

Introduction

IN THE first half of the twentieth century, young women and girls in Mali sang about the quality of their food, specifically their sauce: “Oh! it’s so good, oh! it’s so good / The fish sauce / Served nicely over fonio! . . . The mix of okra and rice is a tasty meal.”¹ As they sang in call and response, each girl danced and proclaimed her own sauce-making prowess. As the line “Oh! it’s so good” hints, sexuality and sensuality mingled with the sauce. The song animated the nighttime, but it also playfully communicated a significant message about the value of women’s labor and the centrality of food to rural life. Women and girls made delicious food, and it was a feat to be lauded. Indeed, food production and preparation were not easy tasks. It was taxing manual labor involving wood collection, growing and gathering ingredients for the sauce, and pounding grains before the fire was even lit under the cooking pot.

The song also suggests that women’s food production and preparation was the subject of popular interest and discourse. A folktale from the opening of the century further addresses how women accomplished the difficult task of preparing an appetizing meal. It is a story about a pot and speaks to the ways that women created and managed a technological infrastructure for food production. In the tale, a woman asks her female neighbor to borrow a cooking pot. The neighbor obliges the request, and after a few days the first woman returns the original pot along with a second smaller one. In giving her neighbor the two pots, the first woman

calls the smaller one the “daughter” of the big pot. Not long after this episode the same woman returns again to borrow the big cooking pot, but this time fails to return it. When the neighbor inquires after her pot, she is told the pot is dead. The audience for the story is prompted, along with the neighbor, to ask, “How is it that pots die?” The first woman replies: “They have daughters.”² The big pot’s transformation into a mother serves as a comic (albeit dark) explanation for the first woman’s failure to return the pot.

What does this tale have to do with women’s expertise and cooking in twentieth-century Mali? First, for all women a cooking pot was an ordinary yet essential object. The story signifies the importance of a *women’s* technological infrastructure but also its potentially shifting nature. Both women characters in the tale negotiate their access to a changing number of cooking pots just as women throughout the twentieth century have innovated and managed transformations in the range of tools and technologies available to them for food production and preparation. If women wanted to make good food, they needed pots and a host of other women’s technologies.

Importantly, this story about pots connects women and their means of cooking with physical labor, specifically the experience of childbirth. Food preparation is a similarly distinct woman’s task associated with sexuality, social reproduction, environmental fertility, and women’s embodied labors. Moreover, the “daughter pot” in the story alludes not only to women’s difficult and potentially dangerous labor (both in childbirth and in food preparation) but also to the complex relations between women who often must work together. Indeed, at first glance, the story seems to be one of failed female cooperation. Yet the humor of the story suggests a more positive interpretation: that is, if women heed its lesson. Collective female labor, especially during food shortages, was a critical element of women’s work. It was also essential to the assurance of food security. Finally, calling one of the pots a “daughter” suggests the transmission of feminine knowledge and social continuity, specifically for the generations of women over the course of the century who prepared the quotidian meal.

Food was the talk of rural life, and it was at the center of gender politics throughout the century. In moments of leisure, young women bragged to one another about their sexual allure and food preparation skills. For them, cooking was a point of individual pride. Other songs and stories from the first decades of the century feature heroic women saving towns from famine, hospitable wives who are generous with meals, and

magical cooking pots. But they also highlight young girls who refuse to cook and female lovers who deceive young men with gifts of food.³ Women's food labors, so central to daily life, were sometimes a source of social contention. Fittingly, the supernatural aspects of many of these tales anticipated the ways women's cooking and use of their pots could appear fantastical later in the century. In those years, women faced severe ecological crises and the oftentimes counterproductive intrusions of colonial and postcolonial states in agriculture and the food supply. It would not have been amiss to ask: How could they possibly make a meal? Women's mundane yet *extraordinary* daily food production and preparation labors over the course of the twentieth century are the subject of this book.

The women who did this work were creative technological actors. As I argue here, women in rural Mali engineered a complex and highly adaptive food production system that depended on female labor power and made use of modest technologies. Theirs is a history that showcases rural domestic space as an arena of technological innovation. Women and what they did with their pots mattered a great deal. Certainly, Malian women incorporated labor-saving techniques and technologies into their work routines, but they were equally concerned with the production and collection of nutritious ingredients, the availability of resources such as wood fuel, and the pleasure of eating. Their technological work was a complex interplay of skill, knowledge, social meaning, leisure, and survival. Importantly, women's embodied techniques were central to their ability to ensure food production. Beyond subsistence, women's embodied expertise made the preparation of tasty and culturally meaningful meals possible, helped manage their labor time, and significantly displayed the value of their labor—like the young women who sang about their fish sauce. Together, this women's work is embodied engineering.

Cooking in Mali was very much a “technique of the body,” to quote Marcel Mauss.⁴ Women bent their backs to tend gardens and gather wild foods. They also walked into the bush to collect and carry wood;⁵ they wielded the pestle and stirred the pot. Importantly, embodied labor, skill, and knowledge were idealized in rural Malian society. At the same time, these labors were compounded by recurring ecological crises such as drought or deforestation. For example, the regular preparation of food might have seemed like a remarkable feat in early twentieth-century rural communities with memories of a severe famine prompted by a

drought from 1913 to 1914. Dogon children born during those years were sometimes named *Ogulum* or “I survived the drought.”⁶ Undoubtedly, women’s food production tasks during periods of shortage were physically taxing but all the more materially and symbolically significant. As Naminata Diabate has shown in her work on women’s agency and the female body, when women collectively signal distress—as Malian women displayed in the last quarter of the century by hiding rice under their clothes to prevent state seizure during a major drought—their embodied actions, while betraying great vulnerability, are paradoxically powerful.⁷ It is in such “exceptional and biopolitical conditions” that “their bodies seem to be all that they have left.”⁸ Diabate’s examination of biopolitics in Africa is instructive here in its insistence on agency and the power of the female body, even in moments of significant political or environmental crisis.

Malian women’s relationships with the natural world have not been ideal. They have faced unpredictable flooding, drought, and locust swarms, all of which threatened harvests and potentially produced fatigue and hunger. Yet, women also have been agents in shaping their natural environment and their relationships with that world. They sought nourishing, flavorful foods in the wilds, collected edible plants from rivers, and planted food-bearing trees to make sure there would be something to eat. In times of abundant grain harvests, women celebrated the collective physical labor that produced the surplus and prepared millet beer to heighten the pleasure of eating. Feast or famine, women’s material experiences and those of their communities have been intimately connected to changes in the environment.⁹ Moreover, eating was always a sensory experience.¹⁰

The creation of this embodied rural world was a technological affair. Specifically, women’s embodied interactions—or, to borrow Donna Haraway’s formulation, “conversations”—with their natural world incorporated the technological.¹¹ Just as daily food labor was a task of the body, the use of technological objects such as a grinding stone, a garden hoe, a fishing basket, or a cooking pot was a sensorial and embodied experience. Women’s quotidian actions and gestures were purposeful and drew together their environmental and technological expertise. Writing about the ancient world, Marcia-Anne Dobres articulates a broader claim about women as technological agents: “Ancient technicians were sensual and experiential beings who made sense of the world—and made sense of themselves—as they made and used material culture during the mundane

routines of everyday practice. This body was mindful, sensual and a gendered *conduit* through which technicians materialised, negotiated and transformed their world—and through such means *made* things meaningful.”¹² Similarly, women in Mali made filling and flavorful food by drawing upon their material and embodied expertise with the natural and technological world. In their labors they also produced the social meanings of women’s work, but in so doing, their actions reinforced gendered social expectations for women.

Women were expected to cook.¹³ Yet, through this quotidian production of food, the vast majority of women in Mali took a formative role in shaping the region’s twentieth-century history from colonial-era French West Africa to its postcolonial transformations in 1960 and the succeeding decades. Malian women lived in a region that was predominantly rural. As a result, government administrations in need of finance sought to direct the agricultural economy, and early French administrations aimed to turn the region into a colonial breadbasket. An ecological crisis prompting the 1913–14 famine complicated these ambitions. Yet in the midst of hunger, and facing the threat of famine, women’s labors produced significant food security. Succeeding government interventions and agricultural development programs were often heavy handed, and over several decades of forced labor regimes, industrial development, decolonization, rural socialism, military dictatorship, and severe drought, the region saw dramatic (and in some cases rapid) transformation. The gendered dimensions of such wide, sweeping change were significant. Specifically, food supply was politicized in these years, making women’s daily food labors extremely important.

The state presence in daily life is important to this history, but it did not determine women’s daily activities. The gendered division of labor, women’s food production and preparation technologies, the environment, rural animation, and local taste preferences were all essential to both the provision of and the meanings associated with food. At different points in time over the century, one or more of these factors became more pronounced than the others in ensuring rural well-being. Yet, each was an important element of the overall foodscape or enviro-technological habitus: by which I mean the context in which women gained access to food resources and prepared daily meals. Certainly, the power of the state was heightened at distinct moments in women’s lives; nevertheless, the gradual social, environmental, and technological changes that affected women the most unfolded across the major political breaks and eras.

Women experienced political and economic shifts most immediately through changes in the environment and access to food resources but more specifically through changes in women's technologies. For example, in the late 1940s, women in rural Mali began cooking in metal pots rather than clay ones. It was a seemingly modest transformation in the daily labor of food preparation but one with wide-reaching import. Following several decades of intensified colonial demands for wood, deforestation was a real concern. This was particularly problematic for women because wood fuel for cooking was harder to come by. The adoption of a metal pot—which cooked faster and used less wood fuel—addressed this ecological concern and saved women much time devoted to wood collection. Indeed, this midcentury moment speaks to the ways that rural women in Mali ensured food security, now a ubiquitous term in development circles. Women's ability to reengineer their own labor was essential to making sure the daily meal was in the bowl.

The history presented here rejects a persistent image of women in Africa as subjects without access to or knowledge of technology. As I demonstrate, women in Mali were, in fact, rural food engineers. By contrast, prior narratives about women and development have centered the "status of African women," a generic catchall concept, which emerged as a policy concern first among colonial observers and administrators and later among development experts, scholars, and postcolonial government officials. These narratives broadly presented "third-world" women as a development "problem."¹⁴ With particular regard to women and technology in Africa, one well-known development scholar from the 1970s, Ester Bose-rup, observed that women's increasing labor burdens were an obstacle to improving their status and argued that the solution was the introduction of new technologies.¹⁵ It was not a perspective that framed women as active agents. Rather, when women entered the discussion of technology, the way to address women's concerns was understood simply to be a matter of transfer.¹⁶ Unfortunately, the representation of African women as not having access to technology was coupled with an image of African women as overburdened by labor: these images have continued to frame outside perceptions of their history.

Women's need for wood fuel is an illustrative example. During the 1970s, the wider Sahel region experienced widespread drought, and pictures of rural Sahelian women suffering from the crisis exacerbated stereotypes about overburdened women on the continent. In particular, popular depictions of a lone woman walking a long distance to collect and carry a

heavy load of wood fuel for cooking dramatized deforestation and marked women as sympathetic victims for international aid. Previous scholars of gender and development have already critiqued this widely circulated type of image, pointing to several problematic assumptions: that women are closer to nature because of their gendered labor, ideal environmental managers due to their assumed sacrifice, and also victims whose plight dramatizes environmental decline.¹⁷ It is worth noting that these images also suggest Africa was a region lacking in modern infrastructure and domestic technologies that would otherwise alleviate women's labor. As Jane Guyer has already argued, such widespread representations imply that African women's work has remained static over the twentieth century.¹⁸ These are stubborn stereotypes. Less widely circulated images from this period feature metal house goods, harkening back to the major midcentury technological shift previously mentioned and raising questions about women's technological work during the Great Sahel Drought (see figure I.1). Despite such evidence, colonial and postcolonial observers, administrators, and experts have refused to see African women as environmental and technological agents in their own right.



FIGURE I.1. A woman carrying a metal basin during the Great Sahel Drought, 1973. Courtesy of the Library of Congress. Prints and Photographs Division, lot no. 11515 (17). Photo collection credited to the Food and Agricultural Organization and the World Food Program.

EMBODIED ENGINEERING AT THE OFFICE DU NIGER SCHEME

By specifically looking at the women who were a part of the major agricultural program called the Office du Niger (hereafter referred to as “Office”), the history of rural Malian women as embodied engineers comes into focus. The Office was arguably the most important development intervention by the French in West Africa and later occupied a significant role in the economy and politics of independent Mali. The scheme was established under colonial rule in the 1930s—in what was then the French Soudan—to produce primarily cotton and secondarily rice for export. This twin vision of industrial cotton cultivation and regional food production fueled grand economic promises, and as Chéiban Coulibaly has observed, inspired a specific development mythology in Mali.¹⁹

Irrigation and so-called modern agricultural technologies were central to the design of the Office. It drew upon the Niger River to feed a canal network that radically altered the surrounding agricultural landscape, and its founding disrupted rural communities across much of the colony and neighboring French Upper Volta (contemporary Burkina Faso). The construction of a large dam on the Niger River was accompanied by the digging of canals and heavy machinery. It was a costly project. The French colonial government invested impressive sums into building the Office during a global depression. Indeed, it had more financial resources to build an irrigation system, roads, and towns than most officials in the empire had for colony-wide public works. Yet, French colonial critics argued that its founder, Emile Bélimé, and other planners paid too much attention to the technical infrastructure to the detriment of people’s material conditions. Indeed, for decades the Office failed to produce a profit for either its farmers or the colonial government.²⁰

Nevertheless, administration officials believed modernization at the Office (read: “improved” farming) would bring about the intensification of production. This shift in the organization of agriculture would be accomplished through the importation of Western technological know-how and materials. Imported steel and cement from France went into building the Markala dam that fed the irrigation system. Thousands of men were conscripted by the colonial government to build the dam and carve wide canals into the countryside. As was the case in other areas of Africa, labor-intensive technologies were a hallmark of the colonization process rather than labor-saving technologies.²¹ Male laborers and a small number of industrial machines dug canals and cleared vast tracts of land for expansive fields. In so doing, they also cleared bushes and trees that women relied upon for sauce ingredients. It was a new material world.

By the end of the century the population of the project was made up of an initial generation of settlers who had arrived by force under the colonial government's coercive recruitment scheme, voluntary male workers and their families who arrived following the Second World War and were attracted by the economic promises of industrial agriculture, the similarly hopeful nationalist settlers of the 1960s, and desperate migrants seeking refuge from the environmental catastrophes of the 1970s and 1980s. The Office was diverse, and as it expanded over several decades, settlers came from rural farming, fishing, and even herding communities from across the region. During all this time, the Office formally ignored women as possible target populations for agricultural development yet relied significantly on their labor and expertise. In rereading the history of the Office in light of women's own technological experiences, I draw attention to their sense of what constituted development rather than the goals of technocrats and other experts. Indeed, women's assessments of project agriculture and technology considered daily meals produced, their nutritional value, and importantly *taste*, rather than production for a colonial or postcolonial export economy. From this perspective, it was the texture of daily life and the quality of food that served as the measure of development and food security.

In the midst of this rapidly shifting environment, women's ability to adapt their labor and technical infrastructure to new conditions was critical to food security in project towns and villages. Unlike many development experts, they did not see their labor as a problem, rather it was an element of their engineering response. The technologies most directly associated with women—or more appropriately called women's "things"—included modest domestic tools such as the mortar and pestle, cooking pots, and various new metal household goods. A range of industrial agricultural machines also entered the changing rural landscape at the Office. For example, women adapted the first threshers into their food labors, bridging the domestic and industrial nature of twentieth-century agriculture. In short, women who came to the Office integrated the material realities of the colonial and postcolonial irrigation project into an existing system of food production and reengineered it in the process. Much about women's lives at the Office is distinct from that of other women in the region. Yet these distinctions are further instructive when considering the diversity of rural women's experiences.

AFRICAN WOMEN'S HISTORY AND THE HISTORY OF TECHNOLOGY

This book brings African gender history together with the field of science and technology studies (STS). In so doing, I draw on the insights of African

gender scholars who have highlighted the central and shifting role of the household and domestic space for political and economic life.²² In Mali, the household has long been a political space, and it has been recognized as such by both colonial administrators and postcolonial legislators who have intervened in cases of inheritance, runaway wives, and divorce. The same concerns were entangled with local and regional economies, as control over the labor of young wives, enslaved women, and other female servants provoked tensions and negotiations.²³ Food production and preparation similarly situated women's domestic lives and labors at the center of local and regional economies and politics throughout the twentieth century.

This study's analysis is further informed by the focus that scholars of STS bring to the dynamic and textured interactions between the social world, technological artifacts, and the built environment.²⁴ While the study of technology in twentieth-century Africa has only recently gained sustained interest from historians, scholars in the field have highlighted new and shifting African technological networks, forms of labor, and cultures across its decades.²⁵ At the Office, multiple technological cultures emerged, and they were distinctly gendered. Women certainly created and maintained a distinctive technological space at the project. Yet the Office was widely associated with men.²⁶ For example, male farmers' earliest interactions with project technologies were generally marked by avoidance and disdain. Birama Diakon, who has examined the introduction of the plow in Mali and at the Office specifically, has further shown how male farmer's perceptions of the agricultural tool shifted dramatically over several decades, from a belief that the plow harmed fields to its adoption as a *Malian* technology. As this shift unfolded, they remade the plow into a new symbol of a masculine farmer ethic.²⁷

Diakon's study of technology at the Office focuses primarily on men, but he is concerned with women and technology. In addition to the social life of the plow, he also follows the introduction and adaption of modified threshers at the project. As Diakon notes, in the late 1980s and 1990s male farmers encouraged blacksmiths and other new iron workers to produce threshers that also winnowed, a task customarily performed by women. Winnowing ordinarily entitled women to a portion of the harvest. Since the new machines would often perform this task, women lost those harvest rights at the Office. In Diakon's analysis, the new threshers excluded women, and mechanization resulted in a material loss for them.²⁸ He rightly points out women's grievances in relation to these machines. However, women's technological work was not confined to their engagement

with one machine. In focusing on the plow and the modified thresher, Diakon challenges scholars to appreciate the innovation of African settlers, specifically male farmers and blacksmiths, at the Office. However, both technologies were largely controlled by men, even if they also entered the women's technological infrastructure. Neither object allows us to fully see women's technological work and creativity.

What, for example, would a study of the life of the cooking pot reveal? Scholars of technology must attend to the modest and domestic technologies associated with African women. The potential analytical insights to be gleaned from an analysis of mundane technologies are highlighted by Suzanne Moon: "The very ubiquity of [every day or uncontroversial] technologies make them the invisible background of social life, not noticed or written about in any depth, and rarely a subject of interest or passion for contemporary informants."²⁹ Yet, the pots, buckets, and other ordinary household items employed by women at the Office enabled them to make the scheme's otherwise unwieldy irrigation and industrial apparatus actually function.

Women's experiences also tell us that the histories of industrial and domestic technologies at the Office overlapped. For example, women turned canals into domestic water resources, even though the irrigation system was meant to water the project's fields. Previous scholars of technological systems have already shown that large-scale technological infrastructures have the potential to alter domestic life.³⁰ Users of those systems, in turn, alter the technology itself—an example of the coproduction of technology, gender, and society.³¹ Understanding the role of users, in particular, broadens the analytical lens beyond the category of engineer or designer—a framing that too often excluded most Africans from twentieth-century histories of technology.³² Moreover, as Nelly Oudshoorn and Trevor Pinch articulate, "Granting agency to users, particularly women, can thus be considered central to the feminist approach to user-technology relations."³³ Seeing women as users of pots, buckets, canals, threshing machines, and a host of other technologies allows us to expand the technology story of the Office into the domestic arena. As women at the Office negotiated technological changes related to food production, they integrated elements of the scheme into their labor routines, highlighting their role as users of diverse technologies, but also as engineers of a wider food production system. In the process, aspects of women's work and identity were transformed. Women also found new ways to showcase the centrality of their labor to rural life.

It must be noted that this book does not aim to romanticize women's technological work nor to minimize the challenges they faced. Technologies like the thresher certainly had a negative impact on women's livelihoods and even their rural social status. However, as Judy Wajcman reminds us, feminist analysis must move beyond the debate about women's relationship to technology as either dystopian or utopian.³⁴ Women did exert agency at the Office, but the shifting contexts for women's actions and their multiple meanings matter. Agency is a seductive concept for historians interested in women (and men) who are not often framed as historical protagonists, and I carefully emphasize the import of women's actions. Indeed, as Lynn Thomas elaborates, asserting agency for our subjects is not the end of the historical argument but an opening for more refined analysis.³⁵

Because women's innovation is most evident in their adoption of technologies for domestic use, their role as technical actors has not always been visible to historians. There are a few notable exceptions for African women artisans. For example, Sarah Brett-Smith's work on Malian women producers of mud cloth explores their creativity with a focus on the designs of produced cloth as a means for women's specific expression, often relating to bodily concerns such as circumcision and childbirth.³⁶ Additionally, the art historian Barbara Frank has studied how familial relationships between female potters in Mali aided in the transfer of specialized craft knowledge.³⁷ Engaging more directly with the field of STS, the archaeologist Shadreck Chirikure has framed African female potters (and male blacksmiths) as creators of laboratories. In his analysis, their spaces of scientific and technological work extended from the sites of extraction to their workshops. For women potters, the workshop was in the household.³⁸ Eugenia Herbert has examined women's roles in both metallurgy and pottery production in comparative African societies with a focus on the deeply gendered metaphors associated with what she terms "rituals of transformation."³⁹ What her work demonstrates is that African languages of technology are deeply gendered. For example, furnaces for iron production often mimicked the shape of the female body, and rituals surrounding smelting referenced fertility and birthing. Metallurgy, while most often practiced by men, was reliant on metaphorical female body power.

Yet, technology has generally been coded as masculine, and women's interventions have been relegated to realms outside of technology.⁴⁰ When Ralph Austen and Daniel Headrick wrote about the so-called technology gap in Africa, their overall argument rightly questioned classical tropes in the history of technology. Specifically, they suggested that technologies were not always portable. In one example, they point out that an

innovation such as the plow would not have been particularly useful in precolonial Africa, thus its nonadoption was not a sign of technological “backwardness.” In the 1980s it was a point well made. Austen and Headrick nevertheless suggested that African women reared children in a way that reinforced “technological conservatism,” which they believed to be a broad social pattern in Africa: “By carrying and holding their infants off the ground more than other people, African mothers limit their babies’ contacts with the world of objects. . . . In other words, child-rearing is human-energy-intensive and anti-materialistic. For the growing child, the results are a higher degree of inter-personal relations but less experience in manipulating the material world.”⁴¹ The association of African childrearing practices with technological conservatism is unwarranted. Rather, the embodied experience of childrearing produced a particularly embodied technology. Carrying children in a sling, or otherwise secured to the back, would have enabled women to continue to gather foodstuffs or wood fuel, for example, even while caretaking.⁴² It was, in fact, a materially responsive technology. Nevertheless, the idea that African women lack technical capacities or access to “technology” is pervasive even today. It is an idea rooted in a gendered ideology that depicts women, and especially African women, as untechnical, which has, in turn, influenced the study of technology in Africa.⁴³

In the context of debates about dependency theory—or more recently in the context of development—focusing on a gap or absence (as Austen and Headrick did) means that the technologies most often employed by women do not even show up in the frame of analysis. Yet, women in Africa have readily adopted new domestic technologies, from metal pots to diesel-operated grain grinders.⁴⁴ In using these technologies, women claim a specifically gendered technological space. If the starting point is that African women are caught in a technological gap because of their gender and location, it is not easy to discern their actual engagements with technology on a range of scales. Moreover, it discounts women’s continued use of other modest technologies that are often considered unsophisticated: from slings to pots to the iconic mortar and pestle. In concentrating this research on women’s technologies and infrastructure—as well as on their labor, techniques, and knowledge—the analysis in this book reveals a dynamic history of gender and improvisation in rural life.

REEVALUATING THE OFFICE DU NIGER

While technology was central to the Office’s design, embodied labor was essential to the scheme’s construction and operation. Amidu Magasa

highlighted this exploitative history in his foundational study of the colonial Office. The title of this history, *Papa-commandant a jeté un grand filet devant nous*, refers to the callous but mundane violence of an administrator brandishing a whip.⁴⁵ It is an apt metaphor. The construction of the irrigation infrastructure, Office towns, and roads was primarily accomplished using forced labor. Indeed, the building of the Office displayed the worst of colonial rule in French West Africa. Beginning in 1935, the Office—still under construction—was settled by conscripted individual men and families who were subsequently moved by force to new and unfamiliar project towns. Many women and children migrated, but men predominated. Office administrators tightly controlled the daily labor of all project residents, as well as the sales of all cotton and rice. In addition, guards restricted the movement of settlers wishing to travel outside project territory. These first years brought abrupt and intrusive change for most households prompting many women to flee. This early absence of women has been remapped onto the historiography. Strikingly, most studies of the Office have ignored the initial demographic reality and its implications for labor history at the project.

During the Second World War labor coercion and violence only intensified across the colony under the Vichy government in France. More families were forcibly settled at the project, and its farmers—as elsewhere in French West Africa—were pressured to intensify agricultural production for export in the interests of the French empire. One result was chronic local food shortages. Officially, forced recruitment and labor ended in 1946, but these and other coercive practices continued.⁴⁶ Life at the Office during these years continued to be physically taxing and without much celebration for the irrigated harvests. Still, as several key studies have shown, Office settlers survived these difficult years and worked to make the project their own.⁴⁷

Certainly, they worked as part of a project that was an important visible marker of colonial state power, or what Brian Larkin terms the “colonial sublime.”⁴⁸ The Office also served as a monument to the evolutionary trappings inherent in ideas of modernization and eventually to the obvious “failures” of that same project. Indeed, for most of its history the Office has been criticized for failing to accomplish its goals for development, whether economic, environmental, or social.⁴⁹ The Office was an imposing institution, and the power dynamics rooted in its political structure and material form had obvious implications for the daily lives of its residents, extending the reach of state authority through technology.⁵⁰ In time, the

project canals, roads, and irrigated fields came to be familiar elements of people's surroundings, but they did not go unnoticed. They were new and highly visible.⁵¹ For example, running water could be found everywhere, and then would be abruptly cut off at the end of the agricultural campaign, leaving empty ditches that ran alongside towns. Much about the colonial Office was unquestioningly intrusive: where to live, how to work, even what to eat. Yet officials could hardly demonstrate mastery over every aspect of daily life. As Clapperton Chakanetsa Mavhunga and others have shown, when technologies from the West are transported to Africa, they are often reappropriated by the colonized (or the formerly colonized) for their own purposes.⁵² For example, at the Office, men, women, and children bathed, fished, and swam in the irrigation canals. They also learned to redirect the water to nonproject fields, farm with the plow, and make use of large-scale threshing machines to harvest grain for domestic consumption.

The post–Second World War years marked several important shifts. First, the institution benefited from direct funding from France (and the United States through Marshall Plan funds). In previous decades the French government assumed that colonial revenues would finance economic and welfare betterment projects.⁵³ Continued poor production results at the Office encouraged officials to invest further in its technological apparatus. From the 1940s to the 1950s increased mechanization and motorized cultivation—with the addition of wage labor—altered the nature of project farming.⁵⁴ It was an increasingly industrialized rural world. During the same period the Office continued to expand, bringing more families to engage in semimechanized farming. In these and older villages, more women remained at the project. Many women still had little say in the decision to migrate, even if their husbands chose to go to the Office. However, the growing presence of women ushered in a period of greater food security.

The Malian state became independent in 1960, and incoming president, Modibo Keita, shared the colonial belief in the power of technology to bring about transformation in rural Malian society.⁵⁵ Keita strongly supported continued investment in the Office scheme. However, he also promoted the reorganization of all agricultural labor along socialist lines with material implications for the organization of women's labor. In 1968 Keita was overthrown and succeeded by the military leader Moussa Traoré. Like Keita, Traoré placed great emphasis on the Office as a national economic development project. Over three decades, from the 1960s to the 1980s, women faced the challenges of collectivization, militarized authority,

severe rationing of the harvest, and, with the decline of national revenues, a deteriorating project infrastructure. To make matters worse, the Traoré years were marked by severe and recurrent drought and hunger during the Great Sahel Drought.

In these years, the Office actively engaged in what Gabrielle Hecht termed the “technopolitics” of the emerging Cold War.⁵⁶ The international political struggles between Mali, its former colonizer France, and the new global powers (the Soviet Union, China, and the United States) were played out through technology. The Office acquired tractors and vehicles from the Soviet Union and technocratic expertise from the Chinese. Office administrators also sought financial and other aid from international groups such as the World Bank.⁵⁷ As Hecht points out, both Soviet- and Western-inspired models for development emphasized large-scale industrialization.⁵⁸ Major dam projects such as at the Office fit this pattern of development.⁵⁹ Not surprisingly, uneven power relationships continued to permeate the Office at all levels: between the Office and its farmers and between the Office and its postcolonial partners.

Given the prominence of the Office in colonial and postcolonial development planning, this scheme has been subject to several scholarly studies assessing its failures, successes, and possibilities.⁶⁰ As other scholars have established, the definition of development is fragmented and historically contingent, but the emphasis on improving Africa with respect to a supposedly more advanced France (or later the Soviet Union) has been relatively consistent.⁶¹ At the Office the targets of development have shifted from African (read: male) farmers, to the environment, the market economy, and ultimately to the technological infrastructure of the project itself. Indeed, the lack of clarity about what or who was actually being marked for improvement underscores the ambiguous nature of development itself.

Yet, Monica van Beusekom has demonstrated that agricultural methods at the Office were not simply imposed by outside experts: project agriculture was a negotiated practice. Staff members consulted with farmers who advocated for policies to better suit their needs, resulting in the practical use of farmers’ knowledge about soil type, seed selection, and so on. One example of this flexibility is that rice eventually took precedence over cotton because of farmer preferences.⁶² Van Beusekom is right to emphasize the exchanges between men at the Office. However, in her study, agricultural science is presented as a distinctly male endeavor. Men farmed, maintained the canals, and operated the machines. They also engaged

the European experts on matters of agricultural science. At the same time, women's concerns about food resources and their labor time were critical in shaping men's farming practices. When women are at the center of the analysis, it becomes clear that women made as much use of the industrial landscape of the Office as men did. Food production had always been highly technical, and women brought that sensibility to their work when they readapted new infrastructures and technologies to their shifting foodscape and daily routines. Even in moments of financial, ecological, and technical decline, women reengineered the Office—an agricultural program designed for men's cash-crop farming—into a common food resource.

REENGINEERING FOOD SECURITY AND TASTE

The policies and programs of the Office consistently privileged agricultural production over consumption. Yet, elements of the project's design were meant to ensure regional food security. In the 1920s Emile Bélimé integrated rice cultivation into his planning for the scheme, which he had originally intended solely for cotton production. Bélimé did so only in the face of political pressure to address the recurrent problems of food shortages across French West Africa.⁶³ Yet the resulting rice harvests were destined primarily for export to Senegal's growing urban markets. One outcome of the channeling of food resources to territories well beyond the project area was that the consumption needs and preferences of its residents—the very people who had produced the project's rice harvest—slipped from the view of planners.

Before Bélimé advanced his plans for large-scale irrigation, French West Africa had already gained a reputation among colonial scientists as a region in environmental crisis. They feared that the broader Sahel region was undergoing desertification and, worse, they thought it resulted from local farmers' cultivation and land management practices.⁶⁴ The French in particular believed that the reputedly barren environment was related to low population density. In fact, they raised alarms that interrelated environmental and population infertility was the cause of recurrent famine.⁶⁵

When Bélimé redesigned the Office to include rice he claimed that irrigation would rejuvenate the environment, produce food, and repopulate the region. In this example of colonial thinking, assuring agricultural abundance and prosperity was a matter of Western technology and undifferentiated but laboring bodies. In practice, the early operation of the Office provoked ecological crises and food shortages. Farmers faced

uncontrolled flooding in their towns and fields, which harmed the harvest and contributed to outbreaks of dysentery and malaria.⁶⁶ Closer to the end of the twentieth century, government officials and Office administrators once again claimed that irrigation would solve the resurgent problems of drought and famine. In the intervening years, women who stayed at the Office learned how to produce and prepare food in the very particular and changing agricultural environment of the scheme. As it happened, irrigation was not a quick and easy solution to the chronic food problems experienced by Office residents. It was women's labor that ensured food security and social reproduction.

Nevertheless, the contours of the scheme inevitably shaped the nature of women's responses to food crises. Elements of the agro-industrial environment of the Office are perhaps more aptly described as "environmental infrastructure." The term suggested by Emmanuel Kreike takes into account both human and environmental agency in the process of ecological transformation, whether read as an improvement or degradation of the environment.⁶⁷ The resulting Office landscape was a product of this human-ecological interaction and created as much by the colonial technologies of irrigation as by the forces of the Niger River. Of similar hydraulic landscapes Kreike writes, "The creation of irrigation works has never been a one-time investment that produced a permanent and enduring outcome in which humans subjugated Nature forever. The need for repairs, maintenance, and upgrades was incessant; reservoirs, canals, and ditches need to be kept free from silt accumulations, and bunds, embankments, and dikes need to be kept in repair; failure to do so leads to collapse."⁶⁸ This description certainly applies to the challenges faced by farmers and project staff in maintaining the Office. Kreike's broader point about the environment as a form of infrastructure further resonates with the ways in which Office women engineered food production. They intentionally sought to make use of the project's particular agro-industrial resources and even to alter them. Project land was formally owned by the colonial state and later by successive postcolonial regimes.⁶⁹ Even male farmers had few formal rights to the plots they farmed. However, men's symbolic claims to the economic fruits of the Office were hardly disputed by the state. By contrast, women used marginal spaces for their cultivation but in so doing materially claimed those spaces for women.⁷⁰

Women's central role in food production, rather than cash-crop farming, places them at the center of debates over the role of the Office du Niger in regional food security. As an object of study, the Office has

been both a proposed solution to famine in Africa and a development project with a local history of hunger among its residents. This study concludes in the mid-1980s, not long after Amartya Sen refocused scholarly inquiry on famine toward the social, rather than environmental causes asserting that the problem was not the lack of food but social and political access to resources.⁷¹ Around a decade later, Parker Shipton surveyed the state of research on famine in Africa and stressed that the rural producers of food remained the most at risk, especially women.⁷² Historical memory in Mali suggests that while women have been critical to rural subsistence, they have also long been among the most vulnerable to hunger. For example, a folk story published in 1905 by Charles Monteil, a colonial official, narrates the fate of a regional ruler who casts out his favorite wife. She is left to glean for millet in the fields, a survival practice remembered by women in later decades.⁷³ One interpretation of the tale is that all women are potentially vulnerable to hunger. Yet, they are not simple victims. In the story, this mistreatment is ultimately punished. Other records of famine and food shortage for the early colonial period offer a complex understanding of women, vulnerability, and hunger. They produce food security for themselves and others out of necessity through their seasonal labors and the cultural emphasis on food sharing. Indeed, food production is a field in which women assert authority. A significant historical shift occurred with the establishment of the Office, which left women with reduced access to wild foods during moments of hunger. In response they turned the technological apparatus of the colonial Office into the new wilds. During the Great Sahel Drought, international food aid would similarly replace wild food, but it was marked locally as the most detested famine food rather than aid.

It is worth noting that the hunger of the outcast wife highlighted in the aforementioned story is unrelated to famine. Rather it represents an ongoing concern with gender, access to land, and the distribution of resources. As Diana Wylie has argued, an overemphasis on famine has had the effect of masking the related problems of chronic hunger and malnutrition.⁷⁴ Indeed, the Great Sahel Drought and related famine provoked countless studies in the midst of the crisis and immediate aftermath. Several of these works rightly countered long-standing colonial arguments about underproductive environments and African mismanagement of the land. They also pointed to the rise of cash cropping (a defining feature of the Office) under colonial rule and the commodification of the rural economy to the detriment of food production.⁷⁵ At the same time, the

volume of studies framed the moment as an exceptional crisis.⁷⁶ More recently, Vincent Bonnacase has critiqued the intellectual and statistical production of the Sahel as a space of poverty and hunger during this period.⁷⁷ In the absence of strictly defined famine in the succeeding years, the provision of food aid slowed, and the resulting development policies emphasized environmental rehabilitation. Nevertheless, food remained a daily concern for many in the region.

What constituted food security in rural Mali? Throughout the twentieth century, “food security” has been a contested term and a subject for political debate.⁷⁸ At the Office food security was produced in large measure through women’s labors. In the early years of the scheme, the predominantly male households did not produce enough food to eat. Chronic hunger plagued residents for many decades and recurred in the postcolonial years. Yet, it was the quality and not simply the quantity of available food that concerned women. Quality for the politician and the development worker related to the nutritional content of food. But for local women and men, quality was also measured by the taste for specific textures, smells, flavors, and the sensations of fullness. The taste sensorium is multiple and engages sight as well as smell.⁷⁹ All these bodily senses play a role in determining what is “tasty” (or even what counts as “food”). What people wanted to eat at the Office also related to cultural identity, even as their identities shifted at the Office. For example, women prepared familiar meals (originally made from millet) using the staple crop of their new environment: rice. In time, as rice became a more desirable food across the region, the Office gained a reputation for its crop, and Office women’s rice repertoires expanded, thus reshaping what constituted food at the Office.

Over several decades at the Office, women often struggled to produce meals that conformed to local standards of high-quality food. The question of producing satisfying and flavorful food was also an issue that reflected women’s felt sense of hard work and status. Indeed, Office women worked against assumptions that a proper village life did not exist at the project. Their work was important not only for ensuring everyday survival but also for creating respectable rural status at the Office. For many years, the difficulties of producing palatable meals made the maintenance of rural hospitality challenging. At the same time, women’s changing food production practices altered the flavors of standard meals.⁸⁰ For women, maintaining control over food and daily life also meant attending to taste.⁸¹ In short, food was a measure of social well-being much broader than the term “food security” generally implies in policy circles.⁸²

The well-being of Office residents was profoundly challenged during the Great Sahel Drought. In the midst of extreme hunger women and men living at the Office struggled to feed themselves but also to provide aid to their regional neighbors. Strangers suffering from famine flocked to the Office for its rice. While a proliferation of international institutions and NGOs responded to the crisis, they failed to offer food security in local terms.⁸³ As Benedetta Rossi has shown, for Niger local responses to the drought drew on deep historical roots. While historical hierarchies determined access to resources in Niger and played a role in the production of hunger, they also produced social networks of support. For the most part, these ties of mutual aid were largely unseen by government and international aid workers responding to the regional crisis.⁸⁴ In Mali, long-standing cultural ideologies of food sharing similarly shaped the responses of Office women and men who hosted strangers (most of whom were women) in need of rice to take home. Office residents were obligated to share even when the numbers arriving overwhelmed them. They were further compelled to aid the strangers because the rice Office farmers produced in their irrigated fields was good “food” when compared to the substandard and barely edible international aid. Even in the midst of a famine, quality and taste were essential elements of food security. As an enjoyable embodied experience, eating always mattered.

METHODS AND OUTLINE

Taking the embodied techniques of women at the Office du Niger as an archive, this book traces a history of women’s intellectual production that overlaps with patterns of consumption, taste, and the aesthetics of women’s technological production. And it is also rooted in the value of female labor. This is an embodied form of knowledge that was accentuated in moments of extreme crisis and redefined the very meanings of development and food security. The writing of this history was inspired by a rich field of scholarship that centers the body as a site for the production of gendered knowledge.⁸⁵ I draw from a diverse array of primary sources to tease out a history with little direct documentation. Significantly, I rely on oral testimony and observations of women’s work and physical movements, paying close attention to women’s experiences *as women* at the Office.⁸⁶ Like Susan Geiger’s study, the interviews cited here speak to collective experiences. This is due in no small measure to the fact that women living in distant villages across the Office du Niger offered similar testimony about labor routines, their use of specific tools and machines, and strategies for

survival during the Great Sahel Drought. As Geiger finds for women political activists in Tanzania, the women's testimony from the Office demonstrates their *creative* collective action.⁸⁷

As interviews were conducted with women (and men) at the present-day Office, many of the insights contained in this study were gained through observations of courtyard cooking spaces, village canals, and agricultural machines in use, and by picking vegetables in women's gardens, eating food in their homes, and exchanging gifts of soap, tea, chickens, and cola nuts. This social and material interaction with women and men at the Office often prompted specific memories of harvest celebrations, a remarkable market trip, or the arrival of the first industrial machines. Objects like metal pots and serving bowls, an old plow, or noisy nearby threshers also prompted fruitful conversations about technology. Focusing discussion on these tools, or talking while walking along a familiar path or working in a garden, allowed my interviewees to express their memories and historical interpretations in material and spatial form. It is an expanded conception of oral history beyond the interview that is drawn from the work of environmental historian Tamara Giles-Vernick.⁸⁸ As Barbara Cooper has also argued, oral history practice is often performance, and many women and men interviewed here gestured to give embodied expression to specific memories.⁸⁹

This study also draws from regional folk stories collected in the first decades of colonial rule. The suggestion here in reading these sources is that a popular conversation about food, labor, technology, and gender emerges. Luise White writes about the significance of rumor in East Africa: “[People] construct and repeat stories that carry the values and meanings that most forcibly get their points across.”⁹⁰ She elaborates that it is the circulation of the stories, in particular, that allows for their wider historical significance.⁹¹ The stories examined here offer formulaic elements about food, hunger, women's cooking, and pots that convey specific local understandings of early twentieth-century rural life in Mali. Similarly, new stories about hosting guests and women hiding food began to circulate during the Great Sahel Drought, suggesting a renewed rural conversation about women's labor, hunger, and generosity. My analysis is complemented by reading oral traditions about the origins of agriculture and ecological change, which like the popular folk stories continue to circulate and resonate with historical transformations at the colonial and postcolonial Office.⁹²

Also consulted for this study were European travel narratives and ethnographic writings, missionary records, botanical research reports, and official records from the Office du Niger, both colonial and postcolonial

government archives, and records from the Food and Agricultural Organization (FAO) and World Food Program (WFP). While many of the formal state and institutional archives contain little documentation on women's lives, recorded food shortages and demographic crises highlight particular moments of embodied experience. The official records for the Office du Niger and agricultural development prior to its creation also document the diversity of regional food resources and cultivation practices, estimated regional food production figures, Office census figures, as well as the technical workings of the project's infrastructure, the recruitment and management of labor, and complaints of male farmers. In analyzing these sources alongside the memories and practices of women and men at the Office, this book documents the history of Mali's female food engineers.

Chapter 1 examines the gendered agricultural landscape of rural Mali in the early decades of the twentieth century and provides the theoretical framework for embodied engineering. At the outset of the twentieth century, rural life centered on food. It was a specifically embodied experience. Annual agricultural festivals, in particular, encouraged the excessive consumption of food and beer, all prepared by women. During these festivals, the sense of bodily fullness was made meaningful in material contrast to social memories of hunger and famine. Even in moments of food shortages, however, taste remained a central element to the food that was produced. Over the course of these first decades of the century, French policies intruded on rural life and the specific gendered labor routines of women whose work supported the year-round preparation of daily meals.

The remaining chapters follow the experiences of both women and men at the Office from the first years of settlement in the early 1930s up to the Great Sahel Drought (1969–73) and succeeding years of international food aid and development interventions. Chapter 2 focuses on recruitment for the Office scheme and the food shortages characteristic of the first decade of settlement. The colonial body politics of labor recruitment and the problems of food production at the Office were intimately connected. Until the mid-1940s families at the Office did not produce enough food to eat. Significantly, the colonial emphasis on production for export had the unforeseen consequence of suppressing the qualitative aspects of food cultivation that were relevant to local taste. Women were conspicuously missing from Office towns during these years. The absence of women's bodies and their labor was understood locally as a demographic crisis. Living at the Office required too much of women's bodies, and in the absence of their labor, the production of food and its association with animated rural life suffered.

After several decades of colonial rule, women radically reengineered the way they produced food. Chapter 3 showcases how women who stayed at the Office reorganized their food production to better manage a new agro-industrial environment and make it livable. They began to carve out space for food crop production along the edges of the industrial fields and plant valuable food trees. They also established social and market networks with women living in communities at the edges of the Office. With portions of the money earned from cash-crop production, women purchased the foodstuffs that they could not produce from the denuded Office landscape. Over time, living at the Office meant “farming for money.” Women also worked to re-create a social agricultural world. In these years, Office women reshaped the natural world of the Office and their shifting socioeconomic realities.

Chapter 4 looks at the same period with special attention to the interplay between small-scale domestic technologies and large-scale industrial ones in the daily preparation of food. It was in the late 1940s that women began using new metal pots, buckets, and other modest household technologies to ease their daily labor. This transformation of household infrastructure enabled women to mitigate the negative effects of a depleted-resource landscape. Many women also sought informal employment alongside industrial threshers, which afforded them access to machine-processed rice. While European staff assumed men and not women were targets of technological development, women actively engaged with new technologies (modest and industrial) as it suited their needs. They also shaped how these new technologies took on gendered meaning in daily life and imbued them with social value.

In 1960 an independent Malian government took over the Office. Chapter 5 looks at this shift and the subsequent crisis of the Great Sahel Drought. When the region was hit by ecological crisis, successive governments looked to the Office to produce food for the nation. Unsurprisingly, state policies favoring urban markets and militarized rationing failed to provide meaningful food security. Yet, Office residents turned the project into a refuge for hunger migrants. Food aid was still critical to survival, but its poor quality required women to once again reengineer their cooking just to make edible meals. Guards strictly monitored the harvests, and women in need of something to cook would smuggle rice, hiding it in cloth, from state-run fields. They accomplished this task by feigning pregnancy with their bundled rice babies. It was another modest but effective technological solution that reveals the depth of women’s embodied techniques and knowledge.