Ashley et al. 2006; Place et al. 2012).

The literature describes the past relationship between law enforcers and villagers as tense. Although villagers recognize the need for a system to regulate tree cutting, they try to avoid regulations and cut trees in forests where customary and state surveillance is weak. Resentment from cases where foresters have seemingly given out fines or permits arbitrarily or granted permits for outsiders to cut trees have exacerbated villagers' distrust of foresters and led them to exploit forests (Yatich et al. 2014; Ashley et al. 2006; Ly et al. 2006). According to field research in 2006 near Ségou, "The current reality is that the forests are extractive vacuums rather than protected areas. Villagers attest that foresters have a personal stake in . . . and benefit from degradation. During the study, it became clear that the foresters stationed at each classified forest post were unfamiliar with classified forest laws and user-rights" (Ashley et al. 2006, 674).

THE NATIONAL FOREST POLICY REFORMS TO FORESTRY GOVERNANCE

As part of the expansion of the decentralization process, forestry policies integrated several measures conducive to securing better tenure and stewardship of tree-based resources by rural communities. In the early 1990s the National Forestry Policy (PFN)³¹ sought to promote sustainable management of forest, wildlife, and fishery resources while recognizing communities of men and

³¹ Politique Forestière Nationale

women as key managers of the natural resources on their land (Thomas and Samassekou 2003).

The importance and potential of agroforestry are robustly incorporated into the PFN. It acknowledges the value of agroforestry parks and trees outside of forests for food security, poverty reduction, culture, and protection against erosion. It emphasizes the need to support and finance community forest resource management and to mobilize markets for agroforestry products. It also explicitly recognizes the right of rural tree stewards to the use of their trees:

The National Forest Policy aims to recognize the holders of rights over agricultural land, the rights and duties associated with the management of trees. Rural people will then have all decision-making powers concerning the exploitation (felling or pruning) and conservation (assisted natural regeneration, planting, pruning, etc.) of trees including protected species. This provision will facilitate agroforestry developments (which most often use protected species such as Néré, Shea, Balanzan, etc.), the farmers being assured that they will be able to use the trees they have at their convenience planted, protected, and conserved in an agroforestry context (Republic of Mali 1995a, 34).

Also since early 1990s, forestry laws have attempted to place responsibility for conserving and managing forest natural resources in the hands of local authorities. Article 28 of Law 95-004 of 1995 determining management conditions for forest resources³² devolved responsibility to the local level by defining the roles of local authorities in the protection of forest resources. It stipulates that “decentralized local authorities are obliged to take measures to protect forest resources.” Under the decentralization framework, Law 96-050 of 1996³³ defined the composition and management of local governments. It establishes in Article 21 that it is the duty of local authorities to intervene in managing forestry activities and to engage in land use planning, including for the forest area that will be exploited. This must include “natural forests, reforestation, and protection perimeters classified in their name as well as the forest domain registered in their name” and their agricultural domains.

These two laws also removed agroforestry parklands from the forest domain, which is governed under forestry law, and placed them in the agriculture domain, which is entirely under local control under Law 96-050 (Toure and Kanoute 2006). Despite this, laws remained unclear about how species protections applied in agroforestry parklands and farmlands. Because of this issue, the forest service extended policing to farmlands and agroforestry parklands, causing **farmers to uproot trees on their farmland to avoid the difficult process of**

³² Titled “*fixant les conditions de gestion des ressources forestières*”

³³ Titled “*portant principes de constitution et de gestion du domaine des collectivités territoriales*”

obtaining permits for cutting and trimming these trees (USAID 2010; Ashley 2004; Ly et al. 2006; Yatich et al. 2014).

While these revisions to forestry codes in the 1990s tried decentralize governance and recognize the importance of agroforestry for rural people, practices did not change, and the state authorities still implicitly regulated the use and harvesting of trees on agricultural land (such as agroforestry parklands, fallows, and cultivated land) (Tougiani 2011; Toure and Kanoute 2006). There was no guidance on how to apply the reforms and no resources or capacity support for doing so (Toure and Kanoute 2006). Communities have not taken on regulatory authority, and the forest service still regulates protected trees, as it has in the past, on the grounds that otherwise there is a risk of uncontrolled resource use (Ly et al. 2006). At the same time, **communities and foresters do not have a clear common understanding of protective restrictions and user rights**. In the legal vacuum created by ambiguity and the divergent interpretation of legal texts, mistrust between local communities and foresters undermines the stewardship of trees (Yatich et al. 2014).

GENDER AND FOREST RESOURCES

While trees are important to both men and women, the significance of trees differs for the two groups. Lack of rights to land and trees affects women's incentives to adopt agroforestry (Meinzen-Dick 2006). Rural women are major beneficiaries of trees and rely on them as important sources of extra income and household food security (Naughton 2017; Sanogo et al. 2017, but it is men who tend to manage the trees. Women farmers perform different roles and undertake different types of production from men and often have more limited access to finance, education, and decision-making power. Women rely on firewood and fruit such as shea for food, income, and household energy, while men cut trees for lumber. Although women generally have access to trees in the community, their decision-making power over resources, including land, is weaker (Budlender and Alma 2011). This gender dynamic was apparent in the interviews. Women farmers showed little knowledge of regulations around tree cutting. They unanimously insisted that no one may cut trees in the village without permission. In contrast, the men farmers disagreed. They gave a variety of responses about where and when one may cut, although showing little consensus and some uncertainty about the formal regulations (interviews, 2019).

PUBLIC PERCEPTION OF POLICIES AND REGULATIONS IN THE CURRENT DAY

A large literature exists on the impact of Mali's forestry policies and regulations on natural resource management in the 1990s and early 2000s, but sparse research and analysis were found for more recent years. The PFN was revised in 2007 but retained local communities as the main natural resource managers and emphasized the importance of investing in forest sector value chains to drive sustainable development of the forestry sector.³⁴ The Programme de Gestion Décentralisée des Forêts (Decentralized Forest Management Program, or GEDEFOR), whose first phase took place from 2008 to 2013 and whose second phase was completed in 2016, sought to better operationalize the transfer of forest management from the central government to local authorities. However, its impact may not be widespread (Gouzou et al. 2017). The gap in investment in the development of the forest sector remains a major challenge (Gouzou et al. 2017; Republic of Mali 2007b).

Law 95-003 was repealed by Law 10-208 of July 2010 "Determining the fundamental principles relating to the management of the resources of the forest domain." Several provisions of the newer law ensure the application of conservation measures—such as a ban on collecting of green wood or unripe fruits—within the forest domains of local governments. It also maintains the ban on cutting or mutilating protected tree species (with some exceptions for forest management) and gives local governments the ability to edit the protected species list in their locality. In privately owned forests, Law 10-208 retains the state's power to control resources in order to ensure the conservation of natural resources. Several decrees have followed, including one to set the permit fees for different types of forestry products (Décret 10-388-P-RM) and another to define roles and responsibilities at various local levels (commune, *cercle*, region) in decentralized forest management (Décret 2018-0079/P-RM).

While the decrees address some of the gaps and ambiguities in the forestry regulations, further study of more recent forestry regulations is needed. In particular, it will be useful to examine how continued assertion of state control over natural resources after the repeal of the much-studied 1995 forestry law has improved protection of land, trees, and biodiversity and how decentralized natural resource management may still be enabled.

Farmer interviews conducted through this research show that in practice, the same issues with forestry law remain, especially when it comes to implementation. Not only did women farmers show little knowledge of regulations concerning trees, but also the men farmers confirmed that the Forest Code regulations have not been very successfully integrated at the village level. There

³⁴ The PFN faces a gap in financing that prevents it from being fully carried out.

is still confusion about regulations on tree cutting, and farmers continue to avoid the permitting systems whenever possible (interviews, 2019).

On the positive side, the contention between rural communities who were policed by forest administrators described in much of the academic literature from the 1990s seems to have subsided. The farmers, civil society, and advocates we interviewed now describe the relationship as one that is more collaborative and useful. Women farmers, especially, have a high interest in preventing useful trees in the village from being cut and thus welcome enforcement. In interviews, the women farmers expressed hope that the men would take action to resolve the wrongful cutting of trees. For the women, the increased availability of tree products benefited their livelihoods. Male farmers may be capable of acting on this challenge—one interviewee said his community felt empowered to stop the forest service from giving out fruit-harvesting permits to a group of outsiders before the fruits were in season. Civil society partners described instances where the forest service has become a supporting agent in dispensing knowledge about sustainable management and conservation practices and a partner in implementing agroforestry projects.

Even though policies face challenges in comprehension, implementation, and integration with customary laws, the interviews provide some examples of a shift over the years toward a less problematic (though still unequal) power balance between the two important natural resource management actors. As one smallholder farming advocate jokingly said, “Now the forest service is afraid of the villagers because it is sometimes the villagers who police the forest service” (interviews, 2019).

IX. AGRICULTURAL POLICIES

The modernization of agriculture is one of the three main objectives of the 1992 Schéma Directeur du Développement Rural (Rural Development Master Plan, or SDDR). It is also promoted by the Loi d'Orientation Agricole (Agriculture Orientation Law, or LOA), adopted in 2006, which mandated the creation of the Politique de Développement Agricole (Agriculture Development Policy, or PDA) 2011–2020 to replace the SDDR. The Programme National d'Investissement dans le Secteur Agricole (National Agriculture Investment Plan, or PNISA), which operationalizes the LOA and the PDA, brings together all national investment plans, programs, projects, and interventions in the agriculture and food sector in Mali.

The LOA constitutes the broad framework with the long-term vision for the agricultural sector. This long-term vision is based on the “promotion of sustainable, modern, and competitive agriculture, centered primarily on family farms”(Republic of Mali 2006, 1). Recognizing agriculture as a leading economic driver, Mali consistently surpassed other Sub-Saharan African countries in spending on agriculture as a share of the national budget, reaching around 15 percent (Pernechele et al. 2018). The LOA plans to increase this spending to 20 percent of the national budget by 2022. As a policy framework, the PDA also aims to “promote sustainable, modern and competitive agriculture based primarily on family farms.” Through the development of a structured agricultural sector, it aims to “guarantee food sovereignty and make the Agriculture sector the engine of the national economy with a view to ensuring the well-being of populations” (Republic of Mali 2014, 15). It stresses environmental sustainability alongside agricultural intensification, agricultural mechanization, and massive investments in hydro-agriculture development. It asserts that “intensification should not be seen only in terms of chemical inputs. Particular attention must also be paid to organic fertilizers and agroecological techniques for the conservation and restoration of water and soil” (Republic of Mali 2013, 22). It directly points out FMNR and sustainable land and water management in its measures relating to the environment subsector. The promotion of products traditionally produced in agroforestry parklands, such as shea, gum arabic, néré, and medicinal plants, is also one of the LOA's identified measures relating to the forest and wildlife sector. In addition, mango, papaya, banana, and cashew are identified as high-value-added crops with confirmed market opportunities that will receive supportive interventions (Republic of Mali 2006).

AGRICULTURE EXPENDITURES

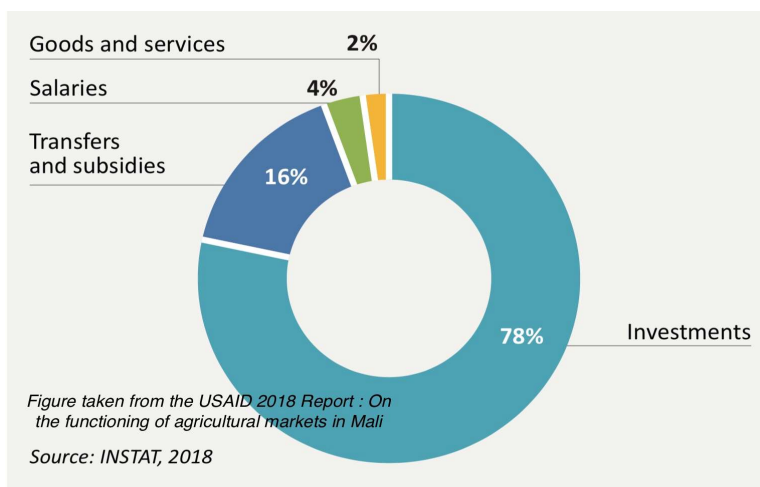
Although the LOA uses a holistic approach emphasizing sustainability that could support the mainstreaming of agroforestry alongside important goals related to strengthening production, in interviews some nongovernment experts expressed concern that in practice, political will (and the agriculture budget) may be heavily directed toward large-scale agribusiness development that does not benefit more marginalized farmers (interviews, 2019). Some prominent actions that demonstrate this political will include the following:

The government makes a large effort and provides sometimes extreme incentives to attract foreign investment in the form of large-scale agricultural leases in irrigation development zones, as described in the previous section on land rights.

The LOA indicates hydro-agricultural developments with water control as the priority investment area, and seeks productivity gains in those areas through improving access to inputs, the use of high-yielding varieties, and the adoption of efficient technical routes (Republic of Mali 2006).

The Malian government has focused most agricultural development on utilitarian and necessary fertilizer subsidies (Bidou and Janin 2013; Laris 2012; FAO 2017). In 2018, 16 percent of the total agriculture budget of 349.8 CFAF billion went to input subsidies alone (see Figure 2). Another analysis shows that between 2006 and 2015, 32 percent of agriculture-specific expenditures (which make up close to 80 percent of total agriculture expenditures) went to input subsidies (such as seed, fertilizer, machinery, equipment, on-farm irrigation, and veterinary services) (Pernechele et al. 2018).

Figure 2. Mali's government agriculture budget by type of expenditure



Even while the PDA’s objectives target social and environmental principles,³⁵ Analysis shows that its approach sometimes contradicts these objectives. For instance, as described in the section on land tenure, the large-scale agricultural leases that the state is trying to pursue pose a real risk of impeding access to land for smallholder farmers in Mali. In the context of recurring food crisis, a USAID (2010, 13) report explains that “many government policymakers fear that if Mali does not encourage large-scale agribusiness development, it will be unable to maintain even current (inadequate) levels of food security.” It is not surprising that government spending on rice accounts for a quarter of the national agricultural budget (USAID 2018c). However, since the policy places this emphasis “especially in areas with large-scale irrigation,” it means many smallholder farmers who live on drylands not suitable for rice cultivation may be excluded from agriculture interventions (interview, 2019). Also, the government allocates significant budgetary resources to input subsidies for cotton, which is at odds with its objective of crop diversification and food sovereignty. It seems especially surprising that in the 2017/2018 season, almost a third of government expenditure on fertilizer subsidies went to cotton (with the rest going to cereal crops, mostly rice) (USAID 2018c). This may be because cotton contributes a significant portion of state revenue.³⁶

Finally, while the investments in cereals and cotton may be necessary and important, the fact that reliance on mineral fertilizer is ingrained in agricultural policy contradicts the fact that Mali's NDCs identify mineral fertilizer as the main GHG emitter within agriculture (accounting for 74 percent). Failure to make concurrently strong efforts to produce the same crops in more sustainable systems, like agroforestry or SRI (especially considering that irrigated rice is the third-largest GHG emitter), represents a lost opportunity. The livestock sector is another missed opportunity. Livestock is identified as one of the most important sectors in Mali, with high potential for growth that is limited by many factors, including insufficient fodder production (Republic of Mali 2014; USAID 2018c). The Pastoral Charter, the main legislation on pastoralism, calls for sustainable livestock feeding and the LOA briefly mentions integrating livestock with vegetal production systems. These are opportunities to promote tree species that can produce nutritious fodder (Cotillon and Tappan 2016) and sylvo-pastoral agroforestry systems lead to sustainable soil and animal health and carbon sequestration (Place et al. 2016).

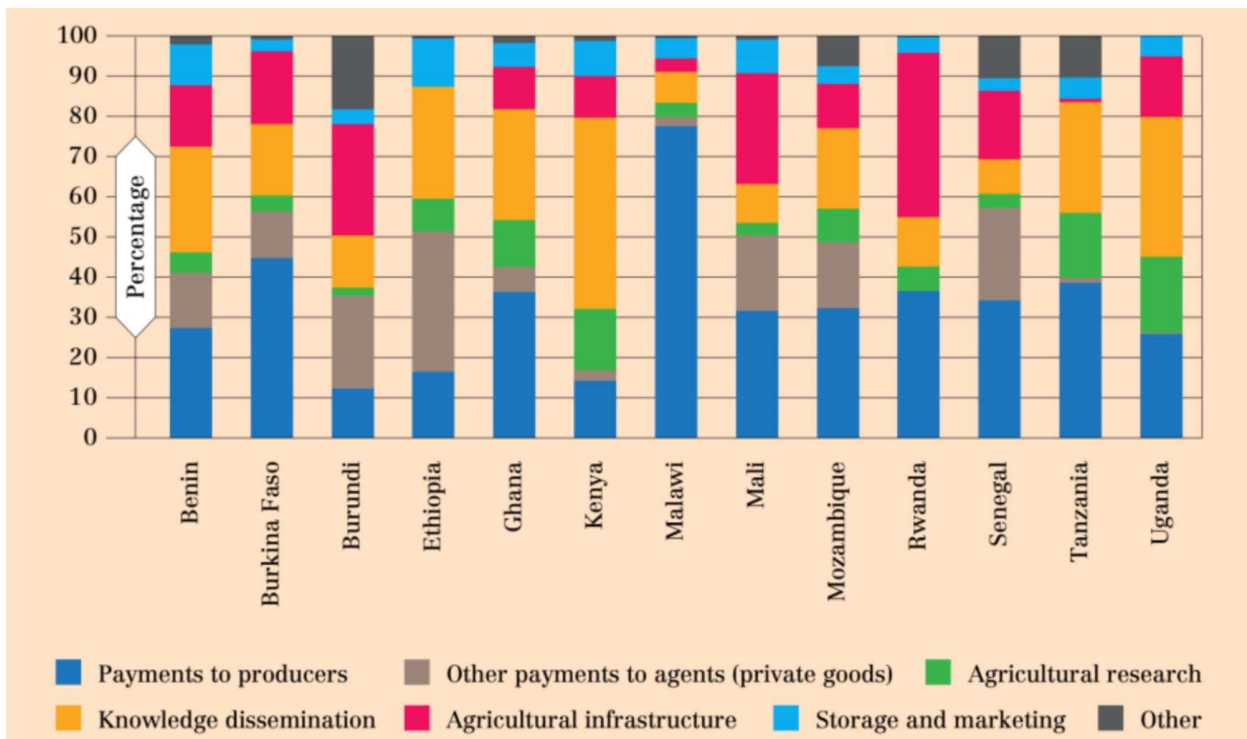
³⁵ These principles include the economic and social promotion of women, young people, and men in rural and peri-urban areas; the country’s food and nutritional sovereignty and security; the reduction of rural poverty; environmental protection and sustainable management of natural resources; and balanced and coherent agricultural land use planning.

³⁶ Cotton accounted for 10 percent of Mali’s export earnings and 12 percent of the state’s revenue in 2016 (USAID 2018c).

AGRICULTURAL RESEARCH AND EXTENSION

There is a big gap in research and extension on agroforestry, and on agriculture in general (interviews, 2019; USAID 2018b,c; Pernechele et al. 2018). Mali has extremely low rates of spending on agricultural research and knowledge dissemination compared with 12 other Sub-Saharan African countries (Figure 3) (Pernechele et al. 2018). In 2008 research on rice accounted for 21 percent of total resources devoted to agronomic and livestock research. Other important crops under research included cotton (12 percent), legumes (8 percent), millet (7 percent), potatoes (6 percent), and sorghum (5 percent) (FAO 2017). Although the PNCC mentions a plan of action for the reduction of emissions resulting from deforestation and forest degradation, and for the preservation and sustainable management of forests and land, this research was unable to confirm that such a plan came into being.

Figure 3. Composition of agriculture-specific expenditures in 13 African countries, average 2006–2015, actual spending, national and external resources



Note: The “knowledge dissemination” category is the sum of technical assistance, training, extension/technology transfer, and inspection.

Source: Pernechele et al. (2018).

The lack of adoption of agroforestry is closely related to the lack of research and agricultural extension to support improved and effective results at scale (Meijer et

al. 2015; Place et al. 2012; Buttoud 2013). For instance, although regeneration-based techniques like FMNR are an alternative to tree planting and a solution to the problem of insufficient germplasm, the lack of seeds and seedlings is still considered a constraint to agroforestry expansion. In the absence of an available supply of seeds and seedlings, governments and NGOs give away free or subsidized seedlings, further lowering incentives for local nursery businesses to produce these necessary inputs. However, private germplasm suppliers struggle to be profitable for a variety of reasons, including the challenge of creating a market that has not previously existed and insufficient farmer willingness to pay (Ashley et al. 2006; Buttoud 2013; Place et al. 2012; Place et al. 2016). Outreach and extension can raise the demand for germplasm to break this production dilemma.

WEAKNESS IN IMPLEMENTATION

In alignment with the decentralization policy, agricultural policies tend to point to local authorities (at the village and municipal levels) as the primary actors in the management of natural resources. This approach may dilute the state's responsibility for implementing the environmental sustainability aspects of the agricultural development strategy. However, the fourth of the PNISA's capacity-strengthening objectives dedicates capacity support to the local governments, including salary support to their agriculture staff and the integration of agriculture matters into their PDSEC (Republic of Mali 2014). Further investigation is needed on whether this support is sufficient to meet the agricultural policy's sustainable resource management goals. In general, as in so many other policy sectors, a recent assessment of agricultural system performance in Mali showed that although the overall policy content is sound, implementation of the policies is weak (Traoré et al. 2019). This weakness is evident in the fact that each year between 2006 and 2015, Mali's execution rate of public expenditure in agriculture was between 70 and 90 percent (Pernechele et al. 2018) despite the high needs in many areas of activity.

X. RECOMMENDATIONS

Mali faces a context in which weak local governance systems and extremely precarious and complicated land rights systems create an environment in which farmers do not feel secure in their future ability to own and use the land on which they currently operate, and local communities do not believe they have the power or responsibility to plan and implement sustainable land and natural resource management systems to retain long-term benefits. The problems in these domains present important policy challenges and opportunities not only for agroforestry but for rural livelihoods as well. If these barriers are not addressed, the positive impacts of policies that support agroforestry—of which there are already many—could be substantially diminished.

The following recommendations are aimed at creating a national policy landscape that can scale up agroforestry and agroecological solutions:

- 1. The decentralization process must be fully administered, with emphasis given to enabling local capacity for sustainable land management.**

Decentralization policy presents an opportunity to optimize land management through locally based solutions, but implementation is a major difficulty.

Efforts must be made to secure financing for the operations of COFOs and municipalities or to develop these entities' ability to generate and manage revenue. The COFOs need to do more to ensure the participation of women. Advocacy is needed to push for the devolution of funds to local governments, as required by decentralization policy. Support from external funding platforms, such as the efforts to decentralize climate finance, can help meet the needs for local governance, especially governance in support of land use management designed to reverse erosion and advance climate resilience.

It is important to recognize and encourage *conventions locales* between municipal governments and local traditional leaders around collaboration and responsibilities for resource management. Communities rely on the *conventions* to resolve conflicts related to livestock, which can be a significant barrier to agroforestry adoption. The collective elaboration of PDSEC presents an important opportunity to strengthen local governance capacity and community resilience in the face of climate change.

2. Women must be included in natural resource management decision making, and gender analysis should be better integrated into policies across the board.

While forestry policies have sought to provide greater local-level autonomy over trees as an agricultural resource, they inadequately acknowledge the differences in how women and men benefit from different species of trees and women's lack of decision-making power over those resources. Consideration of women's needs should be integrated into land use planning. Customary land rights systems should be considered in terms of their benefits and drawbacks for women and integrated with concepts of gender-inclusive land use planning and management.

In addition, further efforts are needed to support women's long-term secure access to land. The LFA currently addresses land access only for women in irrigated areas, but policies need to consider ways to support those geographically excluded from that benefit. As land-related laws go through revision to align with the new LFA, there may be opportunities to integrate sustainable land management as conditions of both statutory and customary land rights.

Policymakers and policy advocates must navigate complex land rights systems that are affected by the shifting trends of desertification, population growth, urban expansion, and a growing rural diaspora. With the revisions of forest and land policy, there is an opportunity to integrate collective management concepts as a way of mediating the tension between customary and statutory laws. It will be key to ensure that land policy includes women and recognizes their perspectives in land use decision making. At present, there is a gender divide in people's preferences and relationships with forest resources, and women have inferior land rights compared with men. This discrimination severely impedes their ability to manage the resources upon which they depend. Women's inclusion in groups like the COFOs and in developing and implementing the PDSEC can help ensure that land use changes do not devastate their livelihoods.

3. Policies governing the various forms of land titling and registration must be clarified and streamlined, and support for proper administrative management complying with those policies must be prioritized.

The statutory system administering land tenure presents a threat to farmers' land rights and systematically enables land speculation and the exploitation of vulnerable people.

Potential policy solutions could include defining and streamlining the authority of different government entities to administer land titles (thus avoiding confusion and doubly-titled land); clearly defining and communicating the process and

costs of registration and titling; harmonizing land conflict arbitration mechanisms within judiciary systems; and strengthening the requirements around social and environmental safeguards for land titling, especially with a view to improving the quality and accuracy of social and environmental assessments.

There is no doubt that customary land rights must be reconciled with the statutory system. Continued advocacy to ensure the sound rollout of the LFA is necessary. Requisite decrees will determine the effectiveness of this promising law at protecting the tenure security of farmers, allowing recognition of village land rights, and preventing land grabs.

4. Forestry policies and regulations should be clarified and broadly communicated.

The Forest Code and forest regulations should continue to explicitly clarify the roles and responsibilities of tree managers on farmlands and agroforestry parklands as well as rules around permitting systems, especially in regard to protected species. Pruning, harvesting, and other uses of trees on agricultural lands (particularly on communal, village, or otherwise customarily recognized land), by the right holder should not be impeded by prohibitive rules, including cumbersome authorization requirements. The relevant connections should be ensured between tree tenure measures in forestry policy and policy measures for land tenure. Policies should facilitate farmers' ability to profit from the use of trees and tree products given sustainable management and should give particular attention to the use of firewood, charcoal, shea, acacia, and other tree-based resources that are important in the strategies poor women use in adapting and coping to climate shocks. Finally, better dissemination of these policies at the local stakeholder level is crucial.

5. Agricultural development programs need to better align their financing and priorities with their purported social and environmental objectives.

The main policies in the agricultural sector generally favor conventional agriculture, with a disproportionate amount of resources allocated to the Office du Niger zone. In contrast, efforts to support smallholder farmers in dryland areas tend to be neglected. Agricultural development policies favor irrigated regions for rice and cotton because such areas have the highest productive and market-side potential; however, this approach needs to be reconsidered in light of the many farming families it excludes. Some attention should be redirected to other regions to better align government agricultural investments with goals for food security, poverty alleviation, and environmental protection. This shift should include prioritizing agroforestry research in addition to conventional cropping systems, and providing financing for the development of forestry products where better

support could also contribute to great agricultural market potential and productivity gains.

6. Fiscal and market policies should support agroecological production, women, and equitable supply chains for farmers.

Investments in agroforestry research must be increased, and financing should be provided for subsidies to give farmers greater incentives to practice agroforestry and to produce agroforestry products.

Agricultural subsidies could be used for tree-based fertilization methods in addition to mineral fertilizers, and policies could go toward building markets for agroforestry products. For example, starting in 2010, France's policy in 2010 allowed agroforestry to be recognized as a legal agricultural land use qualifying for agricultural subsidies. Furthermore, the Indian State of Chhattisgarh adopted an agroforestry policy in 2009 that established a price floor and guaranteed market for agroforestry products. (Place et al. 2012).

Experts recognize that developing markets for products such as shea and niébé is a priority because of their potential impact on women's livelihoods (interviews, 2019), yet they are not high on the list of agricultural development priorities in Mali, which favor cotton and cereal. The potential for increased income from the sale of such agroforestry products may be a powerful financial driver for tree protection, management, and regeneration; however, without assurance of equitable prices, this new market may fail to improve farmers' incomes. When developing markets for agroforestry products that are both important to women and important export products, ensuring equity is the only way to meet poverty reduction goals and to use the market to incentivize agroforestry.

7. Prioritize agroforestry solutions within climate adaptation efforts.

Climate change policy holds promise as a vehicle through which agroforestry can be better supported. Advocacy is needed to overcome the challenges in implementing and mainstreaming climate policies, which remain a barrier to its ability to impact the wider policy landscape. Efforts to promote agroforestry should act in synergy with efforts to advocate for climate change.

Overall, agroforestry could be better integrated into climate policies and recognized as one of the most important ways to meet adaptation and reforestation goals. Although climate change policies do include some agroecological solutions like agroforestry, the PNCC shows greater willingness to focus on industrialized agricultural production systems and attract large foreign investments. Sustainable solutions within the PNCC fall short of driving a truly climate-resilient and poverty-focused agricultural transformation when faced with more powerful interests within the agricultural sector.

XI. RESEARCH LIMITATIONS AND CONCLUSION

It is important to acknowledge that agroforestry alone cannot address the livelihood challenges of the poorest smallholder farmers in the Sahel and that social protection policies and resilience-building efforts must be prioritized for the most marginalized groups (Magrath 2019; Sanogo et al. 2017). Yet agroforestry can still make an important contribution to their livelihoods and ability to adapt to climate change (Djoudi and Brockhaus 2011; Bidou et al. 2019). Today, as Mali's population faces increasing pressure on degrading natural resources, food insecurity, poverty, and conflict, compounded by the effects of climate change, building resilience is ever more crucial. Although agroforestry has helped reverse deforestation and soil erosion in Mali, many communities continue to experience high rates of deforestation and increasing vulnerability. This report has described some of the main policy-related challenges and gaps that have impeded progress, and it has offered some relevant recommendations.

This research is not an exhaustive review of all policies related to agroforestry. Because of time and resource limitations, the most relevant policies were prioritized. An updated PFN with an accompanying strategy was developed in 2017, but the researcher could not locate them or their authorizing decree online. Lack of literature and reports from recent years also limited analysis of some updated forestry policy developments. Conflicts between agroforestry implementers and herders have been mentioned in the literature and interviews as a big difficulty for farmers, but this report does not fully explore that topic. Livestock constitutes a significant portion of rural activities and presents opportunities aligned with agroforestry, but the complexity of issues in the livestock sector and the related topic of conflict in Mali would demand additional research.

Finally, owing to lack of availability, nonresponse, canceled interview appointments, and the global health crisis during the research, attempts to interview government officials for this report were largely unsuccessful. Only one government official was interviewed via email. This research would have benefited greatly from additional perspectives from this stakeholder group—especially from the Ministry of Agriculture. This is another unfortunate limitation of this research.

REFERENCES

- AEDD (Agence de l'Environnement et du Développement Durable). 2010. *Cadre Stratégique d'Investissement en matière de Gestion Durable des Terres (CSI-GDT)*. Bamako, Mali.
- AGCC-Mali 2 (Alliance Globale contre le Changement Climatique au Mali phase 2). 2019. *Stratégie de Communication dans le Domaine du Changement Climatique et des Forêts*.
- Andrieu, N., B. Sogoba, R. Zougmore, F. Howland, O. Samake, O. Bonilla-Findji, M. Lizarazo, et al. 2017. "Prioritizing Investments for Climate-Smart Agriculture: Lessons Learned from Mali." *Agricultural Systems* 154: 13–24.
- Ashley, R. 2004. *The Policy Terrain in Protected Area Landscapes: How Laws and Institutions Affect Conservation, Livelihoods, and Agroforestry in the Landscapes Surrounding the Classified Forests of Fara and Dioforongo, Segou, Mali*. Agroforestry in Landscape Mosaics Working Paper Series. New Haven, CT: World Agroforestry Centre, Tropical Resources Institute of Yale University, and University of Georgia.
- Ashley, R., D. Russell, and B. Swallow. 2006. "The Policy Terrain in Protected Area Landscapes: Challenges for Agroforestry in Integrated Landscape Conservation." *Biodiversity and Conservation* 15 (2): 663–689.
- Bayala J., A. Kalinganire, Z. Tchoundjeu, F. Sinclair, D. Garrity. 2011. Conservation agriculture with trees in the West African Sahel – a review. ICRAF Occasional Paper No. 14. Nairobi: World Agroforestry Centre
- Beaman, L., D. Karlan, B. Thuysbaert, and C. Udry. 2013. "Profitability of Fertilizer: Experimental Evidence from Female Rice Farmers in Mali." *American Economic Review* 103 (3): 381–386.
- Bernard, F., M. Bourne, D. Garrity, C. Neely, and S. Chomba. 2019. *Policy Gaps and Opportunities for Scaling Agroforestry in Sub-Saharan Africa: Recommendations from a Policy Review and Recent Practice*. Nairobi: World Agroforestry (ICRAF).
- Bidou, J.-É., and P. Janin. 2013. "Population et Sécurité Alimentaire: le Mali Peut-il Se Suffire à Lui-même?" In P. Gonin, N. Kotlok, and M.-A. Pérouse de Montclos, eds., *La Tragédie Malienne*. Paris: Vendémiaire.
- Bidou, J.-É., A. Koukperé, and I. Droy. 2019. "La Crise du Parc Arboré à Karité: Exemple de Djougou au Bénin." In : Seghieri Josiane (coord.), Harmand J.M. (coord.) *Agroforesterie et services écosystémiques en zone tropicale : recherche de compromis entre services d'approvisionnement et autres services écosystémiques*. Versailles : Quae, 129-145.
- Boffa, J. M. 2000. "West African Agroforestry Parklands: Keys to Conservation and Sustainable Management." *Unasylva* 51 (200). <http://www.fao.org/3/x3989e04.htm>.
- Brescia, S. 2017. *Fertile Ground: Scaling Agroecology from the Ground Up*. Oakland, CA: Food First Books.
- Budlender, D., and E. Alma. 2011. *Women and Land: Securing Rights for Better Lives*. Ottawa, Canada: International Development Research Centre.

- Buttoud, G. 2013. *Advancing Agroforestry on the Policy Agenda: A Guide for Decision-Makers*. Agroforestry Working Paper 1. Rome: Food and Agriculture Organization of the United Nations.
- Climate Watch. 2018. Nationally Determined Contributions. <https://www.climatewatchdata.org>.
- Cooper, M. W., and C. T. West. 2017. "Unraveling the Sikasso Paradox: Agricultural Change and Malnutrition in Sikasso, Mali." *Ecology of Food and Nutrition* 56 (2): 101–123.
- Cotillon, S. E., and G. G. Tappan. 2016. *Landscapes of West Africa: A Window on a Changing World*. Garretson, SD: United States Geological Survey. <http://pubs.er.usgs.gov/publication/70176549>.
- Coulibaly, M. 2017. *Accaparement des Terres et Sécurité Alimentaire au Mali*. Montreal, Canada: Centre Interdisciplinaire de Recherche en Développement International et Société, Université du Québec à Montréal.
- Danjuma, M. N., and S. Mohammed. 2015. "Zai Pits System: A Catalyst for Restoration in the Drylands." *Journal of Agriculture and Veterinary Science* 8 (2): 2319–2372.
- Dixon, S., and J. Holt. 2010. *Livelihood Zoning and Profiling Report: Mali*. Washington, DC: Famine Early Warning Systems Network (FEWS-NET).
- Djiré, M. 2007. *Land Registration in Mali: No Land Ownership for Farmers? Observations from Peri-urban Bamako*. IIED Issue Paper no. 144. London: International Institute for Environment and Development.
- Djiré, M., A. Keita, and A. Diawara. 2013. *Agricultural Investments and Land Acquisitions in Mali: Context, Trends and Case Studies*. London: International Institute for Environment and Development.
- Djoudi, H., and M. Brockhaus. 2011. "Is Adaptation to Climate Change Gender Neutral? Lessons from Communities Dependent on Livestock and Forests in Northern Mali." *International Forestry Review* 13 (2): 123–135.
- Doraiswamy, P. C., G. W. McCarty, E. R. Hunt Jr., R. S. Yost, M. Doumbia, and A. J. Franzluebbers. 2007. "Modeling Soil Carbon Sequestration in Agricultural Lands of Mali." *Agricultural Systems* 94 (1): 63–74.
- FAO (Food and Agriculture Organization of the United Nations). 2011. "Assisted Natural Regeneration of Forests." <http://www.fao.org/forestry/anr/en/>.
- FAO. 2017. *Mali Country Fact Sheet on Food and Agriculture Policy Trends*. Rome.
- FAO. 2020. "Agroecology Knowledge Hub: Overview." <http://www.fao.org/agroecology/overview/en/>.
- Favretto, N., L. C. Stringer, and A. J. Dougill. 2014. "Unpacking Livelihood Challenges and Opportunities in Energy Crop Cultivation: Perspectives on Jatropha Curcas Projects in Mali." *Geographical Journal* 180 (4): 365–376.
- Funk, C. C., J. Rowland, A. Adoum, G. Eilerts, and L. White. 2012. *A Climate Trend Analysis of Mali*. Famine Early Warning Systems Network Informing Climate Change Adaptation Series. Reston, VA: US Geological Survey; Washington, DC: US Agency for International Development. <http://pubs.er.usgs.gov/publication/fs20123105>.

- Gaasholt, O. M. 2004. "State Decentralization and Local Politics in Mali." *Cadernos de Estudos Africanos* (5/6): 75–88.
- Garriy, D. P., F. K. Akinnifesi, O. C. Ajayi, S. G. Weldesemayat, J. G. Mowo, A. Kalinganire, M. Larwanou, and J. Bayala. 2010. "Evergreen Agriculture: A Robust Approach to Sustainable Food Security in Africa." *Food Security* 2: 197–214.
- Gouzou, J., B. W. Sanou, and N. Dembélé. 2017. *Évaluation à Mi-Parcours du Programme de Gestion Décentralisée des Forêts (GEDEFOR II)*. Stockholm: Swedish International Development Cooperation Agency. <http://www.sida.se/English/publications/>.
- Idelman, E. 2009. *Décentralisation et Limites Foncières au Mali*. London: International Institute for Environment and Development.
- Jones-Casey, K., A. Knox, and Z. Chenitz. 2011. *Women, Inheritance, and Islam in Mali*. Focus on Land in Africa. <https://gatesopenresearch.org/documents/3-1372>.
- Kaya, B., P. E Hildebrand, and P. K. R Nair. 2000. "Modeling Changes in Farming Systems with the Adoption of Improved Fallows in Southern Mali." *Agricultural Systems* 66 (1): 51–68.
- Kimengsi, J. N., & Balgah, R. A. 2017. Repositioning local institutions in natural resource management: Perspectives from sub-saharan africa: Schmollers jahrbuch. *Journal of Contextual Economics*, 137(1-2), 149-172. doi:<http://dx.doi.org/10.3790/schm.137.1-2.149>
- Kone, Y., B. Teme, J. Tefft, and J. Dorsey. 2020. "Are Fertilizer Subsidies Costs Offset by Increasing Food Production? The Case of Mali." *Journal of Food Science and Nutrition* 6 (1): 058.
- Kurothe, R. S., A. K. Vishwakarma, D. R. Sena, G. Kumar, B. K. Raoand, and V. C. Pande. 2014. "Decision Support System for Contour Trenching." *Indian Journal of Soil Conservation* 42 (2): 143–153.
- Laris, P. 2012. "The Sahel's Silent Maize Revolution: Analyzing Maize Productivity in Mali at the Farm-Level." NBER Working Paper 17801. Cambridge, MA: National Bureau of Economic Research. <https://core.ac.uk/reader/6798711>.
- Laris, P., and J. D. Foltz. 2014. "Cotton as Catalyst? The Role of Shifting Fertilizer in Mali's Silent Maize Revolution." *Human Ecology* 42 (6): 857–872.
- Leonhardt, M. 2019. *Regional Policies and Response to Manage Pastoral Movements within the ECOWAS Region*. Abuja, Nigeria: International Organization for Migration. <https://publications.iom.int/books/regional-policies-and-response-manage-pastoral-movements-within-ecowas-region>.
- Liu, C. L. C., O. Kuchma, and K. V. Krutovsky. 2018. "Mixed-Species versus Monocultures in Plantation Forestry: Development, Benefits, Ecosystem Services and Perspectives for the Future." *Global Ecology and Conservation* 15: e00419.
- Lovett, P., and L. Phillips. 2018. *Agroforestry Shea Parklands of Sub-Saharan Africa: Threats and Solutions*. Washington, DC: Program on Forests (PROFOR), World Bank.
- Ly, I., A. Kalinganire, and A. Niang. 2006. "Essai d'analyse de la Prise en Compte des Systemes Agroforestiers par les Législations Forestieres au Sahel: Cas du Burkina Faso, du Mali, du Niger et du Sénégal." ICRAF Working Paper 29. Nairobi: World Agroforestry (ICRAF).

- MAFAP (Monitoring and Analysing Food and Agricultural Policies). 2013. *Revue des Politiques Agricoles et Alimentaires au Mali*. Rome: Food and Agriculture Organization of the United Nations.
- Magrath, J. 2019. "Regreening the Sahel." Oxford. Oxfam (internal publication).
- Maranz, S. 2009. "Tree Mortality in the African Sahel Indicates an Anthropogenic Ecosystem Displaced by Climate Change." *Journal of Biogeography* 36 (6): 1181–1193.
- Mbow, C., P. Smith, D. Skole, L. Duguma, and M. Bustamante. 2014. "Achieving Mitigation and Adaptation to Climate Change through Sustainable Agroforestry Practices in Africa." *Current Opinion in Environmental Sustainability* 6: 8–14.
- Meijer, S. S., D. Catacutan, O. C. Ajayi, G. W. Sileshi, and M. Nieuwenhuis. 2015. "The Role of Knowledge, Attitudes and Perceptions in the Uptake of Agricultural and Agroforestry Innovations among Smallholder Farmers in Sub-Saharan Africa." *International Journal of Agricultural Sustainability* 13 (1): 40–54.
- Meinzen-Dick, R. 2006. "Women, Land and Trees." In D. Garrity, A. Okono, M. Grayson, and S. Parrott, eds., *World Agroforestry into the Future*. Nairobi: World Agroforestry Centre.
- Meinzen-Dick, R., and E. Mwangi. 2009. "Cutting the Web of Interests: Pitfalls of Formalizing Property Rights." *Land Use Policy* 26 (1): 36–43.
- Mentz-Larange, S., and P. Gubbels. 2018. *Integrating nutrition into agroecology for strengthened resilience of rural communities in the Sahel*. Ouagadougou, Burkina Faso: Groundswell International.
- Ministry of Foreign Affairs of the Netherlands. 2018. *Climate Change Profile: Mali*. The Hague.
- Msuya, T. S., and J. R. Kideghesho. 2012. "Mainstreaming Agroforestry Policy in Tanzania Legal Framework." In M. Kaonga, ed., *Agroforestry for Biodiversity and Ecosystem Services*. Rijeka, Croatia: IntechOpen. <https://doi.org/10.5772/35859>.
- Naughton, C., T. Deubel, and J. Mihelcic. 2017. "Household Food Security, Economic Empowerment, and the Social Capital of Women's Shea Butter Production in Mali." *Food Security* 9 (4): 773–784.
- NDC Partnership. 2017. *Partnership in Action: One Year On*. Washington, DC: World Resources Institute.
- NDC Partnership. 2019. *Partnership in Action: Three Years On*. Washington, DC: World Resources Institute.
- Neimark, B., C. Toulmin, and S. Batterbury. 2018. "Peri-Urban Land Grabbing? Dilemmas of Formalizing Tenure and Land Acquisitions around the Cities of Bamako and Ségou, Mali." *Journal of Land Use Science* 13 (3): 319–324.
- Ollenburger, M., T. Crane, K. Descheemaeker, and K. E. Giller. 2019. "Are Farmers Searching for an African Green Revolution? Exploring the Solution Space for Agricultural Intensification in Southern Mali." *Experimental Agriculture* 55 (2): 288–310.
- Padgham, J. et al. 2015. *Vulnerability and Adaptation to Climate Change in the Semi-Arid Regions of West Africa*. ASSAR (Adaptation at Scale in Semi-Arid Regions) Working Paper. Ottawa, Canada: Collaborative Adaptation Research Initiative in Africa and Asia (CARIAS), International Development Research Centre.

- Pernechele, V., J. Balié, and L. Ghins. 2018. *Agricultural Policy Incentives in Sub-Saharan Africa in the Last Decade (2005–2016)*. Rome: Food and Agriculture Organization of the United Nations.
- Place, F., and P. Dewees. 1999. "Policies and Incentives for the Adoption of Improved Fallows." *Agroforestry Systems* 47: 323–343.
- Place, F., and Y.-C. Prudencio. 2006. "Policies for Improved Land Management in Smallholder Agriculture: The Role for Research in Agroforestry and Natural Resource Management." In D. Garrity, A. Okono, M. Grayson, and S. Parrott, eds., *World Agroforestry into the Future*. Nairobi: World Agroforestry Centre.
<http://www.worldagroforestry.org/downloads/Publications/PDFS/bc06145.pdf>.
- Place, F., O. C. Ajayi, E. Torquebiau, G. Detlefsen, M. Gauthier, and G. Buttoud. 2012. "Improved Policies for Facilitating the Adoption of Agroforestry." In M. Kaonga, ed., *Agroforestry for Biodiversity and Ecosystem Services: Science and Practice*. Rijeka, Croatia: IntechOpen.
<https://www.intechopen.com/books/agroforestry-for-biodiversity-and-ecosystem-services-science-and-practice/improved-policies-for-facilitating-the-adoption-of-agroforestry>.
- Place, F., D. Garrity, S. Mohan, and P. Agostini. 2016. *Tree-Based Production Systems for Africa's Drylands*. Washington, DC: World Bank.
- Pollard, E. A. 2014. "The Politics and Policy of Decentralization in 1990s Mali." Master's thesis, Indiana University, Bloomington, IN.
- Reij, C., and R. Winterbottom. 2015. *Scaling Up Regreening: Six Steps to Success*. Washington, DC: World Resources Institute.
- Reij, C., G. Tappan, and M. Smale. 2010. *Agroenvironmental Transformation in the Sahel: Another Kind of "Green Revolution."* IFPRI Discussion Paper 00914. Washington, DC: International Food Policy Research Institute.
- Republic of Mali. 1995a. *Politique Nationale Forestière*. Annexes. Bamako.
- Republic of Mali. 1995b. Loi n° 95-004 Fixant les Conditions de Gestion des Ressources Forestières. FAOLEX Database. <http://www.fao.org/faolex/results/details/en/c/LEX-FAOC002794>.
- Republic of Mali. 2006. *Loi d'Orientation Agricole (LOA)*. Bamako.
- Republic of Mali. 2007a. *Programme d'Action National d'Adaptation aux Changements Climatiques (PANA)*. Bamako.
- Republic of Mali. 2007b. *Politique Forestière Nationale*. Avant Projet. Bamako.
- Republic of Mali. 2010a. Loi n°10-028 du 12 juillet 2010 Déterminant les Principes Fondamentaux Relatifs à la Gestion des Ressources du Domaine Forestier National. FAOLEX Database. <http://faolex.fao.org/docs/pdf/Mli180434.pdf>.
- Republic of Mali. 2010b. Décret n° 10-387/P-RM 26 juillet 2010 Fixant la Liste des Essences Forestières Protégées et des Essences Forestières de Valeur Économique. FAOLEX Database. <http://www.fao.org/faolex/results/details/en/c/LEX-FAOC151801>.
- Republic of Mali. 2011. *Politique Nationale sur les Changements Climatiques (PNCC)*. Bamako.

- Republic of Mali. 2013. *Politique de Développement Agricole du Mali (PDA)*. Document Provisoire Bamako. <http://extwprlegs1.fao.org/docs/pdf/mli145852.pdf>
- Republic of Mali. 2014. *Plan National d'Investissement dans le Secteur Agricole (PNISA)*. Bamako.
- Republic of Mali. 2016. *Contribution Déterminée au Niveau National (NDC)*. Bamako.
- Republic of Mali. 2017. Loi n°2017-001/ du 11 avril 2017 Portant sur le Foncier Agricole (LFA). Bamako.
- Republic of Mali. 2018. *Décret n°2018-0662/P-RM du 08 août 2018 Portant Réglementation de l'Exploitation des Produits Forestiers dans le Domaine Forestier National*. FAOLEX Database. <http://www.fao.org/faolex/results/details/en/c/LEX-FAOC180435>.
- Rinaudo, T., A. Muller, and M. Morris. 2019. *Farmer Managed Natural Regeneration (FMNR) Manual*. Melbourne: World Vision Australia.
- Rosenstock, T., A. Wilkes, J. Courtney, N. Namoi, M. Bulusu, and D. Mboi. 2018. *Making Trees Count in Africa: Improved MRV Is Needed to Meet Africa's Agroforestry Ambitions*. CCAFS Info Note. Wageningen, Netherlands: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). <https://cgspace.cgiar.org/handle/10568/98831>.
- Sanogo, K., J. Binam, J. Bayala, G. B. Villamor, A. Kalinganire, and S. Dodiomon. 2017. "Farmers' Perceptions of Climate Change Impacts on Ecosystem Services Delivery of Parklands in Southern Mali." *Agroforestry Systems* 91 (2): 345–361.
- Sogoba, B., A. Ba, R. Zougmore, and O. B. Samaké. 2014. *How to Establish Dialogue between Researchers and Policymakers for Climate Change Adaptation in Mali: Analysis of Challenges, Constraints and Opportunities*. Working Paper No. 84. Copenhagen: CGIAR Research Program on Climate Change, Agriculture and Food Security. <https://cgspace.cgiar.org/handle/10568/56669>.
- Styger, E., and G. Traoré. 2018. *50,000 Farmers in 13 Countries: Results from Scaling Up the System of Rice Intensification in West Africa*. Dakar, Senegal: West and Central Africa Council for Agricultural Research and Development (CORAF/WECARD).
- Thomas, I., and S. Samassekou. 2003. *Role of Planted Forests and Trees outside Forests in Sustainable Forest Management in the Republic of Mali*. Planted Forests and Trees Working Papers, Working Paper 28. Rome: Food and Agriculture Organization of the United Nations.
- Tougiani, A. 2011. *Forest Law Enforcement, Governance and Trade in the Sahel*. African Forest Forum Working Paper Series 1 (6). Nairobi: African Forest Forum.
- Traoré, B., M. T. Van Wijk, K. Descheemaeker, M. Corbeels, M. C. Rufino, and K. E. Giller. 2015. "Climate Variability and Change in Southern Mali: Learning from Farmer Perceptions and On-Farm Trials." *Experimental Agriculture* 51 (4): 615–634.
- Traoré, A., A. Samaké, O. Sanogo, S. Haggblade and Y. Koné. 2019. *Improving Agricultural Policy System Performance in Mali: Stakeholder Diagnostics and Prescriptions*. Research Paper 140. East Lansing, MI: Innovation Lab for Food Security Policy, Michigan State University.
- Toure, M. D., and Kanoute, A. 2006. *La Prise en Compte des Systemes Agroforestiers Par la Legislation au Mali : Contexte et Objectifs de la Revision du Code Forestier en 1995*. Bamako, Mali: Sahel Eco.

- Umtoni, C., A. Ayantunde, M. Turner, and G. J. Sawadogo. 2016. "Community Participation in Decentralized Management of Natural Resources in the Southern Region of Mali." *Environment and Natural Resources Research* 6 (2): 1–15.
- UNFCCC. 2016. Contribution Determinée au Niveau National de Mali. New York. https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Mali%20First/Mali_revised%20NDC.pdf
- USAID (US Agency for International Development). 2010. *Mali Land Tenure Assessment Report*. Washington, DC.
- USAID. 2018a. *Climate Risks in Food for Peace Geographies: Mali*. Washington, DC.
- USAID. 2018b. *Mali: In-depth Assessment of Extension and Advisory Services*. Developing Local Extension Capacity Project (DLECP). Washington, DC.
- USAID. 2018c. *On the Functioning of Agricultural Markets in Mali*. https://cdn.ymaws.com/www.andeglobal.org/resource/resmgr/research_library/2018-11_MIFP_Study_on_Agricu.pdf
- USAID. 2019. "Mali: Agriculture and Food Security." <https://www.usaid.gov/mali/agriculture-and-food-security>.
- Waldron, A., D. Garrity, Y. Malhi, C. Girardin, D. C. Miller, and N. Seddon. 2017. "Agroforestry Can Enhance Food Security While Meeting Other Sustainable Development Goals." *Tropical Conservation Science* 10: 1–6.
- Ward, C. 2016. *Improved Agricultural Water Management for Africa's Drylands*. Washington, DC: World Bank. <https://doi.org/10.1596/978-1-4648-0832-6>.
- Weston, P., R. Hong, C. Kaboré, and C. A. Kull. 2015. "Farmer-Managed Natural Regeneration Enhances Rural Livelihoods in Dryland West Africa." *Environmental Management* 55 (6): 1402–1417.
- "What Is Agroforestry?" *World Agroforestry | Transforming Lives and Landscapes with Trees*. <http://www.worldagroforestry.org/about/agroforestry> (September 13, 2020).
- World Bank. 2012. *Mali - Options for Preparing a Sustainable Land Management (SLM) Program in Mali Consistent with TerrAfrica for World Bank Engagement at the Country Level (English)*. <http://documents.worldbank.org/Curated/En/101971468282246575/Mali-Options-for-Preparing-a-Sustainable-Land-Management-SLM-Program-in-Mali-Consistent-with-TerrAfrica-for-World-Bank-Engagement-at-the-Country-Level-Working-Paper.69972>. Washington, D.C.
- World Bank. 2020a. "Mali – Fostering Agricultural Productivity Project (English)." <http://documents.worldbank.org/curated/en/639951583423102824/Mali-Fostering-Agricultural-Productivity-Project>
- World Bank. 2020b. "The World Bank in Mali: Overview." <https://www.worldbank.org/en/country/mali/overview>.
- World Bank. 2020c. "Population Growth (Annual %) - Mali." Databank. Accessed June 5, 2020. <https://data.worldbank.org/indicator/SP.POP.GROW?locations=ML&display=graph>.

- Verchot, L. V., M. Van Noordwijk, S. Kandji, T. Tomich, C. Ong, A. Albrecht, J. Mackensen, et al. 2007. "Climate Change: Linking Adaptation and Mitigation through Agroforestry." *Mitigation and Adaptation Strategies for Global Change* 12 (5): 901–918.
- Yatich, T., A. Kalinganire, J. C. Weber, K. Alinon, J. M. Dakouo, O. Samaké, and S. Sangaré. 2014. *How Do Forestry Codes Affect Access, Use and Management of Protected Indigenous Tree Species: Evidence from West African Sahel*. Occasional Paper no. 15. Nairobi: World Agroforestry Centre.
- Zamudio, A. N. 2016. *Review of Current and Planned Adaptation Action in Mali*. CARIAA Working Paper no. 11. Ottawa, Canada: International Development Research Centre, Collaborative Adaptation Research Initiative in Africa and Asia (CARIAA).
- Zomer, R., A. Trabucco, R. Coe, and F. Place. 2009. *Trees on Farm: Analysis of Global Extent and Geographical Patterns of Agroforestry*. ICRAF Working Paper. Nairobi: World Agroforestry Centre (ICRAF).
- Zomer, R. J., H. Neufeldt, J. Xu, A. Ahrends, D. Bossio, A. Trabucco, M. van Noordwijk, and M. Wang. 2016. "Global Tree Cover and Biomass Carbon on Agricultural Land: The Contribution of Agroforestry to Global and National Carbon Budgets." *Scientific Reports* 6 (1): 29987.
- Zougmore, R. B., S. T. Partey, E. Totin, M. Ouédraogo, P. Thornton, N. Karbo, B. Sogoba, et al. 2019. "Science-Policy Interfaces for Sustainable Climate-Smart Agriculture Uptake: Lessons Learnt from National Science-Policy Dialogue Platforms in West Africa." *International Journal of Agricultural Sustainability* 17 (5): 367–382.

GLOSSARY

Agroecological farming: Farming based on applying ecological concepts and principles to optimize interactions between plants, animals, humans, and the environment while taking into consideration social aspects. Its goal is to maximize ecological processes for production systems that support biodiversity, ecosystem services, food security, resilience, and climate change adaptation for a sustainable and fair food system.

Agroforestry: Land use management methods and technologies that integrate trees and shrubs into farming and pastoral systems and that complement and enhance the sustainability, productivity, and resilience of those systems.

Carbon sequestration: Long-term storage of carbon dioxide out of the Earth's atmosphere. It is a natural process that stabilizes carbon in a form where it will not contribute to warming the atmosphere, such as in trees or soil.

Cercle: An administrative division within a region. Mali's regions are divided into 42 *cercles*.

Classified Forest: Natural areas with trees that are officially designated as forest (as opposed other designations such as agroforestry parkland, fallow land, national park, or forest preserve). The different designations distinguish what management activities are carried out under law within the different classifications.

Collectivité territoriale: Local government defined under decentralization. Comprised of different levels defined as regions, circles, and communes.

Commission foncière (COFO): Land commission charged with mediating rural land conflicts. COFOs exist at the communal, *cercle*, and village levels.

Decree (*décret* in French): a regulatory text that provides additional detail and implementation guidance to laws.

Evergreen agriculture: The integration of trees with food crops and livestock to create more sustainable and productive agricultural systems for small-scale farmers. The trees provide fuel, fertilizer, food, timber, and fodder. The policy analysis in this report applies to both agroforestry and evergreen agriculture, but the report uses the term “agroforestry.”

Improved fallows: Fallows planted to leguminous, fast-growing tree species for shorter periods—three to four years—than traditional fallows (Kaya et al. 2000).

Short-duration fallows are now being tried as an alternative to traditional fallows in lands under pressure.

Mineral fertilizer: Inorganic salts, obtained by extraction or physical and chemical processes, used as plant nutrients. They are sometimes referred to as “chemical fertilizer.”

Nationally determined contribution: Each country’s official commitment to take actions toward meeting the Paris Agreement on climate change, to which Mali is a signatory.

Office du Niger: An extensive irrigation system begun in the 1930s in Segou, Mali, around the Niger River basin.

Reducing emissions from deforestation and forest degradation (REDD+): An international initiative to reduce deforestation and forest degradation, a major driver of climate change, using forest carbon stocks.

Resilience: In the livelihood context, the ability of communities to cope with external stresses and disturbances as a result of social, political, and environmental change.

Sylvopastoral agroforestry: A type of agroforestry in which trees are planted with wide spacing in grazed pastures.

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