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FAILED PROMISES AND DAMAGED ENVIRONMENT: WOMEN AND CONSEQUENCES OF POST-WW II AGRICULTURAL MECHANIZATION IN THE GAMBIA

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ABSTRACT

This paper examines the understudied effects of Agricultural knowledge and technology transfer in The Gambia as part of a general quest to understand deforestation. The Gambia's agriculture continued to experience the adverse effects of environmental degradation, which restructured rainfall patterns and caused saltwater and lime intrusion in swampy agricultural lands, the domain of women rice growers in the country's gendered agricultural system. Much of the scholarship on West African environmental history challenges established colonial literature and policies that condemn the indigenous agricultural practices as environmentally profligate but fail to scrutinize the impact of agricultural technology and knowledge transfer on women. The studies on The Gambia generally remained silent on the environmental effects of mechanized agriculture.

Keywords: Agricultural mechanization, Post-WW II development, Gender and agriculture, Environmental degradation, Women's roles in rural economies

INTRODUCTION

The post-World War II food crisis heightened the attempts to diversify The Gambia's agriculture through mechanized irrigation. The Gambia was hit hard. By 1947, mechanized agriculture and river irrigation were hardly new in Britain's colony of approximately eleven thousand square miles. However, it was a more ambitious and long-term plan to confront the country's dependence on imported staple rice. The colonial government's first major step was to transform its gendered approach to agriculture, in which policies since the 1890s reoriented social labor obligations and choices of crops. Taxation and other fiscal demands from the early colonial state compelled men to cultivate peanuts as cash crops in the uplands, and women farmers continued to grow rice in the swamps. Over the years, the government lent its full support to male farmers and the peanut cash

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crop economy at the expense of food crops such as rice. The government then was willing to subsidize rice imports to encourage farmers to grow more peanuts (Webb 1992; Carney 1993).

Korieh's (2001 p. 117) observation of the gendered colonial agricultural policy in Nigeria's Igboland reflects British agricultural policies in the entire British West Africa. Like in Nigeria, the agricultural policies in The Gambia neglected women and the crops they specialized in cultivating. Although there was no official gender discrimination policy against women farmers, the British patriarchal mindset shaped the exclusion of women from educational, extension, and agricultural loan schemes to improve production. Nevertheless, the neglected women farmers whose domain was in the rice sector became the primary focus of attention after World War II. However, men's involvement in mechanized rice cultivation remained an important goal of the government (Webb, 1992).

The first phase of the agricultural development project bridged shallow waterways, deeper creeks, and causeways to make swamp rice fields (*bafaros*) accessible to women farmers and save them from long hours of the onerous daily commute through knee-deep muck and mangrove roots. An estimated 150 kilometers of causeways, bridges, and culverts were constructed by 1955, and swamp rice cultivation was extensively expanded (Webb, 1992, p.553).[1] The second phase of agricultural development aimed to expand rice cultivation through river irrigation in the middle reaches of the Gambia River, which had the best topography, access to irrigation water, and better rainfall distribution.[2] The middle reaches are between 100km and 290km upstream from Banjul, the capital of The Gambia. The colonial agricultural experts who pioneered the agricultural diversification project considered this region "the most promising area in West Africa for rice growing and the area which would give the quickest results" in providing a sustainable food supply.[3] These irrigation projects had failed by the 1960s due to technical failures in irrigation system design. The Department of Agriculture focused on expanding peanut cultivation by encouraging animal traction to improve yields and farmers' general economic conditions (Weil, 1970, pp.244-246).

The colonial government's irrigation schemes set the model for post-colonial agricultural activities in The Gambia. The post-independence mechanized irrigation scheme was equally ambitious and large-scale, and there was a serious need to confront the newly independent country's dependence on imported rice. Between 1965 when The Gambia became independent, and 1990, mechanization and rice irrigation projects applied different models and received technical and financial support from NGOs and international donors, which include the Taiwanese Agricultural Mission (1966-

[1] CSO 2/1668, Bridges, Culverts and Crossings in 1938 and subsequent years, NRS, Banjul, The Gambia.
[2] CSO 2/3312 Gambia Rice Farm, NRS, Banjul, The Gambia, see the memo by Controller of Plans on Gambia Rice Projects (Kundang and Walli Kunda), 3rd November, 1949.
[3] Ibid

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74), the World Bank (1973-76) and the People's Republic of China Mission (1975-1979) (Webb, 1992).

Agricultural development projects during the colonial and post-colonial periods failed to fulfill the promises and hopes of women rice growers. For the colonial government, it was another exploitative economic venture. The post-colonial governments throughout Africa mimicked or were a continuum of colonial realities. The independent leaders of The Gambia brazenly brought back to life the failed policies of the colonial government, which equally failed hands down in offsetting the country's dependence on imported rice. These agricultural development projects failed women and left massive environmental destruction in their wake.

The Gambia Environmental Agency in 2007 observed that environmental degradation-related hazards in The Gambia since the 1960s markedly transformed the weather patterns, which continued to affect the country's agriculturalists. Erratic rainfall patterns destroyed crops with unpredictable torrential rains, storms, cold spells, intra-seasonal drought, heat waves, and unseasonal rains. The changing weather patterns put unbearable pressure on the natural resources, the ecosystem, and the agricultural system (GoG 2007 pp.10 & 20). The government paper blames “rapid urbanization from 23 percent to 41 percent," which catalyzed the rapid clearing of forests and woodlands for urban settlements and household energy. The agricultural lands also expanded unabated, as well as over-fishing and severe coastal erosion, especially along The Gambia's Atlantic coastline (GoG p.10). Indeed, these anthropogenic factors immensely contributed to the destruction of the environment, but the government paper put little emphasis or no mention of its agricultural development activities, which expanded cultivable land areas and annexed vegetation cover and woodlands.

LITERATURE REVIEW

Much of the scholarship on West African environmental historiography challenges established colonial literature and policies that condemn the indigenous agricultural practices as environmentally profligate, but the majority fail to highlight the effects of environmental destruction on women farmers. For example, Millington's (1987) study of environmental degradation, soil conservation, and agricultural policies in Sierra Leone shows that early colonial surveys in the former British colony concurred on the causes of denudation on wasteful and reckless shifting cultivation of African farmers. Thus, spatial and temporal restrictions on African agriculture and agricultural methods were the primary strategy to combat denudation, not imported agricultural machinery. Mortimore (1989) and Fairhead and Leach (1996) contest the colonial era reading of African landscape, African environmental management techniques, farming methods, and knowledge. Mortimore (1989), whose study is focused on Mangalands in Northern Nigeria, has condemned erroneous assumptions about African land use practices, which emerged from

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experts' ignorance of indigenous land use practices. He blames "the judgments of the 'experts' in the natural sciences and the new technology of remote sensing, whose basis in 'ground truth' does not include inquiries into the operations of Indigenous land-use systems" (p.2). Fairhead and Leach (1996) noted that scientists' and inhabitants' conceptions of the causes of desiccation differed because of the different assumptions concerning the relationship between social and ecological processes.

Many African societies conceive nature, society, culture, and environment as inseparable entities (pp.5-6). Mortimore (1989) and Fairhead and Leach (1996) agree on divergent ideas or assumptions about the African environment in the local populations and the scientific communities. Acheampong (2001) and Greene (2002) also represent an important strand in West African environmental historiography. They examine the relationship between ecology and society and how environmental factors shape the belief systems of African communities. These two works show how European conceptions of ecology as only a material realm shaped their attempts to control ecological pressures and their determination to suppress the Africans' views of their surroundings.

Much of the studies on The Gambia, done mainly by European scholars who were once colonial officials, blamed hunters and farmers for bringing about environmental degradation. For example, Reeve (1969) and Southern (1952) blame Gambian farmers' slash-and-burn farming techniques and overhunting for destroying forest cover and wildlife. However, recent studies on The Gambia's environment do not discuss the effects of agricultural knowledge and technology transfer on the environment. Instead, much of the scholarship highlights the social identities, agrarian relations, gendered struggles, and conflicts over access to and control of land and agricultural resources. Indeed, most of these works focus on women and the social transformation wrought by mechanized agriculture. However, no environmental effects of mechanization and irrigation systems have been discussed. For example, Webb (1992) describes ecological change and social transformation among the agrarian communities of rural Gambia. Webb (1992) highlights the failed attempts by the post-independence Gambia government to implement models transferred from outside by donors such as Taiwan and China in the country's drive to be food self-sufficient. He fails to highlight the environmental effects of these agricultural projects during the colonial and post-colonial irrigation projects. However, Carney (1993) and Sarr (2016) consider the expanding peanut cultivation for the destruction of the Gambian environment. For Carney (1993), the declining peanut revenues caused the environmental crisis, as the farmers were forced to abandon the traditional land fallow methods and crop rotation to expand peanut cultivation to compensate for poor peanut prices. Sarr (2016), equally blames the expanding peanut economy, but he emphasizes that the lands that were preserved as sacred were encroached upon by the Muslim clerics and their disciples in order to expand peanut cultivation. Carney (2017) argues that the

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government initiated these agricultural schemes to diversify agriculture from the dominant peanut cash crop to improve food coarse grain production, but the projects failed to break the gendered division of labor. In effect, male participation in rice production brought about their increased control over surplus production and female land dispossession.

Justification

The perceived technological superiority of the imported agricultural machinery was the fervor surrounding agricultural mechanization during the colonial period. The Gambia government and farmers received agricultural technology with much hope, reverence, and acceptance of the inferiority of their archaic farming knowledge and practices. Stoll *(2014 pp.389-390)* argues that the difference between a scythe, a symbol of indigenous farming implement and skills, and a John Deere harvester is not merely the technological superiority of the harvester, its surplus value, its spirit of progress, and the landscape changes, rather more farmers become landless, unemployed, starved, and the harvester damages large tract of environment. Stoll's scythe and harvester metaphor draws attention to modern environmental farming technology and knowledge in The Gambia (Stoll, 2014, pp. 389-390). Consequently, this paper aims to achieve two important objectives. First, it explores the environmental effects of the post-WWII agricultural expansion activities in The Gambia, which included imported agricultural knowledge and technology transfer.

As Tovar-Restrepo (2017, p.416) argues, social science research shows a significant difference in effects and experiences of environmental destruction and changing climate by different population members, including gender, age, ethnicity, and urban and rural people. As a result, the second argument of this paper is that the changing climate affects more women farmers in The Gambia, who are rice growers, than male farmers. While Gambian male farmers mainly cultivate peanuts in the uplands, female farmers grow rice in the swamps. As a result, environmental effects such as erratic rainfall patterns cause female farmers to deal with salt and lime intrusion in their rice fields.

SCOPE AND METHODOLOGY

The scope of this study covers four and half decades of colonial rule and post-independence agricultural activities in The Gambia. It focuses on the period stretching from 1945 to 1990 because of the profound historical dynamics that were taking place in the tiny British colony, particularly in the areas of agricultural development. My methodological approach is inspired by the work of several African historians who, since the 1960s, have been collecting oral histories and archival documents to piece together the events and periods they study. In that regard, the archival evidence I collected during my research trip to The Gambia last summer would be utilized. I conducted archival research at the Gambia National Records Service (the National Archive), where tons of European colonial documentary sources are held.

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These archival documents are included in this paper as footnotes with archival labels such as CSO, meaning Colonial Secretary's Office in Bathurst, and CO, meaning Colonial Office in London, which include reports from Colonial Commissioners, Special Committees, Letters from Colonial Administrators, ordinances and newspapers. These constitute a rich body of sources that serve as the most important sources for this study of the Gambia's colonial and post-colonial agricultural activities. The second source type will rely on extant literature on environmental history, climate change, gender, and development.

Damaged Environment

Massive environmental destruction and oppression of women in the Agricultural expansion programs in The Gambia parallels ecofeminist claims that there is a connection between nature and the oppression of women. The agricultural mechanization and irrigation programs are development models coated in inherent capitalist violence against nature and Western oppression of women imported and imposed on Gambian rice growers. Many ecofeminists believe that Western culture and science oppress both nature and women. Thus, many of them are anti-science and anti-technology. Vandana Shiva, for example, argues that the combination of Western reductionist science, the industrial revolution, and capitalism has led to the exploitation of nature and women, especially in the Third World. The Industrial Revolution and its by-product, colonization, created a limitless appetite for African resources. As a result, any development model and institution imported from the colonial metropole had the hallmark of lecherous capitalist destruction of nature and oppression of women, which Shiva calls "maldevelopment" because such development is "bereft of the feminine, the conservation, the ecological principle" (Shiva, 1989).

Agricultural development programs in The Gambia seemed altrusitic colonial ventures aimed to save Africans from starvation, but they were fraught with economic motives. As ecofeminist argues, colonial and post-colonial poorly designed irrigation schemes caused massive destruction of the mangrove swamps and forest cover. Carney (1993 p.409) attests to environmental damage agricultural machinery wreaked in The Gambia's North Bank and Central regions, which are the epicenters of agricultural expansion activities. Peanut farmers destroyed several thousand more acres of vegetation cover. In three major project sites (Jenoi, Kudang, Pachari/Walli Kunda swamps), over twenty-four thousand acres of mangrove swamps and vegetation cover were taken over to become rice farms. In addition to rice farms, the irrigation infrastructure also took over a vast tract of vegetation cover, including miles of irrigation canals, feeder ditches, roads, water control systems, and two pumping stations.[4]

[4] CSO 2/3312 Gambia Rice Farm, NRS, Banjul, The Gambia, see the memo by Controller of Plans on Gambia Rice Projects (Kundang and Walli Kunda), 3 November 1949.

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Indiscriminate wildlife destruction was the hallmark of projects. For example, when local farmers in Walli Kunda swamps lost their farms to the mechanized irrigation scheme, many encroached-on hippopotamus habitats in the neighboring Kai Hai Islands. The hippos faced the fury of the colonial war on pests when they continually depredated on the rice field. In 1947 alone, fifty-three wayward hippos were confirmed shot (Clarke, 1953, p.299). both the colonial and independent governments of The Gambia encouraged indiscriminate poisoning and shooting of wild animals considered pests. For example, between 1947 and late 1953, over 75 359 baboons, 28 637 monkeys, and 27 470 bush pigs were killed.[5] Both colonial and post-colonial governments sponsored animal pogroms in the name of pest control, which included the infamous "tail for shilling" campaign, during which local hunters received monetary inducement from regional commissioners for any animal tail they submitted. There were other macabre methods, such as bush burning and poisoning of wild animal drinking sites with *Sodium Arsenite* and *Parish Green,* and thousands more animals that died because of poisoning which were never captured in the statistics.[6]

Agricultural programs in The Gambia left an indelible mark of environmental destruction, a clear vindication of ecofeminist theoretical propositions. The destruction of vegetation cover and wildlife attests to both colonial and post-colonial governments' economic development priorities over environmental protection. Understanding the destructive nature of modern agricultural technology and ideas gives insight into anthropogenic causes of climate change. Indeed, some African farming practices might harm the environment, but the application of modern technology supported by imported ideas should also be scrutinized.

False Hopes and Consequences

The main objective of agricultural mechanization during the colonial period was to create a food surplus to cut the colony's dependence on imported rice staples. Early colonial officials' emphasis on peanut agriculture and neglect of women rice growers impeded the development of agriculture and dependence on imported foodstuff. The independent government also desired to attain food sufficiency and to effectively and efficiently integrate women farmers, as emphasized by the conditions of the donors who funded most of the post-colonial agricultural projects. The desire to achieve goals in food sufficiency evolved over time, and each phase created false hopes for women farmers and the general population.

One of the significant designs of the project was to create surpluses by growing the second crop through tidal irrigation to meet the national rice demands. The rain-fed rice would be grown

[5] Ibid.

[6] CSO 2/3208 Destruction of noxious beast, NRS, Banjul, The Gambia. See the dispatch from the Ag. Director of Medical and Health Services, Bathurst, to the Colonial Secretary, Bathurst of 12 September 1949.

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between June through October, and irrigated rice would be grown between December and April. Double cropping was hoped to strengthen household food reserves while generating surpluses to raise rural incomes. The planners of both colonial and post-colonial projects repeatedly failed to comprehend that the agricultural revolution involved more than technical infrastructure and knowledge; instead, it involved social factors that governed land tenure and the already gendered agricultural system. Consequently, in addition to the environmental degradation it caused, the mechanized irrigation projects failed to meet the women's hopes of financial independence and livelihood improvement. As Carney (2005, p.330) argues, male participation in rice production increased male control over surplus production and female land dispossession. The horticultural projects created alongside the rice fields ensured improvement in women's income but were equally rife with gendered contestation over access to irrigated land because the irrigation projects gave women access to land as laborers but denied them full claims to the benefits of the agricultural produce.[7]

In the 1980s, a new crisis bedeviled women rice farmers' productive efforts. According to the Gambia government climate adaptation paper, "the disappearance of freshwater swamps and soil salination in lowland areas resulting from sea level rise" began to negatively impact rice production and the livelihoods of women farmers, particularly in the middle reaches of the Gambia River. The paper argues that spatial patterns and temporal changes in rainfall have been happening since the 1960s. It had worsened due to erratic rainfall patterns and continual droughts in the rainy season, which have placed tremendous pressure on agriculture as well as natural resources and the ecosystem (GoG, 2007, pp. 15-16)—consequently, women rice farmers in the Gambia experienced a disappearance of freshwater swamps. Soil salinization in lowland areas and sea-level rise also affected rice production. Saline-water intrusion significantly undermined the food sufficiency goals of the government and the livelihood of women rice farmers. Between the 1980s and 90, in many instances, rice growers abandoned their rice fields in Lower River and Central Regions, the rice baskets of The Gambia (M'koumfida et al., 2018, p.1).

M'koumfida et al.'s (2018) study of saltwater intrusion in the Gambia outlined a multi-causal phenomenon, which includes "low rainfall resulting from climate variability and change which can exacerbate the natural-balanced saline-water intrusion" (pp.3-4). They add that factors related to groundwater resource extraction contribute to increased salinization of groundwater and further to surface waters. Since the late 1940s, when mechanized irrigation began, water demand for pump irrigation in The Gambia accounts for more than 70% of the total demand for water. These facts

[7] The new scheme departed from the earlier swamp rice improvement project in one important way. Female rice growers lost control of land through a 30-year lease program and eventually became laborers. See CSO 2/3312 Gambia Rice Farm, NRS, Banjul, The Gambia, and the Points on which an agreement was reached between the Gambia Government and the Colonial Development Corporation on 21 February 1951.

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make a direct connection between the agricultural expansion projects that overstretched the resources of the tiny West African country. However, the article's authors still blame "the increase in demand for domestic use, thanks to population growth" (N'koumfida, 2018, p.4).

The independent government's agricultural department attempted to ameliorate saltwater intrusion through donor support. However, their cures for the problem are often imported ideas that become causes of new maladies. For example, the Taiwanese Agricultural Mission (1966-74), the World Bank (1973-76), and the People's Republic of China Mission (1975-1979) all funded and supervised the construction of dykes and embankments throughout the rural Gambia (Webb, 1992, pp.543-546). These are ideas that are mostly familiar to the deltas and floodplains of Asia, but the feasibility studies of the projects in the Gambia failed to consider the region's topography and erratic rainfall pattern. Consequently, donor efforts would fail, as did colonial and post-independence governments before them.

The main goal of the tidal irrigation projects was to trap tidal water through simple canalling techniques. At first, the successes of tidal projects were compared to the first phase of colonial agricultural expansion projects because they were cost-effective and less technical for women farmers. The climate change-induced erratic rainfall pattern had exposed the weaknesses of dyke and embarkment projects. First, the infrastructure does not allow the soil to be fertilized naturally by river tides that annually deposit fertile alluvium. The entire area must depend on artificial fertilizers and insecticides, which add phosphorus and chemicals to the waterways and lessen biodiversity. The canals and dikes might not directly obstruct marine organisms, but chemicals flow out of the system and into the waterways that could poison waterways. Second, although heavy rains were not needed to flood the dykes and embanked fields, the rains were needed to desalinize the trapped water. Machine plowing mixed fertilizer, insecticide, and unknown chemicals from stagnant water also caused massive lime intrusion, an epidemic as serious as a salt intrusion. Many farmers in the middle reaches of the Gambia River abandoned their farms because of lime intrusion, and they mostly blamed agricultural machinery for their predicament. They always hoped heavy rains would wash away lime and salt, the patterns of which is very erratic in the Sahel.

CONCLUSION

Post-World War II agricultural activities in the Gambia were significant attempts to diversify the country's dependence on imported rice and, more importantly, to diversify the country's dependence on peanuts. Poorly designed technology and inapplicability of the models transferred from other parts of the world impeded the success of the venture. However, the environmental effects and oppression of women draw attention to ecofeminist claims against science and technology, and Western capitalists' models transferred to Africa. The changing climatic conditions

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further put further strain on women farmers. As this paper argues, technology and knowledge import to Africa should be scrutinized lest profound environmental as well as social effects.

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