

PUBLIC POLICY

Gendered Adaptation Debt: A Human Security Analysis of Climate-Driven Water Scarcity and Credit Exclusion among Female Smallholders in the Federal Capital Territory, Nigeria

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Abstract

Climate adaptation policy in Nigeria is meant to advance food security and gender equality together, yet little is known about how it plays out for women farmers on the edge of the capital. This article examines the gendered side of climate adaptation in the agrifood sector of the Federal Capital Territory (FCT) between 2016 and 2025. It combines Human Security Theory, Feminist Political Ecology and the Climate Vulnerability Framework to ask how gaps in public adaptation support become private burdens for female smallholders, a burden described here as “gendered adaptation debt”. The study is qualitative and draws on 20 in-depth interviews with officials and association representatives in Abuja and two focus group discussions with smallholder farmers and food traders. Participants described dry-season water scarcity that pulls women from their fields for several hours each morning, land and collateral rules that keep them out of formal credit, and reliance on high-interest informal loans to buy seed and equipment. Interviewees reported that distribution of climate-smart inputs is fragmented and often defaults to male-dominated local leadership. Because the sample is small and Abuja-centred, the findings are presented as exploratory. The article recommends low-interest, cooperative-guaranteed credit for women’s groups, community-managed water points, shared storage and gender-disaggregated tracking of input distribution.

Keywords: adaptation debt; Federal Capital Territory; gender; human security; Nigeria

1 Introduction

Climate adaptation, food security and gender equality sit side by side in the Sustainable Development Goals (SDGs 13, 2 and 5) [1], and governments are expected to advance all three at once. In practice they rarely move together. Where patriarchal norms are deeply rooted and state capacity is thin, global mandates tend to land on top of existing inequalities and produce uneven results [2].

The Federal Capital Territory (FCT) of Nigeria shows this tension clearly. Abuja is the seat of federal policy-making, yet the surrounding area councils of Abaji, Bwari, Gwagwalada, Kuje and Kwali depend largely on rainfed farming, which leaves local food systems exposed to climate variability [3]. Since the Paris Agreement the federal government has passed the Climate Change Act of 2021 [4] and revised its Nationally Determined Contributions. Over the same period food prices have climbed sharply: national food inflation reached 40.87% in June 2024 [5]. The NBS has since rebased its price index, and the food inflation rate it reports for October 2025 is 13.12% [6], a fall the Bureau itself attributes largely to the new base year, so the two figures should not be compared directly. Explanations usually point to erratic rainfall and flooding. This article asks what those explanations leave out.

The starting point is human security, which the UNDP's 1994 Human Development Report framed as freedom from want and freedom from fear for individuals, rather than the defence of borders [7]. Seen this way, a dry well or a refused loan is a security problem. The article argues that when public adaptation support does not reach women farmers, the cost does not disappear. It is passed on to them as lost time, unpaid labour and private debt. This accumulated burden is called "gendered adaptation debt" here.

Two questions guide the study. First, how do water scarcity and exclusion from land and credit affect the economic, food and environmental security of female smallholders in the FCT? Second, how do policy makers explain the gap between adaptation policy and what actually reaches women? The analysis is confined to the FCT, and national figures are used only as background. The article is derived from the author's doctoral dissertation [8]; a companion article [9] draws on the same fieldwork to examine state capacity and food access.

2 Theoretical framework

Three lenses are combined. Human Security Theory supplies the normative yardstick. It recognises seven dimensions: economic, food, health, environmental, personal, community and political security [7]. This article works with four of them (economic, food, environmental and personal security) because the fieldwork spoke to these most directly. Health, community and political security were not probed systematically and are left for later work.

The Climate Vulnerability Framework explains why exposure to the same climate stress does not mean the same harm for everyone. Vulnerability depends on how exposed and sensitive a system is, and on its capacity to adapt [10]. In the farming belt of the FCT that capacity is uneven.

Feminist Political Ecology accounts for part of that unevenness. It treats access to land, water and credit as shaped by gender relations [11], and Nigerian research shows how social norms restrict women's land tenure, financial inclusion and mobility [3]. Together the three lenses give the mechanism examined here. Where the state does not provide shared adaptation infrastructure, such as pumps, storage or subsidised inputs, the gap tends to be filled by private borrowing, and women who cannot offer land as collateral borrow on the worst terms. The findings are mapped to the dimension of human security they affect in Table 2.

3 Methodology

3.1 Design and sampling

The study is an exploratory qualitative case study of the policy network that links federal ministries in Abuja with farming communities in Abuja and the wider FCT. Participants were chosen purposely, because the aim was to reach people with specific knowledge of policy delivery and farm-level conditions rather than to represent a population [12, 13]. Table 1 shows who took part. Twenty officials and staff from ten institutions were interviewed individually, and two focus group discussions (FGDs) were held in Abuja, one with smallholder farmers belonging to the All Farmers Association of Nigeria (AFAN) and one with food traders from the National Association of Nigerian Food Traders (NANFT). The interviews show how policy is designed and explained; the FGDs show how it is experienced. The 20 interviewees were drawn from a listed population of 201, taking roughly 10% from each institution, an allocation rule the dissertation takes from Black and Champion [14]. Here it is a

pragmatic quota within a purposive sample, not probability sampling. FGD members were chosen for availability, accessibility and willingness to take part.

Table 1. Fieldwork participants.

Code	Participants	n	Institutions / location	Date
IDI-01 to IDI-20	Officials and staff of ten institutions with at least five years' experience in climate and food-security work	20	Federal Ministry of Agriculture and Food Security (2); Nigerian Meteorological Agency (2); National Council on Climate Change (2); Federal Ministry of Environment (2); National Agency for the Great Green Wall (2); Forestry Research Institute of Nigeria (2); International Fund for Agricultural Development (1); Centre for Environmental Sustainability and Development Awareness (1); All Farmers Association of Nigeria (3); National Association of Nigerian Food Traders (3). All in Abuja	May 2025– May 2026
FGD-1	Smallholder farmers, members of the All Farmers Association of Nigeria (AFAN)	3– 8	Youth Centre, Area 8, Abuja	2025– 26
FGD-2	Food traders and merchants, National Association of Nigerian Food Traders (NANFT)	3– 8	Abuja	2025– 26

Note: IDI = in-depth interview; FGD = focus group discussion. The same participant table appears in the companion article. Source: dissertation Table 3.1 and Appendix IV.

3.2 Data collection and analysis

Interviews and FGDs followed semi-structured guides organised around four themes: afforestation and food availability, policy inconsistency and food access, climate awareness and food affordability, and alignment with the UNFCCC. The FGD guide added questions on land, water (including how hard it is for women to get water), transport, storage, middlemen and security. Fieldwork took place in Abuja between May 2025 and May 2026. Interviews averaged about 45 minutes and were recorded with permission. Responses were coded in phases aligned with the research questions and analysed thematically [15], then compared with the policy documents consulted, including the Climate Change Act and Nigeria's Nationally Determined Contributions.

3.3 Ethics, quotations and sufficiency

Participants received an introduction letter from the Department of Political Science, Nasarawa State University, Keffi (5 October 2024) and were assured of confidentiality and anonymity. Participants appear by code only (IDI-n corresponds to "Participant n" in the dissertation; FGD-1 and FGD-2), and job titles are kept general because the pool of senior officials is small. Quotations were lightly edited for readability without changing their meaning. The article does not claim data saturation in the strict sense [16]. With only two FGDs and a single study site, the data are treated as enough for an exploratory account, not for generalisation.

4 Results

4.1 Policy makers: Fragmented delivery and a gap at the point of distribution

The 20 interviews describe a system that satisfies international reporting expectations but is only loosely connected to farming communities. Bodies such as the National Council on Climate Change (NCCC) and the FCT Agriculture and Rural Development Secretariat (ARDS) exist, yet officers said the environment, water and agriculture directorates work without a shared data system and communicate poorly with local extension units. One director described the consequence for women plainly:

“Our central climate frameworks are designed in high-level offices to comply with international treaty guidelines, often targeting broad national metrics. However, our implementation channels within the FCT are deeply fragmented. The directorates handling environment, water resources, and agricultural development operate independently without a shared data matrix. This means that while we receive global praise for our policy documents, we lack the field-level personnel and resources to distribute climate-smart inputs equitably to women farmers in councils like Kwali or Bwari. Consequently, resource distribution often defaults to traditional local leadership structures, which are overwhelmingly male-dominated, systematically leaving female smallholders without direct state support.”

Officers also tied the problem to money. Years of under-funding were said to have weakened rural extension services and delayed decentralised irrigation and storage. A second officer added that, as dry spells lengthen, the absence of state-backed water infrastructure leaves women responsible for securing water for both the household and the farm.

Macroeconomic change came up repeatedly. Officers said that the removal of the fuel subsidy and the fall in the naira raised transport and input costs, and that public spending shifted toward short-term relief. In their view commercial banks remain reluctant to lend to agriculture, which leaves women's cooperatives, who usually lack land titles, dependent on informal lenders. This is the officers' reading. No bank staff or financial regulators were interviewed, so it should be treated as a perception that still needs confirming from the lending side.

4.2 Smallholders and traders: Water, debt and the market

The first FGD gave the clearest picture of what the policy gap costs at household level. A female cooperative leader said (FGD-1):

“The dry seasons are getting longer and hotter, and our local wells are drying up completely. Because we don't own the land we farm, we cannot drill deep boreholes or get formal bank loans to buy solar pumps. As women, we are forced to spend three to four hours every morning walking long distances just to carry water on our heads for our homes and our crops. This leaves us with very little time or energy to cultivate our fields properly. When our crop yields fail because of these weather shocks, we are forced to borrow from local lenders at very high interest rates just to buy seeds for the next season, locking us into a continuous cycle of debt that destroys our economic security.”

Three things stand out. The first is time: water collection takes the morning hours that crops need. The second is assets: without land title the group cannot drill a borehole or offer collateral for a solar pump. The third is debt: when yields fall, the only credit on offer is expensive, and the loan taken to buy next season's seed becomes the next problem. This chain is what the article means by gendered adaptation debt. The three-to-four-hour estimate is the participants' own and was not measured independently.

The second FGD added the market side. A trader observed that women farmers without cold storage or transport are pushed into distress sales (FGD-2):

“Because smallholder women have no access to cold storage rooms or direct public transport trucks, they are forced to sell their perishable fresh produce to wealthy middlemen at giveaway prices just to avoid complete spoilage.”

This is a trader’s description of women’s position, not women’s own testimony, so it is best read alongside the FGD-1 account. It is consistent with the wider concern about post-harvest losses, which AFAN participants (FGD-1) put at 30–40% of their produce. The picture was not uniformly negative. Two interviewees said NiMet advisories and a collaboration between NiMet, the FMAFS and the FAO had helped cooperative farmers in pilot zones in Niger, Kaduna and Benue states report 10% to 20% higher cereal yields in the 2021–2023 seasons, though gains this small and isolated did not protect the wider food supply.

4.3 An emerging issue: Insecurity and resource competition

Participants in the FGDs also mentioned, briefly, that shrinking grazing and farming land has increased local tension and, in some places, pushed farmers off their land. This was not probed systematically, so it is reported as an emerging issue and not as a finding. It bears on personal security and fits wider Nigerian evidence linking climate stress, resource conflict and food insecurity [17, 18], but it deserves a study of its own.

Table 2. Themes, evidence base and human security dimensions.

Theme	Evidence base	Effect on female smallholders (as reported)	Dimension affected
Water scarcity	FGD-1; IDIs	Several hours each morning spent fetching water, leaving less time for cultivation	Environmental; food
Credit and tenure	FGD-1; IDIs	No land title as collateral; exclusion from formal credit; borrowing at high interest to buy seed	Economic
Input distribution	IDIs	Climate-smart inputs default to male-dominated local leadership	Economic; food
Market access	FGD-2 (trader’s account); IDIs	Distress sales to middlemen; post-harvest loss (participants’ own estimate: 30–40%)	Economic; food
Insecurity (emerging)	Brief FGD remarks	Local tension over land and grazing; disrupted farming. Exploratory only	Personal

Note: Source: fieldwork in Abuja (dates as in Table 1). Estimates drawn from published sources are marked as such in the text.

5 Discussion

Taken together, the interviews and FGDs point the same way. Officials describe delivery that is fragmented and defaults to male-led local structures; women describe the result as lost time, lack of access to credit and expensive debt. This fits evidence that patriarchal arrangements deepen women’s vulnerability to climate change in Nigeria [3], and macro-level evidence that climate-related disasters reduce domestic food production [17].

The findings also support the feminist political ecology point that information and training without assets behind them can push vulnerable producers deeper into debt to fund their own survival. They

are consistent with work arguing that compliance-driven approaches to climate governance miss local realities [19, 20]. The contribution here is to name the mechanism: a gap in public provision is felt first as time poverty and credit exclusion, and then becomes private debt.

Two cautions apply. The link from water collection to lower yields is plausible and reported by participants, but yields were not measured. And the claims about banks and local leaders rest on what officials and farmers said, not on banks or traditional leaders themselves. These are the places where further data would most strengthen the argument.

6 Recommendations

The recommendations follow from the findings above. Several of the bodies named were not part of the sample, so each proposal should be tested with them before adoption.

1. Green micro-credit for women's cooperatives. Because exclusion from formal credit pushed women toward costly informal loans, the Central Bank of Nigeria and the FCT Administration, working with microfinance institutions, should create low-interest green credit lines for female-led cooperatives that accept community-vouched cooperative guarantees in place of land collateral.

2. Community-managed water points. Because water collection takes women away from their fields, the FCT ARDS and the federal ministry responsible for water resources should prioritise solar-powered boreholes and rainwater-harvesting reservoirs in rural FCT area councils (for example Kuje, Bwari, Kwali and Gwagwalada, none of which was sampled here), sited and managed in ways that do not depend on individual land title.

3. Shared storage and collective marketing. Because women without storage or transport sell at distress prices, cooperative-run cold storage and group marketing should be supported so that women can hold produce and sell at better prices.

4. Gender-disaggregated tracking of input distribution. Because officers said distribution defaults to male-led local structures, the NCCC, the FMAFS and the FCT ARDS should keep shared, gender-disaggregated records of who receives climate-smart inputs, so that gaps become visible and can be corrected.

7 Limitations and future research

The study rests on 20 interviews and two FGDs collected in Abuja, and it should be read as exploratory. Institutional informants carry much of the explanatory weight; banks, extension officers and traditional leaders were not interviewed, and the gender of participants is not reported. Participants may have given socially desirable answers, particularly officials describing their own institutions. There was no separate comparison of women's and men's accounts, so the findings show how scarcity is described but not how far it differs by gender. Health, community and political security, the emerging insecurity theme, and options such as community-managed agroforestry zones are left for future research.

8 Conclusion

The study set out to see what conventional accounts of climate impact leave out, and its answer is adaptation debt. Across 20 interviews drawn from ten institutions (about 10% of a listed population of 201) and two focus groups, the same chain appeared. Dry spells and unpredictable rains cut yields;

producers without land title, credit or storage pay for seed, water and equipment themselves; and the cost returns as higher prices, with a measure of maize rising from about ₦150 around 2020 to ₦500 or more, post-harvest losses that participants put at 30–40%, and national food inflation that peaked at 40.87% in 2024. Women carry much of the water-fetching and unpaid labour beneath this chain and are least able to borrow on fair terms. These figures come from a small, Abuja-based sample, so they illustrate the pattern more than measure it. The practical conclusion is consistent across the evidence: low-interest green credit, community water points, shared storage and gender-aware tracking of inputs address the cause, while information campaigns alone do not.

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