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Gender, Environment, and Development Concerns in Irrigated Rice Schemes in West Africa

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Chapter 1: Approaches to Studying Gender, Environment, and Development

Introduction

In this study, I examine the links between gender, environment, and development (GED), first analyzing various approaches to studying the topic, and then outlining the social repercussions of two development projects in terms of GED considerations. In chapter 1, I review three approaches to studying GED, cultural ecofeminism, gender planning, and political ecology, examining the benefits and limitations of each approach. Following this examination, I outline a GED study completed from a political ecology perspective in chapter 2. Using Judith Carney's study of irrigated rice cultivation and gender conflict in The Gambia, I argue that her somewhat modified political ecology approach is an effective framework for analyzing GED concerns at The Gambia setting. In chapter 3, I test Carney's model further, using the framework to study the social repercussions of irrigated agriculture at the Bakel in the Senegal River valley. In the chapter, I both modify Carney's framework for studying GED, and examine women's involvement in an irrigated agricultural development project.

Since the late 1980s, some researchers, development planners and policy makers have focussed their attention on studying gender (women), the environment, and development. Though the importance of women's roles in the development process 'has been widely acknowledged at both research and project levels', the continued preponderance of 'gender-blind' development schemes often exacerbate, rather than ameliorate women's living conditions (Moser and Levy, 1986). Similarly, development projects that are supposed to increase agricultural productivity and promote self-sufficiency may instead do the opposite, and may also degrade the environment.

While they agree that this issue of gender, the environment, and development needs to be more

thoroughly examined, researchers and development planners disagree about which theoretical approach to take. In this chapter, I will examine three such approaches including cultural ecofeminism, gender planning, and political ecology. Though each approach possesses advantages and limitations, I will argue that political ecology is the most appropriate approach to use in studying this issue because it most completely integrates gender, development projects, and environmental change.

Cultural Ecofeminism

Cultural ecofeminism is one approach used to study the GED issue. One of several strains of ecofeminism, it is based in part on the claims of this more general theory including:

(1) There are connections between the oppression of nature and the oppression of women
(2) One must understand these connections in order to understand the oppression of both nature and women.
(3) Feminist theory must include a ecological perspective.
(4) Solutions to ecological problems must include a feminist perspective (Warren, 1987, cited in Hombergh, 1993).

Additionally, ecofeminism rejects normative dualism, replacing it with interconnectedness, equality, and diversity (Hombergh, 1993).

Besides these general principles, cultural ecofeminists believe that because of their physiology, social roles, and psychology, women have been associated with nature in many cultures (Merchant, 1992). Physiologically, women give birth to children, and are consequently more attune with nature than men are. Socially, women, because of childcare and other domestic duties, have often not worked in the public sphere. In third world peasant societies, women's role as providers of 'sustenance, food, and water' often enables them to understand the complex interactions in nature (Shiva, 1989). Psychologically, many cultures grant women greater

emotional capacities with sensitivity to the personal while cultures assign men greater rationality and objectivity (Merchant, 1992).

Because many cultural ecofeminists believe that western culture and science devalues both nature and women, they are anti-science and anti-technology and industry. Cultural ecofeminists hold this view because historically nature has often been depicted as feminine in gender, and because women have been excluded as partners in science and industry. During the European scientific revolution, figures such as Bacon and Descartes helped alter views of nature, transforming it from a living organism into a inanimate machine. This change in the perception of nature coincided with the rise of the Industrial Revolution, a revolution that created a 'limitless appetite for resource exploitation' (Shiva, 1989). According to Vandana Shiva in her book *Staying Alive: Women, Ecology, and Development,* the combination of Western reductionist science, the Industrial Revolution, and Adam Smith- type capitalism has led to the exploitation of nature and women, especially in the Third World (1989). This exploitation is inherent in the dominant development model, a model based on violence against nature and women in Shiva's view. Because of its negative repercussions on women and nature, development becomes 'maldevelopment' for Shiva, because such development is 'bereft of the feminine, the conservation, the ecological principle' (1989).

Her solution to the problems associated with maldevelopment is the adoption of a spiritual concept from Indian cosmology called *Prakriti*, or the 'feminine principle'. Defining *Prakriti*, Shiva writes:

> From the point of view of Indian cosmology, ...the world is produced and renewed by the dialectical play of creation and destruction, cohesion and disintegration. The tension between the opposites from which motion...arises is depicted as the first appearance of

> dynamic energy (*Shakti*). ... The manifestation of...this energy, is called nature (*Prakriti*) (1989).

All life arises from *Prakriti,* a living and creative mechanism. *Prakriti*, or the feminine principle, unlike reductionist western science, is non-violent, life-giving, holistic, and diverse. By adhering to this spiritual concept, people will begin to cooperate with nature's processes, subsisting from nature instead of exploiting natural resources to maximize profits.

Shiva believes that in order to avoid annihilation of 'nature and the entire human species', people must live according to the feminine principle. With this goal, the feminine principle becomes more than a form of spirituality, but encompasses ecological, feminist, and political concerns. Some Third World women small-holders, the Chipko of the Garhwal region of Uttar Pradesh, an area in north-central India, for instance, follow this broader version of the feminine principle. In consequence, they serve as a model for the rest of humanity. Chipko women continue to adhere to the feminine principle because unlike the 'ecologically alienated, consumerist elite women of the Third World and the over-consuming west', and Third World men who generally participate in 'life-destroying' activities once development occurs, both their biological and cultural roles connect them to nature. Nature and women share an 'organic process of growth' because women collect and consume 'what [grows] in Nature', and because both women and Nature 'make things grow' (Shiva, 1989). Because of these connections and their adherence to the feminine principle, Chipko women are 'laying the foundations for the recovery of the feminine principle in nature and society, and through it the recovery of the earth as sustainer and provider' (Shiva, 1989).

Limitations of Cultural Ecofeminism

There are several limitations to using cultural ecofeminism as an approach to study GED. First, the assertion that women are innately closer to nature than men because they give birth to children is highly problematic. I think a person's life experiences and mode of production might influence his/her relationship to nature more so than his/her biological capacities. For example, a person who lives in a city, works in an office, and buys her food at a grocery store would probably not be as aware of the inner workings of nature as a person who lives in rural setting and grows his own food for subsistence. Another limitation of cultural ecofeminism is that it often promotes the noble savage idealization. This problem is quite evident in Shiva's book where she frequently insinuates that before western science and maldevelopment, there was no sexism or environmental degradation in the Third World.

Other limitations of cultural ecofeminism center around its applicability- basically whether it will work in practice at a large scale. This problem is evident in Shiva's 'feminine principle' solution to end the environmental degradation and sexism she views as inherent in 'maldevelopment'. Shiva fails to offer a framework through which people could adopt this belief. She does not explain how development planners and western scientists will be persuaded to include the 'feminine principle' in development projects, or how people in general, especially First World residents, will be induced to live according to this concept. Because the Chipko women are predisposed to adhere to the feminine principle due to their religion and culture, it is questionable whether or not this principle will readily be accepted in cultures that lack religious and spiritual beliefs comparable to the *Prakriti* concept in Indian cosmology.

The limitations of Shiva's cultural ecofeminist approach are evident in her study of development projects and displaced people. Examining how people are displaced due to the

construction of dams and mines, Shiva largely confines her analysis to these peoples' spiritual beliefs. Instead of detailing the ways displacement affects peoples' production practices and lives, or quantifying how dams and mines alter the environment, she focuses on peoples' spiritual attachment to the land and soil. She writes, "Since soil is the sacred mother, the womb of life in nature and society, its inviolability has been the organizing principle for societies which 'development' has declared backward and primitive" (Shiva and Mies, 1993). Though it is important to include these spiritual aspects in a study of GED, I think that Shiva's approach falls short because of its limited focus.

Gender Planning

Gender planning, a top-down reformist approach to established development traditions moves beyond the spiritual focus of cultural ecofeminism (Hombergh, 1993). Caroline Moser, the British social anthropologist who designed this approach, believes that established traditions do not adequately address the question of women and development. She devised the following classification for policy approaches related to this issue:

(1) The welfare approach, popular during the 1950s and 60s, was based on the stereotype that women's work solely involved reproduction. Policy makers viewed women as victims of underdevelopment, an idea that led to top-down handouts of goods and services.
(2) The equity approach, which arose in the early 1970s, focussed on reducing inequality between women and men, but lacked an examination of gender and power issues.
(3) The anti-poverty approach, also from the 1970s, focussed on women's basic needs and women's productive role, but does little to minimize sexism.
(4) The efficiency approach, which began in the late 1970s, viewed women as human resources for development.
(5) The empowerment approach, the most recent approach which maintains that by strengthening and extending women's power, historically based inequalities can be eliminated. A bottom-up approach largely overlooked by governments and development agencies, it consequently may be slow in affecting significant changes for

women (Hombergh, 1993 and Moser, 1993).

Moser's gender planning approach avoids some of the short-comings of these other approaches to women and development. The goal of gender planning is to 'ensure that women, through empowering themselves, achieve equity and equality with men in developing societies' (Moser and Levy, 1986). Moser argues that gender planning should be a specific approach in development planning because in the past, development planners using traditional approaches have overlooked women's concerns. Gender planning is based on the belief that because men and women hold different roles in society, they consequently have different needs. According to Moser, because many development projects ignore the 'triple role of women', that is, women's reproductive, productive, and managerial roles, they are ineffectual in improving women's lives (Moser and Levy, 1986). Women's reproductive role includes child-bearing and domestic tasks, but also care and maintenance of the workforce (husbands and working children), and the future workforce (infants and school-going children). The productive role refers to their income earning activities while the managerial role relates to 'activities undertaken primarily by women at the local level', including monitoring firewood and water resources (Moser, 1993). Because women must balance these three roles in their lives, gender planning is an 'intersectoral planning tradition', differing from past traditions that focussed on each role separately. By disaggregating households on the basis of gender instead of viewing households as indivisible units where all members have equal access to resources, planners can more readily identify women's triple role.

Besides enabling planners to recognize women's triple role, the gender planning approach also helps planners understand the differences between women's 'practical' and 'strategic' interests. Practical interests, determined by women themselves, are needs associated with everyday life,

while strategic interests are long-term goals aimed to end existing inequalities between men and women. Strategic interests, which differ depending on the 'particular cultural and socio-political context in which they are formulated', may include an abolition of the gendered division of labor or a reduction in women's childcare and domestic burdens (Moser, 1993). Because many development projects focus solely on practical interests, Moser believes that this distinction will force planners to become more sensitive to women's strategic interests (Moser and Levy, 1986).

Besides devising gender planning as a new theory to women and development, Moser also designed a methodology to gender planning, explaining how to implement the approach. Supposedly neutral traditional planning methodology, blind to gender differences and separated from a 'concrete reality or context', often results in women losing access to resources in development projects. Gender planning methodology which is rooted in context, helps planners better understand project strengths and weaknesses, particularly whether projects meet both strategic and practical interests. Moser proposes a six-step process in order to implement the gender planning approach, steps neither mutually exclusive or sequential in practice. The purpose of step one, gender diagnosis, is to understand how the mechanisms behind development problems and the solutions identified by government will impact gender- determined access to resources and affect women's practical and strategic interests. Gender consultation and participation, the second step, means that local women participate in project planning to ensure that their needs will be addressed. Step three, entry strategy, defines what is possible for gender planning to achieve in a given situation. This step influences policy and project design and implementation. The goal of step four, policy, programme and project formulation, is to make gender planning part of mainstream development. Moser believes that modifications in policy and program planning, not

just intervention in projects themselves, is necessary in order to create real changes in terms of gender and development. Step five, institutional intervention, ensures that 'agencies possess the necessary resources and political commitments to successfully incorporate the gender planning theory into projects, programmes, and policies' (Moser and Levy, 1986). Finally, the sixth step, monitoring gender relationships, is a result of the 'iterative' nature of the gender planning process, 'enabling it to adopt and react to changes' (Moser and Levy, 1986). Monitoring gender relationships also establishes gender planning as an integral part of development planning in general.

Limitations of Gender Planning

Though the gender planning approach, if successfully implemented, may bring more attention to women's needs in development projects, there are some limitations to using the approach to study GED. Two potential problems arise in designing projects to meet women's strategic interests. First, it is questionable that local power elites, normally elder men, would allow development planners to implement projects that could erode their power. Consequently, they might refuse to cooperate with planners desiring to address women's strategic interests in projects. Second, while Moser indicates that women themselves will be involved in determining what their practical interests are, she is unclear about who will define their strategic interests. Some of the strategic interests she mentions, ending the gendered division of labor for instance, come from western feminist thought, and may not coincide with Third World women's needs. To avoid the paternalism (maternalism?) that often results when outsiders decide what is 'best' for locals, I think that Third World women, rather than western feminists, should outline their strategic interests.

Third World women do react against the inequalities present in their lives without outsiders

telling them what to do. For example, because they were earning little money working as individual laborers in irrigated rice fields, Mandinka women in The Gambia formed communal labor groups to increase their income earning potential. These groups also helped Mandinka women to gain more political power in their communities (Watts, 1993).

Another possible limitation to gender planning is its iterative methodology. While this methodology could be positive in that it allows project managers and development planners to modify projects when necessary, it may have negative repercussions if planners and managers are poorly trained. Because planners and managers are not given definitive instructions on how to run projects or structure planning, planners and managers hold greater personal responsibility for the decisions they make. Without extensive training, or without provision of funds needed to finance such training, managers and planners may be ill-equipped to handle their responsibilities in this framework.

A more fundamental limitation of the gender planning approach is that it lacks an environmental dimension. In her approach, Moser does not include provisions to examine the ways projects may impact the environment, or how environmental changes influence women's lives. Because environmental changes may affect production practices and access to resources, I think that any approach to gender and development should include environmental concerns.

Political Ecology

Unlike the gender planning approach, political ecology includes an environmental dimension. Designed by Piers Blaikie in the mid 1980s, political ecology includes political economy and ecology in its framework and branches several temporal and spatial scales (Fischer, 1994). A researcher using this approach examines the constraints the broader political economy places on

local production strategies in order to determine how changes in land use can lead to environmental degradation. Changes in production activities due to the broader political economy could cause changes in the distribution of resources locally, which could create changes in the physical environment. This process may then loop back, environmental changes affecting land use and production practices.

In this 'bottom-up' analytical approach, researchers should first examine the politics and economics within the household, considering factors like the division of labor and access to resources. Researchers should then analyze household decisions about land use and production practices, studying a household's factor endowments, meaning access to land, labor, and other resources. This analysis should include all income-generating opportunities because 'land-use decisions are affected by these other forms' (Blaikie, 1985). For example, in South Yemen, small-holders abandoned terracing because there was a labor shortage due to high outmigration to Saudi Arabia and the Gulf (Blaikie, 1985). After completing this household analysis, researchers should examine the broader political and economic structures that affect small-holders' production practices, land- use strategies, and income generation opportunities. Examples of such structures, which should be studied from local, state, and international levels, include commercialization of agriculture or taxation from government. Next, researchers should analyze the nature and interrelationships of the state, government, and administration to determine their political and economic interests. Following this examination, researchers should consider, from the perspective of the individual producer to the state, whether or not it is in their perceived economic and/or political interest to change production practices and land-use patterns to reduce environmental degradation (e.g. participate in soil conservation programs). For politically weak

small-holders with limited access to resources, there may be little individual incentive to alter production practices. Poor small-holders, often pushed onto marginal lands, may have shortened planning horizons because short-term needs outweigh long-term concerns. With commercialization of Third World economies, small-holders may face the 'reproductive squeeze', meaning that they could be pressured by shifting terms of trade. A rise in prices of agricultural inputs combined with a drop in crop prices could further impoverish small-holders, making them work land harder in some cases. Finally, a loss of necessary productive inputs due to social, economic, and environmental factors, could make it difficult for small-holders to subsist without potentially degrading the environment (Blaikie, 1985 and Turner, lecture).

After completing this analysis, researchers should examine first if land-use changes are causing environmental degradation , and second, if the effects of environmental degradation are looping back and causing a decrease in production or asset value. Further, because degradation patterns differentially affect some households more than others, peoples' responses to environmental change are varied. For example, in Zambia, soil erosion more directly impacts politically weak small-holders rather than commercial farmers who move on to new fields or, in the case of European farmers, leave the country altogether (Blaikie, 1985).

Limitations of Political Ecology

There are several limitations associated with this approach that researchers should be aware of before using it as a framework to study GED. One criticism of political ecology is that it is too inclusive, and should instead focus on major political, economic, and environmental factors related to land use change. A second limitation of political ecology is that while poverty is linked to environmental degradation in the Third World, it is plausible that accumulation of wealth (i.e.

cattle), could also degrade the environment. Another problem with the approach relates to the land-use change causing environmental degradation link. Often, researchers equate land-use change with environmental degradation, assuming that because there are changes in land-use, that there are also changes in the environment. This problem has plagued social scientists in particular since their background and training may lack an ecological perspective. Conversely, physical scientists using the approach may focus on ecology at the expense of political economic concerns. In Blaikie's individual-user model, the assumption that within households, an individual's access to resources is static, presents another limitation in this approach. Women's access to resources will likely change in cases of divorce for instance (Turner, lecture).

Two final problems of political ecology are the difficulty of relating multiple temporal and spatial scales to each other, and the ambiguity of the term environmental degradation (Fischer, 1994). Researchers must consider whether or not they can accurately extrapolate data from one scale to another, and should define environmental degradation in terms of his/her study. Concerning this definition of environmental degradation Blaikie and Brookfield write:

> Socially, degradation must relate to capability, and it is only if the degradation process under one system of production has reduced the initial capability of land in a successor system, actual or potential, that degradation is, as it were, carried across the allocation change. In actual practice, this is often the case, since more serious degradation reduces capability for most, if not all, future possible land uses (cited in Fischer, 1994).

Despite these limitations, I think that political ecology is a good approach to use in studying GED because it allows researchers to carefully examine the political, economic, social, and ecological factors that affect women's production practices and access to resources. Researchers can then determine if, in a particular society, there is differential access to resources based on gender, or if there is a sexual division of labor. Researchers can also examine the ways

development projects impact access to resources, production practices, and gender relations.

The following chapter of this paper includes a summary of Judith Carney's studies on GED concerns related to rice irrigation projects in the Gambia. Focussing mostly on gender relations rather than the ecological change Blaikie stresses, Carney deals effectively with the 'static access' problem of Blaikie's individual user model, illustrating how women's access to land and crops has changed as a result of the construction of irrigated rice perimeters. Her work, completed from a somewhat refined political ecology perspective, illustrates further the benefits of using the framework to study GED.

Chapter 2: Gender Conflict and Agrarian Change in The Gambia

Introduction

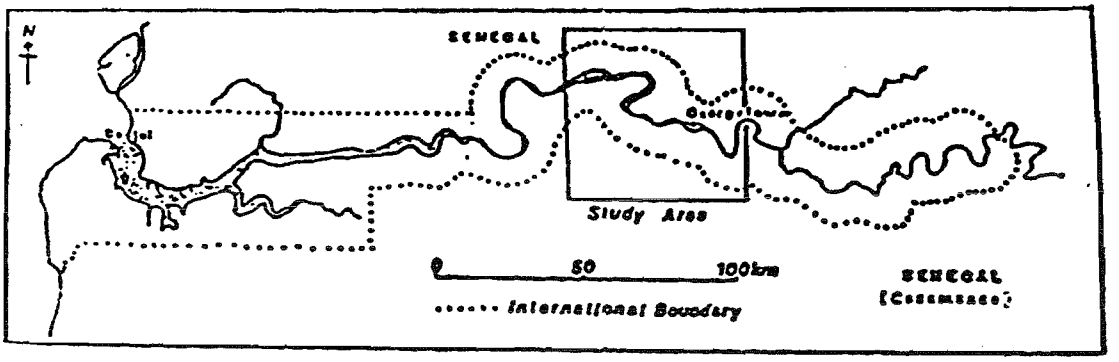
Judith Carney, studying the links between agrarian change and gender relations among the Mandinka, examines 'how diversification and food security are transforming wetland environments in The Gambia' (Carney, 1993). Carney argues that development projects which promote irrigation and year-round rice cultivation create conflicts between men and women who fight over 'the distribution of work and benefits of increased household earnings' (1993). With these changes in household economy come new claims about land tenure that often allow male heads of household to enclose wetlands, control female labor, and reap the agricultural surpluses which result from such labor.

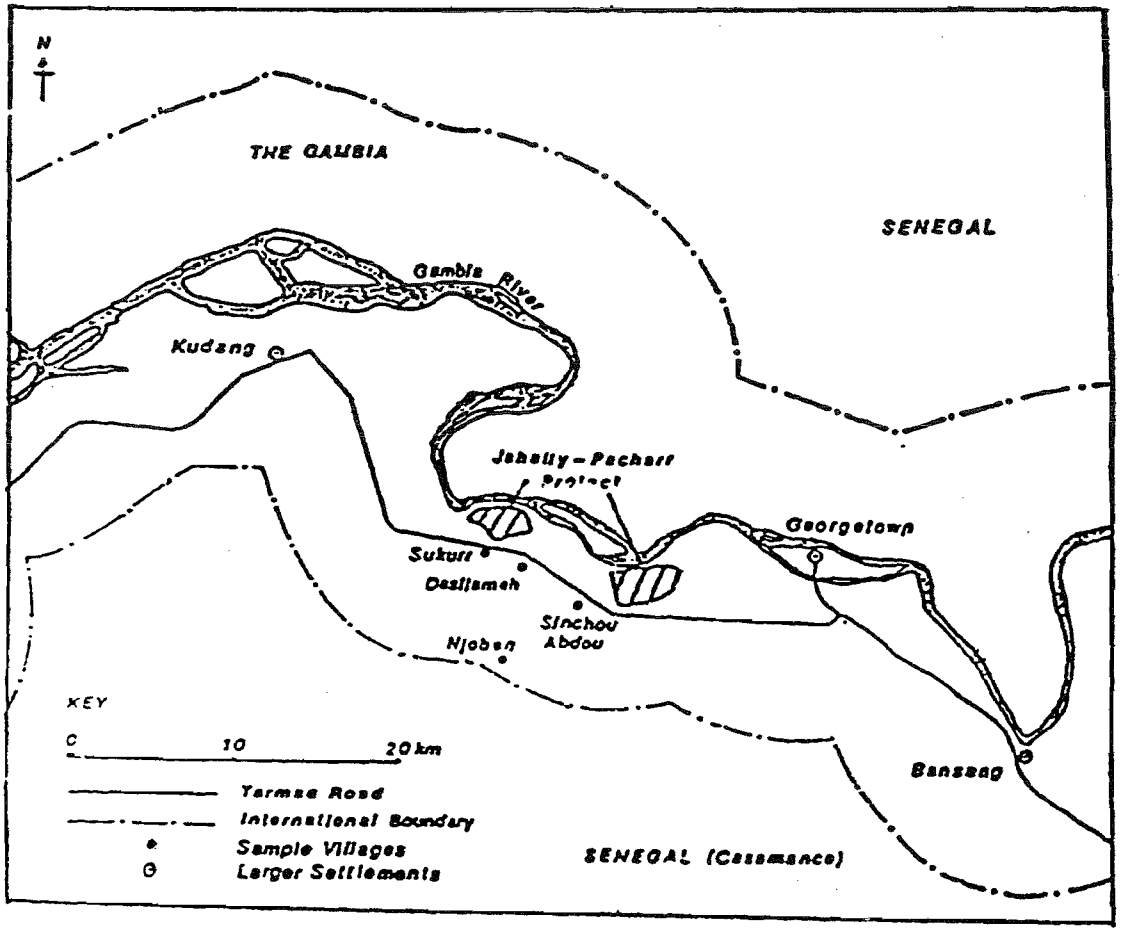
Background

The Research Setting

The Gambia is a narrow strip land, 25 to 50 km wide, and 325 km long, that surrounds the Gambia River (Figure 1). One of the smallest countries in Africa, The Gambia lies on the fringe of the Sahel along the West African coast, and is situated between 13 and 14 degrees North latitude (Schroeder, 1992). The low-lying river basin gradually rises to an upland plateau where rainfed crops like sorghum, millet, maize, and groundnuts are cultivated. Rice and vegetables are grown in low-land areas, both in the alluvial plain and in inland swamps (Carney, 1993). Agricultural production is governed by the arrival of the rainy season which lasts from late June to October. In the past century average annual rainfall has decreased between 15 and 20 percent, the most drastic changes occurring in the past twenty years (Schroeder, 1992).

Figure 1--- Map of The Gambia with study area inset





Source: P. Webb, 1989

Mandinka Social Structure

The Mandinka, the predominant ethnic group in The Gambia, have a highly stratified society. While researchers have devised numerous structures for classifying Mandinka society, Patrick Webb divides the society into five main groups that he calls lineages (1989). Villagers who are descendants of nobles from the pre-colonial period belong to the highest status group, the 'master lineage.' Before the abolition of slavery in 1934, nobles' status was linked to slave ownership and military prowess. In the present day, decisions affecting the village as a whole must be sanctioned by this group. The founding lineage follows in rank after the master group, and is composed of village founders and their lineages. Because they first cleared and settled the village lands, members of this group are elites in their communities. The third group, the 'freeborns', includes a heterogenous mix of farmers, traders, and religious instructors. In most villages, this is the largest group. Following the freeborns is the artisan lineage, a group consisting of specialist smiths, leather workers, musicians, potters, weavers, and carpenters. Though most artisans were not slaves, they were, and continue to be, connected with a higher status household in a patron/client relationship. The fifth and lowest ranking group is comprised of ex-slaves who were formerly agricultural or domestic workers. Though today there is some intermarriage between ex-slaves and other groups, there is still a stigma attached to this lineage. In some instances, former master households are still obligated to help ex-slaves during food shortages. In return, ex-slaves may be forced to work in fields belonging to their former masters (P. Webb, 1989).

These lineage categories are important in determining one's access to land and political power. Though the quantity of land held by a particular household often depends upon the size of its labor force, social status also plays a role, the most prestigious families possessing the best quality

land. Though the village chief, the *Al Kalo*, and the religious leader, the *Iman*, are elected positions, normally men from only the master or founder lineages hold such positions. Ex-slaves and artisans are not eligible candidates for these offices. In contrast, any man or woman is able to join the village's council of elders once he/she reaches the appropriate age (P. Webb, 1989).

The compound is the basic residential unit in Mandinka society. According to Carney, the compound is 'composed of a patrilineal kin group, which in the polygamous society, consists of a man and his wives, his sons and their wives and families as well as elderly widowed mothers and mothers-in-law' (Carney, 1988). Within the compound, all able-bodied individuals must provide labor for communal food production.

The compound itself is composed of consumption units called *sinkiros*, and production units called *dabadas*. The *sinkiro* embraces those people who eat together, but also refers to the basic production unit for women, joining the labor of co-wives, unmarried daughters, and daughters-in-law. Though the ultimate leader of the *sinkiro* is the compound head, the operational head is often the woman within the unit who holds the most status (P. Webb, 1989). Men 's labor is organized within the *dabada*. Each compound may have one or more *dabadas*, which in turn may have one or more *sinkiros* (Carney, 1988). The existence of numerous *dabadas* and *sinkiros* within the compound is a result of polygyny and the tradition of married sons living in their father's compound. These sons, especially after their father's death, often prefer to have their own production and consumption units. Quarrels between co-wives sometimes necessitate the creation of separate *sinkiros* for a single *dabada* (Dey, 1981).

Land Use Categories

The land tenure system in rural The Gambia is communal with individual use and ownership

rights. Land within the system falls into one of two categories, each category carrying different labor relations and crop rights. Land claimed and used by the compound is called *maruo*. All compound members provide labor for cultivation on *maruo* land, the harvest from which is controlled by the compound head. Traditionally, men meet their *maruo* obligation by cultivating millet, sorghum, maize, or groundnuts on the uplands, while women grow rice in low-lying areas to fulfill their responsibility (Carney, 1993). Men's *maruo* crops are cultivated by the *dabada*, while women's *maruo* cultivation is organized within the *sinkiro* (Dey, 1981).

A second land use category, *kamanyango*, refers individually owned land. The *dabada* sometimes cultivates men's *kamanyango* crops in order of the seniority of its members. Though most women farm their *kamanyango* fields individually, some women cultivate a common *kamanyango* and divide the produce after harvest. Additionally, some women have access to non-*sinkiro* reciprocal labor networks (Dey, 1981). Individuals acquire *kamanyango* fields either by clearing uncultivated, unclaimed land, or inheriting it from relatives. Inheritance is an important way for women to gain access to land, since they often inherit land from their mothers (Carney, 1988).

A second and more widespread definition of *kamanyango* grants individuals usufruct rights to grow crops on compound, or *maruo* land. Dependent compound members, meaning junior males and adult women, are given access to personal fields in return for providing labor on *maruo* land. Because individuals control land use on *kamanyango* fields and hold rights to the crop produced, '*kamanyango* labor rights provide subordinate family members the means to obtain cash from farming' (Carney, 1993). These plots are critically important to the economic independence of Mandinka women who, living in a largely polygynous society where men and women's household

budgets are separate, use their *kamanyango* earnings to buy clothing and supplemental foods for children. Some women do not have separate *maruo* and *kamanyango* fields, but after the harvest take part of the crop for themselves and use the rest for the compound (Dey, 1981). Mandinka women, who do not have access to the uplands, grow rice and vegetables in the low-lying areas where they acquire *kamanyango* rights.

Agroecological Zones in Mandinka Rice Cultivation

The Mandinka developed methods for cultivating rice in five distinct agroecological zones (Figure 2). The main determinants that shaped of evolution of Mandinka rice cultivation include irregularities in annual and seasonal precipitation, micro-environmental diversity, and an abbreviated wet season that intensifies labor demands. Other factors that influenced this evolution are variations in soil type, topography, and moisture regimes. Carney devised a classification of

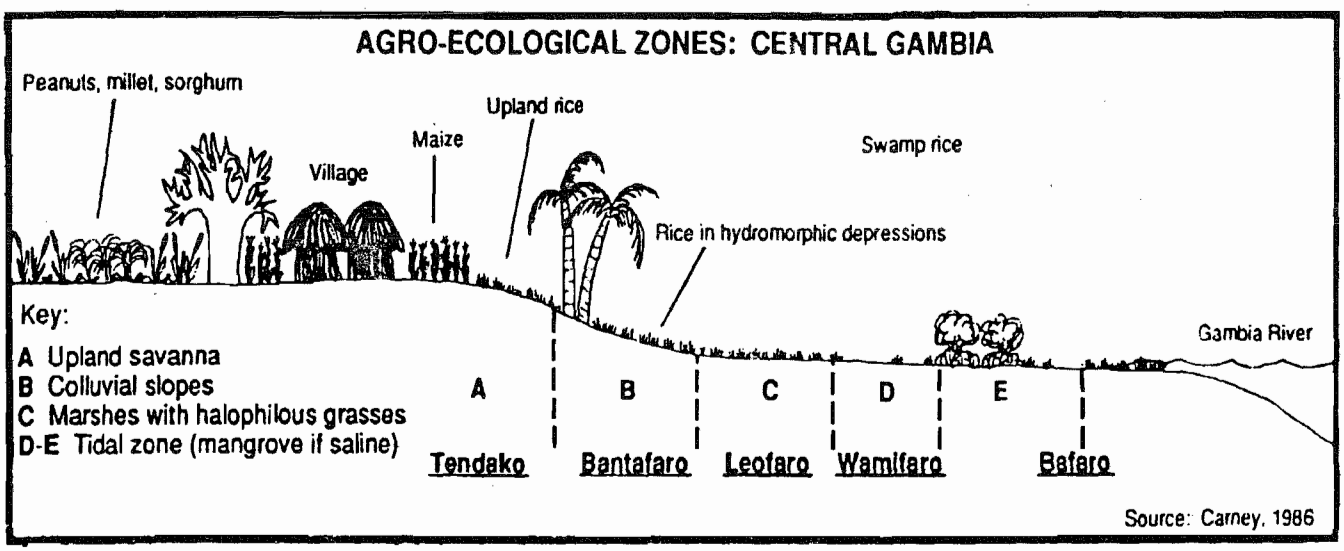


Figure 2. Agroecological Zones in The Gambia (Source: Carney, 1991).

these rice production zones based on soil and water management principles. The first zone, *tendako*, is where Mandinka cultivate rainfed, upland rice in sandy, free-draining soils. Precipitation meets all the moisture demands of this crop. Phreatic rice, cultivated in

hydromorphic soils, is grown on transitional slopes between upland and riverine production areas, or in hydromorphic depressions called *bantafaro*. A combination of rainfall and high water tables, underground streams, or run-off provide the rice with necessary moisture. According to Carney, this zone is 'characterized by heavy alluvial/colluvial soils enriched by organic matter of high water-holding capacity' (Carney, 1991). Because farmers can generally grow rice in *bantafaro* even when rains are sporadic, cultivation of the zone is crucial to food production strategies.

Besides growing upland and phreatic rice, Mandinka cultivate rice in lowland, riverine areas that are periodically inundated by the tides. This tidal rice is cultivated in three separate zones based upon the frequency of tidal flooding. The seasonal intrusion of marine water in some riverine areas further impacts tidal rice cultivation, though marine water does not affect upstream stretches which have freshwater year-round. Cultivation is possible in seasonally marine areas if the period of freshwater exceeds three months.

The land that borders rivers and their principal tributaries, *barfaro*, is flooded daily. In riverine areas where there is freshwater year-round, farmers often practice double cropping. The tides carry alluvium rich in organic matter to the zone, eliminating the need for inorganic fertilizers. *Wamifaro* is the zone of tidal rice cultivation that lies behind the daily flooded swamps. Bi-monthly, lunar tides wash the zone which expands in area during seasonally high river levels. In freshwater areas *wamifaro* can be double cropped. In seasonally saline areas a final zone, *leofaro*, lies immediately behind the *wamifaro* zone and is occasionally flooded by high tides. Cultivation in *leofaro* is largely dependent on rainfall which flushes out salts that collect in the zone during the dry season. Farmers may plant their crop only after desalinization (Carney, 1991).

Sexual Division of Labor

Traditionally, women have been the chief rice producers in The Gambia, growing the crop in low-lying areas and in inland swamps. Men grow millet, sorghum, maize, and groundnuts in the uplands, participating little in rice cultivation. However, prior to the 19th century, agriculture was divided mostly according to specific tasks. Both men and women were involved in lowland and upland agriculture, men clearing fields for rice cultivation and women weeding upland fields for example. This division of labor changed by the mid-19th century, in part because of the growth of groundnut cultivation. The commoditization of The Gambian economy combined with British colonial rule, with its taxation and fiscal policies, led to an increased reliance on groundnuts as a cash crop. With this reliance came an 'increasingly specialized use of agricultural space' and a more gendered division of labor among the Mandinka (Carney, 1993).

Women's rice production became more critical to household subsistence with the increase in groundnut production (Weil, 1973). According to Carney, "By the end of the century, Mandinka men's growing emphasis on peanut cultivation resulted in a reduction in millet and sorghum production for household subsistence" (Carney, 1993). The gendered division of labor became more spatially segregated in consequence, men growing cash crops in uplands and women cultivating subsistence crops in the lowlands. This specialized use of agricultural land and sexual division of labor helps explain why gender conflict has resulted in response to rice irrigation projects implemented during the 20th century (Carney, 1993).

History of Rice Development

Rice is the dietary staple of The Gambia, and is an indigenous food crop. In an effort to increase rice production in The Gambia, thus decreasing the country's dependence on rice imports,

numerous international development agencies and foreign governments have funded rice development projects. Early projects focussed on improving access to fields and introducing new seed varieties. After World War II, the colonial government funded programs to clear mangrove swamps, build causeways and bridges, and distribute improved seeds. Participants were also taught new ways to prepare seedbeds (Watts, 1993). By the mid-1950s, the area under cultivation had doubled to 49,000 acres, and milled rice imports had decreased by 80 percent.

The success of the project depended upon an increase in female labor, especially since men did not labor in the expanded rice fields. Rather than working in these fields, men continued to sell groundnuts and bought cereals in response to shortfalls in food production (J. Webb, 1992). The colonial government recognized that men's refusal to cultivate rice posed the biggest obstacle to the program, but were unsuccessful in recruiting male labor. Attempting to induce men to grow rice, the government brought a group of male workers to The Gambia from Sierra Leone where men cultivate rice, to teach Mandinka men basic rice cultivation techniques. The project failed to end the gendered division of rice cultivation, in part because Mandinka men viewed rice as 'wet work', and a 'women's crop' (Watts, 1993).

Besides this swamp improvement project, the colonial government also promoted irrigation as a way of increasing rice yields. In 1949, the Colonial Development Corporation (CDC) implemented a large-scale irrigation project at Jahaly Pacharr, an area on the river's south bank in the McCarthy Island Division (P. Webb, 1989). The project differed from past efforts in that the CDC leased land to female growers. It failed miserably due to both technical and social reasons, notably a poorly designed irrigation system and a lack of male or female interest in wage work. However, more than a simple failure, the CDC project is 'notable for adumbrating the post-

independence emphasis on irrigation as well as the gender-based conflicts that would surface in subsequent wetland development projects' (Carney, 1993).

These gender conflicts resulted because of disagreements about customary land tenure, centering on attempts by village elites or heads of household to reduce women's land and labor rights in rice farming. Specifically, land where an individual has been granted usufruct rights (*kamanyango*), was converted to communal land controlled by the household head (*maruo*). This type of conflict arose during the colonial government's rice projects of the 40s and 50s where access to fields and productivity improved. Men began questioning women's customary use rights, fearing that land would be alienated from the compound because of women's access to land. Some Mandinka men believed that "if women mark the land and divide it, it would become 'women's property' so that when a husband dies or divorces his wife, the wife will still retain the land, which is wrong. Women must not own land" (Carney, 1993). A similar result occurred after the failure of the CDC irrigation project. Because the government had operated the project on a sharecropping basis with each woman, women claimed ownership of the land after its failure. Household heads deemed the fields *maruo*, causing women to lose their individual fields as well as their former usufruct, *kamanyango* rights to the land (Carney, 1988). For women, this meant a loss in personal income without a decrease in work burden.

Despite the failure of the CDC irrigation scheme, three similar schemes followed its suit. These projects include the Taiwanese Agricultural Mission (1966-74), the World Bank Agricultural Development Project (1973-76), and the Agro-Technical Team of the People's Republic of China (1975-79) (Dey, 1981). The projects promoted import substitution, encouraging domestic rice production to counter the 9,000 tons of rice imported to The Gambia

each year. Declining groundnut prices exacerbated this problem, eroding the government's foreign exchange reserves and thus their ability to purchase imported rice (Carney, 1993).

The development of small-scale, mechanized production with complete water control, combined with the double-cropping of high-yielding, green revolution rice seeds, was supposed to increase productivity, but avoid the labor shortages of the CDC scheme. Donors constructed small-scale perimeters of about 10 to 20 hectares in size and hoped to revolutionize the technical means of production by using small pumps, rototillers, and threshers. They also planned to 'capture' men's labor by extending production into the dry season after men had harvested their rainfed, upland crops. Unlike the CDC scheme, participants in these more recent projects controlled labor allocation on the perimeters and maintained direct use rights to the land (Watts, 1993).

Despite these modifications from the CDC scheme, the projects failed to meet donor and participant expectations. According to Watts, "Cropping intensities were low, productivities fluctuated wildly, and wet season yields were significantly lower than dry season" (1993). Also, while men did begin to cultivate rice in these schemes, they labored during the dry season only, working in upland fields during the wet season. In contrast, women worked year-round in the irrigated perimeters, perimeters that they did not control (Watts, 1993).

Social Repercussions of Phase I Rice Irrigation

Impact on Gender Relations

These projects, forming what Carney calls the first phase of irrigation in The Gambia, worsened the nascent gender conflicts that resulted from the CDC scheme. Donors introduced green revolution technology to male heads of household despite the fact that rice was traditionally

grown by women. Because donors gave men irrigation packages, many have designated their perimeters as *kamanyango* (Carney, 1988). When household heads claim perimeters as *maruo,* they depend on women's labor to meet projects' double-cropping requirements. By giving men control of irrigation technology, donors unwittingly enabled them to gain control of female labor and the surpluses gained from double-cropping. Heads of household claimed female labor under the communal land use category *maruo*, a claim that, due to the double-cropping requirement, meant year-round labor. There was no precedent for year-round *maruo* claims for labor, since historically women were required to perform these labor obligations for a single season only. While village elites and male heads of household aimed to include women's participation on the irrigated perimeters, granting them access to rice lands, this 'access' meant that women would labor on plots 'whose benefits would flow to men as disposable surpluses' (Carney, 1993).

Irrigated rice projects have thus affected the social organization of agricultural production among the Mandinka in several ways. First, projects have lessened women's access to land and weakened their control of rice crops. Second, these changes have enabled the household head to increase his control of female labor. Third, the conflicts surrounding women's rights to own rice land have led to new traditions in the farming system created to limit women's control of crops. Finally, due to the outcome these struggles, men control the 'investible surplus of rice production' (Carney, 1988).

The Household Question

The resultant gender conflicts and overall failure of the irrigation projects are consequences of project donors' 'uninformed view of The Gambian household based production system' (Carney, 1993). Dey, commenting on the Taiwanese project relates, "The Taiwanese technicians assumed

that the local subsistence production system was based on a household which was a unified unit of production directed and controlled by a single male head" (1981). By making these assumptions, donors jeopardized the success of the project from its onset.

These misconceptions about the African household are not limited to development planners however, but exist in many studies about Africa. Economists typically study African societies in terms of the household, in part because they can readily use the unit in statistical modelling. Survey data are also collected in terms of the household. While using household methodology allows economists to simplify social relations in order to understand commodity flows, it masks the intra-household relationships between men and women (Guyer, 1981). P. Webb criticizes using the household model for studying African societies because of the tendency to assume that 'the family, the house, the household, and the farm exactly coincide, and the male head of the family is typically the decision maker' (1989). To obtain a more accurate understanding of agricultural production within African societies, researchers should gear studies to include intra-household dynamics. For example, in determining access to labor, one should consider how work is done, who works for whom, how labor terms are negotiated and how 'the micropolitics of labor mobilization and control influence output, productivity, and distribution' (Berry, 1993). Donor consideration of such intra-household concerns, while not ensuring project success, could at least decrease a project's chances of failing.

The IFAD Irrigation Project

In 1984 yet another irrigation project began operating at Jahaly Pacharr. The project, funded by the International Fund for Agricultural Development, was a large-scale, centralized operation that implemented contract farming production relations. It was also designed to repair the effects of

past projects by awarding women the right to control production on the irrigated perimeters. By 1987, the project was to encompass nearly 1500 hectares and include over 2000 families from 70 villages (Carney, 1988).

During the initial stages of the IFAD project in the late 1970s, planners were concerned chiefly with establishing double-cropping on the perimeters, and accessing the necessary labor to achieve the double-cropping goal. However, while planners realized that labor from dependents, particularly from women skilled in rice cultivation, was crucial to double-cropping, they were also sensitive to the international attention past projects had received concerning the deleterious effects of irrigation schemes on women farmers. Their solution to these concerns included the following provisions: First, the Gambian government built the perimeters on lease land, thereby controlling land use and farmer productivity. Second, planners implemented contract farming, requiring farmers to double-crop and repay the seasonal credit package. Project management could evict farmers who failed to meet these guidelines. Third, to meet labor demands, the original female rice cultivators were given usufruct access to the irrigated land. Government officials recognized the importance of women's labor to meeting production goals, admitting, "....women are better than men as far as transplanting is concerned and they are also better than men as far as working in the water...so quite frankly we expect a lot of labour from women, more so than from men" (Watts, 1993). The project's focus on gender equity caught attention from donors, many donors funding the project based on this objective. According to IFAD, "In assisting the Government (of The Gambia) to reach its goal of rice self-sufficiency and to improve the lot of the rural poor, the project makes special reference to women, who traditionally have been the major rice growers under arduous swamp conditions" (Carney, 1988).

Meeting the equity objective proved difficult to achieve, however, evident from the initial distribution of plots. Though donors and management specified that the original female rice cultivators were to receive rights to the irrigated plots, 87 percent of the plots were registered in male names after the distribution process was completed. This result created conflict between Mandinka men and women, largely because women's swamps rice fields had been absorbed into the project. If denied control of irrigated plots, Mandinka women, who do not have upland *kamanyango* rights, would not have access to alternative areas to grow cash crops. Women would also lose their right to cultivate a personal field in exchange for laboring on *maruo* fields. One woman, aware of this predicament said, "It seems this project is just like the Chinese one when we suffered before. We aren't going to put up with that again... I have this to say to you men. We women aren't going to accept the way we have been treated in the past. We were asleep then. But now we are awake" (Carney, 1988).

Besides this gender conflict, disagreement arose between project management and IFAD over management's failure to give plots to women. Because IFAD funded the Jahaly Pacharr scheme mainly in response to the Gambian government's promise to ensure gender equity in the project, the management's inability to meet this goal led to conflict. International pressure on IFAD to protect the project's equity goal increased after the BBC circulated a documentary about plot distribution at Jahaly Pacharr, a film that highlighted the plight of Mandinka women. In response, IFAD took over the plot allocation process and distributed an additional 340 hectares of irrigated land. In Jahaly, 99 percent of plots were registered in women's names, while in Pacharr, 66 percent of plots were given to women. However, though these results were praised as a 'successful implementation of equity goals in rural development,' in practice they did little to

ensure women's access to plots (Carney, 1988).

Social Impacts of the IFAD Project

Intra-Household Struggles over Land and Crops

The social repercussions of the IFAD sponsored project were similar to the effects of past irrigation schemes; women lost access to land and crops. Though IFAD registered project plots in women's names, Mandinka men and women did not consider perimeters individual fields, but viewed them as *maruo*. Men agreed to the second plot distribution because project management listed their names alongside their wives, indicating that the plots were compound land. Also, in cases of divorce where a woman was geographically displaced from the village, her plot would be given to another female member of her ex-husband's compound, a fact that further legitimized the *maruo* designation. Because *maruo* status was necessary for men to meet the labor demands of double-cropping, management was not eager to fight for women's *kamanyango* on the perimeters. IFAD was able to redistribute project land solely because men had *de facto* control of the plots.

In addition to giving the compound head control of labor, the *maruo* status of perimeters meant that he controlled production. Though previously *maruo* crops were not sold, the double-cropping requirement created crop surpluses, allowing heads of household to sell rice. This fact allowed men to use *maruo* labor to grow their *kamanyango* crops. In contrast, Mandinka women have lost access to *kamanyango* fields, laboring year-round on the *maruo* perimeters. Instead of meeting its equity goals, the project has 'increased the power and accumulation possibilities of senior males' (Carney, 1988).

Women's Responses to Labor Demands

Because women failed to receive *kamanyango* rights on project land, they began to negotiate with

their husbands, requesting payment for their work. By the end of the project's third year, participants had devised the following resolutions to this conflict: (1) Some women worked on irrigated fields (*maruo*), but held usufruct rights to tidal and rain-fed plots. (2) Women labored on irrigated perimeters, but received a portion of the rice crop as payment. (3) Women stopped working on the perimeters because compound heads could not, or refused to offer them labor renumeration in some form. Women in the first group often shared tidal and rainfed plots with other women, and cultivated fields for one season only, factors that limited their income-earning potential. Most women at Jahaly Pacharr fell into the third category, and began pursuing other activities to generate income. Many women joined work groups and hired themselves out as wage laborers, while others cultivated market gardens, and/or engaged in trade (Watts, 1993).

This 'proletarinization' of women's labor contributed to an erosion of reciprocal labor networks among Mandinka women. Women began working collectively as wage laborers where previously they worked together in cooperative labor groups, easing the impact of labor bottlenecks on the individual. The cooperative groups also helped sick and pregnant women who were unable to labor in fields. While the new wage relation in Mandinka society may have liberating effects for women, such as promoting an increased awareness concerning local political issues, this change could also promote continued gender conflict (Watts, 1993).

Conclusion

Studying agrarian change and gender conflict in The Gambia, Carney has effectively modified Blaikie's political ecology framework to examine the social implications of the development of irrigated perimeters at Jahaly Pacharr. Concerned mostly with women's diminishing access to rice fields, Carney solves the 'static access' problem in Blaikie's individual user model, illustrating

instead that one's access to resources over time is not guaranteed. While Carney's model does not include a strong examination of ecology, meaning specifically how ecological changes may have affected women's access to land, this exclusion does not undermine her study since men's ability to control access to irrigated perimeters within traditional Mandinka land tenure, rather than ecological change, is causing women to lose rights to land. In other words, Carney's model works effectively given the situation at the perimeters in Jahaly Pacharr. In the following chapter, I plan to test Carney's framework for studying GED further, and will use the model to examine the social repercussions of irrigated agriculture in the Senegal River valley.

Chapter 3: The Social Implications of Irrigated Agriculture at the Bakel

Introduction

In using Carney's model to study further the social implications of the development of irrigated agriculture, I will focus on the perimeters at Bakel in the Senegal River valley. In this chapter, I plan to both analyze the situation at Bakel and compare it to the state at Jahaly Pacharr. I also hope to determine if Carney's model is appropriate for the Bakel setting. Initially, because of the similarities in the geomorphology and local populations of the two sites, Carney's model seems relevant to the Bakel. However, because there are also significant differences between the two sites, Carney's framework may need modification to more accurately reflect the Bakel situation.

Background

The Research Setting

Bordering the Senegal River, the department of Bakel lies in Eastern Senegal near the boundaries of Mali and Mauritanita (Figure 1). Bakel, which rests in what historically was the Soninke kingdom of Gadyaaga, is a transitional zone between the valley the upper basin of the Senegal River. The river system is highly seasonal, its flow varying dramatically between the dry and the three month rainy season which lasts from July to September (Miller, 1991). At the height of the flood season in September, the average flow is 3,320 cubic meters per second (cumecs), while in May and June, the average flow falls to around 10 cumecs. There is also substantial interannual variation in the river's flow depending upon the intensity of the rains. During the drought years of the late sixties and early seventies, the yearly average flow rarely rose above 500 cumecs (P. Bloch, 1993).

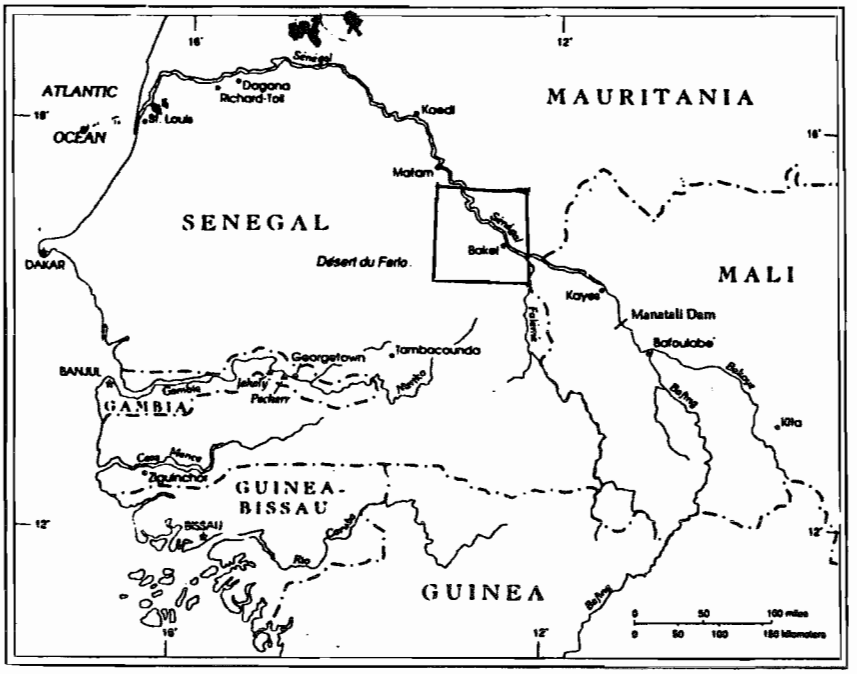


Figure 1. Map of the Senegal and Gambia River basins (Source: Bloch, 1993).

Soninke Social Structure

The Soninke, who concentrate in the three-way border of Senegal, Mauritania, and Mali, possess a rigidly stratified social structure (P. Bloch, 1993). The social structure in contemporary Soninke society is largely a result of the governmental and economic organization of the Gadyaga kingdom. The nobles, called the *hooro*, included three groups: the Bacili, the *mangu*, and the *modini*. The Bacili, the royal family in Gadyaga, ruled the state from the 14th century until the end of the 19th when the French annexed the area. The king or *tunka* managed the kingdom in the name of the Bacili, a family whose members were called the *tunkalemu*, the 'children of the king.' The Bacili did not practice agriculture or trade, but 'lived from the labor of their slaves and the plunder of war' (Miller, 1991). The *mangu*, members of the Bacili court, immediately followed them in status. The *mangu* advised the Bacili in military concerns and like the Bacili, relied on slave labor to cultivate their fields. The *modini*, were the marabouts or Muslim clerics

of the kingdom. Initially, they were primarily concerned with trade and education, but became involved in the military in the 19th century, leading several wars (Miller, 1991).

The *nyaxamalani*, the artisans, followed the *hooro* in social status. There were several occupational groups within the *nyaxamalani* including traditionistes (*gesere*), blacksmiths (*tage*), woodworkers (*tegu*), griots (*dyare*), and leatherworkers (*garanke*). The function of the traditionistes and griots was similar, the traditionistes reciting and singing verses about the genealogical history of noble families, and the griots praising noble ancestry in song (Sella, 1987). These groups, whom the nobles considered 'impure', were linked with particular noble families.

The *jaagarafe* were slaves associated with the Bacili family who were in charge of the kingdom's administrative needs. They collected land rents, managed agricultural fields, and cared for official visitors. Slaves with few or no rights in the kingdom were called *komo*. The Soninke made a distinction between slaves depending on whether they were purchased (*komo xobonte*), captured (*komo ragante*) or born in captivity (*komo saardo*). While in theory, *komo* could become freed slaves (*komo baganinte*) through self-purchase or koranic study, their status remained relatively low even as freed slaves (Miller, 1991).

Despite the French colonial government's emancipation of slaves in 1905-08, these caste distinctions remain embedded among the Soninke (Manchuelle, 1989). Though former *komo* are now economically and socially independent from their old masters, *komo* hold limited land tenure rights (Traore, 1987). All groups, including the *hooro*, now cultivate fields themselves, but the *hooro* continue to control access to land while the descendants of slaves, the *komo*, generally pay *hooro* some type of land rent to obtain access to farmland (P. Bloch, 1989).

Besides this social stratification in terms of caste, social hierarchies based on age exist in

Soninke society. Senior males limit junior males' access to land by controlling their ability to marry and have children. According to Weigel, this control takes form in dowries, matrimonial strategies, and endogamy (1980). By controlling access to reproduction then, senior males control access to labor and land.

The compound or *ka* is the basic residential unit in Soninke society. The *ka* includes the members of patrilineal extended families living in a single compounded, and may take the following forms: (1) A man, his wife (or wives) and their unwed children. (2) Two or more brothers, their wives, and their unwed children. (3) A man, his wife (or wives), their married sons with wives and unwed children (Sella, 1987). The *ka* also refers to the production and consumption units, units that are controlled by the *kagumme*, normally the eldest male within the *ka*. The *kagumme* controls dominant production relations, including access to labor and land, and manages the remittances migrants send home (Weigel, 1980). Before the abolition of slavery, the *kagumme* also controlled access to slave labor, a fact that guaranteed the loyalty of dependents who wanted to share the benefits of such labor. Besides controlling production, the *kagumme* is responsible for providing food for all dependents within the *ka*, though during food shortages dependents, including junior males and women, may contribute produce (Pollet and Winter, 1978).

Traditional Land Tenure

The Soninke have a hybrid system of land tenure based on traditional dependent relationships and relations between individuals and lineage segments (Weigel, 1980). The concept of *gumage*, meaning the power associated with holding rights to land, is central in Soninke land tenure. The *gumme* is one who controls land, a sort of land manager according to Miller (1991). In the

Gadyaga kingdom the Bacili were the *gummu* and exercised complete control over land tenure. The Bacili allocated land to villages as they were established. However, they did not merely give out land because villages requested access, but allocated land in terms of a broader economic and political strategy. According to Traore, "By allocating a piece of land, the *niinegume*, or land owner, intended to seal an alliance with the village concerned" (1987). For example, the Bacili gave villages that had political ties to their clan permanent title to agricultural and grazing lands. In this type of grant, the Bacili effectively lost rights to control the land, and could not claim any share of the harvest. The families in the village who were granted ownership, rather than the Bacili, allocated the land and obtained land rents. The families maintained this control unless their village disappeared, in which case the lands reverted to the Bacili (Traore, 1987).

Because they depended upon land rents for their living, the Bacili did not grant most villages permanent rights to land. They instead gave villages usufruct rights and collected land rents, the ownership rights of the Bacili remaining intact. In many villages the *jaagarafu* were responsible for collecting the rents and paying them to the Bacili. The receiving village held no tenure rights, and the Bacili could withhold usufruct if villagers did not uphold certain conditions (i.e. failed to pay the land rent) (Traore, 1987).

This system of usufruct access and land rents still exists in Soninke land tenure. At the village level, the *niinegumme* (landowner), generally a *hoore* noble, allocates land to the landless- other nobles, members of subordinate castes, descendants of slaves, and ethnic minorities. These individuals, *tegumme* or field owners, cultivate land indefinitely as long as their relationship with the *niinegumme* remains amiable (Traore, 1987 and Sella, 1987). In exchange for use rights, the landless pay one or more types of rent including the *diaka*, *niinegumankande*, *muso*, and

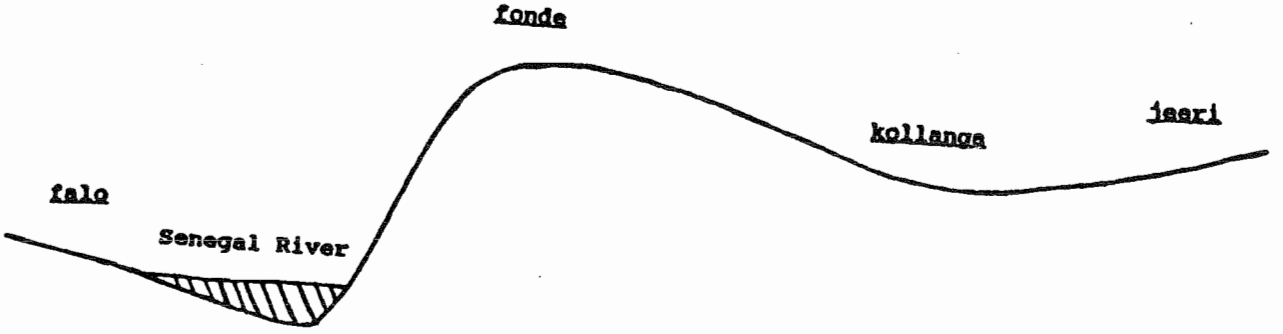
debigumankande. The *diaka*, normally ten percent of the crop, is equivalent to the Islamic *zakat*. However, instead of a religious tithe, the *diaka* is more frequently a secular land tax. The *niinegumankande*, literally a basketful, is a small portion of the crop paid to the landowner, while the *debigumankande* is a basketful given to the village chief. The *muso* is a variable crop share paid to the landowner, the exact amount of which is determined by the relationship between the landowner and user. Historically, the land rent could constitute half of the crop, though presently the system weakening (P. Bloch, 1993).

Besides granting individuals usufruct and collecting land rents, *niinegummu* may make permanent grants of land. In such cases, the *niinegummu* forfeit tenure rights, but maintain political ties to the land. This type of tenure transfer occurs frequently between a *niinegumme* and an artisan family (*nyaxamala*). Although still politically dependent upon the *ninnegumme*, the *nyaxamala* acquires all ownership rights and pays no land rent. The grantee may then choose to allocate land and collect rents for his own benefit. The type of grant *niinegummu* choose to offer depends largely on the type of agricultural land in question. They normally do not make permanent grants of the most fertile land, or even grant usufruct to the best lands in many instances (Traore, 1987).

Agroecological Zones

There are several distinct types of agricultural land in the Senegal River valley (Figure 2). *Walo* lands comprise all lands that lie within the floodplain and are inundated by the river's annual flood. *Walo* lands, on which the Soninke practice flood recession agriculture during the rainy season, consist primarily of river bank land called *falo* where the Soninke grow the bulk of their food. On the well-watered and fertile *falo* fields, Soninke cultivate sorghum on the higher banks, and maize,

sweet potatoes, cowpeas, eggplant, and squash on the lower banks. Access to *falo* land is quite limited, landowning families normally cultivating it themselves rather than renting it to other groups (Traore, 1987).



Cross Section of Soninke Agroecological Zones (Source: Miller, 1991).

Kollanga is a second type of land within the floodplain and consists of large flood basins. Since there are more *kollanga* than *falo* lands in existence, *kollanga* land is socially and economically important to landowners (*niinegummu*) because they obtain most of their land rents from it. Because *niinegumme* often rent *kollanga* to peasants who do not own any land, they extract high rents from these fields (Traore, 1987).

A third type of land, *foonde*, is an intermediate zone that sits on the margin of the *walo*. Cultivated during both the dry and rainy season, the high banks on *foonde* land are formed by alluvium from the Senegal River (Weigel, 1980). Though *foonde* are rarely inundated by the flood, they compare to *walo* land in terms of their fertility and retain moisture for long periods of time. Similar to their control of *walo* fields, generally only the most influential families own *foonde*, though less powerful families often gain access by paying land rents (Traore, 1987).

The Soninke practice rain-fed agriculture only on the uplands called *jeeri*. *Jeeri* comprise the

majority of agricultural land in the Bakel, constituting two-thirds of the arable surface area in the region. Because *jeeri* fields are relatively numerous and less fertile than *walo* or *foonde* land, rents on *jeeri* are quite flexible. Most Soninke have access to *jeeri*, including the descendants of slaves (*komo*), (Traore, 1987).

***Relations of Production within the* ka**

The *kagumme* controls the dominant production relations within the *ka*, including access to land and labor, and provides food for the members of his *ka*. While he no longer controls slave production, the *kagumme* controls the labor of his dependents and the remittances migrant workers send home. He is responsible for obtaining land from *niinegummu* and distributing it to dependent family members including junior males and women. However, before junior men are allowed to cultivate their individual fields (*salluma*), they must assist the *kagumme* in cultivating the communal field called *te-khore*. Members of patrilineal work groups follow a work schedule determined by the status its participants. While all dependents cultivate the *te-khore* field controlled by the *kagumme*, lower ranking dependents must also work on the personal fields belonging to higher status members within their work group. Low ranking dependents do not receive assistance on their fields, but cultivate their own *salluma* fields individually after laboring for the senior group members. Despite these differences in access to labor, all dependents control the produce harvested from their *salluma* fields (Pollet and Winter, 1980).

Women also have access to *salluma* fields, growing groundnuts in *jeeri* and rice on *foonde* land, though typically their husbands maintain *gumage* of the plots (Weigel, 1980, and Miller, 1991). Before the abolition of slavery, slave women often cultivated fields belonging to noble women. Presently, women cultivate these fields alone or with the help of unmarried daughters,

and are the sole owners of the harvest. In cases of food shortage, women may donate produce to the *kagumme*, designating it for consumption within the *ka* (Pollet and Winter, 1978). Women traditionally have not labored on *te-khore* fields, though there are some discrepancies in the literature concerning this point. According to Pollet and Winter while some women did labor on *te-khore*, there were social norms against men and women working in the same fields, these norms being especially strong in villages where marabouts were influential. However, if a *kagumme* owned a limited number of slaves, it was acceptable for male and female slaves to cultivate the same field (Pollet and Winter, 1978).

Miller differs somewhat from Pollet and Winter regarding women's participation in *te-khore* cultivation. He does not discuss the social norm that Pollet and Winter outline, but argues that 'women have always worked on the *te-khore* fields predominantly cultivated by men' (his emphasis, 1991). One explanation for this difference lies in the high incidence of male migration since colonization, varying between 30 and 50 percent, among the Soninke[1]. According to Sella, women's participation in *te-khore* cultivation compensates for the labor shortage due to male migration (1987). Therefore, it seems that the practical need for labor on *te-khore* surpassed the social norm prohibiting men and women from cultivating the same field. What is not clear, however, is what, if any, types of struggles occurred between men and women as a result of this change.

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[1]Pollet and Winter argue that outmigration began as a result of the French emancipation of slaves from 1905-08. Deprived of their labor force, the Soninke were forced to migrate and seek employment (1978). Manchuelle disagrees to some extent, arguing that labor migration among the Soninke began fifty years before the emancipation of slavery. Rather than following the emancipation of slavery, migration was a response to measures Europeans took to halt the slave trade (1989).

Sexual Division of Labor

Traditionally, agricultural production among the Soninke was crop specific according to gender. Women cultivated rice, indigo, cotton, and groundnuts, while men grew millet, sorghum, maize, and tobacco (Pollet and Winter, 1978, and Weigel, 1980). In contrast, most agricultural tasks were not gender specific, men and women both clearing land, weeding, planting seeds, and harvesting produce. Some tasks were gender specific however, men cutting and threshing crops and women winnowing the grain (Pollet and Winter, 1978).

This division by crop and task is evident today on the perimeters. Though there is a marked 'substitutionality' of men's and women's labor, each sex completing many of the same tasks (Keita, 1983), women contribute the bulk of their labor on the perimeters to rice cultivation. According to Miller, "The high rate of assistance given men on rice-specific tasks reflects not only the fact that rice farming on the perimeters is particularly labor intensive, but that men seek the assistance of their wives according to the skills and experience they have developed from farming rice traditionally" (1991). However, the fact that men now cultivate rice, a traditional women's crop, illustrates that the division between 'men's' and 'women's' crops is breaking down to some extent.

State Land Tenure Laws and Agricultural Development Policy

While the Soninke continue to follow many of the provisions of their traditional land tenure, the state's land laws also affect their ability to acquire land. The national land law (*Loi sur le Domaine National*), implemented in 1964, makes the state the sole owner of all national land and dissolves all traditional ownership claims. According to P. Bloch, the law was the Senegalese government's attempt to 'place the best aspects of customary African tenure systems on a modern egalitarian and democratic foundation' (1993). In practice, the law may not impact people to a

large degree since it authorizes 'the continued occupancy and use of the land by those who had occupied and used it before the law was enacted' (Bloch, 1986). Under the law there are four categories of national land: *zones urbaines, zones classees, zones pionnieres* (settlement zones), and *zones de terroir* (occupied village land). Most land in the Bakel perimeters falls in the *zones de terroir* category (P. Bloch, 1986).

While the land law makes the state guarantor of the national domain, local governments manage land distribution at the village level. In the administrative reform of 1972, the Senegalese government created a system of *communautes rurales* (rural communities) organized according to geographic and ethnic concerns. The administrative reform also provided for locally elected rural councils (*conseils rural*) that became responsible for allocating rural land and directing 'the development and farming of such lands' (Sella, 1987). In designing this system of local control, the national government envisioned a type of land management that reflected local priorities and conditions (P. Bloch, 1993).

This administrative reform, which was implemented region by region beginning in 1972, did not reach the Bakel until 1982 when elections for the rural council occurred. While the council has accomplished little thus far, P. Bloch argues that the council will become more influential in the future if the state 'continues its present policy of disengagement and decentralization' (1993). However, though the councils are aimed at making local land tenure more egalitarian in nature, they may in fact enable local elites to retain control of land. Such control is evident in the Bakel, where the same families who own land control the rural councils (P. Bloch, 1993).

The state's attempt to lessen its involvement in rural land management and agricultural development continued with the publication of the *Nouvelle Politique Agricole* (New Agricultural

Policy) in 1984. While the policy does not grant individuals private ownership of land, it encourages groups and individuals to form rural communities for commercial agricultural development. The policy guidelines call for an overall reduction in parastatal involvement in agricultural development, the transfer of parastatal functions, like crop storage to producers, and changes in price policy to remove all subsidies on agricultural inputs. Also, under the guidelines, the private sector, rather than parastatals, would provide farmers with inputs (Woodhouse and Ndiaye, 1991). The 1984 policy includes the Senegalese government's *deperissement* objective, a strategy aimed at 'withering away' state control of commercial agricultural development and giving farmers more responsibility (P. Bloch, 1989).

Irrigation on the Bakel Perimeters

Project History

Contrary to what occurred in other areas of Senegal, the small irrigated perimeters at the Bakel (BISP) were constructed due to the initiative of local farmers (O.M.V.S. report, 1980). Migrant workers returning home from France, notably Diabe Sow and Seydou Nianghane, wanted to use their earnings to improve conditions in their villages. Anticipating an end to France's demand for African manual labor, the two men decided to create income generating opportunities in the Bakel region (P. Bloch, 1993). Sow and Nianghane, with financial and technical assistance from Oxfam, an English NGO (non-governmental organization), and a French NGO, *Compagnie Internationale de Development Rural* (CIDR), purchased pumps and organized villagers into farmers' groups called *groupements* (Miller, 1991). Farmers constructed perimeters on *foonde* and *kollanga* land and began growing crops on the perimeters during the 1974-5 cropping season, cultivating maize and sorghum during the rainy season and vegetables during the dry (O.M.V.S.

report, 1980). They cultivated the irrigated plots collectively, the perimeters amounting to a village level *te-khore*. Participants, following a work schedule designed by the *groupement* head, equally contributed labor to the perimeters and divided the produce equally after harvest (P. Bloch, 1993).

Following the initial cropping season, BISP quickly grew from a modest, locally-controlled project into a 'bureaucratized' and 'capital intensive' endeavor. In 1975, USAID and SAED simultaneously became involved in the scheme, USAID when CIDR approached them to finance pumping equipment, and SAED (*Societe d'Amenagement et d'Exploitation des terres du Delta du fleuve Senegal*) when the Minister of Development visited the site and decided that the agency should take over. In response to CIDR's request, USAID created a 3.1 million dollar project, a scheme that grew to a 7 million dollar project by its implementation in 1977. SAED, the parastatal agency in charge of Senegal River Basin development, wanted to model the Bakel perimeters after past projects on the middle valley as opposed to allowing local farmers to manage the scheme (P. Bloch, 1993 and O.M.V.S. report, 1980).

Soninke farmers, led by Sow and Nianghane, formed a group called the Federation of Farmers to counter SAED's takeover attempt, an action that according to Adrian Adams was bureaucratic, uninformed, and destructive (P. Bloch, 1986). Having ignored the Bakel perimeters until USAID enlarged the project to include better water control, larger plots, and more participants, SAED intervened after the project showed signs of success and nearly destroyed it in the process. Though Soninke farmers wanted to cultivate fields collectively, SAED pushed for individualized cultivation where farmers would work fields independently. SAED also imposed crop rotations, technologies, input supply, and marketing arrangements that were unfamiliar to farmers and

misguided in practice. For example, though rice was not a staple in the local diet, SAED decided that rice should be the required crop on the perimeters. Farmers would grow rice in all soil types, including sandy soils that did not hold water adequately, and then sell it to SAED at extremely low prices. In turn, SAED would resell the rice to cities outside the region (Bloch, 1986).

The Federation of Farmers, unwilling to comply with SAED's plan, wanted to continue cultivating fields collectively and to focus on subsistence crops like sorghum and millet. They also wanted to cultivate both irrigated and rainfed fields, rather than laboring solely on irrigated plots. The two sides eventually reached a compromise, in part because the government's *deperissement* objective forced SAED to grant the farmers more control of the perimeters. Farmers gained control of crop choice and SAED lost its monopoly on input provision and crop marketing. However, the Federation did not takeover SAED's place in managing the Bakel project (O.M.V.S. report, 1980, and Bloch, 1986).

Access to Perimeters

Before constructing the perimeters, SAED obtained usufruct rights from landowners, but did not gain complete ownership of land, indicating that traditional landowners would retain control of land should the project fail (Sella, 1987). Though SAED's involvement may represent a threat to the interests of landholding elites, the drought forced them to accept SAED's help. This need is evident from the comment of one elite who said, 'A drowning man will grab onto any object you reach out to him to save his life, even if it is a knife; this is how we felt when we accepted SAED's help' (Bloch, 1993). Despite the innovation associated with the perimeters, it is not yet clear how irrigation will affect elites' power. Because, in recent years, people in the Bakel have begun to think the drought is over and have returned to rainfed agriculture, irrigation may not

continue to threaten the interests of traditional landholders. According to Bloch, "If the traditional agricultural system, combined with remittance flows, can once again provide a fairly reliable basis for the restoration of the nobles' control over land, nobles may prefer this to continued risky experimentation with innovations" (1993).

As a condition of their involvement, SAED decreed that all farmers had equal access to irrigated fields, meaning that all villagers, regardless of caste or gender, were supposed to be allowed to join *groupements*. Farmers wanting to participate had only to help prepare land for the installation of irrigation equipment to become *groupement* members. Though farmers cultivated fields collectively for the first two cropping seasons, many began cultivating plots individually during later years after the 'free rider' problem arose on the communal fields. SAED devised a lottery system to divide the individual fields, attempting to eliminate caste discrimination in plot selection. Because participants were to acquire fields of equal size and land quality, SAED designed most perimeters to minimize differences in quantity and quality of land, as well as access to water. For example, in the Aroundou perimeters plots are long, narrow strips of land that descend from the river bank to depressed areas. In the system, each farmer holds access to land near the head of the irrigation system, land with sandy soil (near the river bank), and land with clayey soil (in the depressions). Though SAED's equal-access condition has not eliminated social inequality among the Soninke, many *komo* and *jaagarafu* have access to plots in perimeters throughout the Bakel, indicating that elites power has diminished to some degree (Bloch, 1987).

While some members of traditional slave castes have gained access to plots, women of all castes often hold limited access to fields. In many villages, married women are counted as part of the *ka* in terms of their *groupement* membership. In some perimeters, a *ka* may receive equal

amounts of land for each of its adult members, male or female, while in other villages, the *ka* receives half as much land for each of its female members compared to the amount male members are given. The *groupement* may forbid married and dependent women from participating altogether, but allow female heads of household to participate (P. Bloch, 1993).

When women do obtain access to irrigated plots, their rights to land are somewhat limited. Because inheritance patterns are patrilineal, women often cannot inherit land. If a woman dies, her husband, husband's brothers, or sons inherit the land. In cases of divorce, a woman who continues to cultivate her plot maintains control of the land if she remains unmarried, or if her next husband belongs to the *groupement*. If she remarries and her new husband is not a member of the *groupement*, her former husband gains control of the field (M. Bloch, 1987).

Social Repercussions of the Perimeters

Women's Access and Management Rights in the Perimeters

In general, women have lost economic independence as a result of the current management practices on the perimeters. While in traditional farming women hold relative independence in choosing plots and controlling the farming process, women have little access or control over land on the irrigated perimeters. Women, in a subordinate relationship with *groupements* and the rural council, have lost their ability to make decisions about agricultural production. Because women have been excluded from the rural councils and from most leadership positions in the *groupement*, it is difficult for them to seek redress if they disagree with management decisions. Women also lack the money needed to finance perimeter maintenance and buy inputs. Finally, though women have fared poorly in the irrigated schemes, they spend the majority of their agricultural work

hours laboring in the perimeters,[2] a fact due to the labor intensive nature of irrigated cultivation and the high rate of migration among male Soninke (Miller, 1991).

Despite their lack of independence on the perimeters, women comprise the majority in most Soninke *groupements* in the Bakel.[3] This figure gives a misleading indication of women's rights in the perimeters because they are often allocated smaller plots of land than men. For example, in the Moudery I perimeter, women farm 29 percent of the plots but constitute 57 percent of the *groupement* membership (Miller, 1991). Even when women gain access to perimeters, the irrigated fields they cultivate are often considered *te-khore* by the *kagumme*. Because of the *te-khore* field designation, the *kagumme* alone controls the harvest and women obtain little personal benefit from their labor (M. Bloch, 1987). In some instances however, women manage and cultivate *te-khore* fields in the absence of male family members (Miller, 1991).

When the original perimeters were constructed, the few women who had access to irrigated *salluma* or personal fields acquired this type of access because their traditional rainfed plots were absorbed into the perimeters. Prior use of land is often the only grounds on which women can obtain access to irrigated fields, this new access replacing the rights from the fields lost to the perimeter. Women are not granted this 'replacement' access in all cases though, sometimes losing access to land completely after perimeters are constructed. For instance, though the president of the Moudery II claims that his perimeter sits on 73 fields once farmed by women, none of the

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[2]According to Keita in his report on the Bakel perimeters, for women between the ages of 15 and 60, 94 percent of their total agricultural work hours were spent in irrigated rice cultivation (1983).

[3]According to Bloch, women's membership in the Bakel perimeters comprises 62.3 percent of the total (cited in Miller, 1991).

women who lost land to Moudery II gained access to the scheme (Miller, 1991). When women do obtain rights to irrigated plots, their fields are frequently less productive than men's. Weigel hypothesized that this difference in productivity occurs because women hire less labor than men do, likely a result of women's limited ability to pay for help (Miller, 1991).

Women who do not farm irrigated plots as *salluma* rely on rain-fed agriculture to obtain their personal income. Cultivating rice, indigo, and groundnuts, some women must travel longer distances to their rain-fed fields as a result of perimeter construction on what were previously their traditional fields (Miller, 1991). Besides the burden of increased travel time to fields, women also face labor bottlenecks in trying to cultivate their traditional fields while simultaneously laboring on irrigated plots (Jaeger, 1988).[4] Though cultivating traditional fields may overburden women who must also labor on irrigated plots and perform domestic tasks, they rely on this income to fulfill their personal responsibilities which include buying their own and their daughters' jewelry and clothing (M. Bloch, 1987). Additionally, women use the produce from their *salluma* fields to feed their infants the *baowia*, or mid-morning meal (Miller, 1991).

Moudery VII: The Women's Perimeter

Women in the village of Moudery, excluded from many of the perimeters in their village, petitioned the rural council to acquire land for a women's perimeter. Though the council granted the women thirty hectares of land, the women's perimeter was moved to an area with lower quality land when an SAED technician gave the first site to his brother to cultivate. According to Miller, this action was typical for SAED in terms of their receptiveness to the construction of

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[4]Though Keita suggests using animal traction to relieve these labor bottlenecks, Jaeger argues that the expense of using draft animals makes them unviable for the perimeters (Keita, 1983, and Jaeger, 1988).

women's perimeters (1991). The eventual women's perimeter is nine hectares in size, giving each of its members around 0.03 hectares of land. Though the rural council has allocated land for another women's perimeter, the percentage of irrigated land women control will remain around 13 percent because a perimeter for 'heads of household' will also be constructed. The amount of irrigated land women cultivate will also remain relatively small. Despite their insignificant size, the plots could benefit women since, unlike on other schemes, women are among the *groupement* officers on the perimeter and control scheme management to some degree (Miller, 1991).

Caste on the Perimeters

While women in general have fewer rights than men in the perimeters, women elites hold more valuable types of rights to land than lower status women. Though use rights on perimeter land are rather equally distributed among women, 'rights that involve management of land are skewed by status' (Miller, 1991). In his survey work on the Moudery perimeters, Miller found that first wives from *hoore* families belong to twice as many *groupements* as wives of *komo* status (1991). While 33 percent of all *hoore* women in Moudery belong to least one *groupement*, 25 percent of all *komo* women hold *groupement* membership. Besides maintaining a higher percentage of *groupement* membership, *hoore* women often possess larger fields than *komo* women. On average, *hoore* women each farm .11 hectares of perimeter land, while *komo* women cultivate 0.07 hectare (Miller, 1991).

Members of the great slave caste, the *jaagarafe*, represent a divergence from this distribution of perimeter rights. Though belonging to a lower caste, *jaagarafe* women have two times the *groupement* membership rate of *hoore* women and three times the rate of *komo* women. *Jaagarafe* women maintain this dominance because of the two perimeters where most women

hold *groupement* membership, *jaagarafe* men control the perimeter management. For example, the president of Moudery III, a *jaagarafe*, chose the *groupement* members himself, picking people mostly from his own family. On the perimeter, 15 of the 27 female members are *jaagarafe*. On the women's perimeter, 18 percent of *groupement* memberships belong to *jaagarafe* women though they comprise only 11 percent of the village's female population, a distribution that resulted because the perimeter's vice president is closely related to a politically powerful *jaagarafe* male. Thus, while a woman's caste is influential in determining her management rights in the perimeters, her relationship to politically powerful men is also important (Miller, 1991).

Carney's Model for the Bakel Situation

Initially, Carney's model seems relevant to the Bakel situation, given the similarities between the irrigated perimeters at Jahaly Pacharr and the Bakel site. In both instances, women have lost personal fields where they practiced traditional agriculture to the perimeters, but have not always obtained access to the irrigated plots. When given access to the perimeters, women at both sites often labor in communal or family fields where the compound head controls the harvest, rather than cultivating personal fields where the individual farmer manages the produce. The communal designation of most perimeters, partly a result of the labor intensive nature of irrigated agriculture, means that women have fewer opportunities to cultivate individual fields. Also, while they labor on the perimeters, neither Mandinka nor Soninke women play a major role in perimeter management. Finally, because of their loss of personal income, women at Jahaly Pacharr and at the Bakel have become more economically dependent on men.

However, despite these similarities, the differences between the two sites make Carney's model somewhat inappropriate for the Bakel setting. For instance, in her model, Carney does not

distinguish between women of different castes, but refers to women generally as if they represent a homogenous group. While this general reference may be adequate for the Jahaly Pacharr project, it is problematic for the Bakel since there, women's caste membership affects their rights on the perimeters. As mentioned in the preceding section, *hoore* women hold more valuable types of rights to land than *komo* women, indicating that rights to perimeters are skewed by status to some degree. *Jaagarafe* or 'great slave' women, representing a divergence from this pattern, possess more rights to perimeter land than women from other castes largely because of their relationships with politically influential men. Consequently, though women from other castes lost economic independence after perimeter construction, it seems that *jaagarafe* women have been impacted to a lesser degree.

Besides its exclusion of differential access to perimeter rights based on caste, Carney's model, offering a limited treatment of ecology, does not deal extensively with how ecological change has impacted production practices. Though Carney indicates that, at the national and international levels, the drought played a significant role in promoting the development of irrigated agriculture, she does not thoroughly examine how the drought impacted agriculture production at the local level. While this exclusion does not detract from Carney's study given the situation at Jahaly Pacharr, the circumstances at the Bakel require a more complete examination of the drought.[5] At the Bakel, the severity of the Sahelian drought of the 1970s forced elites to cooperate with the constuction of irrigated perimeters. According to P. Bloch, elites would never have allowed

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[5]Because gender conflict concerning women's access to 'improved' swampland fields began before the drought years of the 1970s, starting in the 1940s and 50s as a result of the colonial government's early irrigation projects, it seems likely that while exacerbating the conflict, the drought was not a direct factor in creating the problem (see Carney, 1993).

SAED to build perimeters had the drought not occurred (1993). Because SAED declared that people from all castes were allowed to participate on the perimeters, elites who traditionally controlled the land where perimeters were constructed, faced a threat to their power (P. Bloch, 1993). Therefore, while the drought merely worsened the gender conflict associated with irrigated agriculture at Jahaly Pacharr, it figured prominently in the creation of perimeters at Bakel. In turn, the management of these perimeters has led to a loss of economic independence for Soninke women.

Conclusion

Using Carney's framework as a guideline, I have attempted to illustrate the social implications of irrigated agriculture among the Soninke of the Bakel in this chapter. Modified to include caste considerations and to more thoroughly examine the effects of drought, the model works well for the Bakel setting. At both Jahaly Pacharr and the Bakel, women have lost economic independence as a result of the development of irrigated perimeters, though not to the same degree. It seems that at the Bakel, though Soninke women often do not hold rights to individual fields on the perimeters, some women continue to possess individual rights to rain-fed fields. Most Mandinka women at Jahaly Pacharr have lost these rights and now work as wage laborers for personal income. However, though some Soninke women still have access to individual fields, the combined labor demands of irrigated and rain-fed cultivation have burdened Soninke women with an increased workload. As was the case at Jahaly Pacharr, women bear the brunt of labor demands created by rice irrigation, rice being the favorite crop of development agencies eager to end food shortages in the Sahel. Unless women are able to secure some type of payment for this labor, they will continue to cultivate irrigated fields that benefit the compound without receiving

any personal economic gain.

Chapter 4: Overview of Previous Chapters

In chapter one, I attempted to find an appropriate framework through which to study the links between gender, environment, and development. After examining cultural ecofeminism, gender planning, and political ecology, I found that political ecology was the most effective of the three approaches in terms of analyzing GED. With its focus on spirituality, cultural ecofeminism does not include a thorough examination of production practices that would indicate how environmental change affects people's modes of production. Relying on the assumption that women, due to their ability to bear children, are predisposed to be closer to nature in comparison with men, the approach offers a limited perspective to studying GED.

Gender planning, while moving beyond the spiritual focus of cultural ecofeminism, lacks an environmental dimension through which one may examine the ways development projects impact the environment. By dividing women's needs into practical and strategic, practical being those needs local women perceive and strategic including the gender equity goals perceived by development planners, the approach offers a limited view of local power relations since projects must work through local male elites. Finally, because the success of using the approach to plan development projects rests on the application of its 'iterative methodology', it may not be effective

in practice if project managers are poorly trained and unable to modify projects when necessary.

Political ecology, specifically Carney's version of the approach, offers a more effective framework to study GED compared to gender planning or cultural ecofeminism. Carney's model, correcting the static access to resources problem apparent in Blaikie's version, represents a thorough approach to use in analyzing GED links. While Carney focusses more on gender relations rather than environmental change, her version of political ecology allows one to examine the social, economic, ecological, and political factors that affect women's production practices, access to resources, and involvement in development projects.

Having determined that Carney's political ecology model was more effective than cultural ecofeminism or gender planning to study GED, I outlined her study of agrarian change and gender conflict in The Gambia in chapter two. Carney's study, based on her modified political ecology framework, reveals that with the development of irrigated rice perimeters on land where women traditionally held usufruct rights, men, concerned that women were gaining control of farmland, changed the 'lexicon of plot tenure' on irrigated fields (Carney, 1993). To meet the labor demands of irrigated rice cultivation, household heads altered the traditional practice where individuals were given access to personal fields in return for cultivating the household's communal field. Because of the double-cropping requirement on the perimeters, women worked year-long on the communal field without opportunities to cultivate individual fields and earn personal income. Mandinka women, whose traditional rice fields were absorbed into the irrigated perimeters, now often labor as wage laborers on irrigated fields to replace the income generating opportunities they lost with the construction of the perimeters.

After outlining the social implications of irrigated rice development projects in The Gambia, I

studied the effects of irrigated agriculture at the Bakel in chapter three. While the circumstances at the Bakel were not identical to the conditions at Jahaly Pacharr, I used Carney's model to examine the GED issues at the Bakel perimeters, given the similarities between the two sites. Like the Mandinka women at Jahaly Pacharr, the Soninke women at the Bakel perimeters lost economic independence as a result of the development of irrigated agriculture. Some women who lost fields to the perimeters did not receive access to the irrigated fields as compensation. Additionally, most women who obtained access to the schemes worked in their compound's communal field and did not personally benefit from their labor. Though Soninke women, unlike the Mandinka, did not devote two cropping seasons to the communal field[6], they faced labor bottlenecks in trying to simultaneously cultivate traditional rain-fed fields and irrigated plots. A high rate of male migration and women's expertise in traditional rice cultivation led Soninke women to spend the majority of their agricultural work hours laboring in irrigated rice fields.

Despite the numerous similarities in the social impacts of irrigated agriculture at Jahaly Pacharr and the Bakel, Carney's model was not completely accurate for the Bakel setting. First, the model lacked an analysis of differential access to resources based on caste, instead referring to women generally. Because, at the Bakel perimeters, women's caste designation affects their rights on the irrigated plots, this exclusion was problematic. Modifying Carney's model to include analysis of caste solved this problem, revealing that for the Soninke, women belonging to elite castes fared better on the perimeters than women from lower castes.

Besides the caste exclusion, Carney's model also dealt little with the ways ecological changes

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[6]Double-cropping is not practiced at the Bakel perimeters because project technicians have determined dry season irrigated rice cultivation would be uneconomical (Jaeger, 1988).

alter production practices at the local level. While indicating that at national and international levels drought impacted agricultural and developmental policy, Carney did not emphasize the Mandinka farmers reaction to the drought. For the Bakel perimeters, an examination of drought impacts at the local level was critical to understanding the development of irrigated agriculture at the site. Because the effects of drought forced Soninke elites to cooperate in the development of an egalitarian (or supposedly egalitarian) irrigation scheme, a possible threat to their power, I modified Carney's model to include a broader analysis of the drought.

Though I altered Carney's model to some degree, the basic model remains her version of political ecology. I am somewhat disappointed in the modification however, because it is still relatively weak on the ecology side. While it is evident that the effects of the drought led to changes in agricultural production, it is not clear how the irrigated perimeters have influenced the environment at the Bakel. Because none of the literature I studied discussed this latter question, I have not included it in this thesis.

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