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How gender norms constrain women's economic resilience to climate change challenges in Nigeria

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Contents

Executive Summary

Purpose: This report presents the findings of qualitative assessments conducted on inequitable norms that restrict women's capacities to build economic resilience to climate change challenges in Nigeria. The study sought to answer the following question: What gender norms prevent women from building economic resilience to climate change challenges in agrifood systems (AFSs), and to what extent do these discriminatory biases exist at different institutional levels?

The study collected data on three area: (1) weather and climate events affecting the performance of the cassava, catfish, and chicken value chains, (2) the gender division of roles and duties along the different value chain nodes, and (3) gender norms existing at different institutional levels and how they interact with different identities affecting the adaptive capacities of men and women and their resilience to climate change impacts.

Methodology: The report is based on data collected through a stakeholder's workshop in Nigeria, 55 individual interviews (IDIs) and key informant interviews (KIIs) and 18 focus group discussions (FGDs). Eighteen respondents were interviewed for each of the catfish and chicken value chains, and 19 for the cassava value chain. The study was conducted in Ogun State for the catfish value chain and in Oyo State for the chicken and cassava value chains. Data was collected on the climate shocks experienced by different value chain actors, their coping mechanisms and resilience, as well as the gender norms that govern these value chains and their implications for women's economic resilience. A resilience approach was used to analyze the data from a gender perspective.

Findings: Underlying gender and cultural norms influence the adaptive capacities of men and women and, therefore, their economic resilience to the impacts of climate change. Gender norms limit women from owning assets, expanding businesses or accessing credit. As a result, women often maladapt to climate change impacts by engaging in short-term survival strategies that do not consider the changes they need to make and the transformation they need to undergo to be resilient in the face of future climate change. Gender norms, such as those related to the division of roles, access to and control of assets, mobility and so on, often lead to low adaptive capacities for women, resulting in less resilience. However, norms are increasingly being challenged, and both men and women question them, with women starting to own property and other assets. At the same time, men are also engaging in value chain activities previously regarded as women's. The extent to which these nascent changes will lead to economic resilience for women remains to be seen.

Practical implications: When looking at women's economic resilience to the impact of climate change, it is critical to examine the gendered power relations within households and communities, because these often influence women's participation in value chain activities. Additionally, resilience approaches that ignore broader economic processes, such as political and economic decisions and investment in infrastructure at the national level, may not adequately address women's economic resilience against the impact of climate change, because a lack of good infrastructure often worsens climate change impacts.

Value: This paper adds the understanding of gender norms to resilience thinking and theoretical frameworks.

1. Introduction

Climate change impacts agricultural productivity, food security and livelihoods (Nazirul et al. 2019). Several factors, such as gender norms, exacerbate these impacts on women by making them more vulnerable because of preexisting social and economic inequalities (Awiti 2022; Akinsemolu and Olukoya 2020). Studies have been conducted on underlying institutional factors on gender and climate change (Ume et al. 2021). Climate change disproportionately impacts women because of their responsibility for food and nutrition security for families (Omoyemen 2010). In general, women have low levels of adaptation to climate change (Boko 2007) because of a lack of access to resources and technologies and low levels of knowledge and education.

Several factors influence women's adaptive capacities, including their work burdens, discriminatory gender norms and women's underrepresentation in climate policy decision-making at all levels (FAO 2023). Gender norms and institutional factors exacerbate these deficiencies, preventing women from accessing, owning, and using the necessary resources for adaptation. The impact of adverse climate events varies depending on gender and socioeconomic status. For example, low-income women may experience high impact and slow recovery periods from events like flooding (Ajibade et al. 2013).

Because of their inadequate access to productive resources like agricultural land, women cannot make decisions that could affect community activities such as mitigation and adaptation plans and food production (ESCAP 2022). Gender norms that restrict the roles and agency of women hamper their access to and adoption of new agricultural technologies and farming techniques that are better suited to accelerating adaptation to weather and climate changes. Gender disparities in access and control of resources pertinent to value chain activities are exacerbated by the rising impact of climate change challenges, especially in countries like Nigeria, where there is a high dependence on agriculture as the main source of livelihood. In analyzing the ability to cope with and adapt to climate change from a gender perspective for smallholder farmers in Ghana, Assan et al. (2018) observed that male heads of households tend to adopt and use climate adaptation innovations more than female household heads. Women and other socially marginalized groups continue to experience the more significant impact of climate crises.

The interplay between the gendered impacts of climate change and food security in Nigeria is poorly documented (Anugwa et al. 2023). Many studies have looked at men and women as binary categories but have not dug deeper to understand how gender relations and norms affect women's ability to be economically resilient to the impacts of climate change. For instance, stereotypical threats may prevent women from taking on roles that can promote their resilience to climate change and adaptive capacities because of the fear of being judged negatively by others from their community. Studies have illustrated that the gendered impacts of climate change can vary from community to community (Akinsemolu and Olukoya 2020), and women's sensitivity and adaptive capacity differ from value chain to value chain. Using case studies of three value chains in Nigeria (cassava, catfish and chicken), this paper will investigate how gender norms impact women's economic resilience to climate change impacts.

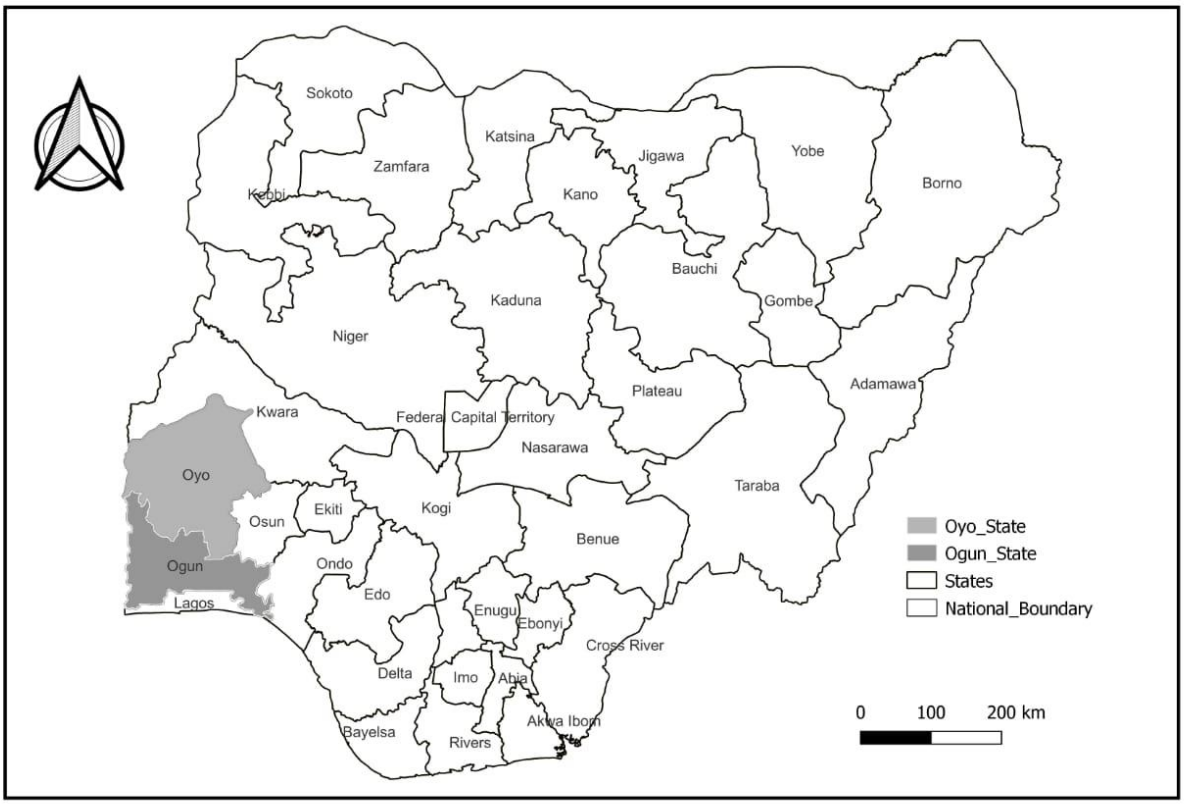
2. Context

Like other developing countries, Nigeria is highly dependent on agriculture and its natural resource base, increasing the likelihood of significant impacts of climate variability and environmental degradation on livelihoods for men and women. The country's climate has changed and is increasingly experiencing rising temperatures, unpredictable rainfall patterns, rising sea levels and flooding, drought and desertification, land degradation, increased frequency of extreme weather events, depleted freshwater supplies and a decline in biodiversity (Ebele and Emodi 2016; Elisha et al. 2017; Olaniyi et al. 2014). Low agricultural productivity has also been a key impact of climate change in Nigeria (Omoyemen 2010). As a climate change hotspot, Nigeria presents a compelling case to understand how gender norms influence women's economic resilience (Akinsemolu and Obafemi 2019) in the face of climate change impacts to identify key levers to foster transformative change that improves the adaptive capacities of women.

Patriarchal traditions and norms and economic, political, educational and environmental factors increase women's vulnerability to climate change in Nigeria (Akinsemolu and Obafemi 2019). For example, exposure to extreme weather events, including flooding, drought and rising sea levels, increases the labor burdens of women and girls, because they must walk long distances in search of clean water. In many communities in Nigeria, women have low levels of education because of gender and social norms surrounding school that negatively affected them as girls. Lack of education makes them rely more on natural resource-based livelihoods than men, which exacerbates their vulnerability to climate change variability. Furthermore, lack of access to critical climate-smart information impedes women and other vulnerable groups from responding effectively to climate change. Although climate change severely impacts women who engage in agriculture, they are excluded from making decisions related to climate change and how to adapt (Ume et al. 2021).

This study was conducted in Ogun State (fish value chains) and Oyo State (chicken and cassava value chains). Ogun and Oyo are two of Nigeria's six states in the Southwest geopolitical zone. Ogun hosts the largest hub of aquaculture enterprises in West Africa and is among the top catfish-producing states in the country. Women in the state are not economically empowered (Ntiwunka 2013) and suffer various forms of domestic violence, which affects their performance in agriculture and engagement in a variety of livelihood activities (Gbolahan and Ayodapo 2023; Ashimolowo and Tufale 2012). Women in Ogun are highly engaged in catfish processing but earn low incomes. Oyo is one of the top 10 cassava-producing states in the country and is a high producer of commercial broiler chickens. Just like in Ogun, women in Oyo have low empowerment levels, and gender income inequalities persist for the cassava value chain (Donkor et al. 2022) and low access to use of loans for female chicken farmers, leading to low productivity on their farms (Otunaiya et al. 2014

Figure 1. Study districts.



3. Methodology

This paper adopts a resilience approach to understand how gender norms shape women's economic resilience to climate change impacts. Resilience approaches look at the capacity of people to respond to anticipated and unanticipated climate changes in ways that allow sustainable adaptation and continued transformation to meet current and future challenges. Resilience approaches consider three key issues: (1) exposure to shock, (2) sensitivity and (3) adaptive capacity (Thompson-Hall 2016). Sensitivity refers to the likelihood of being harmed once exposed to a shock, and adaptive capacity relates to the tools and resources that can be used to adapt to the change and their use. We use the resilience approach to understand how gender norms shape sensitivities to climate shocks, women's adaptive capacities and their economic resilience to climate change.

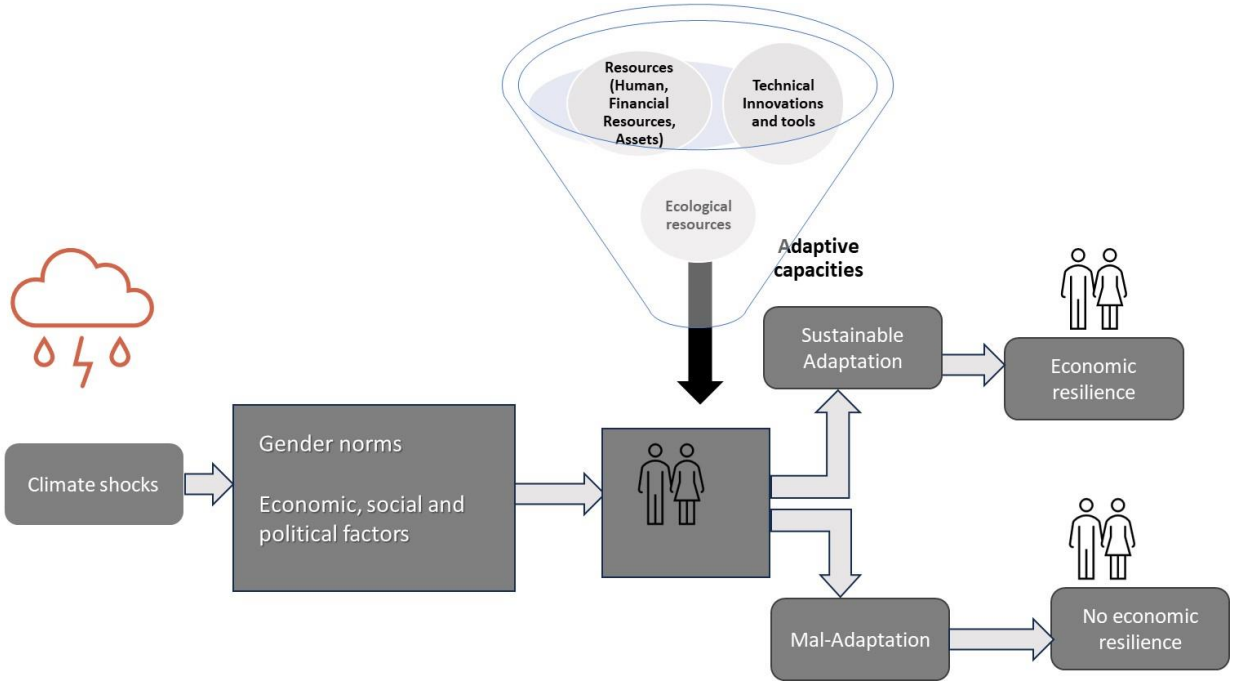


Figure 2. Resilience approach to data analysis.

Men and women are exposed to the same shocks but have different adaptive capacities because of their different lived experiences.

Resilience approaches are criticized for ignoring power dynamics (Thompson-Hall 2016), such as resilience for whom and what resilience means to different actors (Tanner et al. 2015). In the context of economic resilience, for example, the focus is usually on what institutional changes can be made to protect and promote economic gains, which often ignores the power dynamics in defining and using the term "resilience." However, the approach in this paper integrates the analysis of gender norms and livelihoods, acknowledging the power relations between men and women in communities and households and focusing on economic resilience for women.

3.1 Tools and sampling

The study used qualitative research tools, including a stakeholder workshop, IDIs, KIIs and FGDs, to understand climate change and its impacts on value chain performance and livelihoods and how gender norms affect women's economic resilience to climate change challenges. Study participants were purposively selected, as outlined in Table 1, to ensure representation from the cassava, catfish, and chicken value chains. Respondents included producers, processors, traders, and value chain supporters and service providers, such as input suppliers, farmers association leaders, microfinance staff, and officials from the government and nongovernmental organizations (NGOs). We selected three value chains to understand how gender norms mediate the impacts of climate change on women's economic resilience at the AFS level. We focused on value chain actors and chain supporters from all nodes to gain a deeper understanding of how climate change impacts affect the entire chain.

Table 1. Data collection instruments and sampling.

Tool	Purpose	Respondents
Stakeholder workshop	– To identify and map the key stakeholders in the respective value chains of interest to identify the value chain actors and chain supporters to engage in the study. – To understand which norms, constrain women and other groups from participating in and benefiting from work in the different nodes of the value chain.	– The stakeholders were selected from value chain experts with a national or regional value chain perspective, such as university faculty, NGOs, government departments, the private sector and representatives of producer organizations.
IDIs	– To understand how changes in weather patterns have affected the performance of the value chain and the livelihoods of smallholders who depend on the value chain for their livelihoods. – To understand what gender norms exist for community members participating at different value chain nodes and how these affect their economic resilience.	– Community members involved in the value chain including producers, processors and traders operating at the community level, both in rural areas and peri-urban areas.
	– To understand how players at the different nodes are coping with climate change impacts. – To understand what gender norms exist at the different nodes of the chain and how these affect their economic resilience.	– This included actors at different nodes of the value chain, such as processing, marketing, and transportation.
KIIs	– To understand the perception of gender norms and how they affect the resilience of service providers. – To understand how gender norms affect the ability of service providers to provide services to men and women operating at different nodes of the value chain.	– This included value chain service providers, such as input suppliers and financial providers, as well as aggregators, traders, and middle persons.
	– To provide background social, economic and political information about the community. – To provide a timeline of key climate events over the past decade.	– Community leaders.

Tool	Purpose	Respondents
	– To get more insights into community gender norms and how they affect the resilience of men and women in communities against the impact of climate change.	
	– To get more insights into gender norms and to understand how government policies affect the ability of men and women to cope and be resilient to the impacts of climate change.	– Government representatives, regulatory bodies, NGOs.
Community-level FGDs	– To provide background social, economic and political information about the community. – To understand from their perspective what they perceive as the constraints that limit women's economic resilience to climate change challenges. – To provide a timeline of key events over the past decade.	– Producers in fish, livestock, and cassava, as well as community-level processors and traders.

3.2 Description of the sample

The study first hosted a stakeholders workshop in Ibadan. Seventeen stakeholders (eight men and nine women) participated in the workshop. They came from academia, NGOs, government departments, the private sector, farmers associations and other nodes of the value chain—all with a national or regional perspective of the value chains of interest. The stakeholders adopted a participatory approach that led to mutual interaction and learning, as well as discussion with the different actors across the three value chains. Three main tools were applied:

- Tool 1: Background information on climate change impacts on the value chain of interest
- Tool 2: Gendered value chain mapping
- Tool 3: Actor analysis tool.

Tool 1 elicited information about how critical events, including those related to climate change, had affected the value chains over the past 10 years. Tool 2 was applied to map the actors involved in the value chain from a gender perspective. Tool 3 was used to profile the various chain supporters in the cassava, catfish and chicken value chains.

The study also conducted 55 IDIs and KIIS as well as 18 FGDs. Eighteen respondents each were interviewed for the catfish and chicken value chains, and 19 for the cassava value chain.

Table 2. Description of the sample

Value chain	IDIs		KIIs		Total
	Male	Female	Male	Female	
Cassava	5	5	4	5	19
Catfish	4	5	5	4	18
Chicken	6	5	3	4	18
Total	15	15	12	13	55

All the men who participated were at least 36 years old, as were 60 percent of the women. The rest of the women were aged 35 or below.

The study also implemented a total of 18 sex disaggregated FGDs (9 men's groups and 9 women's groups) with a total of 27 men and 27 women participating in FGDs in each of the three value chains.

3.3 Data analysis

Three key activities were implemented during data analysis. The first included developing a codebook using the study tools. The second involved reading the transcripts to update the code book from the dataset. The third included data coding and analysis. The coding methodology included a hybrid deductive–inductive approach. The study used NVIVO coding software to code the data.

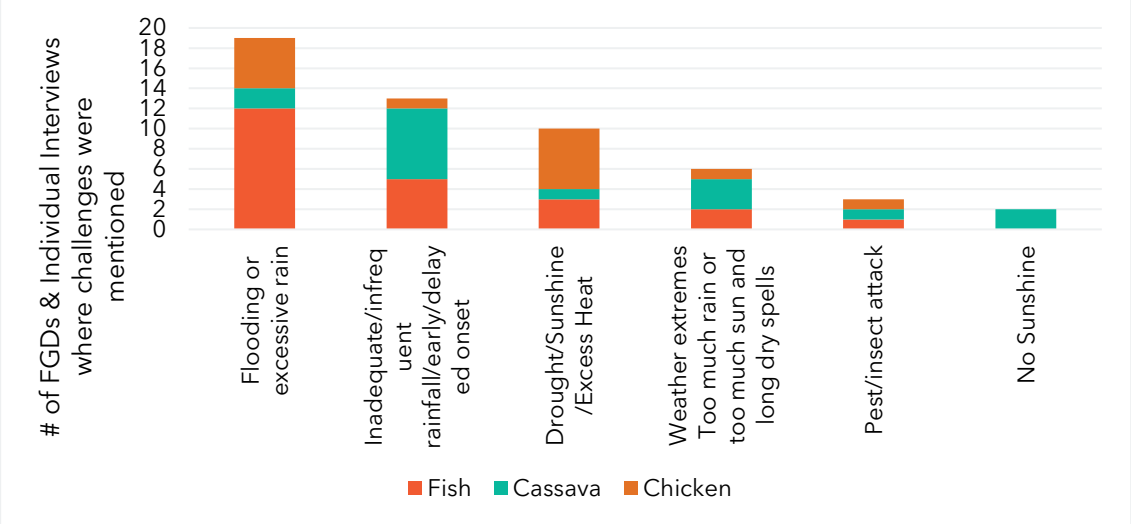
4. Results

The results section is structured into three key themes. The first theme focuses on the exposure to climate shocks and their impact on the different value chains. The second focuses on the impact of these shocks on men and women, and the third on how gender norms prevent women from building economic resilience to climate change challenges.

4.1 Exposure to climate shocks and their impact on chicken, cassava and catfish value chain

The actors identified six key climate change challenges across the three different value chains: (1) flooding or heavy rain, (2) inadequate or infrequent rainfall, (3) pests and insect and diseases, (4) drought, sunshine and excess heat, (5) no sunshine and (6) extreme weather

Figure 3. *Climate shocks.*



4.1.1 Flooding or heavy rain

Most farmers and key stakeholders mentioned flooding or excessive rains as a key climate- or weather-related event affecting the three value chains. Although it was suggested that floods and droughts are increasing, many in the study did not believe the flooding and heavy rains result from climate change impacts. Instead, they said the main causes of flooding are poor infrastructure development, such as the lack of proper drainage systems, growth of unplanned cities, and construction on wetlands or other water channels, which affects ecological patterns and the morphology of rivers. Poor road facilities affect farmers' productivity and income, especially in rural areas. This compounds the problems because it makes it hard to reach

farms and take products to markets when it rains. Respondents in the catfish value chain in Ogun State also mentioned poor city planning as another cause. They said that they were affected by floods, especially having their fish swept away or ponds contaminated, causing high fish mortalities and leading to the collapse of some fish farms.

"As I sit here, I lost more than 7 million Naira," said a participant in the male catfish farmers FGD in Ogun State. "When the rain came, the river became filled … the river was filled beyond level. All of us here if we calculate the amount of money we lost here, maybe we lost billions of Naira."

Cassava and chicken farmers said the poor road network, which is worsened by floods, prevents them from easy access to their farms and the market. During floods, it is difficult for some chicken farmers to access their farms, leading to loss of birds and equipment. Normally, those producing huge amounts of chickens have farms away from their homesteads and experience devastating losses.

Heavy rain also impacts the chicken value chain. If the weather is too wet, chickens become exposed to diseases because farmers fail to keep the coops dry. They need to pack dry wood shavings on the floor of the chicken coops, but shavings are in short supply at the sawmill during the rainy season. Heavy rain also increases the time it takes to complete certain tasks. For instance, after using shavings as litter, chicken farmers dry, package and sell it to vegetable farmers, who will eventually use it as fertilizer. With heavy rains, chicken farmers cannot dry the shavings and so cannot sell them. Since they cannot dry the shavings, they must remove them from the chicken coop. There is also the added problem of air pollution resulting from the foul smell.

Flooding affects the production of crops such as maize, soybean and sunflower, which are key raw materials for producing chicken feed. This, in turn, raises the price of inputs. As such, flooding leads to high feed costs and, ultimately, to high production costs and ripple effects across the chicken value chain. When the cost of feed increases, chicken farmers may temporarily drop out of chicken farming, affecting other input suppliers such as hatchery operators and drug and vaccine sellers because their sales will go down from the lack of demand for their products. When flooding occurs, the risks of chicken diseases increase, because chicken farmers require more medications and other biosecurity measures. Chicken coops may get flooded, requiring farmers to relocate their chickens or raising the coops to avoid floodwaters. Additionally, heavy rain lowers the chickens' capacity to lay eggs, and so the eggs become small. Also, the roofs of the coops can leak, affecting the health and production of the chickens.

Cassava farmers noted that heavy rain has destroyed cassava roots, rotting them and leading to low productivity and poor harvests.

4.1.1.1 How flooding and heavy rain affect the marketing and processing of agricultural products

Flooding also affects the marketing of fish and chicken because the roads are poorly maintained, and buyers and traders cannot travel to affected villages and communities to acquire the products. Also, flooding increases the transportation time because it makes bad roads even worse, leading to product loss and spoilage. Additionally, when farmers call buyers to purchase produce, they cannot travel because of floods or because roads are damaged even when the floods have receded.

When there is flooding, fish processors, who are mostly women, do not have access to fish to process, similar to when there is excessive heat or a long dry spell. During these times, the cost of fish goes up—from NGN 500 for a big fish to NGN 700 for a small fish. This also affects fish processors. Additionally, when there is a lot of rain, fish processors suffer losses. Rainfall affects patronage because clients may not show up after a processor has killed their fish, causing the fish to spoil. For those making fish pepper soup, clients do not like soup made from refrigerated fish, because they claim this spoils the taste. Also, fish becomes scarce during dry weather, and prices become higher, making business more challenging for those who sell fish. Rivers no longer flow well; ponds are dry and feed prices go up.

During the rainy season and when there is heavy rain, it takes longer to smoke fish using charcoal. Processors may lose fish. During normal weather, it can take a processor 3 to 4 days to process their fish, but during rainy weather it can take 6 to 7 days to dry the fish because the charcoal is wet. A prolonged drying period can cause the fish to spoil. Although this problem is expected during the rainy season, extreme weather changes have exacerbated the problem. Sometimes, it will rain so much that even the charcoal in storage, or during transportation, will get soaked. In this case, processors will not have time to dry their charcoal to smoke their fish. Fish processors now spend too much time trying to dry their charcoal to make it easier to smoke fish during this time.

When the rain comes with heavy wind, women who process *garri* have problems frying it. They will also not have access to good cassava when it rains because they cannot go to the farm to get it.

4.1.2 Inadequate or infrequent rainfall

Study participants regarded rainfall as no longer consistent; it may come too early, too late or not at all. Early onset of rains affects the planting of cassava. When farmers cannot plant and harvest yam, cassava and maize, processors and transporters are also affected.

"Six or five years ago, we used to load up our vehicles overnight, but [now] we wake up early and are barely able to fill up our vehicles," said a male cassava transporter in Oyo State. "Can you see how climate change has affected us as transporters? When farmers cannot get good yields because of climate change, then transporters like me will not have any work to do. It affects our sales."

Farmers can no longer rely on rainfall patterns because of extreme variation from season to season and area to area.

4.1.3 Drought and excess heat

Droughts affect producers but have ripple effects on the whole value chain. Stakeholders noted that, before 2015, there used to be a lot of rainfall. Now, however, by June or July the quantity of water has decreased drastically. Farmers across all three value chains can no longer rely on rain-fed agriculture. Long dry spells and droughts also lead to low harvests and household food insecurity. In turn, poor harvests lead to diet changes because farmers can no longer

rely only on the crops they farm. Some cassava farmers mentioned eating corn, which they never ate during the "old days," because, with unreliable rainfall, their preferred food crops are not performing well.

Fish farmers mentioned excess heat as problematic because it increases fish mortality and affects water quality and the biological processes of the fish. Very high temperatures dry the ponds, particularly for farmers who depend on groundwater instead of borehole water.

"Fish farmers want to pump water but do not have many boreholes," said a female government officer in Ogun State. "So, they look for swampy land, where the water can build itself up. With climate change and the high temperature, the swamps dry up faster. When the swamps dry, fish are harvested earlier, at 3 to 4 months, not at 5 or 6 months when they are supposed to be harvested." (Note: this quote has been edited for readability.)

Early harvesting leads to losses for farmers because the fish are harvested before reaching the desired market size. Some farmers plant bananas around the pond to induce a cooling effect for water in the pond by providing shade and putting measures in place to manage the waterflow.

Excessive heat causes the ground to become too hard, presenting problems for cassava farmers during harvest. A female chicken farmer and community leader in Oyo State who also produced cassava stated that villagers had received government loans during the COVID-19 pandemic and used it to farm cassava.

"The soil is hard, and it is challenging to get laborers to work on the farm," she said. "It's like a whole village. We used the federal government loan that was given to us as a COVID-19 loan on cassava farming. We have about 250 hectares of land under cassava in two villages. Up to 100 hectares have not been harvested yet. So, it (excessive heat) brings much damage. However, it is favorable for you if you want to dry cassava."

Thus, excessive heat affects farmers who cannot benefit from their cassava by failing to harvest it when the ground becomes too dry and hard.

Excessive heat and drought also impacts chicken farming. For example, farmers stated that when there is a drought, they lack enough water for their chickens. When chickens do not have enough water, they produce fewer eggs than normal. Farmers also noted that when it is too hot, vaccines fail, and the quality of vaccines received cannot be assured because some vaccines must be kept at a specific temperature for their viability to be retained. This increases mortality and disease among chickens.

However, chicken farmers noted that some changes that affect chicken production are not linked to climate change but to seasonal variations in weather. Producers and traders said that during the rainy season chicken production decreases because the weather becomes cool, leading to a drop in feeding and water intake. When temperatures are too high, however, chicken farmers need to find a way to cool down their chickens; otherwise, egg and meat production both decrease and mortality and morbidity will increase. Chicken farmers may put ice blocks in the drinking water, but the lack of electricity makes this difficult for women to implement. When it is too hot, chickens drink a lot of water, so farmers spend a lot of money on plastic containers for their chickens to drink from. When temperatures are too high, farmers reduce the number of broilers they keep in order to improve airflow in the coop. Although hot and cold weather is part of normal weather seasonal cycles, climate change has introduced weather extremes more than accounted for in normal seasonal cycles alone.

4.1.4 Pests, insects and diseases

Across all three value chains, farmers said pests and diseases have increased. For cassava, pest attacks include insects, grasshoppers and sparrows. During the rainy season, soldier ants attack the chickens (broilers), resulting in high mortality. Juvenile fish can be attacked by dragonflies, which have increased over the years. To protect the fish from dragonflies, farmers cover their ponds with nets.

4.2 Impacts of climate change on men and women

All the participants confirmed that events related to climate and weather impact both men and women in similar ways. However, further analysis shows that the impact varies between men and women depending on several factors, including their roles in the value chain. This section highlights the impact of the various climate change events on men and women actors in the catfish, cassava and chicken value chains.

4.2.1 Catfish

The stakeholder workshop also mapped the catfish value chain. The actors in the chain include input suppliers (hatchery operators, feed millers), producers (small-scale farmers, large-scale farmers), fish traders (supermarkets, eateries, fast food joints, open market traders), processors (smoked fish, fish sausage), cold room operators (run by states, individuals and cooperatives) and consumers (pepper soup joints, restaurants, households, schools). The stakeholders also identified chain supporters. These include aquaculture farmer associations, extension services, transporters, ice sellers, technicians, artisans, researchers, veterinary and lab services providers, finance providers and information service providers.

In the interviews, study participants were also asked to map where men and women are found along the value chain. The results of the mapping exercise are presented in Table 3.

Table 3. Gender division of roles catfish value chain.

	Men	Women	Rationale/explanation
Ponds and farming	✓		• Digging ponds and building them are for men because of the heavy labor involved. • Checking in on the hatchery and late-night security requires a lot of time and overnight visits, which is only suitable for men. • Although women farm too, it is not comparable.
Slaughtering fish	✓		• Men are more capable of slaughtering fish.
Processing (washing, frying, drying, smoking)	✓	✓	• Processing is more feminine work, but norms are changing. • Women are respected more than men when it comes to processing.

	Men	Women	Rationale/explanation
			• Men are needed to cut the catfish because it is a physically difficult job. • Tasks are shared in processing, with men drying and women washing the fish.
Transportation	✓		• Mostly men transport fish. Community members may disapprove of women transporting it. • Women are viewed as less agile because they take longer to transport the fish. • There are hazards associated with women traveling alone.
Buying and selling fish	✓	✓	• Selling and trading are primarily for women, who are seen as better salespeople and better with money. • However, selling fish at the market may be viewed unfavorably by women.

Men and women play different roles along the catfish value chain. In input supply, according to stakeholders, women usually operate shops and farms, but they do not own the farms or businesses. It was noted that women often say their husbands own the businesses or the fish farms, and cooperatives and the state mainly own cold rooms to maintain the cold chain. Men usually own those run by individuals (as opposed to cooperatives) because of the huge capital investment needed. Most producers are male.

There are only a few women in small-scale production, and even fewer in large-scale production. Commercial fish farms also mainly employ men rather than women. Likewise, the private sector employs very few women.

Table 1 lists some of the reasons why women are not regarded as significantly involved in pond work and fish farming in general. Some of the value chain activities require commitment. For example, the catfish hatchery requires one to sleep on the farm tending to the eggs and fry because this stage is sensitive and needs continuous monitoring. Sleeping at the farm is considered unsafe for a woman and not encouraged because it prevents her from caring for household chores. Unless the woman is single, it is inappropriate for her to leave her house to sleep in the hatchery. Even when she is unmarried, her parents may disapprove of such a movement.

When it comes to processing fish, processors are mainly women. Most use smoking kilns, charcoal, electric smokers, and dryers for catfish. One industrial processor, a man, also produces fish sausages and other products. Men dominate industrial processing because the level of investment is huge, and the skills and resources needed are immense. Most fish traders on the open markets are women**.** For small-scale traders, husbands may buy fish

from farms and hand it to their wives to sell. According to the stakeholders, vending requires one to talk and negotiate, and women are much better at this than men. Women are the ones who are involved in small-scale trading because men find vending difficult and not appropriate for their status. Men are the ones who go to farms to buy fish and bring it to their wives to sell because of the perceived security risks that women may face if they go to the farms alone.

Men and women in the catfish value chain suffer from economic losses caused by weather events. However, the nodes at which they are impacted may differ depending on their role. For example, male fish farmers mentioned losing billions of Naira at the production level when climate events disrupt fish farming. Those with ponds far from the river and those who harvest their fish before the floods come usually are not affected.

However, women are affected mostly at the retail and processing stage, where they are heavily involved. Although men are directly affected in production, women might be swindled when buying fish from men if there is not enough fish on the market. Also, women processors and retailers will take longer than normal to source catfish.

"The waiting time sourcing for their raw materials is extended," said a male government representative in Ogun State. "They might be hopping from one place to another until they get what they are looking for."

The waiting period to access fish affects women's businesses and their profits. Women fish retailers are affected during the dry season because wholesale fish prices increase from NGN 1000 or 1200 to NGN 1500 Naira per kilogram.

Heavy rain also affects fish processors, primarily women. Because of a lack of charcoal, they cannot dry their fish sufficiently after heavy rains.

In one of the IDIs, a female value chain fish processor in Ogun State said that "during the wet season, charcoal is usually more expensive than it is during the dry season. During the dry season, it costs us between NGN 2500 and NGN 3000, but during the rains, especially when it rains continuously for 3 or 4 days, it can cost as much as NGN 6000 to NGN 7000. It would even be scarce. On those days when there is a continuous downpour, the charcoal gets wet, and when there is no sun to dry them, it poses a lot of difficulty for the business."

Some respondents mentioned that men and women work together as spouses within households. As a result, they are affected equally by adverse climate events.

"It affects the two because they are a couple now. If the fish farm of the head of the house is flooded, whether you like it or not, it is going to affect what goes into the maintenance of the family," said a male government representative in Ogun State. "Whatever hits the eyes, hits the nose."

There is no denying that household units feel the impact of climate change challenges on incomes and the household's lifestyle. However, in their capacities, men and women are impacted differently depending on the value chain node they are found in. Some of the participants suggested that men are less affected than women because men have other sources of income, have more income-generating opportunities and can implement ways to have access to water, such as investing in water pumps.

4.2.2 Cassava value chain

The cassava value chain includes input providers, farmers, processors, transporters and marketers. Men are mostly involved in transportation along the value chain. When it comes to processing, men use machines such as grinders and pulverizers. At the same time, processors are mainly women,

who are involved in processing and cooking *garri* (cassava flakes), *lafun* (cassava flour) and *fufu* (cassava paste). The gendered division of roles and activities in the cassava value chain in the study area is presented in Table 4.

Table 4. Gender division of roles in the cassava value chain

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	Men	Women	Rationale/explanation
Farming	✓	✓	• Farming is strenuous work and is thus seen as a man's job. • Women are also becoming farmers. There are many more female cassava farmers than male, and they farm even better than men. If there are good technologies, women can do it. There are women who are farmers with farms far away from home.
Transportation	✓		• Loading and unloading is heavy work. • Men have access to vehicles.
Grinding	✓		• Although this is mostly seen as a man's job, women can grind if they have a machine. • A woman may end up grinding if she is strong like a man.
Selling/trading	✓	✓	•
Processing/ cooking		✓	• This is mostly seen as a woman's job because societal expectations and norms discourage men from processing and cooking. • Men are engaged in other tasks.

In the cassava value chain, it was suggested that although men dominate activities such as farming, transportation and grinding, women dominate processing cassava into *garri* and cooking it.

In cassava farming, most farmers are men, so they are heavily impacted when a crop fails because of a climate event. However, it was noted that the ripple effects also affect women *garri* processors. When asked who is affected more by climate change challenges, participants had differing opinions. Some said that, as producers, men are affected more, but some opined that low cassava harvests also affect women processors because it impacts their livelihood when little or no cassava is harvested. As such, men and women are impacted differently depending on the node of the value chain where they are.

Some cassava farmers noted that weather changes mostly affect *garri* processors, who are mainly women. One respondent estimated that 95 percent of women in their town were *garri* processors. When there is a lot of rain and little sunshine, *lafun* processors cannot dry their cassava sufficiently and can suffer from severe post-harvest losses.

"During the rainy season, if one can successfully dry the cassava flour *(clubs)* with the little sun that comes out and can get it to the market to sell, then the person will enjoy the profits from the sale," said a female cassava trader in Oyo State during an IDI. "Sometimes, when you keep bagging, offloading and re-bagging, it produces a foul odor that would make it unmarketable."

Of course, cassava on the farm can rot if the rain becomes excessive.

During an IDI, a male processor noted that although men and women in the cassava value chain face similar challenges, women who own farms and depend on hired labor may suffer more than men in the event of poor harvests due to weather-related events. Normatively, men are regarded as cassava farmers. Women engaged in cassava farming need to employ labor for certain activities. In the event of crop failure, these women suffer more because they still need to pay for the labor.

"It is the same business challenges that both men and women face," the respondent said. "However, the women who own farms and employ laborers to work with them suffer because when the harvest is poor due to no rain or scanty rains, the agreement made with the laborers will be affected. For instance, you have agreed to pay a laborer NGN 400,000 at the end of the year, and then all the money you as a farmer realize is NGN 450,000, what do you do then? You start running up and down to borrow money to fulfill the agreement with the laborer."

When the heat is too high and the ground becomes too hard, women farmers may also fail to get enough laborers to harvest their cassava.

Some women said that they are better able than men to cope with climate change events, such as crop failure, because they can engage in additional business activities like petty trading, as well as making *garri* for sale. Men often have challenges engaging in such coping mechanisms because they concentrate on cassava farming, and petty trading is considered belittling for men in the South-West region of Nigeria.

However, some male and female cassava farmers stated that climate change is not their biggest problem. Instead, it is the lack of labor, the high costs of processing cassava and the diminished profits from cassava farming. A male cassava producer said his main challenge was labor shortage because people are no longer interested in the hard labor associated with cassava farming. "Without laborers, we can't work as farmers," he said. The general economic climate, leading to expensive parts to service cassava grinding machines, or the lack and high cost of fuel to run the machines, make cassava processing expensive. A female cassava farmer noted that climate change had not severely affected her farm because a farmer can still harvest cassava even with little rain. However, her profit from farming cassava had declined, and her other farming enterprises, such as tomato and tobacco, had been severely affected.

4.2.3 Chicken value chain

Men and women are engaged in the entire chicken value chain, although men are more involved in constructing chicken houses and transportation, while women are more engaged in processing. The gender division of labor among actors in the chicken value chain in the study area is presented in Table 5.

Table 5. Gender division of roles in the chicken value chain

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	Men	Women	Rationale / explanation
Own/manage chicken farms	✓	✓	• Although women and men can own hatcheries and raise chickens, there are contrasting views on whose role it is to manage chicken farms. • Some see it as a woman's project because they spend more time at home and can watch over chickens. Even if a man owns the business, wives/employed women manage it. • Some see men as responsible because they can live on the farm. Women need to take care of their children and family, does will not allow them to have enough time to stay in the hatchery like men.
Building chicken houses	✓		• This requires knowledge and engineering.
Slaughter chickens	✓	✓	• Mostly men slaughter chickens, but women can too, if they are courageous enough or if they have expertise or interest. • Men and women do this job equally in some communities.
Transportation	✓		• Although this is seen as almost exclusively a man's job, it is not uncommon for women to transport and load or unload chicken. • One woman who loads and unloads chicken said men do not like the idea of women doing their job. • Women and men state that time needs to be spent at home, which comes first, making it difficult to participate fully. • Transportation is risky and is done at night.

	Men	Women	Rationale / explanation
Selling chicken eggs	✓	✓	• Although both women and men sell eggs, it is viewed mainly as a woman's job. • Women know how to market better.
Processing/ cooking chicken		✓	• Mainly, women do the processing, but men can too if it brings income for them. • Men would be looked down upon if they washed and cooked chicken. • Cooking is women's activity because they find it easy to do any work that relates to cooking. • One woman mentioned that men cook as well, especially BBQ chicken.
Factory operation	✓		• Processing chicken in factories requires operators to stay overnight, which women cannot do because they have a responsibility to be at home.

Although climate change affects both men and women, a female chicken producer said that women are more impacted because men have better resources. It was noted that women often have fewer chickens and fewer resources to help them recover after an adverse climate event. Female chicken farmers also mentioned the significant losses from weather-related events.

"It affects everybody," said a woman who produces community chickens in Oyo State. "But men are more prosperous; they have more money and more chicken. They may not feel it the same way as women because women have fewer chickens than men, and they may not have as much money as men."

A common theme among women was the financial and economic ruin they experience from climate events and sometimes the inability to be resilient and start from there they left off. When flooding occurs, for example, men have land and other assets that they own to help them quickly relocate their chickens or raise the coops if needed. It was pointed out that men more than women may compromise production strategies to reduce the cost of production. These strategies can include adulterating inputs such as feed ingredients and vaccines. Also, others may use growth hormones or pig feed if it is cheaper than chicken feed.

There was a general understanding from participants that climate change affects both men and women. Still, they said excessive heat affects women more than men because they are always in the markets and because of their production roles. For instance, women may need to be at the chicken farm frequently to change the water or add ice blocks to the drinking water to help the chickens cool down or to take battery-charged fans to the coop to try to cool the temperature down. The impact of climate change challenges, especially excess heat, on female chicken farmers is that it will increase their labor. Some respondents felt that men and women are affected the same way, but those without knowledge of managing the impacts are affected more.

Farmers who acquired *lapo* loans (microfinance loans) to support chicken farming were regarded as being at high risk of failing to pay the loans back after an adverse event.

"Yes, it affects because if you have your birds and they did not do well, eventually some even run into loss, and when they run into a loss, their well-being and their general livelihood are affected," said a male federal government representative from the chicken value chain during a KII. "They usually incur a lot of debt, and there is no way to escape it; they must start struggling again. The truth is that some of them even get all these small *lapo* loans to grow their businesses. Therefore, incurring debt may affect their income and livelihoods."

Thus, access to capital is important to grow businesses. However, it might put farmers at risk if they have huge loans and no weather-related insurance to cover them for losses.

4.2.4 Fatalism and adaptive capacities of men and women

Confronted with climate change impacts, several respondents expressed a sense of fatalism, believing their survival and coping relied on divine intervention. Men and women across all three value chains said that adverse climate events were from God and that nothing could be done against them except to accept fate and beg God for divine intervention. Processors and producers talked about begging God and enduring suffering until better weather prevailed, believing in divine intervention. Some respondents said they pray for God's assistance to help them save money for emergencies or machine failures. Some women experience frustration when heavy rain disrupts processing activities and plead with God to stop the rain. One respondent said that she needed God to protect her from working like an elephant and "suffering under the yoke of poverty" because of adverse weather patterns. Fatalism is a key indicator highlighting a feeling of helplessness and lack of adaptive capacity for men and women value chain actors.

However, it was noted that norms that regard men as household heads put pressure on men and cause instability in the home amid suffering caused by climate change challenges that result in production failure.

"We all know they are meant to support the family as the man is the head," said a female government representative from the catfish value chain in Ogun State. "So, it (adverse climate events) affects the support that they give to the many. The income they should bring in from what they do is less than before."

Men are expected to be the heads of the households and providers, so climate impacts affect them. These impacts can cause conflict in the home if production is low and household food security and income are threatened without any plan or resources to adapt to these changes.

It was also suggested that while women can take up menial jobs such as fetching water to survive in the short term, men are not willing or able to take up these jobs because they perceive that such jobs do not befit their status.

"Climate change affects men more because, as the major breadwinner in the house, they have to provide for the family, affecting the men more," said a male government representative from the cassava value chain in Oyo State during a KII. "The female farmer can decide to take up menial jobs in the community during that period, like fetching water, but men can't stoop so low, so it affects the men more than the women."

Therefore, men may become angry at being unable to take care of their families and being heads, while women might resent their man if there is no food in the household, leading to internal household conflict. Stakeholders also noted that although farmers need to diversify their

livelihoods to be resilient, more women could diversify than men "due to the ability of women to multitask and quickly perceive the danger ahead." (A participant at the stakeholders workshop in Ibadan).

4.3 How gender norms impact women's economic resilience to climate change challenges

The different value chains in Nigeria are governed by some cross-cutting norms that influence women's and men's ability to be economically resilient to climate change challenges. Table 6 lists the norms that cut across all three value chains.

Table 6. Cross-cutting norms mentioned in the value chains.

Cassava	Catfish	Chicken
Women should not supply inputs such as improved cassava varieties (cuttings), fertilizers and herbicides.	Women should not operate catfish hatcheries.	Women should not operate hatcheries.
Women should not go alone to buy stem cuttings.	A woman cannot go to a hatchery to buy fingerlings for catfish production. A woman cannot go to fish farms to buy catfish for sale or processing.	Women should not own chicken farms away from their home.
A woman cannot get credit or a loan for cassava farming without the approval of her husband.	A woman cannot get credit or a loan for fish farming without the approval of her husband.	A woman cannot get credit or a loan for chicken farming without the approval of the husband.
Women should not own land for cassava production.	Women should not own fishponds.	Women should not own land for chicken production.
A woman should not be a chairperson or leader of a cassava association or cooperative.	A woman should not be a chairperson or leader of a catfish association or cooperative.	A woman should not be a chairperson or leader of a chicken association or cooperative.
A man will be considered less of a man if he is involved in	A man will be considered less of a man if his wife is involved in fish farming. Women should primarily be	A man will be considered less of a man if he is involved

Cassava	Catfish	Chicken
cassava peeling, washing, sieving and toasting.	the ones who clean and process fish.	in the processing of chicken, such as dressing chicken.
Women should not be the ones who travel when transporting fresh or processed cassava for sale outside their place of residence.	Women should not be the ones to transport the inputs (for production) and catfish for sale outside their place of residence.	Women should not be the ones to transport the inputs (for production) and chickens and chicken products for sale outside their place of residence.
Women should not spend long periods outside their homes engaging in the sale or trade of fresh or processed cassava.	Men should primarily be the ones who control the earnings obtained from the sale of fish.	Women should not spend long periods outside their homes engaging in the sale or trade of chickens and chicken products.
Women cassava farmers should not negotiate prices with traders who come from outside their residence.		Women chicken farmers should not negotiate prices with traders who come from outside their residence.
		Men should be responsible for marketing chicken, not women.

4.3.1 Norms preventing women from participating in lucrative nodes of the value chain

Norms that prevent women from engaging in lucrative value chain agribusinesses prevent them from expanding their business and increase their capital and savings to be resilient to the impacts of climate change. For instance, women are not encouraged to work in input supply, such as supplying cassava cuttings or operating chicken and catfish hatcheries. These norms disempower women and affect their economic stability and resilience. For example, it was suggested that women usually operate shops and farms but do not own farms or businesses. It was noted that women often say their husband owns the businesses or the farms. Participants highlighted that some of these norms are enforced because of insecurity and envy from husbands. When a woman is empowered, the husband may feel jealous and insecure and plot to bring the woman down.

Two participants in the value chain stakeholders' workshop in Nigeria spoke to this issue.

According to a male participant, "In one project, we empowered this woman with cassava processing equipment. She started making more money than her husband. The

husband started asking the woman to give him all the money she made. Later, the husband started working with other men in the community to frustrate the woman until her business went down."

A female participant in the same workshop added, "You can't just empower a woman and leave the husband. If you do that, you will be putting pressure on the woman. The man can even start refusing to support his children. He will direct them to their mother whenever they want something because she has more money now."

Thus, some of the norms preventing women from participating in lucrative value chain nodes are linked to the issue of control and power within households and the need for men to remain heads of households in charge of women and children.

However, related norms are changing. For instance, some stakeholders added that some men do not regard women working and earning their own money as a threat or challenge if they are involved and are aware of what the woman is doing. Additionally, it was suggested that the lack of representative of women at certain value chain nodes is not from norms prohibiting them from participating but because of a lack of capital to invest. For example, men usually own cold rooms because of the huge capital investment needed to install one.

4.3.2 Norms preventing women from accessing credit or other forms of finance

Male and female respondents strongly agreed that women should not get credit or loans without the approval of their husbands. Most women said that they needed their husband to approve when they got credit so that he could help them repay it if things did not work out well and they could not service the loan fully. Most respondents said that a woman should tell her husband and get permission from him before getting a loan to expand her business unless the woman is single, widowed or divorced, in which case they did not need to inform anyone. High interest rates are also a problem, which means the husband must be aware if the woman fails to repay the loan. "So, people require the consent of their husbands, and some require the support of their husbands to give them courage" (A female chicken farmer).

Women's lack of access to funds or loans that enable them to adopt technologies to deal with climate change challenges makes women less resilient. For instance, men fish producers said that some men manage to buy technologies such as pumps to pump water into ponds during the dry season. Yet women across all value chains mainly mentioned lack of funds as the major hindrance for them to adopt such technologies to help them become more resilient to climate change. Cassava farmers noted that women are more vulnerable to irregular rainfall, which is made worse by their dependence on rainfed agriculture because they do not have access to funds to acquire climate-smart agriculture technologies like irrigation systems.

Some women have received training on modern technologies to help with processing cassava. However, when asked why they had not adopted these technologies, female respondents mentioned the lack of money or finance as the main obstacle because "there is nothing we can do for free (A female cassava farmer)."

Women said the cost associated with adopting certain technologies are prohibitive. Two women chicken producers in Oyo State spoke to this issue during separate IDIs.

One of the two women said, "I saw this thing in one of the poultry groups I belong to on WhatsApp. There is the engine that they use to spray the birds. Not sprinkler-like mist; they use it to cool. If someone has that kind of technology, but I can't afford it. But if there is an intervention, maybe provision of

such a technology for us to cool down in the hot period for the bird, it will be good."

According to the second woman, "What happens is that this '*vogue' (*referring to a type of sprinkler machine for chickens*)* that we are talking about is very costly, so not many women can afford it, so they will not use it; the nipple alone costs NGN 3000."

The lack of money to adopt technologies is a significant obstacle to promoting women's economic resilience. Respondents suggested that men have more resources than women, so it is easier for them to adopt such technologies that make them more resilient to climate change than women. Women chicken farmers also suggested that since women own only a few chickens compared with men, it does not make economic sense for them to invest in expensive technology for little returns.

Cassava farmers noted something similar. They said that men can easily access credit because they have collateral and that lending institutions prefer giving credit to a man over a married woman because they are uncomfortable talking to married women in the absence of their husbands.

"Can you imagine you find your wife negotiating credit repayment with another man or has failed to pay back?" said a male participant in the workshop. "What would you think of as a husband if it was you? The story would change from credit to something else … it will be like what are you doing with my wife?"

"Men love to deal with men when selling on credit," said a female participant during the workshop. "This is because when the time for payment comes, the issue can be misconstrued; the husband's brother or the husband himself can accuse a man of having a sexual relationship or trying to embarrass someone's wife, so the lender can even lose everything in such cases."

Because of these reasons, when it comes to offering credit or loans, men prefer dealing with other men rather than women. As such, men can more easily access finance than women. With this money, men can easily access critical inputs like herbicides and pesticides they may need to cope in the context of the impacts of climate change, where pests and diseases are increasing.

As a result of a lack of access to finance and resources, women sometimes adopt harmful coping mechanisms. For example, cassava processors can close factories and engage in other businesses when they fail to cope with climate events that affect their business. The stakeholders agreed that more women close factories than men.

4.3.3 Norms against women owning assets

Across the different value chains, several norms against women owning assets prevent them from being economically resilient to the impacts of climate change. The participants explained that because men own land, they can benefit more from the cassava value chain than women. For instance, because men have access to land and, in some cases, commercial farms, they can easily access credit and other commercial inputs, such as herbicides, by using land as collateral. Additionally, when women do not own productive assets, they are not regarded as farmers but as helpers, which makes it difficult for them to benefit fully from their efforts.

Norms that prevent women from owning assets make them more vulnerable to the adverse effects of climate change. For example, cassava farmers cope with flash floods by moving their farms to other land that is not flooded. Both men and women are affected, but more women struggle to cope with this problem because of their limited access to land. Although some male and female respondents said that women in their community could own land, in many instances they cannot buy land in their own

right. Across all three value chains, women are not allowed to control productive assets such as land. Land ownership for women is not encouraged and, in some instances, is actively discouraged. During an IDI, a male producer said that it is not true that women cannot own cassava farms, because some women are even better farmers than men. However, this comes with a caveat.

"If a woman owns the land, it'll be in her husband's name," he said. "Even if she buys, it will be purchased in her husband's name. "[If a woman is not married], she will buy it in her father's name. Once she is not yet in her husband's house, she must buy it in her father's name."

Married women need permission from their husband to purchase land. One female participant suggested that if a woman does not own land, and she is not a farmer, the woman will have to seek permission from her husband to buy the land. During a discussion, in which they were shown a vignette about a woman named Joana, all the men in the catfish group did not approve of her buying land in her name and would not support it. All the women in the catfish group approved of Joana purchasing land only if she put both her and her husband's names on the title deed. There was variation among the women's chicken group. However, the majority agreed that putting the wife's name on a joint deed would be better so that if the husband died or married another wife, the wife's investment would be protected against unscrupulous relatives. However, it was noted that the wife should inform the husband before putting her name on any title deed.

According to men in the chicken value chain, "If she does not inform her husband before buying the land, it may lead to problems in the family. This can lead to pride on the side of the woman."

In the chicken FGD, men suggested that if a wife bought land without the husband's permission and put her name on the title deed, the husband might withdraw his support for the wife. During an IDI, a male respondent in the chicken value chain in Oyo State gave an example of a couple where the husband had permitted his wife to purchase land in his village.

"Pride sets in for the woman, and she removes the husband's name from their joint account," he said. "The angry husband vowed to ensure the business did not grow again. As we are talking, both the husband and wife are not on good terms."

As a result of norms that prevent women from owning land, many women do not own farms but rent instead. When renting land, however, in the event of a catastrophic climate event, the renter may be unable to rent the land the following season. Sometimes, women may wish to rent, but the landowner may refuse to grant them access, making their businesses unstable.

Even when running successful businesses, women need permission from their husbands before further investments or expanding their businesses. Norms such as these prevent women from being economically resilient to climate change.

However, the norms against women owning land are slowly changing, and opportunities for land ownership are increasing for them. Yet women still need to tell their husbands or other male relatives before purchasing land. Many people believed women can own land and start businesses.

"Nothing should stop a woman from acquiring property … once the husband, child or older sibling is informed, nothing should stop a woman from doing whatever she wishes" (A participant in a female chicken value chain FGD).

However, it was suggested that norms against women owning land are particularly being challenged in urban areas.

"Some years ago, most people felt women should not be dealing with properties and

land. But things are changing, especially in the urban areas. Women are buying land and building houses in their names. It may be difficult, but women do it if they have money (Female chicken producer, Oyo State)."

Even when women can own land, opinion was split on whether women can own farms away from home. Some said that women with young children to care for should not own farms at such a distance, while others said it depends on the age of the women. However, not owning land far from home sometimes prevents women from expanding their businesses or responding appropriately to climate change impacts. For example, without owning land far from home, women cannot keep large amounts of chickens or respond appropriately to floods by relocating their chickens to higher ground. If they do not farm away from home, they can only engage in small-scale chicken rearing, which is not lucrative.

Some women are beginning to challenge norms surrounding land ownership. There seem to be some indications that views against women owning land could be changing, as shown by the following notes from the workshop:

- Women need to own land so that they can use it anytime they want to.
- Women should be allowed to own land if they like, and they should be allowed to own anything they want.
- Although it is difficult, women are buying land and building houses. Opinions are changing, albeit slowly.
- Women should own land so that if they die or their husband marries another wife, their children will not suffer.
- Some husbands are supportive of their wives owning land in their name.

4.3.4 Norms related to the gender division of labor

Some norms govern the gender division of labor and shape men's and women's economic resilience to climate change impacts. For example, processing *garri* and cassava flour is considered a woman's role, while men's responsibility is mainly to produce cassava.

"Many women will not make heaps," said a male transportation operator for cassava in Oyo State during an IDI. "I know that women will not want to do jobs that need high energy. Men like me will not also make cassava flour (*elubo*, *lafun*) because it can make people look down on them."

Designating specific roles, such as making soil heaps for cassava for men, mean that women become dependent on men for certain activities. Some men may not allow their wives to sell chickens, so these wives would have to depend on their husbands to sell their produce come harvest time.

Chicken retailers noted that female retailers opened their establishments later than their male counterparts and closed earlier because it is not suitable for a woman to allow her business to disturb her work at home; the home comes first.

Norms that discourage women from doing specific tasks along the value chain increase their reliance on men's labor or hired labor. This can be a barrier to economic productivity if there is difficulty in obtaining labor.

According to a female respondent in the cassava value chain during an IDI, "It is different for men because, while we are still searching for laborers, men can make use of their strength to work for themselves."

An example from the cassava value chain shows that men can travel at any time to source stem cuttings and do not need permission from anyone, while women may

not be allowed to do so, making them dependent on men.

"Can you imagine a woman going to the farm in the bush in the middle of men?" said a male participant in Nigeria's value chain stakeholders' workshop. "First, if she tries to tell a man how she wants her stem to be cut before she even finishes talking, the man will look at her and ask, 'Who are you to tell me how to cut stems? I have been cutting stems for 15 years, so what can you tell me? Where are you coming from? Don't you have a husband?'"

It is also regarded as a security risk for a woman to travel to cassava farms away from home in the bush to buy the stems.

The gender division of roles is usually predicated on the domestic roles women must also play in their homes. For instance, transportation businesses, such as driving trucks, is regarded as a man's role across all three value chains. It was deemed difficult for women to engage in it and be able to take care of their domestic responsibilities. For instance, in some cases transportation is done at night to take advantage of cool temperatures, which makes it impossible for women to do. Both men and women agreed it was a security risk for women to be away from home at night.

Because of women's domestic roles, many people would disapprove of them assuming roles that would take them away from home for long periods, which is regarded as negatively impacting their home life. In general, respondents, both men and women, agreed that women should not spend extended periods away from home marketing produce.

Still, norms governing the gender division of roles are being challenged. For instance, restrictions are less impactful on men than on women. Men can be involved in value chain nodes where women dominate, especially when this is attracting more financial gains, without negatively impacting their reputation. Yet women who challenge norms and want to move into men's roles may be viewed negatively. Although processing is mainly regarded as a woman's job, no one will look down upon such a man when they are involved in commercial large-scale processing. Men are often targeted for employment in processing plants of the belief that they "work harder and faster."

For commercial purposes, men are now doing other activities that they never used to do, such as dressing chickens or fish processing. Although it is still regarded as a job for women, men are involved in slaughtering chickens, and it is now viewed as a man's role. On the other hand, norms preventing women from participating in certain nodes may continue to be enforced. For example, chicken producers noted that community members may not support a woman operating a chicken hatchery and may ask why she is encroaching on men's work. Additionally, men may resist their wives doing certain activities because they fear being judged by others.

"They see the man as nothing because it's like it's the woman controlling the man," said a male cassava farmer during an IDI.

When women work outside the home in environments where they interact with men, they may be labeled as "prostitutes," which also restricts the businesses that women can freely engage in. For example, women are not expected to be involved in pepper soup joints unless are not married. However, when men take part in such businesses or in areas where women used to dominate, there are not many negative sanctions against them. It was noted that men have encroached into some processing activities that women have previously done.

Some norms are also aligned with the resources that men and women control. Regarding hatchery ownership, for example, some women operate chicken hatcheries, though fewer in number because they need more investment in equipment. More men

than women have more money to invest in such a venture. Also, men have more time to attend training and gain the technical skills they need to operate hatcheries compared with women, who are expected to take care of domestic chores at home. It was also suggested that the economic risks involved in running a hatchery are high, and women may not be economically able or willing to take on such risks.

4.3.5 Gender norms that restrict women's mobility

Societal norms that restrict women's mobility and demand that they are responsible for caring for the children limit women's economic resilience. This was particularly acute during the COVID-19 pandemic, women value chain actors were saddled with the responsibility of staying at home and looking after children and household needs.

"Men still find their way around it," said a female chicken input supplier in Oyo State during an IDI. "But because I had to stay with the kids since they were not going to school. If I were male, I would not be affected like that. If some people do not buy, they will go to other places and can travel easily. But for a woman like me, I cannot travel. I have so many things to do at home and cannot move quickly to other places. I'm limited to my immediate environment or some things I can do online. Sometimes, your customers demand to see you face to face and have a meeting, but I'm limited because my kids are still very young. They are so young, so there's a limit to how much I can travel."

Overall, research participants often noted that men cope better with the impacts of climate change because they can easily travel to meet clients and do business, while women are tied down by children and homecare duties. Restrictions on women's movement also means that they close their businesses earlier than men so that they can be home at a respectable time and sometimes open late so that they can take care of their domestic chores.

5. Discussion

Data analysis reveals that women and men encounter similar climate challenges; however, gender norms shape their experiences and create gendered opportunities for economic resilience. This paper suggests that men are more economically resilient than women to the impacts of such challenges because they have more access to finance, including loans, land and other assets that can help with resilience. In some instances, however, women are regarded as more resilient in the short term because they can engage in petty trading to survive an adverse climate event compared with men. Yet this type of short-term adaptation limits and does not lead to systemic transformation in ways that improve women's economic adaptive capacities in case of future events. "Returning to normal" after a climate calamity may be maladaptation (McEvoy et al. 2013) because the normal may not consider changes and transformation needed in the near future. Engaging in small businesses is a short-term strategy that does not build resilience to adapt to future shocks. The lack of resilience and ability to adapt for some women is evidenced by the fatalism exhibited by some respondents, who mentioned that climate change was of God, and they could not do anything to adapt.

Women and men challenge gender norms. However, repercussions may be more acute for women. For instance, men in Nigeria who engage in more "feminine" activities, such as *garri* production, may not experience repercussions as women do. Women who challenge norms may get divorced or lose prestige in their community and family, resulting in marginalization or

disempowerment. Additionally, if men engage in normatively women's agribusiness or activities on a larger scale, societal sanctions are not imposed upon them because they are regarded as "doing it for business." The larger the business is, the more acceptable it is for men to engage in a traditionally defined female occupation.

Women suffer from low adaptive capacity because of social and institutional factors that do not support their efforts to adapt (Ume et al. 2021). These institutional factors include roles and norms and other gender roles and expectations. For example, some gender norms prevent women from accumulating assets needed to reduce sensitivity to climate shocks and increase adaptive capacities. Restrictive gender norms prevent women from adopting technologies that could bolster their resilience or prevent them from receiving services they need to address increasingly challenging agricultural production. Women mentioned being unable to adopt technologies, such as nets to protect their fish from pests and temperature regulation systems for chicken production, because of a lack of resources. Structural barriers, including insufficient physical infrastructure and unsupportive regulatory and policy environments, expose men and women to risks affecting their economic resilience to climate change in particular value chains.

The study also identified potential opportunities for change. Certain gender norms are shifting, becoming more flexible and contested. Some men and women are advocating for women to own land, particularly in cases where the husband dies or takes another wife and neglects the first. Additionally, educated young women are increasingly engaging in large-scale agriculture businesses. However, they may still require the support of influential male figures to manage their male workers, who may not readily comply with their directives. These emerging trends indicate that a comprehensive approach to understanding gender norms and discriminatory structures while integrating gender-sensitive agricultural policies can foster economic and socially sustainable impacts, ultimately promoting women's economic resilience in climate change scenarios. Finally, although this paper focuses only on gender norms, there is also a need to consider larger-scale political and economic changes that may promote or hinder resilience. Concentrating only on gender norms, though useful, may miss this critical dynamic. Additionally, economic resilience approaches that focus on intrahousehold power dynamics and access to resources may improve economic resilience for women since it was noted that women who have the support of their husbands are more resilient than those who don't.

5.1 Recommendations and options for action

The findings from the study show the importance of working with men and women agrifood systems actors, including opinion leaders in communities, traditional authorities, government representatives and other stakeholders. Together, they can identify leverage and levers to help alleviate restrictive gender norms and balance power relations in ways that increase the capacities of women AFS actors to build economic resilience to climate change challenges. When leverage points in any system are addressed, "a small shift in one thing can produce big changes in everything" (Meadows 1999, 1. This results in the deeper-level change required to strengthen capacities to build economic resilience to climate change challenges.

Figure 3. Next steps to determine leverage points and intended outcomes and impacts

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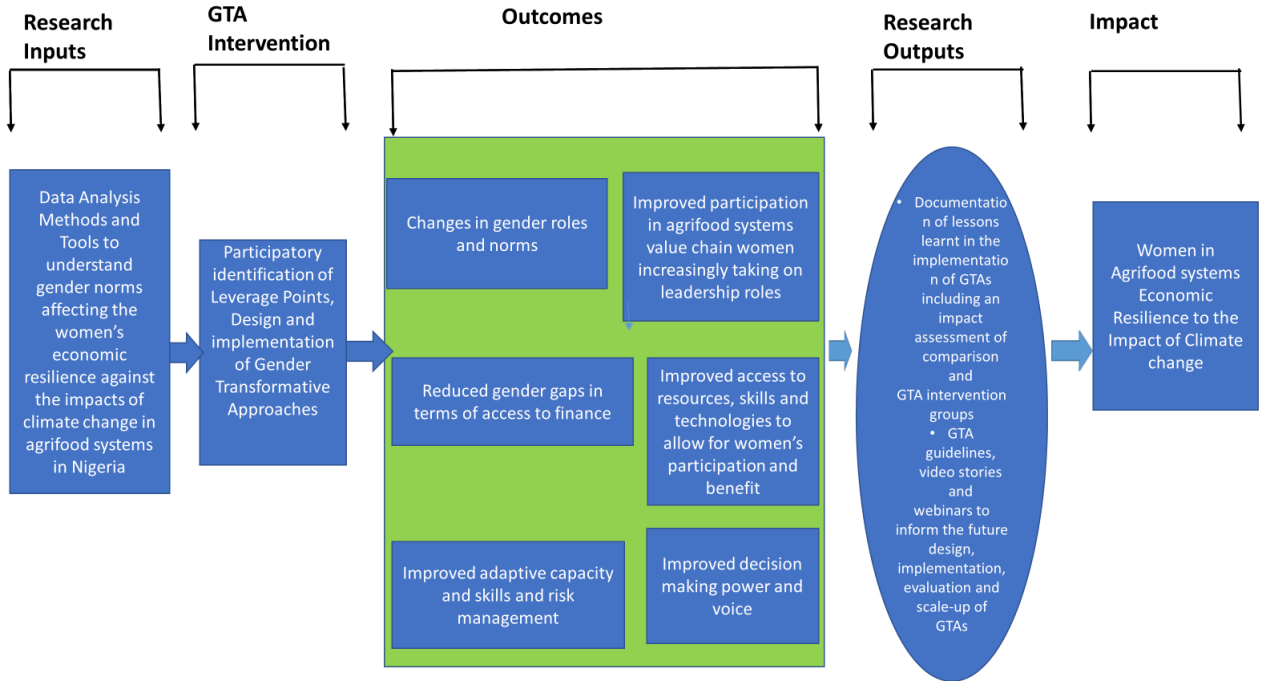

Although the key levers will be identified through the participatory process based on the study results, some preliminary activities should be considered, including the following:

- Organize and support women's groups to encourage one another and to raise their voices and concerns to community leaders and other key stakeholders.
- Train women and raise awareness of their role in small-scale fisheries to engage communities to challenge norms against women's participation and benefits.
- Engage financial service providers to promote access to finance and technologies for women value chain actors.
- Offer business skills development for women and training on climate change and adaptation.
- Strengthen the gender capacities of local governance structures and facilitate a process to challenge them to develop collective solutions to provide a conducive environment for women to work in the sector.

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