

# GENDER, BIODIVERSITY LOSS, AND CONSERVATION LOSING GROUND

## GENDER RELATIONS, COMMERCIAL HORTICULTURE, AND THREATS TO LOCAL PLANT DIVERSITY IN RURAL MALI

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### THE SETTING

Niamakoroni is a farming community, located on the Mande plateau in south-central Mali, approximately 35 km from Bamako. The settlement is a series of closely clustered adobe brick structures and shade trees. It was founded at the close of the 19th century, by a lineage segment from a nearby community, to gain access to new farmland. Contemporary residents of Niamakoroni, as did their ancestors before them, claim a Bamana (Bambara) ethnic identity.

The primary domestic group in the community (residential, food production and consumption unit) is called a *du* (*duw*, plural) in the Bamana language (Bamanankan). Members of each *du* live close to one

another and share meals throughout the year. Niamakoroni's *duw* are multi-generational joint families; junior males, and their spouses and families, live and work under the authority of the group's eldest male, the *dutigi*. As senior members of their lineage groups, *dutigiw* have access to arable uplands and the authority to direct the labour of those who live with them.

Women in the community are responsible for food processing, cooking and all household maintenance tasks. Men have few domestic obligations aside from building and maintaining houses (see also Creevey, 1986; Thiam, 1986).

### GENDERED DOMAINS IN THE FOOD ECONOMY

The community depends on rain-fed agriculture for subsistence, and in Niamakoroni the sparse rains fall from June through September. The community depends mainly on this short rainy season to meet most of their food needs. The majority of able-bodied, working-age villagers cultivate or collect food crops and plants, which they refer to as *ka balo* (for life) activities.

Clearly demarcated gender relations mark this food production process. The men in each household work collectively in their group's main upland field (*foroba*), located in bush areas a few kilometres from the settlement. Here, staple crops are produced, including sorghum, millet, corn, cowpeas, peanuts and Bambara

groundnuts. Throughout most of the region, sorghum and millet account for the most acreage (PIRL, 1988).

Women are responsible for the cultivation and collection of plants, to make the sauces that flavour men's grain crops in the daily meals. During the rainy season married women, in each domestic group, work individually in upland fields assigned to them by the *dutigiw* to produce *nafenw*, or 'sauce-things'. Mostly women inter-crop peanuts, cowpeas, kenaf, roselle, okra and sorghum. Cropping patterns focus on traditional leafy and vegetable items that complement the staples produced on the *forobaw*. Most women's crops are for direct consumption, although sometimes items are sold to generate income, which is typically



used to purchase commercial sauce ingredients such as bouillon cubes, vegetable oil or salt (Wooten, 1997).

In addition to cultivating relish crops, in upland fields in the rainy season, throughout the year women gather various wild or semi-wild plant resources from their fields or from bush areas to use in their sauces. They gather and process the leaves of the baobab tree to make a key sauce ingredient, and use the fruit of the shea nut tree to make cooking oil and lotion for skin care. As reported elsewhere in the region (Becker, 2000, 2001; Gakou *et al.*, 1994; Grisby, 1996), they maintain these productive trees in their fields, and make use of species in the bush areas around the community. A wide variety of wild and semi-wild greens are regularly used for their sauces.

This general pattern of distinct gender contributions to the food economy, with men providing grains and women providing sauces, is widespread among the Bamana (Becker, 1996; Thiam, 1986;

Toulmin, 1992). However, there is another typical production activity associated with Bamana women: gardening. Accounts from across the Bamana region suggest that women regularly use low-lying areas, near streams, for home gardens and to collect wild plants for sauce ingredients (Grisby, 1996, Konate, 1994). Indeed, *nako*, the Bamana word for garden, is often translated literally as 'sauce-stream', referring both to the type of produce and to the production site. Women, in most Bamana communities, have for generations been responsible for producing *nafenw*. Therefore, the historical association between the women of Niamakoroni and *nakow* (sauce-streams) seems logical. Yet today, they do not garden in such areas around their village. Instead, they grow their sauce crops in upland fields and gather wild food plants in nearby bush areas. Over the past few decades gardening, which was once closely associated with women and the food economy, has become a man's affair and a commercial venture.

## GARDENING FOR CASH: MEETING THE DEMANDS OF URBAN CONSUMERS

In addition to working in their respective *daw* for domestic consumption, individuals of all ages in Niamakoroni can engage in independent commodity production activities that will earn them a personal income. These are typically referred to as *ka wari nyini* (for cash/money) activities.

While a variety of income-generating activities occur in the community, everyone perceives market-gardening to be for income generation and potential accumulation. Men and women alike commonly identified market-gardening as the preferred strategy for earning an income. They also noted that urban consumers in Bamako, the capital city, provide the main market for the garden produce (see also Konate, 1994).

Bamako has grown dramatically since the French set up their administrative headquarters in the city at the end of the 19th century. Today there is a well-established regional market for cereals, and most urban consumers depend on rural producers to supply their basic staples, such as sorghum and millet. Moreover, there is an increasing demand for specialized horticultural produce.

Since French colonial forces began to consume fresh fruits and vegetables produced in the colonies, Bamako's residents have increasingly become interested in acquiring and consuming exotic fruits and vegetables (République du Mali, 1992; Villien-Rossi, 1966). A number of factors contributed to this shift in consumption. They include the expansion of governmental nutritional campaigns that highlighted the nutritional value of fresh fruits and vegetables, the emergence of a middle class that considers Western dietary patterns to be a sign of culture and wealth, and the growth in the number of foreign aid workers who wish to consume fruits and vegetables native to their home countries. Together, these created a strong demand for specialized, non-traditional, horticultural items in the capital. Communities, such as Niamakoroni, are well placed in this overall context as they are within market distance of the capital (see also Becker, 1996; Konate, 1994).

Market gardening is now a central component of the local livelihood system in Niamakoroni. In the mid-1990s, there were 22 market-gardening operations in the

community, each with its own garden leader (*nakotigi*). Married men managed most garden operations (19 out of 22, or 86 percent). Each of the three women *nakotigi* had the position of first wife within a polygynous unit. As such, they had all retired from direct engagement in the food production realm, and their activities were no longer managed by their respective *dutigi*. Compared to other *nakotigi*, these women operated relatively minor enterprises, working on small plots in peripheral locations. Most *nakotigi* are helped by younger brothers or sons and daughters and, in some cases, wives. The *nakotigi* establish cropping patterns, organize labour, make decisions about harvest and marketing, and sell the produce and distribute the proceeds as they see fit.

In the mid-1990s, Niamakoroni's 22 *nakotigi* operated a total of 34 different garden plots ranging in size from 378 to 9 720 m<sup>2</sup> with an average of 3 212 m<sup>2</sup>. Mainly these plots were in low-lying areas immediately surrounding the community. Most were well delineated and fenced to protect them from livestock damage. The plots controlled by the three women gardeners were unfenced, and were the smallest (378–650 m<sup>2</sup>). Moreover, their plots were located deep in the bush along relatively minor streams.

Market gardens produce a wide variety of vegetables and fruits, most of which are non-traditional exotics. The most common types of vegetables grown in Niamakoroni were tomatoes, bitter eggplant, common beans, hot pepper, and cabbage. At one point or another, all 22 *nakotigi* cultivated these crops. Other vegetable crops included onion, European eggplant, green pepper, squash, and okra. Fruit crops also played a major role in these gardens. Often these fruit plantings occupied a large part of an enclosed garden area, mainly as pure orchards or, less frequently, integrated into a diversely planted garden. Except for the plots belonging to the three women *nakotigi*, all garden plots contained at least some mature (productive) fruit plantings including banana, papaya, mango, and various citrus species. In all cases, banana was the most abundant fruit crop. Papaya was the next most common and was cultivated by all 19 male *nakotigi*, who also had mango trees. Most gardeners had citrus stock including lemons, oranges, mandarins, tangelos, and grapefruits, where lemons were the most common. With the exception of bitter eggplant, hot pepper, and mango, these crops are non-traditional garden plantings. All of the garden crops,

traditional and non-traditional alike, are in high demand in the capital city.

Gardeners frequently use a range of commercial inputs and all 22 *nakotigi* purchase commercial vegetable seed for their market gardens. In addition to purchasing vegetable seed and seedlings, Niamakoroni's *nakotigi* regularly purchase orchard stock. All 19 male *nakotigi* purchase orchard stock, banana plantings, citrus seedlings or citrus-grafting stock and the Badala market, along the Niger river was their main source. Some of the male *nakotigi* said they also obtained such items from *nakotigi* in neighbouring communities where longer-established orchards exist. The three women *nakotigi* had not planted any citrus trees in their plots and the bananas they cultivated were obtained locally.

All 19 male *nakotigi* said that they purchase chemical fertilizer for their plots. Fourteen also stated that they purchase animal manure (mainly chicken). A few male *nakotigi* also purchase chemical pesticides from time to time. The gardeners are usually unaware of the health risks of these materials and thus fail to protect themselves.

Gardeners were unanimous when asked about their production goals. All 22 *nakotigi* viewed their horticultural activities as a way to earn income and that all produce from their gardens was destined for sale. Indeed, garden produce only very rarely appeared in the local diet and, when it did, was damaged or deteriorating. The bulk of the produce from Niamakoroni's gardens was directed to Bamako's markets. Produce was taken to a suburban site where urban market traders, mostly young women, purchased it from gardeners or their helpers. On some occasions, these buyers traveled directly to the gardens to secure produce indicating the high demand in the capital city.

To give some idea of potential income from market gardening, a series of crop value estimates were made. This analysis showed that the total value of the banana crop alone, across all gardens during 1993–1994 was approximately US\$35 000. The projected value of the total papaya crop for the year was approximately US\$9 500. The individual with the largest number of banana plantings (736) could have taken in approximately US\$4 400 from this crop alone. The individual with the fewest banana plantings (36)

could have earned US\$216. The projected value of the total papaya crop for the year was approximately US\$9 500. The individual with the most mature plantings (76) could have taken in about US\$1 600 from this crop, whereas the individual with the fewest mature plantings (4) could have earned US\$85. These examples indicate that potential incomes from market gardening are relatively high for Mali, which has a very low per capita income, US\$260 in the early 1990s (Imperato, 1996).

Based on proceeds from these two crops alone, if shared equally among all 184 Niamakoroni residents, the gross per capita income would be approximately US\$242, or nearly the national average. However, figures are based on gross value and not net income. Furthermore, income generated through gardening is not distributed uniformly. The vast majority of garden leaders are men; therefore they are the primary benefactors of this relatively lucrative livelihood diversification strategy (Wooten, 1997).

## CONTRASTING VIEWS ON THE DEVELOPMENT OF COMMERCIAL HORTICULTURE

Clearly, market gardening is significant in contemporary Niamakoroni. However, it is clearly a male-dominated commercial activity, which focuses on largely exotic, non-traditional crops. Nonetheless, as stated in the introduction, gardening has not always been male dominated, market-oriented and based on exotic plants. Moreover, not all people have quietly accepted market gardening, nor is it likely to affect everyone in the same way. Indeed, men and women in the community tell the story of market-gardening development and current garden tenure patterns in different ways. The juxtaposition of their accounts highlights a significant change in the nature of gardening over time.

From the viewpoint of an elder man, garden tenure in Niamakoroni shares a characteristic with the settlement of the community: first farmers made first claims. When the initial Jara settlers began farming in Niamakoroni, male lineage heads established themselves as guardians of the land (Wooten, 1997). As such, male descendants of the founding Jara patrilineages retained the right to distribute upland tracts to the community's household heads. However, it appears that the original Jara claim did not necessarily include lowlands, which men at that time did not see as being central to the food production regime. Based on the commentaries provided by Nene Jara and Shimbon Jara, the two male elders, it seems that control over these areas fell to those who opened them for cultivation, in most cases to the first generation of market gardeners: their fathers.

Others subsequently joined the first wave of gardeners in the community, as they began to see the advantages of garden cultivation. Young men entered into the domain by clearing what Nene referred to as 'unused areas.' In addition, over time, some young men, who had worked for the original garden heads, established their own operations. They either claimed 'unused' land, or obtained a section of their fathers' or elder brothers' original holding after death or retirement. Later still, some individuals obtained plots from non-related individuals. Rent was not mentioned, although short-term, non-monetized loans of plots were made. Nene and Shimbon noted that recently a few women had begun gardening activities, far out in the bush, on lands that they said men deemed too distant for serious horticulture activities. The women cleared these areas themselves in order to garden.

Women offered quite a different view of the development of market gardening. Various older women reported that, prior to men's development of the low-lying areas for commercial gardening activities; women had cultivated crops and collected plants in some of those areas. Wilene Diallo, the community's oldest woman, said she and the other village wives used plots in these areas during the rainy season to cultivate traditional vegetable crops for their sauces (*naw*). She also said village women sometimes planted rice in low-lying areas during the rainy season. The rice produced was a traditional variety, used in special meals or marketed. The pattern was noted in published accounts on rural production patterns in other areas of Mali (e.g. various papers in Creevey, 1986; Becker, 1996).

Thus, before the first generation of market gardeners became established, it appears that women used some stream areas freely, without direct competition from men. They did so with the primary goal of producing local sauce crops. Such uncontested use of these areas may be associated with the fact that a ready market for specialized horticultural produce had

not yet developed, and that men perceived low-lying areas to be less desirable. Mamari Jara, one of Niamakoroni's contemporary male garden leaders, said that about a generation ago some land was originally used by a few village women to produce leaves and vegetables for sauces.

## LOST GROUND, THREATENED RESOURCES

Whatever the exact historical particulars, it is clear that today women are largely excluded from the community's garden spaces. To establish their commercial enterprises, men have appropriated the physical space of the lowlands, as well as the garden production niche itself. They have laid claim to land where their mothers and wives once cultivated and collected plants for the household saucepot. This has important implications for women's contributions to the food economy and their relative standing in the community.

Women's marginalization from the gardening niche in Niamakoroni limits their ability to produce traditional foodstuffs. They endeavour to grow sufficient sauce crops on the upland fields, allocated to them by their *dutigiw*, but productivity there is limited. Women's range of domestic obligations limits the time available for cultivation of these fields. Moreover, some traditional crops may not grow well in upland environments, because the upland fields can only be cultivated in the rainy season, while sauces require fresh plant material throughout the year. Thus, even if the women are fortunate enough to secure a harvest of some sauce crops from their fields, they still need to locate additional local plant resources for their sauces. With constrained access to the low-lying areas, their ability to procure these items is hindered. Women's marginalization from gardening limits their access to financial resources, which could be used to purchase some of the sauce ingredients they are unable to secure locally.

It should be noted that this shift has not gone unnoticed or unchallenged by the women of Niamakoroni. During interviews, several women voiced

their dissatisfaction with the situation. As one woman said, 'Men get all the gardens. They get all the money. Yet they don't give us anything, not even money for sauce or our babies.' Some women clearly resent that the traditional woman's sphere has now become part of a man's world. Moreover, it is important to bear in mind that there were three female *nakotigiw*. Their gardens were very small, located at considerable distance from the village on relatively minor streambeds; nonetheless they had commercially oriented gardens. However, unlike most married women in the community, these women gardeners were senior wives who had retired from most of the regular duties associated with the household food economy. Their accomplishments, meager as they might be, were not likely to be widely replicated.

In addition to the emergence of a series of social and economic challenges, women's exclusion from the garden realm may lead to detrimental shifts in a number of other important domains. The shift documented here indicates changes in culinary patterns; a possible decline in nutritional status, reduction in local plant diversity and overall environmental stability. While these issues were not specifically evaluated in the study, the data presented do reveal a number of significant threats.

The expansion of men's market gardening may lead to a decrease in the availability of local plants for the diet. Men have pushed women and women's crops out of the gardening niche. In the process, many garden plants maintained by men, and associated with urban consumers, have replaced local plants, which are linked with women and the saucepot in Niamakoroni gardens. Today's male market gardeners are not

interested in maintaining women's sauce crops, unless there is a suitable urban market for them, for bitter eggplant. Indeed, most men see women's plants, especially traditional leaf crops and wild sauce plants, as weeds to be removed in favour of income-earners such as tomatoes or bananas. The well-manicured market gardens rarely contained traditional vegetables and wild or semi-domesticated plants.

In short, lacking access to traditional gardening and collecting areas, women had fewer options when it comes to making their sauces. Although this result has not been documented, a change in local culinary patterns may be underway. Ironically, by growing and selling garden crops, male gardeners may be contributing to a decline in the nutritional value of their own meals. Without access to appropriate gardening niches, women lack the opportunity to maintain traditional plant resources *in situ*. While some of their traditional plants may be suitable for upland cultivation, during the rainy season, many more wild or semi-domesticated plants are adapted to the low-lying stream areas. Thus, this situation presents a challenge for the maintenance of viable locally adapted plants and, over time, to the continuity of local knowledge of

these tried and true species. In short, without continuous management, it is possible that these species may be locally eroded.

The threat to local plant biodiversity is not limited to garden areas. A number of important secondary environmental effects are related to the development of men's market gardening in Niamakoroni. Without access to lowlands for sauce production, or other alternatives for income-generation, women are increasingly focusing their attention on the exploitation of other local, bush-based plant resources for food and for income generation in support of their domestic cooking obligations (Wooten, 1997). Specifically, they are expanding their commercial production of charcoal, shea nut butter and toothbrushes made from plants. In interviews, several women noted that they use the proceeds from these activities to secure sauce items for their household meals. All of these activities are dependent upon the use of wild native plant resources. Women's expanding use of these resources reveals what may represent a vicious cycle. Without access to garden spaces, women may over-exploit bush resources to acquire income for sauce ingredients they can no longer produce locally.



### References

All sources cited are taken from:

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